

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umiat STATE/COUNTY ALASKA BOOK NO. 1 PAGE 32 OF 32  
 LINE/LOOP NO. 28-31 TYPE SURVEY Vert CLIENT USGS DATE 14 DY 1 MO 81 YR  
 SURVEYOR M. O'BRIEN 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 DI		RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST			
1													
2	Δ	<del>PARK MARK</del> 31'			90	5.3			55.8			81426 ELEV. 55.83	
3													
4	Δ	JP 100			60	5.2		61.1 ✓	55.7				
5		TS 99	440		90 20 11	11			47.5				
6		TS 98	880		90 22 01	11			44.5				
7	⊙	TS 97	1320		89 49 18	11	-6.9						
8					270 10 38	11			51.3				
9													
10	Δ	TS 97	880		89 08 43	11							
11					270 51 10	11							
12		TS 96	440		89 24 40	11			45.6				
13	Δ	" 95	-0.7		90	52		52.1 ✓					
14		" 94	440		89 06 25	11			48.0				
15		93	880		89 43 25	11			45.4				
16	⊙	92	1320		89 41 32	11			48.2	✓			
17													

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umlat STATE/COUNTY ALASKA BOOK NO. 1 PAGE 33 OF 2  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 14 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1124

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
				SLOPE					HORIZ	INST			
1	Δ	TS 92	0-		90	5.3		53.5				1	
2		TS 91	445		89 21 13	11.			47.5			2	
3		TS 90	380		89 48 08	11			45.6			3	
4		TS 89	1320		89 59 36	11			42.7			4	
5		TS 88	1960		90 03 07	4.5			47.5			5	
6												6	
7												7	
8												8	
9	Δ	SP 100	1320		89 53 09	5.0						9	55.7
10		10			210 07 00	5.0						10	
11		SP 101	880		89 19 57	11.						11	
12		102	440		89 11 33	11						12	
13	Δ	103	0-		90	5.2		58.0				13	
14		104	440		88 53 58	11.						14	
15	⊙	105	880		89 26 32	11			55.6			15	
16					270 33 30	11						16	
17												17	

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umiat STATE/COUNTY Alaska BOOK NO. 1 PAGE 34 OF 3  
 LINE/LOOP NO. 28-81 TYPE SURVEY VEET CLIENT USGS DATE 5 BY 1 MO 8 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 with CREW NO. 1106

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
				SLOPE					HORIZ	INST			
1	Δ	SP 105	1320		89 58 59	5.0						1	
2					270 01 07	5.0						2	
3		SP 106	880		89 38 11	11.0						3	
4		+ LINE 39	899		90 33 34	11.0		42.3				4	
5		108	0		269 26 29	11.0						5	
6		SP 107	440		90 04 39	5.0						6	
7		BATT MARK			269 55 21	5.0		54.6				7	
8	Δ	SP 108	0		88 90 0	5.1		100.1				8	
9		SP 109	440		88 58 34	11.						9	
10		SP 110	880		89 24 30	11						10	
11	⊙	SP 111	1320		89 43 51	11						11	
12					270 16 11	11.		55 A				12	
13												13	
14	Δ	SP 111	1320	1	89 59 26	5.0						14	
15					270 00 46	5.0						15	
16		SP 112	880		89 34 21	11.						16	
17												17	

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umia STATE/COUNTY ALASKA BOOK NO. 1 PAGE 35 OF 4  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USCS DATE 15 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 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
				SLOPE					HORIZ	INST			
1		SP 113	410		89 13 37	11						1	
2	Δ	SP 114	- 0 -		90	5.0		60.1	✓			2	
3		SP 115	440		89 25 37	11						3	
4		SP 116	880		90 30 51	11						4	
5	○	SP 117	1320		85 07 56	11						5	
6					294 52 04	11			161.1	✓		6	
7												7	
8	Δ	SP 117	1320		89 47 28	11						8	
9					270 12 38	11						9	
10		SP 118	880		89 35 47	11						10	
11		" 119	440		89 01 23	11						11	
12	Δ	" 120	- 0 -		90	5.0		167.3	✓			12	
13		" 121	440		89 03 17	11						13	
14		" 122	880		89 32 32	11						14	
15		" 123	1320		89 51 53	11						15	
16	○	" 124	1760		90 12 27	11			160.0	✓		16	
17					269 47 42	11						17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Uniat STATE/COUNTY Alaska BOOK NO. 2 PAGE 36 OF 5  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 15 BY 1 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"/> T <input type="checkbox"/> SS <input type="checkbox"/> O	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
				SLOPE					HORIZ	INST			
1	Δ	SP 124	1320		88 35 08	11						1	
2					274 24 54	11						2	
3		SP 125	880		89 03 42	11						3	
4		" 126	440		89 07 49	11						4	
5	T	" 127	-0-		90	50		128.4	✓			5	
6		" 128	440		89 13 34	11						6	
7		" 129	880		89 30 36	11						7	
8	O	" 130	1320		89 45 04	11						8	
9					270 15 01	11			123.1	✓		9	
10												10	
11	Δ	SP 130	1320		90 17 40	5.0						11	
12					269 42 32	11.0						12	
13		SP 131	880		90 04 18	11.0						13	
14		" 132	440		89 34 18	11.0						14	
15	T	" 133	-0-		90	50		134.9	✓			15	
16		" 134	440		89 28 55	11						16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umist STATE/COUNTY Alaska BOOK NO. 1 PAGE 37 OF 6  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 15 BY 1 MO 81 YR  
 SURVEYOR M. O'LEARY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	 SS	STATION	VERTICAL						HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			RIGHT TURNED HORIZONTAL ANGLE
				SLOPE 					HORIZ 	INST		
1		SP 135	880		90 01 21	11						1
2		136	1320		89 47 43	11						2
3		137	1760		89 54 45	11						3
4					270 05 20	11			126.6			4
5					05							5
6		SP 137	2200		89 58 22	11						6
7					270 01 47	11						7
8		138	1760		90 11 20	11						8
9		139	1320		90 08 46	11						9
10		140	880		90 07 00	11						10
11		141	440-		89 35 35	11						11
12		142	-0-		90	5.0			136A			12
13		143	440		89 44 48	11.0						13
14		144	880		89 41 51	11.						14
15		145	1320		89 40 12	11						15
16		146	1760		89 46 35	11			132A			16
17					270 13 26	61						17

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umat STATE/COUNTY Alaska BOOK NO. 1 PAGE 38 OF 7  
 LINE/LOOP NO. 28-31 TYPE SURVEY Vert CLIENT USGS DATE 16 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 186

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			RIGHT TURNED HORIZONTAL ANGLE	
				SLOPE					HORIZ	INST			ROD
1		SP 146	1320		89 23 46	11.						1	
2					270 36 05	11						2	
3		SP 147	880		89 06 52	11						3	
4		" 148	440		88 59 26	11						4	
5		" 149	-0-		90	5.2		122.5				5	BARR MARK Elev
6		#81425	35'		90'	5.85			123.6			6	122.67
7		BARR MARK										7	123.6 - 122.67 = .93 tie
8		SP 150	440		95 23 31	18.						8	
9		151	880		92 59 20	11						9	
10		152	1320		92 28 49	11						10	
11		153	1760		91 49 27	11						11	
12		154	2200		91 28 57	11			60.6?			12	61.6
13					268 30 56							13	
14												14	
15		154	495		90 48 19	11						15	
16					269 11 45	11						16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umia STATE/COUNTY Alaska BOOK NO. 1 PAGE 39 OF 8  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 16 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 W:14 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			RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST		
1		SP 155	1045		90 56 43	11						
2		SP 156	605		91 36 23	11						
3		SP 157	165		96 03 12	11						
4	⊥							92.6			93.6	
5		SP 158	275		90 48 04	11						
6		SP 159	715		90 23 35	11						
7		SP 160	1155		90 18 15	11						
8		SP 161	1595		90 05 14	11						
9	◎	SP 162	2635		90 03 29	11			71.6		80.6	
10					269 56 39	11						
11												
12	Δ	SP 162	1045		91 44 03	11						
13					268 16 02	11						
14		SP 163	605		92 53 58	11						
15		16A	165		99 02 19	11						
16	⊥							123.2			123.2	
17												

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SYMBOLS

Δ = BACKSIGHT

⊥ = INSTRUMENT SET-UP

SS = SIDESHOT

◎ = FORESIGHT



# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umiat STATE/COUNTY ALASKA BOOK NO. 1 PAGE 40 OF 9  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert. CLIENT USGS DATE 16 BY 1 MO 81 YR  
 SURVEYOR M. O'BEARDE INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

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			RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST		
1		SP 165	875		91 12 45	12						
2		SP 166	715		89 09 52	11						
3		167	1155		89 10 15	11						
4	0	168	1595		89 21 58	11						
5					270 38 03	11			128.9			129.9
6												
7	A	SP 168	1760		89 25 29	11						
8					270 31 48	11						
9		SP 169	1320		89 23 48	11						
10		" 170	880		89 25 18	11						
11		" 171	440		89 01 47	11						
12	π	" 172	-0-		90	4.3			122.1			123.1
13		" 173	440		89 23 06	11						
14		" 174	880		89 39 50	11						
15		175	1320		89 46 44	11						
16		176	1760		89 49 08	11						
17												

