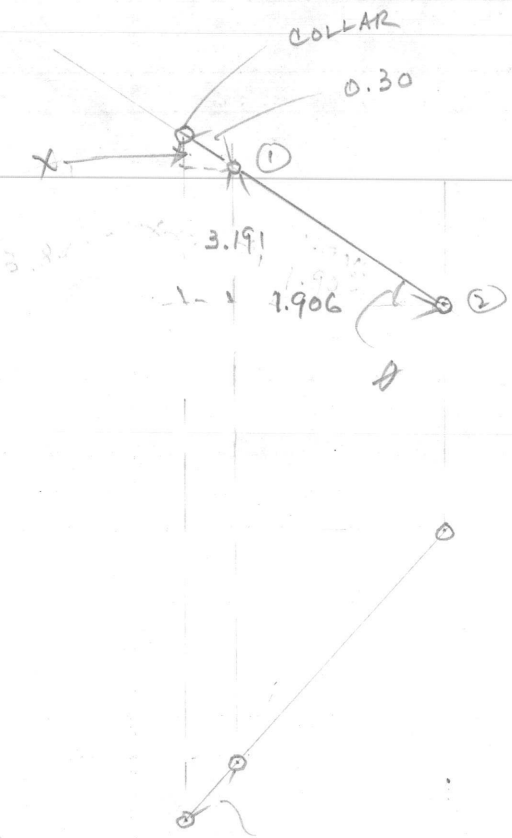


B.S.	75-048	75-048	75-048	75-048	75-041		
S.T.A.	Lp37	Lp37	Lp37	Lp37	TP1	U12	
F.S.	DDH-U-2 <sup>COLLAR</sup> ①	DDH-U2 ②	DDH-U1 <sup>COLLAR</sup> ①	DDH-U1 ②	COLLAR U12	U13	
MEAS. DISTANCE	10.50	8.52	10.20	8.78			
VERT. ANGLE	+03-50-40	+03-55-00	+03-29-00	+03-22-40			
SINE - V.A.	.06705	.06831	.06076	.05892			
COSINE - V.A.	.99775	.99766	.99815	.99826			
STA. ELEVATION	1156.232	1156.232	1156.232	1156.232			
H.I.	-2.280	-2.280	-2.280	-2.280			
INST. HEIGHT							
DISTANCE	+0.704	+0.582	+0.620	+0.517			
DIFF.							
H.P.	0	0	0	0			
F.S. ELEVATION	1154.656	1154.534	1154.572	1154.469	1152.910	1152.910	
AZ. B.S. TO STA.	70-32-29						
±180 - 00' - 00"	180						
AZ. STA. TO B.S.	250-32-29	250-32-29	1250-32-29	250-32-29			
HORZ. ANGLE	173-22-00	175-08-20	180-01-20	171-52-00			
-360 - 00' - 00"	423-54-29	425-40-49	430-33-49	422-24-29			
AZ. STA. TO F.S.							
BEARING	N 63-54-29 E	N 65-40-49 E	N 70-33-49 E	N 62-24-29 E	S 43-47-59 W	N 43-47-59 E	
HORZ. DISTANCE	10.476	8.500	10.181	8.765	0.323	0.600	
COSINE BEARING							
STA. LAT.	10 775.122				10 686.141	10 685.908	
DIFF.	+4.607	+3.500	+3.388	+4.060	+0.233	+0.433	
F.S. LAT.	10 779.729 N	10 778.622 N	10 778.510 N	10 779.182 N	10 685.908 N	10 686.341 N	N
SINE BEARING							
STA. DEP.	76 82.127				7 600.722	7 600.498	
DIFF.	+9.408	+7.746	+9.601	+7.768	+0.224	+0.415	
F.S. DEP.	76 91.535 E	76 89.873 E	76 91.728 E	76 89.895 E	7 600.498 E	7 600.913 E	E
GRADE CALC.							
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	ROA	ROA	ROA	ROA			
CHECKED BY:	ws	ws	ws	ws			
DATE	12/7/75	12/7/75	12/7/75	12/7/75			
FIELD PAGE NO.	399	399	399	399			

B.S.	75-048	75-048	75-050	75-050	75-044	75-044	75-043			
S.T.A.	75-050	75-050	75-048	75-048	75-043	75-043	75-044			
F.S.	COLLAR U-11 ①	U-11 ②	U10 ①	COLLAR U10 ②	COLLAR U18 ①	U18-②	U4 ① COLLAR +1.44			
MEAS. DISTANCE	4.92	3.93	9.85	10.36	6.44	5.55	9.79			
VERT. ANGLE	-13-00-00	+04-48-20	+02-15-20	+11-42-00	+20-29-20	+03-23-40	+05-25-00			
SINE - V.A.	.22495	.08377	.03936	.20279	.35003	.05921	.09440			
COSINE - V.A.	.97437	.99648	.99923	.97922	.93674	.99825	.99553			
STA. ELEVATION	1157.251	1157.251	1156.624	1156.624	1155.865	1155.865	1155.943			
H.I.	-2.420	-2.420	-2.780	-2.780	-2.250	-2.250	-2.700			
INST. HEIGHT	1154.831	1154.831	1153.844	1153.844	1153.615	1153.615	1153.243			
DISTANCE	-1.107	+0.329	+0.388	+2.101	+2.254	+0.329	+0.924			
DIFF.	1153.724	1155.160	1154.232	1155.945	1155.869	1153.944	1154.167			
H.P.	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00			
F.S. ELEVATION	COLLAR 1153.724 ✓	1155.160	1154.232 ✓	COLLAR 1155.945 ✓	COLLAR 1155.869 ✓	1153.944 ✓	1154.167 ✓			
AZ. B.S. TO STA.	60-40-19			COLLAR 1158.407	43-59-09		223-59-09			
±180 -00' -00"	180				180		180-			
AZ. STA. TO B.S.	240-40-19	240-40-19	60-40-19	60-40-19	223-59-09	223-59-09	43-59-09			
HORZ. ANGLE	194-16-00	212-30-20	156-58-40	157-28-20	00-04-00	00-34-00	160-50-00			
-360 -00' -00"	434-56-19	453-10-39	217-38-59	218-08-39	224-03-09	224-33-09	204-49-09			
AZ. STA. TO F.S.	74-56-19	93-10-39								
BEARING	N 74-56-19 E	S 86-49-21 E	S 37-38-59 W	S 38-08-39 W	S 44-03-09 W	S 44-33-09 W	S 24-49-09 W			
HORZ. DISTANCE	4.794	3.916	9.842	10.145	6.033	5.540	9.746			
COSINE BEARING										
STA. LAT.	10 780.219		10 773.816		10 751.051		10 729.259			
DIFF.	+1.246	-0.217	-7.792	-7.979	-4.336	-3.948	-8.845			
F.S. LAT.	10 781.465 N	10 780.002 N	10 766.024 N	10 765.837 N	10 746.715 N	10 747.103 N	10 720.414 N			
SINE BEARING										
STA. DEP.	7 689.829		7 678.432		7 656.977		7 635.943			
DIFF.	+4.629	+3.910	-6.012	-6.266	-4.195	-3.887	-4.091			
F.S. DEP.	7 694.458 E	7 693.739 E	7 672.420 E	7 672.166 E	7 652.782 E	7 653.090 E	7 631.852 E			
GRADE CALC.										
F.S. GRADE ELV.										
GRADE CHAIN										
OFFSETS	LEFT	RIGHT	PLUS	MINUS	L.	R.	P.	M.	L.	R.
CALCULATED BY:		ROA		ROA		ROA		ROA		ROA
CHECKED BY:		WS		WS		WS		WS		WS
DATE		7 JAN 76		"		"		"		7 JAN 76
FIELD PAGE NO.		412		412		412		412		412

B.S.	75-043	75-043	75-043	75-043	75-043	75-043		
S.T.A.	75-044	75-044	75-044	75-044	75-044	75-044		
F.S.	44 ②	46 ①	Collar 46 ②	Collar 43 ①	43 ②	Collar 45		
MEAS. DISTANCE	9.51	10.30	+681 10.26	+1.061 12.73	11.31	9.68		
VERT. ANGLE	+00-26-00	+02-20-30	+09-24-00	+04-35-40	-00-19-20	-09-39-20		
SINE - V.A.	.00756	.04086	.16333	.08010	.00562	.16772		
COSINE - V.A.	.99997	.99916	.98657	.99679	.99998	.98583		
STA. ELEVATION	1155.943	1155.943	1155.943	1155.943	1155.943	1155.943		
H.I.	-2.700	-2.700	-2.700	-2.700	-2.700	2.700		
INST. HEIGHT	1153.243	1153.243	1153.243	1153.243	1153.243	1153.243		
DISTANCE	+0.072	+0.421	+1.676	+1.020	-0.064	-1.624		
DIFF.	1153.315	1153.664	1154.919	1154.263	1153.179	1151.619		
H.P.	+0.00	+0.00	+0.00	+0.00	+0.00	+0.00		
F.S. ELEVATION	1153.315 ✓	1153.664 ✓	1154.919 ✓	1154.263 ✓	1153.179 ✓	Collar 1151.619 ✓		
AZ. B.S. TO STA. ±180 -00' -00"	223-59-09 180		Collar 1155.600	Collar 1155.324				
AZ. STA. TO B.S.	43-59-09	43-59-09	43-59-09	43-59-09	43-59-09	43-59-09		
HORZ. ANGLE -360 -00' -00"	159-58-40 203-57-49	157-44-20 201-43-29	157-19-30 201-18-39	165-19-20 209-18-29	163-20-20 207-19-29	158-37-40 202-36-49		
AZ. STA. TO F.S.								
BEARING	S 23-57-49 W	S 21-43-29 W	S 21-18-39 W	S 29-18-29 W	S 27-19-29 W	S 22-36-49 W		
HORZ. DISTANCE	9.510	10.291	10.122	12.689	11.310	9.543		
COSINE BEARING								
STA. LAT.	10 729.259							
DIFF.	-8.690	-9.560	-9.430	-11.065	-10.048	-8.809		
F.S. LAT.	10 720.569 N	10 719.699 N	10 719.829 N	10 718.194 N	10 719.211 N	10 720.450 N		N
SINE BEARING								
STA. DEP.	7 635.943							
DIFF.	-3.863	-3.809	-3.679	-6.211	-5.192	-3.669		
F.S. DEP.	7 632.080 E	7 632.134 E	7 632.264 E	7 629.732 E	7 630.751 E	7 632.274 E		E
GRADE CALC.								
F.S. GRADE ELV.								
GRADE CHAIN								
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.	
CALCULATED BY:	ROA	ROA	ROA	ROA	ROA	ROA	ROA	
CHECKED BY:	WS	WS	WS	WS	WS	WS	WS	
DATE	7 JAN 76						7 JAN 76	
FIELD PAGE NO.	412	412	412	413	413	413	413	

B.S.	75-045	75-045	75-027	75-028	75-028	75-028				
S.T.A.	75-041	75-041	75-028	TPX	TPX	TPX				
F.S.	① U-14 to COL	② U-14	TPX	REF.1	REF.2	COLLAR U15				
MEAS. DISTANCE	14.9	13.3	-							
VERT. ANGLE	+ 5-34-00	- 7-32-40	-							
SINE - V.A.	.09700	.13130								
COSINE - V.A.	.99528	.99134								
STA. ELEVATION	1158.725	1158.725								
H.I.	- 2.720	- 2.720								
INST. HEIGHT	1156.005	1156.005								
DISTANCE	+ 1.445	- 1.746								
DIFF.	1157.450	1154.259								
H.P.	0	0								
F.S. ELEVATION	1157.450	1154.259				BY LEVEL	1166.185 ✓			
AZ. B.S. TO STA.			122-25-50	305-28-26						
±180 - 00' - 00"			180 -	180						
AZ. STA. TO B.S.	110-01-39	110-01-39	302-25-50	125-28-26	125-28-26	125-28-26				
HORZ. ANGLE	151-30-00	155-26-40	3-02-36	278-19-33	98-19-33	290-11-08				
- 360 - 00' - 00"	261-31-39	265-28-19	305-28-26	403-47-59	223-47-59	415-39-34				
AZ. STA. TO F.S.				43-47-59		55-39-34				
BEARING	S 81-31-39 W	S 85-28-19 W	N 54-31-34 W	N 43-47-59 E	S 43-47-59 W	N 55-39-34 E				
HORZ. DISTANCE	14.830	13.185	23.000	10.300	3.600	10.218				
COSINE BEARING										
STA. LAT.	10 687.064	10 687.064	10 685.020	10 698.368	10 698.368	10 698.368				
DIFF.	- 2.185	- 1.041	+ 13.348	+ 7.434	- 2.598	+ 5.764 ✓				
F.S. LAT.	10 684.879 N	10 686.023 N	10 698.368 N	10 705.802 N	10 695.770 N	10 704.132 N	N			
SINE BEARING										
STA. DEP.	7 617.497	7 617.497	7 541.638	7 522.907	7 522.907	7 522.907				
DIFF.	- 14.668	- 13.144	- 18.731 ✓	+ 7.129 ✓	- 2.492	+ 8.437				
F.S. DEP.	7 602.829 E	7 604.353 E	7 522.907 E	7 530.036 E	7 520.415 E	7 531.344 E	E			
GRADE CALC.										
		COLLAR								
		0.30								
F.S. GRADE ELV.		PLS. SEE CALC.								
GRADE CHAIN		AT THE BACK								
OFFSETS	LEFT	RIGHT	PLUS	MINUS	L.	R.	P.	M.	L.	R.
CALCULATED BY:	ROA		ROA		ROA		ROA		ROA	
CHECKED BY:	WS		WS		ROA		ROA		ROA	
DATE	13 01 76		13 01 76							
FIELD PAGE NO.	418		418							



$$\begin{aligned} \text{Elev.} \\ \textcircled{2} \quad 10\ 686.023 - 7604.353 &= 1157.450 \\ \textcircled{1} \quad 10\ 684.879 - 7602.829 &= 1154.259 \\ \hline &= 3.191 \\ \textcircled{-} \quad 1.144 \quad \textcircled{-} \quad 1.524 \end{aligned}$$

$$\begin{aligned} \text{TAN } 1.33217 &= \frac{S}{180} = 53^\circ 06' 21'' \text{ W} \\ &233 \quad 0.30 \\ &.79974 \end{aligned}$$

$$\begin{aligned} 10\ 684.879 - 7602.829 \\ - 0.180 \quad - .240 \\ \hline \textcircled{*} \quad 10\ 684.799 - 7602.589 \end{aligned}$$

$$\begin{aligned} \tan \theta &= \frac{3.191}{1.906} \\ &= 1.67419 \\ &= 59^\circ 00' 09'' \end{aligned}$$

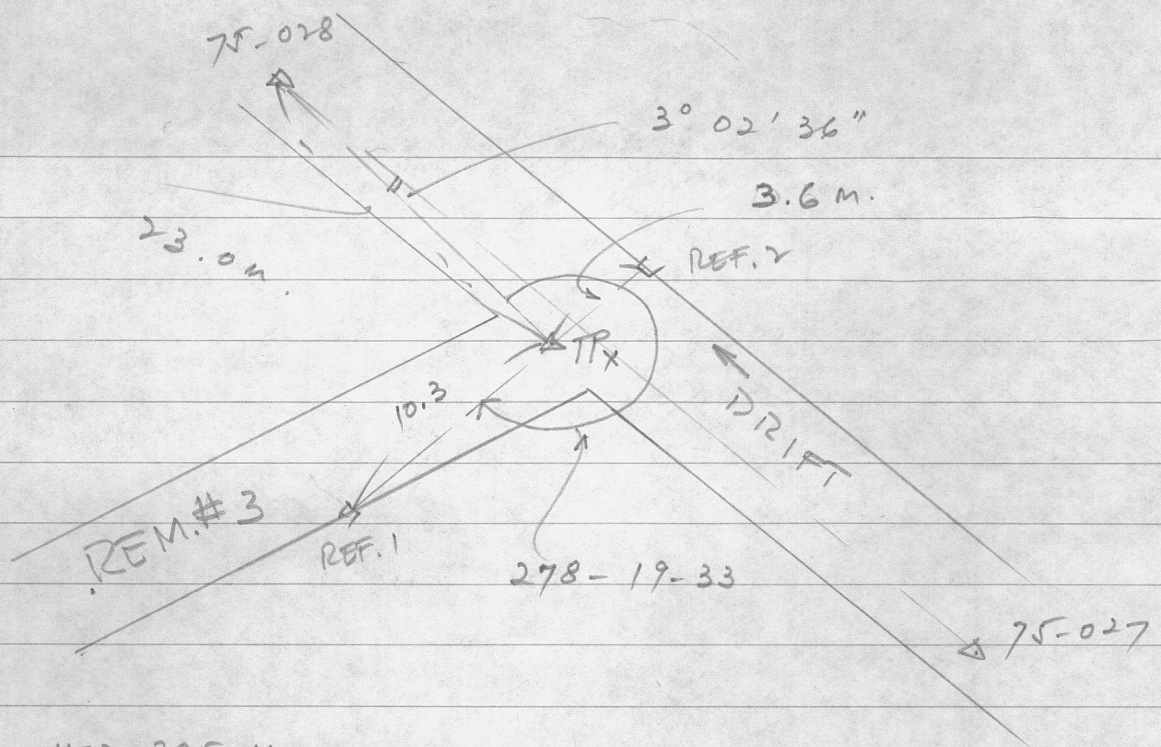
$$\therefore \sin 59^\circ 00' 09'' = \frac{x}{0.30}$$

$$\begin{aligned} x &= .85851 \times .30 \\ &= 0.258 \end{aligned}$$

$$\begin{aligned} + \quad 3.191 \\ \hline 3.449 \end{aligned}$$

$$\begin{aligned} \text{Elev. } \textcircled{1} &= 1157.450 \\ &+ \quad .258 \\ \hline 1157.708 \end{aligned}$$

