

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 66 OF         
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 16 DY 4 MO 81 YR  
 SURVEYOR M.O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	 <small>SS</small> 	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1		Well location		2695	89 49 12	5.0	-3.6					1	GROUND ELEV.	
2					210 12 46	5.0	-3.4					2	22.9	
3												3		
4		SP 101	-0-		90	55		19.3				4		
5		TS 88	5720		89 58 45	11	-8.2		11.1			5		
6		89	5250		89 59 31	11	-9.7		9.6			6		
7		90	4840		89 59 50	11	-10.3		9.0			7		
8		91	9400		89 59 41	11	-10.2		9.1			8		
9		92	3960		89 58 25	11	-8.9		10.4			9		
10		93	3520		89 59 05	11	-9.8		9.5			10		
11		94	8090		89 58 46	11	-9.7		9.6			11		
12		95	2640		89 59 17	11	-9.6		9.0			12		
13		96	2200		89 57 46	11	-9.5		9.8			13		
14		97	1760		89 57 07	11	-9.5		9.8			14		
15		98	1320		89 56 20	11	-9.6		9.7			15		
16		99	880		89 53 08	11	-9.2		10.1			16		
17		100	440		89 47 51	11						17		

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

2

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 67 OF         
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 16 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	 SS 	STATION	VERTICAL						HORIZONTAL		REMARKS		
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST			
1		SP 102	440		88 58 42	11						1	
2		103	880		89 18 23	11						2	
3		10A	1320		89 36 18	11						3	
4		105	1760		89 40 42	11						4	
5		106	2200		89 42 24	11						5	
6		107	2640		89 42 25	11						6	
7		Well Location	2695		89 49 12	5.0						7	
8					210 10 46	5.0						8	
9												9	
10		Well Location	3025		90 00 00	9.3						10	Ground Elev. 22.9
11												11	
12		108	2640		89 59 02	11						12	
13		109	2200		90 59 44	11						13	
14		110	1760		89 58 41	11						14	
15		111	1320		89 59 10	11						15	
16		112	880		89 58 30	11						16	
17					89 57 20	11						17	

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SYMBOLS  = BACKSIGHT
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# HORIZONTAL AND VERTICAL SURVEY NOTES

3

GSI AREA Harrison Bay STATE/COUNTY ALASKA BOOK NO. 4 PAGE 68 OF         
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 16 BY 4 MO. 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	 SS 	STATION	VERTICAL							HORIZONTAL		REMARKS		
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR DJ		RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE 					HORIZ 	INST				
1		113	440		89 27 00	11						1		
2		114	-0-		90	5.3		32.2				2		
3		115	440		89 42 10	6.0						3		
4		116	880		89 40 34	7.3						4		
5		117	1370		89 43 12	7.3						5		
6		118	1760		89 48 55	7.3						6		
7		119	2200		89 45 02	10.	-1.3					7		
8					270 14 52	16.	.4	31.8				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

4

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 69 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 18 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	  	STATION	VERTICAL						HORIZONTAL		REMARKS		
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST			
1		SP 119	3960		90	7.4					1		
2											2		
3		120	3520		90 03 12	11					3		
4		121	3080		90 03 46	11					4		
5		122	2140		90 05 40	11					5		
6		123	2260		90 05 04	11					6		
7		124	1760		90 07 11	11					7		
8		125	1320		90 10 07	11					8		
9		126	900		89 53 32	11					9		
10		127	440		89 38 06	11					10		
11		SP 128	-0-		90	5.5		39.2			11		
12		129	440		89 32 55	11					12		
13		130	880		89 46 00	11					13		
14		131	1320		89 50 55	11					14		
15		132	1760		89 02 38	11					15		
16		133	2200		89 48 05	11					16		
17											17		

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**SYMBOLS**

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA HARRISON BAY STATE/COUNTY ALASKA BOOK NO. 4 PAGE 10 OF 5  
 LINE/LOOP NO. 27-81 TYPE SURVEY VERT CLIENT USGS DATE 18 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	 <small>SS</small> 	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
				SLOPE 					HORIZ 	INST			
1		134	2640		89 47 13							1	
2		135	3080		89 46 55							2	
3		136	3520		89 42 12		+7.5		46.7			3	
4					270 17 47							4	
5												5	
6		SP 136	3080		89 52 11		+3.8					6	
7					270 07 58							7	
8		137	2640		89 55 19							8	
9		138	2200		90 04 13							9	
10		139	1760		90 10 20							10	
11		140	1320		90 10 41							11	
12		141	880		90 01 00							12	
13		142	440		89 03 16							13	
14		143	-0-		90	5			50A			14	
15		KA	440		90 09 30							15	
16		KA	880		90 17 00							16	
17												17	

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**SYMBOLS**

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 76 OF 6  
 LINE/LOOP NO. 21-81 TYPE SURVEY Vert CLIENT USGS DATE 18 DAY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	  	STATION	VERTICAL						HORIZONTAL		REMARKS				
			DISTANCE		<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE	
			SLOPE	HORIZ						INST					ROD
1		146	1320		90 16 11	//							1		
2		147	1760		90 11 00	//							2		
3		148	2200		90 06 38	//							3		
4		149	2640		90 01 00	//							4		
5		150	3080		90 01 03	//		-11.7					5		
6					269 58 55	//			38.6				6		
7													7		
8		SP 150	2475		90 01 04	//		+11.6					8		
9					269 59 03	//							9		
10		151	2035		89 59 40	//							10		
11		152	1595		90 01 51	//							11		
12		153	1155		90 02 11	//							12		
13		154	75		90 03 30	//							13		
14		155	25		89 39 50	//							14		
15		TP	-0-		90	5A			50.2				15		
16		156	165		90 50 20	//							16		
17		INTERSECTION	23'		90 31 16	//			39.0				17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 72 OF 7  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 18 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE		<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DR RIGHT TURNED HORIZONTAL ANGLE	LINE	
			SLOPE	HORIZ						INST				ROD
1		157	605		90 31 16 16							1		
2		158	1045		90 18 08 11							2		
3		159	1485		90 11 08 11							3		
4		160	1925		90 08 54 11							4		
5		161	2365	<	90 07 02 11							5		
6		162	2805		90 07 25 11							6		
7	⊙	163	3245		90 07 04 11		-17.5					7		
8					29 52 48 11				32.7			8		
9												9		
10	Δ	SP 163	3080		89 57 17 11		18.4					10		
11					270 02 43 11							11		
12		164	2620		89 56 15 11							12		
13		165	2200		89 54 38 11							13		
14		166	1760		89 50 13 11							14		
15		167	1370		89 48 13 11							15		
16		168	880		<del>90 45</del>							16		
17		1			90 41 57 11							17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 73 OF 8  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 18 DY 2 MO 31 YR  
 SURVEYOR H. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

