

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HONOLULU PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 1 OF 1
 LINE LOOP NO. SI-XS TYPE SURVEY _____ CLIENT HUSKY DATE 13 DY 4 MO 72 YR
 SURVEYOR J. ANDERSON 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										T.K. 2159.5	REFERENCE: G.A.S SURVEY	1	-TAIL SPREAD-	
2		B.M. 79341	2849.9		92 37 52	+15.0	+130.8	+145.8	2305.7			2	-SOUTH END-	
3			TELLING METRE DISTANCE		267 21 56	+15.0	+131.0	+146.6				3	METAL TAG:	
4		E.O.L. PIPE, V.P. 2000 LINE SI-XS	0		90 00 00	-4.9	-	-4.9				4	1184, LN SI-XS, E.O.L. V.P. 2000, GRAV. B383	
5		1998	220		-							5	CHANGED TO	
6		1996	440		92 39 08	-15.0	-20.4	-35.4				6	"PT. VETTI"	
7		1994	660		-							7		
8		1992	880		93 06 07	-22.0	-47.6	-69.6				8	7' + 15' BOOST	
9		1990	1100		-							9		
10		1788	1320		93 16 27	-26.0	-75.4	-101.4				10	7' + 4' + 15' BOOST	
11		1986	1540		-							11		
12		1984	1760		93 12 44	-26.0	-98.6	-124.6				12	7' + 4' + 15' BOOST	
13		1982	1980		-							13		
14		1980	2200		93 07 17	-2.6	-119.8	-122.4				14	7' + 4' + 15' BOOST	
15		1978	2420									15		
16		1976	2640 ✓		93 10 12	-15.0	-146.0	-161.0		2144.5		16		
17					266 49 18	-15.0	-146.4	-161.4				17		

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS

= BACKSIGHT

= INSTRUMENT SET-UP







= SIDESHOT

= FORESIGHT

VERTICAL AND VERTICAL SURVEY NOTES

GSI AREA Howards Pass STATE/COUNTY ALASKA BOOK NO. 4 PAGE 2 OF 59
 LINE/LOOP NO. SI-XS TYPE SURVEY _____ CLIENT Husky DATE 13 DY 4 MO 72 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

2

LINE		STATION	VERTICAL						ELEVATION		LR 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														
2	Δ	1976	T 13.80	880	91 55 58	+15.0	+59.4	+74.4	2219.0					
3	Δ		C 5.00	1760	268 03 41	+16.0	+59.5	+74.5						
4		1974		1540										
5		1972		1320	93 07 07	4.0	-71.8	-75.8						
6		1970		1100										
7		1968		880	93 05 29	-16.0	-47.5	-62.5						
8		1966		660										
9		1964		440	93 19 59	-4.0	-25.6	-29.6						
10		1962		220										
11	π	1960		0	90 00 00	+9	-	-9						
12		1958		220										
13	\odot	1956	T 14.40	440	90 00 00	12.0	-	-12.0	2207.0					
14	ϕ		B 10.00	440	276 00 00	12.0	-	-12.0						
15														
16														
17														

DELETED
 WITH SLACKS REMOVED

KANSAS
 (SSE)

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS Δ = BACKSIGHT ∇ = INSTRUMENT SET-UP SS = SIDESHOT \odot = FORESIGHT

VERTICAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 60 OF 3
 LINE/LOOP NO. SI-XS TYPE SURVEY _____ CLIENT Huskey DATE 13 DY 4 MO 72 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 SS 	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			1754	1100 ✓			85 40 48	+12.0	-82.9	-70.9		2136.2		2	
3							274 18 26	+12.0	-82.6	-70.6				3	
4		END OR TAIL SO	1754	880										4	
5		SOUTH END OF	1752	660	658		85 38 56	-4.0	+49.9	+45.9		2182.1		5	
6		46	1750	440										6	
7		44	1748	220	219.4		85 41 06	-2.0	+16.5	+14.5		2150.7		7	
8	X	42	1746	0			90 00 00	-4.9	-	-4.9		2131.3		8	
9		40	1744	220	219.2		95 01 05	-4.0	-19.2	-23.2		2113.0		9	
10	J	38	1742	440										10	
11	O	36	1740	13.80 660 ✓			92 50 44	-15.0	-32.8	-47.8		2088.4		11	
12	O			13.700 660			267 09 24	-15.0	-32.7	-47.7				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

VERTICAL AND HORIZONTAL SURVEY NOTES

GSI AREA HONARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 4 OF 61
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT Huser DATE 12 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON 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	HORIZ										
1														
2	Δ	36 1940	T 9.70	770	85 10 15	+1.5	-129.6	-128.1	1960.4					2
3	Δ		B 2.00	1540	274 49 11	+1.5	-124.4	-127.9						3
4		34 1938		1320										4
5		32 1936		1100	1096.5	85 25 13	-5.0	+87.8	+82.6		2043.0			5
6		30 1934		880										6
7		28 1932		660		85 17 25	-5.0	+54.2	+49.2		2009.6			7
8		26 1930		440										8
9		24 1928		220		85 06 14	-4.0	+18.8	+14.8		1975.2			9
10	⊗	22 1926		0		90 00 00	+1.9	-	-1.9		1955.5			10
11		20 1924		220		95 22 26	-4.0	-20.6	-24.6		1935.8			11
12		18 1922		440										12
13		16 1920		660		95 15 03	-4.0	-66.2	-70.2		1890.2			13
14		14 1918		880										14
15		12 1916		1100		91 51 36	-2.0	-35.7	-37.7		1922.7			15
16		10 1914		1320										16
17		8 1912		1540		87 28 42	-2.0	+14.0	+12.0		1972.4			17

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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. 4 PAGE 5 OF 5
 LINE/LOOP NO. S1-XS TYPE SURVEY _____ CLIENT HURLEY DATE 13 DY 1 MO 79 YR
 SURVEYOR J. ANDERSON 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	
									INST	ROD				
1												1		
2		6 1910	1760								1960.4		2	
3		4 1908	1980			88 00 46	-2.0	+68.7	+66.7		2027.1		3	UP 1904 IS THE
4		2 1906	2200										4	SOUTHERN MOST VP
5		1904	2420			87 35 10	-2.0	+101.8	+99.9		2060.3		5	ON L-SIXS
6	o	1902	1470	1320		87 25 37	-2.0	+118.5	+116.5		2076.9		6	MARKER PIPE & TAG
7	o		1.50	2640		272 34 14	-2.0	+118.4	+116.4				7	
8													8	
9													9	
10	Δ	1902	14.63	663		94 42 58	+15.0	+54.5	+69.5		2146.5		10	
11	Δ		8.00	663		265 16 23	+12.0	+54.6	+69.6				11	
12		1900	440			96 01 05	-4.0	-46.1	-50.1		2096.4		12	
13		1898	220										13	
14	x	1896	9			90 00 00	-4.9	-	-4.9		2141.6		14	
15		1894	220										15	
16		1892	440			93 01 24	-2.0	-23.2	-25.2		2121.3		16	
17		1890	660										17	





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

VERTICAL AND HORIZONTAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 6 OF 63
 LINE/LOOP NO. 51-X5 TYPE SURVEY _____ CLIENT Husky DATE 13 DY 4 MO 27 YR
 SURVEYOR J. Anderson 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				
															
1														1	
2	o	1888	T 11.40	440		92 50 02	15.0	+3.5	-58.5		2087.9			2	
3	o		C 7.00	880		267 09 34	15.0	+3.6	-58.6					3	
4														4	
5														5	
6	Δ	1886	T 14.90	1090		86 28 10	+4.0	-67.1	-63.1		2024.8			6	
7	Δ		B 4.00	1090		273 31 31	+4.0	-67.1	-63.1					7	
8		1886	880											8	
9		1884	660			86 26 46	2.0	+40.9	+38.9		2063.7			9	
10		1882	440											10	
11		1820	220			86 23 32	2.0	+13.8	+11.8		2036.6			11	
12	*	1878	0			90 00 00	+4.9	-	+4.9		2019.9			12	
13		1876	220			96 44 36	+4.0	-28.8	-29.8		1995.0			13	
14		1874	440											14	
15		1872	660			96 32 00	+4.0	-75.1	-73.1		1925.7		1915.7	15	
16		1870	880											16	
17		1868	1100			92 34 46	2.0	+49.5	-51.5		1973.3			17	

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

VERTICAL AND HORIZONTAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 7 OF 64
 LINE/LOOP NO. 51-KS TYPE SURVEY _____ CLIENT Husky DATE 13 DY 4 MO 7 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184







LINE	 	STATION	VERTICAL						ELEVATION		HORIZONTAL		REMARKS	
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD	L/R OR DJI	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE	HORIZ										
1														
2		1866	1320							2024.8				
3		1864	1540	90 32 58	-4.0	-14.8	-18.8		2006.0					
4		1862	1760											
5	o	1860	T 14.00 770	90 23 07	-5.0	-13.3	-18.3		2006.4					
6	o		C 5.00 1280	269 36 35	-5.0	-13.5	-18.5							
7														
8														
9	A	1860	T 14.70 770	89 13 22	+2.0	-20.9	-18.9	1987.4						
10	A		C 7.00 1540	270 46 53	+2.0	-21.0	-19.0							
11		1858	1320											
12		1856	1100	89 34 06	-4.0	+8.3	+4.3	1991.7						
13		1854	880											
14		1852	660	70 09 09	-4.0	-1.8	-5.8	1981.6						
15		1850	440											
16		1848	220	89 57 40	-4.0	+0.1	-3.9	1983.5						
17	X	1846	0	90 00 00	-4.0	-	+1.9	1982.5						