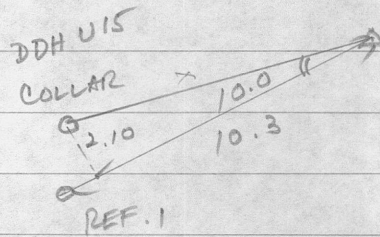
$$\begin{aligned} 1154.259 \\ + \quad 3.449 \\ \hline 1157.708 \end{aligned}$$



$$75-027 = 1172.395 \text{ M.}$$

$$\begin{array}{r} - 4.050 \\ \hline 1168.345 \\ - 2.350 \\ \hline 1165.995 \\ + 1.680 \\ \hline 1167.675 \\ - 1.490 \\ \hline \end{array}$$

$$\text{EL. COLLAR U15} = 1166.185 \checkmark$$



$$\tan \theta = \frac{2.10}{10.0} = 0.21000$$

$$= 11^{\circ} 51' 35'' \checkmark$$

$$+ 278-19-33$$

$$\underline{290-11-08} \checkmark$$

$$\sin 11-51-35 = \frac{2.10}{x}$$

$$x = \frac{2.10}{.20552}$$

$$= 10.248 \checkmark$$

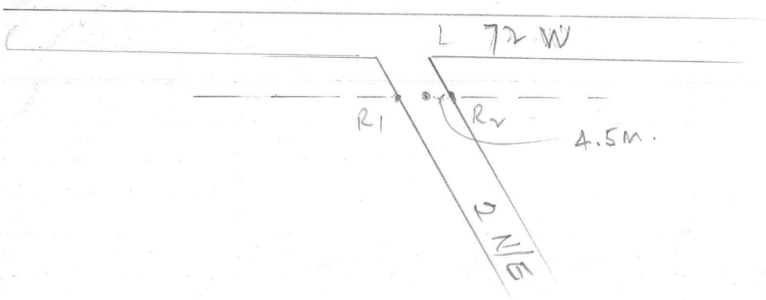
B.S.	75-043	75-043		75-043	75-043	75-043	75-043	75-043
S.T.A.	75-044	75-044	(R2 SEE FRONT P.)	75-044	75-044	75-044	75-044	75-044
F.S.	Collar U-16 (1)	(2) U-16	U-20	Collar U-23	Collar U-22	# (1) U-21 Bot.	# (2) U-21	
MEAS. DISTANCE	4.600	4.300		9.000	9.900	11.520	12.78	
VERT. ANGLE	-17-16-40	+01-21-40		0	0	+01-25-20	+07-32-20	
SINE - V.A.	.29700	.02375				.02482	.13120	
COSINE - V.A.	.95488	.99972				.99969	.99136	
STA. ELEVATION	1155.943	1155.943		1155.943				
H.I.	-2.780	-2.780		-2.800	-2.800	-2.800	2.800	
INST. HEIGHT	1153.163	1153.163		1153.143		1153.143	1153.143	
DISTANCE	-1.366	+0.102		0	0	+0.286	+1.677	
DIFF.	1151.797	1153.265		1153.143	1153.143	1153.429	1154.820	
H.P.	0.000	0.000		-1.400	-1.435	0	0	
F.S. ELEVATION	1151.797	1153.265	1152.920	1151.743	1151.708	1153.429	1154.820	
AZ. B.S. TO STA.	223-59-09			223-59-09				
±180-00'-00"	180			180				
AZ. STA. TO B.S.	43-59-09	43-59-09		43-59-09	43-59-09	43-59-09	43-59-09	
HORIZ. ANGLE	75-40-20	103-18-20		156-04-40	159-31-40	162-07-00	164-06-00	
-360-00'-00"	119-39-29	147-17-29		200-03-49	203-30-49	206-06-09	208-05-09	
AZ. STA. TO F.S.								
BEARING	S60-20-31 E	S32-42-31 E	S43-48-00 W	S20-03-49 W	S23-30-49 W	S26-06-09 W	S28-05-09 W	
HORIZ. DISTANCE	4.392	4.299	4.500	9.000	9.900	11.516	12.670	
COSINE BEARING				.93931	.91696	.89801	.88224	
STA. LAT.	10 729.259	10 729.259	10 688.275	10 729.258	10 729.258	10 729.258	10 729.258	
DIFF.	-2.173	-3.617	-3.248	-8.454	-9.078	-10.341	-11.178	
F.S. LAT.	10 727.086 N	10 725.642 N	10 685.027 N	10 720.804 N	10 720.180 N	10 718.917 N	10 718.080 N	
SINE BEARING				.34307	.39897	.43998	.47080	
STA. DEP.	7 635.943	7 635.943	7 602.769	7 635.943	7 635.943	7 635.943	7 635.943	
DIFF.	+3.817	+2.323	-3.115	-3.088	-3.950	-5.067	-5.965	
F.S. DEP.	7 639.760 E	7 638.266 E	7 599.654 E	7 632.855 E	7 631.993 E	7 630.876 E	7 629.978 E	
GRADE CALC.								
F.S. GRADE ELV.								PLS. SEE SKETCH OVER.
GRADE CHAIN								COLLAR + 1 m. AT # 2
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.	
CALCULATED BY:	ROA	ROA	ROA	ROA	ROA	ROA	ROA	
CHECKED BY:	WS	WS						
DATE	20/01/76	20/01/76	04 02 76	04 02 76	04 02 76	04 02 76	04 02 76	
FIELD PAGE NO.	425	425		431	431	431	431	

COLLAR 10 727.086 - 7639.760  
 10 725.642 - 7638.866  
 + 1.444 + 1.494

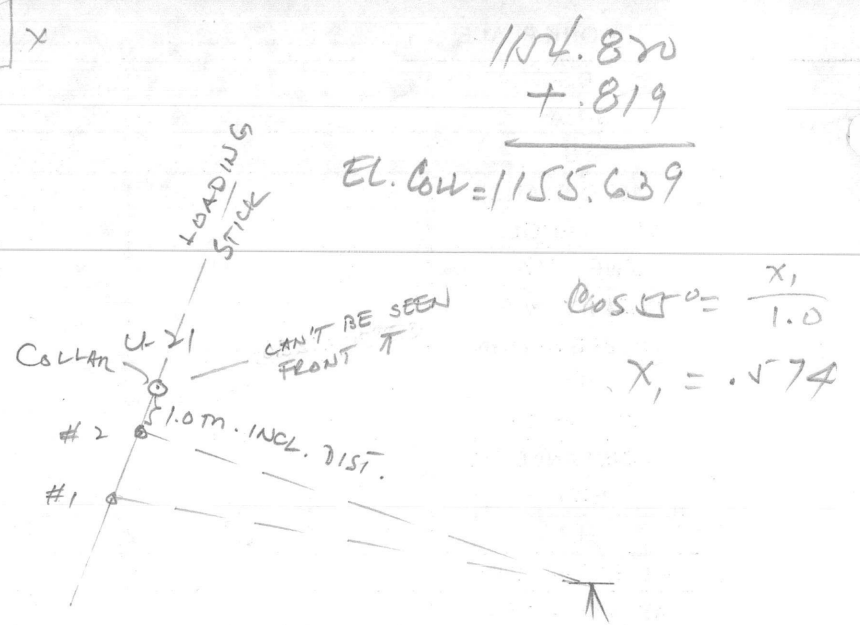
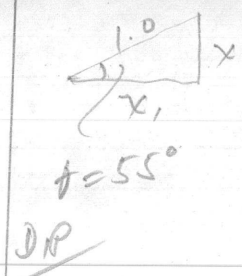
1.03463 N 45-58-30 E, 2.078  
 .71904

$$\frac{1.468}{2.078} = 0.70645$$

35° 14' 20" = 36-00-00 / 35-14-20 S  
 Av = 35-37-10



$$EL = R_1 - R_2 = 1154.47 - 1.55 = 1152.92$$



CALCULATE SHOTS #s 1 & 2  
 BEAR & EL. OF 1-2

1 = 10 718.917 - 7630.876 1153.429  
 2 = 10 718.080 - 7629.978 1154.820  
 @ .837 @ .898 -1.391  
 1.072879 0.73152

**BEAR # 1-2 S 47-00-49 W 1.228**

$$\frac{1.391}{1.228} = \tan \theta = 1.132736$$

$$\sin 55 = \frac{x}{1.0}$$

$$x = .81915 \times 1.0 = 0.819$$

48-33-41 =  
**VSE - 55°**

B.S.	75-043	75-043	PLS. SEE SKETCH ON	LP45	LP45	LP45	LP45
S.T.A.	75-044	75-044	#2 P-5	75-050	75-050	75-050	75-050
F.S.	Bot. U24 ①	Bot. U24 ②	CELLAR U21	U26 B	U26 C	U27 B	U27 C <small>offset</small>
MEAS. DISTANCE	5.550	5.000		2.250	2.430	2.880	4.720
VERT. ANGLE	+ 21 - 17 - 00	+ 06 - 11 - 40		- 18 - 06 - 20	+ 10 - 02 - 00	+ 00 - 17 - 00	+ 32 - 39 - 00
SINE - V.A.	.36298	.10790		0.31077	0.17422	0.00495	0.53951
COSINE - V.A.	.93180	.99416		0.95049	0.98471	0.99999	0.84198
STA. ELEVATION	1155.943			1157.251			
H.I.	- 2.800	- 2.800		- 2.410			
INST. HEIGHT	1153.143	1153.143		1154.841	1154.841	1154.841	1154.841
DISTANCE	+ 2.014	+ 0.540		- 0.699	+ 0.423	+ 0.014	+ 2.546
DIFF.	1155.157	1153.683		1154.142	1155.264	1154.855	1157.387
H.P.	0	0					
F.S. ELEVATION	1155.157	1153.683	1155.639				
AZ. B.S. TO STA.							
± 180 - 00' - 00"							
AZ. STA. TO B.S.	43 - 59 - 09	43 - 59 - 09		97 - 02 - 39	97 - 02 - 39	97 - 02 - 39	97 - 02 - 39
HORIZ. ANGLE	76 - 02 - 00	100 - 20 - 00		79 - 53 - 30	88 - 42 - 40	354 - 37 - 00	341 - 08 - 00
- 360 - 00' - 00"	120 - 01 - 09	144 - 19 - 09		176 - 56 - 09	185 - 45 - 19	451 - 39 - 39	438 - 10 - 39
AZ. STA. TO F.S.			227 - 00 - 49			91 - 39 - 39	78 - 10 - 39
BEARING	S 59 - 58 - 51 E	S 35 - 40 - 51 E	S 47 - 00 - 49 W	S 03 - 03 - 51 E	S 05 - 45 - 19 W	S 88 - 20 - 21 E	N 78 - 10 - 39 E
HORIZ. DISTANCE	5.171	4.971	0.574	2.139	2.393	2.880	3.974
COSINE BEARING	.50029	.81228	.68182				
STA. LAT.	10 729.258	10 729.258	10 718.080	10 780.219	10 780.219	10 780.219	10 780.219
DIFF.	- 2.587	- 4.038	- 0.391	- 2.136	- 2.381	- 0.083	+ 0.814
F.S. LAT.	10 726.671 N	10 725.220 N	10 717.689 N	10 778.083 N	10 777.838 N	10 780.136 N	10 781.033 N
SINE BEARING	.86586	.58327	.73152				
STA. DEP.	7635.943	7635.943	7629.978	7689.829	7689.829	7689.829	7689.829
DIFF.	+ 4.477	+ 2.899	- 0.450	+ 0.114	- 0.240	+ 2.879	+ 3.890
F.S. DEP.	7640.420 E	7638.842 E	7629.518 E	7689.943 E	7689.589 E	7692.708 E	7693.719 E
GRADE CALC.							
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	ROA	ROA	ROA	P.J.G.	P.J.G.	P.J.G.	P.J.G.
CHECKED BY:	WS	WS	WS	WS	WS	WS	WS
DATE	04 02 76	04 02 76	04 02 76	17-02-76	17-02-76	17-02-76	17-02-76
FIELD PAGE NO.	431	431	431				

② 10 725.220 - 7638.842

① 10 726.671 - 7640.420

⊕ 1.451 ⊕ 1.578

1.08753

K 47-24-03E

2.144

$$\frac{1.474 \text{ D.E.}}{2.144 \text{ HD}}$$

.68750

DIP = 34-30-30

B.S.	75-027	75-028	75-028	75-028	75-028	75-028	75-028
S.T.A.	75-028	TP	TP	TP	TP	TP	TP
F.S.	TP	U28 ①	U28 COLLAR	U29 ①	U29 COLLAR	U30 ①	U30 COLLAR
MEAS. DISTANCE	24.137	17.39	18.99	17.19	18.95	17.31	18.84
VERT. ANGLE	+ 4-52-00	+ 00-57-00	- 3-05-40	+ 00-32-00	- 00-51-40	+ 2-18-00	+ 6-16-00
SINE - V.A.	.08484	.01658	.05398	.00931	.01503	.04013	.10916
COSINE - V.A.	.99639	.99986	.99854	.99996	.99989	.99919	.99402
STA. ELEVATION	1166.915	1166.143					
H.I.	-2.820	+ 1.405	+ 1.405	+ 1.405	+ 1.405	+ 1.405	+ 1.405
INST. HEIGHT	1164.095	1167.548	1167.548	1167.548	1167.548	1167.548	1167.548
DISTANCE	+ 2.048	+ .288	- 1.025	+ .160	- .285	+ .695	+ 2.057
DIFF.	1166.143						
H.P.	0	0	0	0	0	0	0
F.S. ELEVATION	1166.143	1167.836	1166.523	1167.708	1167.263	1168.243	1169.605
AZ. B.S. TO STA.	122 25 50	306 28 10	306 28 10	306 28 10	306 28 10	306 28 10	306 28 10
± 180 - 00' - 00"	+ 180	- 180	- 180	- 180	- 180	- 180	- 180
AZ. STA. TO B.S.	302 25 50	126 28 10	126 28 10	126 28 10	126 28 10	126 28 10	126 28 10
HORZ. ANGLE	04 02 20	294 45 20	293 42 00	293 38 00	292 19 30	292 49 00	292 14 40
- 360 - 00' - 00"	306 28 10	421 13 30	420 10 10	420 06 10	418 47 40	419 17 10	418 42 50
AZ. STA. TO F.S.		61 13 30	60 10 10	60 06 10	58 47 40	59 17 10	58 42 50
BEARING	N	WN 61 13 30 E	N 60 10 10 E	N	E N	E N	E N
HORZ. DISTANCE	24.050	17.388	18.962	17.189	18.948	17.296	18.727
COSINE BEARING							
STA. LAT.	10 685.020	10 699.315	10 699.315	10 699.315	10 699.315	10 699.315	10 699.315
DIFF.	+ 14.295	+ 8.370	+ 9.432	+ 8.568	+ 9.817	+ 8.834	+ 9.725
F.S. LAT.	10 699.315 N	10 707.685 N	10 708.747 N	10 707.883 N	10 709.132 N	10 708.149 N	10 709.040 N
SINE BEARING							
STA. DEP.	75 41.638	75 22.298	75 22.298	75 22.298	75 22.298	75 22.298	75 22.298
DIFF.	- 19.340	+ 15.241	+ 16.450	+ 14.902	+ 16.206	+ 14.870	+ 16.004
F.S. DEP.	75 22.298 E	75 37.539 E	75 38.748 E	75 37.200 E	75 38.504 E	75 37.168 E	75 38.302 E
GRADE CALC.		Az 48° 42' 12" Dip - 39° 13'		Az 73° Dip - 13° 51'	Az 46° 14' 03" Dip - 13° 51'	Az 51° 50' 34" Dip + 43° 22'	
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:							
CHECKED BY:							
DATE							
FIELD PAGE NO.							

WS  
P. J. G.  
125-02-76  
449

B.S.	75-028	75-028	75-028	75-028		75-049	75-049			
S.T.A.	TP	TP	TP	TP		LP 40	LP 40			
F.S.	431 ①	431 COLLAR	432 ①	432 COLLAR	433 COLLAR	434 ①	434 COLLAR			
MEAS. DISTANCE	11.58	13.34	11.44	11.10		15.18	15.32			
VERT. ANGLE	- 0 - 49 - 00	- 2 - 57 - 20	+ 1 - 22 - 40	- 6 - 05 - 20		- 5 - 58 - 00	- 11 - 46 - 00			
SINE - V.A.	.01425	.05156	.02404	.10607		.10395	.20393			
COSINE - V.A.	.99990	.99867	.99971	.99436		.99458	.97899			
STA. ELEVATION						1150.165	1150.165			
H.I.	+ 1.405	+ 1.405	+ 1.405	+ 1.405		- 2.43	- 2.43			
INST. HEIGHT	1167.548	1167.548	1167.548	1167.548		1147.735	1147.735			
DISTANCE	- .165	- .688	+ .275	- 1.177		- 1.578	- 3.124			
DIFF.						1146.157	1144.611			
H.P.	0	0	0	0		0	0			
F.S. ELEVATION	1167.383	1166.860	1167.823	1166.371	1169.411	1146.157	1144.611			
AZ. B.S. TO STA.	306 28 10	306 28 10	306 28 10	306 28 10		313 50 35	313 50 35			
± 180 - 00' - 00"	- 180	- 180	- 180	- 180		- 180	- 180			
AZ. STA. TO B.S.	126 28 10	126 28 10	126 28 10	126 28 10		133 50 35	133 50 35			
HORZ. ANGLE	304 44 00	307 38 30	302 25 00	303 26 40		199 - 21 - 10	199 21 10			
- 360 - 00' - 00"	431 12 10	434 06 40	428 53 10	429 54 50	224 00 00	333 11 45	333 11 45			
AZ. STA. TO F.S.	71 12 10	74 06 40	68 53 10	69 54 50						
BEARING	N	E N	E N	E N	E S 44 00 00 W					
HORZ. DISTANCE	11.579	13.322	11.437	11.037		15.098	14.998			
COSINE BEARING										
STA. LAT.	10699.315	10699.315	10699.315	10699.315	10709.139 <sup>(u29)</sup>	10754.119	10754.119			
DIFF.	+ 3.731	+ 3.647	+ 4.120	+ 3.790	- 8.560	13.476	13.387			
F.S. LAT.	10703.046 N	10702.962 N	10703.435 N	10703.105 N	10700.572 N	10767.595 N	10767.506 N			
SINE BEARING										
STA. DEP.	7522.298	7522.298	7522.298	7522.298	7538.504 <sup>(u29)</sup>	7595.842	7595.842			
DIFF.	+ 10.961	+ 12.813	+ 10.669	+ 10.366	- 8.266	- 6.808	- 6.763			
F.S. DEP.	7533.259 E	7535.111 E	7532.967 E	7532.664 E	7530.238 E	7589.034 E	7589.079 E			
GRADE CALC.	A <sub>2</sub> 92° 35' 49" Dip - 15° 45'		A <sub>2</sub> 222° 33' 27" Dip - 72° 51'		A <sub>2</sub> 224° 00' 00" Dip + 45°	A <sub>2</sub> Dip	153° 10' 41" - 86° 18'			
F.S. GRADE ELV.										
GRADE CHAIN										
OFFSETS	LEFT	RIGHT	PLUS	MINUS	L.	R.	P.	M.	L.	R.
CALCULATED BY:										
CHECKED BY:										
DATE										
FIELD PAGE NO.										