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
1		169	440		89 21 10	11						1		
2		SP 170	-0-		90	5.4		41.1				2		
3		171	440		89 14 02	11						3		
4		172	880		89 36 40	11						4		
5		173	1320		89 44 34	11						5		
6		174	1760		89 46 48	11						6		
7		175	2200		89 43 00	11						7		
8		176	2640		89 47 38	11						8		
9		177	3080		89 51 04	11	-2.8					9		
10					270 09 01	11		38.3				10		
11												11		
12		SP 177	3080		90 14 28	11	+23.8					12		
13					269 45 25	11						13		
14		178	2640		90 17 38	11						14		
15		179	2200		90 20 39	11						15		
16		180	1760		90 25 38	11						16		
17												17		

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SYMBOLS

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 94 OF 9  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vent CLIENT 4569 DATE 18 DY 4 MO 81 YR  
 SURVEYOR M.O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	  	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" 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		181	1320		90 36 12	11						1		
2		182	880		90 52 00	11						2		
3		183	440		89 39 38	11						3		
4		184	-0-		90	5.5		62.1				4		
5		185	440		89 10 17	11						5		
6		186	880		89 58 40	11						6		
7		187	1320		90 05 02	11						7		
8		188	1760		90 03 28	11						8		
9		189	2200		90 06 17	11						9		
10		190	2640		90 06 38	11						10		
11		191	3080		90 08 11	11	-15.4					11		
12					269 54 54	11		46.7				12		
13												13		
14		SP 191	1760		90 44 42	11	+33.8					14		
15					269 15 16	11						15		
16		192	1320		90 58 44	11						16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 75 OF 10  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 18 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	 <small>SS</small> 	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	
1		193	380		90 33 10							1		
2		194	440		89 55 00							2		
3		195	-0-		90 55			80.5				3		
4		196	440		89 45 35							4		
5		197	880		89 51 20							5		
6		198	1320		89 51 53							6		
7		199	1760		89 58 57							7		
8		200	2200		90 08 22							8		
9		201	2640		90 07 08							9		
10		202	3080		90 11 38							10		
11		203	3520		90 04 36		-15.5					11		
12					269 55 21				65.1			12		
13												13		
14		SP203	2100		90 23 23		+25.9					14		
15					269 36 39							15		
16		204	1760		90 11 13							16		
17												17		

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SYMBOLS

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 76 OF 11  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT W568 DATE 8 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	 SS	STATION	VERTICAL						ELEVATION		UR 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  HORIZ										
1		205	1320		90 05 02	11							1	
2		206	2820		90 04 41	11							2	
3		207	440		89 58 00	11							3	
4		208	0-		90 55				90.9				4	
5		209	440		89 38 11	11							5	
6		210	880		90 25 55	11							6	
7		211	1320		90 31 33	11							7	
8		212	1760		90 22 35	11							8	
9		213	2200		90 20 02	11							9	
10		214	2640		90 15 48	11							10	
11		215	3080		90 14 12	11							11	
12		216	3520		90 03 14	11		-14.1					12	
13					269 56 43	11				70.8			13	
14													14	
15		SP 216	2100		90 38 57	15		+39.8					15	
16					269 21 13	15							16	
17													17	

END

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SYMBOLS

= BACKSIGHT

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# HORIZONTAL AND VERTICAL SURVEY NOTES

12

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 12 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT 11365 DATE 18 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1136

LINE	 SS	STATION	VERTICAL							HORIZONTAL		REMARKS	
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR D/I		RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST			
1		217	1760		90 36 60	11						1	
2		218	1320		90 29 00	11						2	
3		219	880		90 32 05	11						3	
4		220	440		90 29 04	11						4	
5	A	221	-0-		90	5.5			116.6			5	
6		222	440		89 59 34	11						6	
7		223	880		89 22 22	11						7	
8		224	1320		89 33 33	11						8	
9		225	1760		89 39 59	11						9	
10		226	2200		89 45 00	11						10	
11		227	2640		89 47 21	11						11	
12	⊙	228	3080		89 49 44	11		-1.6				12	
13					210 10 18	11				115.0		13	
14												14	
15	Δ	228	3520		89 59 10	11		19.9				15	
16					210 00 50	11						16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

13

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 18 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 18 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. FZ Wild CREW NO. 1186

LINE	 SS	STATION	VERTICAL						HORIZONTAL		REMARKS	
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST		
1		229	3080		89 58 14	V					1	
2		230	2140		89 52 30	V					2	
3		231	2200		89 54 02	V					3	
4		232	1760		89 51 11	V					4	
5		233	1320		89 47 49	V					5	
6		234	880		89 37 02	V					6	
7		235	440		89 13 50	V					7	
8		236	0		90	55		124.9			8	
9		237	440		90 05 37	V					9	
10		238	880		90 23 42	V					10	
11		239	1320		90 35 00	V					11	
12		240	1760		90 48 13	V					12	
13		241	2200		90 43 50	V					13	
14		242	2140		90 37 56	V					14	
15		243	3080		90 32 32	V					15	
16		244	3320		90 27 54	V	-39.3				16	
17					209 31 58	V		85.5			17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

14

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 79 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 17 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS	
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	ELEVATION		L/R OR DI	RIGHT TURNED HORIZONTAL ANGLE		LINE
								SLOPE	HORIZ				
1	Δ	Z44	3080		89 51 11	11		45.6				1	
2					270 03 49	11						2	
3		Z45	2610		89 51 18	11						3	
4		Z46	2200		89 52 55	11						4	
5		Z47	1760		89 50 24	11						5	
6		Z48	1320		89 47 31	11						6	
7		Z49	880		89 39 03	11						7	
8		Z50	440		89 20 12	11						8	
9	⊙	Z51	0-		90	55		91.1	85.6			9	
10		Z52	440		89 15 18	11						10	
11		Z53	880		89 26 41	11						11	
12		Z54	1320		89 30 54	11						12	
13		Z55	1760		89 37 00	11						13	
14		Z56	2200		89 27 25	11						14	
15		Z57	2610		89 21 04	11						15	
16	⊙	Z58	3080		89 21 10	11		24.0				16	
17					270 38 50	11			115.1			17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