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 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 65 OF 8
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT Husky DATE 13 DY 9 MO 7 YR
 SURVEYOR S. Anderson 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 	HORIZ 										
1									1987.4			1		
2		1844	220			95 07 07	2.0	19.6	-21.6		1965.8		2	
3		1842	440			-							3	
4		1840	660			94 34 32	4.0	62.7	-56.7		1930.7		4	
5		1838	880			-							5	
6		1836	1100			94 19 52	15.0	83.1	-98.1		1889.3		6	
7		1834	1320			-							7	
8		1832	1540			92 18 40	2.0	60.8	-62.8		1924.6		8	
9		1830	1760			-							9	
10		1828	1980			91 33 52	2.0	54.1	-56.1		1931.3		10	
11		1826	2200			-							11	
12		1824	2420			90 57 30	4.0	40.5	-44.5		1942.9		12	
13	⊙	1822	+14.20 1320			90 44 19	1.0	34.0	-35.0		1952.4		13	
14	⊙		C 1100 2640			267 15 40	1.0	34.0	-35.0				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. 4 PAGE 9 OF 66
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT HUGGET DATE 13 DY 4 MO 29 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1784

LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE	HORIZ										
1												1		
2	Δ	1822	T 14.80	880	22 31 04	+15.0	+ 38.7	+53.7	2006.1			2		
3	Δ		B 6.00	880	247 28 37	+15.0	+ 38.7	+53.7				3		
4		1820	660		93 33 25	-2.0	-40.9	-42.9		1943.2		4		
5		1818	440									5		
6		1816	220		94 48 08	-5.0	- 18.4	-23.4		1938.8 1982.7		6		
7	π	1814	0		90 00 00	-4.9	-	-4.9		2001.2		7		
8		1812	220		90 38 03	-2.0	- 2.9	-4.4		2001.7		8		
9		1810	440									9		
10	\odot	1808	T 8.60	660	89 08 43	-2.0	+ 9.8	+ 7.8		2013.9		10		
11	\odot		B 2.00	660	270 50 41	-2.0	+ 9.7	+ 7.7				11		
12												12		
13												13		
14												14		
15												15		
16												16		
17												17		


WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS Δ = BACKSIGHT ∇ = INSTRUMENT SET-UP \odot = FORESIGHT SS = SIDESHOT



VERTICAL AND HORIZONTAL SURVEY NOTES

GSI AREA HAWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 10 OF 67
 LINE/LOOP NO. SI-XS TYPE SURVEY _____ CLIENT Husky DATE 14 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1189

10

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	LINE
			SLOPE	HORIZ						INST	ROD				
1										2013.9			1		
2	Δ	1808	F 14.40 SLOPE	940 HORIZ		92 +6 49	+15.0	+91.2	+106.2	2120.3			2		
3	Δ		C 5.00 SLOPE	1880 HORIZ		267 -12 42	+15.0	+91.5	+106.5				3		
4		1806	1650 SLOPE			-							4		
5		1804	1430 SLOPE			73 32 27	-2.0	-88.3	-90.3	2030.0			5		
6		1802	1210 SLOPE			-							6		
7		1800	990 SLOPE			94 18 11	-4.0	-74.3	-78.3	1951.7			7		
8		1798	770 SLOPE			-							8		
9		1796	550 SLOPE	547.2 HORIZ		95 48 06	-4.0	-55.3	-59.3	2061.0			9		
10		1794	330 SLOPE			-							10		
11		1792	110 SLOPE	109 HORIZ		97 50 44	-4.0	-14.9	-18.9	2101.4			11		
12	*	1790	0 SLOPE			90 00 00	-4.9	-	-4.9	2116.4			12		
13		1790	110 SLOPE			90 50 25	-2.0	-1.9	-3.9	2116.4			13		
14		1788	330 SLOPE			90 23 46	-2.0	-2.3	-4.3	2116.0			14		
15		1786	550 SLOPE			-							15		
16		1784	770 SLOPE			90 14 05	-4.0	-2.5	-6.5	2113.8			16		
17		1782	990 SLOPE			-							17		

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

VERTICAL AND HORIZONTAL SURVEY NOTES

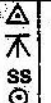




PROJECT NO. Howako Pass STATE/COUNTY ALASKA BOOK NO. 4 PAGE 11 OF 11
 PLAN NO. 51-XS TYPE SURVEY _____ CLIENT MUSKY DATE 14 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184





LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	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 DI	RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ						INST	ROD				
1									2120.3				1		
2		1780	1210		89 57 17	-4.0	+1.0	-2.0		2117.3			2		
3		1778	1430		-								3		
4		1776	1650		89 04 30	-4.0	+26.6	+22.6		2142.9			4		
5		1774	1870		-								5		
6		1772	2090		88 47 47	-4.0	+43.9	+39.9		2160.2			6		
7		1770	2310		-								7		
8	⊙	1768	T 13.80 1260		88 46 46	-1.0	+53.3	+52.3		2172.5			8		
9	⊙		11.00 2500		211 12 58	-1.0	+53.1	+52.1					9		
10	Δ		T 14.10 910		92 32 45	+15.0	+40.4	+55.4		2227.9			10		
11	Δ		B 5.00 910		267 27 12	+15.0	+40.4	+55.4					11		
12	⊙	B.M. 79340	T 11.80 980		88 43 04	-2.0	+21.9	+19.9		2247.9		REFERENCE: B.A.S. SURVEY	12		
13	⊙		B 2.00 980		271 17 00	-2.0	+21.9	+19.9		2247.8		MISCELLANEOUS	13		
14										-0.1			14		
15													15		
16													16		
17													17		

WORKED BY _____ CHECKED BY 1st _____ 2ND _____
 SYMBOLS Δ = BACKSIGHT ⊠ = INSTRUMENT SET-UP SS = SIDESHOT ⊙ = FORESIGHT

VERTICAL AND HORIZONTAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 12 OF 12
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT Huak DATE 14 DY 4 MO 72 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184


LINE		STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ					INST	ROD				
1									2172.6		Adjusted	1		
2		1768	T 13.40 440		90 12 04	+15.0	+3.1	+18.1	2190.8			2		
3			C 9.00 880		269 47 40	+15.0	+3.2	+18.2				3		
4		1766	660		-							4		
5		1764	440		90 37 25	2.0	+4.8	-6.8	2184.0			5		
6		1762	220		-							6		
7		1760	0		90 00 00	-4.9	-	-4.9	2185.9			7		
8		1758	220		-							8		
9		1756	440		91 38 35	-4.0	-12.6	-16.6	2174.2			9		
10		1754	660		-							10		
11		1752	880		91 30 04	-4.0	-23.1	-27.1	2163.7			11		
12		1750	1100		-							12		
13		1748	1320		90 16 31	-4.0	-6.5	-10.5	2180.3			13		
14		1746	1540		-							14		
15		1744	1760		89 55 42	-4.0	+2.2	-1.8	2189.0			15		
16		1742	1980		-							16		
17		1740	2200		90 02 02	-5.5	-1.3	-6.8	2183.9			17		

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

HORIZONTAL AND VERTICAL SURVEY NOTES

13

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 13 OF 70
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT MURKY DATE 14 DY 4 MO 72 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		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					FEET METERS	INST			
1												1	
2	Δ	1740	114.00	1370	89 57 49	+1.5	-1.7	-0.2	2184.1			2	+10.2
3	Δ		21.90	2420	270 01 18	+1.5	-1.0	+0.5				3	
4		1738	2420									4	
5		1736	2200		89 57 18	11.0	+1.7	-9.3		2174.8		5	
6		1737	1980									6	
7		1732	1760		90 00 17	-17.0	-0.1	-17.1		2167.0		7	10' ± 7' BOOST
8		1730	1540									8	
9		1728	1320		89 53 47	-11.0	+2.4	-8.6		2175.5		9	
10		1726	1100									10	
11		1724	880		89 54 33	-2.0	+1.4	-0.6		2183.5		11	
12		1722	660									12	
13		1720	440		91 46 13	-2.0	-12.6	-15.6		2168.5		13	
14		1718	220									14	
15	π	1716	0		90 00 00	-4.9	-	-4.9		2179.2		15	
16		1714	220									16	
17		1712	440		89 43 40	-4.0	+48.1	+44.1		2228.2		17	

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SYMBOLS

Δ = BACKSIGHT

∇ = INSTRUMENT SET-UP

SS = SIDESHOT

\odot = FORESIGHT

VERTICAL AND HORIZONTAL SURVEY NOTES

14

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 14 OF 71
 INSTRUMENT NO. 51-XS TYPE SURVEY _____ CLIENT HUSKY DATE 14 DY 2 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		LR OR DI	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												1			
2		1710	660									2			
3		1708	880		83 32 27	-6.2	+99.0	+93.8		2277.9		3			
4		1706	1100									4			
5		1704	1320		82 56 54	-4.0	+162.0	+158.0		2342.1		5			
6		1701	1650 ✓		81 20 22	2.0	+248.5	+246.5		2430.6		6	TARGET		
7	o		T 1230 1130	2239.4	82 14 57	-1.0	+302.0	+301.0		2485.1		7			
8	o		C 100 2260		277 45 04	1.0	+302.0	+301.0				8			
9												9			
10												10			
11	Δ		T 1935 715	712.9	94.24 34	+15.0	+52.8	+69.8	2555.0			11			
12	Δ		B 700 715		265 35 03	+15.0	+54.9	+69.9				12			
13		1700	1100 ✓	1092.4	96 43 50	-4.5	-128.9	-143.4		2411.6		13	7.5' + 7' BOUND		
14		1698	880									14			
15		1696	660	655.6	96 36 57	-4.0	-76.0	-80.0		2475.0		15			
16		1694	440									16			
17		1692	220	218.3	27 12 50	2.0	-27.6	-29.6		2525.4		17			