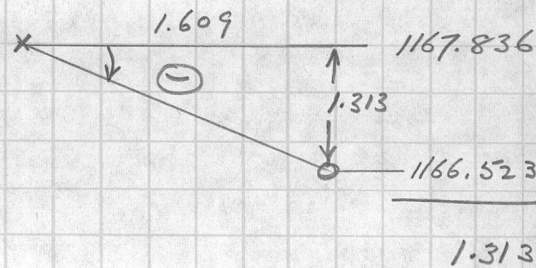
WS  
25-02-75  
449

U2

10707.685	7537.539
10708.747	7538.748
+ <u>1.062</u>	+ <u>1.209</u>

$\frac{1.209}{1.062} = HD = 1.609$   
BRG N 48 42 12 E

Dip =  $\frac{1.313}{1.609} = -39^{\circ} 12' 56''$



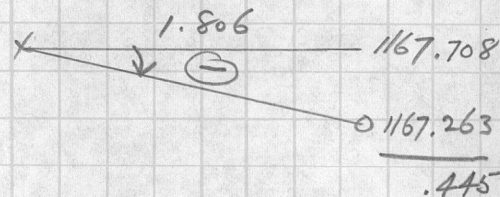
Collar Elev 1166.523  
Dip  $-39^{\circ} 13'$   
Brq N 48 42 12 E  
Az 48 42 12  
Coord N 10708.747  
E 7538.748

U29

10707.883	7537.200
10709.132	7538.504
+ <u>1.249</u>	+ <u>1.304</u>

$\frac{1.304}{1.249} = HD = 1.806$   
BRG = N 46 14 03 E

Dip =  $\frac{.445}{1.806} = -13^{\circ} 50' 31''$



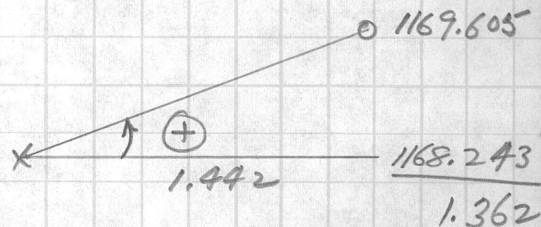
Collar Elev. 1167.263  
Dip  $-13^{\circ} 51' 31''$   
Brq N 46 14 03 E  
Az 46 14 03  
Coord N 10709.132  
E 7538.504

U30

10708.149	7537.168
10709.040	7538.302
+ <u>.891</u>	+ <u>1.134</u>

$\frac{1.134}{.891} = HD = 1.442$   
Brq = N 51 50 34 E

$\frac{1.362}{1.442} = Dip + 43 21 56$



Collar Elev 1169.605  
Dip  $+ 43^{\circ} 22'$   
Brq N 51 50 34 E  
Az 51 50 34  
Coord N 10709.040  
E 7538.302

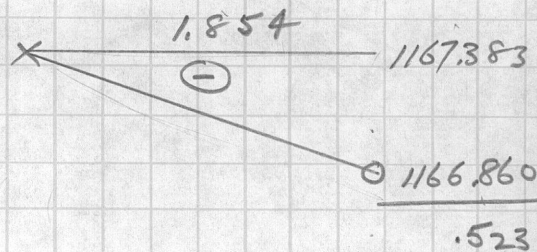
FEB 25/76

U

10703.046	7533.259
10702.962	7535.111
<u>-</u>	<u>-</u>
.084	1.852

1.852	HD	1.854
.084	Brg	S 87° 24' 11" E

Dip  $\frac{.523}{1.854} = -15^{\circ} 45' 12''$



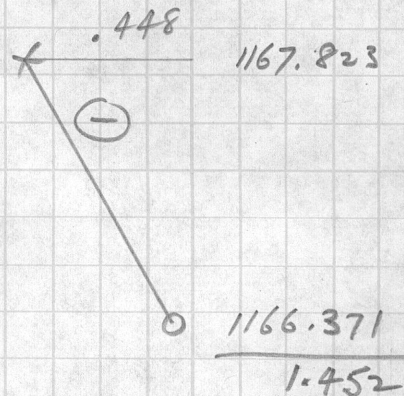
Collar Elev 1166.860  
 Dip - 15° 45'  
 Brg S 87° 24' 11" E  
 Az 92° 35' 49"  
 Coord NO 10702.962  
 E 7535.111

U32

10703.435	7532.967
10703.105	7532.664
<u>-</u>	<u>-</u>
.330	.303

.303	HD = .448
.330	Brg = S 42° 33' 27" W

Dip  $\frac{1.452}{.448} = -72^{\circ} 51' 10''$



Collar Elev 1166.371  
 Dip - 72° 51'  
 Brg S 42° 33' 27" W  
 Az 222° 33' 27"  
 Coord N 10703.105  
 E 7532.664



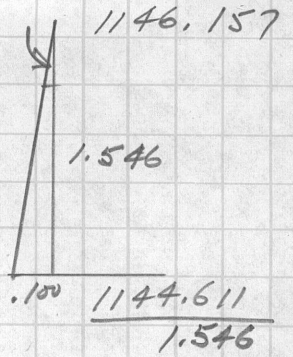
U3

10767.595	7589.034
<u>10767.506</u>	<u>7589.079</u>
S .089	E .045

$$\frac{.045}{.089} = \text{HD} \cdot .100$$

BRG S 26° 49' 19" E

$A_z = 153^\circ 10' 41''$   
 Brg. = S 26° 49' 19" E  
 Dip = -86° 17' 57"  
 Elev Collar. = 1144.611

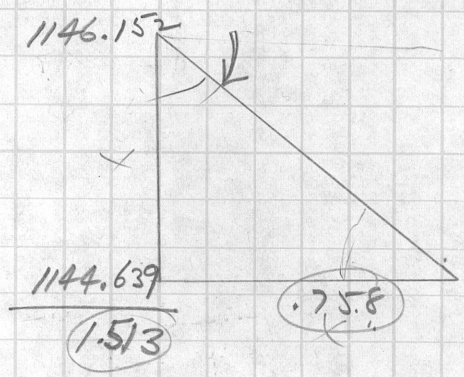


U35

10767.638	7588.767
<u>10768.045</u>	<u>7589.407</u>
+ .407	+ .640

$$\frac{.640}{.407} = \text{HD} \cdot .758$$

Brg N 57° 32' 46" E



$$\text{Dip} = \frac{1.513}{.758} = -63^\circ 23' 20''$$

$A_z = 57^\circ 32' 46''$   
 Brg = N 57 32 46 E  
 Dip = -63° 23'  
 Elev Collar = 1144.639

U-36, U-37, ~~U-38~~

LP 43 ✓

~~U-36~~  
~~U-37~~  
~~U-38~~

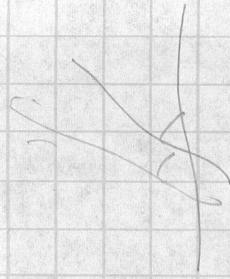
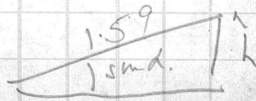
	BS	75-041	LP 43	"	"	"
	STA	75-045	76-008	"	"	"
	FS	LP 43	U-36-C	U-36-E	U-37-C	U-37-E
①	M. DIST	12.927	22.880	21.280	22.580	21.318
②	V ✓	4°-34'-00"	+10°-16'-00"	10°27'30"	09°48'40"	9°42'20"
③	STA. ELEV.	1159.908	1167.182	"	"	"
	H.I.	-2.750	-3.3 <del>00</del> <sup>30</sup>	-3.330	-3.330	-3.330
	H.P	+3.070	φ	φ	φ	φ
	F.S. ELEV	(1161.257)	(1167.9 <del>00</del> <sup>30</sup> )	(1167.715)	(1167.700)	(1167.446)
④	AZ. STA. TO BS	292°15'17"	316°-14'-48"	"	"	"
⑤	HOR. ✓	203°41'50"	180° <del>00'20"</del> <sup>10'40"</sup>	180°00'20"	176°-16'-00"	178°-51'20"
	AZ STA TO FS	135°57'07"	136°25'28"	136°15'08"	132°30'48"	135°06'08"
	HOR. DIST.	12.886	22.514	20.927	22.250	21.013
⑥	STA LAT.	10682.829	10,645.904	"	"	"
	F.S. LAT.	(10673.567)	(10,629.594)	(10,630.787)	(10,630.869)	(10631.019)
⑦	STA DEP.	7627.818	7663.170	"	"	"
	F.S. DEP	(7636.777)	(7678.689)	(7,677.640)	(7679.571)	(7678.002)

dip = +7°42'  
 az = 138°40'

dip = +9  
 az = 095°27'

B.S.	43	43	43	43	43	43	
S.T.A.	76-008	76-008	76-008	76-008	76-008	76-008	
F.S.	U-36 END	U-36 COLLAR	U-37 END	U-37 COLLAR	U-38 END	U-38 COLLAR	
MEAS. DISTANCE	21.280	22.880	21.318	22.580	21.384	22.786	
VERT. ANGLE	+10-27-30	+10-16-00	+09-42-20	+09-48-40	+09-52-00	+09-56-40	
SINE - V.A.	.18152	.17823	.16858	.17040	.17136	.17269	
COSINE - V.A.	.98339	.98399	.98569	.98537	.98521	.98498	
STA. ELEVATION	1167.224	1167.224	1167.224	1167.224	1167.224	1167.224	
H.I.	-3.330	-3.330	-3.330	-3.330	-3.330	-3.330	
INST. HEIGHT	1163.894	1163.894	1163.894	1163.894	1163.894	1163.894	
DISTANCE	+3.863	+4.077	+3.594	+3.848	+3.664	+3.935	
DIFF.	1167.757	1167.971	1167.488	1167.742	1167.558	1167.829	
H.P.	0	0	0	0	0	0	
F.S. ELEVATION	1167.757	1167.971	1167.488	1167.742	1167.558	1167.829	
AZ. B.S. TO STA.	134-09-26						
±180 - 00' - 00"	180						
AZ. STA. TO B.S.	314-09-26	314-09-26	314-09-26	314-09-26	314-09-26	314-09-26	
HORZ. ANGLE	180-00-20	180-10-40	178-51-20	176-16-00	180-25-00	178-20-00	
-360 - 00' - 00"	494-09-46	494-20-06	493-00-46	490-25-26	494-34-26	492-29-26	
AZ. STA. TO F.S.	134-09-46	134-20-06	133-00-46	130-25-26	134-34-26	132-29-26	
BEARING							
HORZ. DISTANCE	20.926	22.514	21.013	22.250	21.068	22.444	
COSINE BEARING							
STA. LAT.	10 647.709	10 647.709	10 647.709	10 647.709	10 647.709	10 647.709	
DIFF.	-14.579	-15.734	-14.334	-14.428	-14.786	-15.160	
F.S. LAT.	10 633.130 N	10 631.975 N	10 633.375 N	10 633.281 N	10 632.923 N	10 632.549 N	N
SINE BEARING							
STA. DEP.	7664.714	7664.714	7664.714	7664.714	7664.714	7664.714	
DIFF.	+15.012	+16.104	+15.365	+16.938	+15.008	+16.550	
F.S. DEP.	7679.726 E	7680.818 E	7680.079 E	7681.652 E	7679.722 E	7681.264 E	E
GRADE CALC.							
F.S. GRADE ELV.	Recalc. DJH	Recalc. DJH.	Recalc. DJH	Recalc DJH.	Recalc. DJH	Recalc DJH.	
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	ROA	ROA	ROA	ROA	ROA	ROA	
CHECKED BY:	P.J.G.	P.J.G.	P.J.G.	P.J.G.	P.J.G.	P.J.G.	
DATE	10 MAR 76	10 MAR 76	10 MAR 76	10 MAR 76	10 MAR 76	10 MAR 76	
FIELD PAGE NO.							

1.59



$$\begin{array}{r}
 10\ 633.130 - 7679.726 \\
 10\ 631.975 - 7680.818 \\
 \hline
 \ominus 1.155 \quad + 1.092 \\
 + \quad \quad \quad -
 \end{array}$$

U-36 S 43-23-38 E →  
 A2 = 136-36-21

$$\begin{array}{r}
 10\ 633.375 - 7680.079 \\
 10\ 633.281 - 7681.652 \\
 \hline
 \ominus .094 \quad \oplus 1.587
 \end{array}$$

U-37 <sup>180</sup> S 86-36-37 E →  
 A2 93-23-23

$$\begin{array}{r}
 10\ 632.928 - 7679.722 \\
 10\ 632.549 - 7681.264 \\
 \hline
 \ominus 0.379 \quad \oplus 1.542
 \end{array}$$

U-38 <sup>180</sup> S 76-11-29 E  
 A2 103-48-31

$$\begin{array}{r}
 .971 \\
 .757 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 .742 \\
 .488 \\
 \hline
 \end{array}
 \quad
 \begin{array}{r}
 .829 \\
 .558 \\
 \hline
 \end{array}$$

D.E. = .214 ÷ 1.59

.254 ÷ 1.59 =

.271 ÷ 1.59

DIPS = + 7° 44' 06"

+ 9° 11' 32"

+ 9° 48' 48"



$$\begin{array}{r}
 \text{U-39 END} = 10\ 767.623 - 7588.859 \\
 \text{" COL} = \underline{10\ 767.245 - 7588.402} \\
 \text{⊖} \quad 0.378 \quad \text{⊖} \quad 0.457
 \end{array}
 \qquad
 \begin{array}{r}
 1146.593 \\
 \underline{1144.623} \\
 \text{DE} = 1.970
 \end{array}$$

0.593

S 50-24-17 N  
230-24-17 ✓

DIP = 73-14-51 ✓

$$\begin{array}{r}
 \text{U-40 E} = 10\ 767.874 - 7589.141 \\
 \text{U-40 C} = \underline{10\ 767.051 - 7588.308} \\
 \text{⊖} \quad 0.823 \quad \text{⊖} \quad 0.833
 \end{array}
 \qquad
 \begin{array}{r}
 1146.197 \\
 \underline{1144.597} \\
 \text{DE} = 1.600
 \end{array}$$

1.171

S 45-20-45 W  
225-20-45 ✓

DIP = 53-48-02 ✓

$$\begin{array}{r}
 \text{U-41 E} = 10\ 768.059 - 7589.699 \\
 \text{U-41 C} = \underline{10\ 769.061 - 7590.681} \\
 \text{⊕} \quad 1.002 \quad \text{⊕} \quad 0.982
 \end{array}
 \qquad
 \begin{array}{r}
 1146.102 \\
 \underline{1144.633} \\
 \text{DE} = 1.469
 \end{array}$$

1.403

N 44-25-21 E  
44-25-21 ✓

DIP = 46-18-59 ✓

$$\begin{array}{r}
 \text{U-42 E} = 10\ 767.170 - 7589.577 \\
 \text{U-42 C} = \underline{10\ 767.689 - 7590.105} \\
 \text{⊕} \quad 0.519 \quad \text{⊕} \quad 0.528
 \end{array}
 \qquad
 \begin{array}{r}
 1146.771 \\
 \underline{1148.632} \\
 1.861
 \end{array}$$

0.740

N 45-29-33 E  
45-29-33 ✓

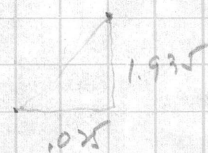
DIP = +68-18-56

$$\begin{array}{r}
 \text{U-43 E} = 10\ 767.257 - 7589.522 \\
 \text{U-43 C} = \underline{10\ 767.235 - 7589.511} \\
 \text{⊖} \quad 0.022 \quad \text{⊖} \quad 0.011
 \end{array}
 \qquad
 \begin{array}{r}
 1146.822 \\
 \underline{1148.757} \\
 1.935
 \end{array}$$

0.025

S 26-33-54 W  
206-33-54 ✓

DIP = +89-15-35



$$U-44 E = 10768.340 - 7588.115$$

$$1147.051$$

$$U-44 C = 10767.796 - 7587.309$$

$$1148.788$$

$$\ominus \quad 0.544 \quad \ominus \quad 0.806$$

$$DE = 1.737$$

$$0.972$$

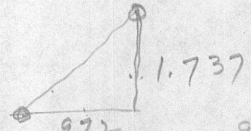
$$S 55 - 58 - 59 W$$

$$235 - 58 - 59 \checkmark$$

$$\frac{V}{H}$$

$$DIP = 29 - 13 - 50$$

$$DIP = +60 - 46 - 09$$



$$\tan \theta = \frac{1.737}{0.972}$$



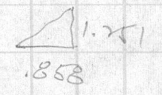


B.S.	76-006	76-006	76-006	76-006	76-006	76-006	76-006	76-006
S.T.A.	TP	TP	TP	TP	TP	TP	TP	TP
F.S.	U-57 END	U-57 COL	U-56 END	U-56 COL	U-55 END	U-55 COL	U-55 COL	U-55 COL
MEAS. DISTANCE	5.65	6.72	5.51	6.42	5.41	6.47		
VERT. ANGLE	-08-39-00	-13-30-00	-10-16-00	-02-24-00	-10-55-00	-02-58-00		
SINE - V.A.	.15040	.23345	.17823	.04188	.18938	.05175		
COSINE - V.A.	.98863	.97237	.98399	.99912	.98190	.99866		
STA. ELEVATION	1143.895							
H.I.	+1.500	+1.500	+1.500	+1.500	+1.500	+1.500		
INST. HEIGHT	1145.395	1145.395	1145.395	1145.395	1145.395	1145.395		
DISTANCE	-0.850	-1.569	-0.982	-0.269	-1.025	-0.335		
DIFF.	1144.545	1143.826	1144.413	1145.126	1144.370	1145.060		
H.P.	0	0	0	0	0	0		
F.S. ELEVATION	1144.545	1143.826	1144.413	1145.126	1144.370	1145.060		
AZ. B.S. TO STA.								
±180 - 00' - 00"								
AZ. STA. TO B.S.	323-25-26	323-25-26	323-25-26	323-25-26	323-25-26	323-25-26		
HORZ. ANGLE	306-33-20	297-33-00	307-01-20	298-16-40	305-33-00	298-36-40		
-360 - 00' - 00"	629-58-46	620-58-26	630-26-46	621-42-06	628-58-26	622-02-06		
AZ. STA. TO F.S.	269-58-46	260-58-26	270-26-46	261-42-06	268-58-26	262-02-06		
BEARING								
HORZ. DISTANCE	5.586	6.534	5.422	6.414	5.312	6.461		
COSINE BEARING								
STA. LAT.	10 826.922	10 826.922	10 826.922	10 826.922	10 826.922	10 826.922		
DIFF.	-0.002	-1.025	+0.042	-0.926	-0.095	-0.895		
F.S. LAT.	10 826.920 N	10 825.897 N	10 826.964 N	10 825.996 N	10 826.827 N	10 826.027 N		N
SINE BEARING								
STA. DEP.	7 649.536	7 649.536	7 649.536	7 649.536	7 649.536	7 649.536		
DIFF.	-5.586	-6.453	-5.422	-6.347	-5.311	-6.399		
F.S. DEP.	7 643.950 E	7 643.083 E	7 644.114 E	7 643.189 E	7 644.225 E	7 643.137 E		E
GRADE CALC.								
F.S. GRADE ELV.								
GRADE CHAIN								
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.	
CALCULATED BY:	ROA	"	"	"	"	"	"	
CHECKED BY:	WS	WS	WS	WS	WS	WS	WS	
DATE	C APR 76	"	"	"	"	"	"	
FIELD PAGE NO.	487	487	487	487	488	488		



$$\begin{array}{r}
 \text{U-48 END} = 10\,827.350 - 76\,45.807 \quad 1144.587 \\
 \text{COL} = \underline{10\,826.650 - 76\,45.320} \quad \underline{1143.336} \\
 \ominus 0.706 \quad \ominus 0.487 \quad 1.251
 \end{array}$$

