

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 134 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 29 YR
 SURVEYOR B. BENEDICT 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					INST	ROD			
1		120	0		H1 +56				2619.8			1	
2												2	
3												3	
4		100	2200	89-15-14	145				2639.95	L	adjusted	4	BEGINNING OF L-615
5				270-44-33						R		5	MARKER PILE
6												6	
7												7	
8		100	2200	89-15-07	145		14.32	2625.67		L		8	
9				270-44-25			-14.28 14.23			R		9	
10		104	1760	89-16-22	68	+22.34	+15.54	2641.21				10	
11		106	1540									11	
12		108	1320	89-11-30	45	+18.62	+14.12	2639.79				12	
13		110	1100									13	
14		112	880	89-17-45	45	+10.81	+6.31	2631.98				14	
15		114	680									15	
16		116	440	89-17-42	45	+8.93	+1.43	2627.10				16	
17		118	220									17	

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

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 135 OF 2
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

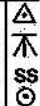







LINE		STATION	VERTICAL							ELEVATION		LR OR DI	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD					
			SLOPE 	HORIZ 											
1										2625.67				1	
2		120	0			-	5.6							2	
3		122	220											3	
4		124	440			92 51 05	8.9	-21.89	-30.19		2595.48			4	
5		126	660											5	
6		128	880			92 53 02	5.3	-44.27	-49.57		2576.10			6	
7		130	1100											7	
8		132	1320			93 01 08	5.3	-69.52	-74.82		2550.85			8	
9		134	1540											9	
10		136	1760			93 05 40	5.3	-95.01	-100.40		2525.27			10	
11		138	1980			93 01 15	10.2				2511.75	L	adjusted	11	13 ft. @
12		138				266 58 35						R		12	267 03 25
13														13	-114.28
14														14	
15														15	
16														16	
17														17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 136 OF 3
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 72 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		LR OR DR	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												2511.75			1	
2		138	2200			88° 07' 36"	+10.		-62.02	2449.02			L		2	+5.7 (88° 15' 05")
3						271° 51' 50"			-61.93 -61.84				R		3	-62.13
4		140	1980			88° 22' 13"	-4.5	+56.31	+51.81			2501.63			4	
5		142	1760												5	
6		144	1540			88° 33' 37"	-4.5	+38.69	+34.19			2484.01			6	
7		146	1320												7	
8		148	1100			88° 41' 35"	-4.5	+25.09	+20.59			2470.41			8	
9		150	880												9	
10		152	660			88° 43' 24"	-4.5	+14.70	+10.20			2460.02			10	
11		154	440												11	
12		156	220			89° 12' 00"	-4.5	+3.07	-1.43			2448.39			12	
13		158	0			-	-	-	-5.4	2444.42					13	
14		160	220												14	
15		162	440			91° 37' 53"	-5.3	-12.53	-17.89	2431.93					15	
16		164	660			91° 39' 18"	-5.3	-17.91	-23.21	2426.61					16	
17		166	880												17	

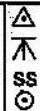





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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 157 OF 4
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 72 YR
 SURVEYOR B. BENEDICT 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									2449.82			1		
2		168	1100			91° 19' 12"	5.3	-25.34		2424.48		2		
3		170	1320									3		
4	⊙	172	1540			91° 27' 41"	13.0			2397.94	L	adjusted	4	70.00 (91° 33' 50")
5	⊙					268° 32' 19"					R		5	-52.03
6												6		
7												7		
8	Δ	172	2640			88° 18' 56"	+10.0		-67.75	2330.21	L		8	+5.0 (88° 25' 27")
9	Δ					271° 48' 58"			-67.73 -67.71		R		9	-67.60
10		174	2420									10		
11		176	2200			88° 43' 10"	-2.5	+49.17	+44.67	2374.88		11		
12		178	1980									12		
13		180	1760			88° 59' 25"	-2.0	+31.01	+27.01	2357.22		13		
14		182	1540									14		
15		184	1320			89° 27' 47"	-4.5	+12.37	+7.87	2338.08		15		
16		186	1100									16		
17		188	880			89° 35' 18"	-4.5	+6.32	+1.82	2332.03		17		

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SYMBOLS

Δ = BACKSIGHT

⊕ = INSTRUMENT SET-UP

⊙ = SIDESHOT

⊙ = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 5 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. H84

LINE	 SS 	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									2330.21			1		
2		190	660									2		
3		192	440	89° 55' 25"	2.0	+0.58	-1.42		2328.79			3		
4		194	220									4		
5		K 196	0	-	5.6	-	-5.60		2324.61			5		
6		198	220									6		
7		200	440	90° 30' 32"	5.3	-3.91	-9.21		2321.0			7		
8		202	660									8		
9		204	880	90° 34' 20"	5.3	8.79	-14.09		2316.12			9		
10		206	1100									10		
11		208	1320	90° 33' 51"	5.3	-13.00	-18.30		2311.21			11		
12		210	1540									12		
13		212	1760	90° 33' 51"	5.3	-17.33	-22.63		2307.58			13		
14		214	1980									14		
15		216	2200	90° 39' 00"	5.3	-24.96	-30.26		2299.95			15		
16		218	2420									16		
17												17		

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SYMBOLS

= BACKSIGHT




= INSTRUMENT SET-UP

SS = SIDESHOT

= FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 6¹³⁹ OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		LR 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	○	220	2640		90°38'26"	13.0				2288.39	L	adjusted	2	14.0 (90°37'10")
3	○				267°21'46"						R		3	-42.54
4													4	
5													5	
6	△	220	1760		88°53'08"	+10.0		24.29	2264.16		L		6	+5.0 (89°03'00")
7	△				271°06'21"			-24.23 24.16			R		7	-24.48
8		222	1540										8	
9		224	1320		89°01'10"	4.5	+22.59	+18.09		2282.25			9	
10		226	1100										10	
11		228	880		89°07'17"	4.5	+13.49	+8.99		2273.15			11	
12		230	660										12	
13		232	440		88°56'55"	-4.5	+8.07	+3.57		2267.73			13	
14		234	220										14	
15	⊠	236	0			5.6	-	-5.6		2258.56			15	
16		238	220										16	
17		240	440		91°48'54"	4.5	12.94	9.44		2254.72			17	









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

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 140 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE 	HORIZ 										
1									2264.16			1		
2		242	660									2		
3		244	880		92° 06' 06"	5.3	32.27	37.57		2226.59		3		
4		246	1100									4		
5		248	1320		92° 02' 35"	5.3	47.06	52.36		2211.18		5		
6		250	1540									6		
7		252	1760		92° 02' 40"	5.0				2196.65	L	adjusted	7	+10.0 (91° 52' 50")
8		252			267° 56' 45"						R		8	
9												9		
10												10		
11		252	2640		89° 06' 52"	9.0		31.95	2164.74		L		11	+10.0 (89° 05' 25")
12					270° 52' 55"			-31.97 -31.86			R		12	-31.92
13		254	2420			4.5						13		
14		256	2200		82° 21' 50"	↓	+24.42	+19.92		2184.66		14		
15		258	1980			4.5						15		
16		260	1760		82° 27' 27"	↓	+16.66	+12.16		2176.9		16		
17		262	1540			4.5						17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

8

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 141 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 73 YR
 SURVEYOR B. BENEDICT 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										2164.74			1	
2		264	1320			89° 36' 06"	4.5	+3.18	+4.68		2169.42		2	
3		266	1100										3	
4		268	880			89° 39' 00"	4.5	+5.38	+0.88		2165.62		4	CRACK
5		270	660										5	
6		272	440			89° 56' 33"	2.0	+0.44	-1.56		2163.18		6	2.0
7		274	220										7	
8		276	0				5.7	-	-5.7		2159.04		8	
9		278	220										9	
10		280	440			91° 02' 37"	4.0	8.01	-12.01		2152.73		10	
11		282	660										11	
12		284	880			91° 05' 09"	2.0	17.44	-19.44		2145.3		12	
13		286	1100										13	
14		288	1320			91° 05' 20"	5.3	25.08	-30.38		2134.36		14	
15		290	1540										15	
16		292	1760			91° 03' 33"	3.3	32.53	-37.83		2126.91		16	
17		294	1980										17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

142 9

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. _____ PAGE 7 OF _____

LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 79 YR

SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> \odot	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	\odot	296	2200		90°49'33"	10.0				2123.51	L	adjusted	2	5.0 (90°55'40"	
3	\odot				269°10'20"						R		3	-41.26	
4													4		
5													5		
6	Δ	296	2200		89°17'46"	5.0	5.33	-21.47	2102.09				6	(89°11'00)" 10.0	
7	Δ				270°40'48"	-		-21.42 21.35					7	-21.5	
8		298	1980										8		
9		300	1760		89°17'50"	4.5	+21.57	+17.09		2119.18			9		
10		302	1540										10		
11		304	1320		89°21'21"	4.5	+14.84	+10.34		2112.43			11		
12		308	1100										12		
13		308	880		89°35'50"	4.5	+6.19	+2.19		2104.28			13		
14		310	660										14		
15		312	440		89°24'28"	4.5	+3.27	-0.73		2101.36			15		
16		314	220										16		
17	Δ	316	0			5.6	-	-5.6		2096.49			17		

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SYMBOLS

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\odot = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 10 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DJ	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									2102.09				1	
2		318	220										2	
3		320	440	91°06'12"	4.0	8.47	12.47		2089.62				3	
4		322	660										4	
5		324	880	91°00'10"	4.0	15.4	19.4		2082.69				5	
6		326	1100										6	
7		328	1320	90°58'20"	5.3	22.40	27.70		2074.39				7	
8		330	1540										8	
9		332	1760	91°02'47"	5.3	32.14	37.44		2064.65				9	
10		334	1980										10	
11		336	2200	91°07'08"	5.0				2054.88	L	adjusted		11	10.0 (90°59'18")
12				268°53'31"						R			12	-5.0 (268°52'57")
13													13	-5.0 (91°06'27")
14													14	-47.95
15													15	
16													16	
17													17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. _____ PAGE 11 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 SS 	STATION	VERTICAL						ELEVATION		LR 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										2054.88			1	
2		336	1540			88°39'55"	+5.0		30.92	2023.97		L	2	+10.0 (88°28'40")
3						271°19'48"			-30.87 30.86			R	3	-30.91
4		338	1320										4	
5		340	1100			89°09'05"	-4.5	+18.21	+13.71				5	
6		342	880										6	
7		344	660			89°23'25"	-4.5	+7.02	+2.62				7	
8		346	440										8	
9		348	220			89°39'33"	-4.0	+2.07	-1.93				9	
10		350	0				-5.6		-5.6				10	
11		352	220										11	
12		354	440			92°04'02"	-5.8	15.88	-21.18				12	
13		356	660			91°03'33"	-4.0	12.20	-16.20				13	
14		358	880				-5.8						14	
15		360	1100			90°56'41"	↓	19.62	24.92				15	
16		362	1320										16	
17		364	1540			90°40'12"	-5.3	21.59	-26.89				17	

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SS = SIDESHOT

= FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

12

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 12 OF 125
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT 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									2025.99				1		
2		366	1760							1990.93			2		
3		368	1980			90° 48' 12"	5.0	27.76	33.06				3		
4	○	370	2200			90° 41' 37"	5.0	26.63	31.63	1993.02	L	adjusted	4	-10.0 (90° 33' 42")	
5	○					269° 18' 52"					R		5	-31.57	
6													6		
7													7		
8	A	370	2200			90° 54' 00"	+5.0		+39.46	2032.49	L		8	+10.0 (90° 46' 13")	
9	A					269° 05' 55"			+39.47 +39.48		R		9	+39.58	
10		372	1980			90° 59' 48"	4.0	6.47	10.47	2022.02			10		
11		374	1760										11		
12		376	1540			91° 38' 45"	4.0	44.23	48.23	1984.26			12		
13		378	1320										13		
14		380	1100			92° 45' 08"	4.0	52.82	56.82	1975.67			14	CREEK	
15		382	880										15		
16		384	660			93° 22' 22"	4.5	38.83	43.32	1989.17			16		
17		386	440										17		

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

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

1985.55
39.56
2025.11
TI-28471B

HORIZONTAL AND VERTICAL SURVEY NOTES

13

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE ¹⁸⁶ 13 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 72 YR
 SURVEYOR B. BENEDICT 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										
1									2032.49			1		
2		388	220						RETURN 2026.9			2	(7033)	
3		390	0		5.6		5.6		2026.9	adjusted		3	Intersection of RIX-VF-55.64	
4		392	220									4	E L-615-VF 390	
5		394	440	86° 56' 12"	2.0	+23.51	+21.51		2054.0			5	MARKER PIPE	
6		396	660	87° 05' 40"	4.0	33.46	+29.46		2061.95			6		
7		398	880	87° 10' 10"	5.5	42.0	+37.97		2070.45			7	-10.0 (86 52' 43")	
8				272' 49' 28"	5.5		+37.93					8	-37.92	
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 = SIDESHOT = FORESIGHT

TI-23471B
 2025.04
 5.60
 2019.44

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 14 OF 14
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 8 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊕	STATION	VERTICAL						ELEVATION		L/R OR DJ	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														
2		398												
3	Δ		2640			91-28-34	+10.0		+77.86	2148.56				
4	Δ					91-30-48	+10.0		+77.99 +78.11					91-34-50 - 5.0
5		400	2420											
6		402	2200 2200 1980			91-34-55	4.2	60.73	-64.93			2083.63		
7		406	1760											
8		408	1540			91-43-35	4.2	46.39	-50.59			2097.97		
9		410	1320											
10		412	1100			91-52-48	4.2	36.09	-40.29			2108.27		
11		414	880											
12		416	660			91-53-25	4.2	21.77	-25.97			2122.59		
13		418	440											
14		420	220			91-55-47	4.0	7.41	-11.41			2137.15		
15	⊕	422	0			HI	5.6	-	-5.6			2142.96		
16														
17		404	1980			91-36-38	4.2	55.65	-59.85			2088.71		