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

VERTICAL AND HORIZONTAL SURVEY NOTES

15

GSI/AREA: HOWARD PASS STATE/COUNTY: ALASKA BOOK NO. 4 PAGE 15 OF 72
 LINE/LOOP NO: SI-X3 TYPE SURVEY: _____ CLIENT: HUEBET DATE: 14 DY 4 MO 72 YR
 SURVEYOR: J. ANDERSON INSTRUMENT DESC/SERIAL NO.: _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> T <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DR		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ					FEET	METERS				
1									2555.0			1		
2	X	1690	0		90 00 00	-4.9	-	-4.9		2550.1			2	
3		1688	220		88 02 16	-2.0	+7.5	+5.5		2560.5			3	
4	o	1686	T 10.00	440	88 32 43	-6.5	+11.2	+4.7		2559.7			4	
5	o		B 6.00	440	271 27 08	-6.5	+11.2	+4.7					5	
6													6	
7													7	
8	Δ	1686	T 13.65	665	89 19 14	+7.0	-7.9	-0.9		2558.8			8	
9	Δ		B 7.00	665	270 40 12	+7.0	-7.8	-0.8					9	
10		1684	440		89 54 11	-4.0	+0.7	-3.3		2555.5			10	
11		1682	220		-								11	
12	X	1680	0		90 00 00	-4.9	-	-4.9		2553.9			12	
13		1678	220		-								13	
14		1676	440	437.9	95 37 57	-4.0	+3.2	-47.2		2511.6			14	
15		1674	660		-								15	
16		1672	880	876.5	95 05 58	-4.0	+78.2	-82.2		2476.6			16	
17		1670	1100		-								17	

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

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

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HAWKER PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 16 OF 73 16
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT Husky DATE 15 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1124

LINE	 	STATION	VERTICAL							HORIZONTAL			REMARKS	
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE	HORIZ					INST	ROD				
1									2558.8			1		
2		1668	1320	1315.9	94 31 19	-4.0	104.1	-108.1		2450.7			2	
3		1666	1540		-								3	
4		1664	1760		93 26 10	-4.0	105.5	-109.5		2449.3			4	
5		1662	1780		-								5	
6		1660	2200		92 14 19	-4.0	85.9	-89.9		2468.9			6	
7		1658	2420		-								7	
8		1656	2640		91 11 29	-4.0	54.9	-58.9		2499.9			8	
9		1654	2860		-								9	
10		1652	3080		90 11 38	-4.0	10.4	-14.4		2544.4			10	
11		1650	3300		90 02 47	-4.0	2.7	-6.7		2552.1			11	
12	o	1649 + 50	3342.20		90 06 50	-2.0	6.6	-8.6		2549.9			12	- 8.9
13	o		TELLYMETRE DERIVED		269 52 37	-2.0	7.2	-9.2					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. 4 PAGE 74 OF 17
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT HUSKY DATE 15 DY 4 MO 72 YR
 SURVEYOR J. ANDERSON 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 DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ						INST	ROD				
1													1		
2		1649 + 50	T 10.78	378		86 52 41	+7.0	-20.6	-13.6	2536.3				2	
3			B 7.00	378		272 06 29	+7.0	-20.5	-13.5					3	
4		1648	220			86 44 50	-2.0	+12.5	+10.5	2546.8				4	
5		1646	0			90 00 00	-7.9	-	-7.9	2531.4				5	
6		1644	220			96 10 05	-2.0	-23.6	-25.6	2510.7				6	
7		1643	330			94 34 40	-15.0	-26.3	-41.3	2494.9				7	
8						265 24 22	-15.0	-26.4	-41.4					8	
9														9	
10														10	
11		1642	T 14.70	1420	1415.6	85 30 26	+1.0	-110.9	-109.9	2385.2				11	
12			B 0.50	1420		274 28 32	+1.0	-110.5	-109.5					12	
13		1642	1320											13	
14		1640	1100			87 14 45	-2.0	+52.9	+50.9	2436.1				14	
15		1638	880											15	
16		1636	660			90 35 25	-2.0	-6.8	-8.8	2376.4				16	
17		1634	440											17	

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS

= BACKSIGHT

= INSTRUMENT SET-UP

SS = SIDESHOT

= FORESIGHT

VERTICAL AND HORIZONTAL SURVEY NOTES

18

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 18 OF
 LINE/SECTION 51-XS TYPE SURVEY CLIENT Husky DATE 15 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE		STATION	VERTICAL							HORIZONTAL			REMARKS	
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE	HORIZ					INST	ROD				
1									2385.2			1		
2		1632	220	216	100 54 12	-4.0	-40.9	-44.9		2340.3			2	
3		1630	0		90 00 00	-4.9	-	-4.9		2380.3			3	
4		1628	220		87 21 06	-2.0	+10.2	+18.2		2403.4			4	
5		1626	440		-								5	
6		1624	660	657.9	85 22 30	-4.0	+53.0	+49.0		2434.2			6	
7		1622	880		-								7	
8		1620	1100	1095.7	84 54 57	-2.0	+97.1	+95.1		2480.3			8	
9		1618	1320		-								9	
10	o	1616	+12.75	775	1543.7	84 49 01	-5.0	+139.5	+134.5		2519.7		10	
11	o		-5.00	1550		275 09 47	5.0	+139.5	+134.5				11	
12													12	
13													13	
14	Δ	1616	+13.40	440		80 00 00	+11.35	-	+11.35	2531.2			14	+ 11.5
15	Δ		+9.00	440		270 00 00	+11.45	-	+11.45				15	
16		1614	220		90 32 09	-2.0	-2.1	-4.1		2527.1			16	
17		1612	0		90 00 00	-4.9	-	-4.9		2526.3			17	

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

HORIZONTAL AND VERTICAL SURVEY NOTES

76



19

GSI/REF: HOWARD PASS STATE/COUNTY: ALASKA BOOK NO. 4 PAGE 17 OF
 LINE/LOOP NO.: 51-X3 TYPE SURVEY: CLIENT: HURDY DATE IS DY 4 MO 79 YR
 SURVEYOR: J. ANDERSON INSTRUMENT DESC/SERIAL NO.: CREW NO. 1184

LINE		STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ					FEET	METERS				
1									2531.2			1		
2		1610	220		94 18 22	-2.0	-16.5	-18.5		2512.7			2	
3		1608	440		94 14 52	-7.0	-32.6	-36.6		2494.6			3	
4		1606	660		92 46 00	-2.0	-31.9	-33.9		2497.3			4	
5	o	1605	T 13.76	770	71 34 24	-15.0	-21.1	-36.1		2495.0			5	
6	o		D 6.00	770	268 24 51	-15.0	-21.3	-36.3					6	
7													7	
8													8	
9	Δ	1605	T 14.80	1380	2739.4	83 00 57	+1.0	-333.7	-332.7	2162.7			9	-332.3
10	Δ		C 1.00	2760		276 58 43	+1.0	-332.8	-331.8				10	
11		1604	2640	2621.2	83 07 40	-2.0	+312.1	+310.1		2472.8			11	
12		1602	2420										12	
13		1600	2200	2190.4	84 39 16	-2.0	+204.1	+202.1		2364.8			13	
14		1598	1980										14	
15		1596	1760	1755.0	85 39 45	-2.0	+132.7	+130.7		2293.4			15	
16		1594	1540										16	
17		1592	1320	1317.5	86 30 21	-2.0	+80.3	+78.3		2241.0			17	

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

VERTICAL AND HORIZONTAL SURVEY NOTES

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GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 20 OF
 LINE/LOOP NO. 51-XS TYPE SURVEY CLIENT HUSKY DATE 15 DAY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	 	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ					INST	ROD				
1									2162.7			1		
2		1570	1100	-								2		
3		1588	880	87 36 18	-4.0	+36.8	+32.8		2195.5			3		
4		1586	660	-								4		
5		1584	440	87 41 31	-4.0	+17.7	+13.7		2176.4			5		
6		1582	220	-								6		
7		1580	0	90 00 00	+9	-	-4.9		2157.8			7		
8		1578	220	-								8		
9		1576	440	94 34 00	-2.0	-35.0	-37.0		2125.7			9		
10		1574	660	-								10		
11		1572	880	93 12 20	-4.0	-49.2	-53.2		2109.5			11		
12		1570	1100	-								12		
13		1568	1320	92 58 58	-2.0	-68.7	-70.7		2092.0			13	TARGET	
14		1566	1540	-								14		
15		1564	1760	92 23 20	-4.0	-73.4	-77.4		2085.3			15		
16		1562	1980	-								16		
17		1560	2200	92 05 57	-4.0	-80.6	-84.6		2078.1			17		

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






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

HORIZONTAL AND VERTICAL SURVEY NOTES

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GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 21 OF
 LINE/LOOP NO. 51-X2 TYPE SURVEY CLIENT Hussey DATE 15 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. CREW NO. 184

LINE		STATION	VERTICAL						ELEVATION		LR 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	o	1558	T 15.90	1190	91 46 37	15.0	73.8	-88.8			2073.5		2	-89.2
3	o		C 2.00	2350	268 12 12	15.0	74.6	-89.6					3	
4													4	
5													5	
6	A	1558	T 13.70	770	89 53 34	15.0	2.9	+12.1			2085.8		6	
7	A		C 6.00	1540	270 05 34	15.0	2.5	+12.5					7	
8		1556	1320		90 37 36	4.0	15.2	23.2			2066.6		8	
9		1554	1100										9	
10		1552	880		91 14 58	4.0	19.2	23.2			2062.6		10	
11		1550	660										11	
12		1548	440		92 04 06	4.0	15.9	19.9			2065.9		12	
13		1546	220										13	
14	x	1544	0		90 00 00	4.9		4.9			2080.9		14	
15		1542	220										15	
16		1540	440		91 36 55	2.0	12.4	14.4			2071.4		16	
17		1538	660										17	

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SYMBOLS

 = BACKSIGHT

 = INSTRUMENT SET-UP

 = SIDESHOT

 = FORESIGHT

VERTICAL AND HORIZONTAL SURVEY NOTES

22

GSI AREA HONOLULU YASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 22 OF 79
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT Husky DATE 15 DY 4 MO 79 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL							HORIZONTAL			REMARKS	
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE	HORIZ					INST	ROD				
1									2085.8			1		
2		1536	880		31 45 40	7.0	27.0	-31.0			2054.8		2	
3		1534	1100		-								3	
4		1532	1320		90 19 13	15.0	7.4	-22.4			2063.4		4	
5		1530	1540		-								5	
6		1528	1760		71 27 01	8.0	44.5	-52.5			2033.3		6	
7		1526	1980		-								7	
8		1524	2200		90 58 34	2.0	37.5	-39.5			2046.3		8	
9		1522	2420		-								9	
10		1520	2640 ✓		90 07 54	3.5	6.1	-9.6			2075.8		10	TARGET
11					269 50 02	3.5	6.9	-10.4					11	- 10.0
12													12	
13													13	
14		1520	711.90 990		88 54 43	+1.5	-10.8	-17.3			2058.6		14	
15			821.00 990 ✓		271 04 18	+1.5	-18.5	-17.0					15	
16		1518	770		-								16	
17		1516	550		90 06 16	2.0	1.0	-3.0			2055.6		17	