0.858 m. 34-35-53 ✓



DIP = -55° 33' 20"

$$\begin{array}{r}
 \text{U-50 END} = 10\,827.083 - 76\,44.131 \quad 1144.503 \\
 \text{COL} = \underline{10\,825.601 - 76\,43.895} \quad \underline{1144.519} \\
 \ominus 1.482 \quad \ominus 0.236 \quad + 0.016
 \end{array}$$

1.501<sup>m</sup> 9-02-53 ✓

DIP + 00° 36' 38"

$$\begin{array}{r}
 \text{U-49 END} = 10\,827.056 - 76\,44.128 \quad 1144.520 \\
 \text{COL} = \underline{10\,825.927 - 76\,43.088} \quad \underline{1144.542} \\
 \ominus 1.129 \quad \ominus 1.040 \quad + 0.022
 \end{array}$$

1.535<sup>m</sup> 42° 34' 04" <sup>39 01</sup>

DIP + 00° 49' 16"

$$\begin{array}{r}
 \text{U-57 END} = 10\,826.920 - 76\,43.950 \quad 1144.545 \\
 \text{COL} = \underline{10\,825.897 - 76\,43.083} \quad \underline{1143.826} \\
 \ominus 1.023 \quad \ominus 0.867 \quad - 0.719
 \end{array}$$

1.341<sup>m</sup> 40° 16' 53" ✓

DIP - 28° 11' 55"

$$\begin{array}{r}
 \text{U-56 END} = 10\,826.964 - 76\,44.114 \quad 1144.413 \\
 \text{COL} = \underline{10\,825.996 - 76\,43.189} \quad \underline{1145.126} \\
 \ominus 0.968 \quad \ominus 0.925 \quad + 0.713
 \end{array}$$

1.339<sup>m</sup> 43° 41' 55" ✓

DIP ~~00° 31' 57"~~  
+ 28 02 05

$$\begin{aligned}
 \text{U-55 END} &= 10\ 826.827 - 7644.225 \\
 \text{COL} &= \underline{10\ 826.027 - 7643.137} \\
 &\ominus 0.800 \quad \ominus 1.088
 \end{aligned}$$

1.350 m  $53^\circ 40' 23''$

$$\begin{aligned}
 &1144.370 \\
 &\underline{1145.060} \\
 &+ 0.690 \\
 &\text{DIP} \\
 &+ 27^\circ 04' 19''
 \end{aligned}$$

$$\begin{aligned}
 \text{U-52 END} &= 10\ 826.808 - 7643.662 \\
 \text{COL} &= \underline{10\ 826.400 - 7643.186} \\
 &\ominus 0.408 \quad \ominus 0.476
 \end{aligned}$$

0.627 m  $49^\circ 23' 55''$

$$\begin{aligned}
 &- 1145.942 \\
 &- \underline{1147.300} \\
 &+ 1.358 \\
 &\text{DIP} \\
 &+ 65^\circ 13' 00''
 \end{aligned}$$

$$\begin{aligned}
 \text{U-53 END} &= 10\ 827.081 - 7643.834 \\
 \text{COL} &= \underline{10\ 827.039 - 7643.677} \\
 &\ominus 0.042 \quad \ominus 0.157
 \end{aligned}$$

0.162 m  $75^\circ 01' 23''$

$$\begin{aligned}
 &1146.199 \\
 &\underline{1147.510} \\
 &+ 1.311 \\
 &\text{DIP} \\
 &+ 01^\circ 19' 15'' \\
 &\underline{82\ 54\ 45}
 \end{aligned}$$

$$\begin{aligned}
 \text{U-54 END} &= 10\ 828.781 - 7644.988 \\
 \text{COL} &= \underline{10\ 829.438 - 7645.418} \\
 &\oplus 0.657 \quad \oplus 0.430
 \end{aligned}$$

0.785 m  $33^\circ 12' 15''$

$$\begin{aligned}
 &1146.764 \\
 &\underline{1148.115} \\
 &+ 1.351 \\
 &\text{DIP} \\
 &59^\circ 50' 28''
 \end{aligned}$$

B.S.	76-003	76-007	76 007	76 007	76 007	76 007	76 007	76 007
S.T.A.	76-007	TP	TP	TP	TP	TP	TP	TP
F.S.	TP	U 5'8(1) End	U 5'8 (1) Collar	U 5'8 (2) End	U 5'8 (2) Collar	U 5'9 End	U 5'9 Collar	
MEAS. DISTANCE	15.664	- 10.958	- 11.200	- 10.890	- 11.114	- 10.116	- 10.840	
VERT. ANGLE	- 15-04-40	- 00-59-00	- 00-55-00	- 01-57-00	- 01-53-20	- 00-57-00	- 05-26-20	
SINE - V.A.	.26013							
COSINE - V.A.	.96557							
STA. ELEVATION	1142.276	1135.106						
H.I.	- 3.095	+ 1.365	+ 1.365	+ 1.365	+ 1.365	+ 1.365	+ 1.365	
INST. HEIGHT	1139.181	1136.471	1136.471	1136.471	1136.471	1136.471	1136.471	
DISTANCE	- 4.075	- .188	- .179	- .371	- .366	- .168	- 1.027	
DIFF.								
H.P.	0							
F.S. ELEVATION	1135.106	1136.283	1136.292	1136.100	1136.105	1136.303	1135.444	
AZ. B.S. TO STA.	334 21 35	282 45 35						
± 180 - 00' - 00"	- 180	- 180						
AZ. STA. TO B.S.	154 21 35	102 45 35	102 45 35	102 45 35	102 45 35	102 45 35	102 45 35	
HORIZ. ANGLE	128-24-00	159 50 40	158 51 00	160 23 20	159 32 50	162 52 30	160 04 10	
- 360 - 00' - 00"	282 45 35	262 36 15						
AZ. STA. TO F.S.		262 36 15	261 36 35	263 08 55	262 18 25	265 38 05	262 49 45	
BEARING								
HORIZ. DISTANCE	15.125	10.956	11.199	10.884	11.108	10.115	10.791	
COSINE BEARING								
STA. LAT.	10796.166	10799.507	10799.507	10799.507	10799.507	10799.507	10799.507	
DIFF.	+ 3.341	- 1.410	- 1.634	- 1.298	- 1.487	- .770	- 1.347	
F.S. LAT.	10799.507 N	10798.097 N	10797.873 N	10798.209 N	10798.020 N	10798.737 N	10798.160 N	
SINE BEARING								
STA. DEP.	7560.351	7545.600	7545.600	7545.600	7545.600	7545.600	7545.600	
DIFF.	- 14.751	- 10.865	- 11.079	- 10.806	- 11.008	- 10.086	- 10.707	
F.S. DEP.	7545.600 E	7534.735 E	7534.521 E	7534.794 E	7534.592 E	7535.514 E	7534.893 E	
GRADE CALC.								
F.S. GRADE ELV.								
GRADE CHAIN								
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.	
CALCULATED BY:	W.P.	"	"	"	"	"	"	
CHECKED BY:	P.S.G.	"	"	"	"	"	"	
DATE	APR. 21/76	"	"	"	"	"	"	
FIELD PAGE NO.	494-495	"	"	"	"	"	"	

B.S.	76 007	76 007	76 007	76 007	76 007	76 007	76 007
S.T.A.	TP	TP	TP	TP	TP	TP	TP
F.S.	460 collar	461 collar	462 END	462 collar	463 END	463 collar	464 END
MEAS. DISTANCE	9.830	10.040	10.040	10.930	10.140	10.980	8.305
VERT. ANGLE	-08-47-20	-08-25-00	-02-26-20	-04-35-30	+1-39-40	+5-06-20	+09-02-00
SINE - V.A.							
COSINE - V.A.							
STA. ELEVATION							
H.I.	+1.365	+1.365	+1.365	+1.365	+1.365	+1.365	+1.365
INST. HEIGHT	1136.471	1136.471	1136.471	1136.471	1136.471	1136.471	1136.471
DISTANCE	-1.502	-1.470	-.427	-.875	+.294	+.977	+1.304
DIFF.							
H.P.							
F.S. ELEVATION	1134.969	1135.001	1136.044	1135.596	1136.765	1137.448	1137.775
AZ. B.S. TO STA.							
±180 - 00' - 00"							
AZ. STA. TO B.S.	102 45 35	102 45 35	102 45 35	102 45 35	102 45 35	102 45 35	102 45 35
HORZ. ANGLE	166 25 20	164 47 20	164 06 20	159 47 00	163 16 20	159 23 00	169 53 20
- 360 - 00' - 00"							
AZ. STA. TO F.S.	269 10 55	267 32 55	266 51 55	262 32 35	266 01 55	262 08 35	272 38 55
BEARING							
HORZ. DISTANCE	9.715	9.932	10.031	10.895	10.136	10.936	8.202
COSINE BEARING							
STA. LAT.	10799.507	10799.507	10799.507	10799.507	10799.507	10799.507	10799.507
DIFF.	-.139	-.425	-.549	-1.414	-.701	-1.495	+.379
F.S. LAT.	10799.368 N	10799.082 N	10798.958 N	10798.093 N	10798.806 N	10798.012 N	10799.886 N
SINE BEARING							
STA. DEP.	7545.600	7545.600	7545.600	7545.600	7545.600	7545.600	7545.600
DIFF.	-9.714	-9.923	-10.016	-10.803	-10.112	-10.833	-8.193
F.S. DEP.	7535.886 E	7535.677 E	7535.584 E	7534.797 E	7535.488 E	7534.767 E	7537.407 E
GRADE CALC.							
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:							
CHECKED BY:							
DATE	APR. 21/76						
FIELD PAGE NO.	494 - 495						

B.S.	76 007	76 007	76 007	76 007	76 007					
S.T.A.	TP	TP	TP	TP	TP					
F.S.	464 Collar	465 END	465 Collar	466 END	466 Collar					
MEAS. DISTANCE	8.840	9.700	9.958	9.330	9.420					
VERT. ANGLE	+ 15-17-20	+ 7-48-00	+ 14-53-00	- 00-12-00	+ 12-36-40					
SINE - V.A.										
COSINE - V.A.										
STA. ELEVATION										
H.I.										
INST. HEIGHT	1136.471	1136.471	1136.471	1136.471	1136.471					
DISTANCE	+ 2.331	+ 1.316	+ 2.558	- .033	+ .429					
DIFF.										
H.P.										
F.S. ELEVATION	1138.802	1137.787	1139.029	1136.438	1136.900					
AZ. B.S. TO STA.										
± 180 - 00' - 00"										
AZ. STA. TO B.S.	102 45 35	102 45 35	102 45 35	102 45 35	102 45 35					
HORZ. ANGLE	167 14 20	167 23 00	167 36 20	162 51 20	156 11 10					
- 360 - 00' - 00"										
AZ. STA. TO F.S.	269 59 55	270 08 35	270 21 55	265 36 55	258 56 45					
BEARING										
HORZ. DISTANCE	8.527	9.610	9.624	9.330	9.410					
COSINE BEARING										
STA. LAT.	10799.507	10799.507	10799.507	10799.507	10799.507					
DIFF.	00	+ .024	+ .061	- .713	- 1.804					
F.S. LAT.	10799.507 N	10799.531 N	10799.568 N	10798.794 N	10797.703 N					
SINE BEARING										
STA. DEP.	7545.600	7545.600	7545.600	7545.600	7545.600					
DIFF.	- 8.527	- 9.610	- 9.624	- 9.303	- 9.235					
F.S. DEP.	7537.073 E	7535.990 E	7535.976 E	7536.297 E	7536.365 E					
GRADE CALC.										
F.S. GRADE ELV.										
GRADE CHAIN										
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.			
CALCULATED BY:	WS	"	"	"	"	"	"			
CHECKED BY:	PAH	"	"	"	"	"	"			
DATE	APR. 21 / 76	"	"	"	"	"	"			
FIELD PAGE NO.	494 - 495	"	"	"	"	"	"			

APRIL 21/76

<u>458</u> ①	10798.097	7534.735
	<u>10797.873</u>	<u>7534.521</u>
-	.224	- .214

1136.292 Collar  
 1136.283  
.009 VD

$\frac{.214}{.224} =$  HD = .310  
 Brq S 43-41-31 W  
 Az 223 41 31

DIP  $\frac{.009}{.310} + 1-39-46$

<u>458</u> ②	10798.209	7534.794
	<u>10798.020</u>	<u>7534.592</u>
-	.189	- .202

1136.105 Collar  
 1136.100 End  
.005

$\frac{.202}{.189} =$  HD = .277  
 Brq = S 46-54-15 W  
 Az = 226 54 15

DIP  $\frac{.005}{.277} + 1-02-03$

<u>459</u>	10798.737	7535.574
	<u>10798.160</u>	<u>7534.893</u>
-	.577	- .621

1136.303  
 1135.444 Collar  
.859

$\frac{.621}{.577} =$  HD = .848  
 Brq S 47 06 12 W  
 Az 227 06 12

DIP  $\frac{.859}{.848} - 45 22 09$

<u>460</u>	10799.368	7535.886
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1134.969 Collar ⊖

<u>461</u>	10799.082	7535.677
------------	-----------	----------

1135.001 Collar ⊖

<u>462</u>	10798.958	7535.584
	<u>10798.093</u>	<u>7534.797</u>
-	.865	- .787

1136.044 End  
 1135.596 Collar  
.448

$\frac{.787}{.865} =$  HD = 1.169  
 Brq S 42 17 48 W  
 Az 222 17 48

DIP =  $\frac{.448}{1.169} - 20 58 06$

<u>463</u>	10798.806	7535.488
	<u>10798.012</u>	<u>7534.767</u>
-	.794	- .721

1137.448 Collar  
 1136.765 End  
.683

$\frac{.721}{.794} =$  HD = 1.073  
 Brq = S 42 14 29 W  
 Az = 222 14 29

DIP  $\frac{.683}{1.073} + 32 28 41$

$$\begin{array}{r} \underline{46} \quad 10799.886 \quad 75.407 \\ - 10799.507 \quad - 7537.073 \\ \hline \quad .379 \quad .334 \end{array}$$

$$\frac{.334}{.379} = \text{HD} = \frac{.505}{1.505}$$

Brig = S 41 23 19 W  
Az = 221 23 19

$$\begin{array}{r} 1138.802 \text{ Collar} \\ 1137.775 \text{ End} \\ \hline 1.027 \end{array}$$

$$\text{Dip} = \frac{1.027}{.505} + 63 \text{ } 48 \text{ } 56$$

$$\begin{array}{r} \underline{465} \quad 10799.531 \quad 7535.990 \\ + 10799.568 \quad - 7535.976 \\ \hline \quad .037 \quad - .014 \end{array}$$

$$\frac{.014}{.037} = \text{HD} = \frac{.040}{.359}$$

Brig = N 20 43 32 W  
Az = 339 16 28

$$\begin{array}{r} 1139.029 \text{ Collar} \\ 1137.787 \text{ End} \\ \hline 1.242 \end{array}$$

$$\text{Dip} = \frac{1.242}{.037} + 88 \text{ } 09 \text{ } 19$$

$$\begin{array}{r} \underline{466} \quad 10798.794 \quad 7536.297 \\ - 10797.703 \quad + 7536.365 \\ \hline \quad 1.091 \quad + .068 \end{array}$$

$$\frac{.068}{1.091} = \text{HD} = \frac{1.093}{1.29}$$

Brig = S 3 33 59 E  
Az = 176 26 01

$$\begin{array}{r} 1136.900 \text{ Collar} \\ 1136.438 \text{ End} \\ \hline .462 \end{array}$$

$$\text{Dip} = \frac{.462}{1.093} + 22 \text{ } 54 \text{ } 48$$

U-74  
 U-78  
 U-76

~~U-76~~

~~76-025~~  
~~76-023~~

	BS	76-024	"	"	"	"	"
	STA	76-029	"	"	"	"	"
	FS	U-78 C	U-78 E	U-74-C	U-74-E	U-76-C	U-76-E.
①	M. DIST	12.666	11.820	12.662	11.966	12.720	11.956
②	V <sub>z</sub>	+00° 02' 40"	-00° 35' 30"	-00° 21' 30"	-00° 52' 40"	+00° 00' 40"	-00° 23' 20"
③	STA. ELEV.	1177.664	"	"	"	"	"
	H.I.	-2.710	"	"	"	"	"
	H.P	∅	∅	∅	∅	∅	∅
	F.S. ELEV	(1174.964)	(1174.832)	(1174.875)	(1174.771)	(1174.957)	(1174.873)
④	AZ. STA. TO BS	311° 09' 19"	"	"	"	"	"
⑤	HOR. <sub>z</sub>	188° 31' 20"	188° 48' 10"	192° 06' 20"	191° 43' 20"	196° 29' 10"	194° 52' 10"
	AZ STA TO FS	139° 40' 39"	139° 57' 29"	143° 15' 39"	142° 52' 39"	147° 38' 29"	146° 01' 29"
	HOR. DIST.	12.664	11.819	12.662	11.965	12.720	11.956
⑥	STA LAT.	10,608.611	<del>103</del> "	"	"	"	"
	F.S. LAT.	(10,598.954)	(10,599.562)	(10,598.464)	(10,599.071)	(10,597.866)	(10,598.696)
⑦	STA DEP.	7,721.449	"	"	"	"	"
	F.S. DEP	(7729.645)	(7729.053)	(7729.023)	(7,728.670)	(7728.257)	(7728.130)

dip = +8° 50'  
 az = 135° 46'

dip = +8° 25'  
 az = 149° 49'

dip = +5° 43'  
 az = 171° 18'





