

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 91 OF 91
 LINE/LOOP NO. 21X TYPE SURVEY _____ CLIENT _____ DATE 30 DY 1 MO 79 YR
 SURVEYOR B. BENNETT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		UR OR DL	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE 	HORIZ 										
1			TAKE OFF IRON PIPE AT SP 647 L-R 1					1791 ²		✓		1	SP 647 L-R 1 common	
2			2640		89 33 05	4 ⁵		1775 ⁴				2	WITH UP 748 L-R 1X	
3	-		2640		270 25 02	-	-15.6	1759⁸				3	MARKED BY IRON PIPE	
4		746	2420									4	8 TAGS	
5		744	2200		88 29 32	4 ⁵	+53.5	1828 ⁹				5		
6		742	1980									6		
7		740	1760		89 32 30	4 ⁵	+9.6	1785 ²				7	ELEVATIONS NOT	
8		748	1540									8	ESTABLISHED AT VPS	
9		736	1540 1320		89 37 27	4 ⁵	+4.2	1779 ⁶				9	INDICATE LEVEL	
10		734	1100									10	TERRAIN OR A	
11		732	1320 880		89 43 09	4 ⁵	-0.2	1775 ³				11	CONSTANT DEGREE	
12		730	660									12	OF SLOPE	
13		728	1100 440		88 55 00	2 ²	+6.3	1781 ²				13		
14		726	220									14		
15		724	880 0			5 ⁴	-5.4	1770 ²				15		
16		722	220									16		
17		720	660 440		90 22 10	5 ⁵	-8.3	1767 ¹				17		

WORKED BY W.D.H. CHECKED BY 1ST _____ 2ND _____

SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

92

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 2 OF
 LINE/LOOP NO. R1X TYPE SURVEY CLIENT DATE 30 DY 1 MO 79 YR
 SURVEYOR B. BENNETT INSTRUMENT DESC/SERIAL NO. CREW NO.

LINE	 <small>SS</small>	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
1												1		
2		718	660								1775 ¹		2	
3		716	880			90 24 55	55		-11.9		1763 ²		3	
4		714	1100										4	
5		712	1320			90 23 22	55		-13.3		1772 ¹		5	
6		710	1540										6	
7		708	1760			90 24 16	55		-17.9		1757 ⁵		7	
8		706	1980										8	
9		704	2200			90 25 16	55		-21.6		1753 ⁸		9	
10		702	2420										10	
11		700	2640			90 25 16	55		-24.8		1750 ⁶		11	BEGINNING END OF L-R1X
12													12	MARKED BY IRON
13	⊙	Mount. PIPE	2640			89 29 35							13	PIPE & TAG
14	-	AT SP 647 L-R1	2640			89 29 35							14	
15						89 31 10	55		+15 ⁸		1791 ³		15	
16						270 26 08	-				1791 ²	L-R1 647-IRON PIPE	16	
17											+0 ²	MISTLE	17	

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SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES



GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 3 OF 93
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 30 DY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
			SLOPE 	HORIZ 										
1		TAKE OFF MARKER			PIPE AT		SP 647	L-R1	1791.0				1	SP 647 L-R1 IS
2													2	COMMON WITH VP 748
3			2640			✓	9.8						3	L-R1X -
4			2640		ATO-05-40		14.0	-9.8	+9.8	1800.0			4	MARKER PIPE & TAGS
5	-	750	2420										5	
6	-	752	2200										6	
7	-	754	1980										7	
8	-	756	1760		90-11-25		4.5		-10.3	1790.5			8	
9	-	758	1540										9	
10	-	760	1320										10	
11	-	762	1100										11	
12	-	764	880		90-24-30		4.5		-10.8	1790.0			12	
13	-	766	660										13	
14	-	768	440										14	
15	-	770	220										15	
16		772	0				HI 5.4		-5.4	1795.4			16	
17													17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 94 OF 94
 LINE/LOOP NO. R 14 TYPE SURVEY _____ CLIENT _____ DATE 30 DY 1 MO 79 YR
 SURVEYOR W.D.H. INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
				SLOPE 										
1									1800 ^g				1	
2													2	
3	-	774	220										3	
4	-	776	440										4	
5	-	778	660		89-04-30	5.5	+5.2		1806 ^g				5	
6	-	780	880		89-12-03	4.0	+8.3		1809 ^L				6	
7	-	782	1100										7	
8	-	784	1320		89-17-42	5.5	+10.8		1811 ^g 66				8	
9	-	786	1540										9	
10	-	788	1760		89-21-38	5.5	+14.2		1815 ^g				10	
11	-	790	1980										11	
12	-	792	2200		89-22-12	5.5	+18.8		1819 ^g				12	
13	-	794	2420										13	
14	o	796	2640		89-19-53	5.0	+25.9		1826 ^I				14	
15	o,		2640		270-40-03	5.0							15	
16													16	
17													17	







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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 95 OF 5
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 30 DY 1 MO 79 YR
 SURVEYOR W.D. MELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DJI	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE 	HORIZ 										
1		796										1		
2												2		
3			2640		91-01-04	7.0	+53.8 -60.9				1826 ²		3	
4			2640		268-58-50	7.0	+53.8	1880 ⁵					4	
5	-	798	2200 2420										5	
6	-	800	2200		91-00-45	4.5	-43.3				1837 ²		6	
7	-	802	1980										7	
8	-	804	1760		90-59-20	4.5	-34.8				1845 ²		8	
9	-	806	1540										9	
10	-	808	1320										10	
11	-	810	1100		90-56-35	4.5	-22.6				1857 ⁹		11	
12	-	812	880		90-56-20	4.0	-18.4				1862 ¹		12	
13	-	814	660										13	
14	-	816	440		90-59-05	4.0	-11.6				1868 ⁹		14	
15	-	818	220										15	
16		820	0		HI	5.4	-5.4				1875 ¹		16	
17													17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 16 OF 26
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 30 DY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DJ	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
1									1880 \bar{E}				1	
2													2	
3	-	822	220										3	
4	-	824	440	89-29-45	4.0		-0.1		1880 \bar{L}				4	
5	-	826	660										5	
6	-	828	880	89-19-45	5.5		+4.8		1885 \bar{E}				6	
7	-	830	1100										7	
8	-	832	1320										8	
9	-	834	1540										9	
10	-	836	1760	89-25-45	5.5		+12.1		1892 \bar{E}				10	
11	-	838	1980										11	
12	-	840	2200	89-26-00	5.5		+16.4		1896 \bar{L}				12	
13	-	842	2420										13	
14	0	844	2640	89-27-03	7.0	18.5							14	
15	0		2640	270-23-19	7.0		+18.6		1899 \bar{L}				15	
16													16	
17													17	

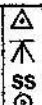





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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 7 OF 97
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 30 DY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE 	HORIZ 											
1		844								1899 ¹			1		
2					90-42-30								2		
3			2640		90-53-20	570	14.0						3		
4			2640		269-17-21	50	14.0	+46.6	1945 ³				4		
5	-	846	2420										5		
6	-	848	2200										6		
7	-	850	1980										7		
8	-	852	1760		90-58-10	4.5		-34.2	1911 ⁵				8		
9	-	854	1540										9		
10	-	856	1320		90-58-55	4.5		-27.1	1918 ⁶				10		
11	-	858	1100										11		
12	-	860	880		91-07-40	4.0		-21.3	1924 ⁴				12		
13	-	862	660										13		
14	-	864	440		91-18-12	4.0		-14.0	1931 ⁷				14		
15	-	866	220										15		
16		868	0		H1	5.4		-5.4	1940 ³				16		
17													17		