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. 1 PAGE 15 OF 148
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 8 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 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														
3	-	424	220		89-21-03	4.0	+2.49	-1.51		2148.56				3
4		426	440											4
5		428	660		88-59-25	4.0	+11.63	+7.63		2147.05				5
6		430	880											6
7		432	1100		88-59-25	5.2	+19.38	+14.18		2156.19				7
8		434	1320											8
9		436	1540		88-42-44	5.2	+34.04	+28.84		2162.74				9
10		438	1760		88-21-10	5.0	+50.59	+45.59		2177.4				10
11		440	1980		88-09-50	5.2	+63.44	+58.24		2194.15				11
12		442	2200		87-57-57	5.2	+78.09	+72.89		2206.8				12
13		444	2420		87-46-15	4.0	+94.13	+90.13		2221.45				13
14		446	2640		87-43-47	5.2	+104.58	+99.38		2235.69				14
15	o	447	2750		87-41-47	10.0				2247.94				15
16	o				272-17-42	10.0				2248.17		adjusted	87-34-47	16
17														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 16 OF 16
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 8 BY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> T <input type="checkbox"/> SS <input type="checkbox"/> O	STATION	VERTICAL						ELEVATION		L/R OR D/I	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										2248.17			1		
2		447											2		
3	Δ		1210		88-18-46	+14.0	-21.66	2226.51					3	88-21-00 13.0	
4	Δ				271-41-18	14.0	-21.67 21.67						4		
5		448	1106										5		
6		450	886		88-20-45	4.2	+25.40	+21.20		2247.7			6		
7		452	660		88-15-18	4.2	+20.10	+16.08		2242.58			7		
8		454	440		88-11-05	2.0	+13.94	+11.94		2238.44			8		
9		456	220		87-34-55	4.0	+9.28	+5.28		2231.78			9		
10	T	458	0		HI	5.6	-	-5.6		2220.9			10		
11		460	220		94-26-07	4.0	-17.01	-21.01		2205.49			11		
12		462	440		94-29-15	5.3	-34.43	-39.73		2186.77			12		
13	O	464	660		94-52-48	14.0				2156.13	adjusted		13	95-00-25 12.5	
14	O				265-06-55	14.0							14		
15													15		
16													16		
17													17		

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS

Δ = BACKSIGHT





T = INSTRUMENT SET-UP

SS = SIDESHOT

O = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES


GSI AREA HOWARD Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 17 OF 17
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 8 DY 2 MO 79 YR
 SURVEYOR BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1104


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 										
1		464	2640		86 21 54	+5		162.52	1993.72			1		
2					273 37 30	-		162.41 162.29				2		
3		466 470	2420		86 39 48	-4 ³	+140.85	+136.55		2130.27		3		
4		468 472	2200		87 01 45	-4 ³	+114.02	+109.72		2103.44		4		
5		470 474	1980		87 43 13	-4 ³	+78.76	+74.46		2068.18		5		
6		472 476	1760		87 53 10	-4 ³	+64.92	+60.62		2054.34		6		
7		474 478	1540		87 56 51	-4 ³	+55.16	+50.86		2044.58		7		
8		476 480	1320		87 51 25	-4 ³	+49.36	+45.06		2038.78		8		
9		478 482	1100		87 52 10	-4 ³	+40.89	+36.59		2030.31		9		
10		480 484	880		87 52 10	-4 ³	+32.72	+28.42		2022.14		10		
11		482 486	660									11		
12		486 > 484 488	440		88 17 50	-4 ³	+13.07	+8.77		2002.49		12		
13		488 492	0		90 - - -	-5 ⁶	-	-5.6		1988.12		13		
14		490 494	220		93 01 00	-5 ³	-11.58	-16.88		1976.84		14	CREEK	
15		492	440		92 29 38	-5 ³	-19.15	-24.45		1969.27		15	CREEK	
16		494	660		91 31 08	-5 ³	-17.49	-22.79		1970.73		16		
17		496	880		91 48 05	-5 ³	-17.68	-22.98		1970.74		17		

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SYMBOLS

 = BACKSIGHT

 = INSTRUMENT SET-UP

SS = SIDESHOT

 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

U.S.I. 18
 T.S.I. 151
 UGSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 18 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 8 DY 2 MO 79 YR
 SURVEYOR Benedict 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					INST	ROD				
1								1973.72				1		
2		498	1100									2		
3		500	1320	90 46 38	5 ³	17.91	23.21		1970.51			3		
4		502	1540									4		
5		504	1760	90 40 20	5 ³	20.65	26.95		1967.77			5		
6		506	1980									6		
7		508	2200	90 35 55	5.0				1965.35	Adjusted		7	19 20 28 00 - 27.82	
8	-			869 24 20								8		
9												9		
10												10	89 03 35 10	
11		508	880	89° 41' 27"	5.0		27.89	1937.51				11	89 22 55 5	
12				270 09 50	4.2		27.84 - 27.80					12	270 36 46	
13		512	440	89° 20' 57"	4.2	+4.23	-0.07		1937.44			13		
14		516	0	91° 39' 22"	5.6	-	-5.6		1931.91			14		
15		518	220	90° 51' 42"	5.3	-3.31	-8.61		1928.90			15		
16		524	880	90° 25' 14"	5.3	-6.46	-11.76		1925.75			16		
17												17		

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS

= BACKSIGHT

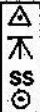


= INSTRUMENT SET-UP

ss = SIDESHOT

= FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 19 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 8 DY 2 MO 72 YR
 SURVEYOR BENEFIT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1104

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												1		
2	⊙	528	1320		91° 22' 02"	5.0				1924.03		adjust	2	10.0 (91° 08' 55")
3	⊙				268° 38' 07"								3	
4													4	
5	Δ	520	2200		89° 53' 00"	4.9		+0.32		1924.49			5	10.0 (89° 49' 15")
6	Δ				270° 06' 10"			+0.26 +0.59					6	
7		532	1760		89° 58' 07"	4.3	+26.56	+3.30 23.26		1946.75	1921.19		7	
8		536	1320		89° 59' 40"	4.3	+0.13	-4.17		1920.32			8	
9		540	880		90° 14' 24"	4.3	-3.67	-7.99		1916.50			9	
10		544	440		90° 04' 04"	4.0	-0.52	-4.52		1919.97			10	
11	⊥	548	0		-	5.6	-	-5.6		1918.89			11	
12		550	220			5.3							12	
13		552	440		89° 55' 40"	↓	+0.55	-4.75		1919.74			13	
14		554	660										14	
15		556	880		89° 53' 53"	5.3	+1.57	-3.73		1920.75			15	
16		558	1100										16	
17		560	1320		89° 49' 00"	5.0	+4.22	-1.12		1923.37			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. 1 PAGE 20 OF 20
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 8 DY 2 MO 79 YR
 SURVEYOR BENEDICT 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	INST	ROD				
			SLOPE	HORIZ										
														
1									1924.49			1		
2		562	1540									2		
3		564	1760	89° 57' 33"	5.3	+1.25	-4.05		1920.44			3		
4		566	1980									4		
5		568	2200	89° 57' 58"	5.3	+1.30	-4.0		1926.49			5		
6		570	2420									6		
7	o	572	2640	89° 57' 07"	5.7				1920.26		adjusted	7	10.0 (89° 51' 39")	
8	o			270° 02' 25"								8		
9												9		
10												10		
11	Δ	572	1760	89° 50' 23"	5.1		-0.06	1920.21				11		
12	Δ			270° 02' 53"			-0.05					12		
13		574	1540									13		
14		576	1320	89° 52' 36"	4.3	+2.84	-1.46	1918.9				14		
15		578	1100									15		
16		580	880	89° 39' 10"	4.3	+5.33	+1.03	1921.3				16		
17		582	660									17		

WORKED BY BEB CHECKED BY 1ST _____ 2ND _____

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

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 20A OF 21
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 8 DY 2 MO 72 YR
 SURVEYOR 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		LR OR DR		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE 	METERS HORIZ 					INST	ROD				
1								SEE PAGE 20, LINE 7	1923.28			1		
2		572	1200	88 28 43	+ 5.0	26 ⁹	26 ⁹	1893 ⁴				2		
3				271 31 15								3		
4												4		
5				86 17 11	5.0							5		
6				200 00 10						Reference B.A. 5		6		
7		B.M. 79444	1740	85 58 15	5.0	117 ³			2010.20 2013.76	2010		7 B.M. 79444		
8				274 01 56		117 ⁴			+ 3.56			8 (2016.23)		
9												9		
10												10		
11												11		
12												12		
13												13		
14												14		
15												15		
16												16		
17												17		

13.7
 3.0
 8.7
 2
 17.4

WORKED BY ? CHECKED BY 1ST _____ 2ND _____

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

HORIZONTAL AND VERTICAL SURVEY NOTES

155

22

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 21 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 8 BY 2 MO 72 YR
 SURVEYOR 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		LR OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1														
2		584	440			89° 32' 40"	4.0	+3.50	-0.5		1919.7			2
3		586	220				-							3
4		588	0			-	-	-5.6			1914.6			4
5		590	220											5
6		592	440			91° 46' 55"	5.3	-13.68	-18.98		1901.2			6
7		594	660											7
8		596	880			91° 31' 11"	5.3	-23.34	-28.64		1891.6			8
9		598	1100											9
10		600	1320			91° 37' 52"	5.3	-37.57	-42.87		1877.3			10
11		602	1540											11
12		604	1760			91° 32' 33"	10.0				1863.13			12
13						268 29 08								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

157

23

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 22 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 8 BY Z MO 79 YR _____
 SURVEYOR Benedict INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1104

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 										
1									1863.13			1		
2		604	1540		89 46 27	5.0	-1.12	1862.04				2	+10.0 (89 35 27)	
3					270 13 17		-1.09 -1.06					3		
4		606	1320									4		
5		608	1100		90 18 34	4.3	5.94	-10.24		1851.8		5		
6		610	880		90 26 00	4.3	6.66	-10.96		1851.1		6		
7		612	660		90 28 00	4.3	1.54	-5.84		1856.2		7		
8		614	440									8		
9		616	220		91 28 15	2.0	6.65	-7.65		1854.4		9		
10		618	0		90 -	5.6	-	-5.6		1856.4		10		
11		620	220		91 35 30	5.3	6.11	-11.41		1850.6		11		
12		622	440									12		
13		624	660		91 22 36	5.3	15.86	-21.16		1840.9		13	Creek	
14		626	880									14		
15		628	1100		91 22 36	5.3	26.43	-31.73		1836.3		15	Creek	
16		630	1320		91 22 36	8.8	31.71	-38.51		1823.5		16	Creek	
17		632	1540		91 27 08	3.5	30.07	-35.57		1826.5		17	5.5 "	







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

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 23 OF 57
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 8 DY 2 MO 72 YR
 SURVEYOR Benedict 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									1862.84			1		
2		634	1760									2		
3		636	1980			91 05 42	5.3	-37.84	-33.14		1828.9		3	Creek
4		638	2200			90 54 23	10.0	-34.80	-44.80		1857.2		4	
5		640	2420			90 59 25	38.3	-41.82	-47.12		1814.9		5	5.3
6		642	2640										6	
7		644	2860			90 34 55	5.0				1828.47	adjusted	7	10.0 (90 28 50)
8						269 27 35							8	
9													9	
10		644	1645			90 00 29	5.0		+5.18		1833.68		10	
11						269 59 18			+5.21 +5.23				11	
12		646	1425										12	
13		648	1205			90 07 10	4.3	-2.51	-6.81		1826.9		13	
14		650	985										14	
15		652	765			90 25 11	4.3	-5.60	-9.90		1823.8		15	
16		654	545										16	
17		656	325			92 49 53	4.3	-13.22	-17.52		1816.2		17	

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

HORIZONTAL AND VERTICAL SURVEY NOTES

25

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 24 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 72 YR
 SURVEYOR Benedict INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1124

LINE	 	STATION	VERTICAL						ELEVATION		LR OR DI	HORIZONTAL RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE 	HORIZ 										
1									1833.68			1		
2		658	105									2		
3		658 + 105	0	90° 00' 00"	5.6	-	-5.6		1828.1			3		
4		660	115	91° 33' 23"	5.3	-3.13	-8.43		1825.3			4		
5		662	335									5		
6		664	555	90° 33' 23"	5.3	-8.62	-13.92		1819.8			6		
7		666	775	91° 28' 00"	5.3	-19.84	-25.14		1808.5			7		
8		668	995	90° 35' 45"	5.3	-10.35	-15.65		1818.0			8		
9		670	1215									9		
10		672	1435	90° 35' 25"	10.0				1809.26		adjusted	10		
11				269° 24' 51"								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

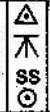






HORIZONTAL AND VERTICAL SURVEY NOTES

159 26

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 25 OF _____

LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 79 YR

SURVEYOR BENEDICT/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					
				SLOPE 											HORIZ 
1												1809.26		1	
2		672	2690		89 03 45	-5	-38.77	1770.52						2	
3					270 56 41	-	-38.94							3	
4		674	2420											4	
5		676	2200		89 07 19	-4 ³	+33.71	+29.41				1799.9		5	
6		678	1980											6	
7		680	1760		89 16 21	-4 ³	+22.35	+18.05				1768.6		7	
8		682	1540											8	
9		684	1326		89 25 59	-4 ³	+13.09	+8.79				1779.3		9	
10		686	1100											10	
11		688	880		89 33 26	-4 ³	+6.80	+2.5				1773.0		11	
12		690	660											12	
13		692	440		89 18 49	-4	+5.27	+1.27				1771.8		13	
14		694	220											14	
15		696	0		-	-56	-	-5.6				1764.9		15	
16		698	220											16	
17		700	440		90 53 53	-56	-6.90	-1.50				1769.0		17	