B.S.	76-017	76-017	76-017	76-017	76-017	76-017	76-017
S.T.A.	TP	TP	TP	TP	TP	TP	TP
F.S.	U-73 COLLAR	U-67 END	U-67 COLLAR	U-72 END	U-72 COLLAR	U-68 END	U-68 COLLAR
MEAS. DISTANCE	7.592	8.692	9.044	7.878	8.280	8.424	8.854
VERT. ANGLE	-10-38-30	-05-31-00	-05-12-00	-14-11-00	-19-38-00	-2-00-00	+02-28-00
SINE - V.A.	.18467	.09614	.09063	.24503	.33600	.03490	.04304
COSINE - V.A.	.98280	.99537	.99588	.96952	.94186	.99939	.99907
STA. ELEVATION	1125.885						
H.I.	+1.520	+1.520	+1.520	+1.520	+1.520	+1.520	+1.520
INST. HEIGHT	1127.405	1127.405	1127.405	1127.405	1127.405	1127.405	1127.405
DISTANCE	-1.402	-0.836	-0.820	-1.930	-2.782	-0.294	+0.381
DIFF.	1126.003	1126.569	1126.585	1125.475	1124.623	1127.111	1127.786
H.P.	0	0	0	0	0	0	0
F.S. ELEVATION	1126.003	1126.569	1126.585	1125.475	1124.623	1127.111	1127.786
AZ. B.S. TO STA.							
±180 - 00' - 00"							
AZ. STA. TO B.S.	325-59-15	325-59-15	325-59-15	325-59-15	325-59-15	325-59-15	325-59-15
HORIZ. ANGLE	317-23-20	332-31-00	326-14-00	333-50-40	329-47-40	326-31-20	320-12-10
-360 - 00' - 00"	643-22-35	658-30-15	652-13-15	659-49-55	655-46-55	652-30-35	646-11-25
AZ. STA. TO F.S.	283-22-35	298-30-15	292-13-15	299-49-55	295-46-55	292-30-35	286-11-25
BEARING							
HORIZ. DISTANCE	7.461	8.652	9.007	7.638	7.799	8.419	8.846
COSINE BEARING							
STA. LAT.	10 839.346	10 839.346	10 839.346	10 839.346	10 839.346	10 839.346	10 839.346
DIFF.	+1.726	+4.129	+3.406	+3.800	+3.392	+3.223	+2.466
F.S. LAT.	10 841.072 N	10 843.475 N	10 842.752 N	10 843.146 N	10 842.738 N	10 842.569 N	10 841.812 N
SINE BEARING							
STA. DEP.	7 502.015	7 502.015	7 502.015	7 502.015	7 502.015	7 502.015	7 502.015
DIFF.	-7.259	-7.603	-8.338	-6.626	-7.023	-7.778	-8.495
F.S. DEP.	7 494.756 E	7 494.412 E	7 493.677 E	7 495.389 E	7 494.992 E	7 494.237 E	7 493.520 E
GRADE CALC.	✓		✓		✓		✓
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	ROA	"	"	"	"	"	ROA
CHECKED BY:	TJL	"	"	"	"	"	TJL
DATE	18 MAY 76	"	"	"	"	"	18 MAY 76
FIELD PAGE NO.	515	515	515	516	516	516	516

U-77 END = 10844.074 - 7495.977 1125.631  
 U-77 COL = 10844.451 - 7496.313 1124.893  
 + 0.377 + 0.336 - 0.738  
 0.505 N 41-42-32 E DIP = -55-37-01  
 221-42-32

U-75 END = 10843.261 - 7495.295 1125.643  
 U-75 COL = 10843.472 - 7495.470 1124.589  
 + 0.211 + 0.175 - 1.054  
 0.274 N 39-40-18 E DIP = -75-25-40

U-79 END = 10842.619 - 7495.003 1125.661  
 U-79 COL = 10841.867 - 7494.408 1125.110  
 - 0.752 - 0.595 - 0.551  
 0.959 S 38-21-07 W - 29-52-47  
 218-21-07

U-73 END = 10842.068 - 7495.047 1125.980  
 U-73 COL = 10841.072 - 7494.756 1126.003  
 - 0.996 - 0.291 + 0.023  
 1.038 S 16-17-12 W + 01-16-09  
 196-17-12

U-67 END = 10843.475 - 7494.412 1126.569  
 U-67 COL = 10842.752 - 7493.677 1126.585  
 - 0.723 - 0.735 + 0.016  
 1.031 S 45-28-17 W + 00-53-21

U-72 END = 10843.146 - 7495.389 1125.475  
 U-72 COL = 10842.738 - 7494.992 1124.623  
 - 0.408 - 0.397 - 0.852  
 0.569 S 44-13-01 W - 56-15-48  
 224-13-01

U-68 END = 10842.569 - 7494.237 1127.111  
 U-68 COL = 10841.812 - 7493.520 1127.786  
 - 0.757 - 0.717 + 0.675  
 1.043 S 43-26-44 W + 32-54-35  
 223-26-44

U-69 END = 10844.047 - 7495.546 1127.607  
 U-69 COL = 10843.024 - 7494.454 1130.43  
 - 1.023 - 1.092 + 2.606  
 1.497 S 46-52-07 W Dip = 60-07-30  
 226-52-07

$$U-70 \text{ END} = 10\ 843.917 - 7495.345 \quad 1128.105$$

$$U-70 \text{ COL} = \underline{10\ 844.052 - 7495.379} \quad 1130.004$$

$$+ 0.135 + 0.034 + 1.899$$

0.139 N 14-08-10 E

+ 85-48-49

$$U-71 \text{ END} = 10\ 843.746 - 7494.989 \quad 1128.110$$

$$U-71 \text{ COL} = \underline{10\ 844.371 - 7495.545} \quad 1129.904$$

$$+ 0.625 + 0.656 + 1.794$$

.836 N 41-39-23 E

+ 65-00-52

B.S.	76-017	76-017	76-017	76-017	76-017	76-017
S.T.A.	TP	TP	TP	TP	TP	TP
F.S.	U-69 END	U-69 COLLAR	U-70 END	U-70 COLLAR	U-71 END	U-71 COLLAR
MEAS. DISTANCE	8.000	8.865	8.116	8.540	8.320	8.565
VERT. ANGLE	+ 01-27-00	+ 18-28-00	+ 04-57-00	+ 17-43-00	+ 04-51-30	+ 16-58-00
SINE - V.A.	.02530	.31675	.08629	.30431	.08469	.29182
COSINE - V.A.	.99968	.94851	.99627	.95257	.99641	.95647
STA. ELEVATION	1125.885					
H.I.	+1.520	+1.520	+1.520	+1.520	+1.520	+1.520
INST. HEIGHT	1127.405	1127.405	1127.405	1127.405	1127.405	1127.405
DISTANCE	+ 0.202	+ 2.808	+ 0.700	+ 2.599	+ 0.705	+ 2.499
DIFF.	1127.607	1130.213	1128.105	1130.004	1128.110	1129.904
H.P.	0	0	0	0	0	0
F.S. ELEVATION	1127.607	1130.213	1128.105	1130.004	1128.110	1129.904
AZ. B.S. TO STA.						
±180 - 00' - 00"						
AZ. STA. TO B.S.	325-59-15	325-59-15	325-59-15	325-59-15	325-59-15	325-59-15
HORZ. ANGLE	340-01-00	329-57-00	338-26-00	339-2-30	336-04-00	341-51-00
-360 - 00' - 00"	666-00-15	655-56-15	664-25-15	665-20-45	662-03-15	667-50-15
AZ. STA. TO F.S.	306-00-15	295-56-15	304-25-15	305-20-45	302-03-15	307-50-15
BEARING						
HORZ. DISTANCE	7.997	8.408	8.086	8.135	8.290	8.192
COSINE BEARING						
STA. LAT.	10 839.346	10 839.346	10 839.346	10 839.346	10 839.346	10 839.346
DIFF.	+ 4.701	+ 3.678	+ 4.571	+ 4.706	+ 4.400	+ 5.025
F.S. LAT.	10 844.047 N	10 843.024 N	10 843.917 N	10 844.052 N	10 843.746 N	10 844.371 N
SINE BEARING						
STA. DEP.	7 502.015	7 502.015	7 502.015	7 502.015	7 502.015	7 502.015
DIFF.	- 6.469	- 7.561	- 6.670	- 6.636	- 7.026	- 6.470
F.S. DEP.	7 495.546 E	7 494.454 E	7 495.345 E	7 495.379 E	7 494.989 E	7 495.545 E
GRADE CALC.		✓		✓		✓
F.S. GRADE ELV.						
GRADE CHAIN						
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.
CALCULATED BY:	ROAD	"	"	"	"	ROAD
CHECKED BY:	SP	"	"	"	"	SP
DATE	18 MAY 76	"	"	"	"	18 MAY 76
FIELD PAGE NO.	516	516	516	516	516	516



B.S.	75-048	76-031	76-031	76-018	76-018	76-018	76-018
S.T.A.	75-050	76-035	76-035	76-012	76-012	76-012	76-012
F.S.	U-86 COL	U-94- <del>END</del>	U-94 COL	U-81 <del>END</del>	U-81 Collar	U-83 <del>END</del>	U-83 Collar
MEAS. DISTANCE	4.150	6.850	7.948		16.050		16.500
VERT. ANGLE	-13-20-00	-08-06-00	-06-58-00		-4-55-40		+7-59-20
SINE - V.A.	.23062	.14090	.12129		.08590		.13898
COSINE - V.A.	.97304	.99002	.99262		.99630		.99030
STA. ELEVATION	1157.251	1103.239			1140.963		1140.963
H.I.	-2.300	-2.490	-2.490		-1.795		-1.795
INST. HEIGHT	1154.951	1100.749	1100.749		1139.168		1139.168
DISTANCE	-0.957	-0.965	-0.964		-1.379		+2.293
DIFF.	1153.994	1099.784	1099.785				1141.461
H.P.	0	0	0		0		+0.600
F.S. ELEVATION	1153.994	1099.784			1137.789		1142.061
AZ. B.S. TO STA.		313-32-45			224 26 00		
±180 -00' -00"		180			-180		
AZ. STA. TO B.S.	240-40-19	133-32-45	133-32-45		44 26 00		44 26 00
HORZ. ANGLE	177-14-20	215-19-20	215-07-40		356 49 20		357 37 40
-360 -00' -00"	417-54-39	348-52-05	348-40-25		401 15 20		402 03 40
AZ. STA. TO F.S.	57-54-39				41 15 20		42 03 40
BEARING							
HORZ. DISTANCE	4.038	6.782	7.889		15.991		16.340
COSINE BEARING							
STA. LAT.	10 780.219	10 960.392	10 960.392		10 823.022		10 823.022
DIFF.	+2.145	+6.654	+7.735		+12.022		+12.131
F.S. LAT.	10 782.364 N	10 967.046 N	10 968.127 N		10 835.044 N		10 835.153 N
SINE BEARING							
STA. DEP.	7 689.829	7 379.865	7 379.865		7 559.785		7 559.785
DIFF.	+3.421	-1.309	-1.549		+10.545		+10.947
F.S. DEP.	7 693.250 E	7 378.556 E	7 378.316 E		7 570.330 E		7 570.732 E
GRADE CALC.							
BEAR. & DIP CALC		1.081-0.240	0.009				
F.S. GRADE ELV.		N 12-31-03W	1.107				
GRADE CHAIN		341-28-57	FLAT		DIP = -90°		DIP = +90°
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	ROA	ROA	ROA		WS		WS
CHECKED BY:		P.J.G.	P.J.G.				
DATE	20 MAY 76	24 MAY 76	24 MAY 76		29 MAY 76		29 MAY 76
FIELD PAGE NO.	516						

B.S.	76 018	76 018	76 018	76 018	76 018	76 018	
S.T.A.	76 012	76 012	76 012	76 012	76 012	76 012	
F.S.	485 END	485 COL	487 END	487 COL	489 END	489 COL	
MEAS. DISTANCE	15.766	15.646	14.186	13.382	2.222	3.260	
VERT. ANGLE	+7-35-20	+9-04-30	-00-41-40	-5-42-00	+34-54-40	+41-14-20	
SINE - V.A.	.13206	.15773	.01212	.09932	.57230	.65920	
COSINE - V.A.	.99124	.98748	.99993	.99506	.82004	.75197	
STA. ELEVATION	1140.963						
H.I.	- 1.795						
INST. HEIGHT	1139.168	1139.168	1139.168	1139.168	1139.168	1139.168	
DISTANCE	+ 2.082	+ 2.468	- 0.172	- 1.329	+ 1.272	+ 2.149	
DIFF.	1141.250	1141.636	1138.996	1137.839			
H.P.	-	-	-	-	-	-	
F.S. ELEVATION	1141.250	1141.636	1138.996	1137.839	1140.440	1141.317	
AZ. B.S. TO STA.							
±180 - 00' - 00"							
AZ. STA. TO B.S.	44 26 00	44 26 00	44 26 00	44 26 00	44 26 00	44 26 00	
HORZ. ANGLE	358 35 00	358 32 20	355 37 20	355 23 00	153 19 00	154 14 40	
- 360 - 00' - 00"	403 01 00	402 58 20	400 03 20	399 49 00	197 45 00	198 40 40	
AZ. STA. TO F.S.	43 01 00	42 58 20	40 03 20	39 49 00			
BEARING							
HORZ. DISTANCE	15.628	15.450	14.185	13.316	1.822	2.451	
COSINE BEARING							
STA. LAT.	10 823.022	10 823.022	10 823.022	10 823.022	10 823.022	10 823.022	
DIFF.	+ 11.426	+ 11.304	+ 10.857	+ 10.228	- 1.735	- 2.322	
F.S. LAT.	10834.448 N	10834.326 N	10833.879 N	10833.250 N	10821.287 N	10820.700 N	N
SINE BEARING							
STA. DEP.	7559.785	7559.785	7559.785	7559.785	7559.785	7559.785	
DIFF.	+ 10.662	+ 10.531	+ 9.128	+ 8.527	- .555	- .785	
F.S. DEP.	7570.447 E	7570.316 E	7568.913 E	7568.312 E	7559.230 E	7559.000 E	E
GRADE CALC.							
	AZ = 227° 02' 14"		AZ = 223° 41' 45"		AZ 201° 23' 47"		
	DIP = + 65° 07' 17"		DIP = - 53° 03' 32"		DIP = + 54° 18' 29"		
F.S. GRADE ELV.	N 10 834.141		N 10 833.250		N 10 820.700		
GRADE CHAIN	E 7570.116		E 7568.312		E 7559.000		
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R. P. M.	L. R. P. M.	L. R. P. M.	L. R. P. M.	
CALCULATED BY:	Elev Collar = 1142.226		Elev Collar = 1137.839		Elev. Collar = 1141.317		
CHECKED BY:	WS		-		-		
DATE	29 MAY 76		-		-		
FIELD PAGE NO.							

10 603.883	-	7732.368	1174.940
10 603.298	-	7732.983	1175.072
<u>- 0.585</u>		<u>+ 0.615</u>	<u>0.132</u>

DIST. = 0.849

DIP + 8 - 56 - 40

S 46 - 25 - 55 E

133 - 34 - 05

10 603.376	-	7732.004	1174.879
10 602.784	-	7732.380	1174.983
<u>- 0.592</u>		<u>+ 0.376</u>	<u>0.104</u>

D = 0.701

S 32 - 25 - 16 E

DIP + 8 - 31 - 55

147 - 34 - 44

10 602.982	-	7731.479	1174.981
10 602.157	-	7731.638	1175.064
<u>- 0.825</u>		<u>+ 0.159</u>	<u>0.083</u>

70  
85

D = 0.840

S 10 - 54 - 31 E

DIP + 5 - 40 - 14

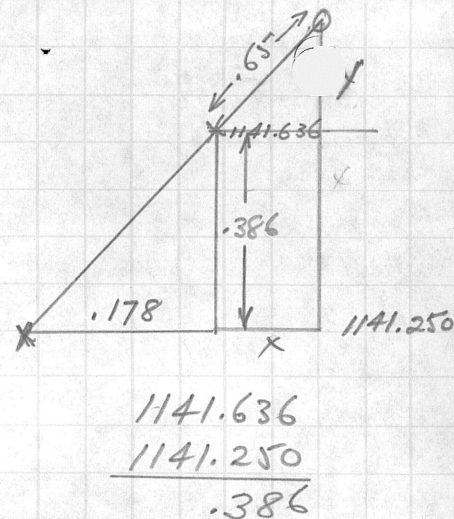
169 - 05 - 29

U 5

END	10834.448	7570.447
COL	<u>10834.327</u>	<u>7570.316</u>
	- 0.121	- 0.131

$\frac{.131}{.122} = HD = .179$   
 BRG = S  $47^{\circ}02'14''$  W  
 Az =  $227^{\circ}02'14''$

DIP =  $\frac{.386}{.179} = +65^{\circ}07'17''$  ( $+65^{\circ}$ )



$$\sin 65^{\circ}14'37'' = \frac{y}{.65}$$

$$\begin{aligned}
 y &= \sin 65^{\circ}07'17'' \times .65 \\
 &= .90720 \times .65 \\
 y &= .590
 \end{aligned}$$

$$\cos 65^{\circ}14'37'' = \frac{x}{.65}$$

$$\begin{aligned}
 x &= \cos 65^{\circ}07'17'' \times .65 \\
 &= .42070 \times .65 \\
 &= .273
 \end{aligned}$$

$$\begin{aligned}
 \text{Elev Collar} &= 1141.636 \\
 &+ .590 \\
 \hline
 &1142.226
 \end{aligned}$$

$227^{\circ}02'14'' @ .273$

$$\begin{aligned}
 &10834.327 \\
 &- .186 \\
 \hline
 &10834.141
 \end{aligned}$$

$$\begin{aligned}
 &7570.316 \\
 &- .200 \\
 \hline
 &7570.116
 \end{aligned}$$

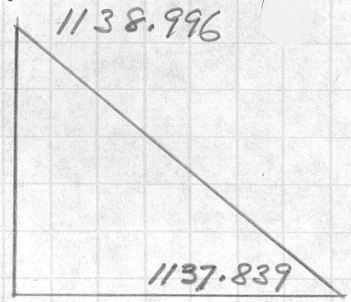
U 7

END	10833.879	7568.913
COL	10833.250	7568.312
	<u>          .629</u>	<u>          .601</u>

$\frac{.601}{.629} = \text{HD } .870$   
 BRG S 43° 41' 45" W  
 AZ 223° 41' 45"

DIP =  $\frac{1.157}{.870} = -53^{\circ} 03' 32''$   
 (-53°)

1138.996  
 1137.839  
          1.157



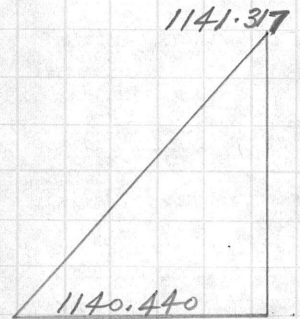
U 89

	10821.287	7559.230
	10820.700	7559.000
	<u>          .587</u>	<u>          .230</u>

$\frac{.230}{.587} = \text{HD } .630$   
 BRG S 21° 23' 47" W  
 AZ 201° 23' 47"

DIP =  $\frac{.877}{.630} = +54^{\circ} 18' 29''$   
 (+53°)