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

VERTICAL AND HORIZONTAL SURVEY NOTES

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23

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 4 PAGE 23 OF
 INSTRUMENT NO. 51-X5 TYPE SURVEY CLIENT Husky DATE 15 DY 4 MO 72 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE		STATION	VERTICAL							HORIZONTAL			REMARKS	
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DR	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE	HORIZ					FEET METERS	INST				
1										2058.6			1	
2		1514	330										2	
3		1512	110	87 20 35	2.0	+ 1.3	-0.7			2057.9			3	
4	X	1511	0	90 00 00	4.9	-	-4.9			2053.7			4	TARGET
5		1510	110	93 12 52	2.0	- 6.2	-8.2			2050.4			5	
6		1508	330	93 51 33	4.0	- 22.2	- 26.2			2032.4			6	
7		1506	350										7	
8		1504	770	93 21 57	2.0	- 45.2	- 47.2			2011.4			8	
9		1502	990										9	
10		1500	1210	93 07 40	4.0	- 66.0	- 70.0			1988.6			10	
11		1498	1430										11	
12		1496	1650	92 54 06	4.0	- 83.5	- 87.5			1971.1			12	
13		1494	1870										13	
14		1492	2090	92 53 43	4.0	- 106.8	- 110.8			1947.8			14	
15		1490	2310										15	
16	o	1488	T 14.60 1260	92 34 21	15.0	- 113.1	- 128.1			1930.2			16	- 128.4
17	o		C 2.00 2520	267 24 50	15.0	- 113.7	- 128.7						17	

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

VERTICAL AND HORIZONTAL SURVEY NOTES

24

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 24 OF
 LINE/LOOP NO. 91-XS TYPE SURVEY CLIENT Husky DATE 16 DY 4 MO 72 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. CREW NO. 182

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	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	ROD				
1													1		
2	Δ	1488	13.80	880		87 54 34	+15.0	-67.2	-49.2	1881.3			2	-48.9	
3	Δ		5.00	1760		272 04 08	+15.0	-63.5	-48.5				3		
4		1486	1540			-							4		
5		1494	1320			88 35 06	2.0	+32.6	+30.6				5	1911.9	
6		1482	1100			-							6		
7		1480	880			89 04 29	2.0	+14.2	+12.2				7	1893.5	
8		1478	660			-							8		
9		1476	440			89 23 50	2.0	+4.6	+2.6				9	1883.9	
10		1474	220			-							10		
11	⊗	1472	0			90 00 00	4.9	-	-4.9				11	1876.4	
12		1470	220			-							12		
13		1468	440			90 29 50	4.0	-3.8	-7.8				13	1873.5	
14		1466	660			-							14		
15		1464	880			90 25 39	4.0	-6.5	-10.5				15	1870.8	
16		1462	1100			-							16		
17		1460	1320			90 11 21	4.0	-4.4	-8.4				17	1872.9	

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____





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

HORIZONTAL AND VERTICAL SURVEY NOTES

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25

GSI AREA Howards Pass STATE/COUNTY Alaska BOOK NO. _____ PAGE 25 OF _____
 LINE/LOOP NO. 151-XS TYPE SURVEY _____ CLIENT Husky DATE 14 DY 4 MO 79 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		LR OR DR	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE	HORIZ										
			<input type="checkbox"/> FEET <input type="checkbox"/> METERS											
1									1861.3			1		
2		1458	1540									2		
3		1456	1760	87 59 58	-4.0	+0.0	-4.0		1877.3			3		
4	⊙	1454	12.90 990	89 56 10	2.5	+2.2	-0.3		1880.7			4		
5	⊙		23.00 1980	270 02 50	2.5	+1.6	-0.9					5		
6												6		
7												7		
8	Δ	1454	13.10 1210	88 26 13	+1.0	-59.0	-58.0	1823.2				8	MARKER PIPE	
9	Δ		21.00 2420	271 22 25	+1.0	-58.0	-57.0					9	AT VP 1452	
10		1452	2200	88 38 43	2.0	+52.0	+50.0		1873.2			10		
11		1450	1980									11		
12		1448	1760	88 46 59	2.0	+37.4	+35.4		1858.6			12		
13		1446	1540									13		
14	⊙	1444	1320	88 04 44	2.0	+44.3	+42.3		1865.5			14		
15		1442	1100									15		
16		1440	880	90 07 26	-4.0	+1.9	-5.9		1817.3			16		
17		1438	660									17		

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

VERTICAL AND HORIZONTAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 26 OF 83 26
 LINE/LOOP NO. 51-X3 TYPE SURVEY _____ CLIENT Husky DATE 16 DY 4 MO 79 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ					INST	ROD				
1								1823.2				1		
2		1436	470		90 58 20	-4.0	-7.5	-11.5			1811.7		2	
3		1434	220		-								3	
4	<input type="checkbox"/> X	1432	0		90 00 00	-4.9	-	-4.9			1818.3		4	
5	<input type="checkbox"/> SS	B.M. 79338	T 1240	1240	88 09 12	-6.5	+79.9	+73.4	T.K. 1821.3		1894.5	REFERENCE 1 G.A.S. SURVEY	5	
6	<input type="checkbox"/> SS		C 1.00	2480	271 50 11	-6.5	+79.5	+73.0			1896.4		6	
7		1430	220		-						+1.9	MISCLOSURE	7	
8		1428	440		90 28 42	-4.0	-3.7	-7.7			1813.6		8	
9		1426	660		-								9	
10		1424	880		90 29 46	-4.0	-7.6	-11.6			1809.7		10	
11		1422	1100		-								11	
12		1420	1320		90 34 28	-4.0	-13.2	-17.2			1804.1		12	
13		1418	1540		-								13	
14		1416	1760		90 23 48	-4.0	-12.2	-16.2			1805.1		14	
15		1414	1980		-								15	
16	<input type="checkbox"/> O	1412	T 14.00	1100	90 10 26	-7.5	-6.7	-14.2			1806.7		16	
17	<input type="checkbox"/> O		C 300	2200	269 48 18	-7.5	-7.0	-15.0					17	

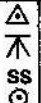





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SYMBOLS Δ = BACKSIGHT ⊕ = INSTRUMENT SET-UP SS = SIDESHOT ⊙ = FORESIGHT

VERTICAL AND HORIZONTAL SURVEY NOTES

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GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 27 OF 43
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT HUGES DATE 16 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 184

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				
															
1										1806.7			1		
2		1412	T 13.0	12.0	88 46 10	+1.0	-52.0	-51.0	1756.1				2	-50.6	
3			C 1.00	2420	271 12 48	+1.0	-51.2	-50.2					3		
4		1410	2200		-								4	10 MILE PIPE AT	
5		1408	1980		88 58 04	-4.0	+35.7	+31.7		1787.8			5	VP <u>1452</u>	
6		1406	1760		-								6		
7		1404	1540		89 02 34	-4.0	+25.7	+21.7		1777.8			7		
8		1402	1320		-								8		
9		1400	1100		88 56 58	-4.0	+20.2	+16.2		1772.3			9		
10		1378	880		-								10		
11		1376	660		89 53 50	-4.0	+1.2	-2.8		1753.3			11		
12		1374	440		-								12		
13		1372	220		90 27 50	-4.0	-1.8	-5.8		1750.3			13		
14		1370	0		90 00 00	-4.0	-	-4.0		1751.2			14		
15		1368	220		92 55 02	-2.0	-11.2	-13.2		1742.9			15		
16		1366	440		-								16		
17		1364	660		91 55 37	-4.0	-22.2	-26.2		1729.9			17		

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SYMBOLS

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SS = SIDESHOT

 = FORESIGHT

VERTICAL AND HORIZONTAL SURVEY NOTES

28

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 28 OF 43
 LINE/LOOP NO. SI-XS TYPE SURVEY _____ CLIENT HUSKY DATE 16 DY 4 MO 72 YR
 SURVEYOR J. ANDERSON 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
1									1756.1				1		
2		1282	880										2		
3		1390	1100			91 16 27	-4.0	-24.5	-28.5		1727.6		3		
4		1378	1320										4		
5		1374	1540			90 21 20	-4.0	-9.6	-13.6		1742.5		5		
6		1374	1760										6		
7		1372	1980			90 13 28	15.0	-7.8	-22.8		1733.3		7		
8		1370	2200										8		
9		1368	2420			90 21 40	-4.0	-15.3	-19.3		1736.8		9		
10	o	1366	T 1420 1320			89 58 59	15.0	+0.5	-14.1		1741.7		10	TARGET	
11	o		C 1.00 26A			270 00 30	15.0	+0.4	-14.6				11		
12													12		
13													13		
14	A	1366	12.15 715			89 27 59	+3.5	-12.5	-9.0		1732.8		14		
15	A		5.00 1430			270 29 24	+3.5	-12.2	-8.7				15		
16		1264	12.15			89 25 15	2.0	+12.2	+10.2		1743.0		16		
17		1262	990										17		

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




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

VERTICAL AND HORIZONTAL SURVEY NOTES

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29

GSI AREA Howards Pass STATE/COUNTY Alaska BOOK NO. _____ PAGE 29 OF 43
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT Husky DATE 16 DY 4 MO 79 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		LR OR DI	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE	<input type="checkbox"/> FEET METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
														