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

HORIZONTAL AND VERTICAL SURVEY NOTES

160 27

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 26 OF _____

LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 79 YR _____

SURVEYOR 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		702	660			90 47 10	53						2	
3		707	880			90 47 10	53	12.07	17.37		1753.2		3	
4		706	1100								1748.0		4	
5		708	1320			90 44 52	53	17.23	22.53				5	
6		710	1540										6	
7		712	1760			90 53 42	53	27.49	32.79		1737.7		7	
8		714	1980										8	
9		716	2200			90 53 42	53	34.36	39.66		1730.9		9	
10		718	2420										10	
11	⊙	720	2640			90 46 10	10				1728.96	adjusted	11	
12	-					269 13 32	-						12	
13													13	
14	Δ	720	3300			89 36 47	5		17.51		1708.18		14	89 37 34
15	-					270 22 39	-		17.38				15	270 22 34
16									17.24				16	
17													17	

WORKED BY _____ CHECKED BY 1ST _____ 2ND _____

SYMBOLS

= BACKSIGHT

= INSTRUMENT SET-UP

= SIDESHOT

= FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

161

28

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 27 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 29 YR
 SURVEYOR 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									1708.18			1		
2		722	3080									2		
3		724	2860		89 37 45	-43	+18.51	+14.21		1722.4		3		
4		726	2640									4		
5		728	2420		89 37 45	-43	+15.66	+11.36		1719.5		5		
6		730	2200									6		
7		732	1980		89 42 32	-43	+10.06	+5.76		1713.9		7		
8		734	1760									8		
9		736	1540		89 43 41	-43	+7.31	+2.01		1711.2		9		
10		738	1320									10		
11		740	1100		89 46 55	-43	+4.19	+0.11		1708.3		11		
12		742	880									12		
13		744	660		90 00 09	-4	+0.03	-3.97		1704.2		13		
14		746	440									14		
15		748	220		90 38 38	-43	-2.47	-6.77		1701.4		15		
16		750	0				5.6	-	-5.6	1702.6		16		
17		752	220									17		

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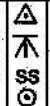


SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

29

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 29 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 79 YR
 SURVEYOR Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

162

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										1708.18			1		
2		754	440			90° 50' 53"	4.3	-6.51	-10.81		1697.4		2		
3		756	660			90° 47' 03"	4.3	-9.02	-13.33		1694.9		3		
4		758	880										4		
5		760	1100			90° 43' 01"	4.3	-13.76	-18.06		1856.96	adjusted	5		
6	⊙	762	1320			90° 43' 14"	5.0					should be	6	1686.96	
7	⊙					269° 16' 39"							7		
8													8		
9	Δ	762	2420			89° 03' 45"	5.0		-34.72	1852.26			9		
10	Δ					270° 56' 09"			-34.70 -34.68				10		
11		766	1980			89° 17' 15"	4.3	+24.62	+20.32		1872.6	Subtract 200'	11		
12		770	1540			89° 25' 57"	4.3	+15.25	+10.95		1863.2		12		
13		774	1100			89° 27' 40"	4.3	+10.35	+6.05		1858.3		13		
14		778	660			89° 45' 47"	4.3	+2.73	+1.57		1850.7		14		
15		782	220			89° 40' 00"	4.3	+1.28	-3.02		1849.2		15		
16	⊗	784	0			90° -	5.6		-5.6		1846.7		16		
17		786	220										17		

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

HORIZONTAL AND VERTICAL SURVEY NOTES

163

30

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 29 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 79 YR
 SURVEYOR ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> \odot	STATION	VERTICAL						ELEVATION		LR 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									1852.26			1			
2		788	440			90°40'12"	5.3	5.15	10.45		1841.8	2			
3		790	660									3			
4		792	880			90°31'43"	5.2	8.12	13.42		1838.8	4			
5		794	1100			90°38'48"	6.5	12.41	18.91		1833.4	5			
6		796	1320			90°24'28"	5.3	9.39	14.69		1837.6	6			
7		798	1540			0						7			
8		800	1760			90°15'43"	5.3	8.05	13.35		1838.9	8			
9		802	1980									9			
10		804	2200			90°03'44"	5.3	2.39	7.69		1844.6	10			
11		806	2420									11			
12		808	2640			89°05'54"	5.3	+4.68	-0.62		1851.6	12			
13		810	2860									13			
14	\odot	812	3080			89°55'51"	1.5				1655.20	14			
15	\odot					270°04'06"						15			
16												16			
17												17			

Subtract
200'

CRACK
294







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

HORIZONTAL AND VERTICAL SURVEY NOTES

164 31

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 30 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 79 YR
 SURVEYOR 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						
				SLOPE 											HORIZ 	
1												1655.20			1	
2		812	2640			89° 52' 15"	5.0		-16.45		1638.78				2	
3						270 23 33			-16.42 -16.38						3	
4		814	2420				AS								4	
5		816	2200			89° 30' 28"	4.3	+18.90	+14.60		1653.4				5	
6		818	1980				AS								6	
7		820	1760			89° 36' 27"	4.3	+12.06	+7.76		1646.5				7	
8		822	1540												8	
9		824	1320			89° 44' 20"	4.3	+6.02	+1.72		1640.5				9	
10		826	1100												10	
11		828	880			89° 54' 43"	4.3	+1.35	-2.95		1635.8				11	
12		830	660												12	
13		832	440			89° 54' 43"	4.3	+0.68	-3.62		1635.2				13	
14		834	220												14	
15		836	0			90 00 00	5.6		-5.6		1633.2				15	
16		838	220												16	
17		840	440			90 11 30	5.3	-1.47			1632.0				17	

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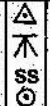
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SYMBOLS  = BACKSIGHT  = INSTRUMENT SET-UP SS = SIDESHOT  = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

32

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 31 OF 165
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 79 YR
 SURVEYOR ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1104

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									1628.78			1		
2		842	660									2		
3		844	860	90° 24' 09"	5.3	-6.18	-11.48		1627.3			3		
4		846	1100									4		
5		848	1320	90° 35' 07"	5.3	-13.48	-18.78		1620.0			5		
6		850	1540									6		
7	⊙	852	1760	99° 55' 12"		-6.5			1612.32		adjusted	7	90 39 49	
8	⊙											8	265 20 14	
9												9		
10												10		
11	Δ	852	2040	88° 56' 25"	3.0		-45.97		1566.49			11		
12	Δ			271° 02' 50"			-45.83					12		
13		854	2420									13		
14		856	2200	89° 06' 08"	4.3	+38.31	+34.01		1600.5			14		
15		858	1980									15		
16		860	1760	89° 00' 08"	4.3	+30.65	+26.35		1592.8			16		
17		862	1540									17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

166

33

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 32 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 79 YR
 SURVEYOR 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		864	1320			89° 00' 09"	A.3	+22.98	+18.68		1566.49	1585.27	2	
3		866	1100			-							3	
4		868	880			88° 59' 10"	A.3	+15.57	+11.27			1577.8	4	
5		870	660			-							5	UP 870 REFERENCE
6		872	440			89° 03' 01"	A.3	+7.29	+2.99			1569.5	6	BY A 10 MILE
7		874	220			-							7	MARKER PIPE
8	X	876	0			90° -	5.6	-	-5.6			1560.9	8	
9		878	220			-							9	
10		880	440			90° 58' 32"	5.3	-7.49	-12.77			1563.7	10	
11		882	660			-							11	
12		884	880			90° 39' 13"	5.3	-10.04	-15.34			1551.2	12	
13		886	1100			-							13	
14		888	1320			90° 41' 09"	5.3	-15.80	-21.10			1545.4	14	
15		890	1540			-							15	
16		892	1760			90° 40' 41"	5.3	-20.83	-26.13			1540.4	16	
17		894	1980			-							17	

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SYMBOLS

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 = INSTRUMENT SET-UP

SS = SIDESHOT

 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

117

34

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 1 PAGE 33 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT DATE 9 DY 2 MO 79 YR
 SURVEYOR ANDERSON INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL					ELEVATION		L/R OR DIR	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		896	2200		90 40 16	5.3	28.8	-31.1		1566.49		1535.4	2		
3		898	2420										3		
4	⊙	900	2640		90 44 14	13.0						1533.26	4	90 27 19	
5	⊙				269 52 18								5	269 32 41	
6													6		
7													7		
8	Δ	13.10	2220		90 00 00	12.6		12.4					8		
9	Δ	2.0			270 00 21			12.3					9		
10	⊗	11.10											10		
11	⊙	2.220	1950		89 32 50	7.5		5.2				1554.57	11		
12	⊙				270 22 13			5.2					12		
13		12.75											13		
14		3.6											14	12-25 1578.0	
15		9.78											15	Elev. 1570.3	
16		19.50											16		
17													17		

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





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HORIZONTAL AND VERTICAL SURVEY NOTES

168

35

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. PAGE 84 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT DATE 10 DY 2 MO 79 YR
 SURVEYOR ANDERSON INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	  	STATION	VERTICAL						ELEVATION		L/R OR D/I	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										1554.57			1		
2													2		
3			1810		90-19-08	+13.0	+10.07	+23.22	1577.79				3		
4			1810		269-40-18	+13.0	+10.22	+10.37					4		
5													5		
6			0		HI	5.5							6		
7													7		
8		INT L-R28 EL-45X	2200		89-51-46	2.0	+5.27	+3.26	1581.05				8	(1570.3)	
9		IRON PIPE 1978	2200		210-08-11	2.0	+5.26	5.24	1578.00			Reference: BAS SURVEY	9		
10									+3.05			MISCLOSURE	10		
11													11		
12													12		
13													13		
14													14		
15													15		
16													16		
17													17		

11.05
2.00
9.05

13.0
2.0 1/2

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HORIZONTAL AND VERTICAL SURVEY NOTES

169 36

GSI AREA HOWARD PASS STATE/COUNTY ALABAMA BOOK NO. 1 PAGE 35 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT HUSKY DATE 10 DY 2 MO 79 YR
 SURVEYOR ANDERSON BENEDICT 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 DR	RIGHT TURNED HORIZONTAL ANGLE	
				SLOPE 									
1									1533.26		adjusted	1	
2		900	2640 ✓		87 54 18	5.0	+0.48	1533.87				2	+10.0 (89 42 43)
3					270 05 02		+0.61 +0.74					3	
4		902	2420		-							4	
5		904 (906) 908	2200 1980 1760		89 57 10	4.2	23		1536.3			5	ELEVATIONS HAVE
6					90 05 18	4.2	-69		1527.1			6	BEEN ADJUSTED
7		910	1540		-							7	
8		912	1320		90 13 00	4.2	-92		1524.7			8	
9		914	1100		-							9	
10		916	880		90 13 00	4.2	-75		1526.4			10	
11		918	660		-							11	
12		920	440		90 27 00	4.2	-77		1526.3			12	
13		922	220		-							13	
14		924	0		90 00 00	5.6	-	9.6	1528.3			14	
15		926	220		-							15	
16		928	440		89 16 52	3.3	00		1533.9			16	
17		930			-							17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 36 OF 170 37
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HOOKY DATE 10 DY 2 MO 79 YR
 SURVEYOR BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						ELEVATION		LR 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									1533.87			1	ELEVATIONS HAVE	
2		932	880		88 06 54	5.3		83		1542.2		2	BEEN ADJUSTED	
3		934	1100									3		
4		936	1320		88 51 18	5.3		21'		1555.0		4		
5		938	1520									5		
6		940	1760		88 45 03	5.3		33'		1567.0		6		
7		942	1980									7		
8		944	2200		88 45 40	5.3		42'		1576.2		8		
9		946	2420									9		
10		948	2640		88 42 18	5.3		54.5		1588.4		10		
11	⊙	950	2860 ✓		88 39 52	5.0		61.8		1595.99	adjusted	11	-10.0 (88 34 00)	
12	⊙				271 19 47			61.7				12		
13												13		
14												14		
15	Δ	950	1540 ✓		91 46 40	5.0		+52.73	1648.76			15	+10.0 (91 35 44)	
16	Δ				268 13 00			+52.77 +52.80				16		
17												17		

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

HORIZONTAL AND VERTICAL SURVEY NOTES

38

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 37 OF 171
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT MUSKEY DATE 10 BY 2 MO 72 YR
 SURVEYOR KENNETH BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DJ	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									1648.76			1	ELEVATIONS HAVE	
2		952	1320									2	BEEN ADJUSTED	
3		954	1100			91 45 03	4.3		-37 ⁹		1610 ²	3		
4		956	890			91 48 48	4.3		-32 ⁰		1578 ²	4	1616.74	
5		958	660									5		
6		960	440			91 00 42	4.3		-12 ¹		1636 ²	6		
7		962	220									7		
8		964	0			90° 00' 00"	5.6		-5.6		1643 ²	8		
9		966	220									9		
10		968	440			88° 36' 45"	5.3		5 ⁴		1654 ²	10		
11		970	660									11		
12		972	890			88 52 50	5.3		11 ⁹		1660 ²	12		
13		974	1100									13		
14		976	1320			88 58 33	5.3		18 ³		1667 ¹	14		
15		978	1540 ✓			89 01 10	5.0		21 ⁴		1670.33	15	adjusted	
16						270 58 42			21 ⁴			16	20.0 (88 50.10)	
17												17		

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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 38 OF 172 39
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 10 DY 2 MO 29 YR
 SURVEYOR ANDERSON BENEDICT 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										
1									1670.33			1		
2		978	1980 ✓			91 22 20	+5.0	+52 ³⁴	1722.67			2	+10.0 (91 13 33)	
3						268 37 40		+52 ³⁴				3		
4		980	1760			91 23 30	+3	-47°			1675 ²	4		
5		982	1540			-						5	ELEVATIONS HAVE	
6		984	1370			91 25 05	+4.3	-36°			1685 ²	6	BEEN ADJUSTED	
7		986	1100									7		
8		988	886			91 25 05	+4.3	-26°			1696 ²	8		
9		990	660									9		
10		992 ²	440			91° 05' 28"	+4.3	-12°			1710 ²	10		
11		996	0			90° 40' 00"	5.6	-5.6			1717 ²	11		
12		998	220			-						12		
13		1000	440			89 02 00	5.3	2°			1724 ²	13		
14		1002	660			-						14		
15		1004	880 ✓			87 11 21	5.0	75			1730.20	15	adjusted -10.0 (88 52 00)	
16						270 48 28		74				16		
17												17		