15

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 80 OF 81  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 19 DY 9 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR D/I		RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1	Δ	SP 258	3080		89 59 05		+10.0					1		
2					270 00 57							2		
3		259	2690		90 03 09							3		
4		260	2200		89 04 10							4		
5		261	1760		90 04 49							5		
6		262	1320		89 59 14							6		
7		263	880		89 47 34							7		
8		264	440		89 07 25							8		
9	Δ	265	-0-		90	5.4		125.1				9		
10		266	440		89 09 24							10		
11		267	880		89 34 35							11		
12		268	1320		89 51 00							12		
13		269	1760		90 02 21							13		
14		270	2200		90 01 35							14		
15		271	2640		90 01 34							15		
16		<del>272</del>	<del>3080</del>		<del>90 01 21</del>	<del>  </del>						16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 816 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 19 DY 4 MO 8 L YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1	⊙	272	3080		90 01 25	11		-12.1				1		
2					269 58 25	11			113.0			2		
3												3		
4	A	272	3960		90 26 07	11		+39.0				4		
5					269 51 55	11						5		
6		273	3520		90 25 07	11						6		
7		274	3080		90 16 40	11						7		
8		275	2640		90 21 53	11						8		
9		276	2200		90 33 45	11						9		
10		277	1760		90 32 45	11						10		
11		278	1320		90 30 51	11						11		
12		279	880		90 36 32	11						12		
13		280	440		89 49 19	11						13		
14	A	281	-0-		90	5.5			152.5			14		
15		282	440		89 33 20	11						15		
16		283	880		90 24 20	11						16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

17

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 82 OF       
 LINE/LOOP NO. 21-81 TYPE SURVEY Vert CLIENT USGS DATE 19 BY 4 MO 81 YR  
 SURVEYOR M.O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	Δ ⚓ SS ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS				
			DISTANCE	<input checked="" 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		284	1320		90 30 22	H							1		
2		285	1760		90 20 57	H							2		
3		286	2200		90 13 10	H							3		
4		287	2640		90 14 04	H							4		
5		288	3080		90 19 38	H							5		
6		289	3520		90 17 43	H							6		
7	⊙	290	3960		90 11 17	H							7		
8					289 45 42	H	-27.1		125.4				8		
9													9		
10	Δ	290	3960		89 53 49 <sup>46</sup>	H	+3.6						10		
11					270 06 17	H							11		
12		291	3520		90 09 33	H							12		
13		292	3000		90 16 23	H							13		
14		293	2640		90 24 08	H							14		
15		294	2200		90 35 40	H							15		
16		295	1760		91 00 12	H							16		
17													17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 83 OF 18  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 19 DY 4 MO 81 YR  
 SURVEYOR M. O'LEARY INSTRUMENT DESC/SERIAL NO. T-2 W:K CREW NO. 1186

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 checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST					ROD
			SLOPE 	HORIZ 										
1		296	1320		91 25 09	11						1		
2		297	880		92 07 44	11						2		
3		298	440		92 15 24	11						3		
4	⋈	299	-0-		90	55		128.9				4		
5		300	440		89 53 50	11						5		
6		301	880		89 25 00	11						6		
7		302	1320		89 22 57	11						7		
8		303	1760		89 25 09	11						8		
9		304	2200		89 35 10	11						9		
10	⊙	305	2640		<del>89 38 25</del>							10		
11		<del>306</del>	<del>3080</del>		89 38 25	11	45.7	134.6				11		
12					270 21 29	11		<del>134.6</del>				12		
13												13		
14	A	SP305	3520		89 45 32	11	-4.1					14		
15					276 14 31	11						15		
16		306	3080		89 45 09	11						16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 94 OF 19  
 LINE/LOOP NO. 281 TYPE SURVEY Vert CLIENT USGS DATE 19 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" 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		307	2640		89 45 44	11						1		
2		308	2200		89 52 20	11						2		
3		309	1760		89 51 25	11						3		
4		310	1320		90 09 00	11						4		
5		311	880		90 29 50	11						5		
6		312	440		89 48 33	11						6		
7	Δ	313	0		90	5.5		130.5				7		
8		314	440		89 20 15	11						8		
9		315	880		90 06 00	11						9		
10		316	1320		89 58 10	11						10		
11		317	1760		89 46 20	11						11		
12		318	2200		90 05 26	11						12		
13	⊙	319	2640		89 57 02	11	-8.6					13		
14					270 03 09	11		122.0				14		
15												15		
16												16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY ALASKA BOOK NO. 4 PAGE 25 OF 20  
 LINE/LOOP NO. 27-21 TYPE SURVEY Vert CLIENT USGS DATE 19 BY 4 MO 81 YR  
 SURVEYOR M. O'LEARY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" 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	Δ	319	3580		89 59 40			110.5				1		
2					210 00 26							2		
3		320	2640		90 37 02							3		
4		321	2200		90 43 50							4		
5		322	1760		90 49 06							5		
6		323	1320		90 45 00							6		
7		324	880		90 55 27							7		
8		325	440		90 32 44							8		
9	⋈	326	- 0 -		90	5.5		132.4				9		
10		327	440		89 24 20							10		
11		328	880		89 37 22							11		
12		329	1320		89 47 06							12		
13		330	1760		89 52 01							13		
14		331	2200		89 42 33							14		
15		332	2640		89 44 50							15		
16	⊙	333	3680		89 51 50			~3.5				16		
17					210 08 20				179.0			17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 286 OF 21  
 LINE/LOOP NO. 27-81 TYPE SURVEY vert CLIENT USGS DATE 20 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	ELEVATION			L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE	HORIZ				INST	ROD				
1	Δ	SP 333	1160		89 55 31	11		18.6				1		
2			1		270 09 26	11						2		
3		334	1320		89 55 35	11						3		
4		335	880		89 59 21	11						4		
5		336	410		89 43 02	11						5		
6	Δ	337	-0-		90	5.5			137.7			6		
7		Intersection	337		90 22 03	11			124.5			7		
8												8		
9												9		
10		338	410		90 23 33	11						10		
11		339	880		89 55 43	11						11		
12		340	1320		89 58 33	11						12		
13		341	1760		90 03 43	11						13		
14		342	2200		90 00 23	11						14		
15		343	2640		89 59 47	11						15		
16		344	3080		90 02 51	11						16		
17												17		