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SYMBOLS = BACKSIGHT   
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 = SIDESHOT   
 = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA UmiaT STATE/COUNTY Alaska BOOK NO. 1 PAGE 41 OF 10  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 16 DY 1 MO 8 YR  
 SURVEYOR H. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	△ ⚓ SS ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS		
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST			
1		SP 177	2200		96 01 02	5.						1	
2	⊙	SP 178	2140		89 53 42	11						2	
3					290 06 38	11			116.2	✓		3	117-2
4												4	
5	△	SP 178	2200		96 21 16	11						5	
6					269 38 56	11						6	
7		SP 179	1760		90 21 52	11						7	
8		SP 180	1320		90 26 36	11						8	
9		" 181	880		90 16 14	11						9	
10		" 182	440		89 45 52	11						10	
11		" 183	-0-		90	4.5		140.6		✓		11	141-6
12		" 184	440		88 53 09	11						12	
13		" 185	880		89 18 47	11						13	
14		" 186	1320		89 28 44	11						14	
15	⊙	" 187	1760		89 28 08	11						15	
16			1		270 32 00	11			146.0	✓		16	147-1
17												17	

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umiat STATE/COUNTY Alaska BOOK NO. 1 PAGE 42 OF 42  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 16 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

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		SP 187	1760		89 52 11	11																
2					270 07 58	11																
3		SP 188	1320		89 41 36	11																
4		" 189	880		89 20 18	11																
5		" 190	440		88 41 14	11																
6		" 191	-0-		90	5.0			152.9		<input checked="" type="checkbox"/>											154.0
7		" 192	440		89 14 31	11																
8		" 193	880		89 37 29	11																
9		" 194	1320		89 47 40	11																
10		" 195	1760		89 50 27	11																
11			880		270 09 45	11				146.9	<input checked="" type="checkbox"/>											148.0
12																						
13		SP 195	1760		89 29 38	11																
14					270 36 28	11																
15		SP 196	1320		89 44 41	11																
16		197	880		89 35 57	11																
17																						

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

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GSI AREA Umat STATE/COUNTY Alaska BOOK NO. 1 PAGE 43 OF       
 LINE/LOOP NO. 28-B1 TYPE SURVEY Vert CLIENT USGS DATE 16 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> $\Delta$ <input type="checkbox"/> $\nabla$ <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			RIGHT TURNED HORIZONTAL ANGLE
									SLOPE	HORIZ		
1		SP 198	440		89 15 00	11						
2	$\nabla$	199	-0-		90	5.0		142.3		✓		143.3
3		200	440		89 01 43	11						
4		201	880		89 14 37	11						
5		202	1320		89 13 57	11						
6		203	1760		89 23 45	11						
7		204	2200		89 28 54	11						
8	$\nabla$	205	2640		89 33 40	11						
9					270 26 29	11		151.7		✓		152.7
10												
11	$\Delta$	SP 205	2640		89 42 48	11						
12					270 17 10	11						
13		206	2200		89 40 38	11						
14		207	1760		89 45 22	11						
15		208	1320		89 49 07	11						
16		209	880		89 37 00	11						
17												

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 SYMBOLS     $\Delta$  = BACKSIGHT     $\nabla$  = INSTRUMENT SET-UP    SS = SIDESHOT     $\odot$  = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

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GSI AREA Umia STATE/COUNTY ALASKA BOOK NO. 1 PAGE 44 OF 44  
 LINE/LOOP NO. 28-81 TYPE SURVEY vert CLIENT USGS DATE 15 BY 1 MO 81 YR  
 SURVEYOR M.O'BRAY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> $\Delta$ <input type="checkbox"/> $\nabla$ <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			RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST		
1		SP 210	440		89 17 39	11					1	BARR MARK
2	$\nabla$	" 211	-0-		90	5.5		149.4		142.4	2	Elev. 139.35
3		" 212	440		89 29 39	11					3	8
4		" 213	880		89 55 25	11					4	141.2 - 139.4
5		" 214	1320		90 11 00	11					5	21.8 tie
6		" 215	1760		90 15 35	11					6	
7	$\odot$	BARR MARK	3005.2		90 05 05	4.0			141.2	142.2	7	
8					269 55 02	4.0			125.9		8	
9	$\Delta$	BARR MARK	3005.2		90 05 02	4.0			139.4		9	
10	$\nabla$	SP 211	-0-		90	5.5		147.6			10	
11	$\odot$	SP 216	2200		90 16 59	11					11	
12					268 43 07	11			125.9		12	
13					89 48 06	11					13	
14	$\Delta$	SP 216	1760		89 48 06	11					14	
15					210 12 09	11					15	
16		217			89 44 49	11					16	
17											17	

WORKED BY \_\_\_\_\_ CHECKED BY 1ST MM 2ND \_\_\_\_\_  
 SYMBOLS  $\Delta$  = BACKSIGHT  $\nabla$  = INSTRUMENT SET-UP SS = SIDESHOT  $\odot$  = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umiat STATE/COUNTY ALASKA BOOK NO. I PAGE 15 OF 14  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 16 BY MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

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			RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST		
1		SP 218	880		89 42 06	11						
2		SP 219	440		89 21 58	11						
3	A	SP 220	-0-			5.0		130.7	✓			
4		SP 221	440		89 16 36	11						
5		" 222	880		89 37 29	11						
6		" 223	1320		89 45 22	11						
7		" 224	1760		89 54 50	11						
8	⊙	" 225	2200		89 53 56	11						
9					270 06 01	11			123.6	✓		123.0 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">123</span>
10												
11	A	SP 225	2200		89 48 25	11						
12					270 11 25	11						
13		226	1760		89 46 41	11						
14		227	1320		89 47 32	11						
15		228	880		89 38 33	11						
16		229	440		89 19 01	11						
17												

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

SYMBOLS

= BACKSIGHT








= INSTRUMENT SET-UP

= SIDESHOT

= FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umiat STATE/COUNTY ALASKA BOOK NO. 4 PAGE 46 OF 15  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT UBCS DATE 16 BY 1 MO 31 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	  	STATION	VERTICAL						ELEVATION		LR 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		SP 230	- 0 -		89 00 00	5.1			127.2				1	
2		231	040		89 19 05	11.							2	
3		232	880		89 38 58	11							3	
4		233	1320		89 38 12	11							4	
5		234	1450		89 51 27	11							5	
6		235	1200		89 52 37	11							6	
7		236	2690		89 52 56	11							7	
8		237	3080		89 49 17	11							8	
9					270 10 40	11			125.9				9	124.5 
10													10	
11		237											11	
12													12	
13													13	
14													14	
15													15	
16													16	
17													17	

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

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Um, at STATE/COUNTY Alaska BOOK NO. 4 PAGE 47 OF 16  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 17 DY 1 MO 81 YR  
 SURVEYOR M. O'Grady INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

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	
				SLOPE					HORIZ	INST				ROD
1		SP237	1760		90 05 22	11								
2					269 54 43	11								
3		238	1320		90 13 27	11								
4		239	880		89 59 46	11								
5		240	440		89 32 32	11								
6		241	- 0 -		90 5.0			139.6	134.6				132.9	
7		242	440		89 41 01	11								
8		243	880		89 53 20	11								
9		244	1320		90 00 39	11								
10		245	1760		89 57 08	11								
11		246	2200		90 03 38	11								
12		247	2690		90 04 00	11								
13					268 55 59	11			125.7	✓			123.6	
14														
15		SP237	2206		89 50 40	11								
16					270 09 27	11								
17														

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



# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umia STATE/COUNTY ALASKA BOOK NO. 21 PAGE 48 OF 17  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 17 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T2 W. 6 CREW NO. 186

LINE	<input type="checkbox"/> $\Delta$ <input type="checkbox"/> $\nabla$ <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			RIGHT TURNED HORIZONTAL ANGLE	
				SLOPE					HORIZ	INST			ROD
1		SP 248	1760		89 50 29	11							
2		249	1320		89 47 33	11							
3		250	880		89 40 35	11							
4		251	440		89 17 36	11							
5		252	- 0 -		90	5.0		130.6	125.6			123.1	(710)
6		253	440		89 07 24	11							
7		254	880		89 36 04	11							
8		255	1320		89 43 12	11							
9		256	1760		89 45 51	11							
10		257	2200		89 47 08	11							
11	$\odot$	258	2640		89 47 05	11			129.6			126.7	(120)
12					270 12 49	11							
13	$\nabla$	SP 258	- 0 -		90	4.9		134.5					# 81424
14	$\odot$	BARR MARK	970		90 09 05	7.0			124.9		123.6 - 124.9 =		BARR MARK
15					269 50 48	7.0			123.6		1.3 + 1e		Elev. 123.56 ✓
16	$\Delta$	BARR MARK	970		90°	9.0							
17	$\nabla$	SP 258	- 0 -		90	5.4		132.6	(127.2)				

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SYMBOLS  $\Delta$  = BACKSIGHT  $\nabla$  = INSTRUMENT SET-UP SS = SIDESHOT  $\odot$  = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Um. #4 STATE/COUNTY ALASKA BOOK NO. 21 PAGE 49 OF 18  
 LINE/LOOP NO. 28-81 TYPE SURVEY vert CLIENT USGS DATE 17 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