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

HORIZONTAL AND VERTICAL SURVEY NOTES

173
40

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 39 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT HUSKY DATE DY 2 MO 79 YR
 SURVEYOR BENEDIET INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	 SS 	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									1730.20			1		
2		1004	2640 ✓		90 24 28	+10.0	+2965	1758.78				2	+13.0 (90 20 30)	
3					267 35 54		+2950					3		
4		1006	2480		-							4		
5		1008	2200		90 30 12	+4.3	-236		1735 2			5	ELEVATIONS HAVE	
6		1010	1980		-							6	BEEN ADJUSTED	
7		1012	1760		90 24 24	+3	-167		1742 1			7		
8		1014	1540		-							8		
9		1016	1320		90 35 56	+3	-181		1740 2			9		
10		1018	1100		-							10		
11		1020	880		90 44 25	+3	-157		1743 1			11		
12		1022	660		-							12		
13		1024	440		90 26 28	+3	-79		1751 1			13		
14		1026	220		-							14		
15		1028	0		90 00 00	5.6	-5.6		1753 2			15		
16		1030	220		-							16		
17		1032	440		89 36 33	-5.3	-23		1756 2			17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

174 41

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 1 PAGE 40 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT Husky DATE 10 DY 2 MO 77 YR
 SURVEYOR Benedict 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								1758.78				1		
2		1034	660	-								2		
3		1036	880	89° 20' 05"	5.3		+4.9		1763.68			3		
4		1038	1100	-								4		
5		1040	1320	89° 15' 15"	5.3		+11.9		1770.68			5		
6		1042	1540	-								6		
7		1044	1760	89° 21' 48"	5.3		+14.3		1773.08			7		
8		1046	1980	-								8		
9		1048	2200	89° 23' 26"	5.3		+18.2		1776.98			9		
10		1050	2420	-								10		
11		1052	2640 ✓	89° 18' 36"	12.0				1778.92		adjusted	11	14.0 (89 16 20)	
12				270 00 22								12		
13												13		
14		1052	1980 ✓	90° 00' 00"	+11.3		+11.22		1790.11			14		
15				270 00 15			+11.19 +11.15					15		
16		1054	1760	-								16		
17		1056	1540	90° 13' 28"	4.3							17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

42

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 41 OF _____
 LINE/LOOP NO. _____ TYPE SURVEY _____ CLIENT _____ DATE _____ DY 2 MO 79 YR
 SURVEYOR _____ 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 	HORIZ 										
1									1790.11			1		
2		1058	1320									2		
3		1060	1100			90° 29 10	4.3		-13.6		1778.51	3		
4		1062	880									4		
5		1064	660			90° 28 07	4.3		-9.7		1780.41	5		
6		1066	440									6		
7		1068	220			90 30 37	5.3		-6.3		1783.8	7		
8	⊗	1070	0				35.6		-6.6		1784.5	8		
9		1072	220									9		
10		1074	440			89 34 20	5.3		-2.0		1788.1	10		
11		1076	660			88 57 11	5.3		+6.8		1796.9	11		
12		1078	880									12		
13		1080	1100			87 47 10	5.3		+37.2		1827.3	13		
14		1082	1320									14		
15		1084	1540			87 36 15	5.3		+59.1		1849.2	15		
16		1086	1760									16		
17												17		



1124

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY _____ BOOK NO. 1 PAGE 42 OF 176 43
 LINE/LOOP NO. _____ TYPE SURVEY _____ CLIENT _____ DATE _____ DY 2 MO 9 YR
 SURVEYOR _____ INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	△ SS ⊙	STATION	VERTICAL						ELEVATION		LR OR DI	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS	
			DISTANCE	□ FEET □ METERS		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST					ROD
				SLOPE 	HORIZ 										
1									1799.11			1			
2	⊙	1088	1980			87 41 07	3.3		+74.8			2			
3	⊙	1090	2200 ✓			88 55 46	5.0				1826.47	adjusted	3		
4	⊙					271 04 08							4		
5													5		
6													6		
7	△	1090	2420 ✓			91 08 34	4.0		+62.14	1888.69			7		
8	△					268 50 59			+62.22 +62.30				8		
9		1092	2200			91 31 02	4.3		-62.5		1826.2		9		
10		1094	1980										10		
11		1098	1760			91 52 11	4.3		-61.7		1827.0		11		
12		1098	1540										12		
13		1100	1320			92 39 51	4.3		-65.6		1823.1		13		
14		1102	1100			92 48 12	7.0		-68.8		1819.9		14		
15		1104	880			92 48 12	6.4		-49.4		1839.3		15		
16		1106	660			92 47 02	6.4		-38.5		1850.2		16		
17		1108	440			92 38 44	4.3		-24.6		1864.1		17		

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

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 177 ⁴³ OF _____
 LINE/LOOP NO. _____ TYPE SURVEY _____ CLIENT _____ DATE 10 DY 2 MO 79 YR
 SURVEYOR ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

44










LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> \odot	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		1110	220						1888.69			1			
2	π	1112	0			90°00'00	5.6	-	-5.6		1883.1	2			
3		1114	220			-						3			
4		1116	440			88°42'47	5.3		+4.6		1893.3	4			
5		1118	660			-						5			
6		1119	770			88°23'16	5.3					6			
7		1120	880			\downarrow	\downarrow		+16.4		1905.1	7			
8		1122	1100			-						8			
9		1124	1320			88°29'27	5.3		+29.5		1918.2	9			
10		1126	1540			-						10			
11		{ 1128	{ 1760			{ 88°31'21	{ 5.0					11			
12	\odot	{ 1128	{ 1760			{ 88°30'05	{ 12.0				1923.12	adjusted	12		
13	\odot					271°30'09	12.0						13		
14													14		
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

GSI AREA HOWARD PASS STATE/COUNTY _____ BOOK NO. 1 PAGE 44 OF 178 45
 LINE/LOOP NO. _____ TYPE SURVEY _____ CLIENT _____ DATE 10 DY 2 MO 77 YR
 SURVEYOR _____ INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DJ	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												1923.12		1	
2		1128	2+20 ✓			90° 28' 52"	43.0	+33.20		1958.3				2	
3						269 38 26		+33.14 +33.09						3	
4		1130	2200											4	
5		1132	1980			90° 37' 38"	4.3	-25.9		1930.4				5	
6		1134	1760											6	
7		1136	1540			90° 37' 38"	4.3	-21.1		1935.2				7	
8		1138	1320											8	
9		1140	1100			90 36' 02"	4.3	-15.5		1940.8				9	
10		1142	880											10	
11		1144	660			90° 34 08	4.3	-8.9		1947.4				11	
12		1146	440											12	
13		1148	220			91 28' 45"	4.3	-9.5		1946.8				13	
14		1150	0			90° 00 00	5.6	-5.6		1950.7				14	
15		1152	220			88 55 27	5.3	-1.2		1955.1				15	
16		1154	440											16	
17		1156	660			88 51 23	5.3	+7.9		1964.2				17	

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SYMBOLS

 = BACKSIGHT

 = INSTRUMENT SET-UP


ss = SIDESHOT

 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

179
46

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 45 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT HUSKY DATE 15 BY Z MO 79 YR
 SURVEYOR BENEDICT 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	INST	ROD				
			SLOPE	HORIZ										
1									1956.3			1		
2		1158	880									2		
3		1160	1100		88 51 23	5.3		+19 2		1975.3		3		
4		1162	1320									4		
5	⊙	1164	1540 ✓		88 55 00	15.0				1970.59	adjusted	5		
6	⊙				271 05 13							6		
7												7		
8	Δ	1164	1540 ✓		90 21 45	5.0		+14.69	1985.29			8		
9	Δ				269 38 11			+14.70 +14.71				9		
10		1166	1320									10		
11		1168	1100		90 36 02	4.6		-17 5		1967.8		11		
12		1170	880									12		
13		1172	660		91 14 56	4.6		-20 4		1964.9		13		
14		1174	420									14		
15		1176	220		91 13 07	4.6		-9 5		1976.0		15		
16	⊗	1178	0		90 00 00	5.6		-5 6		1979.7		16		
17		1180	220									17		

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SYMBOLS

Δ = BACKSIGHT

⊕ = INSTRUMENT SET-UP

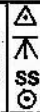

SS = SIDESHOT

⊙ = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES


47

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 1 PAGE 46 OF 180
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE _____ DY 2 MO 7 YR
 SURVEYOR Benedict 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									1985.29			1		
2		1180	820		91 01 00	-4.0	-7.9		1977.4			2		
3		1182	440		-							3		
4		1184	660		90 12 54	-5.3	-7.8		1977.5			4		
5		1186	880		-							5		
6		1188	1100		90 11 52	-5.3	-9.1		1976.2			6		
7	⊙	1190	1320 ✓		90 23 00	-5.0	-13.8		1971.63			7		
8	⊙				269 36 36							8	10.0 (269 49 30)	
9												9		
10	Δ	1190	1320 ✓		94 03 42	+5.0	+98.46	2070.11			adjusted	10	10.0 (93 50 40)	
11	Δ				265 56 04		+98.48 +96.50					11		
12		1192	1100		95 35 07	-4.3	-111.3		1958.8			12		
13		1194	880		96 59 00	-4.3	-111.3		1958.8			13		
14		1196	660		97 16 15	-4.3	-87.8		1982.3			14		
15		1198	440		98 49 28	2.0						15		
16		1200	220		90 09 18	-2.0	-45.3		2026.8			16		
17	⊗	1202	0		90 00 00	-5.6	-3.6		2064.5			17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

48

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE ¹⁸¹47 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT HUCKY DATE 13 DY 2 MO 22 YR
 SURVEYOR BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

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									2070.11			1			
2		1204	220			84 02 00	4.0	+18.9		2087.0		2			
3		1206	440			82 23 45	5.3	+52.9		2123.0		3			
4		1208	660 ✓			82 58 13	10.0			2144.78	adjusted	4	-12.0 (82 27 46)		
5		1250				277 21 31						5			
6												6			
7		1208	880 ✓			93 28 08	10.0	+65.78		2210.49		7	+12.0 (93 30 27)		
8						266 22 10		+65.77		+65.75		8			
9		1210	660			93 50 05	4.3	-48.4		2162.1		9			
10		1212	440			93 36 52	4.0	-31.7		2178.8		10			
11		1214	220			93 51 42	2.0	-16.8		2193.7		11			
12		1216	0			90 00 00	5.6	5.6		2204.9		12			
13		1218	220			87 22 05	5.3	+4.8		2215.3		13			
14		1220	440			87 13 39	5.3	+16.0		2226.5		14			
15		1222	660			87 04 42	5.3	+28.4		2238.9		15			
16		1224	880 ✓			87 08 40	5.0			2250.70	adjusted	16			
17						272 55 55						17			

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 SS = SIDESHOT
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HORIZONTAL AND VERTICAL SURVEY NOTES

182 49

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 1 PAGE 48 OF

LINE/LOOP NO. 615 TYPE SURVEY CLIENT Husky DATE 11 DY 2 MO 79 YR

SURVEYOR Benedict INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DJ	RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE	HORIZ										
1									2250.70			1		
2		1224	660 ✓		90 45 16	+5.0	+13.68	2264.4				2	+10.0 (90 19 25)	
3					269 14 22		+13.70 +13.72					3		
4		1226	440		-							4		
5		1228	220		90° 50' 10"	-4.0	-7.2		2257.2			5		
6		1230	0		90° 00' 00"	-5.6	-5.6		2204.9			6		
7		1232	220		-							7		
8		1234	440		90 23 54	-3.3	-8.4		2202.1			8		
9		1236	660									9		
10		1238	880 ✓		90 43 00	10.0			2242.51		adjusted	10	-12.0 (90 35 06)	
11					269 16 54							11		
12												12		
13		1238	2640 ✓		87 23 15	+5.0	-115.48					13	+10.0 (87 16 55)	
14					272 36 15		-115.39 -115.29	2128.12				14		
15		1240	2420		87 37 17	-4.3	+96.3		2224.4			15		
16		1242	2200		87 45 13	-4.3	+82.0		2210.1			16		
17		1244	1980		87 48 48	-8.0	+67.6		2195.7			17		






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

HORIZONTAL AND VERTICAL SURVEY NOTES

50

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 49 OF 183
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 11 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT 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													1	
2		1246	1760							2128.12			2	
3		1248	1540			87 47 31	+4.3		+55.1		2183.2		3	
4		1250	1320										4	
5		1252	1100			88 15 22	+4.3		+29.2		2157.3		5	
6		1254	880										6	
7		1256	660			88 52 32	+4.3		+8.7		2136.8		7	
8		1258	440										8	
9		1260	220			89 29 26	+4.0		-2.0		2126.1		9	
10		1262	0			90°00'00"	-5.6		-5.6		2122.5		10	
11		1264	220										11	
12		1266	440			90 33 08	-5.3		-9.5		2118.6		12	
13		1268	660			90 30 00	-5.3		-11.1		2117.0		13	
14		1270	880										14	
15		1272	1100			90 16 42	-5.3		-10.6		2117.5		15	
16		1274	1320										16	
17		1276	1540			90 31 00	-5.3		-19.1		2109.0		17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

184

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 1 PAGE 50 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT Huak DATE 11 DY 2 MO 19 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						ELEVATION		LR 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		1278	1760						2128.12			1		
2		1280	1980			90 16 00	5.3		-14.4		2113.7		2	
3		1282	2200										3	
4		1284	2420			90 12 12	5.3		-13.8		2114.3		4	
5	⊙	1286	2640 v			90 13 28	5.0				2113.58		5	
6	⊙					269 47 15							6	
7													7	
8	Δ	1286	1320 ✓			91 07 48	+10.8		+36.10 +36.15		2149.71		8	
9	Δ					268 51 53	+10.1		+36.16				9	
10		1288	1100										10	
11		1290	880			91 36 07	8.0		-32.6		2117.11		11	
12		1292	660			91 27 09	4.3		-21.0		2128.71		12	
13		1294	440			91 18 18	4.16	20					13	
14		1296	220			91 24 40	4.0	✓	-7.4		2142.31		14	
15	⋈	1298	0			90 00 00	5.6		-5.6		2144.1		15	
16		1300	220			90 35 00	4.0		-6.2		2143.5		16	
17		1302	440										17	