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## HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Unirson Bay STATE/COUNTY ALASKA BOOK NO. 4 PAGE 87 OF 22  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT U.S.G.S DATE 20 DY 4 MO 81 YR  
 SURVEYOR M.O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE	<input checked="" 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	⊙	345	3520		89 57 08	11		-7.8				1		
2					270 02 49	11			129.8			2		
3												3		
4	Δ	345	1760		89 50 25	11		+6.0				4		
5					270 09 27	11						5		
6		346	1320		89 50 03	11						6		
7		347	880		89 43 36	11						7		
8		Well Location			90	4.5			131.4			8		
9		North Ingot										9		
10		#1 Husky										10		
11		348	440		89 05 36	11						11		
12	Δ	349	-0-		90	5.4			135.9			12		
13		350	440		90 23 51	11						13		
14		351	880		90 09 12	11						14		
15		352	1320		90 16 26	11						15		
16		<del>353</del>	<del>1760</del>		<del>90 15 51</del>	<del>11</del>						16		
17		Intersect			90 15 51	11			118.5			17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY ALASKA BOOK NO. 4 PAGE 88 OF 23  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 20 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DJ		RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1		353	1760		90 09 14							1		
2		354	2200		90 13 23							2		
3		355	2640		90 12 28							3		
4	⊙	356	3080		90 07 48		-17.9					4		
5					269 52 12				118.1			5		
6												6		
7	Δ	SP 356	2640		90 02 55		+13.1					7		
8					269 57 06							8		
9		357	2200		90 13 43							9		
10		358	1760		89 58 08							10		
11		359	1320		89 51 12							11		
12		360	880		89 40 35							12		
13		361	440		89 14 13							13		
14	Δ	362	0		90	Δ 55		131.2				14		
15		363	440		89 51 10							15		
16		364	880		90 26 15							16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 89 OF 24  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 9 MO 81 YR  
 SURVEYOR M.O'BRYEN INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" 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		365	1320		90 09 42	11						1		
2		366	1760		89 59 42	11						2		
3		367	2200		90 01 28	11						3		
4		368	2640		90 01 57	11						4		
5	⊙	369	3080		90 02 07	11	-2.7					5		
6					29 57 53	11		118.5				6		
7												7		
8	Δ	SP 369	2640		89 59 10	11	+10.2					8		
9					29 00 48	11						9		
10		370	2200		89 59 50	11						10		
11		371	1760		90 41 00	11						11		
12		372	1320		90 18 45	11						12		
13		373	880		90 07 18	11						13		
14		374	440		90 01 56	11						14		
15	⋈	375	-0-		90	5.5		128.7				15		
16		376	440		89 23 00	11						16		
17												17		

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SYMBOLS

Δ = BACKSIGHT

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 90 OF 25  
 LINE/LOOP NO. 21-81 TYPE SURVEY Vert CLIENT USGS DATE 20 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 WIL CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR D/I		RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1		371	880		89 54 32	11						1		
2		378	1320		90 09 07	11						2		
3		379	1760		90 21 43	11						3		
4		380	2200		90 25 47	11						4		
5		381	2640		90 20 37	11						5		
6		387	3080		90 18 30	11						6		
7	⊙	383	3570		<del>90 15 40</del>	11						7		
8					90 15 51	11		-21.0				8		
9					269 44 04	11			101.7			9		
10												10		
11	A	383	3570		91 03 21	11		+75.6				11		
12					268 56 40	11						12		
13		389	3080		91 09 15	11						13		
14		385	2640		91 16 33	11						14		
15		386	2200		91 23 33	11						15		
16		387	1760		91 28 00	11						16		
17												17		

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SYMBOLS

Δ = BACKSIGHT

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SS = SIDESHOT

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# HORIZONTAL AND VERTICAL SURVEY NOTES

26

GSI AREA HARRISON BAY STATE/COUNTY Alaska BOOK NO. 4 PAGE 26 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 4 MO 81 YR  
 SURVEYOR M. O'BRADY INSTRUMENT DESC/SERIAL NO. T-2 CREW NO. 1186

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		388	1320		91 16 12	11						1		
2		389	880		91 07 40	11						2		
3		390	440		90 13 05	11						3		
4	Δ	391	--		90	5.4		177.3				4		
5		392	440		89 38 12	11						5		
6		393	880		89 33 20	11						6		
7		394	1320		89 29 17	11						7		
8		395	1760		89 31 00	11						8		
9		396	2200		89 34 27	11						9		
10		397	2640		89 37 00	11						10		
11		398	3080		89 37 46	11						11		
12	⊙	399	3520		89 43 22	11		+6.3				12		
13					270 16 30	11			183.5			13		
14												14		
15	Δ	SP 399	2640		88 43 47	11		-47.7				15		
16					271 16 15	11						16		
17												17		

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 292 OF 27  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 20 BY 4 MO 01 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. J-2 with CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ○	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" 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		400	2200		88 38 14	11						1		
2		401	1760		88 33 05	11						2		
3		402	1320		88 32 14	11						3		
4		403	880		88 48 35	11						4		
5		404	440		88 38 22	11						5		
6	<input checked="" type="checkbox"/> Δ	405	-0-		90	5.5		135.8				6		
7		406	440		91 51 11	11						7		
8		407	880		90 57 08	11						8		
9		408	1320		90 38 14	11						9		
10		409	1760		90 18 31	11						10		
11		410	2200		90 00 15	11						11		
12	<input checked="" type="checkbox"/> ○	411	2640		89 57 16	11		-8.8				12		
13					270 02 42	11			127.0			13		
14												14		
15	<input checked="" type="checkbox"/> Δ	SP 411	<del>2640</del> 2200		89 40 45	11		-1.4				15		
16					270 19 16	11						16		
17					41							17		

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SYMBOLS

Δ = BACKSIGHT

Δ = INSTRUMENT SET-UP

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 93 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY VERT CLIENT USGS DATE 20 DY 4 MO 81 YR  
 SURVEYOR N. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS			
			DISTANCE		<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			LR OR DI	RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ						INST	ROD				
1		412	1760		89 36 35								1		
2		413	1320		89 37 00								2		
3		414	680		89 27 04								3		
4		415	480		88 39 10								4		
5	⋈	416	-0-		90	SS		125.6					5		
6		417	440		90 35 47								6		
7		418	880		90 23 10								7		
8		419	1320		90 13 30								8		
9		420	1760		90 04 08								9		
10		421	2200		89 57 24								10		
11	⊙	422	2690		90 00 29		-11.2						11		
12					269 59 39				1144				12		
13													13		
14	Δ	SP 422	1485		90 06 28		+13.71						14		
15					268 53 47								15		
16		423	1045		90 06 53								16		
17													17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. ✓ PAGE 294 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Next CLIENT USGS ~~FR~~ DATE 20 DY 4 MO 81 YR  
 SURVEYOR M.O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE	<input checked="" 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		424	605		90 19 11	11						1		
2		425	165		88 12 46	11						2		
3	⊗	TP 425+165	-0-		90,	5.5			128.1			3		
4		426	275		92 13 50	11						4		
5		427	715		91 56 00	11						5		
6		428	1155		91 01 55	11						6		
7		429	1595		90 47 31	11						7		
8		430	2035		90 31 08	11						8		
9		431	2475		90 12 02	11						9		
10	⊙	432	2915		<del>90 05 15</del>	11						10		
11					269 05 00	11						11		
12					90 04 58	11			-15.0		113.0	12		
13					40 10							13		
14	Δ	SP432	3080		89 38 07	11			-8.8			14		
15					270 22 00	11						15		
16		433	2640		89 34 22	11						16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