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SYMBOLS

 = BACKSIGHT

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SS = SIDESHOT

 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 8 OF 98
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 30 DY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1134

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
1														
2														
3	-	870	220											
4	-	872	440		89-01-43	4.0		+3.5		1949 ²				
5	-	874	660											
6	-	876	880		88-50-30	5.5		+12.3		1958 ⁰				
7	-	878	1100											
8	-	880	1320		88-49-28	5.5		+21.6		1967 ³				
9	-	882	1540											
10	-	884	1760		88-45-26	5.5		+32.7		1978 ⁴				
11	-	886	1980											
12	-	888	2200		88-40-13	5.5		+45.7		1991 ⁴				
13	-	890	2420											
14	0	892	2640		88-24-52	14.0	+59.2	+59.2		2004 ²				
15	0		2640		271-34-56	14.0								
16														
17														

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 99 OF 9
 LINE/LOOP NO. R 1X TYPE SURVEY _____ CLIENT _____ DATE 30 DY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		UR OR BI	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS	
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST					ROD
			SLOPE	HORIZ											
1		892										1			
2												2			
3			2640		91-45-48	7.0	88.1					3			
4			2640		268-14-09	7.0		+88.1	2093 ²			4			
5		894	2420									5			
6		896	2200		91-45-56	4.5		-72.2	2020 ¹⁰⁸			6			
7		898	1980									7			
8		900	1760		91-46-06	4.8		-58.3	2034 ⁷			8			
9		902	1540									9			
10		904	1320		91-48-20	4.0		-45.6	2047 ⁴			10			
11		906	1100									11			
12		908	880		91-47-23	4.0		-31.5	2061 ⁵			12			
13		910	660									13			
14		912	440		91-57-37	4.0		-19.1	2073 ⁹			14			
15		914	220									15			
16		916	0		HI	5.4		-5.4	2087 ⁶			16			
17												17			

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SYMBOLS

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 100 OF 10
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 30 DY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		UR OR DR	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE 	HORIZ 										
1													1	
2													2	
3	-	918	220										3	
4	-	920	440			88-11-10	5.5		+8.4		2101 ⁴		4	
5	-	922	660										5	
6	-	924	880			88-07-20	5.5		+23.4		2116 ⁴		6	
7	-	926	1100										7	
8	-	928	1320			87-56-50	5.5		+41.8		2134 ⁸		8	
9	-	930	1540										9	
10	-	932	1760			87-26-36	5.5		+73.1		2166 ¹		10	
11	-	934	1980										11	
12	-	936	2200			87-04-40	5.5		+106.8		2199 ⁸		12	
13	-	938	2420										13	
14	0	940	2640			86-36-32	10.0	146.2					14	
15	0		2640			273-23-26	10.0		+146.3		2239 ³		15	
16													16	
17													17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 11 OF 101
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 30 DY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1124

LINE	 	STATION	VERTICAL						ELEVATION		U/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE	HORIZ											
1		940								2239 ²			1		
2													2		
3	A		1100		95-06-46	10.0	108.0						3		
4	A		1100		264-53-22	10.0		+108.0	2347 ³				4		
5	-	942	880		95-17-44	4.5		-85.7		2261 ⁶			5		
6	-	944	660		95-18-50	4.5		-65.6		2281 ⁷			6		
7	-	946	440		95-44-48	4.5		-48.6		2298 ⁷			7		
8	-	948	220		95-49-40	4.5		-26.8		2320 ⁵			8		
9	π	950	0		HI	5.5		-5.5		2341 ⁸			9		
10	-	952	220		85-55-00	5.5		+10.2		2357 ⁵			10		
11	-	954	440		86-05-30	5.5		+24.5		2371 ⁸			11		
12	-	956	660		86-15-35	5.5		+37.6		2384 ⁹			12		
13	-	958	880		86-00-26	5.5		+55.8		2393 ¹			13		
14	o	958+110	990		85-58-53	10.0	59.5						14	TP	
15	o		990		274-01-08	10.0		+59.5		2406 ⁸			15		
16													16		
17													17		

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SYMBOLS

= BACKSIGHT

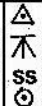








= INSTRUMENT SET-UP

SS = SIDESHOT

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 12 OF 102
 LINE/LOOP NO. R 1 X TYPE SURVEY _____ CLIENT _____ DATE 31 BY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DIA	HORIZONTAL RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD					
			SLOPE 	HORIZ 											
1		958+110										2406 ²		1	TP
2														2	
3			880		91-45-45	10.0	37.1							3	
4			880		268-14-25	10.0		+37.0	2443 ⁸					4	
5	-	960	770		91-58-33	5.3		-31.8	2412 ⁰					5	
6	-	962	550		93-14-21	5.3		-36.4	2407 ⁴					6	
7	-	964	330		94-50-38	5.3		-33.2	2410 ⁸					7	
8	-	966	110		99-05-27	2.0		-19.4	2424 ⁴					8	
9		966+110	0		H1	5.4		-5.4	2438 ⁴					9	TP
10	-	968	110		95-16-06	2.0		-12.1	2431 ⁷					10	
11	-	970	330		95-35-25	10.0		-42.1	2401 ⁷					11	
12	-	968 OFFSET	410		101-38-18	7.0		-92.0	2331 ⁸					12	VP'S 968 & 970 WILL
13	-	970 OFFSET	560		100-24-54	5.0		-106.2	2337 ⁶					13	BE OFFSET 350°
14	-	972	550		95-47-20	14.0		-69.5	2374 ³					14	FEET TO THE EAST
15	-	974	770		95-36-40	10.0		-85.3	2358 ⁵					15	OF LINE DUE TO
16	-	976	990		95-25-45	5.6		-99.3	2344 ⁵					16	ROUGH, STEEP
17	-	978	1400 1210		95-25-45	5.6		-120.1	2323 ¹					17	TERRAIN

13.8
0.5
0.0

6.6
2.0

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____
 SYMBOLS:  = BACKSIGHT
  = INSTRUMENT SET-UP
 ss = SIDESHOT
  = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

103

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 13 OF
 LINE/LOOP NO. R1X TYPE SURVEY CLIENT DATE 31 BY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

12.1 1/2
 5.0 1/2
 7.1
 14.2 1/2
 1.0

LINE	 	STATION	VERTICAL						ELEVATION		HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD	L/R OR DJ	RIGHT TURNED HORIZONTAL ANGLE		LINE
				SLOPE										
1									2443 ^B			1		
2												2		
3		980	1430		95-33-26	5.0	-143.4					3		
4			1430		264-26-33	5.0	-143.4		2300 ^L			4		
5	A											5		
6			2640		85-48-34	5.0	-188.1					6		
7			2640		274-10-53	5.0	-187.9	2112 ^S				7		
8	-	982	2420		86-01-45	5.3	+162.4		2274 ⁹			8		
9	-	984	2200		86-07-00	5.3	+143.8		2256 ³			9		
10	-	482 986	1980		86-10-15	5.3	+127.0		2239 ⁵			10		
11	-	988	1760	86-17-52	86-10-20	5.3	+108.4		2220 ⁹			11		
12	-	990	1540		86-23-00	5.2	+91.9		2204 ⁴			12		
13	-	992	1320		86-31-50	5.2	+74.6		2187 ¹			13		
14	-	994	1100		86-43-35	5.2	+57.5		2170 ²			14		
15	-	996	880		86-56-10	5.2	+41.8		2154 ³			15		
16	-	998	660		87-05-23	5.2	+28.2		2140 ²			16		
17	-	1000	440		87-21-30	5.2	+15.0		2127 ²			17		