LINE	<input type="checkbox"/> $\Delta$ <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			RIGHT TURNED HORIZONTAL ANGLE
				SLOPE 					HORIZ 	INST		
1	$\odot$	SP 26A	2640		90°	15.2			117.5	✓		
2	$\Delta$	SP 26A	-0-		90°	5.2						
3												
4		SP 259	2200		89 51 46	11			117.1			
5		" 260	1760		89 56 44	11			116.0			
6		" 261	1320		89 46 52	11			116.8			
7		" 262	880		89 39 28	11			117.0			Do not use
8		" 263	440		89 04 23	11			118.8			
9	$\Delta$	" 26A	-0-		90	5.2		122.7	117.5	✓		
10		" 265	110		89 12 53	11			117.8			
11		" 266	880		89 36 19	11			117.3			Original 770 elevations are OK
12		" 267	1320		89 46 56	11			116.8			
13		" 268	1760		89 49 42	11			117.1			
14		" 26A	2800		89 51 18	11			117.4			
15	$\odot$	270	2640		89 53 21	11						
16					270 06 34	11			116.9	✓		
17												

WORKED BY \_\_\_\_\_ CHECKED BY 1ST M. O'GRADY 2ND \_\_\_\_\_

SYMBOLS

$\Delta$  = BACKSIGHT

$\nabla$  = INSTRUMENT SET-UP

SS = SIDESHOT

$\odot$  = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umiat STATE/COUNTY Alaska BOOK NO. 7 PAGE 50 OF 19  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 17 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

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		SP 270	2000		89 51 47						0.2	1	
2					270 08 17							2	
3		271	1460		89 49 12				117.2			3	
4		272	1320		89 45 56				117.0			4	
5		273	880		89 35 51				117.8			5	
6		274	440		89 17 50				117.0			6	
7		275	0-		90	52		122.6	117.4			7	
8		276	440		89 15 22				117.3			8	
9		277	880		89 36 35				117.6			9	
10		278	1390		89 45 16				117.3			10	
11		279	1760		89 46 27				118.6			11	
12		280	2200		89 45 41							12	
13					270 14 22				120.8		0.4	13	
14												14	
15		SP 280	2200		89 48 50							15	
16					276 11 13							16	
17												17	

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umiat STATE/COUNTY Alaska BOOK NO. 1 PAGE 51 OF 20  
 LINE/LOOP NO. 28-31 TYPE SURVEY VERT CLIENT USGS DATE 17 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

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
				SLOPE 					HORIZ 	INST		
1		281	1760		89 48 50	11			119.3	0.2		
2		282	1320		89 45 43	11			119.1			
3		283	880		89 42 00	11			118.2			
4		284	440		89 25 13	11			118.0			
5		285	- 0 -		90	5.4		124.5	119.1			
6		286	440		89 19 52	11			118.7			
7		287	880		89 39 30	11			118.8			
8		288	1320		90 01 38	11			113.0			
9		289	1760		90 04 08	11			111.5			
10		290	2200		90 02 33	11			112.0			
11	⊙	291	2640		90 01 31	11						
12					269 58 30	11			112.5	0.5	114.7 (710)	
13												
14	A	SP 291	2640		89 57 24	11						
15					270 02 45	11						
16		SP 292	2200		89 56 56	11			112.4			
17												

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

21

GSI AREA Umiaat STATE/COUNTY ALASKA BOOK NO. 4 PAGE 52 OF       
 LINE/LOOP NO. 28-31 TYPE SURVEY Vert CLIENT USGS DATE 17 DY 1 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		L/R OR D/I		RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST			
1		SP 293	1760		89 56 27	11			112.2		0.6	1	
2		294	1320		89 54 42	11			112.4			2	
3		295	880		89 45 51	11			114.0			3	
4		296	440		89 32 27	11			113.9			4	
5	⊥	297	<0-		90	5.3		121.3	116.0			5	
6		298	440		88 42 52	11			120.2			6	
7		299	880		89 21 00	11			120.3			7	
8		300	1320		89 30 20	11			121.8			8	
9		301	1760		89 36 47	11			122.3			9	
10	○	302	2200		89 46 18	11						10	
11					270 13 35	11			119.2		0.6	11	111.6 (170)
12												12	
13												13	
14												14	
15												15	
16												16	
17												17	

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

22

GSI AREA Um, at STATE/COUNTY ALASKA BOOK NO. 21 PAGE 13 OF 13  
 LINE/LOOP NO. 28-81 TYPE SURVEY VERT CLIENT USGS DATE 18 DY 1 MO 81 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 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	Δ	SP 302	2640		89 38 11	11						1	
2					270 21 54	11						2	
3		SP 303	2200		89 43 10	11			113.1			3	
4		304	1760		89 38 00	11			113.6			4	
5		305	1320		89 47 30	11			107.1			5	
6		306	880		89 38 11	11			107.9			6	
7		307	440		89 23 56	11			106.9			7	
8	⊗	SP 308	-0-		90	5.2		113.3	108.1			8	
9		309	440		89 31 07	11			105.6			9	
10		IN LINE 310	880		89 49 06	11			105.1			10	
11		IN LINE 311	1320		89 52 42	11			105.1			11	
12	⊙	IN LINE 312	1760		90	9.1						12	
13					89 54 45	11			105.0			13	92.7 (770)
14					270 05 12	11						14	
15												15	
16	Δ	SP 312	1760		90	9.2						16	
17												17	

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

23

GSI AREA Umait STATE/COUNTY Alaska BOOK NO. 1 PAGE 54 OF 54  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 18 DY 1 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			RIGHT TURNED HORIZONTAL ANGLE	
				SLOPE					HORIZ	INST			ROD
1	Δ	SP 312	1760		89 54 59	11							
2					270 05 02	11							
3		SP 313	1320		89 52 50	11			105.2				
4		314	820		89 48 09	11			105.4				
5		315	440		89 33 57	11			105.07				
6	⊗	316	-0-		90	52		113.4	108.2				
7		317	490		89 13 27	11			108.3				
8		318	880		89 32 03	11			109.5				
9		319	1320		89 38 00	11			110.9				
10		320	1760		89 38 53	11			112.2				
11	⊙	321	2200		89 44 12	11							
12					270 15 43	11			112.6		-0.8		101.0 (710)
13	⊗	312	-0-		90	5.4							
14		off set 312	1080		89 42 09								
15	⊗	311 311											
16		off set 310	900										
17													

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# HORIZONTAL AND VERTICAL SURVEY NOTES

24

GSI AREA Umiat STATE/COUNTY Alaska BOOK NO. 1 PAGE 15 OF 15  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 18 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	 SS 	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														
2		310	700											
3		offset 310												
4														
5														
6		SP 321	2200		89 44 21	11								
7					270 15 37	11								
8		SP 322	1760		89 48 29	11			108.4		0.8			
9		" 323	1320		89 46 01	11			107.9					
10		" 324	880		89 39 32	11			107.7					
11		" 325	440		89 18 30	11			107.8					
12		" 326	0		90	5.2		113.5	108.3					
13		" 327	440		89 10 55	11			108.7					
14		328	880		89 32 26	11			109.5					
15		329	1320		89 37 27	11			111.1					
16		330	1760		89 41 10	11			112.2					
17														

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



# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umi At STATE/COUNTY Alaska BOOK NO. 1 PAGE 56 OF 25  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 15 DY 1 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 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			ROD
1	⊙	SP 331	2200		89 49 42	//							
2					270 15 17	//			112.3	✓	-0.9		101.9 (710)
3													
4	Δ	SP 331	2200		89 49 06	//							
5					270 10 53	//							
6		SP 332	1760		89 45 46	//			112.6				
7		333	1320		89 41 50	//			112.3				
8		334	980		89 35 24	//			111.6				
9		335	440		89 11 26	//			111.5				
10		336	-0-		90	5.4		116.2 ✓	110.8				
11		337	440		89 27 23	//			109.4				
12		338	880		89 43 05	//			109.1				
13		339	1320		89 55 28	//			107.0				
14		340	1760		90 07 20	//			101.6				
15	⊙	341	2200		40 05 22	//							
16					289 54 41	//			101.9 ✓		-1.0		98.7 (710)
17													

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umiat STATE/COUNTY ALASKA BOOK NO. 1 PAGE 57 OF 26  
 LINE/LOOP NO. 28-31 TYPE SURVEY Vert CLIENT USGS DATE 18 BY 1 MO 31 YR  
 SURVEYOR M. O'BRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

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
				SLOPE					HORIZ	INST			
1		SP 341	2200		89 56 01	11						1	
2		"			270 04 03	11						2	
3		SP 342	1760		90 00 38	11			99.0		1.0	3	
4		" 343	1320		89 56 09	11			100.8		↓	4	
5		" 344	880		89 06 10	11			101.8			5	
6		" 345	940		89 14 32	11			105.1			6	
7		" 346	- 0 -		90	5.4		110.9	104.8			7	
8		" 347	440		89 06 30	11			106.1			8	
9		" 348	880		89 46 43	11			102.7			9	
10		" 349	1320		89 50 00	11			103.1			10	
11		" 350	1760		89 43 46	11			107.6			11	
12		" 351	2200		89 48 00	11			107.0		-1.1	12	
13					270 12 01	11						13	104.9 <sup>710</sup>
14												14	
15		SP 351	2200		89 52 24	11						15	
16					270 07 31	11						16	
17												17	