30

GSI AREA Harrison Bay STATE/COUNTY ALASKA BOOK NO. 4 PAGE 35 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert. CLIENT USGS DATE 20 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" 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		434	2200		89 38 00	11						1		
2		435	1760		89 57 50	11						2		
3		436	1320		89 55 40	11						3		
4		437	880		89 54 22	11						4		
5		438	440		89 36 50	11						5		
6	1	439	-0-		90	5.5		104.2				6		
7		440	440		89 00 08	11						7		
8		441	880		89 26 00	11						8		
9		442	1320		89 36 03	11						9		
10		443	1760		89 25 45	11						10		
11		444	2200		88 57 05	11						11		
12		445	2640		88 56 45	11						12		
13	⊙	446	3080		89 00 46	11	42.3					13		
14					270 59 09	11		146.5				14		
15												15		
16												16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

31

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 96 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY VERT CLIENT UEGS DATE 20 BY 4 MO 81 YR       
 SURVEYOR W. GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL							HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	ELEVATION		L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE		LINE
				SLOPE				HORIZ	INST				
1	Δ	446	1320		90 05 26	11		+13.1				1	
2					269 54 37	11						2	
3		447	880		89 56 36	11						3	
4		448	440		89 40 31	11						4	
5	⋈	449	-0-		90	SS		59.5				5	
6		450	440		90 03 41	11						6	
7		451	880		90 11 00	11						7	
8		452										8	
9	⊙	TP 451+275	1155		90 18 10	11		-17.1		142A		9	
10					269 41 41	11						10	
11												11	
12	Δ	TP 451+275	2805		89 20 42	11		-21.2				12	
13					270 39 13	11						13	
14		452	2670		89 49 26	11						14	
15		453	2700		90 00 20	11						15	
16		454	1760		89 59 56	11						16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

32

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 97 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR DI		RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ					INST	ROD				
1		455	1320		90 03 20	11						1		
2		456	890		89 57 30	11						2		
3		457	440		89 41 33	11						3		
4	⋈	458	- 0 -		90	5.5			121.2			4		
5		459	440		89 41 22	11						5		
6		460	880		89 07 15	11						6		
7		461	1320		89 21 30	11						7		
8		462	MLO		89 21 30	11						8		
9		463	2200		89 32 50	11						9		
10	⊙	464	2640		89 38 49	11		+5.4				10		
11					270 21 20	11					126.7	11		
12												12		
13	⋈	SP 464	2640		89 58 12	11		+9.5				13		
14					270 01 48	11						14		
15		465	2200		89 57 00	11						15		
16		466	1760		90 19 38	11						16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

33

GSI AREA HARRISON BAY STATE/COUNTY ALASKA BOOK NO. 4 PAGE 78 OF 78  
 LINE/LOOP NO. 27-811 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" 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		467	1320		90 33 05	21						1		
2		468	880		90 06 35	11						2		
3		469	440		89 39 18	11						3		
4	⋈	470	-0-		90	55		136.1				4		
5		471	440		89 08 58	11						5		
6		472	880		89 37 30	11						6		
7		473	1320		89 47 30	11						7		
8		474	1760		89 48 32	11						8		
9		475	2200		89 37 35	11						9		
10	⊙	476	2640		89 39 15	11	+5.1					10		
11					270 20 45	4		141.2				11		
12												12		
13	A	SP476	2200		89 51 39	11	+7.5					13		
14					270 05 20	11						14		
15		477	1760		89 57 22	11						15		
16		478	1320		90 00 00	11						16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

34

GSI AREA HARRISON BAY STATE/COUNTY Alaska BOOK NO. 4 PAGE 99 OF       
 LINE/LOOP NO. 27-21 TYPE SURVEY Vert. CLIENT USGS DATE 20 DY 4 MO 21 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL			REMARKS		
			DISTANCE	<input checked="" 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		479	800		90 02 22	11						1		
2		480	440		89 22 47	11						2		
3	⊙	481	-0-		90	5.5			148.7			3		
4		482	416		88 37 45	11						4		
5		483	880		89 10 00	11						5		
6		484	1326		89 05 30	11						6		
7		485	1760		89 08 43	11						7		
8		486	2200		89 15 24	11						8		
9	⊙	486+165	2365		89 13 42	11	+19.6					9		
10					270 44 16	11			168.3			10		
11												11		
12	Δ	486+165	3470		89 47 53	11	-1.5					12		
13					270 11 57	11						13		
14		487	3195		89 51 31	11						14		
15		488	2755		89 51 00	11						15		
16		489	2315		89 58 03	11						16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY ALASKA BOOK NO. 4 PAGE 100 OF 35  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 1 MO 8 YR  
 SURVEYOR M. O'BRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS		
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST			
1		490	1875		90 103A	U					1		
2		491	1435		90 00 U	U					2		
3		492	995		89 52 17	U					3		
4		493	555		89 48 56	U					4		
5		494	115		95 37 25	U					5		
6	⊕	TP 494+115	-0-		90 54		166.9				6		
7		495	325		95 21 57	U					7		
8		496	765		92 22 10	U					8		
9		497	1205		91 30 21	U					9		
10		498	1645		91 06 46	U					10		
11		499	2085		90 55 58	U					11		
12	⊙	500	2525		90 45 13	U	-44.1				12		
13					269 14 55	U		122.9			13		
14					63						14		
15											15		
16											16		
17											17		

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SS = SIDESHOT

⊙ = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

36

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 101 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert. CLIENT USGS DATE 762 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS	
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	ELEVATION		L/R OR D/I		RIGHT TURNED HORIZONTAL ANGLE
			SLOPE	HORIZ				FEET <input checked="" type="checkbox"/> METERS <input type="checkbox"/>	INST			
1	Δ	SP500	1760		89 56 58	11	49.4				1	
2					276 02 55	11					2	
3		501	1320		89 56 26	11					3	
4		502	880		89 53 42	11					4	
5		503	440		89 40 04	11					5	
6	Δ	504	-0-		90	5.4		132.3			6	
7											7	
8	⊙	BARR MARK		50'	90°	6.4			125.9		8	
9		B1417									9	
10											10	
11	Δ	BARR MARK		50'	90°	6.4					11	
12											12	
13	Δ	SP 504	-0-		90	5.4		131.8			13	
14		505	440		89 11 19	11					14	
15		506	880		89 25 06	11					15	
16		507	1320		88 29 25	11					16	
17											17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 102 OF 37  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert. CLIENT USGS DATE 20 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 w. 12 CREW NO. 11926