1									1732.8			1		
2		1360	770			89 37 15	-4.0	+5.1	+1.1		1733.9		2	
3		1358	550			-							3	
4		1356	330			90 13 23	-2.0	-1.3	-3.3		1729.5		4	
5		1354	110			-							5	
6		1353	10			90 00 00	-4.9	-	-4.9		1727.9		6	
7		1352	180			91 05 48	-4.0	-2.1	-6.1		1726.7		7	
8		1350	320			-							8	
9		1348	550			90 17 30	-4.0	-2.8	-6.8		1726.0		9	
10		1346	770			-							10	
11		1344	990			91 29 25	-4.0	-8.5	-12.5		1720.3		11	
12		1342	1210			-							12	
13		1340	1430			90 37 25	-5.2	-13.9	-19.1		1713.7		13	
14		1338	1650			-							14	
15		1336	T 14.20: 920			90 22 36	-5.0	-6.7	-21.7		1711.0		15	
16			C 5.00: 1840			269 47 03	-5.0	-6.9	-21.9				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. 4 PAGE 30 OF 43
 LINE/LOOP NO. SI-XS TYPE SURVEY _____ CLIENT Huxey DATE 16 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

30

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														1		
2		1336	T 8.70	770		90 10 24	+15.0	+4.7	+19.7	1731.0				2		
3			C 1.00	1540		269 43 21	+19.0	+5.2	+20.2					3		
4		1334	1320											4		
5		1332	1100			90 54 58	-4.0	-17.6	-21.6		1709.4			5		
6		1330	880											6		
7		1328	660			91 29 02	-4.0	-16.9	-20.9		1710.1			7		
8		1326	440											8		
9		1324	220			53 25 05	-4.0	-13.1	-17.1		1713.9			9		
10		1322	0			90 00 00	-4.0	-	-4.9		1726.1			10		
11		1320	220			31 36 09	-4.0	-6.1	-10.1		1720.9			11		
12		1318	440											12		
13		1316	660			91 09 20	-4.0	-13.3	-17.3		1713.7			13		
14		1314	880											14		
15		1312	1100			90 51 41	-4.0	-16.5	-20.5		1710.5			15		
16		1310	1320											16		
17		1308	1540			90 04 49	-4.0	-2.2	-6.2		1724.8			17		

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

VERTICAL AND HORIZONTAL SURVEY NOTES

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31

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 31 OF 43
 LINE/LOOP NO. 51-X3 TYPE SURVEY _____ CLIENT HUSKY DATE 16 DY + MO 72 YR
 SURVEYOR J. ANDERSON 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 DI	RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ						INST	ROD				
1										1731.0				1	
2		1206	1760											2	
3		1204	1980			89 27 23	-1.0	+18.8	+14.8			1745.8		3	
4		1302	2200											4	
5		1300	2420			89 03 41	+4.0	+40.0	+06.0			1767.0		5	
6		1298	2640											6	
7	o	1296	T14.20 1420			88 55 50	-3.0	+53.0	+50.0			1780.5		7	
8	o		C0.00 2840			271 02 56	-3.0	+52.0	+49.0					8	
9														9	
10														10	
11	A	1296	T12.00 1100			88 04 50	+1.0	-73.7	-72.7			1708.2		11	-72.3
12	A		C1100 2200			271 53 48	+1.0	-72.8	-71.8					12	
13		1294	1980											13	
14		1292	1760			88 48 15	-2.0	+26.7	+34.7			1742.9		14	
15		1290	1540											15	
16		1288	1320			89 54 47	-2.0	+2.0	-2.0			1706.2		16	
17		1286	1100											17	

TI-23471B

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

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

VERTICAL AND HORIZONTAL SURVEY NOTES

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32

GSI AREA HAWKID PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 32 OF 43
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT HUBBY DATE 16 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON 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 DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
										INST	ROD				
1									1708.2				1		
2		1284	880		91 16 13	-4.0	-12.5	-23.5				1684.7	2		
3		1282	660		-								3		
4		1280	440		90 58 48	-4.0	-7.5	-11.5				1676.7	4		
5		1278	220		-								5		
6		1276	0		90 00 00	-4.9	-	-4.9				1703.3	6		
7		1274	220		-								7		
8		1272	440		91 49 55	-4.0	-14.1	-18.1				1690.1	8		
9		1270	660		-								9		
10		1268	14.80	880 ✓	91 49 29	-15.0	-28.0	-43.0				1665.0	10		
11			6 6.00	880	248 09 08	-15.0	-28.4	-43.4					11		
12													12		
13													13		
14		1268	12.00	1100	88 56 57	+1.0	-40.3	-39.3	1626.0				14		
15			6 1.00	2200 ✓	271 02 05	+1.0	-39.7	-38.7					15		
16		1266	1980		-								16		
17		1264	1760		89 19 44	-4.0	+20.6	+16.6				1642.6	17		

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

VERTICAL AND HORIZONTAL SURVEY NOTES

33

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 33 OF 43
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT HUSKY DATE 16 DY 4 MO 72 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 184

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	ROD				
1									1626.0				1		
2		1262	1540										2		
3		1260	1320	89 47 10	-2.0	+4.2	+2.2		1628.2				3		
4		1258	1100										4		
5		1256	880	90 35 34 4	-4.0	-9.1	-13.1		1612.9				5		
6		1254	660										6		
7		1252	440	91 24 07	-2.0	-10.8	-12.8		1613.2				7		
8		1250	220										8		
9	X	1248	0	90 00 00	-4.9	-	-4.9		1621.1				9		
10		1246	220										10		
11		1244	440	90 33 12	-2.0	-4.2	-6.2		1619.8				11		
12		1242	660										12		
13		1240	880	90 38 43	-4.0	-9.9	-13.9		1612.1				13		
14		1238	1100										14		
15		1236	1320	90 26 14	-4.0	-13.9	-17.9		1608.1				15		
16		1234	1540										16		
17		1232	1760	90 33 00	-4.0	-16.9	-20.9		1605.1				17		

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SYMBOLS = BACKSIGHT
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 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

34

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 4 PAGE 34 OF 43
 LINE/LOOP NO. 01-XS TYPE SURVEY _____ CLIENT Husky DATE 16 DY 4 MO 79 YR.
 SURVEYOR J. Anderson 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	LR OR DI	RIGHT TURNED HORIZONTAL ANGLE		LINE
1										1626.0			1		
2		1230	1980										2		
3		1226	2200			90 35 14	-4.0	-22.5	-26.5		1599.5		3		
4		1226	2420										4		
5	o	1224	2640 ✓			90 22 52	-15.0	-17.6	-32.6		1593.0		5		
6	o					269 36 02	15.0	-18.4	-33.4				6		
7													7		
8													8		
9	Δ	1224	T 1920 1320			89 22 54	+7.0	-28.5	-21.5	1571.8			9	-21.2	
10	Δ		C 1100 2640			270 36 11	+7.0	-27.8	-20.8				10		
11		1222	2420										11		
12		1220	2200			89 20 45	-2.0	+25.1	+23.1		1594.9		12		
13		1218	1980										13		
14		1216	1760			89 32 16	-4.0	+14.2	+10.2		1582.0		14		
15		1214	1540										15		
16		1212	1320			89 31 10	-4.0	+11.1	+7.1		1578.9		16		
17		1210	1100										17		

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SYMBOLS = BACKSIGHT
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VERTICAL AND HORIZONTAL SURVEY NOTES

GSI AREA HAWKND Pass STATE/COUNTY Alaska BOOK NO. 92 PAGE 35 OF 43
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT Husky DATE 16 DY 4 MO 79 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

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LINE	 	STATION	VERTICAL						ELEVATION		LR 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				
1									1571.8			1		
2		1208	800		89 36 01	-4.0	+ 6.1	+ 2.1		1573.9		2		
3		1206	660		-							3		
4		1204	440		90 05 26	-2.0	- 0.7	- 2.7		1569.1		4		
5		1202	220		-							5		
6	X	1200	0		90 00 00	-4.9	-	-4.9		1566.9		6	TARGET	
7		1198	220		-							7		
8		1196	440		90 40 04	-2.0	- 5.2	- 7.2		1564.6		8		
9		1194	660		-							9		
10		1192	880		90 26 43	-2.0	- 6.8	- 8.8		1563.0		10		
11	o	1191	T 12.00	99.0	90 00 00	-12.0	-	-12.0		1559.7		11	TARGET	
12	o		B 3.00	99.0	270 00 00	-12.17	-	-12.2				12		
13												13		
14												14		
15												15		
16												16		
17												17		

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SYMBOLS = BACKSIGHT
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 SS = SIDESHOT
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HORIZONTAL AND VERTICAL SURVEY NOTES

36

GSI AREA MISHEGUN MOUNTAIN STATE/COUNTY ALASKA BOOK NO. 4 PAGE 36 OF 43
 LINE/LOOP NO. SV XS TYPE SURVEY _____ CLIENT HUSKY DATE 16 DAY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	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		RIGHT TURNED HORIZONTAL ANGLE		LINE
									SLOPE	HORIZ			
1										1559.7		1	
2	Δ	1121	T 12.30 730		85 45 49	+2.0	-6.0	-3.5	1556.4			2	
3	Δ		C 5.00 1460		270 13 17	+2.5	-5.6	-3.1				3	
4		1190	1350									4	
5		1188	1130		89 46 46	-2.0	+4.3	+2.3		1558.7		5	
6		1186	910									6	
7		1184	690		87 55 25	-2.0	+0.9	-1.1		1555.3		7	
8		1182	470									8	
9		1180	250		90 13 42	-2.0	-1.0	-3.0		1553.4		9	INTERSECTION
10		1178	30									10	L-SIX 3 UP 1177+80°
11	X	1177 + 80	0		90 00 00	+4.9	-	-4.9		1551.5		11	L-611 UP 2101+35°
12												12	MARKER PIPE
13	SS	V.P. 2112	T 12.75 1175		89 23 43	-2.0	+12.4	+10.4	MIS-CLOSURE	1565.9	REFERENCE: BOOK 611	13	
14	SS	LINE 611	B 1.00 1175		270 35 14	-2.0	+12.0	+10.0	-0.7	1566.6	PAGE 48 LINE 14	14	
15		1176	190		92 38 40	-2.0	-8.8	-10.8		1545.6		15	
16		1174	410									16	
17		1172	630		90 37 06	-2.0	-6.8	-8.8		1547.6		17	