TI-23471B

WORKED BY CHECKED BY 1ST 2ND

SYMBOLS = BACKSIGHT
 = INSTRUMENT SET-UP
 = SIDESHOT
 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HAWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 104 OF 11
 LINE/LOOP NO. R 1X TYPE SURVEY _____ CLIENT _____ DATE 31 DY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR D/I	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
1									2112 ⁵				1	
2													2	
3	-	1002	220		87-41-00	5.3	+3.6		2116 ¹				3	
4	X	1004	0		41	5.4	-5.4		2107 ¹				4	
5	-	1006	270		92-23-11	4.0	-13.2		2099 ³				5	
6	-	1008	440										6	
7	-	1010	660		91-38-22	4.0	-22.9		2089 ⁶				7	
8	-	1012	880										8	
9	-	1014	1100		91-12-53	4.0	-27.3		2085 ³				9	
10	-	1016	1320										10	
11	-	1018	1540		91-02-38	4.0	-32.0		2080 ⁵				11	
12	-	1020	1760										12	
13	-	1022	1980		90-56-41	4.0	-36.6		2075 ⁹				13	
14	-	1024	2200										14	
15	-	1026	2420		90-45-07	4.0	-35.6		2076 ⁹				15	
16	○	1028	2640		90-30-34	10.0	-33.3						16	
17	○		2640		269-29-40	10.0	-33.2		2079 ³				17	

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS = BACKSIGHT
 = INSTRUMENT SET-UP
 = SIDESHOT
 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 15 OF 105
 LINE/LOOP NO. L-RIX TYPE SURVEY _____ CLIENT HUSKY DATE 2 DY 2 MO 79 YR
 SURVEYOR W. D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1194

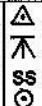





LINE	 	STATION	VERTICAL						ELEVATION		UR OR DN	HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
				SLOPE	HORIZ										
1		1028								2079 [±]			1		
2													2		
3			2640		90-48-05	5.0	41 ³ 42 ²	2121 ³					3	2121 ³ S ² 6	
4			2640		269-11-17	5.0	42 ³ 42 ³						4		
5		1030	2480										5		
6		1032	2200		90-52-30	5.3	-38 ⁸			2092 ⁵			6		
7		1034	1980										7		
8		1036	1760		90-48-54	5.3	-30 ³			2091 ¹			8		
9		1038	1540										9		
10		1040	1320		90-48-54	5.3	-24 ⁰			2097 ³			10		
11		1042	1100										11		
12		1044	880		90-53-20	4.0	-77 ⁶			2103 ⁷			12		
13		1046	660										13		
14		1048	440		91-17-50	2.0	-12 ⁰			2109 ⁹			14		
15		1050	220										15		
16		1052	0		H1	5.4	-5.4			2115 ⁹			16		
17													17		

WORKED BY BRB CHECKED BY: 1ST _____ 2ND _____

SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 106 OF _____
 LINE/LOOP NO. L-RIX TYPE SURVEY _____ CLIENT HUSKY DATE 2 DY 2 MO 77 YR
 SURVEYOR W. D. HELAUDE INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

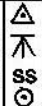







LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE 	HORIZ 										
1												1		
2												2		
3		1054										3		
4		1056	440		89-32-48	2.0	15		2122 ⁸			4		
5		1058										5		
6		1060	880		89-10-15	4.0	88		2130 ¹			6		
7		1062										7		
8		1064	1320		89-01-48	5.7	167		2138 ⁰			8		
9		1066										9		
10		1068	1760		89-48-55	5.7	30 ⁹		2152 ¹			10		
11		1070										11		
12		1072	2200		88-44-00	5.7	43 ⁰		2164 ⁴			12		
13		1074										13		
14	○	1076	2640		88-39-55	5.0	56 ⁶		2178 ⁰			14	2178 ³	
15	○				271-20-06	5.0	56 ⁶					15		
16												16		
17												17		

WORKED BY BEB CHECKED BY 1ST _____ 2ND _____

SYMBOLS  = BACKSIGHT  = INSTRUMENT SET-UP  = SIDESHOT  = FORESIGHT


HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 17 OF 107
 LINE/LOOP NO. L. 21X TYPE SURVEY _____ CLIENT HUSKY DATE 2 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1124

LINE	  	STATION	VERTICAL						ELEVATION		LR OR DR	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS	
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST					ROD
															
1		1076										1			
2												2	2299'		
3			2640		92-24-40	10.0	120 ⁹	2298 ⁹				3			
4					267-35-25	10.0	120 ⁹					4			
5		1078										5			
6		1080	2200		92-38-10	5.3	-106 ⁺	2192 ⁵				6			
7		1082										7			
8		1084	1760		92-46-50	5.3	-90 ⁶	2208 ³				8			
9		1086										9			
10		1088	1320		92-49-30	5.3	-70 ³	2229 ⁶				10			
11		1090										11			
12		1092	890		92-45-47	5.3	-47 ⁷	2251 ²				12			
13		1094										13			
14		1096	440		92-44-45	5.3	-26 ⁴	2272 ⁵				14			
15		1098										15			
16		1100	0		HI	5.4	-5 ⁴	2293 ⁵				16			
17		1100										17			

WORKED BY BBB CHECKED BY 1st _____ 2ND _____

SYMBOLS

 = BACKSIGHT

 = INSTRUMENT SET-UP

 = SIDESHOT

 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

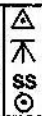






GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 108 OF 18
 LINE/LOOP NO. R 1X TYPE SURVEY _____ CLIENT _____ DATE 2 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE 	HORIZ 											
1															
2															
3		1102													
4		1104	440		87-47-00	3.0		15 9		2314 9					
5		1106													
6		1108	880		87-26-52	4.0		35 2		2334 1					
7		1110													
8		1112	1320		87-19-50	5.7		55 8		2354 7					
9		1114													
10		1116	1760		87-09-30	5.7		81 6		2380 5					
11		1118													
12		1120	2200		87-14-00	5.7		100 6		2399 5					
13	0	1122	2420		87-16-27	6.0		109 2		2408 1					
14	9				87-43-28	6.0		109 2						2408 3	
15															
16															
17															

WORKED BY BRB CHECKED BY 1ST _____ 2ND _____
 SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 19 OF 109
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 3 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
				SLOPE 										
1		1122										1		
2												2		
3			660		90-32-35	10.0		-16 ²	2424 ³			3	2424 ⁶	
4			660		269-27-63	10.0		-16 ²				4		
5		1124	440		90-52-08	4.0		-10 ⁷		2413 ⁷		5		
6		1126	220		91-28-30	2.0		-7 ⁷		2416 ⁷		6		
7		1128	0		H1	5.3		-5.3		2419 ⁰		7		
8												8		
9		BAS 79364	600		83-58-13	5.0		58 ^u		2482 ⁴		9	2482 ⁴ - L -	
10			600		276-01-26	5.0		58 ^o				10	2488 ³² B.M.	
11												11	TIE. -5.9	
12												12		
13												13		
14												14		
15												15		
16												16		
17												17		