1141.317  
 1140.440  
          0.877



B.S.	76 010	TP1	TP1	TP1	TP1	TP1	TP1
S.T.A.	TP1	TP2	TP2	TP2	TP2	TP2	TP2
F.S.	TP2	U 88 Collar	U90 End	U90 Collar	U92 End	U92 Collar	U100 Collar
MEAS. DISTANCE	35.43	4.340	2.674	3.120	3.796	4.454	5.264
VERT. ANGLE	+ 0-26-00	- 20 05 30	- 13-13-30	- 29 47 50	- 7 21 30	- 6 15 20	+ 16 18 40
SINE - V.A.	.	.34352					
COSINE - V.A.		.93914					
STA. ELEVATION	1157.066	1156.184					
H.I.	- 1.150	+ 1.360					
INST. HEIGHT	1155.916	1157.544	1157.544	1157.544	1157.544	1157.544	1157.544
VERT. DISTANCE	+ .268	- 1.491	- .612	- 1.550	- .486	- .485	+ 1.478
DIFF.	1156.184		1156.932	1155.994			
H.P.	0						
F.S. ELEVATION	1156.184	1156.053	1156.932	1155.994	1157.058	1157.059	1159.022
AZ. B.S. TO STA.	314 25 52	133 37 12					
± 180 - 00' - 00"	- 180	+ 180					
AZ. STA. TO B.S.	134 25 52	313 37 12	313 37 12	313 37 12	313 37 12	313 37 12	313 37 12
HORZ. ANGLE	359 11 20	193 26 00	168 30 00	157 54 20	226 46 00	233 52 40	220 06 00
- 360 - 00' - 00"	493 37 12	507 03 12	482 07 12	471 31 32	540 23 12	547 29 52	533 43 12
AZ. STA. TO F.S.	133 37 12	147 03 12	122 07 12	111 31 32	180 23 12	187 29 52	173 43 12
BEARING							
HORZ. DISTANCE	35.429	4.076	2.603	2.708	3.765	4.427	5.052
COSINE BEARING							
STA. LAT.	10778.312	10753.871	10753.871	10753.871	10753.871	10753.871	10753.871
DIFF.	- 24.441	- 3.420	- 1.384	- .994	- 3.765	- 4.389	- 5.022
F.S. LAT.	10753.871 N	10750.451 N	10752.487 N	10752.877 N	10750.106 N	10749.482 N	10748.849 N
SINE BEARING							
STA. DEP.	7705.296	7730.944	7730.944	7730.944	7730.944	7730.944	7730.944
DIFF.	+ 25.648	+ 2.217	+ 2.204	+ 2.519	- .025	- .578	+ .553
F.S. DEP.	7730.944 E	7733.161 E	7733.148 E	7733.463 E	7730.919 E	7730.366 E	7731.497 E
GRADE CALC.		Dip - 90°		A <sub>3</sub> 38° 55' 39" Dip - 61° 53' 33"		A <sub>3</sub> 221° 32' 52" Dip ⊕	A <sub>3</sub> 222° 29' 25" Dip + 35° 06' 49"
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	WS	WS	WS	WS	WS	WS	WS
CHECKED BY:							
DATE	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76
FIELD PAGE NO.	540 - 543	-	-	-	-	-	-

U90  
 E 10752.487 773.148  
 Collar 10752.877 7733.463  
 + .390 + .315

$\frac{.315}{.390} =$  HD .501  
 BRG N 38° 55' 39" E  
 Az 38° 55' 39"

End 1158.932  
 Collar 1155.994  
 .938

Dip =  $\frac{.938}{.501} = -61^{\circ} 53' 33''$

U92 End 10750.106 7730.919  
 Collar 10749.482 7730.366  
 - .624 - .553

$\frac{.553}{.624} =$  HD .834  
 BRG S 41° 32' 52" W  
 Az 221° 32' 52"

Dip ⊖

U96 End 10749.915 7731.141  
 Collar 10749.376 7730.672  
 - .539 - .469

$\frac{.469}{.539} =$  HD .714  
 BRG S 41° 01' 39" W  
 Az 221° 01' 39"

Collar 1158.055  
 End 1157.805  
 + .250

Dip =  $\frac{.250}{.714} = +19^{\circ} 17' 50''$

U98A End 10750.183 7731.484  
 Collar 10749.842 7731.181  
 - .341 - .303

$\frac{.303}{.341} =$  HD .456  
 BRG S 41° 37' 23" W  
 Az 221° 37' 23"

-65° Dip

$\frac{.867}{.456} = -62^{\circ} 15' 28'' ??$

U98 End 10749.483 7731.820  
 Collar 10749.231 7731.637  
 - .252 - .183

$\frac{.183}{.252} =$  HD .311  
 BRG S 35° 59' 12" W  
 Az 215° 59' 12"

1156.814  
 1156.092

$\frac{.722}{.311} = -66^{\circ} 41' 46''$

U100 End 10749.31' 7731.966  
 Collar 10748.841 7731.497  
 - .512 - .469

$\frac{.469}{.512} = HD .694$   
 Brg S 42° 29' 25" W  
 Az 222° 29' 25"

End 1158.534 + .488

Dip =  $\frac{.488}{.694} = + 35° 06' 49"$

U102 End 10750.010 7732.043  
 Collar 10749.741 7731.795  
 - .269 - .248

$\frac{.248}{.269} = HD .366$   
 Brg S 42° 40' 26" W  
 Az 222° 40' 26"

Collar 1160.637  
 End 1159.836 + .801

Dip =  $\frac{.801}{.366} = + 65° 26' 35"$

U104 End 10751.095 7732.938  
 Collar 10751.375 7733.202  
 + .280 + .264

$\frac{.264}{.280} = HD .385$   
 Brg N 43° 18' 55" E  
 Az 43° 18' 55"

Collar 1160.596  
 End 1159.823 + .773

Dip =  $\frac{.773}{.385} = + 63° 31' 26"$

U106 End 10751.661 7733.958  
 Collar 10752.194 7734.480  
 + .533 + .522

$\frac{.522}{.533} = HD .746$   
 Brg N 44° 24' 09" E  
 Az 44° 24' 09"

Dip = 0

End 1156.713  
 Collar 1156.252 - .461

U108 End 10751.014 7734.383  
 Collar 10751.562 7734.922  
 + .548 + .539

$\frac{.539}{.548} = HD .769$   
 Brg N 44° 31' 32" E  
 Az 44° 31' 32"

Dip =  $\frac{.461}{.769} = - 28° 24' 42"$   
 30° 56' 30"

B.S.	TP 1	TP 1	TP 1	TP 1	TP 1	TP 1	TP 1
S.T.A.	TP 2	TP 2	TP 2	TP 2	TP 2	TP 2	TP 2
F.S.	496 End	496 Collar	498A End	498A Collar	498 End	498 Collar	4100 End
MEAS. DISTANCE	3.970	4.532	3.782	4.310	4.534	4.912	4.730
VERT. ANGLE	+ 3 46 30	+ 6 28 40	- 9 48 20	- 20 31 20	- 9 16 20	- 17 12 00	+ 12 05 00
SINE - V.A.							
COSINE - V.A.							
STA. ELEVATION							
H.I.							
INST. HEIGHT	1157.544	1157.544	1157.544	1157.544	1157.544	1157.544	1157.544
VERT. DISTANCE	+ .261	+ .511	- .644	- 1.511	- .730	- 1.452	+ .990
DIFF.							
H.P.							
F.S. ELEVATION	1157.805	1158.055	1156.900	1156.033	1156.814	1156.092	1158.534
AZ. B.S. TO STA. ±180 - 00' - 00"							
AZ. STA. TO B.S.	313 37 12	313 37 12	313 37 12	313 37 12	313 37 12	313 37 12	313 37 12
HORZ. ANGLE - 360 - 00' - 00"	223 31 30	229 50 20	218 03 20	223 00 40	215 05 20	217 53 00	213 36 30
AZ. STA. TO F.S.	537 08 42	543 27 32	531 40 32	536 37 52	528 42 32	531 30 12	527 13 42
BEARING							
HORZ. DISTANCE	3.961	4.503	3.727	4.036	4.475	4.692	4.625
COSINE BEARING							
STA. LAT.	10753.871	10753.871	10753.871	10753.871	10753.871	10753.871	10753.871
DIFF.	- 3.956	- 4.495	- 3.688	- 4.029	- 4.388	- 4.640	- 4.510
F.S. LAT.	10749.915 N	10749.376 N	10750.183 N	10749.842 N	10749.483 N	10749.231 N	10749.361 N
SINE BEARING							
STA. DEP.	7730.944	7730.944	7730.944	7730.944	7730.944	7730.944	7730.944
DIFF.	+ .197	- .272	+ .540	+ .237	+ .876	+ .693	+ 1.022
F.S. DEP.	7731.141 E	7730.672 E	7731.484 E	7731.181 E	7731.820 E	7731.637 E	7731.966 E
GRADE CALC.							
		P <sub>2</sub> 221° 01' 39" Dip +19° 17' 50"		P <sub>2</sub> 221° 37' 23" Dip -62° 15' 28"		P <sub>2</sub> 215° 59' 12" Dip -66° 41' 46"	
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	WS	WS	WS	WS	WS	WS	WS
CHECKED BY:							
DATE	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76
FIELD PAGE NO.	540 - 543	-	-	-	-	-	-

B.S.	TP 1	TP 1	TP 1	TP 1	TP 1	TP 1	TP 1
S.T.A.	TP 2	TP 2	TP 2	TP 2	TP 2	TP 2	TP 2
F.S.	U102 End	U102 Collar	U104 End	U104 Collar	U106 End	U106 collar	U108 End.
MEAS. DISTANCE	4.622	5.230	4.108	4.544	3.750	3.925	4.548
VERT. ANGLE	+29 43 30	+36 15 40	+33 41 30	+42 12 00	-4 30 20	-4 15 20	-10 -31-50
SINE - V.A.							
COSINE - V.A.							
STA. ELEVATION							
H.I.							
INST. HEIGHT	1157.544	1157.544	1157.544	1157.544	1157.544	1157.544	1157.544
VERT. DISTANCE	+ 2.292	+ 3.093	+ 2.279	+ 3.052	- .294	- .291	- .831
DIFF.							
H.P.							
F.S. ELEVATION	1159.836	1160.637	1159.823	1160.596	1157.250	1157.253	1156.713
AZ. B.S. TO STA. ±180 - 00' - 00"							
AZ. STA. TO B.S.	313 37 12	313 37 12	313 37 12	313 37 12	313 37 12	313 37 12	313 37 12
HORZ. ANGLE - 360 - 00' - 00"	210 29 40	214 44 20	190 41 20	184 15 20	172 38 00	161 45 00	176 05 40
AZ. STA. TO F.S.	164 06 52	168 21 32	144 18 32	137 52 32	126 15 12	115 22 12	129 42 52
BEARING							
HORZ. DISTANCE	4.014	4.217	3.418	3.366	3.738	3.914	4.471
COSINE BEARING							
STA. LAT.	10 753.871	10 753.871	10 753.871	10 753.871	10 753.871	10 753.871	10 753.871
DIFF.	- 3.861	- 4.130	- 2.776	- 2.496	- 2.210	- 1.677	- 2.857
F.S. LAT.	10 750.010 N	10 749.741 N	10 751.095 N	10 751.375 N	10 751.661 N	10 752.194 N	10 751.014 N
SINE BEARING							
STA. DEP.	7730.944	7730.944	7730.944	7730.944	7730.944	7730.944	7730.944
DIFF.	+ 1.099	+ .851	+ 1.994	+ 2.258	+ 3.014	+ 3.536	+ 3.439
F.S. DEP.	7732.043 E	7731.795 E	7732.938 E	7733.202 E	7733.958 E	7734.480 E	7734.383 E
GRADE CALC.							
		A <sub>2</sub> 222° 40' 26" Dip +65° 26' 35"		A <sub>2</sub> 43° 18' 55" Dip +63° 31' 26"		A <sub>2</sub> 44° 24' 09" Dip 0	
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	WS	WS	WS	WS	WS	WS	WS
CHECKED BY:							
DATE	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76	JUNE 27/76
FIELD PAGE NO.	540 - 543	-	-	-	-	-	-

B.S.	TP 1	76014					
S.T.A.	TP 2	76016					
F.S.	U 108 collar	U-120 E	U-120 C	U-112 E	U-112 C	U-114 E	U-114 C
MEAS. DISTANCE	4.778	4.438	4.826	3.670	3.968	3.454	3.716
VERT. ANGLE	- 15 41 00	- 10 - 45 - 30	- 09 - 54 - 20	- 08 - 17 - 40	- 31 - 45 - 40	- 13 - 56 - 00	- 12 - 50 - 00
SINE - V.A.							
COSINE - V.A.							
STA. ELEVATION		1138.504					
H.I.		- 3.455					
INST. HEIGHT	1157.544	1135.049	1135.049	1135.049	1135.049	1135.049	1135.049
VERT. DISTANCE	- 1.292	- 0.828	- 0.830	- 0.529	- 2.089	- 0.832	- 0.825
DIFF.							
H.P.							
F.S. ELEVATION	1156.252	1134.221	1134.219	1134.520	1132.960	1134.217	1134.224
AZ. B.S. TO STA. ±180 - 00' - 00"							
AZ. STA. TO B.S.	313 37 12	153 - 47 - 21	153 - 47 - 21	153 - 47 - 21	153 - 47 - 21	153 - 47 - 21	153 - 47 - 21
HORZ. ANGLE - 360 - 00' - 00"	166 30 40	198 - 49 - 00	203 - 46 - 20	179 - 54 - 40	165 - 23 - 30	143 - 59 - 40	132 - 00 - 00
AZ. STA. TO F.S.	480 07 52	352 - 36 - 21	357 - 33 - 41	333 - 42 - 01	319 - 10 - 51	297 - 47 - 01	285 - 47 - 21
BEARING							
HORZ. DISTANCE	4.600	4.360	4.754	3.632	3.374	3.352	3.623
COSINE BEARING							
STA. LAT.	10 753.871	10890.965	10890.965	10890.965	10890.965	10890.965	10890.965
DIFF.	- 2.309	+ 4.324	+ 4.750	+ 3.256	+ 2.553	+ 1.562	+ 0.986
F.S. LAT.	10751.562 N	10895.289 N	10895.715 N	10894.221 N	10893.518 N	10892.527 N	10891.951 N
SINE BEARING							
STA. DEP.	7730.944	7628.549	7628.549	7628.549	7628.549	7628.549	7628.549
DIFF.	+ 3.978	- 0.561	- 0.202	- 1.609	- 2.205	- 2.966	- 3.486
F.S. DEP.	7734.922 E	7627.988 E	7628.347 E	7626.940 E	7626.344 E	7625.583 E	7625.063 E
GRADE CALC.	R <sub>2</sub> 44° 31' 32" Dip - 30° 56' 30"	0.359 0.426	0.002 0.557	0.596 0.703	1.560 .922	.520 0.576	.007 0.776
F.S. GRADE ELV.		N 40 - 07 18 E	- 00 - 12° 20'	S 40 - 17 - 28 W	- 59 - 24 - 57.	S 42 - 04 30 W	+ 00 - 31 - 00
GRADE CHAIN				220 - 17 - 28		222 - 04 30	
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	WS						
CHECKED BY:							
DATE	JUNE 27/76				29/06/76.		
FIELD PAGE NO.	540 - 543				543 - 544.		

B.S.									
S.T.A.									
F.S.	U-116 E	U-116 C	U-118 E	U-118 C	U-110 C				
MEAS. DISTANCE	3.335	3.824	3.500	4.102	4.340				
VERT. ANGLE	+12 37 -20	+21 -39 -30	+42 -30 -00	+49 -18 .50	-28 -26 -00				
SINE - V.A.									
COSINE - V.A.									
STA. ELEVATION									
H.I.									
INST. HEIGHT	1135.049	1135.049	1135.049	1135.049	1135.049				
VERT. DISTANCE	+ 0.729	+ 1.411	+ 2.365	+ 3.111	- 2.066				
DIFF.									
H.P.									
F.S. ELEVATION	1135.778	1136.460	1137.414	1138.160	1132.983				
AZ. B.S. TO STA. ±180 - 00' - 00"									
AZ. STA. TO B.S.	153-47-21	153-47-21	153-47-21	153-47-21	153-47-21				
HORZ. ANGLE - 360 - 00' - 00"	140-36-40.	130-12-40.	159-42-30.	155-41-10.	187-43-30				
AZ. STA. TO F.S.	294.24 01	284.00- 01	313.29 .51	309.28 .31	341.30 .51				
BEARING									
HORZ. DISTANCE	3.254	3.554	2.580	2.674	3.816				
COSINE BEARING									
STA. LAT.	10890.965	10890.965	10890.965	10890.965	10890.965				
DIFF.	+ 1.344	+ 0.860	+ 1.776	+ 1.700	+ 3.619				
F.S. LAT.	10892.309 N	10891.825 N	10892.741 N	10892.665 N	10894.584 N				
SINE BEARING									
STA. DEP.	7628.549.	7628.549.	7628.549.	7628.549.	7628.549.				
DIFF.	- 2.963	- 3.448	- 1.872	- 2.064	- 1.210				
F.S. DEP.	7625.586 E	7625.101 E	7626.677 E	7626.485 E	7627.339 E				
GRADE CALC.	0.485 0.484	0.682 0.685	0.192 0.076	0.746 0.296					
F.S. GRADE ELV.	545-03-33 W 225°-03' 33"	+ 44-52-27.	568 24-17 W 248-24-17	+74° 33 43.					
GRADE CHAIN									
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.		
CALCULATED BY:									
CHECKED BY:									
DATE			29/06/76.						
FIELD PAGE NO.			543 - 544						14426

B.S.	76-018		76-018							
S.T.A.	LP-61		LP-61							
F.S.	U-130 (COLLAR)		U-130 (END)							
MEAS. DISTANCE	7.605		7.187							
VERT. ANGLE	+72°-53'-55"		+15°-45'-00"							
SINE - V.A.	0.389103		0.271440							
COSINE - V.A.	0.921195		0.962455							
STA. ELEVATION	1141.534		1141.534							
H.I.	-1.777		-1.777							
INST. HEIGHT										
VERT. DISTANCE	+2.959		+1.951							
DIFF.										
H.P.	0		0							
F.S. ELEVATION	1142.716 ✓		1141.708 ✓							
AZ. B.S. TO STA.	223° 23' 55"		223° 23' 55"							
±180 - 00' - 00"	-180°		-180°							
AZ. STA. TO B.S.	43° 23' 55"		43° 23' 55"							
HORZ. ANGLE	190°-36'-10"		190°-23'-20"							
- 360 - 00' - 00"										
AZ. STA. TO F.S.	234° 00' 35"		233° 46' 10"							
BEARING	S-54° 00' 35" - W		S-53° 16' 10" - W							
HORZ. DISTANCE	7.006		6.917							
COSINE BEARING	0.587773		0.590919							
STA. LAT.	10,866.998		10,866.998							
DIFF.	- 4.118		- 4.087							
F.S. LAT.	10,862.88 ✓ N		10,862.911 ✓ N							
SINE BEARING	0.809117		0.806731							
STA. DEP.	7602.953		7602.953							
DIFF.	- 5.669		- 5.580							
F.S. DEP.	7,597.284 ✓ E		7,597.373 ✓ E							
GRADE CALC.										
F.S. GRADE ELV.										
GRADE CHAIN										
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.	P. M.	L. R.	
CALCULATED BY:	R.G.									
CHECKED BY:	R.G.									
DATE	July 21, 1976.									
FIELD PAGE NO.										