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

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA UMIAT STATE/COUNTY ALASKA BOOK NO. 1 PAGE 58 OF 58  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 28 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

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			RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST			
1		352	1760		89 49 24	11			107.5		1		
2		353	1320		89 46 13	11			107.4	+1.1	2		
3		354	880		89 36 16	11			108.1		3		
4		355	440		89 13 15	11			113.0		4		
5		356	-0-		90	5.3		113.0	107.7		5		
6		357	440		89 10 18	11			108.4		6		
7		358	880		89 32 32	11			109.1		7		
8		359	1320		89 40 55	11			109.4		8		
9		360	1760		89 48 13	11			108.1		9		
10		SP 361	2200		89 57 22	11					10		
11					270 02 40	4			103.8	-1.2	11	102.8 (170)	
12											12		
13		SP 361	1320		90 06 10	11					13		
14					269 53 50	11					14		
15		362	880		90 15 13	11			102.3		15		
16		363	440		89 29 25	11			110.1		16		
17											17		

End Data

\*

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Umia STATE/COUNTY ALASKA BOOK NO. 4 PAGE 19 OF 28  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 18 BY 1 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
										INST			
1		SP 36A	-0-		90	5A			117.2 ✓	111.8	1.2		
2		36B	440		89 24 26	11		117.7	110.7				
3		36C	880		89 43 28	11			110.4				
4		36D	1320		89 44 21	11			112.2				
5		36E	1760		89 40 03	11							
6					270 19 54	11			116.4		-13	115.32 (circled)	
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													

WORKED BY \_\_\_\_\_ CHECKED BY 1ST M. O'Grady 2ND \_\_\_\_\_

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 1 PAGE 60 OF 29  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert. CLIENT USGS DATE 19 DY 1 MO 81 YR  
 SURVEYOR M. OGRADY 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		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION				RIGHT TURNED HORIZONTAL ANGLE
			SLOPE	HORIZ					INST	ROD			
1	Δ	RARE MARK	-0-		90	5.5			108.6		107.29	1	81422
2											108.60	2	ELEV. 107.29
3	Δ		-0-		90	5.5					Tie to 13	3	
4												4	
5	○	SP 368	7380.5		89 56 32							5	115.3 (170)
6					89 56 31	6.0						6	
7					270 03 53	6.0						7	
8												8	
9	Δ	RARE MARK	7380		90 03 52	6.0						9	
10					289 55 54	6.0						10	
11												11	
12												12	
13												13	
14												14	
15												15	
16												16	
17												17	

WORKED BY \_\_\_\_\_ CHECKED BY 1ST M/O 2ND \_\_\_\_\_

SYMBOLS

Δ = BACKSIGHT

Δ = INSTRUMENT SET-UP

SS = SIDESHOT

○ = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

30

GSI AREA Umiaf STATE/COUNTY ALASKA BOOK NO. 2 PAGE 61 OF       
 LINE/LOOP NO. 28-21 TYPE SURVEY Vert CLIENT USGS DATE 19 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

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
				SLOPE	HORIZ					INST	ROD			
1	A	SP 368	1760		90	3.6							1	
2	A	SP 368	1760		89 43 46	11.			115.5		P		2	Seep -> c-29 BK-2
3					270 16 19	11.							3	should be 115.1
4		SP 369	1320		89 42 39	11							4	
5		" 370	880		89 29 27	11							5	
6		" 371	440		89 04 07	11							6	
7	A	" 372	- 0 -		90	5.3			118.1	✓			7	
8		373	440		89 25 40	11							8	
9		374	880		89 56 08	11							9	
10		375	1320		89 56 53	11							10	
11		376	1760		89 51 36	11							11	
12		377	2200		89 40 24	11							12	
13	O	378	2640		89 39 46	11				122.7	✓		13	122.3 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">120</span>
14					270 20 08	11							14	
15	A	SP 380	2640		90	5.1							15	
16					89 52 20	11							16	
17					270 07 49	11							17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

31

GSI AREA Umat STATE/COUNTY ALASKA BOOK NO. 1 PAGE 62 OF 62  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vent CLIENT USGS DATE 19 BY 1 MO 81 YR  
 SURVEYOR M. O'NEALY 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	ROD				
1		SP 379	2200			89 51 32	11						1		
2		SP 380	1760			89 51 39	11						2		
3		381	1320			89 46 51	11						3		
4		382	880			89 40 07	11						4		
5		383	440			89 12 01	11						5		
6	Δ	384	-0-			90	5.3		127.7	✓			6		
7		385	440			89 24 32	11						7		
8		386	880			89 48 59	11						8		
9		387	1320			89 50 53	11						9		
10		388	1760			89 59 06	11						10		
11	◎	389	2200			89 59 39	11						11		
12						270 00 16	11						12		
13						90	10.8		117.0	✓			13	116.3 (770)	
14													14		
15	Δ	SP 389	1760			89 45 57	11						15		
16						270 13 58	11.						16		
17						89 51							17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA UmiaT STATE/COUNTY Alaska BOOK NO. A PAGE 65 OF 32  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 19 DY 1 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 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
				SLOPE					HORIZ	INST			
1		390	1320		89 50 14	11						1	
2		391	880		89 47 49	11						2	
3		392	440		89 16 09	11						3	
4	Δ	393	-0-		90	5.3		120.7				4	
5		394	440		89 03 19	11						5	
6		395	880		89 41 44	11						6	
7		396	1320		89 48 13	11						7	
8		397	1760		89 49 51	11						8	
9	⊙	398	2200		89 50 58	11						9	
10					270 08 56	11			115.6			10	
11					90	5.5						11	
12												12	
13	Δ	SP 398	1760		90 20 41	11						13	
14					210 39 23	11						14	
15		399	1320		90 24 55	11						15	
16		400	880		90 15 08	11						16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Um, at STATE/COUNTY Alaska BOOK NO. 1 PAGE 64 OF 33  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 14 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 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 DI	RIGHT TURNED HORIZONTAL ANGLE	
									SLOPE	HORIZ				INST
1		SP 401	440		89 48 50	11						1		
2	<input type="checkbox"/> Δ	SP 402	-0-		90	5.0		137.1					2	
3		SP 403	420		90 06 01	11							3	
4		SP 404	880		90 42 09	11							4	
5		SP 405	1320		90 34 08	11							5	
6		SP 406	1760		90 27 10	11							6	
7	<input type="checkbox"/> ⊙	SP 407	2200		90 22 39	11							7	
8					269 37 14	11			111.7	<input checked="" type="checkbox"/>			8	110.6 <span style="border: 1px solid black; border-radius: 50%; padding: 2px;">770</span>
9													9	
10	<input type="checkbox"/> Δ	SP 407	1320		89 44 50	11							10	
11					290 15 20	11							11	
12		SP 408	880		89 25 30	11							12	
13		409	440		89 07 55	11							13	
14	<input type="checkbox"/> Δ	410	-0-		90	5.1		116.8		<input checked="" type="checkbox"/>			14	
15		411	440		89 44 51	11							15	
16		412	880		89 58 39	11							16	
17													17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Unmet STATE/COUNTY Alaska BOOK NO. 1 PAGE 65 OF 34  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 19 BY 1 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			RIGHT TURNED HORIZONTAL ANGLE
			SLOPE	HORIZ					INST	ROD		
1		SP 413	1320		90 02 40	11						1
2		SP 414	1760		90 00 50	11						2
3	⊙	415	2200		89 54 56	11						3
4					290 05 08	11			109.1	✓		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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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 1 PAGE 66 OF 35  
 LINE/LOOP NO. 28-31 TYPE SURVEY Vert CLIENT USGS DATE 20 BY 1 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			LR OR DI	RIGHT TURNED HORIZONTAL ANGLE
			SLOPE	HORIZ					INST	ROD			
1	Δ	SP45	1760		89 45 23	11						1	
2					270 14 36	11						2	
3					90	3.6	✓					3	
4		416	1320		89 42 47	11						4	
5		417	880		89 33 47	11						5	
6		418	440		89 00 09	11						6	
7		419	0		90	5.2		112.6	✓			7	
8		420	440		89 13 33	11						8	
9		421	880		89 31 38	11						9	
10		422	1320		89 37 29	11						10	
11	○	423	1760		89 49 31	11						11	
12					270 10 26	11			107.0	✓		12	105.6 (720)
13					90	5.7						13	
14												14	
15	Δ	423	2200		89 45 49	11						15	
16					270 14 22	11						16	
17					90	2.0						17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY ALASKA BOOK NO. 1 PAGE 67 OF 36  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 1 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			RIGHT TURNED HORIZONTAL ANGLE	LINE
			SLOPE	HORIZ					INST	ROD			
1		SP 424	1760		89 53 08	11						1	
2		425	1320		89 45 46	11						2	
3		offset 426			90	6.2						3	
4		offset 427			90	6.2						4	
5	⌈	428	-0-		90	5.2		108.8				5	
6		offset 428	235		90	6.2						6	
7		offset 429			90	6.2						7	
8		offset 430			90	6.2						8	
9		SP 431	1320		89 43 58	11						9	
10		SP 432	1760		89 44 35	11						10	
11	◎	SP 433	2200		89 44 40	11						11	
12					270 15 12	11			107.7			12	
13					90	1.2						13	
14												14	
15	A	SP 433	2200		89 56 06	11						15	
16					270 03 54	11						16	
17					90 00	2.6						17	