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ					INST	ROD				
1		508	1760		88 29 55	11						1		
2		509	2200		88 36 34	11						2		
3	⊙	510	2690		88 42 00	11	49.0					3		
4					271 17 50	11		180.8				4		
5												5		
6												6		
7												7		
8												8		
9												9		
10												10		
11												11		
12												12		
13												13		
14												14		
15												15		
16												16		
17												17		

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**SYMBOLS**

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# HORIZONTAL AND VERTICAL SURVEY NOTES

38

GSI AREA Ichipikuk Ikpikpak STATE/COUNTY Alaska BOOK NO. 4 PAGE 103 OF       
 LINE/LOOP NO. 27-31 TYPE SURVEY Vert. CLIENT USGS DATE 22 DY 4 MO 81 YR  
 SURVEYOR M.O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	  	STATION	VERTICAL							HORIZONTAL		REMARKS	
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DJI		RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST			
1		SP 510	2200		89 29 02	11		-8.9		180.9		1	START ELEV 180.8
2					29 31 01	11						2	
3		511	1760		89 18 20	11						3	
4		512	1320		89 19 07	11						4	
5		513	880		89 07 38	11						5	
6		514	440		89 11 33	11						6	
7		SP 515	-0-		90	5.5			171.9			7	
8												8	
9		Intersection	2273		89 30 00	11				180.9		9	
10		Line 28										10	
11		Line 27										11	
12												12	
13		516	440		90 21 00	11						13	
14		517	880		90 09 21	11						14	
15		518	1320		90 19 06	11						15	
16		519	1760		90 12 21	11						16	
17												17	

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 = INSTRUMENT SET-UP   
 = SIDESHOT   
 = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

39

GSI AREA IKpikpak STATE/COUNTY Alaska BOOK NO. 4 PAGE 104 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 22 DY 4 MO 81 YR  
 SURVEYOR KIOGRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 186

LINE	  	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1		520	2200		90 27 33	11		-28.5				1		
2					269 32 22	11			143.4			2		
3												3		
4	A	SP 520	3080		89 24 26	11		-21.1				4		
5					270 35 30	11						5		
6		521	2640		89 23 52	11						6		
7		522	2200		89 28 07	11						7		
8		523	1760		89 42 24	11						8		
9		524	1320		89 52 47	11						9		
10		525	880		89 48 02	11						10		
11		526	440		89 44 45	11						11		
12		527	-0-		90	55			122.3			12		
13		528	440		89 27 55	11						13		
14		529	880		89 43 51	11						14		
15		530	1320		89 48 40	11						15		
16		531	1760		89 19 30	11						16		
17												17		






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

# HORIZONTAL AND VERTICAL SURVEY NOTES

40

GSI AREA Ikpiakupuk STATE/COUNTY Alaska BOOK NO. 4 PAGE 105 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 22 BY 4 MO 81 YR  
 SURVEYOR M. O'BRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 186

LINE		STATION	VERTICAL							HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE	HORIZ					INST	ROD				
1		532	2200		89 11 33	11							1		
2		<del>533</del>	<del>2640</del>		<del>89 11 43</del>	11		+20.0					2		
3					270 48 28	11			142.4				3		
4													4		
5		SP532	2640		90 04 12	11		+14.1					5		
6					269 55 58	11							6		
7		533	2200		90 18 41	15							7		
8		534	1760		90 17 02	11							8		
9		535	1320		90 05 45	11							9		
10		536	880		89 56 29	11							10		
11		537	440		89 37 30	11							11		
12		538	-0-		90	5.5			156.4				12		
13		539	440		89 16 25	11							13		
14		540	880		89 23 22	10		-1.6					14		
15					270 36 36	11			154.8				15		
16													16		
17													17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA IKpikpak STATE/COUNTY Alaska BOOK NO. 4 PAGE 106 OF 41  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 22 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" 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	Δ	SP 540	2200		89 18 21	11		-15.8				1		
2					270 41 43	11						2		
3		541	1760		89 31 42	11						3		
4		542	1320		89 43 04	11						4		
5		543	880		89 47 10	11						5		
6		544	440		89 12 52	11						6		
7	Δ	545	0-		90	5.5		139.0				7		
8		546	440		90 25 10	11						8		
9		547	880		90 04 27	11						9		
10		548	1320		89 46 19	11						10		
11		549	1760		90 08 30	20						11		
12		550	2200		89 58 32	11						12		
13	⊙	TP 55 D-155	<del>2640</del> 2255		89 47 19	11		-2.6				13		
14					270 12 43	11			136.5			14		
15												15		
16												16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

42

GSI AREA IkpiKpak STATE/COUNTY Alaska BOOK NO. 4 PAGE 107 OF       
 LINE/LOOP NO. Z7-81 TYPE SURVEY Vert CLIENT USGS DATE 22 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	  	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" 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		TP530+55	3025		89 52 29			+4.2				1		
2					270 07 44							2		
3		551	2640		90 12 41							3		
4		552	2200		90 13 44							4		
5		553	1760		90 08 50							5		
6		554	<del>1320</del> 1320		90 16 14							6		
7		555	<del>800</del>		90 11 32							7		
8		556	440-		89 53 00							8		
9		557	-0-		90	5.5			140.6			9		
10		558	440		89 15 40							10		
11		559	880		89 36 10							11		
12		560	1320		89 36 43							12		
13		561	1760		89 43 10							13		
14		562	2200		89 44 55							14		
15		563	2640		89 34 51							15		
16		564	3080		89 33 59			+12.5				16		
17					210 26 10				153.1			17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA IkpiKpuk STATE/COUNTY Alaska BOOK NO. 4 PAGE 108 OF 43  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 22 BY 4 MO 8 YR  
 SURVEYOR M. D. GRADY INSTRUMENT DESC/SERIAL NO. T-2 W. H. CREW NO. 1186