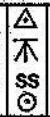





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SYMBOLS Δ = BACKSIGHT = INSTRUMENT SET-UP SS = SIDESHOT ⊙ = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES


52

GSI AREA Honaka Pass STATE/COUNTY ALASKA BOOK NO. 1 PAGE 51 OF 185
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 11 DY 2 MO 79 YR
 SURVEYOR B. BENEDIKT 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				
														
1									2149.71			1		
2		1304	660		90 31 40	-5.3	-114		2138.3			2		
3		1306	880		-							3		
4		1308	1100		90 35 17	-5.3	-166		2133.1			4		
5		1310	1320		-							5		
6		1312	1540		90 23 25	-5.3	-157		2134.0			6		
7		1314	1760		-							7		
8	⊙	1316	1980 ✓		90 18 29	-5.0			2134.44			8	-10.0 (90 09 53)	
9	⊙				269 41 41							9		
10												10		
11												11		
12	Δ	1316	2640 ✓		89 32 35	+5.0	-16.20	2118.29				12	+10.0 (89 36 13)	
13	Δ				270 27 02		-16.15 -16.05					13		
14		1318	2420									14		
15		1320	2200		89 40 00	-4.3	+86		2126.9			15		
16		1322	1980									16		
17		1324	1760		89 56 54	-4.0	+23		2120.6			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 _____ BOOK NO. 1 PAGE 52 OF _____

LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 11 DY 2 MO 79 YR

SURVEYOR B. Benedict INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

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				
1										2118.29			1	
2		1326	1540			-							2	
3		1328	1320			90 10 05	4.3		- 8'		2110.2		3	
4		1330	1100			-	#						4	
5		1332	880			90 25 10	4.0		- 10'		2107.9		5	
6		1334	660			-							6	
7		1336	440			90 49 42	4.3		- 10'		2107.6		7	
8		1338	220										8	
9		1340	0			90° 00 00	5.6	-	5.6		2112.7		9	
10		1342	220										10	
11		1344	440			89 05 42	5.3		+ 1'		2120.0		11	
12		1346	660										12	
13		1348	880			88 43 16	5.3		+ 14'		2132.7		13	
14		1350	1100										14	UP 1350 REFERENCED
15		1352	1320			88 35 32	5.3		+ 27'		2145.5		15	BY A 10 MILE
16		1354	1540										16	MARKER PIPE
17		1356	1760			88 33 30	5.3		+ 39'		2157.3		17	

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

HORIZONTAL AND VERTICAL SURVEY NOTES

54

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 1 PAGE 53 OF 187
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 11 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	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									2118.29			1		
2		1358	1980									2		
3		1360	2200			88 35 36	5.3	+48.8		2168.1		3		
4		1362	2420									4		
5	⊙	1364	2640 ✓			98 53 44	10.0			2174.51	adjusted	5	[13.0 (88 30 00)]	
6	⊙					271 35 29						6	10.0 (271 25 23)	
7												7	(88 34 17)	
8	Δ	1364	1480			91 50 48	+5.0	+52.65	2227.16			8		
9	Δ					268 09 11		+52.65				9		
10	X											10		
11	⊙	BAS B.M.	800			88° 22' 20"	+10		2237.18 2239.9		ref. B.A.S.	11	(2239.9)	
12	⊙	79421				271 36 58				-2.72	MISCLOSURE	12	B.M. BAR MARK	
13												13	# 79421	
14												14	(STAMPED ON PLAQUE)	
15												15		
16												16		
17												17		

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

HORIZONTAL AND VERTICAL SURVEY NOTES

55

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 54 OF 188
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUCKY DATE 12 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL					ELEVATION		L/R OR DJ	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 	ANGLE VERT 										
1										2174.51	Adjusted	1		
2		1364	1760 ✓	90 30 45	9.0/11.0/12.0	+5.0	+20.68	2195.27				2	+10.0 (90 21 00)	
3				269 28 40	9.0/11.0/12.0		+20.76					3	+20.75	
4		1366	1540									4		
5		1368	1320		90 36 50	4.3	-18.1	-18.4		2176.9		5		
6		1370	1100									6		
7		1372	880		90 38 25	4.3	-10.2	-11.5		2180.8		7		
8		1374	660									8		
9		1376	440		90 28 10	4.3	-2.6	-6.9		2188.4		9		
10		1378	220									10		
11		1380	0		90 00 00	5.6	-	-5.6		2189.7		11		
12		1382	220									12		
13		1384	440		91 37 14	5.3	-12.8	-18.1		2177.2		13		
14		1386	660									14		
15		1388	880		91 26 26	5.3	-25.0	-28.3		2167.0		15		
16		1390	1100									16		
17		1392	1320		91 19 30	5.2	-30.7	-26.0		2159.3		17		

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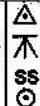


SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

189

56

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 55 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT MUSKY DATE 12 DY 2 MO 72 YR
 SURVEYOR B. BENEDICT 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	INST	ROD				
			SLOPE 	<input type="checkbox"/> FEET <input type="checkbox"/> METERS HORIZ 										
1									2195.27			1		
2		1374	1540	9 -								2		
3		1396	1760	91 11 54	5.4	-35.8	-41.2		2154.1			3		
4	⊙	1398	1980 ✓	91 17 22	5.0				2145.09		adjusted	4	+10.0 (91 OR 52)	
5	⊙			268 42 37								5	-49.66	
6												6		
7												7		
8	Δ	1398	2200 ✓	88 25 53	+5.0		-55.32		2089.82			8	+10.0 (88 (8 03))	
9	Δ			271 33 40			-55.27					9	-55.23	
10		1400	1980	88 59 54	4.2	+34.6	+30.4		2120.2			10		
11		1402	1760	89 31 03	4.3	+15.4	+11.1		2100.9			11		
12		1404	1540	89 56 00	4.0	+0.0	-4.0		2085.8			12		
13		1406	1320	-								13		
14		1408	1100	90 52 17	4.3	-16.0	-20.3		2069.5			14		
15		1410	880	-								15		
16		1412	660	93 15 03	4.3	-38.4	-42.7		2047.1			16	CREEK BED	
17		1414	440	-								17		

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

HORIZONTAL AND VERTICAL SURVEY NOTES

190

57

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 56 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT HUSKY DATE 12 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT 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										
1									2089.82				1	
2		1416	220			98 17 40	2.0	-31.9	-32.9		2056.92		2	
3	X	1418	0			90 00 00	5.6	-	-5.6		2084.2		3	
4		1420	220			87 12 52	4.0	+10.9	+6.9		2096.7		4	
5		1422	440			86 39 00	5.3	+25.6	+20.3		2110.1		5	
6		1424	660			-							6	
7		1426	880			86 39 00	5.3	+51.2	+45.9		2135.7		7	
8		1428	1100			86 40 44	5.3	+64.0	+58.7		2148.5		8	
9		1430	1320			-							9	
10		1432	1540			86 37 47	5.3	+89.5	+84.2		2174.0		10	
11		1434	1760			-							11	
12	⊙	1436	1980 ✓			86 36 28	5.0				2201.24	adjusted	12	To.0 (86 28 10)
13	⊙					273 23 07							13	+ 111.93
14						35							14	
15													15	
16													16	
17													17	

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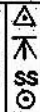








SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

191

58

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 57 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT HUSKY DATE 12 BY 2 MO 29 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1384

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	Δ	1436	2640 ✓			93 23 28	4.7		+160.92		2362.24		2	
3	Δ					266 36 05			+161.0				3	
4		1438	2420			- 35			+161.09				4	
5		1440	2200			93 31 13	4.3	-134.3			2223.6		5	
6		1442	1980			-							6	
7		1444	1760			93 39 00	4.3	-112.6	-116.9		2245.3		7	
8		1446	1540			-							8	
9		1448	1320			93 39 00	8.5	-84.4	-93.9		2268.3		9	
10		1450	1100			-							10	
11		1452	880			93 42 42	8.0	-56.3	-64.3		2297.9		11	
12		1454	660			-							12	
13		1456	440			93 23 30	4.3	-25.6	-29.9		2332.3		13	
14		1458	220			-							14	
15	\times	1460	0			90 00 00	5.6	-	-5.6		2356.6		15	
16		1462	220										16	
17		1464	440			88 19 21	3.3	+12.8	+7.5		2369.7		17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

192

59

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 58 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT HUSEY DATE 12 DY 2 MO 59 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR DJ	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									2362.24			1		
2		1466	660									2		
3		1468	880			88 21 50	-5.3	+25.6	+20.3		2382.5	3		
4		1470	1100									4		
5		1472	1320			88 09 30	-5.3	+42.2	+36.9		2399.1	5		
6		1474	1540									6		
7		1476	1760			88 07 39	-5.3	+56.3	+51.0		2413.2	7		
8		1478	1980									8		
9		1479	2090 ✓			88 08 13	-10.0				2419.51	9	adjusted -13.0 (88 03 36)	
10						271 51 38						10	+57.75	
11												11		
12												12		
13		1479	1430 ✓			86 51 37	+13.0			-65.36	2354.18	13	+14.0 (86 49 17)	
14						273 08 04				-65.33		14	-65.29	
15		1480	1320							-65.30		15		
16		1482	1100			86 47 10	-4.3	+60.8	+56.5		2410.17	16		
17		1484	880			86 47 56	-4.0	+48.6	+44.6		2398.8	17		

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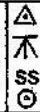






SYMBOLS = BACKSIGHT = INSTRUMENT SET-UP = SIDESHOT = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

193

60

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. PAGE 59 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT Husky DATE 12 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1104

LINE		STATION	VERTICAL						ELEVATION			L/R OR D/I	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	ELEVATION					
				SLOPE 	HORIZ 						INST				
1										2354.18				1	
2		1486	660											2	
3		1488	440			87 04 55	4.3	+23.0	+18.7		2372.9			3	
4		1490	420			88 31 05	2.0	+5.0	+3.8		2358.0			4	
5		1492	0			90 00 00	5.6	-	-5.6		2348.6			5	
6		1494	220			91 22 40	5.3	-24.3	-29.6		2324.6			6	
7		1496	440			93 14 10	4.0	-28.1	-32.1		2322.1			7	
8		1498	660			92 52 07	5.0	-32.6	-37.6		2316.6			8	
9		1500	880			92 43 12	5.0	-40.9	-45.9		2308.3			9	
10		1502	1100											10	
11		1504	1320			92 50 30	5.3	-65.2	-70.5		2283.7			11	
12		1506	1540											12	
13		1508	1760			92 44 50	5.3	-81.9	-87.2		2267.0			13	
14		1510	1980 ✓			92 41 05	10.0				2250.67		adjusted	14	-13.0 (92 35 50)
15						267 18 32								15	-102.72
16														16	
17														17	

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

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HORIZONTAL AND VERTICAL SURVEY NOTES

194 61

GSI AREA LOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 60 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT MUSKY DATE 12 DY 2 MO 79 YR
 SURVEYOR BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		LR 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										2250.67			1		
2	Δ	1510	2640 ✓			86 33 43	+5.0		-153.46	2097.29			2	+10.0 (86 27 09)	
3	Δ					273 25 50			-153.29				3	-153.40	
4		1512	2420			86 54 40	-5.0	+83.5	+78.5		2175.8		4		
5		1514	2200			-							5		
6		1516	1980			87 12 40	-4.3	+97.9	+93.6		2190.9		6		
7		1518	1760			-							7		
8		1520	1540			87 59 15	-4.3	+53.0	+48.7		2146.0		8		
9		1522	1520			-							9		
10		1524	1100			89 33 08	-4.3	+9.6	+5.3		2102.6		10		
11		1526	880			90 46 00	-4.3	-12.8	-17.1		2080.2		11		
12		1528	660			-							12		
13		1530	440			90 52 50	-4.3	-6.4	-10.7		2066.6		13		
14		1532	220			96 09 22	-14.0	-23.6	-37.6		2059.7		14		
15	⊗	1534	0			90 00 00	-5.6	-	-5.6		2091.7		15		
16		1536	220			-							16		
17		1538	440			89 13 10	-5.4	+6.4	+1.0		2098.3		17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

62

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE ¹⁹⁵70 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT Husky DATE 12 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

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		1540	660		89 15 25	10.8	+7.7	-3.1	2097.29			1		
2		1542	880		-							2		
3		1544	1100		89 15 25	18.5	+12.8	-5.7	2091.6			3		
4		1546	1320		-							4		
5		1548	1540		89 15 25	13.5	+17.9	+4.4	2101.7			5		
6		1550	1760		-							6		
7		1552	1980		89 15 25	10.2	+18.1	+7.9	2105.2			7		
8	o	1554	2200 v		89 16 11	13.0			2111.78		adjusted	8	+14.0 (89 15 00)	
9	o				270 44 10							9	+14.80	
10												10		
11												11		
12	A	1554	1760 v		89 01 40	+12.9		-17.03	2094.8			12	+14.0 (88 59 48)	
13	A				270 57 55	+12.9		-16.98				13	-16.82	
14		1556	1540		89 12 55	8.0	+22.4	+14.4	2109.2			14		
15		1558	1320		-							15		
16		1560	1100		89 08 48	8.0	+16.0	+8.0	2102.8			16		
17		1562	880		-							17		

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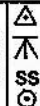






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HORIZONTAL AND VERTICAL SURVEY NOTES