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SYMBOLS

Δ = BACKSIGHT

⌈ = INSTRUMENT SET-UP

SS = SIDESHOT

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 7 PAGE 60 OF 37  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 11816

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS				
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION		L/R OR DI	RIGHT TURNED HORIZONTAL ANGLE	LINE	
				SLOPE	HORIZ					INST					ROD
1		SP 434	1760		89 49 38	11							1		
2		435	1320		89 49 53	11							2		
3		436	880		89 48 50	11							3		
4		437	440		89 23 18	11							4		
5	Δ	438	-0-		90	5.4		116.1					5		
6		439	440		90 13 52	11							6		
7		440	880		90 68 06	11							7		
8		441	1320		90 63 50	11							8		
9		442	1760		90 02 13	11							9		
10		443	2200		90 00 07	11							10		
11	⊙	444	2640		89 57 23	11							11		
12					89 02 36	11			107.2				12		
13					90	9.2							13		
14	Δ	SP 444											14		
15			2200		90 12 03	11							15		
16					769 47 59	11							16		
17													17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Harrison Bay STATE/COUNTY ALASKA BOOK NO. 4 PAGE 69 OF 38  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 1 MO 81 YR  
 SURVEYOR M. O'BRADEY 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		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			
			SLOPE	HORIZ					INST			ROD
1		SP 445	1760		90 10 32	11					1	
2		" 446	1320		89 51 56	11					2	
3		" 447	880		89 46 00	11					3	
4		v 448	440		89 36 31	11					4	
5	Δ	v 449	-0-		90	5.2		125.8			5	
6		450	440		89 13 54	11					6	
7		451	880		89 32 56	11					7	
8		452	1320		89 47 30	11					8	
9		453	1760		89 50 20	11					9	
10		454	2200		89 52 08	11					10	
11	⊙	455	2690		89 50 09	11					11	
12					270 09 51	11			122.5		12	
13					90	3.4					13	
14											14	
15	Δ	455	1265		90	15.8					15	
16					90 12 13	11					16	
17					269 47 49	11					17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

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GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 4 PAGE 70 OF         
 LINE/LOOP NO. ZB-81 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 1 MO 81 YR  
 SURVEYOR M. D'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 DI	RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST			
1		SP 456	825		90 10 47	11						1	
2		457	385		89 26 28	11						2	
3	Δ	TP	-0-			5.3		138.0				3	
4		458	55		88 16 38	11						4	
5		459	495		90 37 13	11						5	
6		460	935		91 08 06	11						6	
7		461	1375		90 43 04	11						7	
8	◎	462	1815		90 07 02	11						8	
9					269 53 00	11		123.4				9	
10												10	
11	Δ	462	800		90 03 49	11						11	
12					269 56 16	11						12	
13		463	440		89 43 21	11						13	
14	Δ	464	-0-		90	5.4		135.3				14	
15		465	446		90 22 37	11						15	
16		466	880		90 23 04	11						16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

40

GSI AREA Harrison Bay STATE/COUNTY ALASKA BOOK NO. 4 PAGE 71 OF 71  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 1 MO 8 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

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
									SLOPE	HORIZ			
1		467	1320		90 42 51	11						1	
2		468	1760		90 30 19	11						2	
3		469	2200		90 29 08	11						3	
4					269 35 49	11			108.9			4	
5												5	
6		469	2200		90 19 40	11						6	
7					269 40 30	11						7	
8		470	1760		90 20 32	11						8	
9		471	1320		90 11 16	11						9	
10		472	880		89 50 12	11						10	
11		473	440		89 04 41	11						11	
12		474	-0-		90	5.7			132.3			12	
13		475	440		89 50 56	11						13	
14		476	880		90 13 04	11						14	
15		477	1320		90 06 26	11						15	
16		478	1760		90 00 32	11						16	
17												17	

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



# HORIZONTAL AND VERTICAL SURVEY NOTES

41

GSI AREA Harrison Bay STATE/COUNTY Alaska BOOK NO. 1 PAGE 72 OF 72  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 20 DY 7 MO 8 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 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			
1		<del>479</del>	2200		89 55 07 11							1	
2	⊙	<del>480</del>	2640		89 50 25 11							2	
3					270 09 33 11				128.8			3	
4												4	
5	Δ	SP 480	1760		89 56 20 19.8							5	
6					<del>270 03 52</del>							6	
7					270 03 45 19.8							7	
8		SP 481	1320		89 44 13 11							8	
9		482	880		89 38 43 11							9	
10		483	440		89 29 01 11							10	
11		484	-0-		90	5.3		141.7				11	
12		485	440		90 18 23 11							12	
13		486	880		91 10 03 11							13	
14		487	1320		90 55 26 11							14	
15	⊙	488	1760		90 38 22 11							15	
16		<del>489</del>			269 21 34 11				111.1			16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

42

GSI AREA Teshkukuk STATE/COUNTY ALASKA BOOK NO. 4 PAGE 73 OF         
 LINE/LOOP NO. 23-81 TYPE SURVEY Vert CLIENT USGS DATE 21 DY 1 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												1		
2	Δ	SP 488	840		90 29 14	11							2	
3					269 32 54	11							3	
4		SP 489	440		89 50 16	11							4	
5	∧	490	-0-		90	52		128.7	✓				5	
6		491	440		89 22 46	11							6	
7		492	880		89 50 43	11							7	
8		493	1320		90 00 16	11							8	
9	⊙	494	1760		90 15 57	11							9	
10					269 43 54	11					109.5		10	
11													11	
12	Δ	SP 495	2640		89 37 50	11							12	
13					210 22 09	11							13	
14		495	2200		89 49 15	11							14	
15		496	1760		89 47 05	11							15	
16		497	1320		89 49 15	11							16	
17													17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

43

GSI AREA Teshkepunk STATE/COUNTY Alaska BOOK NO. 1 PAGE 74 OF         
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 21 DY 5 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 type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			L/R OR DR	RIGHT TURNED HORIZONTAL ANGLE
									SLOPE	HORIZ			
1		498	880		90 10 15	11						1	
2		499	440		89 50 11	11						2	
3	⊥	500	-0-		90	5.3		103.4				3	
4		501	440		89 11 08	11						4	
6		502	880		89 31 28	11						5	
6		503	1320		88 40 08	11						6	
7	⊙	504	1765		88 20 58	11						7	
8					271 38 55	11			143.1			8	
9												9	
10	⊥	JP504	1320		90 28 06	11						10	
11					269 31 57	11						11	
12		JP 505	880		90 16 50	11						12	
13		506	440		89 50 51	11						13	
14	⊥	507	-0-		90	5.4		164.9				14	
15		BARR MARK			90	6.4			158.5		156.08	15	BARR MARK 8/19
16		508	440		88 50 45	11					158.5	16	Elev 156.08 ✓
17											+2.4	17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

44

GSI AREA TESHEK PUK STATE/COUNTY Alaska BOOK NO. 1 PAGE 75 OF         
 LINE/LOOP NO. 20-81 TYPE SURVEY Vert CLIENT USGS DATE 21 DAY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 WITH 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 DI	RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST			
1		SP 509	880		89 36 10	11							1
2		510	1320		89 46 01	11							2
3		511	1760		89 47 48	11							3
4		512	2200		89 45 08	11							4
5	⊙	513	2690		89 48 09	11				✓			5
6					270 11 45	11			163.1		160.7 corrected elev.		6
7													7
8	Δ	513	1760		88 09 59	11							8
9					271 49 58	11							9
10		514	1320		89 35 55	11							10
11		off 515											11
12		off 516											12
13	Δ	off 517	535		90°	3.8			117.7	✓	115.3 corrected HI		13
14		off 518											14
15		off 519											15
16		SP 520	1320		89 41 38	11							16
17													17

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# HORIZONTAL AND VERTICAL SURVEY NOTES

45

GSI AREA Teshkepak STATE/COUNTY ALASKA BOOK NO. 51 PAGE 76 OF 76  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 21 DY 7 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. F-2-WiR 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 DI	RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST			
1		SP 521	1760		89 46 31	11							1
2		522	2200		89 48 01	11							2
3	⊙	SP 523	2610		89 49 48	11							3
4					270 10 04	11			14.6		112.3 <i>corrected elev</i>		4
5													5
6	Δ	SP 523	1760		89 59 42	11							6
7					270 00 22	11							7
8		SP 524	1320		89 44 37	11							8
9		" 525	880		89 32 12	11							9
10		" 526	480		88 55 12	11							10
11		" 527	0 -		90	5.4		125 A			123.0 HI		11
12		528	440		89 48 30	11							12
13		529	880		90 21 32	11							13
14		530	1820		90 22 22	11							14
15		531	1760		90 13 05	11							15
16		532	2200		90 12 48	11							16
17													17