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

VERTICAL AND HORIZONTAL SURVEY NOTES

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37

GSI AREA MISNEQUIK MOUNTAIN STATE/COUNTY ALASKA BOOK NO. _____ PAGE 37 OF 43
 LINE/LOOP NO. SV XS TYPE SURVEY _____ CLIENT HUGKEY DATE 16 DY 4 MO 72 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

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				
				SLOPE										
1												1		
2		1170	850							1556.4			2	
3		1168	1070		90 36 10	2.0	-11.3	-12.3		1543.1			3	
4		1166	1290										4	
5		1164	1510		90 24 48	4.0	-10.9	-14.9		1541.5			5	
6		1162	1730										6	
7		1160	1950		90 27 21	5.2	-15.5	-20.7		1538.7			7	
8		1158	2170										8	
9		1156	2390		90 29 46	5.2	-20.0	-25.2		1531.2			9	
10	o	1154	T 14.10 1310		90 24 36	6.0	-18.7	-24.7		1531.4			10	
11	o		c 1.00 2620		269 34 40	6.0	-19.3	-25.3					11	
12													12	
13													13	
14													14	
15													15	
16													16	
17													17	

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SYMBOLS
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 SS = SIDESHOT
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VERTICAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 4 PAGE 38 OF 43 75
38
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT Husky DATE 17 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	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	LINE
			SLOPE	HORIZ					FEET	METERS				
1												1		
2	Δ	1154	1270	770	89 48 18	+5.0	-5.3	+0.3	1531.6			2		
3	Δ		5.00	1540	270 11 14	+5.0	-5.0	+0.0				3		
4		1152	1320		89 46 57	-7.0	+4.2	-2.8				4		
5		1150	1100		-							5		
6		1148	880		89 44 16	-7.0	+4.0	-3.0				6		
7		1146	660		89 43 08	-2.0	+3.2	+1.2				7		
8	\circ	1144	440		89 59 17	-2.0	+0.1	-1.9				8		
9		1142	220		-							9		
10	\times	1140	0		90 00 00	-4.7	-	-4.7				10		
11		1138	220		-							11		
12		1136	440		90 31 47	-4.0	-4.1	-8.1				12		
13		1134	660		-							13		
14		1132	880		90 21 42	-2.0	-5.6	-7.6				14		
15		1130	1100		-							15		
16	\circ	1128	14.20	1320	89 44 34	-1.0	+5.9	+4.4				16		
17	\circ		8.100	1320	270 14 42	-1.5	+5.6	+4.1				17		

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SYMBOLS Δ = BACKSIGHT ∇ = INSTRUMENT SET-UP SS = SIDESHOT \odot = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

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39

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 39 OF 43
 LINE/LOOP NO. SI-X3 TYPE SURVEY _____ CLIENT Husky DATE 17 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

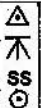


LINE	 	STATION	VERTICAL							HORIZONTAL			REMARKS		
			DISTANCE		<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR DJ		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ						INST	ROD				
1										1535.9			1		
2		1128	14.10	12.10		89 28 21	+2.0	22.3	-20.3	1516.1			2	-19.8	
3			2.00	24.20		270 30 12	+2.0	21.3	-19.3				3		
4		1126	2200										4		
5		1124	1930			89 34 17	-2.0	+14.8	+12.8				5	1528.9	
6		1122	1760										6		
7		1120	1540			89 46 22	-2.0	+6.1	+4.1				7	1520.2	
8		1118	1320										8		
9		1116	1100			89 42 47	-2.0	+5.5	+3.5				9	1519.6	
10		1114	880										10		
11		1112	660			90 07 02	+4.0	-1.4	-5.4				11	1510.7	
12		1110	440										12		
13		1108	220			90 58 19	-4.0	-3.7	-7.7				13	1508.4	
14		1106	0			90 00 00	-4.9	-	-4.9				14	1511.2	
15		1104	220			91 37 30	-4.0	-6.2	-10.2				15	1505.9	
16		1102	440										16		
17		1100	660			90 32 57	+4.0	-6.3	-10.3				17	1495.6	

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 40 OF 43 17
 LINE/LOOP NO. 91-XS TYPE SURVEY _____ CLIENT HURRY DATE 17 DAY 4 MO 79 YR 40
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL							ELEVATION		L/R OR DIR	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD					
			SLOPE 	HORIZ 											
1										1576.1				1	
2		1098	880											2	
3		1096	1100	90 47 41	-4.0	-18.3	-19.3			1496.8				3	
4		1094	1320											4	
5		1092	1540	90 40 46	-4.0	-18.3	-22.3			1493.8				5	
6		1090	1760											6	
7	O	1088	T 1090 990	90 32 21	-1.0	-18.6	-19.6			1497.2				7	-180°
8	O		C 1000 1980 ✓	269 26 33	1.0	-19.3	-18.3							8	
9														9	
10														10	
11	A	1088	T 9.15 715	89 30 43	+1.5	-12.2	-10.7			1486.7				11	
12	A		C 2.00 1430 ✓	270 28 22	+1.5	-11.8	-10.3							12	
13		1086	1210											13	
14		1084	990	89 39 25	-2.0	+5.7	+3.9			1490.6				14	
15		1082	770											15	
16		1080	550	89 38 30	-2.0	+3.4	+1.4			1488.1				16	
17		1078	330											17	

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SYMBOLS

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SS = SIDESHOT

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. _____ PAGE 41 OF 43
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT Husky DATE 17 DY 4 MO 79 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 184

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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										1486.7				1	
2		1086	110			90 55 32	2.0	1.8	2.8		1482.9			2	
3	X	1075	0			90 00 00	4.2	-	4.2		1481.8			3	
4		1074	110			-								4	
5		1072	330			91 47 18	2.0	10.3	12.3		1474.4			5	
6		1070	550			-								6	
7		1068	770			90 57 28	4.0	12.9	16.9		1469.8			7	
8		1066	930			-								8	
9		1064	1210			90 52 47	4.0	18.6	22.6		1464.1			9	
10		1062	1430			-								10	
11		1060	1650			90 41 17	2.0	19.8	21.8		1464.9			11	
12		1058	1870			-								12	
13		1056	2090			90 40 15	4.0	24.5	28.5		1458.2			13	
14		1054	2310			-								14	
15	o	1052	T 1440	1260		90 20 52	15.0	15.3	30.3		1455.9			15	-30.8
16	o		C 2.00	2520		269 37 57	15.6	16.2	31.2					16	
17														17	

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SYMBOLS

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= INSTRUMENT SET-UP


= SIDESHOT

= FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 99 OF 43
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT HUCKY DATE 17 DY 4 MO 72 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

42

LINE		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	LINE
			SLOPE	HORIZ					INST	ROD				
1														
2	Δ	1052	2420		89 37 40	+5.0	-17.8	-12.0	1443.5					
3	Δ				270 24 07	+5.0	-17.0	-12.0						
4		1050	2200		-									
5		1048	1980		89 35 10	-2.0	+14.3	+12.3	1455.8					
6		1046	1760		-									
7		1044	1540		89 36 10	-2.0	+10.7	+8.7	1452.2					
8		1042	1320		-									
9		1040	1100		89 35 32	-2.0	+7.8	+5.8	1449.3					
10		1038	880		-									
11		1036	660		89 37 12	-2.0	+4.4	+2.4	1445.9					
12		1034	440		-									
13		1032	220		90 32 00	-2.0	-2.0	+0.0	1443.5					
14	\times	1030	0		90 10 00	+9	-	+9						TAC LEGEND:
15	SS	V.P. 911 (MARKER PIPE)	T 12.70	170	89 42 34	-3.5	+5.9	+4.4	MISCLOSURE 1450.4	REFERENCE: LIST MARKER PIPES FOR 1978.				GSI 1184 1/30/78 L-51X S.P. 911
16	SS	LINE 51-X	0 2.00	170	270 16 27	-1.5	+5.6	+4.1	-2.6 1447.8					R.O.K. GRAY, B-252
17		1028	220		91 48 35	-2.0	-6.9	-8.9	1434.6					

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS

Δ = BACKSIGHT

∇ = INSTRUMENT SET-UP

SS = SIDESHOT

\odot = FORESIGHT

VERTICAL AND HORIZONTAL SURVEY NOTES

GSI AREA Hovako Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 43 OF 43
 LINE/LOOP NO. 51-XS TYPE SURVEY _____ CLIENT Husky DATE 17 DY 4 MO. 77 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

43

LINE	 	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ					INST	ROD				
1								1443.5						
2		1026	440	-										
3		1024	660	90 50 43	-2.0	-3.7	-11.7		1431.8					
4		1022	880	-										
5		1020	1100	90 04 28	-4.0	-2.1	-6.1		1437.4					
6		1018	1320	-										
7		1016	1540	90 00 50	-2.0	0.4	-2.4		1441.1					
8		1014	1760	-										
9		1012	1980	90 00 08	-4.0	-0.1	-4.1		1439.4				NO MARKER PIPE AT	
10		1010	2200	-									UP 1004 DUE TO CLOSE	
11		1008	2420	89 58 38	-4.0	+1.0	-3.0		1440.5				PROXIMITY OF PIPE AT	
12		1006	2640	-									END OF L-5' X	
13		1004	2860. ✓	89 58 52	-6.0	+0.9	-5.1		1438.1				LAST VP NORTH	
14				270 00 21	-6.0	+0.3	-5.7						LINE 51-XS	
15														
16														
17													TAIL SPREAD	

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. _____ PAGE 1 OF _____
 LINE/LOOP NO. 51XS TYPE SURVEY _____ CLIENT _____ DATE 13 DY 4 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 11821



LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	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	HORIZ										
1												1		
2	Δ	BAS 79342		D						V	30	2		
3				R				28		D	137-36-57	3		
4	⊥	BAS 79341				5.5		85			137-36-27	4		
5								49		V	180-00-20	5		
6	⊙	VP 2000 L-51XS	2849	91 ⊕	87-10-52	4.6		9.91		R	317-36-57	6		
7					272-48-09						137-36-37	7	137-36-32	
8												8		
9	Δ	79341			92-49-22	6.0				V	32	9		
10					267-10-00					D	286-19-12	10		
11	⊥	2000				5.5					286-18-40	11		
12	SS	TAIL SPREAD										12		
13	SS							46		D	114-04-33	13	114-04-01	
14								61				14		
15	⊙	1958	4620	4616	91-02-23	6.0		16		V	180-00-28	15		
16	⊙				268-56-43			6.72		R	106-19-10	16		
17											286-18-42	17	286-18-41	