WORKED BY BBB CHECKED BY 1ST _____ 2ND _____

SYMBOLS

 = BACKSIGHT

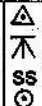












 = INSTRUMENT SET-UP





SS = SIDESHOT

 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 20 OF 110
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT HUSKY DATE 3 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DIA	HORIZONTAL	LINE	REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE 	HORIZ 										
1			TAKE	OFF	BAS	79364		ELEV		2488 ^{3b}		1		
2												2		
3			600			83-52-25	6.0	59°	2430 ³			3	2436 ³	
4			600			276-07-24	6.0	58°	2424 ⁹			4		
5		1130	220									5	1131-0-54	
6		1132	440			89-44-06	4.0	-2°	2428 ³			6		
7		1134	800 660									7		
8		1136	880			89-26-25	5.2	34	2433 ⁷			8		
9		1138	1100									9		
10		1140	1320			89-20-10	10.0	53	2435 ⁵			10	2435 ⁵ 2436-0	
11			1320			276-39-17	10.0	52				11		
12												12		
13			1320			89-36-08	10.0	-08	2436 ⁴			13	2436 ⁴	
14						276-23-12	10.0	-09				14		
15		1142	1210 1100									15		
16		1144	990 880			89-54-25	2.0	-06	2435 ⁹			16		
17		1146	770 660									17		

WORKED BY BPS CHECKED BY 1ST _____ 2ND _____
 SYMBOLS  = BACKSIGHT  = INSTRUMENT SET-UP  SS = SIDESHOT  = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE RT OF 111
 LINE/LOOP NO. L-PIX TYPE SURVEY _____ CLIENT HUSKY DATE 3 BY R MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		UR OR DR	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			<input type="checkbox"/> FEET <input type="checkbox"/> METERS 	<input type="checkbox"/> FEET <input type="checkbox"/> METERS 										
1									2430 ⁴			1		
2												2		
3	-	1148 ✓	440		90-20-18	4.0		-66		2429 ⁸		3		
4		1150	220									4		
5	⊥	1152	0		H1	5.3		-5.3		2431 ¹		5		
6		1154	220		✓	5.4		-5.4				6		
7	○	1154+110	330		90-23-46	14.0		-16 ³		2420 ¹		7	2420 ⁴ 2420 ⁸	
8	○				269-35-55	14.0		-16 ³				8		
9												9		
10	Δ		816		83-08-15	10.0		87 ⁵	2332 ⁷			10	2332 ⁵	
11	Δ		816		276-51-17	10.0		87 ⁵				11		
12		1156	706		83-14-50	14.0		69 ⁰		2401 ⁷		12		
13		1158	486		83-18-40	5.0		51 ⁶		2384 ⁸		13	INSTRUMENT SET UP	
14		1160	266		83-13-20	2.0		29 ⁴		2362 ¹		14	AT 1162+46'-0.5'	
15		1162	46		88-05-05	1.0		0 ⁵		2333 ²		15		
16		1162+110	64		181-51-30	14.0		-27 ²		2305 ⁵		16	EDGE OF CLIFF	
17		1164	174		119-43-40	14.0		-72 ⁷		2259 ⁹		17		

WORKED BY RRE 216 CHECKED BY 1ST _____ 2ND _____

SYMBOLS Δ = BACKSIGHT ⊥ = INSTRUMENT SET-UP SS = SIDESHOT ○ = FORESIGHT

13.3
10.1

14.3
6.0
8.8

14.46
2.02

14.75
13.00
1.75

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 22 OF 112
 LINE/LOOP NO. L-RIX TYPE SURVEY CLIENT HUSKY DATE 3 DY 2 MO 79 YR
 SURVEYOR W. D. HELANDER INSTRUMENT DESC/SERIAL NO. CREW NO. 1194

LINE	 	STATION	VERTICAL						ELEVATION		HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD	L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE		LINE
				SLOPE 										
1									2392.7				1	
2		0766 67	284										2	
3			297		109-12-00	14.0	-111.7		2221.0				3	BASE OF CLIFF
4		1166 1168	400		106-11-45	14.0	-125.0		2207.1				4	
5		1168 1170	420		102-24-45	14.0	-147.3		2185.4				5	
6		1170											6	CHANNING ERROR
7	○	1172 ✓	1060 1046		99-27-15	14.0	-155.2		2177.4		2144.6 2145.5		7	NO SKIPPED
8	○				260-32-22	14.0	-155.3						8	2177.3
9									1965.7				9	
10	△		3520 3300		86-39-00	14.0	191.8	199.8	1995.6				10	
11	△				273-20-39	14.0	191.8						11	1985.9
12		1174	3300										12	
13		1176	3080	1176	1175 MISSING (SEE DAILY REPORT)								13	
14		1178	2860		87-04-25	4.4	141.8		2127.4		2107.5		14	
15		1180 ✓	2640		87-15-30	4.4	122.0		2107.2		2087.7		15	
16		1182	2420		87-27-14	10.0	97.6		2085.3		2063.3		16	
17		1184	2200		87-27-14	4.4	64.9		2050.5		2030.6		17	

WORKED BY ? CHECKED BY 1ST 2ND
 88-11-52 4.4

SYMBOLS △ = BACKSIGHT = INSTRUMENT SET-UP SS = SIDESHOT ○ = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 23-A OF 113
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 3 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR D/I	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
			SLOPE	HORIZ										
1			TAKE OFF UP 1198 TO ESTABLISH							1956 ⁵ / ₅			1	SEE AC. 23
2			ELEVATIONS FOR VP'S 1192, 1194 & 1196										2	LINE 9
3		1198							1961.9				3	
4													4	
5		1198	0		HI	54		-54		1951 ¹ / ₁			5	
6		1192	660		93-55-45	4.0		-492		1907 ³ / ₃		1892.7	6	
7		1194	440		100-58-20	4.7		-884		1868 ¹ / ₁		1853.5	7	
8		1196	220		103-01-20	4.7		-543		1902 ² / ₂		1887.6	8	
9													9	
10													10	
11													11	
12													12	
13													13	
14													14	
15													15	
16													16	
17													17	

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS = BACKSIGHT
 = INSTRUMENT SET-UP
 SS = SIDESHOT
 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 23 OF 114
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT HUSKY DATE 3 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR D/I	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
				SLOPE										
1									1985.6				1	
2													2	
3		1186	1980		88-38-53	14.0		32.8		20.8 1998.5			3	
4		1188	1760		90-03-55	14.0		15.9		1959.7	1949.8		4	
5		1190	1540		91-10-30	14.0		-15.5		1940.1	1920.2		5	
6		1192	1320										6	
7		1194	1100										7	
8		1196	880										8	
9		1198	660		91-19-00	14.0		-29.2		1956.5	1936.5		9	
10		1200	440		89-48-42	14.0		-12.5		1929.1	1953.1		10	
11		1202	220		✓	7.1		-7.1		1929.5	1958.6		11	
12	π	1204	0		HI	5.3		-5.3		1920.3	1960.4		12	
13		1206	220										13	
14		1208	440		✓	9.6		-9.6		1926.9	1956.1		14	
15		1210	660		✓	14.7		-14.7		1920.9	1951.0		15	
16		1212	880		90-24-40	14.0		-20.3		1960.3	1945.4		16	
17													17	