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# HORIZONTAL AND VERTICAL SURVEY NOTES

46

GSI AREA TeshkepuK STATE/COUNTY ALASKA BOOK NO. 4 PAGE 77 OF         
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 21 BY 1 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		LINE	REMARKS		
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION				L/R OR D/I	RIGHT TURNED HORIZONTAL ANGLE
			SLOPE	HORIZ					INST	ROD				
1	○	SP 533	2640		89.50 02 //						✓		1	
2					270 10 08 //				122.3			119.9 Corrected	2	
3													3	
4													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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# HORIZONTAL AND VERTICAL SURVEY NOTES

47

GSI AREA Teshkeguk STATE/COUNTY Alaska BOOK NO. 21 PAGE 78 OF         
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE        DY        MO        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 DJ	RIGHT TURNED HORIZONTAL ANGLE
			SLOPE	HORIZ					INST	ROD			
1	Δ	SP 533	1320		90 41 42 11							1	
2					269 18 03 11							2	
3		534	880		90 42 25 11							3	
4		535	440		89 50 17 11							4	
5		536	- 0 -		90	5A			146.9 corrected			5	
6	⊙	BARR MARK	60'		90	5.7			141.2			6	
7												7	
8		<del>537</del>	<del>440</del>		<del>89 24 12 11</del>							8	
9		<del>538</del>	<del>880</del>		<del>89 50 01 11</del>							9	
10					90 00 02 11							10	
11												11	
12	Δ	BARR MARK	60'		90	5.65						12	
13												13	
14	Δ	JP 536	- 0 -		90	5A			146.2			14	
15		537	440		89 27 21 11							15	
16		538	880		89 50 35 11							16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

48

GSI AREA Teshkeokuk STATE/COUNTY ALASKA BOOK NO. 1 PAGE 49 OF       
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 22 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 W. R. 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 DI	RIGHT TURNED HORIZONTAL ANGLE
									SLOPE	HORIZ			
1	⊙	SP 539	1320		90 00 21	11						1	
2					269 59 44	11			135.1			2	
3												3	
4	Δ	SP 539	1760		89 36 39	11						4	
5					270 23 21	11						5	
6		540	1320		90 46 42	11						6	
7		541	880		89 41 15	11						7	
8		542	440		91 53 29	11						8	
9	Δ	543	0		90	5.5			134.1			9	
10		544	410		88 49 23	11						10	
11		545	880		88 57 06	11						11	
12		546	1320		08 54 11	11						12	
13		547	1760		88 58 00	11						13	
14	⊙	548	2200		89 04 32	11			158.6			14	
15					270 55 14	11						15	
16												16	
17												17	

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



# HORIZONTAL AND VERTICAL SURVEY NOTES

49

GSI AREA Teshokpuk STATE/COUNTY Alaska BOOK NO. 4 PAGE 80 OF       
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 22 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	<input type="checkbox"/> A <input type="checkbox"/> SS <input type="checkbox"/> O	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	A	SP 548	1320		89 23 43	11						1		
2					290 36 17	11						2		
3		549	880		89 13 06	11						3		
4		550	440		88 36 00	11						4		
5	A	551	-0-		90	5.9		155.6				5		
6		552	440		93 10 12	11						6		
7		553	880		91 47 49	11						7		
8		554	1320		91 15 55	11						8		
9		555	1760		90 56 32	11						9		
10	O	SP 556	2200		90 47 15	11						10		
11					269 12 41	11			114.5			11		
12												12		
13	A	SP 556	2640		90 44 08	11						13		
14					269 10 51	11						14		
15		557	2200		90 47 30	11						15		
16		558	1760		91 00 30	11						16		
17												17		

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

50

GSI AREA Teshkeokuk STATE/COUNTY ALASKA BOOK NO. 21 PAGE 81 OF       
 LINE/LOOP NO. ZB-81 TYPE SURVEY VERT CLIENT 4565 DATE 22 DY 1 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						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		559	1320		90 14 49	11						1		
2		560	880		91 43 30	11						2		
3		561	440		92 33 00	11						3		
4	⊙	562	-0-		90	5.3		159.2				4		
5		563	440		87 52 33	11						5		
6		564	880		88 23 23	11						6		
7		565	1320		88 29 55	11						7		
8		566	1760		88 33 53	11						8		
9	⊙	567	2200		88 47 31	11		192.7				9		
10					271 12 24	11						10		
11												11		
12	Δ	567	2640		89 25 19	11						12		
13					270 34 37	11						13		
14		568	2200		89 35 46	11						14		
15		569	1760		89 43 37	11						15		
16		570	1320		89 41 23	11						16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

51

GSI AREA Teshkepuk STATE/COUNTY Alaska BOOK NO. 21 PAGE 81 OF 81  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 22 DY 1 MO 81 YR  
 SURVEYOR M. O'Grady INSTRUMENT DESC/SERIAL NO. T-2 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 DI	RIGHT TURNED HORIZONTAL ANGLE	LINE
									SLOPE	HORIZ				
1		571	880		89 32 58	11						1		
2		572	440		89 16 00	11						2		
3	<input checked="" type="checkbox"/>	573	-0-		90	5.3		178.9				3		
4		574	440		89 43 29	11						4		
5		575	880		89 46 36	11						5		
6		576	1320		89 44 31	11						6		
7		577	1760		89 39 02	11						7		
8		578	2100		89 33 50	11						8		
9	<input checked="" type="checkbox"/>	579	2640		89 32 58	11		188.8				9		
10					290 27 00	11						10		
11												11		
12												12		
13	<input checked="" type="checkbox"/>	579	1760		290 16 21	11						13		
14					89 43 44	11						14		
15		580	1320		89 27 31	11						15		
16		581	880		89 09 36	11						16		
17												17		

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SS = SIDESHOT

⊙ = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

52

GSI AREA Teshkepak STATE/COUNTY Alaska BOOK NO. 21 PAGE 03 OF       
 LINE/LOOP NO. 28-31 TYPE SURVEY Vert CLIENT USGS DATE 22 BY 1 MO 01 YR  
 SURVEYOR M. O'GARDY INSTRUMENT DESC/SERIAL NO. T-2 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 DI	RIGHT TURNED HORIZONTAL ANGLE	LINE
									SLOPE	HORIZ				
1		SP582	440		88 45 29	11						1.		
2	Δ	583	-0-		90	5.2		191.4				2		
3		584	440		89 50 49	11						3		
4		585	880		90 11 52	11						4		
5		586	1320		90 13 54	11						5		
6		587	1760		90 12 32	11						6		
7		588	2200		90 09 28	11						7		
8	○	589	2640		90 09 05	11			173.6			8		
9					269 50 59	11						9		
10												10		
11	Δ	589	1760		89 00 02	11						11		
12					271 00 12	11						12		
13		590	1300		88 44 22	11						13		
14		591	880		88 28 16	11						14		
15		592	440		87 57 35	11						15		
16	Δ	593	-0-		90	5.3		153.8				16		
17												17		

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SYMBOLS

Δ = BACKSIGHT

Δ = INSTRUMENT SET-UP

SS = SIDESHOT

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# HORIZONTAL AND VERTICAL SURVEY NOTES

53

GSI AREA Teshkepuuk STATE/COUNTY Alaska BOOK NO. 21 PAGE 84 OF       
 LINE/LOOP NO. 28-21 TYPE SURVEY Vert CLIENT USGS DATE 22 DY 1 MO 31 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 CREW NO. 1136

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
									SLOPE	HORIZ			
1		594	440		90 40 42	11						1	
2		595	880		90 34 18	11						2	
3		596	1320		90 30 03	11						3	
4		597	1760		90 15 51	11						4	
5		598	2200		90 03 24	11						5	
6		599	2640		89 59 44	11						6	
7	⊙	600	3080		89 59 32	11						7	
8					270 00 30	11			143.4			8	
9												9	
10	Δ	SP600	2640		90 07 21	11						10	
11					269 52 38	11						11	
12		601	2200		90 06 24	11						12	
13		602	1760		90 05 17	11						13	
14		603	1320		89 57 51	11						14	
15		604	880		89 45 20	11						15	
16		605	440		89 22 40	11						16	
17												17	

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Teshkeput STATE/COUNTY Alaska BOOK NO. 7 PAGE 25 OF 54  
 LINE/LOOP NO. 28-B1 TYPE SURVEY Vert CLIENT USGS DATE 22 DY 1 MO 31 YR  
 SURVEYOR M. O'BRADY INSTRUMENT DESC/SERIAL NO. T-2 CREW NO. 1186

LINE	<input type="checkbox"/> $\Delta$ <input type="checkbox"/> SS <input type="checkbox"/> $\odot$	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	<input type="checkbox"/> FEET <input type="checkbox"/> METERS HORIZ					INST	ROD			
1	$\Delta$	SP 606	-0-		90	52			162.9 160.6			1	
2		607	440		91 13 56	11						2	
3		608	880		91 40 33	11						3	
4		609	1320		91 09 28	11						4	
5		610	1760		90 51 45	11						5	
6	$\odot$	611	2200		90 41 41	11						6	
7					269 18 23	11				123.7		7	
8												8	
9	$\Delta$	SP 611	2200		90 46 22	11						9	
10					269 13 39	11						10	
11		612	1760		90 57 39	11						11	
12		613	1320		90 48 51	22						12	
13		614	880		90 24 00	11						13	
14		615	440		90 23 54	11						14	
15		616	-6-		90	52			162.9 163.6			15	
16		617	440		89 04 04	11						16	
17												17	