HOLE # 11-130

Calc. By: L. BETTIDL  
DATE: July 23, 1976

	NORTHING	EASTING	ELEV.
11-130 (COL)	10,862.880	7,597.284	1142.716
11-130 (END)	<u>10,862.911</u>	<u>7,597.373</u>	<u>1141.708</u>
	- 0.031	- 0.089	+ 1.008

$$\text{ARC TAN AZ} = \frac{.089}{.031} = 70^{\circ} 17' 16''$$

+ 180  
(250 17' 16'')

$$h = \sqrt{(.089)^2 + (.031)^2}$$

$\therefore h = .0942$

$$\text{ARC TAN DIP} = \frac{1.008}{.0942} = (+84^{\circ} 39' 40'')$$

B.S.	<i>76-028</i>	<i>LP-72</i>	<i>LP-72</i>	<i>LP-72</i>	<i>LP-72</i>	<i>LP-72</i>	<i>LP-72</i>
S.T.A.	<i>LP-72</i>	<i>TP-1</i>	<i>TP-1</i>	<i>TP-1</i>	<i>TP-1</i>	<i>TP-1</i>	<i>TP-1</i>
F.S.	<i>TP-1</i>	<i>U-103 (COLLAR)</i>	<i>U-103 (END)</i>	<i>U-99 (COLLAR)</i>	<i>U-99 (END)</i>	<i>U-117 (COLLAR)</i>	<i>U-117 (END)</i>
MEAS. DISTANCE	<i>36.418</i>	<i>2.930</i>	<i>1.994</i>	<i>2.522</i>	<i>2.450</i>	<i>4.560</i>	<i>3.430</i>
VERT. ANGLE	<i>+9° 55' 43"</i>	<i>-24° 19' 20"</i>	<i>-5° 31' 15"</i>	<i>-28° 02' 15"</i>	<i>-11° 53' 20"</i>	<i>+1° 01' 20"</i>	<i>+1° 39' 40"</i>
SINE - V.A.	<i>0.172421</i>	<i>0.411868</i>	<i>0.096208</i>	<i>0.470019</i>	<i>0.206014</i>	<i>.017840</i>	<i>.028988</i>
COSINE - V.A.	<i>0.985023</i>	<i>0.911244</i>	<i>0.995361</i>	<i>0.882640</i>	<i>0.978519</i>	<i>0.999841</i>	<i>0.999580</i>
STA. ELEVATION <i>LP-72</i>	<i>1121.979</i>	<i>1126.714 (1124.032)</i>	<i>1126.714</i>	<i>1126.714</i>	<i>1126.714</i>	<i>1126.714</i>	<i>1126.714</i>
H.I.		<i>(-1.578)</i>	<i>(-1.578)</i>	<i>(-1.578)</i>	<i>(-1.578)</i>	<i>-1.578</i>	<i>-1.578</i>
INST. HEIGHT	<i>-2.890</i>						
VERT. DISTANCE	<i>+6.284</i>	<i>-1.207</i>	<i>-0.192</i>	<i>-1.185</i>	<i>-0.505</i>	<i>+0.081</i>	<i>+0.099</i>
DIFF.							
H.P.	<i>(21.341 (1124.032))</i>	<i>0 (1124.403)</i>	<i>0 (1125.418)</i>	<i>0 (1124.925)</i>	<i>0 (1125.105)</i>	<i>0 (1125.691)</i>	<i>0 (1125.709)</i>
F.S. ELEVATION <i>TP-1</i>	<i>1126.714 ✓</i>	<i>1123.929 ✓</i>	<i>1124.944 ✓</i>	<i>1123.951 ✓</i>	<i>1124.631 ✓</i>	<i>1125.217 ✓</i>	<i>1125.235 ✓</i>
AZ. B.S. TO STA.	<i>133° 49' 36"</i>	<i>134° 31' 46"</i>	<i>131° 31' 46"</i>	<i>131° 31' 46"</i>	<i>131° 31' 46"</i>	<i>131° 31' 46"</i>	<i>131° 31' 46"</i>
± 180 - 00' - 00"	<i>+180°</i>	<i>+180°</i>	<i>+180°</i>	<i>+180°</i>	<i>+180°</i>	<i>+180°</i>	<i>+180°</i>
AZ. STA. TO B.S.	<i>313° 49' 36"</i>	<i>314° 31' 46"</i>	<i>314° 31' 46"</i>	<i>314° 31' 46"</i>	<i>314° 31' 46"</i>	<i>314° 31' 46"</i>	<i>314° 31' 46"</i>
HORZ. ANGLE	<i>180° 42' 10"</i>	<i>121° 11' 35"</i>	<i>140° 49' 40"</i>	<i>150° 58' 10"</i>	<i>142° 21' 00"</i>	<i>114° 54' 00"</i>	<i>121° 36' 35"</i>
- 360 - 00' - 00"							
AZ. STA. TO F.S.	<i>134° - 31' - 46"</i>	<i>78° 13' 21"</i>	<i>95° 21' 26"</i>	<i>105° 29' 56"</i>	<i>96° 52' 46"</i>	<i>69° 25' 46"</i>	<i>79° 08' 21"</i>
BEARING	<i>S-15° 28' 14"-E</i>	<i>N-78° 13' 21"-E</i>	<i>S-81° 38' 31"-E</i>	<i>S-71° 30' 04"-E</i>	<i>S-83° 07' 14"-E</i>	<i>N-69° 25' 46"-E</i>	<i>N-79° 08' 21"-E</i>
HORZ. DISTANCE	<i>35.902</i>	<i>2.670</i>	<i>1.985</i>	<i>2.226</i>	<i>2.397</i>	<i>4.559</i>	<i>3.429</i>
COSINE BEARING	<i>0.701276</i>	<i>0.195561</i>	<i>.093365</i>	<i>0.267220</i>	<i>0.119781</i>	<i>0.351361</i>	<i>0.188424</i>
STA. LAT. <i>LP-72</i>	<i>10,960.995</i>	<i>10,935.818</i>	<i>10,935.818</i>	<i>10,935.818</i>	<i>10,935.818</i>	<i>10,935.818</i>	<i>10,935.818</i>
DIFF.	<i>-25.177</i>	<i>+0.522</i>	<i>-0.185</i>	<i>-0.595</i>	<i>-0.287</i>	<i>+1.602</i>	<i>+0.646</i>
F.S. LAT. <i>TP-1</i>	<i>10,935.818 ✓ N</i>	<i>10,936.340 ✓ N</i>	<i>10,935.633 ✓ N</i>	<i>10,935.223 ✓ N</i>	<i>10,935.531 ✓ N</i>	<i>10,937.420 ✓ N</i>	<i>10,936.464 ✓ N</i>
SINE BEARING	<i>0.712890</i>	<i>0.980692</i>	<i>0.994639</i>	<i>0.963636</i>	<i>0.992800</i>	<i>0.936240</i>	<i>0.982088</i>
STA. DEP. <i>LP-72</i>	<i>7,555.510</i>	<i>7,581.104</i>	<i>7,581.104</i>	<i>7,581.104</i>	<i>7,581.104</i>	<i>7,581.104</i>	<i>7,581.104</i>
DIFF. <i>TP-1</i>	<i>+25.594</i>	<i>+2.618</i>	<i>+1.974</i>	<i>+2.145</i>	<i>+2.380</i>	<i>+4.268</i>	<i>+3.368</i>
F.S. DEP.	<i>7,581.104 ✓ E</i>	<i>7,583.722 ✓ E</i>	<i>7,583.078 ✓ E</i>	<i>7,583.219 ✓ E</i>	<i>7,583.484 ✓ E</i>	<i>7,585.372 ✓ E</i>	<i>7,584.472 ✓ E</i>
GRADE CALC.							
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>
CHECKED BY:							
DATE	<i>July 23, 1976</i>	<i>July 23, 1976</i>	<i>July 23, 1976</i>	<i>July 23, 1976</i>	<i>July 23, 1976</i>	<i>July 23, 1976</i>	<i>July 23, 1976</i>
FIELD PAGE NO.							

B.S.	L.P. - 72	L.P. - 72	L.P. - 72	L.P. - 72	L.P. - 72	L.P. - 72		
S.T.A.	TP-1	TP-1	TP-1	TP-1	TP-1	TP-1		
F.S.	U-109 (COLLAR)	U-109 (END)	U-93 (COLLAR)	U-93 (END)	U-91 (COLLAR)	U-91 (END)		
MEAS. DISTANCE	1.888	3.310	13.230	11.710	13.126	11.838		
VERT. ANGLE	+30° 06' 00"	+9° 51' 00"	+5° 31' 25"	+1° 57' 40"	-1° 23' 00"	-0° 36' 40"		
SINE - V.A.	0.501511	0.171069	.096256	.034221	.021111	.010666		
COSINE - V.A.	0.865151	0.985259	0.995357	0.999114	0.999709	0.999913		
STA. ELEVATION	1126.714	1126.714	1126.714	1126.714	1126.714	1126.714		
H.I.	-1.578	-1.578	-1.578	-1.578	-1.578	-1.578		
INST. HEIGHT								
VERT. DISTANCE	+2.151	+0.566	+1.273	+0.401	-0.317	-0.126		
DIFF.								
H.P.	Ø (1128.061)	Ø (1126.176)	Ø (1126.883)	Ø (1126.011)	Ø (1125.293)	Ø (1125.484)		
F.S. ELEVATION	1127.587 ✓	1125.702 ✓	1126.409 ✓	1125.537 ✓	1124.819 ✓	1125.010 ✓		
AZ. B.S. TO STA. ±180 - 00' - 00"								
AZ. STA. TO B.S.	314° 31' 46"	314° 31' 46"	314° 31' 46"	314° 31' 46"	314° 31' 46"	314° 31' 46"		
HORZ. ANGLE - 360 - 00' - 00"	122° 42' 45"	138° 03' 35"	264° 04' 50"	263° 11' 05"	271° 56' 20"	271° 31' 40"		
AZ. STA. TO F.S.	77° 14' 31"	92° 35' 21"	218° 36' 36"	217° 42' 51"	226° 28' 06"	226° 03' 26"		
BEARING	N-77° 14' 31"-E	S-87° 24' 39"-E	S-38° 36' 36"-W	S-37° 42' 51"-W	S-46° 28' 06"-W	S-46° 03' 26"-W		
HORZ. DISTANCE	4.229	3.261	13.169	11.703	13.122	11.837		
COSINE BEARING	0.220835	.045174	0.781412	0.191072	0.688544	0.693940		
STA. LAT.	10,935.818	10,935.818	10,935.818	10,935.818	10,935.818	10,935.818		
DIFF.	+0.934	-0.147	-10.290	-9.258	-9.035	-8.214		
F.S. LAT.	10,936.752 ✓ N	10,935.671 ✓ N	10,925.528 ✓ N	10,926.560 ✓ N	10,926.783 ✓ N	10,927.604 ✓ N	N	
SINE BEARING	0.975311	0.998979	0.624016	0.611723	0.725194	0.720033		
STA. DEP.	7,581.104	7,581.104	7,581.104	7,581.104	7,581.104	7,581.104		
DIFF.	+4.125	+3.258	-8.218	-7.159	-9.516	-8.523		
F.S. DEP.	7,585.229 ✓ E	7,584.362 ✓ E	7,572.886 ✓ E	7,573.945 ✓ E	7,571.588 ✓ E	7,572.581 ✓ E	E	
GRADE CALC.								
F.S. GRADE ELV.								
GRADE CHAIN								
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.	
CALCULATED BY:	LB		LB		LB		LB	
CHECKED BY:	LB		LB		LB		LB	
DATE	July 22, 1976		July 23, 1976		July 23, 1976		July 23, 1976	
FIELD PAGE NO.								



①

# Calculation Of Dip & Bearing D.D.H.s @ 74-78 W

Calc. By L. Bettiol  
Date: July 23, 1976

Hole # U-103

	NORTHING	EASTING	ELEV.
U-103 (Col.)	10,936.310	7,583.722	1123.929
U-103 (END.)	<u>10,935.633</u>	<u>7,583.078</u>	<u>1124.944</u>
	+ 0.707	+ 0.644	- 1.015

$$\text{Arc Tan Brg.} = \frac{0.644}{0.707} = \text{N-42}^{\circ}19'18\text{"-E} \therefore \text{Az.} = (42^{\circ}19'18\text{"})$$

$$h = \sqrt{(0.644)^2 + (0.707)^2}$$

$$\therefore h = .956339$$

$$\text{Arc Tan Dip} = \frac{-1.015}{.9563} = (-46^{\circ}42'20\text{"})$$

Hole # U-99

	NORTHING	EASTING	ELEV.
U-99 (Col.)	10,935.223	7,583.219	1123.951
U-99 (END.)	<u>10,935.531</u>	<u>7,583.184</u>	<u>1124.631</u>
	- 0.309	- 0.235	- 0.680

$$\text{Arc Tan Az} = \frac{-0.235}{-0.309} = \text{S-37}^{\circ}15'13\text{"-W}$$

$$\therefore (\text{Az} = 217^{\circ}15'13\text{"})$$

$$h = \sqrt{(0.309)^2 + (0.235)^2}$$

$$\therefore h = .388209$$

$$\text{Arc Tan Dip} = \frac{-0.680}{.388209} = (-60^{\circ}16'11\text{"})$$

(2)

HOLE # U-117

	NORTHING	EASTING	ELEV.
U-117 (COL)	10,937.120	7,585.372	1125.217
U-117 (END)	<u>10,936.464</u>	<u>7,584.472</u>	<u>1125.235</u>
	+ 0.956	+ 0.900	- 0.018

$$\text{ARC TAN AZ} = \frac{0.900}{0.956} = (43^{\circ} 16' 18'')$$

$$h = \sqrt{(0.900)^2 + (0.956)^2}$$

$$\therefore h = 1.313$$

$$\text{ARC TAN DIP} = \frac{-0.018}{1.313} = (-00^{\circ} 47' 08'')$$

HOLE # U-109

	NORTHING	EASTING	ELEV.
U-109 (COL)	10,936.752	7,585.229	1127.587
U-109 (END)	<u>10,935.671</u>	<u>7,584.362</u>	<u>1125.702</u>
	+ 1.081	+ 0.867	+ 1.885

$$\text{ARC TAN AZ} = \frac{0.867}{1.081} = (38^{\circ} 43' 51'')$$

$$h = \sqrt{(0.867)^2 + (1.081)^2}$$

$$\therefore h = 1.386$$

$$\text{ARC TAN DIP} = \frac{+1.885}{1.386} = (+53^{\circ} 40' 26'')$$

(3)

HOLE # U-93

	NORTHING	EASTING	ELEV.
U-93 (COL.)	10,925.528	7,572.886	1126.109
U-93 (END)	10,926.560	7,573.945	1125.537
	- 1.032	- 1.059	+ 0.872

$$\text{ARC TAN AZ} = \frac{1.509}{1.032} = 45^{\circ} 11' 23''$$

$$+ 180$$

$$(225^{\circ} 11' 23'')$$

$$h = \sqrt{(1.059)^2 + (1.032)^2}$$

$$\therefore h = 1.478$$

$$\text{ARC TAN DIP} = + \frac{0.872}{1.478} = (+ 30^{\circ} 32' 24'')$$

HOLE # U-91

	NORTHING	EASTING	ELEV.
U-91 (COL.)	10,926.783	7,571.588	1121.819
U-91 (END)	10,927.604	7,572.581	1125.010
	- 0.821	- 0.993	- 0.191

$$\text{ARC TAN AZ} = \frac{0.993}{0.821} = 50^{\circ} 21' 59''$$

$$+ 180$$

$$(230^{\circ} 21' 59'')$$

$$h = \sqrt{(0.993)^2 + (0.821)^2}$$

$$\therefore h = 1.288$$

$$\text{ARC TAN DIP} = - \frac{0.191}{1.288} (- 08^{\circ} 26' 06'')$$

(4)

HOLE # 4-97

	NORTHING	EASTING	ELEV.
4-97 (COL.)	10,926.180	7,572.655	1124.215
4-97 (END)	<u>10,927.280</u>	<u>7,573.547</u>	<u>1125.066</u>
	-1.100	-0.892	-0.851

$$\text{ARC TAN AZ} = \frac{-0.892}{-1.100 + 180} = 39^{\circ} 02' 20''$$

$$(219^{\circ} 02' 20'')$$

$$h = \sqrt{(.892)^2 + (1.1)^2}$$

$$\therefore h = 1.416$$

$$\text{ARC TAN DIP} = -\frac{0.851}{1.416} = (-31^{\circ} 00' 19'')$$

HOLE # 4-95

	NORTHING	EASTING	ELEV.
4-95 (COL.)	10,926.195	7,572.533	1124.080
4-95 (END)	<u>10,927.466</u>	<u>7,573.500</u>	<u>1125.688</u>
	-0.971	-0.967	-1.608