WORKED BY BEB CHECKED BY 1ST _____ 2ND _____
 SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 24 ¹¹⁵ OF
 LINE/LOOP NO. L-RIX TYPE SURVEY CLIENT DATE 3 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> \uparrow <input type="checkbox"/> \odot	STATION	VERTICAL						ELEVATION		L/R OR D/H	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
				SLOPE										
1														
2														
3	\odot	1214	1100		90-52-16	10.0	-267							
4	\odot	1216			269-07-30	10.0	-267							
5														
6	Δ		2690		87-35-32	10.0	-101'	1952'						
7	Δ				272-23-49	10.0	-108'							1852'
8		1216	2420											
9		1218	2200		87-42-17	5.0	332							19413
10		1220	1980		87-44-50	5.0	729							19310
11		1222	1760											
12		1224	1540		87-55-44	5.0	507							19088
13		1226	1320											
14		1228	1100		88-13-40	5.0	290							18871
15		1230	880											
16		1232	660		88-29-20	5.0	124							18705
17		1234	440											

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 SYMBOLS Δ = BACKSIGHT \uparrow = INSTRUMENT SET-UP ss = SIDESHOT \odot = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 25 OF 116
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR D/I	HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE		
1															
2															
3		1236	220		89-29-18	4.0	-2°				1836'				
4		1238	0		H1	5.4	-5.4				1852'				
5		1240	220												
6		1242	440		90-13-20	14.0	-15.7				1842.4				
7		1244	660		90-38-00	14.0	-21.3				1836.8				
8		1246	880												
9		1248	1100		90-54-33	14.0	31.4				1826.7				
10		1250	1320												
11		1252	1540		90-59-17	14.0	-40.5				1817.0				
12		1254	1760												
13		1256	1980		91-01-15	14.0	-49.2				1808.9				
14		1258	2200												
15		1260	2420		90-59-20	14.0	-55.5				1802.6	1784.7		1802.0	
16		1262	2640		219-00-35	14.0	-55.6								
17															

13.9
 4.0
 9.9
 13.2
 4.0
 11.2

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 SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 26 OF 117
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 5 DY 2 MO 7 YR
 SURVEYOR W. D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
1													1	
2													2	
3			1320		88-49-03	14.0		133	17893				3	1788 1/2
4			1320		271-10-26	14.0		132					4	
5		1262	1100										5	
6		1264	880		88-54-04	10.0		69			1796 2		6	
7		1266	660										7	
8		1268	440		88-38-55	10.0		04			1789 7		8	
9		1270	220										9	
10		1272	0		-	56		-56			1783 7		10	
11		1274	220		93-13-35	14.0		-264			1762 9		11	
12		1276	440		93-39-00	4.0		-320			1757 3		12	
13		1278	660										13	
14		1280	880		91-56-40	14.0		-438			1745 5		14	
15		1282	1100										15	
16		1284	1320		91-21-40	4.0		-353			1754 0		16	
17													17	

WORKED BY BRB CHECKED BY 1ST _____ 2ND _____
 SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 1 PAGE 27 ¹⁰⁸ OF
 LINE/LOOP NO. R1X TYPE SURVEY CLIENT Husey DATE 9 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DJ	HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE		
				SLOPE											HORIZ
1													1		
2														2	
3		12.86	1540		90-08-50	14.0	-17.9		1771.7			1754.2	3	1771.2	
4					269-51-00	14.0	-17.9						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		

WORKED BY BED CHECKED BY 1ST 2ND

SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES




GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 22 OF 119
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT HUSKY DATE 4 DY 2 MO 79 YB
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL							HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR DI		RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST			
1												1	
2		1286	2090		90 09 45	10	15 8	1787 8				2	1787 8
3					269 49 52	-	16 0					3	
4		1280	1650		90 09 02	4 5	- 8 8	1772 6				4	
5		1292	1490		90 15 10	4 5	- 10 8	1776 6				5	
6		1294	1210		90 15 10	4 5	- 9 8	1777 5				6	
7		1296	990									7	
8		1298	770		90 40 32	4	- 13 1	1774 3				8	
9		1300	550									9	
10		1302	330		91 13 22	4 5	- 11 5	1775 8				10	
11		1304	110									11	
12		1305	0		-	5 4	- 5 4	1782 0				12	
13		1306	110		100 11 37	2	- 21 5	1765 9				13	
14		1308	330		95 26 57	5 1	- 36 4	1750 9				14	
15		1310	550									15	
16		1312	770		93 34 22	5 1	- 53 1	1734 2				16	
17												17	


WORKED BY BRB CHECKED BY 1ST _____ 2ND _____
 SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 29¹²⁰ OF
 LINE/LOOP NO. R1X TYPE SURVEY CLIENT HUSKY DATE 4 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	 △ SS ⊙	STATION	VERTICAL						ELEVATION		L/R OR D/I	HORIZONTAL		REMARKS	
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
			 SLOPE	 HORIZ											
1															
2		1314	990							1727 ³					
3		1316	1210		92 44 22	5'		-62 ⁹		1729 ⁵					
4		1318	1430												
5		1320	1650		92 01 25	5'		-63 ³		1724 ⁰					
6		1322	1870												
7		1324	2090		91 21 25	5		-59 ⁴		1733 ⁰					
8	⊙	1326	2310		90 55 00	10		-46 ⁸		1740 ⁴		1724 ⁰		1740 ²	
9	-				269 04 40	-		-47 ⁰							
10															
11	△		2310		89 47 45	5		3 ³		1737 ²					
12	-				270 11 47	-		3 ²						1737 ⁰	
13		1328	2090/1870												
14		1330	1870/1650		89 48 36	45		18		1739 ⁰					
15		1332	1650/1430												
16		1334	1430/1210		90 03 45	45		6 ⁰		1731 ²					RIVER BED
17		1336	1210/990		90 35 20	45		-16 ⁹		1720 ³					RIVER BED

20 13⁵/₂
 25 13⁶/₂

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 SYMBOLS: △ = BACKSIGHT  = INSTRUMENT SET-UP SS = SIDESHOT ⊙ = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 30 OF 121
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT HUSKY DATE 4 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
				SLOPE 										
1									1737 ²			1		
2		1340	770		90 55 43	45	-17°		1720 ²			2	RIVER BED	
3		1342	550		91 13 47	45	-163		1720 ⁹			3	ICE.	
4		1344	390									4		
5		1346	110		92 16 32	2	67		1730 ⁸			5		
6	π	1347	0		-	54	-54		1731 ⁸			6		
7		1348	110									7		
8		1350	390		89 30 55	5'	23		1734 ⁹			8		
9		1352	550									9		
10		1354	770		89 44 10	5'	15		1735 ⁷			10		
11		1356	990									11		
12		1358	1210		89 37 52	5'	27		1739 ⁹			12		
13		1360	1430									13		
14		1362	1650		89 11 25	5'	183		1755 ⁵			14		
15		1364	1870									15		
16		1366	2090		88 54 04	5'	95'		1772 ³			16		
17		1368										17		