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SYMBOLS  $\Delta$  = BACKSIGHT  $\nabla$  = INSTRUMENT SET-UP SS = SIDESHOT  $\odot$  = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

55

GSI AREA Keshkepuk STATE/COUNTY ALASKA BOOK NO. 21 PAGE 86 OF 86  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 22 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
				SLOPE	HORIZ										
1		618	880		89 36 08	11						1			
2		619	1320		89 33 51	11						2			
3		620	1760		89 41 36	11						3			
4	⊙	621	2200		89 45 00	11						4			
5					270 11 58	11				181.63		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    Δ = BACKSIGHT    ⊕ = INSTRUMENT SET-UP    ⊙ = SIDESHOT    ⊙ = FORESIGHT

# HORIZONTAL AND VERTICAL SURVEY NOTES

56

GSI AREA Teshkepunk STATE/COUNTY ALASKA BOOK NO. 1 PAGE 87 OF       
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 23 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 CREW NO. 2186

LINE	 SS 	STATION	VERTICAL					ELEVATION		L/R OR DI	HORIZONTAL		REMARKS	
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST		ROD	RIGHT TURNED HORIZONTAL ANGLE		LINE
				SLOPE										
1	B	SP 621	2640		89 35.0	11						1		
2					276 50.2	11						2		
3		SP 622	2200		89 40.3	11						3		
4		" 623	1760		89 36.3	11						4		
5		" 624	1320		89 19.3	11						5		
6		" 625	880		89 12.13	11						6		
7		" 626	440		89 56.06	11						7		
8	A	" 627	-0-		90	5.4		153.3				8		
9		" 628	440		90 28.08	11						9		
10		" 629	880		90 21.54	11						10		
11		" 630	1320		90 33.05	11						11		
12		" 631	1760		90 43.68	11						12		
13		" 632	2200		90 41.19	11						13		
14	(V)	" 633	2640		90 37.07	11						14		
15					269 22.55	11		113.9				15		
16												16		
17												17		

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SYMBOLS = BACKSIGHT   
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# HORIZONTAL AND VERTICAL SURVEY NOTES

57

GSI AREA Teshkeguk STATE/COUNTY Alaska BOOK NO. 721 PAGE 88 OF       
 LINE/LOOP NO. ZB-81 TYPE SURVEY vert CLIENT USGS DATE 23 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 W:V 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			RIGHT TURNED HORIZONTAL ANGLE	LINE
				SLOPE					HORIZ	INST			
1	Δ	633	1320		91 35 19	11					1		
2					268 21 49	11					2		
3		634	880		92 06 33	11					3		
4		635	440		91 48 36	11					4		
5	Δ	630	-0-	90°	<del>88 30 50</del>	115.3		161.5			5		
6		631	440		88 30 50	11					6		
7		638	980		88 55 03	11					7		
8	⊙	639	1320		89 21 12	11					8		
9					270 38 56	11		165.4			9		
10											10		
11	Δ	639	1760		89 55 16	11					11		
12					270 04 50	11					12		
13		640	1320		89 53 02	11					13		
14		641	880		89 44 56	11					14		
15		642	440		89 25 02	11					15		
16		643	-0-		90	5.3		161.7			16		
17								173.9			17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

58

GSI AREA Teshkevik STATE/COUNTY Alaska BOOK NO. 21 PAGE 89 OF       
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 23 DY 1 MO 81 YR  
 SURVEYOR M.O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

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			RIGHT TURNED HORIZONTAL ANGLE	LINE
									HORIZ	INST			
1		SP 644	440		89 54 59	11						1	
2		645	880		90 06 41	11						2	
3		646	1320		90 05 00	11						3	
4		647	1760		90 05 11	11						4	
5		648	2200		90 05 08	11						5	
6		649	2640		90 00 59	11						6	
7					269 59 04	11		-11.6		149.9		7	
8										162.3		8	
9	A	SP 649	1760		89 23 56	11						9	
10					270 36 10	11		-7.6				10	
11		650	1320		89 17 01	11						11	
12		651	880		89 45 06	11						12	
13		652	440		88 53 45	11						13	
14		653	RD-		90	5.3				142.3		14	
15		654	440		89 56 12	11						15	
16		655	880		89 51 31	11						16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

59

GSI AREA Teshokpok STATE/COUNTY Alaska BOOK NO. 21 PAGE 40 OF       
 LINE/LOOP NO. 28-31 TYPE SURVEY Vert CLIENT USGS DATE 23 BY 1 MO 31 YR       
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

END DATA #1

LINE	  	STATION	VERTICAL						ELEVATION		L/R OR DI	HORIZONTAL		REMARKS
			DISTANCE		VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	INST	ROD		RIGHT TURNED HORIZONTAL ANGLE	LINE	
			SLOPE	HORIZ										
1		SP 656	1320		89 17 05	11							1	
2		657	1760		89 11 13	11							2	
3		658	2200		89 15 08	11							3	
4					270 44 44	11	+17.8		160.7				4	
5									172.5				5	
6		SP 658	2200		89 32 45	11							6	
7					270 27 24	11	-6.6						7	
8		659	1760		89 26 49	11							8	
9		660	1320		89 33 54	11							9	
10		661	880		89 21 44	11							10	
11		662	440		88 49 04	11							11	
12		663	0		90	52			163.5	16.9			12	
13		664	440		89 12 19	11							13	
14		665	880		89 43 08	11							14	
15		666	1320		89 51 57	11							15	
16		667	1760		89 59 58	11							16	
17													17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

60

GSI AREA Tshhekpuuk STATE/COUNTY Alaska BOOK NO. 21 PAGE 91 OF 91  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 23 BY 1 MO 81 YR  
 SURVEYOR M. O'G RAY 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		RIGHT TURNED HORIZONTAL ANGLE		LINE
				SLOPE					HORIZ	INST			
1	⊙	SP 668	2250		90 11 29	11						1	
2					269 48 40	11		-18.2		138.3		2	
3										147.8		3	
4	A	SP 668	2200		271 10 25	11						4	
5					88 49 33	11		-34.2				5	
6		669	1760		89 20 31	11						6	
7		670	1320		89 52 49	11						7	
8		671	880		89 47 28	11						8	
9		672	440		89 38 47	11						9	
10	⊙	673	-0-		90	5.2			101.3	-113.6		10	
11		674	440		89 55 27	11						11	
12		675	880		89 44 15	11						12	
13		676	1320		89 48 46	11						13	
14		677	1760		89 50 27	11						14	
15	⊙	678	2200		89 50 26	11						15	
16					270 09 43	11		-4.7		-96.6		16	
17										108.9		17	

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SYMBOLS

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# HORIZONTAL AND VERTICAL SURVEY NOTES

61

GSI AREA Teshikpuik STATE/COUNTY ALASKA BOOK NO. 4 PAGE 92 OF 92  
 LINE/LOOP NO. 28-01 TYPE SURVEY Vert CLIENT USGS DATE 21 BY 1 MO 87 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 with CREW NO. 1186

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			RIGHT TURNED HORIZONTAL ANGLE
				SLOPE					HORIZ	INST		
1		SP 678	1760		90 54 44	11						1
2					269 06 23	11	+38.9					2
3		679	1370		91 01 22	11						3
4		680	880		91 01 33	11						4
5		681	440		96 22 50	11						5
6		682	-0-		90	5.3		+35.8	147.8			6
7		683	440		88 45 45	11						7
8		684	880		89 09 40	11						8
9		685	1320		88 54 32	11						9
10					291 05 23	11			+19.7			10
11									162.0			11
12												12
13												13
14		SP 685	2640		270 18 38	11						14
15					89 41 29	11	-3.4					15
16		686	2200		89 48 59	11						16
17												17

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# HORIZONTAL AND VERTICAL SURVEY NOTES

62

GSI AREA Teshkeokuk STATE/COUNTY Alaska BOOK NO. 21 PAGE 93 OF       
 LINE/LOOP NO. 28-21 TYPE SURVEY Vert CLIENT USGS DATE 24 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

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
							INST	ROD						
1		SP 687	1760		89 38 08	11							1	
2		688	1320		89 29 10	11							2	
3		689	880		89 36 39	11							3	
4		690	440		89 13 17	11							4	
5	X	691	0		90	5.2			+46.6	158.6			5	
6		692	440		89 32 19	11							6	
7		693	880		89 39 45	11							7	
8		694	1320		89 53 05	11							8	
9		695	1760		89 43 50	11							9	
10		696	2200		89 45 20	11							10	
11	0	697	2200		89 49 30	11							11	
12					270 10 32	11		-2.8		143.8			12	
13										155.8			13	
14	Δ	697	2640		89 01 51	11							14	
15					270 58 19	11							15	
16					270 58 16	11		-33.8					16	
17													17	