196





63

GSI AREA HONAKO PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 80 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT HUSKY DATE 12 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	 SS  O	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		1564	660		88 54 33	7.3	+13.4	+9.1	2094.8			1		
2		1566	440		-	-	-	-				2		
3		1568	220		89 14 55	4.2	+3.2	-0.8	2094.0			3		
4		1570	0		90 00 00	5.6	-	-5.6	2089.2			4		
5		1572	220		92 09 55	5.3	8.3	-13.6	2081.2			5		
6		1574	440		-	-	-	-				6		
7		1576	660		92 16 50	5.3	26.9	-32.2	2062.6			7		
8		1578	880		-	-	-	-				8		
9		1580	1100		92 08 20	5.3	41.6	-46.9	2047.9			9		
10		1582	1320		-	-	-	-				10	10.0 (3154 22)	
11		1584	1540 ✓		92 05 30	5.0	-	-	2033.10		adjusted	11	-61.22	
12					267 54 28							12		
13												13		
14												14		
15												15		
16												16		
17												17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

197

64

AREA Howden Pass STATE/COUNTY ALASKA BOOK NO. 1 PAGE 90 OF
 LOOP NO. 615 TYPE SURVEY CLIENT Husky DATE 12 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	STATION	VERTICAL						ELEVATION		L/R OR DJ	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										
									2038.10			1		
	1584	1320 ✓		88 00 50	+5.0		+21.16	1971.93				2	+10.0 (87 48 07)	
				271 59 14			-61.17					3	-40.63	
	1586	1100		-								4		
	1588	880		88 03 46	-4.3	+30.7	+26.4		1938.3			5		
	1590	660		-								6		
	1592	440		88 05 47	-4.3	+14.1	+9.8		1981.7			7		
	1594	220		-								8		
	1596	0		90°00 00	-5.6	-	-5.6		1966.3			9		
	1598	220		-								10		
	1600	440		92 12 04	-5.3	-16.7	-22.2		1949.7			11		
	1602	660		-								12		
	1604	880		92 12 04	-5.3	-33.3	-38.6		1933.3			13		
	1606	1100		-								14		
	1608	1320 ✓		92 03 18	-5.0				1937.43	adjusted		15	10.0 (91 49 38)	
				267 56 20								16		
												17		

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

HORIZONTAL AND VERTICAL SURVEY NOTES

198

65

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 100 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT HUSKY DATE DY 2 MO 72 YR
 SURVEYOR B. BENNETT 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									1939.43			1			
2		1608	2200 ✓		88 41 19	+5.0	-45.45	1894.06				2	(88 33 25)+10.0		
3					271 19 09		-45.37					3	-45.40		
4		1610	1980		-							4			
5		1612	1760		88 45 50	-7.3	+35.8	+31.5	1925.6			5			
6		1614	1540		-							6			
7		1616	1320		88 59 20	-4.3	+23.0	+18.7	1912.8			7			
8		1618	1100		-							8			
9		1620	880		88 59 09	-4.3	+15.4	+11.1	1905.2			9			
10		1622	660		-							10			
11		1624	440		89 06 43	-4.3	+6.4	+2.1	1896.2			11			
12		1626	220		-							12			
13		✓ 1628	0		90° 00 00	-5.6	-	-5.6	1888.55		adjusted	13			
14		1630	220		-							14			
15		1632	440		91 05 32	-5.3	-9.0	-14.3	1879.8			15			
16		1634	660		-							16			
17		1636	880		91 08 13	-5.3	-17.9	-23.2	1870.9			17			

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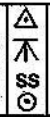









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SYMBOLS = BACKSIGHT
 = INSTRUMENT SET-UP
 SS = SIDESHOT
 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

66

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 101 OF 199
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 13 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE 	HORIZ 										
1									1893.6			1		
2		1628, L-615	T 13.7	 870 / 1740	91 52 14	+5.0	+56.8	+61.7				2		
3			C 5.0		268 08 10		+56.6					3		
4												4		
5		BAR MARKER #	T 11.9	 630 / 1260	87 36 25	-10.0	+57.6	+47.6	2002.9			5		
6		79426	C 5.0		212 23 32		+57.6		1997.3		REFERENCE: B.A.S. SURVEY	6		
7									+5.6		MICRO SURV	7		
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

67

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 1 PAGE 102 OF 200
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 1 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT 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									1894.06			1		
2		1638	1100									2		
3		1640	1320		90 54 16	5.3	-19.2	-24.5		1869.6		3	BANK OF RIVER	
4		1642	1540									4		
5		1644	1760 ✓		90 42 17	5.0				1866.97	adjusted	5	70.0 (90 32 32)	
6					269 17 35							6	NANK R -26.66	
7												7		
8												8		
9		1644	2640 ✓		91 16 58	5.0		+63.96	1930.94			9	10.01 (91 10 33)	
10					268 42 27			+64.07 +64.18				10	NANK V +64.17	
11		1646	2420		- 85							11		
12		1648	2200		91 36 13	4.3	-64.0	-68.3		1862.6		12	I	
13		1650	1980									13	P	
14		1652	1760		91 36 13	12.6	-51.2	-63.8		1867.1		14	R	
15		1654	1540									15	I	
16		1656	1320		91 36 00	3.8	-38.4	-42.7		1888.2		16	BANK OF RIVER	
17		1658	1100									17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

68

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 103 OF 201
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 12 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT 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									1930.94				1		
2		1660	880			92 00 10	-4.3	-20.7	-35.0			1895.9		2	
3		1662	660			-								3	
4		1664	440			92 23 35	-4.3	-17.9	-22.2			1908.7		4	
5		1666	220											5	
6		1668	0			90 00 00	-5.6	-	-5.6			1925.3		6	
7		1670	220			-								7	
8		1672	440			87 57 24	-5.3	+15.4	+10.1			1941.0		8	
9		1674	660			-								9	
10		1676	880			87 57 24	-5.3	+20.7	+25.4			1956.3		10	
11		1678	1100			-								11	
12		1680	1320			88 02 20	-5.3	+46.1	+40.8			1971.7		12	
13		1682	1540			-								13	
14		1684	1760			88 08 50	-5.3	+56.3	+51.0			1981.7		14	
15		1686	1980											15	
16		1688	2200			88 11 10	-5.3	+70.4	+65.1			1996.0		16	
17		1690	2420											17	

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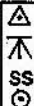













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HORIZONTAL AND VERTICAL SURVEY NOTES

69

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 104 OF 202
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 12 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT 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									1930.94				1	
2		1692	2640 V			88 05 21	10.0				2008.16	adjusted	2	12.0 (88 02 50)
3						271 52 28							3	+ 77.96
4													4	
5													5	
6		1692	1540 V			94 20 54	+5.0	+121.71		2129.94			6	+ 10.0 (94 03 36)
7						265 38 31		+121.78					7	
8		1694	1320			-		+121.84					8	
9		1696	1100			95 09 25	-4.3	-99.1	-103.4		2026.5		9	
10		1698	880			-							10	
11		1700	660			96 00 37	-4.0	-69.0	-73.0		2056.9		11	
12		1702	440			-							12	
13		1704	220			-							13	
14		1706	0			90 00 00	-5.6	-	-5.6		2124.3		14	
15		1708	220			-							15	
16		1710	440			89 37 45	3.0	+2.6	-2.7		2127.2		16	
17		1712	660			-							17	

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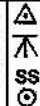


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SYMBOLS  = BACKSIGHT  = INSTRUMENT SET-UP  = SIDESHOT  = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

70

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 1 PAGE 105 OF 203
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKT DATE 12 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL						ELEVATION		L/R OR D/I	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									2129.94			1			
2		1714	860		89 32 27	5.3	+ 5.1	- 0.2		2129.7		2			
3		1716	1100		89 27 56	5.3	+ 9.6	+ 4.3		2134.2		3			
4		1718	1320		-							4			
5	○	1720	1540 ✓		89 06 05	10.0				2143.51	adjusted	5	13.0 (88 59 35)		
6	○				270 53 25							6	+ 14.06		
7												7			
8												8			
9	Δ	1720	2640 ✓		90° 38 00	13.0		+ 42.04	2185.6			9	15.0 (90 35 33)		
10	Δ				269 21 45			+ 42.09 + 42.13				10	+ 42.30		
11		1722	2420		-							11			
12		1724	2200		90 41 50	4.3	- 25.6	- 21.3		2164.3		12			
13		1726	1980		-							13			
14		1728	1760		90 41 50	4.3	- 20.5	- 16.2		2169.4		14			
15		1730	1540		-							15			
16		1732	1320		90 39 37	4.3	- 15.4	- 19.7		2165.9		16			
17		1734	1100		-							17			

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

HORIZONTAL AND VERTICAL SURVEY NOTES

204

71

GSI AREA HOMERAPID PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 106 OF
 LINE/LOOP NO. 615 TYPE SURVEY CLIENT HUSKY DATE 12 DY 2 MO 29 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	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									2185.6			1		
2		1738	880		90 36 15	-4.3	-10.2	-14.5		2171.1		2		
3		1738	660		-							3		
4		1749	440		90 56 33	-7.0	-7.7	-11.7		2173.9		4		
5		1742	220									5		
6	X	1744	0		90 00 00	5.6	-	5.6		2180.0		6		
7		1746	220		-							7		
8		1748	440		89 35 06	5.3	+2.6	-2.7		2182.9		8		
9		1750	660		-							9		
10		1752	880		89 47 40	5.3	+2.6	-2.7		2182.9		10		
11		1754	1100		-							11		
12		1756	1320		89 47 20	5.3	+3.8	-1.5		2184.1		12		
13		1758	1540		-							13		
14		1760	1760		89 48 32	5.3	+5.1	-0.2		2185.4		14		
15		1762	1980		-							15		
16	⊙	1764	2200 ✓		89 42 10	10.0				2186.17	adjusted	16	73.0 (89 13 00)	
17	⊙				270 17 20							17		

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

HORIZONTAL AND VERTICAL SURVEY NOTES

72

GSI AREA HAWAII PASS STATE/COUNTY ALASKA BOOK NO. 1 PAGE 107 OF 205
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 12 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT 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	HORIZ										
1										2186.17			1		
2		1764	880 ✓			90° 47' 58"	+5.0		+17.26	2203.39			2	+10.0 (90 27 50)	
3						269° 12' 40"			+17.22				3	+17.12	
4		1766	660			- 2°			+17.18				4		
5		1768	440			90° 54' 06"	4.0	-6.4	-10.4	2193.0			5		
6		1770	220			-							6		
7		1772	0			90° 00' 00"	5.6	-	5.6	2197.8			7		
8		1774	220			-							8		
9		1776	440			90° 11' 29"	5.3	-1.3	-6.6	2196.8			9		
10		1778	660			-							10		
11		1780	880			90° 18' 56"	5.0			2193.19		adjusted	11	10.0 (89 59 31)	
12		MOST WESTERLY V.P. AT THIS DATE				269° 41' 05"							12	-9.88	
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

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 46 OF 73
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 12 DY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 SS C	STATION	VERTICAL							ELEVATION		LR 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	ELEVATION						
			SLOPE 	HORIZ 				INST	ROD						
1											2193.19		ADJUSTED VALUE FROM PREVIOUS SURVEY	1	
2	Δ	MARKER PIPE V.P. 1780	T 14.30 1320			91 53 40	+15.0	+87.9	+102.9	2296.5				2	
3	Δ	LINE 615	C 1.00 2660			266 05 31	+15.0	+88.6	+103.6					3	
4		1782	2420			-								4	
5		1784	2200			92 35 31	-2.0	-99.5	-101.5		2195.0			5	
6		1786	1980			-								6	
7		1788	1760			92 56 07	-4.0	-70.1	-94.1		2202.4			7	
8		1790	1540			-								8	
9		1792	1320			93 04 14	2.0	-70.7	-72.7		2223.8			9	
10		1794	1100			-								10	
11		1796	880			93 02 31	-4.0	-46.7	-50.7		2245.8			11	
12		1798	660			-								12	
13		1800	440			93 11 24	-2.0	-24.5	-26.5		2270.0			13	
14		1802	220			-								14	
15	X	1804	0			90 00 00	-4.9	-	-4.9		2291.6			15	
16		1806	220			-								16	
17		1808	440			88 24 37	-2.0	+12.2	+10.2		2306.7			17	

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

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. 4 PAGE 109 OF 47
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 12 BY 4 MO 79 YR
 SURVEYOR J Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		L/R OR D/I	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									2296.5				1	
2		1810	660			88 34 40	-2.0	+16.4	+14.4			2310.9		2
3	0	1812	T 15.00	450		88 36 00	-10.5	+22.0	+11.5			2308.0		3
4	0		C 10.50	900		271 23 51	-10.5	+21.9	+11.4					4
5														5
6														6
7	Δ	1812	2640	V		87 01 25	+5.0	-137.1	-132.1			2176.2		7
8	Δ					272 57 52	+5.0	-136.5	-131.5					8
9		1814	2420			-								9
10		1816	2200			87 00 07	-2.0	+115.1	+113.1			2289.3		10
11		1818	1780			-								11
12		1820	1780			87 18 56	-2.0	+82.4	+80.4			2256.6		12
13		1822	1540			-								13
14		1824	1320			88 14 41	-2.0	+40.4	+38.4			2214.6		14
15		1826	1100			-								15
16		1828	880			89 12 36	-2.0	+12.1	+10.1			2186.3		16
17		1830	660			-								17

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

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 110 OF 48 75
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 12 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	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					RIGHT TURNED HORIZONTAL ANGLE
			SLOPE 	HORIZ 											
1									2176.2			1			
2		1832	440		89 42 21	-2.0	+2.3	+0.3		2176.5			2		
3		1834	220		-								3		
4		1836	0		90 00 00	-2.9		-4.9		2171.3			4		
5		1838	220		-								5		
6		1840	440		91 20 05	-2.0	-10.2	-12.2		2164.0			6		
7		1842	660		-								7		
8		1844	880		90 37 21	-4.0	-10.1	-14.1		2162.1			8		
9		1846	1100		-								9		
10		1848	1320		90 26 00	-2.0	-7.7	-9.7		2166.5			10		
11		1850	1540		-								11		
12		1852	1760		90 04 06	-4.0	-2.1	-6.1		2170.1			12		
13		1854	1980		-								13		
14		1856	2200		89 40 30	-2.0	+12.5	+10.5		2186.7			14		
15		1858	2420		-								15		
16		1860	2640 ✓		89 28 13	-2.0	+24.4	+22.4		2198.3			16		
17					270 30 52	-2.0	+23.7	+21.7					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. 4 PAGE 111 OF 111
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 12 BY 4 MO 79 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