WORKED BY BOB CHECKED BY 1ST _____ 2ND _____

SYMBOLS: = BACKSIGHT
 = INSTRUMENT SET-UP
 SS = SIDESHOT
 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 31 OF 122
 LINE/LOOP NO. RIX TYPE SURVEY _____ CLIENT HUSKY DATE 4 DY 2 MO 79 YR
 SURVEYOR B. BENEDIET INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE		
			SLOPE 	HORIZ 											
1															
2		1368	2310			88 48 02	10		384		1775 ⁵	1759-9	2	1775 ³	
3						271 11 34	-		38 ³				3		271-11-34 used
4													4		
5			2640			91 15 52	5		-63'		1838 ⁷		5	1838 ⁵	
6						268 44 02	-		-63 ²				6		
7		1370	2420										7		
8		1372	2200			91 35 12	45		-65 ³		1773 ³		8		
9		1374	1980										9		
10		1376	1760			91 45 45	45		-58 ⁶		1780'		10		
11		1378	1540										11		
12		1380	1320			91 50 30	45		-46 ⁹		1791 ⁸		12		
13		1382	1100										13		
14		1384	980			92 48 46	4		-47 ²		1791 ⁵		14		
15		1386	660			92 48 46	13 ⁵		-45 ⁷		1792 ⁸		15		
16		1388	440										16		CREEK BOTTOM
17		1389 1390	330			92 48 46	15		-31 ²		1807 ⁵		17		

WORKED BY BRD CHECKED BY 1ST _____ 2ND _____

SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

123

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 32 OF
 LINE/LOOP NO. R1X TYPE SURVEY CLIENT HUSKY DATE 4 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
				SLOPE 										
1									1938 ⁷			1		
2		1390	220		92 48 46	4 ³	-15'		1823.6			2		
3		1392	0		—	5 ⁴	-5'		1833.3			3		
4		1393	110		92 21 30	2	-6.5		1832.1			4		
5		1394	220		92 53 30	17 ⁸	-25.9		1812.7			5		
6		1396	440		93 10 55	15 ⁴	-39.8		1798.8			6		
7		1398	660									7		
8		1400	880		91 45 55	5'	-32.2		1806.5			8		
9		1402	1100									9		
10		1404	1320		90 40 31	5'	-20.6		1818.1			10		
11		1406	1540									11		
12		1408	1760		90 06 00	4 ⁵	-7.5		1831.2			12		
13		1410	1980									13		
14		1412	2200		89 43 59	5'	5.2		1843.9			14		
15		1414	2420									15		
16		1416	2640	✓	89 18 08	10	22.3		1860.8		1846.2	16		
17	-				87 41 33	-	22.2					17	1860.6	

WORKED BY BRB CHECKED BY 1ST 2ND
 SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

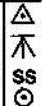



GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE ¹²⁴83 OF
 LINE/LOOP NO. 21X TYPE SURVEY CLIENT HUSKY DATE 4 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	 	STATION	VERTICAL							HORIZONTAL		REMARKS		
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	ELEVATION		L/R OR DI		RIGHT TURNED HORIZONTAL ANGLE	
			SLOPE	HORIZ				INST	ROD					
1			2640			92 07 07	15		-1125	1973 ⁴			1	
2	-					267 52 40	-		-1125				2	1973'
3		1418	2200										3	
4		1420	1980	15 Hr		92 02 50	17		-897	1893 ⁷			4	
5		1422	1760	0									5	
6		1424	1590	+7 Hr		93.25 10	22			1859 ⁶			6	
7		1426	1320										7	
8		1428	1100			92 04 55	15		-549	1922 ²			8	
9		1430	890										9	
10		1432	660			92 03 45	45		-282	1945'			10	
11		1434	440			91 51 40	4		-183	1955'			11	
12		1436	220										12	
13		1440	0			-	54		-54	1968 ⁰			13	
14		1442	220										14	
15		1444	440			90 29 50	4		78	1965 ⁶			15	
16		1446	660										16	
17		1448	880			90 17 25	4		84	1964 ⁷			17	

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SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 125 OF 125
 LINE/LOOP NO. RIX TYPE SURVEY _____ CLIENT HUSKY DATE 4 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

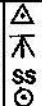




LINE	 SS  ◎	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE 	HORIZ 											
1															
2		1950	1100						1973 ⁴						
3		1452	1320		90 01 10	4		-44		1969 ⁰					
4		1454	1510												
5		1456	1700		89 45 33	4		35		1976 ⁸					
6		1458	1980												
7		1460	2200		89.31 48	5 ¹		13 ⁰		1986 ⁴					
8		1462	2420												
9	◎	1484	2640		89 31 25	5		17 ¹		1990 ²		1976.5		1990 ⁰	
10	-				270 28 00	-		16 ⁹							
11															
12															
13															
14															
15															
16															
17															

WORKED BY BBD CHECKED BY 1ST _____ 2ND _____

SYMBOLS  = BACKSIGHT  = INSTRUMENT SET-UP  = SIDESHOT  = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE ¹²⁶25 OF
 LINE/LOOP NO. RIX TYPE SURVEY CLIENT HUSKY DATE 5 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE 	HORIZ 											
1			2200			90 26 32	4'		20'	2011'			1		
2	-					269 33 40	-		20 9				2	2010 9	
3		1466	1980										3		
4		1468	1260			90 25 32	4		-17 0	1994'			4		
5		1470	1540										5		
6		1472	1320			90 32 20	4		-16 8	1994 4			6		
7		1474	1100										7		
8		1476	880			90 29 20	4		-11 5	1999 6			8		
9		1478	660										9		
10		1480	440			90 10 33	4		-5 3	2005 8			10		
11		1482	220										11		
12		1484	0				5'		-5'	2005 7			12		
13		1486	220										13		
14		1488	440			89 48 42	4'		-2 6	2008 5			14		
15		1490	660										15		
16		1492	880			89 21 25	4		5 9	2017 0			16		
17		1494	1100										17		

WORKED BY B.B.B. CHECKED BY 1ST 2ND

SYMBOLS

 = BACKSIGHT

 = INSTRUMENT SET-UP

 = SIDESHOT

 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES




GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 36 OF 127
 LINE/LOOP NO. RK TYPE SURVEY _____ CLIENT HUSKY DATE 6 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
				SLOPE										
1									2011'					
2		1496	1320		89 09 21	4'		173		2028'				
3		1498	1540											
4		1500	1700		88 54 15	4'		296		2040'				
5	⊙	1502	1980		88 53 57	5'		33'		2044 ²		2031.2		2044 ⁰
6	⊖				271 05 53	-		33'						
7														
8	Δ		660		88 57 58	5'		63		2037 ⁵				RESHOOT BACK SIGHT
9	-				270 02 04	-		63						88 59 12 2037 ³
10		1504	440		88 55 00	4'		63		2044 ⁴				5-
11		1506	220		88 08 21	4'		3'		2040 ⁷				
12	⊕	1508	0			54		-54		2032 ¹				
13		1510	220		92 43 10	4'								
14		1512	440		92 43 10	4'		-259		2012 ⁶				
15		1514	660											
16		1516	880		92 11 36	4'		-378		1999 ⁷				
17		1518	1100											

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 SYMBOLS Δ = BACKSIGHT ⊕ = INSTRUMENT SET-UP SS = SIDESHOT ⊙ = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE ¹²⁸37 OF
 LINE/LOOP NO. R1X TYPE SURVEY CLIENT AUSKY DATE 6 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184







LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
			SLOPE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS HORIZ										
1									2037.5				1	
2		1520	1320 1780		91 42 27	5		- 46.6		1990.9		1978.4	2	1990.2
3	-				268 11 29	-		46.6					3	1990.9
4													4	
5			2640		90 33 18	5		30.7	2021.4				5	
6	-				269 26 30	-		30.5					6	2026.7
7		1522	2420										7	2021.8
8		1524	2200		91 02 24	4°		- 43.8		1977.6			8	
9		1526	1980										9	
10		1528	1760		91 06 37	4°		- 38.0		1983.4			10	
11		1530	1540										11	
12		1532	1320		91 11 20	4°		- 31.9		1990.1			12	
13		1534	1100										13	
14		1536	880		91 12 49	4°		- 22.6		1998.8			14	
15		1538	660										15	
16		1540	440		91 17 38	4°		- 13.9		2007.5			16	
17		1542	220										17	

WORKED BY B. B. CHECKED BY 1ST 2ND

SYMBOLS  = BACKSIGHT
  = INSTRUMENT SET-UP
 SS = SIDESHOT
  = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES.