LINE	  	STATION	VERTICAL						HORIZONTAL		REMARKS		
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	ELEVATION			LR OR DJ	RIGHT TURNED HORIZONTAL ANGLE
				SLOPE	HORIZ				INST	ROD			
1		SP 564	2690			89 20 08	11	-19.8				1	
2						270 40 03	11					2	
3		565	2700			89 16 05	11					3	
4		566	1760			89 11 32	11					4	
5		INTERSECTION		1718		89 11 50	11					5	
6		22-81							146.4			6	
7		27-81 gdet#2										7	
8		567	1320			89 20 05	11					8	
9		568	880			89 12 15	11					9	
10		569	410			89 10 13	11					10	
11		570	-0-			90	5.5		133.3			11	
12		571	440			89 15 50	11					12	
13		572	880			89 38 20	11					13	
14		573	1320			89 45 40	11					14	
15		574	1760			89 47 06	11					15	
16		575	2200			89 36 18	11					16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Ikpi park STATE/COUNTY Alaska BOOK NO. 4 PAGE 109 OF 44  
 LINE/LOOP NO. 27L 81 TYPE SURVEY Vert CLIENT USAS DATE 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 W.L.D. CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊕	STATION	VERTICAL						HORIZONTAL		REMARKS				
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DR	RIGHT TURNED HORIZONTAL ANGLE	LINE	
				SLOPE	HORIZ					INST					ROD
1	⊕	576	2640			89 35 00	11		+8.3				1		
2						270 25 2	11			141.6			2		
3													3		
4	Δ	SP 576	3520			89 38 07	11		-11.7				4		
5						270 22 01	11						5		
6		577	3080			89 44 00	11						6		
7		578	2640			89 36 10	11						7		
8		579	2200			89 34 45	11						8		
9		580	1760	240		90	5.6						9		
10		581	1320	240		90	5.6						10		
11		582	880	240		90	5.6						11		
12		583	440	240		90	5.6						12		
13	⊕	584	-0-	240		90	5.6	129.9	12				13		
14		585	440	240		90	5.6						14		
15		586	880	240		90	5.6						15		
16		587	1320			89 34 34	11						16		
17													17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

45

GSI AREA Ikpikpuk STATE/COUNTY Alaska BOOK NO. 4 PAGE 110 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 22 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		LINE	REMARKS			
			DISTANCE		<input checked="" 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	
			SLOPE	HORIZ						INST					ROD
1		588	1760		89 33 40	11						1			
2		<del>589</del>										2			
3	⊙	Well	1920		89 42 23	6.0	+39					3	INIGOK Well BANY MARK 813A		
4					270 17 22	6.0			133.7			4	134.8		
5												5			
6												6			
7												7			
8												8			
9												9			
10												10			
11												11			
12												12			
13												13			
14												14			
15												15			
16												16			
17												17			

134.8 - 133.7

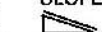

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# HORIZONTAL AND VERTICAL SURVEY NOTES

46

GSI AREA ZKpiKruk STATE/COUNTY Alaska BOOK NO. 4 PAGE III OF       
 LINE/LOOP NO. 23-81 TYPE SURVEY Vert CLIENT USGS DATE 23 DY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR DJI	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE 					HORIZ 	INST				
1	Δ	WELL	2910		90 35 16	10		39.8					1	
2					269 25 00	10		39.7					2	
3		JP 589	2640		90 43 15	11							3	
4		590	2200		90 46 35	11							4	
5		591	1760		90 57 25	11							5	
6		592	1320		90 36 57	11							6	
7		593	880		90 23 42	11							7	
8		594	440		90 11 00	11							8	
9	Δ	595	-0-		90	5.5			174.5				9	
10		596	440		89 45 51	11							10	
11		597	880		90 01 00	11							11	
12		598	1320		90 02 20	11							12	
13		599	1760		89 54 50	11							13	
14		600	2200		89 59 06	11							14	
15	⊙	601	2640		90 03 32	11		-13.6		160.9			15	
16					269 56 36	11		-13.5					16	
17													17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

47

GSI AREA IKPIKPUK STATE/COUNTY Alaska BOOK NO. 4 PAGE 112 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 23 BY 4 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wilco CREW NO.     

LINE	  	STATION	VERTICAL						HORIZONTAL		REMARKS		
			DISTANCE	<input checked="" 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
				SLOPE					HORIZ	INST			
1		601	3685		269 39 10	11		33.1				1	
2					90 21 00	11		33.2				2	
3		602	3245		90 23 34	11						3	
4		603	2805		90 34 35	11						4	
5		604	2365		90 40 24	11						5	
6		605	1925		90 51 17	11						6	
7		606	1485		90 49 00	11						7	
8		607	1045		90 25 18	11						8	
9		608	605		89 51 36	11						9	
10		609	165		89 00 53	11						10	
11		TP	-0-		90	5.5			194.2			11	
12		610	275		90 28 00	11						12	
13		611	715		90 07 43	11						13	
14		612	1155		89 51 12	11						14	
15		613	1595		89 51 40	11						15	
16		614	2035		90 05 26	15		-18.1		176.1		16	
17					269 54 24	15		-18.2				17	

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## HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA IKpikpuk STATE/COUNTY Alaska BOOK NO. 4 PAGE 43 OF 48  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 22 BY 7 MO 81 YR  
 SURVEYOR M.O'LEARY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> ⚓ <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" 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	SP 64	3520		89 39 00	15	-6.8					1		
2					270 21 12	15	-6.9					2		
3		645	3080		89 45 20	11						3		
4		646	2640		89 52 30	11						4		
5		647	2200		89 58 16	11						5		
6		648	1760		90 06 58	11						6		
7		649	1320		90 08 30	11						7		
8		620	880		90 17 22	11						8		
9		621	440		89 26 47	11						9		
10	Δ	622	- 0 -		90	5.5		169.4				10		
11		623	440		89 12 30	11						11		
12		624	880		89 33 50	11						12		
13		625	1320		89 46 56	11						13		
14		626	1760		89 57 25	11						14		
15		627	2200		89 59 15	11						15		
16		628	2640		89 53 55	11						16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Ikpiakpuk STATE/COUNTY Alaska BOOK NO. 4 PAGE 114 OF 149  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USGS DATE 23 DAY 4 MO 81 YR  
 SURVEYOR MOLBARDY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS				
			DISTANCE		<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		LR OR DR	RIGHT TURNED HORIZONTAL ANGLE	LINE	
			SLOPE	HORIZ						INST					ROD
1		629	3080		89 41 52	11							1		
2	⊙	630	3920		89 30 18	11		19.7					2		
3					270 29 50	11		19.7		189.1			3		
4													4		
5	Δ	630	1760		91 10 17	15		50.9					5		
6					268 49 50	15		50.9					6		
7		631	1320		90 47 18	11							7		
8		632	890		90 43 14	11							8		
9		633	440		90 22 02	11							9	LINDA SATI MARK	
10	⊙	634	-0-		90	5.5			240.0				10	242.0	
11													11	TIC: 4.9	
12	⊙	TRI STATION	1180		89 31 21	5.0		4.9					12		
13		LINDA			270 28 48	5.0		4.9		244.9			13	30th Engineer	
14		1955											14	GROUP	
15	Δ	TRI STATION	1180		89 31 21	5.0		-4.9					15		
16					270 28 48	5.0		-4.9		240.0			16		
17													17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA IKPIKPNK STATE/COUNTY Alaska BOOK NO. 4 PAGE 115 OF 50  
 LINE/LOOP NO. 27-21 TYPE SURVEY Vert CLIENT USGS DATE 23 DY 4 MO 81 YR  
 SURVEYOR M. OBRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	  	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1		SP 63A	0-		90	55			237.1			1		
2		635	440		90 01 10	11						2		
3		636	080		89 47 20	11						3		
4		637	1320		89 51 45	11						4		
5		638	1760		90 10 09	11	-16.1					5		
6					269 50 03	11	-16.1	221.1				6		
7												7		
8		SP 63B	3620		89 20 55	11	-29.3					8		
9					270 39 03	11	-29.3					9		
10		639	3060		89 15 52	11						10		
11		640	2610		89 15 18	11						11		
12		641	2200		89 13 53	11						12		
13		642	1760		89 13 46	11						13		
14		643	1320		89 28 25	11						14		
15		644	880		90 44 16	11						15		
16		645	440		92 51 26	11						16		
17												17		