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

HORIZONTAL AND VERTICAL SURVEY NOTES

45

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. _____ PAGE 2 OF _____
 LINE/LOOP NO. 51XS TYPE SURVEY _____ CLIENT _____ DATE 13 DY 3 MO 79 YR
 SURVEYOR Helander/Jensen INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		LR 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 										
1														
2														
3	Δ	2000	⊙ 4620	4616.12	D 88-55-06	6.0								
4					R 271-03-46	✓			06					
5	π	1958	⊙ 6930	6896.45		5.8			68		V ₁	07		
6	O	1895			D 90-58-35	6.0			89		D	173-30-58		
7					R 269-22-10	✓			96			173-30-51		
8									6.45		V ₂	186-00-01		
9									6896.45		R	353-30-50		
10	Δ	1958	6930.0 ⊙	6896.45	D 89-22-40	6.0						173-30-49		173-30-50
11					R 270-36-05	✓								
12	π	1895	5390.0 ⊙	5077.88		5.8			05		D	194-11-36		
13	O	1846			D 91-42-25	6.0			53			174-11-35		
14					R 268-16-23	✓			37		V ₂	179-59-50		
15									77		R	14-11-33		
16									7.88					
17									6377.88			174-11-43		174-11-39

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS Δ = BACKSIGHT π = INSTRUMENT SET-UP SS = SIDESHOT \odot = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

46

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. _____ PAGE 3 OF _____
 LINE/LOOP NO. 51X5 TYPE SURVEY _____ CLIENT _____ DATE 14 BY 4 MO 39 YR
 SURVEYOR Helander & Jensen INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	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												1		
2												2		
3	Δ	1958	6896.45 ⊕	D	6.0			14		V ₁	00-26	3		
4				R	✓			40		D	191-55-15	4		
5	⊗	1895	14096.64 ⊕		5.7			09			191-54-49	5		
6	⊙	BAS 79340		D	89-34-26	6.0		96		V ₂	180-00-31	6		
7				R	276-24-48	✓		6.64		R	11-55-11	7		
8								14096.64			191-54-40	8	191-54-45	
9												9		
10	Δ	1846 1895	5390.0 ⊙	⊕	28-16-56	6.0						10		
11					271-41-54			15		V ₁	23	11		
12	⊗	1846	15878.2 ⊙			5.3		58		D	188-36-56	12		
13	⊙	1701 + 72	15802.00 15828.15 ⊕		28-25-17	6.0		8.2			188-36-34	13		
14					271-33-44			28		V ₂	180-00-19	14		
15								8.15		R	08-36-53	15		
16								15828.15			188-36-14	16	188-36-24	
17												17		

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

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

HORIZONTAL AND VERTICAL SURVEY NOTES

47

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. _____ PAGE 4 OF _____
 LINE/LOOP NO. SIXS TYPE SURVEY _____ CLIENT _____ DATE 14 DY 4 MO 79 YR
 SURVEYOR JENSEN/HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			<input type="checkbox"/> FEET <input type="checkbox"/> METERS 						INST	ROD				
1												1		
2		1846	15802.0	91-35-18	6.0					V.	11	2		
3				268-23-50						D	189-12-36	3		
4		1701+72	1282.0		5.6						189-12-25	4		
5		1690		84-09-57	6.0					V.	180-00-08	5		
6				275-49-08						R	09-12-27	6		
7											189-12-19	7	189-12-23	
8												8		
9												9		
10		1701+72	1282.0	95-47-15	6.0					V.	05	10		
11				264-12-09						D	180-01-38	11		
12		1690	660.0		5.4						180-01-33	12		
13		1684		⁴⁶⁻¹³ 88-51-58	13.0					V.	179-59-50	13		
14				271-13-08						R	00-01-33	14		
15											180-01-43	15	180-01-48	
16												16		
17												17		

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS

= BACKSIGHT

= INSTRUMENT SET-UP

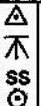


SS = SIDESHOT

= FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

48

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 5 OF _____
 LINE/LOOP NO. SIXS TYPE SURVEY _____ CLIENT _____ DATE 15 DY 4 MO 79 YR
 SURVEYOR HILANDER/JENSEN INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION					
			SLOPE 	<input type="checkbox"/> FEET <input type="checkbox"/> METERS HORIZ 					INST	ROD				
1													1	
2	Δ	1690	3800.6 \odot	3782.26 \odot	90-03-55	11.0			03		V.	--03	2	- 30
3					269-55-14	✓			37		D	170-36-50	3	170-34-44
4	∇	1684				5.8			78				4	170-34-14
5	\odot	1649 + 50'			90-03-56	6.0			82		V.	179-58-50	5	180-00-25
6					269-55-16	✓			2.20		R	350-35-44	6	350-34-39
7									3782.70				7	170-34-14
8													8	170-34-14
9	Δ	1684	3782.20T		89-55-28	6.0			00		V.	02	9	
10					270-03-43				36		D	180-09-51	10	
11	∇	1649 + 50'	3680.0 \odot	3655.5 \odot		5.7			65			180-09-49	11	
12	\odot	1616			90-24-27	11.0			55		V.	180-00-05	12	
13					269- 30 -55				5.51		R	00-09-46	13	
14									3655.51			180-09-41	14	180-09-45
15													15	
16													16	
17													17	

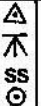




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SYMBOLS Δ = BACKSIGHT ∇ = INSTRUMENT SET-UP SS = SIDESHOT \odot = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

49

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. _____ PAGE 6 OF _____
 LINE/LOOP NO. 51X9 TYPE SURVEY _____ CLIENT _____ DATE 15 BY 4 MO 7 YR
 SURVEYOR Helander/Jensen INSTRUMENT DESC/SERIAL NO. Easter Sunday CREW NO. _____

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	ELEVATION					
				SLOPE 	HORIZ 										
1															
2															
3	Δ	1649 + 50'	3680.0 \odot	3655.5 \oplus	89-30-40	6.0					V ₁	00-29	3		
4					270-28-32	\checkmark					D	193-07-30	4	193-07-01	
5	π	1616	440 \odot	\oplus		5.8						193-07-01	5		
6	\odot	1612	\odot		88-25-48	11.0					V ₂	180-00-18	6		
7					271-33-38	\checkmark					R	13-07-27	7	193-07-05	
8												193-07-09	8	193-07-19	
9													9		
10													10		
11	Δ	1616	440 \odot		90-20-26	11.0					V ₁	00-29	11		
12					269-38-37	\checkmark					D	180-13-53	12		
13	π	1612	370 \odot			5.8					-	180-13-30	13		
14	\odot	1605			92-22-41	6.0					V ₂	180-00-18	14		
15					267-36-33	\checkmark					R	00-13-47	15	180-13-29	
16											-	180-13-29	16	180-13-36	
17													17		

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SYMBOLS Δ = BACKSIGHT π = INSTRUMENT SET-UP SS = SIDESHOT \odot = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

50

GSI AREA Howard Pass x Mt. Bupto STATE/COUNTY Alaska BOOK NO. _____ PAGE 7 OF _____
 LINE/LOOP NO. 51X5 TYPE SURVEY _____ CLIENT _____ DATE 15 DY 4 MO 79 YR
 SURVEYOR Helander/Jensen INSTRUMENT DESC/SERIAL NO. _____ CREW NO. _____

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	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	HORIZ										
1												1			
2												2			
3	Δ	1612	770 ⊙			87-41-40	4.0				V ₁	• 00-17	3		
4						272-17-25	✓			04	D	171-48-32	4		
5	π	1605	4070. ⊙	4049.98 ⊕			5.7			49.		171-48-15	5		
6	⊙	1568				264-17-16	6.0			9.98	V ₂	180-00-06	6		
7						95-41-46	✓			4049.98	R	351-48-21	7		
8												171-48-15	8	171-48-15	
9													9		
10	Δ	1605				84-16-44	6.0				V.	03	10		
11						275-42-17					D	166-33-25	11		
12	π	1568					5.5					166-33-22	12		
13	⊙	1557	1210 ² ⊙			91-03-00	6.0				V ₂	179-59-52	13		
14						268-55-58					R	346-33-16	14		
15												166-33-24	15	166-33-23	
16													16		
17													17		

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

HORIZONTAL AND VERTICAL SURVEY NOTES

51

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 8 OF _____
 LINE/LOOP NO. 51 XS TYPE SURVEY _____ CLIENT _____ DATE 15 BY 4 MO 79 YR
 SURVEYOR HELANDER/JENSEN INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	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	LINE
			SLOPE	HORIZ					INST	ROD				
1												1		
2	Δ	1568			88-54-22	6.0				V	08	2		
3					271-04-52					D	169-31-08	3		
4	⊗	1557	1430° ⊙			5.7					169-31-00	4		
5	⊙	1520 1544			89-38-38	4.0				V	179-59-54	5		
6					270-20-27					R	349-31-04	6		
7											169-31-10	7	169-31-05	
8												8		
9	Δ	1557			90-24-13	6.0				V	10	9		
10					269-35-28					D	180-00-06	10		
11	⊗	1544	2640° ⊙			5.8					179-59-56	11		
12	⊙	1520			89-58-47	10.5				V	180-00-13	12		
13					270-00-37					R	00-00-08	13		
14											179-59-53	14	179-59-54	
15												15		
16												16		
17												17		