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 31 OF 129
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT HOSKY DATE 6 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1194




LINE		STATION	VERTICAL						ELEVATION		L/R OR DIA	HORIZONTAL		REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
			SLOPE 	<input type="checkbox"/> FEET <input type="checkbox"/> METERS HORIZ 										
1														
2		1544	0		54		-54	20214						
3		1546	220											
4		1548	490	89 20 98	4		10							
5		1550	660											
6		1552	880	89 32 21	4		3'							
7		1554	1100											
8		1556	1320	89 41 07	4'		32							
9		1558	1540											
10		1560	1760	89 31 52	4'		104							
11		1562	1980											
12		1564	2200	89 26 47	4'		177							
13		1566	2420											
14		1568	2640	89 24 10	5		227					20324	20492	
15	-			270 35 26	-		225							
16														
17			1980	91 03 02	13		-492							




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SYMBOLS  = BACKSIGHT  = INSTRUMENT SET-UP  = SIDESHOT  = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 130 OF 130
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT HUSKY DATE 6 BY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 SS 	STATION	VERTICAL							HORIZONTAL		REMARKS	
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR DI		RIGHT TURNED HORIZONTAL ANGLE
			SLOPE	HORIZ					INST	ROD			
1					268 56 40	13		493	20932			1	20985
2		1570	1760									2	
3		1572	1540		91 12 28	45		-369		20563		3	
4		1574	1320									4	
5		1576	1100		91 10 22	45		-270		20662		5	
6		1578	890									6	
7		1280	660		91 03 00	45		-166		20766		7	
8		1582	440									8	
9		1584	220		91 41 40	45		-114		20918		9	
10		1586	0		—	54		-54		20879		10	
11		1588	220		90 26 15	4		-67		20875		11	
12		1580	440									12	
13		1592	660		90 07 38	49		-58		20874		13	
14		1594	890									14	
15		1596	1100		90 18 38	53		-112		20820		15	
16		1598	1320									16	
17		1600	1540		89 47 42	53		03		20936		17	

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 SYMBOLS  = BACKSIGHT  = INSTRUMENT SET-UP SS = SIDESHOT  = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOCWORD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 40 OF 131
 LINE/LOOP NO. RIX TYPE SURVEY _____ CLIENT HUSKY DATE 6 BY R MO 19 YR
 SURVEYOR B BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE	HORIZ											
1										2093 ²			1		
2		1602	1760										2		
3		1604	1980		89.28 10	18.10		84		2101.7		2090.8	3		
4	-				210 32 03	-		85					4		
5													5		
6			2750		90 56 50	10		55 ³		2157.2			6		
7	-				269 02 44	-		55 ⁵					7		
8		1608	239 2750		91 00 23	45		- 45 ⁰		2112.2			8		
9		1610	2090										9		
10		1612	1870		91 03 42	45		- 38 ⁹		2118.3			10		
11		1614	1650										11		
12		1616	1430		91 12 20	45		- 34 ⁵		2122.6			12		
13		1618	1210										13		
14		1620	990		91 08 33	4		- 23 ⁷		2133.4			14		
15		1622	770										15		
16		1624	550		91 19 08	45		- 17 ²		2140 ⁰			16		
17		1626	330										17		

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SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 1 PAGE 132 OF 324
 LINE/LOOP NO. RK TYPE SURVEY _____ CLIENT Husky DATE 6 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE		
				SLOPE											HORIZ
1									2157 ²				1		
2		1628	110			91 16 50	4		-65		2150 ⁷			2	
3		1629	0			—	54		-54		2151 ⁸			3	
4		1630	110											4	
5		1632	330			90 59 33	5 ³		-110		2146 ³			5	
6		1634	550											6	
7		1636	770			90 15 30	5 ³		-98		2198 ⁹			7	
8		1638	990											8	
9		1640	1210			90 06 50	5 ³		-77		2149 ⁶			9	
10		1642	1430											10	
11		1644	1650			90 14 04	5 ³		-12'		2145 ¹			11	
12		1646	1870											12	
13		1648	1892090			90 14 04	12 ³		-204		2136 ⁴			13	
14		E.O.L.	1650 2310			90 14 04	14 ³		-236		2133 ⁶			14	
15														15	
16														16	
17														17	

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SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE ¹³³ ~~12~~ OF
 LINE/LOOP NO. R1X TYPE SURVEY CLIENT HUSKY DATE 6 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	 	STATION	VERTICAL							HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR DI		RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST			
1												1	
2		B.M. 79392		57.95	89 39 55	67	27.8		2184.9			2	
3	-				270 20 05	-						3	
4												4	
5												5	
6												6	
7									R1X 2184.9			7	2184.9 2176
8									B.M. 2176.16	✓		8	TLE 8.8
9												9	
10									TLE 8.8			10	
11												11	
12												12	
13												13	
14												14	
15												15	
16												16	
17												17	

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 SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP SS = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

44

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 1 OF _____
 LINE/LOOP NO. L-R1X TYPE SURVEY _____ CLIENT _____ DATE 29 DY 1 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE	HORIZ											
1		748										00 00 00	1	Δ AZ D 700 896	
2		B.P. 79386 - B.O.L. 700 79386 - 700	5280°									D 254 34 00	2	2640 5280°	
3												179 59 52	3		
4												R 74 33 56	4	254-34-00	
5													5		
6		748			D 88-29-20	→						00 00 00	6	Δ AZ. D 958+110	
7		B.P. 79386 - 958+110 79386 - 958+110	23.214 ⁹⁷		R 271-29-35							D 74 29 55	7	23.214 ⁹⁷	
8												179 59 50	8		
9												R 254 29 50	9	74-29-52	
10												00 00 00	10		
11													11	VP 748 IS COMMON	
12													12	WITH SP 647 L-R 1	
13													13	AND IS MARKED BY	
14													14	AN IRON PIPE & TAGS	
15													15		
16													16		
17													17		

TI-23471B

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SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