49

76

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	A	1860	+ 15.00	1320	90 00 00	+12.5	-	+ 12.5	2211.4				2	
3	A		+ 1.80	2440	270 00 00	+13.0	-	+ 13.0					3	
4		1862	2420		-								4	
5		1864	2200		90 28 02	-2.0	-17.9	-19.9	2191.2				5	
6		1866	1980		-								6	
7		1868	1760		90 30 00	-4.0	-15.4	-19.4	2191.7				7	
8		1870	1540		-								8	
9		1872	1320		90 41 50	-2.0	-16.1	-18.1	2193.0				9	
10		1374	1100		-								10	
11		1876	880		90 34 38	-4.0	-8.9	-12.9	2198.2				11	
12		1878	660		-								12	
13		1380	440		90 52 04	-2.0	-6.7	-8.7	2202.4				13	
14		1382	220		-								14	
15	X	1884	0		90 00 00	-4.9	-	-4.9	2206.2				15	
16		1886	220		-								16	
17		1888	440		90 07 33	-2.0	-1.2	-3.2	2207.9				17	

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SYMBOLS = BACKSIGHT
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 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 12 OF 50 77
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 12 DY 4 MO 79 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 SS C	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL RIGHT TURNED HORIZONTAL ANGLE	LINE	REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD				
			SLOPE 	HORIZ 										
1									2211.1			1		
2		1890	660									2		
3		1892	880	90 04 08	4.0	- 1.1	- 5.1		2206.0			3		
4		1894	1100									4		
5		1896	1320	89 59 21	2.0	+ 23.3	+ 21.3		2232.4			5		
6		1898	1540									6		
7		1900	1760	88 45 26	4.0	+ 28.2	+ 34.2		2245.3			7		
8		1902	1980									8		
9		1904	2200	88 49 24	4.0	+ 45.2	+ 41.2		2252.3			9		
10		1906	2420									10		
11		1908	2640 ✓	88 50 44	9.0	+ 53.2	+ 44.2		2255.0			11		
12				271 08 19	9.0	+ 52.5	+ 43.5					12		
13												13		
14												14		
15		1908	11620 1320	91 13 52	+ 15.0	+ 56.7	+ 71.7	2327.0				15		
16			1100 2640	288 45 23	+ 15.0	+ 57.3	+ 72.3					16		
17												17		

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SYMBOLS

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= FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 51 OF 78
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 12 DY 4 MO 72 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 SS 	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 	HORIZ 											
1										2327.0			1		
2		1910	2420			-							2		
3		1912	2200			91 53 23	2.0	-72.5	-74.5		2252.5		3		
4		1914	1980			-							4		
5		1916	1760			91 57 57	4.0	-60.4	-64.4		2262.6		5		
6		1918	1540			-							6		
7		1920	1320			92 07 10	2.0	-48.8	-52.8		2274.2		7		
8		1922	1100			-							8		
9		1924	880			92 06 39	2.0	-32.4	-36.4		2290.6		9		
10		1926	660			-							10		
11		1928	440			92 03 38	2.0	-15.8	-17.8		2309.2		11		
12		1930	220			-							12		
13	X	1932	0			90 00 00	2.9	-	-4.9		2322.1		13		
14		1934	220			-							14		
15		1936	440			88 56 01	2.0	+8.2	+6.2		2338.2		15		
16		1938	660			-							16		
17		1940	880			88 41 44	2.0	+20.0	+18.0		2349.2		17		

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SYMBOLS

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY Alaska BOOK NO. 4 PAGE 114 OF 114
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 12 DY, 4 MO 72 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

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				
1										2327.0			1	
2		1242	1100			-							2	
3		1242	1320			88 39 40	-7.0	+30.8	+23.8		2350.8		3	
4		1246	1540			-							4	
5	⊙	1248	1760 v			88 53 01	-6.5	+34.3	+27.8		2354.7		5	
6	⊙					271 06 33	-6.5	+34.1	+27.6				6	
7													7	
8													8	
9	Δ	1248	2640			90 00 00	+5.1	-	+5.1	2360.1			9	
10	Δ					270 00 00	+5.7	-	+5.7				10	
11		1250	2400			-							11	
12		1252	2200			90 09 30	-2.0	-6.1	-8.1		2352.0		12	
13		1254	1980			-							13	
14		1256	1760			90 24 45	-4.0	-12.7	-16.7		2343.4		14	
15		1258	1540			v							15	
16		1260	1320			90 44 07	-4.0	-4.1	-8.1		2352.0		16	
17		1262	1100			-							17	

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SYMBOLS

Δ = BACKSIGHT

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⊙ = SIDESHOT

⊙ = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY ARIZONA BOOK NO. 4 PAGE 115 OF 115
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 12 DY 4 MO 77 YR
 SURVEYOR J. Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 484

80

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		1964	880			91 35 04	-7.0	-25.1	-29.1			2331.0		2	
3		1966	660			-								3	
4		1968	440			91 57 47	-4.0	-15.1	-19.1			2341.0		4	
5		1970	220			-								5	
6	X	1972	0			90 00 00	-4.7	-	-4.7			2355.2		6	
7		1974	220			-								7	
8		1976	440			89 16 40	-2.0	+5.5	+3.5			2363.6		8	
9		1978	660			-								9	
10		1980	880			89 18 45	-2.0	+10.6	+8.6			2368.7		10	
11		1982	1100			-								11	
12	0	1984	T 13.00 660			89 19 42	-6.5	+13.5	+9.0			2369.1		12	
13	0		c 7.00 1320			270 40 00	-6.5	+15.4	+8.9					13	
14														14	
15														15	
16														16	
17														17	





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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 116 OF 116
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 12 DY 4 MO 79 YR
 SURVEYOR J ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

81


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		1984	T 11.80	880		90 00 00	+7.5	-	+7.5	2376.7				2	
3			C 3.00	1760		270 00 00	+7.7	-	+7.7					3	
4		1986	1540			-								4	
5		1988	1320			90 14 04	-4.0	-5.4	-9.4	2367.3				5	
6		1990	1100			-								6	
7		1992	880			90 38 20	-4.0	-9.8	-13.8	2362.9				7	
8		1994	660			-								8	
9		1996	440			91 54 35	-4.0	-14.7	-18.7	2358.0				9	
10		1998	220			-								10	
11		2000	0			90 00 00	-4.9	-	-4.9	2371.8				11	
12		2002	220			-								12	
13		2004	440			88 53 44	-2.0	+8.5	+6.5	2383.2				13	
14		2006	660			-								14	
15		2008	880			88 43 57	-7.0	+19.5	+12.5	2389.2				15	
16		2010	1100			-								16	
17		2012	1320			88 58 47	-7.0	+23.5	+16.5	2393.2				17	


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SYMBOLS

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 = SIDESHOT

 = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 117 OF 117
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT MUSKY DATE 12 DY 4 MO 72 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

82

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	o	2014	1540 ✓			88 57 51	-8.0	+26.9	+18.9		2395.5			2	
3	o					270 59 42	-8.0	+26.7	+18.7					3	
4														4	
5														5	
6	Δ	2014	T 14.20 920			91 00 42	+15.0	+32.5	+47.5	2443.0				6	
7	Δ		C 5.00 1840			268 57 26	+15.0	+32.4	+47.4					7	
8		2016	1620			91 25 31	-2.0	-40.3	-42.3		2400.7			8	
9		2018	1400			-								9	
10		2020	1180			91 30 14	-2.0	-31.0	-33.0		2410.0			10	
11		2022	960			-								11	
12		2024	740			91 41 46	-2.0	-21.9	-23.9		2419.1			12	
13		2026	520			-								13	L-615 UP 2030+65"
14		2028	300			91 53 21	-4.0	-7.9	-13.9		2429.1			14	L-638 UP 1570+53"
15		1030	80			-								15	
16	κ	2030 + 80'	0			90 00 00	-4.9	-	-4.9		2438.1			16	
17														17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

83

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 118 OF 118
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 12 DY 4 MO 79 YR
 SURVEYOR S. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

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									2443.0			1			
2	SS	B.M. 79379	9599.75			89 18 10	-6.0	+116.8	+110.8		2555.8		REFERENCE D.A.S. SURVEY	2	
3	SS		TELLERMARKER DISTANCE			270 41 34	-6.0	+116.1	+110.1		2553.5			3	
4		2032	140			89 29 46	-2.0	+1.2	-0.8		-2.3		MISLEASURE	4	
5		2034	360			-								5	
6		2036	580			88 47 05	-2.0	+12.3	+10.3		2455.6			6	
7		2038	800			-								7	
8		2040	1020			88 41 27	-2.0	+23.3	+21.3		2466.6			8	
9		2042	1240			-								9	
10		2044	1460			88 25 32	-2.0	+40.1	+38.1		2483.4			10	
11		2046	1680			-								11	
12		2048	1900			87 46 46	-2.0	+73.6	+71.6		2516.9			12	
13		2050	2120			-								13	
14		2052	2340			87 07 45	-2.0	+117.2	+115.2		2560.5			14	
15		2054	2560			-								15	
16	0	2055	2670			87 05 47	-8.5	+135.3	+126.8		2571.8			16	
17	0					272 53 32	-8.5	+134.7	+126.2					17	

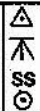
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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. 4 PAGE 57 OF 84
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 12 BY 4 MO 79 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		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD					
			SLOPE	HORIZ											
1										2571.8			1		
2	Δ	2055	T 8.33	333	83 35 03	+5.0	-35.3	-30.3	2541.5				2		
3	Δ		B 5.00	333	274 04 00	+5.0	-35.2	-30.2					3		
4		2056	220		83 36 12	2.0	+24.5	+22.5		2564.0			4		
5	π	2058	0		90 00 00	-4.9	-	-4.9		2536.6			5	WESTERN LIMIT OF LINE 615	
6													6		
7													7	NO PIPE AT	
8													8	END OF L-615	
9													9	DUE TO CLOSE	
10													10	PROXIMITY OF	
11													11	PIPE AT INT.	
12													12		
13													13		
14													14		
15													15		
16													16		
17													17		

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SYMBOLS

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π = INSTRUMENT SET-UP

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\odot = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

85

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 1 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 5 DY 2 MO 77 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		LR OR DR	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			RECIPROCAL		ANGLE	SURVEY						1	VP 390 IS COMMON	
2		<u>BAS 79392</u>										2	WITH VP 1564 L-R IX	
3		<u>BAS 79390 - 390</u>	<u>113249 SS</u>		<u>90-44-57</u>	<u>1.8</u>	<u>HT</u>				<u>D</u>	<u>343-51-37</u>	3	MARKED BY IRON PIPE
4					<u>269-15-25</u>	<u>5.6</u>	<u>HI</u>					<u>343-51-22</u>	4	
5											<u>V</u>	<u>180-00-11</u>	5	
6											<u>R</u>	<u>163-51-47</u>	6	
7												<u>343-51-36</u>	7	<u>343-51-29</u>
8													8	
9													9	REFER TO PG. 4
10													10	LINE 1 FOR OTHER
11													11	SET OF ANGLES
12													12	FOR RECIP ANGLE
13													13	SURVEY
14													14	
15													15	
16													16	
17													17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 2 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 6 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											V	26	1	SEE PG. 5 LINE 1
2		390	29.700 [⊙]	D	88-51-20	HI	5.6				D	314-07-25	2	FOR RECIP ANGLE
3		^{BA3} 79392 - 718	29.670 [⊙]	R	271-06-53	HT	5.0					314-06-59	3	
4						HI					V	180-00-16	4	
5						HT	3.9				R	134-07-17	5	
6												314-07-01	6	314-07-00
7													7	
8													8	
9													9	
10													10	
11		390									V	82	11	
12		79392 - 79390									D	228-18-41	12	
13												228-18-19	13	
14											V	180-00-12	14	
15											R	48-18-36	15	
16												228-18-24	16	228-18-22
17													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. _____ PAGE 3 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 6 DY 2 MO 79 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	LR OR DIR	RIGHT TURNED HORIZONTAL ANGLE		LINE
			SLOPE 	HORIZ 											
1															
2		390										V. 18	1		
3		TP MARKING - 79392										D 44-03-32	2		
4												44-03-14	3		
5												V. 180-00-10	4		
6												R 224-03-27	5		
7												44-03-17	6	44-03-16	
8													7		
9													8		
10													9		
11													10		
12													11		
13													12		
14													13		
15													14		
16													15		
17													16		
18													17		

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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. _____ PAGE 4 OF _____
 LINE/LOOP NO. 615 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	LINE
				SLOPE	HORIZ					INST	ROD				
1		B.M. 11992			89 15 25	4							1	OPIT	
2					270 44 05	-							2		
3		INT											3		
4		B.M. → 300				HI 5.4							4		
5													5		
6													6	REFER TO	
7													7	PG. 1 LINE 1	
8													8	FOR OTHER SET	
9													9	OF ANGLES FOR	
10													10	RECIPROCAL ANGLE	
11													11	SURVEY	
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

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 5 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 6 DY 2 MO 79 YR
 SURVEYOR W.D. HELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> ↑ <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				
1	Δ	INT			9109 92						V ¹	00 00 16	1	SEE PG 2
2	-				268 51 22	3.9	HT				L	184 11 10	2	LINE 2 FOR
3	π	H8 120			—	5 ⁶	HI					184-10-54	3	RESID. ANGLE
4	⊙	100 EOL									V ²	180 00 30	4	
5	-	EOL									R	04 11 27	5	
6												184-10-57	6	184-10-56
7	Δ	INT									V ¹	00 00 16	7	
8	-										L	272 51 11	8	
9	π	H8 120			—	5 ⁶						272-50-55	9	
10	⊙	PT. WOLFTRINE									V ²	180 00 30	10	
11	-										R	92 51 35	11	
12												272-51-05	12	272-51-00
13	Δ	H8 120									V ¹	00 00 27	13	
14	-										L	268 59 52	14	
15	π	PT. WOLFTRINE			—	5 ⁷						268-59-25	15	
16	⊙	INT.									V ²	180 00 30	16	
17	-										R	88 59 55	17	268-59-25