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SYMBOLS

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= SIDESHOT

= FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

51

GSI AREA Ikpiruk STATE/COUNTY Alaska BOOK NO. 4 PAGE 46 OF       
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert. CLIENT USGS DATE 23 BY A MO 81 YR  
 SURVEYOR M. O'LEARY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> Π <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR DJ	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1	Δ	646	-0-		90	5.6		191.8				1		
2		647	440		88 37 01	11						2		
3		648	880		89 00 43	11						3		
4		649	1320		89 02 16	11						4		
5		650	1760		89 00 29	11						5		
6		651	2200		89 11 02	11						6		
7	⊙	652	2640		89 26 37	11						7		
8					270 34 2	11	15.5		207.3			8		
9					89 25 34	11	15.6					9		
10												10		
11	Δ	SP652	2915		89 54 12	11	5.9					11		
12					270 05 51	11	5.9					12		
13		653	2475		90 03 29	11						13		
14		654	2035		90 16 00	11						14		
15		655	1595		90 38 38	11						15		
16		656	1155		90 50 19	11						16		
17												17		

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA IRpikpak STATE/COUNTY ALASKA BOOK NO. 4 PAGE 117 OF 52  
 LINE/LOOP NO. 27-21 TYPE SURVEY LEV CLIENT USGS DATE \_\_\_ DY \_\_\_ MO \_\_\_ YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. \_\_\_\_\_ CREW NO. \_\_\_\_\_







LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			LR OR DR	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1		657	715		91 06 36	11						1		
2		658	275		89 20 40	11						2		
3	<input type="checkbox"/> Δ	TP	-0-		90	55		213.2				3		
4		659	165		89 28 16	11						4		
5		660	605		90 28 26	11						5		
6		661	1045		90 21 14	11						6		
7		662	1485		90 14 53	11						7		
8		663	1925		90 11 49	11						8		
9		664	2365		90 09 35	11						9		
10		665	2805		89 49 18	11						10		
11		666	3245		89 45 22	11						11		
12		667	3685		89 35 24	11						12		
13	<input type="checkbox"/> ⊙	668	4125		89 34 32	11	14.9					13		
14					290 25 38	11	20.0	233.2				14		
15												15		
16												16		
17												17		

WORKED BY \_\_\_\_\_ CHECKED BY 1ST \_\_\_\_\_ 2ND \_\_\_\_\_

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA IKPIKPUK STATE/COUNTY ALASKA BOOK NO. 4 PAGE 118 OF 53  
 LINE/LOOP NO. 27-81 TYPE SURVEY Vert CLIENT USAS DATE 23 DY 24 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. V-2 Wild CREW NO. 1186

LINE		STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1		668	2640		894550	11		0.0					1	
2					270 14 16	11		0.1					2	
3		669	2200		<del>894352</del>	11							3	
4		670	1760		90 02 18	11							4	
5		671	1320		90 32 16	11							5	
6		672	880		89 22 15	11							6	
7		673	440		89 18 18	11							7	
8		SP 674	0		-90°				233.2				8	
9		SP 675	440		894557	11				224.6			9	
10													10	
11		BARR MARK			<del>894550</del>	12	894556	-3.2					11	
12		SP 669+81'	2119		270 14 58	12		-3.0		230.2			12	
13		# 81046											13	
14		BARR MARK	2119		894556	12		3.2					14	
15		SP 669+81'			270 14 58	12		3.0					15	
16		SP 674	-0-		90°				233.8				16	
17									233.2				17	

WORKED BY \_\_\_\_\_ CHECKED BY 1ST \_\_\_\_\_ 2ND \_\_\_\_\_

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

54

GSI AREA J. Koikpunk STATE/COUNTY Alaska BOOK NO. 1 PAGE 119 OF       
 LINE/LOOP NO. 2781 TYPE SURVEY Vert CLIENT USGS DATE 23 BY 4 MO 8 YR       
 SURVEYOR M. O'BRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 186

LINE	  	STATION	VERTICAL						HORIZONTAL		REMARKS			
			DISTANCE	<input checked="" type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR DJ	RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST				
1		TS 1076	880		89 56 35	11	-10.1	-	225.1			1		
2		677	1320		89 59 36	11	-9.7		223.5			2		
3		688	2760		89 55 00	11	-8.4		224.8			3		
4		679	2200		89 43 18	11	-0.2		233.0			4		
5		680	2640		89 26 00	11	15.3		248.5			5		
6		681	3080		89 19 50	11	25.2		258.4			6		
7		682	3520		89 23 08	11	27.0		260.2			7		
8		683	3960		89 27 44	11	26.5		259.7			8		
9		684	4400		89 31 10	11	26.3		259.5			9		
10		685	4840		89 32 20	11	28.4		261.0			10		
11		686	5280		89 31 01	11	28.5		262.7			11		
12		687	5720		89 33 51	20'	24.2		257.4			12		
13												13		
14												14		
15												15		
16												16		
17												17		

WORKED BY \_\_\_\_\_ CHECKED BY 1ST \_\_\_\_\_ 2ND \_\_\_\_\_

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