45

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 2 OF _____
 LINE/LOOP NO. R 1 X TYPE SURVEY _____ CLIENT _____ DATE 31 DY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS										
1													1	
2		748 ID 958+110		TR.	88 29 20	→							2	
3			23,210	23,214.9	271 29 35								3	
4													4	
5		958+110	892.5	TR.	87 55 11	←					00 00 00	5	SEE PG. 3 FOR	
6		AZ. ID 966+122			272 03 05						D 76 22 27	6	AZIMUTH ANGLE	
7											179 59 16	7		
8											R 256 22 11	8	76-22-41	
9		966+122.5	20,117.5	TR	92 06 36	→						9		
10		958+110 ID 1152+110	20,404.00		267 51 03						00 00 32	10		
11											D 183 59 36	11		
12					75 90 02 05	←					180 00 35	12		
13					269 36 02						R 03 59 11	13	183-58-50	
14												14		
15												15		
16												16		
17												17		

TI-23471B

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SYMBOLS
 = BACKSIGHT
 = INSTRUMENT SET-UP
 = SIDESHOT
 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

46

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 3 OF _____
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 30 BY 1 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL							HORIZONTAL		REMARKS		
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DR		RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST.				
1														
2		958+110			→	HI				V.	23	2	FOR USE WITH *	
3		748 - AZIMUTH				HT				D	89-11-12	3	958+110 AZ - 966+122° ON	
4				91-32-36	←	HI 5.6					89-10-49	4	PG 2 L-5	
5				268-27-05		HT 6.0				V.	180-00-45	5		
6										R	269-11-35	6		
7											89-10-50	7	89-10-50	
8												8		
9												9		
10												10		
11		1152+110								V.	18	11	FOR USE WITH *	
12		966+110 - AZIMUTH								D	114-41-24	12	1152+110 AZ - 1346+170 ON	
13											114-41-06	13	PG 4, L-10	
14				270-01-37	←	HI 5.2				V.	180-00-27	14		
15				89-58-41		HT 4.3				R	294-41-30	15		
16											114-41-03	16	114-41-04	
17												17		

TI-23471B

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SYMBOLS

= BACKSIGHT

= INSTRUMENT SET-UP

SS = SIDESHOT

= FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

47

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 4 OF _____
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 3 DY 2 MO 77 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		HORIZONTAL		REMARKS										
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD	L/R OR DI	RIGHT TURNED HORIZONTAL ANGLE		LINE									
				SLOPE											HORIZ								
1		08579364 B.M. → 1152+110		<input type="checkbox"/>																			
2		1152+110																					
3		AZ ID B.M. 79364																					
4																							
5																							
6																							
7																							
8																							
9		1152+110 - 1346+110																					
10		1152+110																					
11		AZ - 1346+110																					
12																							
13																							
14																							
15																							
16																							
17																							

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SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 5 OF _____
 LINE/LOOP NO. R1X TYPE SURVEY _____ CLIENT _____ DATE 4 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL							HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR D/I		RIGHT TURNED HORIZONTAL ANGLE
			SLOPE	HORIZ				INST	ROD	LINE			
1												1	
2		1346+110 (1347)										2	FOR USE WITH ANGLE
3		152+110 - AZ STAKE										3	1347 AZ → 1440 ON PG. 6
4						← HI 5.4						4	88-52-51 LINE 2
5						HT 4.7						5	V ₂ 180-00-32
6												6	R 268-53-21
7												7	88-52-49 88-52-50
8												8	
9												9	
10												10	
11												11	
12												12	
13												13	
14												14	
15												15	
16												16	
17												17	

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SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

49

GSI AREA _____ STATE/COUNTY _____ BOOK NO. _____ PAGE 6 OF _____
 LINE/LOOP NO. _____ TYPE SURVEY _____ CLIENT _____ DATE _____ DY _____ MO _____ YR _____
 SURVEYOR _____ INSTRUMENT DESC/SERIAL NO. _____ CREW NO. _____

LINE	 	STATION	VERTICAL						HORIZONTAL		REMARKS	
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	ELEVATION		L/R OR DI		RIGHT TURNED HORIZONTAL ANGLE
			SLOPE	HORIZ				INST	ROD			
1											1	
2		1347	10214.77	88° 40' 32"		01-19-28			V ¹	00 00 39	2	USE WITH AZIMUTH
3		AZ. → 1440		271 19 14					L	75 33 13	3	ANGLE ON PG. 5
4									V	75-32-34	4	LINE 2
5					54				V ²	180 01 12	5	
6									R	255 33 15	6	
7										75-33-03	7	75-32-49
8		1440							V ¹	00 00 40	8	
9		1347 → 1502							L	182 30 44	9	
10										182-30-04	10	
11				89 21 00		00-39-00			V ²	180 00 52	11	
12				270 38 42					R	02 31 02	12	
13										182-30-10	13	182-30-07
14											14	
15											15	
16											16	
17											17	

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SYMBOLS
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 = SIDESHOT
 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

50

GSI AREA _____ STATE/COUNTY _____ BOOK NO. _____ PAGE 67 OF _____
 LINE/LOOP NO. _____ TYPE SURVEY _____ CLIENT _____ DATE _____ BY _____ MO _____ YR _____
 SURVEYOR _____ INSTRUMENT DESC/SERIAL NO. _____ CREW NO. _____

LINE	 	STATION	VERTICAL							HORIZONTAL		REMARKS		
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR D/I		RIGHT TURNED HORIZONTAL ANGLE	
				SLOPE					HORIZ	INST				ROD
1		1502			90 37 54						" V	00 00 13	1	
2		1440 - 1628+110			269 22 00						L	181 12 24	2	
3											V	180 00 37	3	
4					89 32 42						R	01 12 37	4	181-12-05
5					270 27 49								5	
6													6	
7													7	
8													8	
9		1628+110			90 25 40						" V	00 00 18	9	
10		1502 - 1650			249 33 45						L	180 00 10	10	
11													11	
12		1628+110			89 39 55	67		00-20-05			V	180 00 29	12	
13		1502 - B.M. 79392	5785.08		270 26 05						R	00 00 21	13	179-59-52
14			508								" V	00 00 41	14	
15			85								L	120 32 02	15	
16			28								V	180 00 59	16	
17			57								R	500 32 27	17	120-31-25

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SYMBOLS

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= INSTRUMENT SET-UP

= SIDESHOT

= FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

51

GSI AREA _____ STATE/COUNTY _____ BOOK NO. _____ PAGE 78 OF _____
 LINE/LOOP NO. _____ TYPE SURVEY _____ CLIENT _____ DATE _____ BY _____ MO _____ YR _____
 SURVEYOR _____ INSTRUMENT DESC/SERIAL NO. _____ CREW NO. _____

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			 SLOPE	 HORIZ										
1												1		
2		1628+110		5785.08	90 16 45	10						2		
3	-			⁵⁰⁸ 269 43 12	-							3		
4				⁷⁵ ¹⁶ 027								4		
5		B.M.	0	0	—	56						5		
6												6		
7		B.M. 19392								V	00 00 42	7	USE SCALED DIST.	
8		1628+110 - B.M.	79390							L	49 19 18	8		
9												9		
10										V	180 00 51	10		
11										R	229 19 30	11	49-18-38	
12												12		
13		B.M. 79392		11249.55	90 44 57	18				V	00 00 15	13		
14		B.M. - INT.		⁴⁸ ²⁴ 79390	269 15 25	-				L	343 51 37	14	INT. L-RIX VRI564	
15				¹¹²							343-51-22	15	L-615 VRI 390	
16			0	0	—	56				V	180 00 11	16		
17										R	163 51 47	17	343-51-29	

343-51-36

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