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 6 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 79 YR
 SURVEYOR B. BENEDICT INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> ∇ <input type="checkbox"/> SS <input type="checkbox"/> \odot	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				
1	Δ	BM 71372								V	00 00 30	1	?	
2	-									V ₂	180 01 15	2	ANGLE RECHECKED	
3	∇	INT. $\frac{R1X}{615}$	0	0	-	54					180-00-45	3	IN FIELD	
4	\odot	398	880°		87 10 10	55				D	134 09 05	4	134-08-18 ✓	
5	-				272 49 28	-				R	314 09 16	5	134-07-12	
6											180-00-11	6	180-00-28	
7												7		
8	Δ	INT.			92°49'30"					V ₁	0°00'33"	8		
9	-				267°10'32"					V ₂	180°00'30"	9		
10	∇	398				56					179-59-57	10		
11	\odot	447	5390°		88°05'30"	6.0				D	169°30'40"	11		
12	-				271°54'10"	6.0				R	349°30'10"	12	169-29-53 ✓	
13											179-59-58	13	179-59-49	
14												14		
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

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 7 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 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	LINE
				SLOPE					HORIZ	INST				
1												1		
2		398			91° 52' 35"	+					V	00° 00' 32"	2	
3					268° 00' 42"	+					V ₂	180° 00' 46"	3	
4		447			90° -		5.6					180-00-14	4	
5		452	550'		90° 44' 00"	-	4.0				D	182° 59' 50"	5	
6					267° 15' 42"						R	02° 59' 54"	6	182-59-13 ✓
7												180-00-04	7	180-00-04
8													8	
9		497			89° 26' 24"	+	5.8				V	00° 00' 27"	9	00° 00' 47"
10					270° 34' 20"	+	5.8				V ₂	180° 00' 58"	10	
11		450			-		5.6					180-00-11	11	
12		658 + 105'		22692.84	91° 03' 23"	-	4°				D	180° 00' 51"	12	Dist. by
13					268° 56' 28"	-					R	00° 01' 10"	13	Tallironwater
14												180-00-19	14	180-00-15
15													15	180-00-08 ✓
16													16	
17													17	

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. _____ PAGE 8 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 7 DY 2 MO 77 YR
 SURVEYOR Anderson INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE		STATION	VERTICAL							ELEVATION		LR 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		AZ.									V	00° 00' 31"	1		
2	-										L	180° 03' 33"	2		
3		658+105	0		90° —	56						180-02-59	3		
4		750		119005.62	90° 42' 02"	43					V	180° 00' 47"	4		
5	-			180005.562	269° 17' 50"						R	00° 03' 55"	5		
6												180-03-08	6	180-03-04 ✓	
7													7		
8													8		
9					89° 16' 19"	63							9		
10		658+105			270° 43' 30"	—					V	00° 00' 10"	10		
11	-										L	194° 59' 25"	11		
12		750	1320°		—	56						194-59-15	12		
13		762			90° 40' 53"	45					V	180° 00' 18"	13		
14	-				269° 18' 45"	—					R	14° 59' 18"	14		
15												194-59-00	15	194-59-07 ✓	
16													16		
17													17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 9 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE _____ DY _____ MO _____ YR
 SURVEYOR BENEDICT / ANDERSON 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														
2		750			89 17 30						V	00 00 20	2	
3	-				270 42 18						L	193 58 16	3	
4		762			90 20 16							193-57-56	4	
5		784 814	5720 ✓		269 39 23						V	180 00 10	5	
6	-										R	13 58 30	6	
7												193-57-20	7	193-57-38 ✓
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

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 10 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HURRY DATE 10 BY E MO 19 YR _____
 SURVEYOR 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		LR OR DR		RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1												1		
2	Δ	752			89° 39' 45"	6				V	00° 00' 22"	2		
3	Δ				270° 19' 55"					L	187° 22' 29"	3		
4	⊗	L-615, 814			2							4	187 22 07	
5	⊙	IRON PIPE 1978		17994.65	89° 52' 52"					V	180° 00' 51"	5		
6	⊙	IRON PIPE 1978		463	270° 02' 37"	TOP OF BOMB				R	07° 22' 30"	6	07 21 49	
7		978		79								7	187-21-58	
8				17								8		
9	Δ	752								V	00° 00' 19"	9		
10	Δ									L	136° 44' 52"	10	136 44	
11	⊗	814, L-615									136-44-35	11		
12	⊙	INT. L-R28 & L-457	8910 ²³ ✓		90° 19' 15"					V	180° 00' 37"	12	316 44 25	
13	⊙	IRON PIPE 1978			90° 19' 15"	2.2				R	316° 45' 02"	13	136-44-29	
14					90° 30' 12"						136-44-25	14	136-44-29	
15					269° 23' 49"							15		
16												16		
17												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. _____ PAGE 11 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 79 YR
 SURVEYOR HELANDER 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 DI	RIGHT TURNED HORIZONTAL ANGLE	
			SLOPE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS									
1													
2		978											
3		814 996											
4													
5													
6													
7													
8													
9													
10		1224											
11		1112 1230											
12													
13													
14													
15													
16													
17													

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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. _____ PAGE 12 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 7 DY 2 MO 79 YR
 SURVEYOR W.D. MELANDER INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	 	STATION	VERTICAL						ELEVATION		UR 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											V ₁	33	1	
2		1004	11880°	→ D	89-14-14	HI	5.5				D	169-11-05	2	
3		996 - 1112	11867°	R	270-45-31	HT	6.0					169-10-32	3	
4											V ₂	180-00-50	4	
5				← D	90-49-30	HI	5.5				R	349-11-24	5	
6				R	269-10-18	HT	6.0					169-10-34	6	169-10-33 ✓
7													7	
8													8	
9		996	880°	D	89-07-28	HI	5.6				V ₁	16	9	
10		978 - 1004		R	270-51-41	HT	6.0				D	165-40-08	10	
11												165-39-52	11	
12				D	91-10-30	HI	5.6				V ₂	180-00-28	12	
13				R	268-38-49	HT	6.0				R	345-40-22	13	
14												165-39-54	14	165-39-53 ✓
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. _____ PAGE 13 OF 12
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 9 DY 2 MO 79 YR
 SURVEYOR BENEDICT 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 DR	RIGHT TURNED HORIZONTAL ANGLE		LINE
				SLOPE	HORIZ										
1													1		
2		1004									V	000 00 20	2		
3											L	180 12 30	3	180 12 10	
4		1112	12320										4		
5		1224	12,278 ⁸⁷ ✓								V ²	180 00 11	5	000 12 23	
6											R	000 12 34	6		
7													7	180-12-17 ✓	
8													8		
9													9		
10													10		
11													11		
12													12		
13													13		
14													14		
15													15		
16													16		
17													17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 14 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HUSKY DATE 13 DY 2 MO 79 YR
 SURVEYOR BENEDICT / ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1184

LINE	  	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS
			DISTANCE	<input checked="" 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		1112 → 1224		12,278.87								1		
2												2		
3												3		
4												4		
5		1004 → 1112		11,867.77								5		
6				11								6		
7				18								7		
8				11								8		
9		1224		7042.96								9		
10												10		
11		1230										11		
12												12		
13												13		
14												14		
15												15		
16												16		
17												17		

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HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. _____ PAGE 15 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HURST DATE 11 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			UR OR DI	RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST			
1													
2		1224			90 42 46	+6.0		73		V ₁	000° 00' 25"	2	480° 00' 32
3					269 17 25			37		L	180 01 07	3	
4		1230	27390°					78				4	
5					269 17 25	-6.0		8.93		V ₂	179° 59' 47"	5	(89 40 26)
6		1479	27,378 ⁹³		269 17 25			27,378.93		R	000 00 10	6	(270 19 13)
7											180- 00-23	7	
8												8	180-00-27
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

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 16 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 12 DY 2 MO 19 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	LR OR DR	RIGHT TURNED HORIZONTAL ANGLE		LINE
1											V ₁	30	1	
2		1479									D	90-46-41	2	
3		1230 - AZ										90-46-11	3	
4					← D	90-21-14	5.5 HI				V ₂	180-00-44	4	
5					R	269-38-22	6.0 HT				R	270-46-53	5	
6												90-46-09	6	90-46-10
7													7	
8													8	
9		1479									V ₁	40	9	
10		AZ - 1780	33110 [±]			90-24-22					D	81-02-55	10	
11			33,014 [±]									81-02-15	11	
12								3.3			V ₂	180-00-43	12	
13								3.0			R	261-03-18	13	
14								0				81-02-35	14	81-02-25
15								1.4					15	
16								4.60				TOTAL ANGLE	16	171-48-35
17								33,014.60					17	

TI-23471B

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 17 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT _____ DATE 12 DY 2 MO 79 YR
 SURVEYOR W.D. MELANDER 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 DI	RIGHT TURNED HORIZONTAL ANGLE	
			<input type="checkbox"/> FEET <input type="checkbox"/> METERS 										
1										V.	19	1	
2		1780		→ D	88-21-35	5.4 HI	01-38-25			D	138-34-18	2	
3		1479 - ^{BAS} 7447	5529 ^{of}	R		6.0 HT					138-34-29	3	
4										V.	180-00-39	4	
5				← D		5.4 HI				R	318-34-57	5	
6				R		6.0 HT					138-34-18	6	138-34-23
7												7	
8												8	
9												9	
10												10	
11												11	
12												12	
13												13	
14												14	
15												15	
16												16	
17												17	

TI-23471B

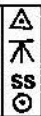


WORKED BY _____ CHECKED BY 1st _____ 2ND _____


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

HORIZONTAL AND VERTICAL SURVEY NOTES

102

GSI AREA HOWARD PASS STATE/COUNTY ALASKA BOOK NO. _____ PAGE 18 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT HARRY DATE 12 DY 4 MO 77 YR
 SURVEYOR J. ANDERSON INSTRUMENT DESC/SERIAL NO. _____ CREW NO. 1164

LINE		STATION	VERTICAL						ELEVATION		LR 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	Δ	B.M. 77447			88 24 40	+5.0					V	000 00 21	1	41 17 56	
2	Δ				271 34 14	+5.0					L	41 18 17	2		
3	Σ	1780, LINE 615			90 00 00	-4.7							3	41 18 00 ✓ MADEK PIPE	
4	⊙				87 58 07	-6.0					V	180 00 15	4		
5	⊙	1810	CHAIN 3300		272 01 41	-6.0					R	221 18 19	5	41 18 04	
6									15				6		
7	Δ	1780			91 59 06	+6.0			51		V	000 00 15	7	180 05 18	
8	Δ				268 00 04	+6.0			15		L	180 05 33	8		
9	Σ	1810			90 00 00	-4.9			59				9	180 05 20 ✓	
10	⊙				89 50 02	-6.0			9. 85		V	180 00 16	10		
11	⊙	1948	CHAIN 15180	15159.85	270 07 21	-6.0			15159. 85		L	000 05 38	11	180 05 22	
12													12		
13	Δ	1810			90 10 47	+6.0			09		V	000 00 13	13	180 02 29	
14	Δ				269 48 56	+6.0			90		L	180 02 42	14		
15	Σ	1948			90 00 00	-4.9			07				15	180 02 31 ✓	
16	⊙				89 29 38	-6.0			73		V	180 00 07	16		
17	⊙	2030 + 80'	CHAIN 9100	9073.37	270 30 11	-6.0			1 3 37		R	000 02 29	17	180 02 22	

INTERSECTION LINES 615 & 638
 WORKED BY _____ CHECKED BY 1ST _____ 2ND _____
 9073.37
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SYMBOLS Δ = BACKSIGHT  = INSTRUMENT SET-UP SS = SIDESHOT ⊙ = FORESIGHT

HORIZONTAL AND VERTICAL SURVEY NOTES

103

GSI AREA Howard Pass STATE/COUNTY ALASKA BOOK NO. _____ PAGE 19 OF _____
 LINE/LOOP NO. 615 TYPE SURVEY _____ CLIENT Husky DATE 12 DY 4 MO 72 YR
 SURVEYOR J. ANDERSON 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	LINE
			SLOPE	FEET METERS					INST	ROD				
1												1		
2	△	1948			90 30 33	+6.0		11		V _i	000 00 15	2	180 05 58 ✓	
3	△				269 28 47	+6.0		14		L	180 06 13	3		
4	⊗	2030 + 80'			90 00 00	-4.9		49				4	180 06 01 ✓	
5	SS	V.P. 1675, LINE 638	CHAIN 11497.	11493.15	88 58 35	-6.0		93		L	87 29 09	5	87 28 54	
6	SS	E.O.L. PIPE			271 00 48	-6.0		3 15		R	267 27 18	6	87 28 58	
7	SS	B.M. 79379		9599.75	89 18 10	-6.0		11493 15		L	75 54 23	7	75 54 08	
8	SS				270 40 34	-6.0				R	255 54 33	8	75 54 13	
9	○	2054 + 80'			87 05 31	-6.0				V _e	180 00 20	9		
10	○		CHAIN 2640		272 53 38	-6.0				R	000 06 24	10	180 06 04	
11												11		
12	△	2030 + 80'			92 52 21	+6.0		09		V _i	000 00 15	12	179 51 28	
13	△				267 06 20	+6.0		95		L	179 51 43	13		
14	⊗	2054 + 80'			90 00 00	-4.9		59				14	179 51 29 ✓	
15	○				95 06 32	-10.0		99		V _e	180 00 27	15		
16	○	2058	CHAIN 360		264 52 57	-10.0		7 75		R	359 51 57	16	179 51 30	
17								9599 75				17		

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