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**SYMBOLS**     
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# HORIZONTAL AND VERTICAL SURVEY NOTES

63

GSI AREA Teshkepuuk STATE/COUNTY Alaska BOOK NO. 1 PAGE 9A OF 9A  
 LINE/LOOP NO. 28-B1 TYPE SURVEY Vert CLIENT USGS DATE 29 DY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1136

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ⊙	STATION	VERTICAL						HORIZONTAL		REMARKS		
			DISTANCE	<input type="checkbox"/> FEET <input type="checkbox"/> METERS	VERTICAL ANGLE OBS.	ROD RDG OR HI	ELEV DIFF	FINAL ELEVATION DIFF	ELEVATION			RIGHT TURNED HORIZONTAL ANGLE	
			SLOPE 	HORIZ 				INST	ROD	LINE			
1		SP 698	2200		89 03 58	11						1	
2		699	1760		88 53 41	11						2	
3		700	1320		88 56 16	11						3	
4		701	880		89 43 19	11						4	
5		702	440		89 22 59	11						5	
6	Δ	703	-0-		90	5.0			40.0	132.0		6	
7		704	440		89 39 24	11						7	
8		705	880		89 36 07	11						8	
9		706	1320		89 50 18	11						9	
10		707	1760		89 56 28	11						10	
11	⊙	708	2200		89 52 33	11						11	
12					290 07 33	11		-6.1		403.9		12	
13										115.9		13	
14	Δ	SP 708	1760		90 45 57	11						14	
15					269 11 18	11		+34.4				15	
16		709	1320		96 54 33	11						16	
17												17	

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# HORIZONTAL AND VERTICAL SURVEY NOTES

64

GSI AREA Teshkepuik STATE/COUNTY Alaska BOOK NO. 2 PAGE 95 OF       
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 24 BY 1 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 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			ROD
1		710	880		90 36 53	11						1	
2		711	440		90 03 09	11						2	
3		712	- 0 -		90	34			138.3	150.3		3	
4		713	440		89 35 52	11						4	
5		714	880		89 53 38	11						5	
6		715	1320		90 11 23	11						6	
7		716	1760		90 18 51	11						7	
8		717	2200		90 14 43	11	-20.3			118.0		8	
9					269 45 15	11				130.0		9	
10												10	
11		SP 717	- 0 -		90	55	+5.5					11	
12			- 0 -		90	55			123.5	136.5		12	
13		Barr Mark	Telecomdel	3477.23	89 56 21	6.1						13	
14					270 03 51	6						14	
15					270 03 56							15	
16					270 03 52	6.1	-2.0			121.4		16	Barr Mark 81415 Elev 137.2
17										133.4		17	137.2-133.4=3.8

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



# HORIZONTAL AND VERTICAL SURVEY NOTES

65

GSI AREA Teshkepuuk STATE/COUNTY Alaska BOOK NO. d PAGE 96 OF       
 LINE/LOOP NO. ZB-81 TYPE SURVEY Vert CLIENT USGS DATE 24 DY 1 MO 81 YR  
 SURVEYOR M O'LEARY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

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		Rarr Mark	3477.23		89 56 21	6.1						1	81415	
2					270 03 52	6.1						2	ELEV.	
3												3		
4		SP 717	-0-		90	55		139.2	133.7			4		
5		SP 718	410		89 38 46	11						5		
6		719	880		89 36 02	11						6		
7		720	1320		89 26 00	11						7		
8		721	1760		89 28 28	11						8		
9		722	2200		89 33 41	11						9		
10		723	2640		89 39 37	11						10		
11					270 20 22	11	+4.8		144.0			11		
12												12		
13		SP 723	2200		89 21 <sup>32</sup> <del>34</del>	11						13		
14					270 35 40	11	-11.9					14		
15		724	1760		89 15 27	11						15		
16		725	1320		89 08 57	11						16		
17												17		

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SYMBOLS = BACKSIGHT   
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 = SIDESHOT   
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# HORIZONTAL AND VERTICAL SURVEY NOTES

66

GSI AREA Teshkeokuk STATE/COUNTY ALASKA BOOK NO. 4 PAGE 91 OF       
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 29 BY 1 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 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
				SLOPE					HORIZ	INST		
1		SP 726	880		89 38 24	11					1	
2		" 727	440		89 27 25	11					2	
3		" 728	0		90	5.3		132.2			3	
4		" 729	440		89 24 29	11					4	
5		" 730	880		89 31 57	11					5	
6		" 731	1320		89 39 26	11					6	
7		" 732	1760		89 36 40	11					7	
8		" 733	2200		89 27 17	11					8	
9		" 734	2610		88 36 26	11	753.3	185.5			9	
10					271 23 31	11					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

67

GSI AREA Toshokpuk STATE/COUNTY ALASKA BOOK NO. 1A PAGE 98 OF       
 LINE/LOOP NO. 728-81 TYPE SURVEY Vert CLIENT USGS DATE 25 BY 1 MO 81 YR  
 SURVEYOR M.O'LEARY INSTRUMENT DESC/SERIAL NO. T-2 Wild CREW NO. 1186

LINE	  	STATION	VERTICAL					ELEVATION		L/R OR D/I	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		SP 734	2200		89 47 16	11						1		
2					270 12 43	11	+2.8					2		
3		735	1760		89 50 23	11						3		
4		736	1320		90 06 43	11						4		
5		737	880		90 21 53	11						5		
6		738	440		90 35 31	11						6		
7		739	- 0 -		90	5.2		188.2				7		
8		740	440		89 18 39	11						8		
9		741	880		89 54 02	11						9		
10		742	1320		90 12 09	11						10		
11					268 47 49	11	-15.6		172.6			11		
12												12		
13		SP 742	1760		89 01 56	11						13		
14					270 53 06	11	-18.8					14		
15		743	1320		89 21 13	11						15		
16		744	880		89 18 36	11						16		
17												17		

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

# HORIZONTAL AND VERTICAL SURVEY NOTES

68

GSI AREA Teshkekpuk STATE/COUNTY Alaska BOOK NO. 4 PAGE 99 OF       
 LINE/LOOP NO. 28-B1 TYPE SURVEY Vert CLIENT USGS DATE 25 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 wild CREW NO. 1186

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
										INST				
1		SP 745	440		88 58 49	11						1		
2		746	0		90	5.3		153.8				2		
3		747	440		89 48 35	11						3		
4		748	880		90 05 31	11						4		
5		749	1320		90 05 04	11						5		
6					269 54 57	11	-12.9	140.9				6		
7												7		
8		SP 749	1760		90 13 11	11						8		
9		SP 750			269 46 56	11						9		
10		750	1320		90 08 06	11						10		
11		751	880		90 08 27	11						11		
12		752	440		89 38 58	11						12		
13		753	0		90	5.2		158.6				13		
14		754	440		89 33 47	11						14		
15		755-754	440		89 34 16	11						15		
16					270 25 43	11		150.9				16		
17												17		

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# HORIZONTAL AND VERTICAL SURVEY NOTES

69

GSI AREA Teshkepuuk STATE/COUNTY ALASKA BOOK NO. 1 PAGE 100 OF 100  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 25 BY 1 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
				SLOPE					HORIZ	INST		
1		A SP 454	1320		88 58 06	11						
2					271 01 56	11						
3		755	880		88 41 24	11		147.1				
4		756	440		88 01 06	11		142.2				
5		759	-0-		90	5,2		138.0	132.8		EOL	
6		TS 758	440		89 44 58	11			128.9			
7		TS 759	880		89 56 17	11			128.2			
8		TS 760	1320		89 57 24	11			128.0			
9		TS 761	1760		89 57 40	11			128.3			
10		TS 762	2200		89 58 42	11			127.9			
11		TS 763	2640		89 59 03	11			127.9			
12		TS 764	3080		89 58 34	11			128.5			
13		TS 765	3520		89 56 08	11			131.2			
14		TS 766	3960		89 40 08	11						
15		<del>TS 767</del>			270 19 56	11			150.2			
16												
17												

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# HORIZONTAL AND VERTICAL SURVEY NOTES

GSI AREA Teshkepuuk STATE/COUNTY Alaska BOOK NO. 1 PAGE 101 OF 70  
 LINE/LOOP NO. 28-81 TYPE SURVEY Vert CLIENT USGS DATE 25 BY 1 MO 81 YR  
 SURVEYOR M. O'GRADY INSTRUMENT DESC/SERIAL NO. T-2 CREW NO. 1186

LINE	<input type="checkbox"/> Δ <input type="checkbox"/> SS <input type="checkbox"/> ◎	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	Δ	T5766	-0-		90	5.3						1		
2	Δ	T5766	-0-		90	5.3						2		
3		T3767	440		93 42 41	11.1			111.1			3		
4		T5768	890		91 17 22	11			129.8			4		
5		T5769	1320		91 03 19	11			120.3			5		
6												6		
7												7		
8												8		
9												9		
10												10		
11												11		
12												12		
13												13		
14												14		
15												15		
16												16		
17												17		

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

**SYMBOLS**

Δ = BACKSIGHT

⊕ = INSTRUMENT SET-UP

SS = SIDESHOT

◎ = FORESIGHT