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

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

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 9 OF _____
 LINE/LOOP NO. 51X5 TYPE SURVEY _____ CLIENT _____ DATE 16 DY 4 MO 79 YR
 SURVEYOR HELANDER/JENSEN INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						HORIZONTAL		REMARKS									
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			UR OR DI	RIGHT TURNED HORIZONTAL ANGLE							
			SLOPE	HORIZ					INST	ROD										
1					89-52-02															
2		1544			90-04-12	8.0 11.0					V.	18								
3					270-07-26						D	173-57-10								
4		1520	990°			5.8						173-56-52								
5		1511			91-17-12	6.8					V.	180-00-19								
6					268-42-12						R	353-57-08								
7												173-56-49								173-56-50
8																				
9		1520			88-36-55	6.0					V.	12								
10					271-22-35						D	179-58-23								
11		1511				5.5				42		179-58-11								
12		1472	4290°	4285°	72-21-40	6.0			2.9	28	V.	180-00-12								
13					267-37-57					86 85	R	359-58-17								
14									5.95	5.75		179-58-05								179-58-08
15																				
16																				
17																				

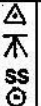


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SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

53

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. _____ PAGE 10 OF _____
 LINE/LOOP NO. 51X5 TYPE SURVEY _____ CLIENT _____ DATE 16 DY 4 MO 79 YR
 SURVEYOR Helander/Jensen INSTRUMENT DESC/SERIAL NO. _____ CREW NO. _____

LINE		STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE 	HORIZ 					INST	ROD				
1												1		
2	A	1511		4285.75 @	87-37-30	6.0					V	00-26	2	
3					272-22-03	✓					D	168-07-32	3	
4	K	1472	1980 =			5.7						168-07-06	4	
5	⊙	1454	2420° @		89-50-42	6.0					V	180-00-20	5	
6					270-08-56	✓					R	348-07-31	6	
7												168-07-11	7	168-07-08
8													8	
9	Δ	1472			90-08-15	6.0					V	00-17	9	
10					269-51-05	✓					D	169-27-16	10	
11	K	1454			04-43-43	5.8		09				169-26-59	11	
12	⊙ SS	803 79338	147° @		85-10-17	4.0		96			D	63-16-56	12	Pipe & Tags set at
13								66					13	Vp 1452
14								61					14	
15								1-88			V	180-00-05	14	79338 63-16-43
16	⊙	1413 1366	9680° @	9661.88 @	90-48-50	6.0		9661.88	+88	79339	R	243-10-49	15	
17					269-10-53	✓				1366 1413	R	349-27-08	16	
												169-27-03	17	169-27-01

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

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

HORIZONTAL AND VERTICAL SURVEY NOTES

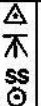












GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. _____ PAGE 11 OF _____
 LINE/LOOP NO. 51X5 TYPE SURVEY _____ CLIENT _____ DATE 16 4 79 YR
 SURVEYOR Helander / Jensen INSTRUMENT DESC/SERIAL NO. _____ CREW NO. _____

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ◎	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													
2													
3	Δ	1454		9661.88 [⊙]	89-11-24	6.0				V ₁	00-28		
4					270-47-35	✓				D	194-28-53		
5	⊗	1366	1430.0 [⊙]			5.7					194-28-25		
6	○	1353			90-32-56	6.0				V ₂	180-00-20		
7					269-26-05	✓				R	14-28-50		
8											194-28-30		194-28-28
9													
10													
11	Δ	1366			89-24-11	6.0				V ₁	11		
12					270-34-52					D	190-21-46		
13	⊗	1353				5.7					190-21-35		
14	○	1341	1320 [⊙]		90-21-25	6.0				V ₂	180-00-10		
15					269-37-35					R	10-21-40		
16											190-21-30		190-21-32
17													

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

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 12 OF _____
 LINE/LOOP NO. SIXS TYPE SURVEY _____ CLIENT _____ DATE 16 DY 4 MO 79 YR
 SURVEYOR HELANDER / TENSEN INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		UR OR DI	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 HORIZ 										
1												1		
2		1353			89-35-55	6.0				V.	15	2		
3					270-23-20				49	D	190-40-30	3		
4		1341				5.8			94		190-40-15	4		
5		1296	4950° 	4944.1 	89-16-58	6.0			44	V.	180-00-21	5		
8					270-42-06				4.10	R	10-40-24	6		
7											190-40-03	7	190-40-09	
8												8		
9												9		
10		1341			90-42-22	6.0			1.0	V.	08-13	10		
11					269-16-45				05	D	178-09-31	11		
12		1296				5.7			55		178-09-23	12		
13		1200	10,560° 	10,553 	91-09-37	6.0			53	V.	180-00-04	13		
14					268-49-23				3.10	R	358-09-23	14		
15											178-09-19	15	178-09-21	
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. _____ PAGE 13 OF _____
 LINE/LOOP NO. SIXS TYPE SURVEY _____ CLIENT _____ DATE 16 DY 4 MO 79 YR
 SURVEYOR Helander/Jensen INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

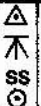






LINE	 	STATION	VERTICAL							HORIZONTAL		REMARKS		
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR D/I		RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1												1		
2													2	
3	Δ	1296		10,553.10 [Ⓞ]	88-50-28	6.0					W	00.19	3	
4					271-08-53	✓					D	194-25-13	4	
5	π	1200	990.0									194-24-54	5	
6	O	1191			90-22-30	6.0					V ₂	180-00-25	6	
7					269-37-02	✓					R	14-25-19	7	
8												194-24-54	8	194-24-54
9													9	
10	Δ	1200	990.0 [Ⓞ]		89-36-50	6.0					D	00-25	10	
11					270-22-16	✓					R	192-20-36	11	
12	π	1191	1473.0 [Ⓞ]			5.8						192-20-11	12	
13	O	1177 + 67			90-20-43	6.0					D	180-00-30	13	Int. Lns. SIXS 611
14					269-38-40	✓					R	12-20-30	14	
15												192-20-00	15	192-20-06
16													16	
17													17	

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SYMBOLS Δ = BACKSIGHT π = INSTRUMENT SET-UP SS = SIDESHOT \odot = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. _____ PAGE 14 OF _____
 LINE/LOOP NO. SIXS TYPE SURVEY _____ CLIENT _____ DATE 18 DY 4 MO 79 YR
 SURVEYOR Helander/Jensen INSTRUMENT DESC/SERIAL NO. _____ CREW NO. _____

LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	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 HORIZ 										
1												1		
2												2		
3		1191			89-38-15	6.0			54		V ₁	00-27	3	
4					270-20-56	✓			46		D	194-46-12	4	
5		1197 + 67'	5457.0 ⊙	5465.52 ⊙					65 5.52			194-45-45	5	
6		1128			90-09-07	6.0			5465.52		V ₂	180-00-32	6	
7					269-49-55	✓					R	14-46-24	7	
8												194-45-52	8	194-45-49
9													9	
10		2212/611	1185 ⊙		89-03-30	8.0					D	99-39-33	10	99-39-06
11													11	
12													12	
13													13	
14													14	
15													15	
16													16	
17													17	

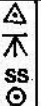


WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

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

HORIZONTAL AND VERTICAL SURVEY NOTES

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GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 15 OF _____
 LINE/LOOP NO. SIXS TYPE SURVEY _____ CLIENT _____ DATE 17 DY 4 MO 79 YR
 SURVEYOR HELANDER / TENSEN 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	ROD			
1													1	
2	Δ	1177+67°			89-50-28	6.0			05		V.	13	2	
3					270-08-50				58		D	182-03-00	3	
4	π	1128				5.8			82			182-02-47	4	
5	\odot	1075	5830° \odot	5823° \odot	90-32-36	6.0			32		V.	180-00-01	5	
6					269-26-31				5.05		R	02-02-48	6	
7												182-02-47	7	182-02-47
8					89-27-40								8	
9	Δ	1128			89-30-05	6.0					V.	20	9	
10	Δ				270-31-25						D	168-40-00	10	
11	π	1075				5.6						168-39-40	11	
12	\odot	1065	1100° \odot		90-51-25	6.0					V.	180-00-16	12	
13					269-07-50						R	348-39-54	13	
14												168-39-38	14	168-39-39
15													15	
16													16	
17													17	

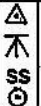










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SYMBOLS Δ = BACKSIGHT π = INSTRUMENT SET-UP SS = SIDESHOT \odot = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

59

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. _____ PAGE 16 OF _____
 LINE/LOOP NO. SIXS TYPE SURVEY _____ CLIENT _____ DATE 17 DY 4 MO 79 YR
 SURVEYOR Helander / Jensen INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		UR OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE 	<input type="checkbox"/> FEET METERS HORIZ 					INST	ROD				
1												1		
2												2		
3		1075	1100.0 @		89-05-48	6.0					V ₁	00-33	3	
4					270-53-20	✓					D	172-02-24	4	
5		1065	3850. @			5.8						172-01-51	5	
6		1030			90-24-15	6.0					V ₂	180-00-41	6	
7					269-35-04	✓					R	352-02-14	7	
8												172-01-33	8	172-01-42
9													9	
10		1065	3850. @		89-37-20	6.0					V ₁	00-14	10	
11					270-22-00	✓					D	11-18-45	11	
12		1030				5.8						11-18-31	12	11-18-31
13		PIPE	1170.0 @		89-28-20	6.0					V ₁	180 00-19	13	
14					270-31-01	✓					R	191-18-44	14	SP911 ~ SIX
15					00-00-30							11-18-31	15	
16		1004	2860.0 @		89-59-30	6.0					V ₁	00-14	16	Last VP
17					269-89-50	✓					D	194-35-13	17	194-34-55

1370
 2.00
 1170

194-34-59

TI-23471B

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HORIZONTAL AND VERTICAL SURVEY NOTES

60

GSI AREA Haw STATE/COUNTY Alaska BOOK NO. _____ PAGE 17 OF _____
 LINE/LOOP NO. _____ TYPE SURVEY _____ CLIENT _____ DATE 17 DY 4 MO 99 YR
 SURVEYOR _____ INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ					INST	ROD				
1														
2		1030												
3		1004												
4										<u>Vs</u>	<u>180-00-13</u>		<u>LAST VP</u>	
5										<u>R</u>	<u>14-35-04</u>			
6											<u>194-34-51</u>			
7														
8														
9														
10														
11														
12														
13														
14														
15														
16														
17														

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