$$\text{ARC TAN AZ} = \frac{-0.967}{-0.971 + 180} = 11^{\circ} 52' 54''$$

$$(224^{\circ} 52' 54'')$$

$$h = \sqrt{(.967)^2 + (.971)^2}$$

$$\therefore h = 1.37$$

$$\text{ARC TAN DIP} = -\frac{1.608}{1.370} = (-49^{\circ} 31' 10'')$$

B.S.	<i>L.P. - 43</i>	<i>L.P. - 43</i>	<i>L.P. - 43</i>	<i>L.P. - 43</i>	<i>L.P. - 43</i>	<i>L.P. - 43</i>	<i>L.P. - 43</i>
S.T.A.	<i>75-051</i>	<i>75-051</i>	<i>75-051</i>	<i>75-051</i>	<i>75-051</i>	<i>75-051</i>	<i>75-051</i>
F.S.	<i>COLLAR - U-123</i>	<i>COLLAR - U-133</i>	<i>COLLAR - U-131</i>	<i>END - U-131</i>	<i>COLLAR U-127</i>	<i>END U-127</i>	<i>COLLAR U-136</i>
MEAS. DISTANCE	<i>20.006</i>	<i>20.002</i>	<i>20.472</i>	<i>20.324</i>	<i>20.216</i>	<i>20.188</i>	<i>20.686</i>
VERT. ANGLE	<i>+5° 23' 25"</i>	<i>+5° 15' 00"</i>	<i>+8° 28' 30"</i>	<i>+8° 35' 10"</i>	<i>+8° 17' 25"</i>	<i>+8° 11' 05"</i>	<i>+13° 17' 10"</i>
SINE - V.A.	<i>0.093939</i>	<i>0.091501</i>	<i>0.147378</i>	<i>0.149296</i>	<i>0.152818</i>	<i>0.151860</i>	<i>0.229955</i>
COSINE - V.A.	<i>0.995578</i>	<i>0.995805</i>	<i>0.98908</i>	<i>0.988793</i>	<i>0.988754</i>	<i>0.988402</i>	<i>0.973201</i>
STA. ELEVATION	<i>1161.485</i>	<i>1161.485</i>	<i>1161.485</i>	<i>1161.485</i>	<i>1161.485</i>	<i>1161.485</i>	<i>1161.485</i>
H.I.	<i>- 2.750</i>	<i>- 2.750</i>	<i>- 2.750</i>	<i>- 2.750</i>	<i>- 2.750</i>	<i>- 2.750</i>	<i>- 2.750</i>
INST. HEIGHT							
VERT. DISTANCE	<i>+1.879</i>	<i>+1.830</i>	<i>+3.017</i>	<i>+3.034</i>	<i>+3.089</i>	<i>+3.066</i>	<i>+4.757</i>
DIFF.							
H.P.	<i>Ø</i>	<i>Ø</i>	<i>Ø</i>	<i>Ø</i>	<i>Ø</i>	<i>Ø</i>	<i>Ø</i>
F.S. ELEVATION	<i>1160.614 ✓</i>	<i>1160.565 ✓</i>	<i>1161.753 ✓</i>	<i>1161.769 ✓</i>	<i>1161.824 ✓</i>	<i>1161.801 ✓</i>	<i>1163.493 ✓</i>
AZ. B.S. TO STA. ±180 - 00' - 00"	<i>133° 31' 15"</i> <i>+180</i>						
AZ. STA. TO B.S.	<i>313° 31' 15"</i>	<i>313° 31' 15"</i>	<i>313° 31' 15"</i>	<i>313° 31' 15"</i>	<i>313° 31' 15"</i>	<i>313° 31' 15"</i>	<i>313° 31' 15"</i>
HORZ. ANGLE - 360 - 00' - 00"	<i>178° 30' 00"</i>	<i>179° 39' 20"</i>	<i>189° 52' 00"</i>	<i>186° 55' 10"</i>	<i>177° 27' 40"</i>	<i>180° 01' 35"</i>	<i>186° 52' 25"</i>
AZ. STA. TO F.S.	<i>132° 01' 15"</i>	<i>133° 10' 35"</i>	<i>143° 23' 15"</i>	<i>140° 26' 25"</i>	<i>130° 58' 55"</i>	<i>133° 32' 50"</i>	<i>140° 23' 40"</i>
BEARING	<i>S-17° 58' 45"-E</i>	<i>S-16° 19' 25"-E</i>	<i>S-36° 36' 15"-E</i>	<i>S-39° 33' 35"-E</i>	<i>S-19° 01' 05"-E</i>	<i>S-16° 17' 10"-E</i>	<i>S-39° 36' 20"-E</i>
HORZ. DISTANCE	<i>19.918</i>	<i>19.918</i>	<i>20.248</i>	<i>20.096</i>	<i>19.979</i>	<i>19.954</i>	<i>20.132</i>
COSINE BEARING	<i>0.669401</i>	<i>0.684217</i>	<i>0.802688</i>	<i>0.770961</i>	<i>0.655821</i>	<i>0.688953</i>	<i>0.770452</i>
STA. LAT.	<i>10,672.675</i>	<i>10,672.675</i>	<i>10,672.675</i>	<i>10,672.675</i>	<i>10,672.675</i>	<i>10,672.675</i>	<i>10,672.675</i>
DIFF.	<i>- 13.333</i>	<i>- 13.629</i>	<i>- 16.253</i>	<i>- 15.493</i>	<i>- 13.103</i>	<i>- 13.747</i>	<i>- 15.511</i>
F.S. LAT.	<i>10,659.342 ✓ N</i>	<i>10,659.046 ✓ N</i>	<i>10,656.422 N</i>	<i>10,657.182 N</i>	<i>10,659.572 N</i>	<i>10,658.928 N</i>	<i>10,657.164 N</i>
SINE BEARING	<i>0.742901</i>	<i>0.729250</i>	<i>0.596400</i>	<i>0.636882</i>	<i>0.754916</i>	<i>0.724807</i>	<i>0.637499</i>
STA. DEP.	<i>7,639.042</i>	<i>7,639.042</i>	<i>7,639.042</i>	<i>7,639.042</i>	<i>7,639.042</i>	<i>7,639.042</i>	<i>7,639.042</i>
DIFF.	<i>+14.797</i>	<i>+14.525</i>	<i>+12.076</i>	<i>+12.799</i>	<i>+15.082</i>	<i>+14.163</i>	<i>+13.834</i>
F.S. DEP.	<i>7,653.839 ✓ E</i>	<i>7,653.567 ✓ E</i>	<i>7,651.118 E</i>	<i>7,651.841 E</i>	<i>7,654.124 E</i>	<i>7,653.505 E</i>	<i>7,651.876 E</i>
GRADE CALC.							
F.S. GRADE ELV.	<i>Recalc. DJH.</i>	<i>Recalc. DJH.</i>	<i>Recalc. DJH.</i>	<i>Recalc. DJH.</i>	<i>Recalc. DJH.</i>	<i>Recalc. DJH.</i>	<i>Recalc. DJH.</i>
GRADE CHAIN							
OFFSETS	LEFT      RIGHT	PLUS      MINUS	L.      R.	P.      M.	L.      R.	P.      M.	L.      R.
CALCULATED BY:							
CHECKED BY:							
DATE							
FIELD PAGE NO.							

~~U-161~~

U-123, U-133, U-131, U-127, U-136

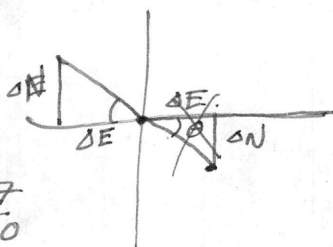
~~LP-85~~ LP-43 ✓  
~~76-033~~

BS	75-041	LP-43	"	"	"	"
STA	75-045	75-051	"	"	"	"
FS	LP-43	U-123 c	U-133 c	U-131 c	U-131 E	U-136 c
① M. DIST	12.927	20.006	20.002	20.472	20.324	20.686
② V <sub>z</sub>	+4° 34' 00"	+5° 23' 25"	+5° 15' 00"	+8° 28' 30"	+8° 35' 10"	+13° 17' 40"
③ STA. ELEV.	1159.908	1161.454	"	"	"	"
④ H.I.	-2.750	-2.750	"	"	"	"
⑤ H.P	+3.070	φ	"	"	"	"
F.S. ELEV	<1161.257>	<1160.583>	<1160.534>	<1161.721>	<1161.738>	<1163.461>
⑥ AZ. STA. TO BS	292° 15' 17"	315° 27' 05"	"	"	"	"
⑦ HOR. z	203° 41' 50"	178° 30' 00"	179° 39' 20"	189° 52' 00"	186° 55' 10"	186° 52' 25"
AZ STA TO FS	135° 57' 07"	133° 57' 05"	135° 06' 25"	145° 19' 05"	142° 22' 15"	142° 19' 30"
HOR. DIST.	12.886	19.918	19.918			20.132
⑧ STA LAT.	10682.829	10671.840	"	"	"	"
⑨ F.S. LAT.	<10673.567>	<10658.016>	<10657.730>	<10655.189>	<10,655.924>	<10,655.906>
⑩ STA DEP.	7627.818	7638.477	"	"	"	"
F.S. DEP	<7636.777>	<7652.817>	<7652.535>	<7649.999>	<7650.747>	<7650.781>

$\Delta N = -.735$        $\alpha z = 225^\circ 30'$   
 $\Delta E = -.748$   
 $\Delta E1 = -.017$        $DIP = 0^\circ 56'$   
 $HD = 1.049$

calc of az 75-051 to LP-43

$\Delta N = +1.727$   
 $\Delta E = 1.700$   
 $\alpha z = 270^\circ + \tan^{-1} \frac{1.727}{1.700}$   
 $= 135^\circ 27' 05"$   
 315





CALCULATION OF DIP & BEARING D.D.H.s @ 2N470W

Calc By: L. BETTOL

DATE: AUG. 7, 1976

HOLE # U-131

	NORTHING	EASTING	ELEV.
U-131 (COL.)	10,656.422	7,651.118	1161.752
U-131 (END.)	10,657.182	7,651.841	1161.769
	- 0.76	- 0.723	- 0.017

$$\text{ARC TAN AZ} = \frac{0.723}{0.760} = 43^{\circ} 34' 15''$$

$$+ 180$$

$$(223^{\circ} 34' 15'')$$

$$h = \sqrt{(0.76)^2 + (0.723)^2}$$

$$h = 1.0490$$

$$\text{ARC TAN DIP} = \frac{-0.017}{1.0490} = (-0^{\circ} 55' 42'')$$

HOLE # U-127

	NORTHING	EASTING	ELEV.
U-127 (COL.)	10,659.572	7,654.124	1161.824
U-127 (END.)	10,658.928	7,653.505	1161.801
	+ 0.644	+ 0.619	+ 0.023

$$\text{ARC TAN AZ} = \frac{0.619}{0.644} = (43^{\circ} 51' 58'')$$

$$h = \sqrt{(0.644)^2 + (0.619)^2}$$

$$h = 0.893$$

$$\text{ARC TAN DIP} = \frac{.023}{.893} = (+1^{\circ} 28' 31'')$$

HOLE # U-137

	NORTHING	EASTING	ELEV.
U-137 (COL)	10,659.737	7,652.158	1162.001
U-137 (END)	<u>10,659.171</u>	<u>7,651.948</u>	<u>1162.439</u>
	+0.566	+0.510	+1.562

$$\text{ARC TAN AZ} = \frac{.510}{.566} = (42^{\circ} 01' 15'')$$

$$h = \sqrt{(.566)^2 + (.510)^2}$$

$$h = 0.7619$$

$$\text{ARC TAN DIP} = \frac{1.562}{.7619} = (+63^{\circ} 59' 53'')$$

~~U-161~~

- ~~LP 85~~  
- ~~76-033~~

U-127, U-137 ✓

BS	LP 43	"	"	"
STA	75-051	"	"	"
FS	U-127 C	U-127 E	U-137 C	U-137 E
M. DIST	20.216	20.188	19.368	19.044
V $\angle$	+8°47'25"	+8°44'05"	+15°46'40"	+11°13'00"
STA. ELEV.	1161.454	"	"	"
H.I.	-2.75	"	"	"
H.P	$\phi$	"	"	"
F.S. ELEV	<1161.793>	<1161.770>	<1163.970>	<1162.908>
AZ. STA. TO BS	315°27'05"	"	"	"
HOR. $\angle$	177°27'40"	180°01'35"	180°26'25"	182°46'35"
AZ STA TO FS	132°54'45"	135°28'40"	135°53'30"	138°13'40"
HOR. DIST.	19.979	19.954	18.638	18.680
STA LAT.	10,671.840	"	"	"
F.S. LAT.	<10,658.237>	<10657.613>	<10658.957>	<10657.908>
STA DEP.	7638.477	"	"	"
F.S. DEP	<7653.109>	<7652.468>	<7651.450>	<7650.921>

$\Delta N = +.624$	$\alpha z = 45^{\circ}46'$	$\Delta N = .549$	$\alpha z = 43^{\circ}56'$
$\Delta E = +.641$		$\Delta E = .529$	
$\Delta EI = +.023$	DIP = 1°28'	$\Delta EI = 1.562$	DIP = 64°00'
HD = 0.895		HD = .762	



CALCULATION DIP & BEARING D.D.H.C 76 W & 3 N.

CALC BY: L. BETTOLD

DATE: AUG. 10, 1976.

	NORTHING	EASTING	ELEV.
U-13A (COLLAR)	10,808.430	7,544.402	1134.118
U-13A (END)	<u>10,807.716</u>	<u>7,543.754</u>	<u>1134.648</u>
	+ 0.714	+ 0.648	- 0.530

$$\text{ARC TAN AZ} = \frac{0.648}{0.714} = (42^{\circ} 13' 33'')$$

$$h = \sqrt{(.714)^2 + (.648)^2}$$

$$h = 0.9642$$

$$\text{ARC TAN DIP} = \frac{.530}{.9642} = (-28^{\circ} 47' 18'')$$

	NORTHING	EASTING	ELEV.
U-13B (COLLAR)	10,808.025	7,544.558	1133.906
U-13B (END)	<u>10,807.354</u>	<u>7,543.832</u>	<u>1135.039</u>
	+ 0.671	+ 0.726	- 1.133

$$\text{ARC TAN AZ} = \frac{0.726}{0.671} = (47^{\circ} 15' 16'')$$

$$h = \sqrt{(.671)^2 + (.726)^2}$$

$$h = 0.9885934$$

$$\text{ARC TAN DIP} = \frac{-1.133}{.9885934} = (-48^{\circ} 53' 38'')$$

*(check survey only)*

B.S.	76-010	76-010	76-010	76-010	76-010	76-010	
S.T.A.	LP-53	LP-53	LP-53	LP-53	LP-53	LP-53	
F.S.	Collar - U-115	END - U-115	Collar - U-125	END - U-125	Collar - U-92	END - U-92	
MEAS. DISTANCE	2.021	1.128	2.886	1.898	3.510	2.802	
VERT. ANGLE	-15° 35' 00"	-36° 10' 25"	-15° 11' 20"	-7° 15' 05"	-6° 23' 10"	-7° 10' 05"	
SINE - V.A.	0.711269	0.597255	0.270113	0.131875	0.111228	0.133134	
COSINE - V.A.	0.699871	0.802051	0.962711	0.990863	0.993795	0.991058	
STA. ELEVATION	1160.089	1160.089	1160.089	1160.089	1160.089	1160.089	
H.I.	-2.660	-2.660	-2.660	-2.660	-2.660	-2.660	
INST. HEIGHT							
VERT. DISTANCE	-1.146	-0.853	-0.780	-0.256	-0.390	-0.374	
DIFF.							
H.P.	0	0	0	0	0	0	
F.S. ELEVATION	1155.983 ✓	1156.576 ✓	1156.649 ✓	1157.173 ✓	1157.039 ✓	1157.055 ✓	
AZ. B.S. TO STA.	313° 17' 59"						
±180 - 00' - 00"	-180						
AZ. STA. TO B.S.	133° 17' 59"	133° 17' 59"	133° 17' 59"	133° 17' 59"	133° 17' 59"	133° 17' 59"	
HORZ. ANGLE	95° 00' 00"	95° 39' 00"	100° 03' 25"	103° 02' 50"	126° 00' 20"	137° 53' 15"	
- 360 - 00' - 00"							
AZ. STA. TO F.S.	228° 17' 59"	229° 26' 59"	233° 51' 21"	236° 50' 19"	259° 18' 19"	271° 11' 11"	
BEARING	S-18° 17' 59"-W	S-19° 26' 59"-W	S-53° 51' 21"-W	S-56° 50' 19"-W	S-79° 18' 19"-W	N-88° 18' 16"-W	
HORZ. DISTANCE	1.117	1.115	2.778	1.881	3.188	2.777	
COSINE BEARING	0.658693	0.650115	0.589807	0.546878	0.176994	0.029589	
STA. LAT.	10,750.219	10,750.219	10,750.219	10,750.219	10,750.219	10,750.219	
DIFF.	-0.933	-0.711	-1.638	-1.029	-0.617	+0.082	
F.S. LAT.	10,749.316 ✓ N	10,749.505 ✓ N	10,748.611 ✓ N	10,749.220 ✓ N	10,749.632 ✓ N	10,750.331 ✓ N	N
SINE BEARING	0.752111	0.759836	0.807511	0.837213	0.984212	0.999562	
STA. DEP.	7,733.881	7,733.881	7,733.881	7,733.881	7,733.881	7,733.881	
DIFF.	-1.066	-0.870	-2.213	-1.575	-3.133	-2.776	
F.S. DEP.	7,732.815 ✓ E	7,733.011 ✓ E	7,731.638 ✓ E	7,732.306 ✓ E	7,730.418 E	7,731.105 ✓ E	E
GRADE CALC.							
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>
CHECKED BY:	<i>RG</i>	<i>RG</i>	<i>RG</i>	<i>RG</i>	<i>RG</i>	<i>RG</i>	<i>RG</i>
DATE	AUG 10 1976	AUG 10 1976	AUG 10 1976	AUG 10 1976	AUG 10 1976	AUG 10 1976	AUG 10 1976
FIELD PAGE NO.							

CALCULATION OF DIP & BEARING D.D.Hs @ 70W & 6N.

CALC. BY: LOUIE BETTIOL

DATE: AUG 10, 1976

HOLE # U-115

	NORTHING	EASTING	ELEV.
U-115 (COLLAR)	10,749.316	7,732.815	1155.983
U-115 (END)	<u>10,749.505</u>	<u>7,733.011</u>	<u>1156.576</u>
	- 0.189	- 0.196	- 0.593

$$\text{ARC TAN AZ} = \frac{0.196}{0.189} = 46^{\circ} 02' 30''$$

$$+ 180$$

$$(226^{\circ} 02' 30'') \quad \checkmark$$

$$h = \sqrt{(.189)^2 + (.196)^2}$$

$$h = 0.2723$$

$$\text{ARC TAN DIP} = \frac{0.593}{.2723} = (-65^{\circ} 20' 09'') \quad \checkmark$$

HOLE # U-125

	NORTHING	EASTING	ELEV.
U-125 (COLLAR)	10,748.611	7,731.638	1156.649
U-125 (END)	<u>10,749.220</u>	<u>7,732.306</u>	<u>1157.173</u>
	- 0.609	- 0.668	- 0.524

$$\text{ARC TAN AZ} = \frac{.668}{.609} = 47^{\circ} 38' 43''$$

$$+ 180$$

$$(227^{\circ} 38' 43'') \quad \checkmark$$

$$h = \sqrt{(.609)^2 + (.668)^2}$$

$$h = 0.9039$$

$$\text{ARC TAN DIP} = \frac{.524}{.9039} = (-30^{\circ} 06' 05'') \quad \checkmark$$

HOLE # U-96

	NORTHING	EASTING	ELEV.
U-96 (COLLAR)	10,749.632	7,730.448	1157.039
U-96 (END)	<u>10,750.331</u>	<u>7,731.105</u>	<u>1157.055</u>
	- 0.699	- 0.657	- 0.016

$$\text{ARC TAN AZ} = \frac{.657}{.699} = 43^{\circ} 13' 33''$$

$$+ 180$$

$$(223^{\circ} 13' 33'') \checkmark$$

$$h = \sqrt{(.699)^2 + (.657)^2}$$

$$h = 0.9593$$

$$\text{ARC TAN DIP} = \frac{.016}{.9593} = (-0^{\circ} 57' 20'') \checkmark$$

HOLE # U-96

	NORTHING	EASTING	ELEV.
U-96 (COLLAR)	10,749.520	7,730.762	1158.026
U-96 (END)	<u>10,750.209</u>	<u>7,731.411</u>	<u>1157.692</u>
	- 0.689	- 0.649	+ 0.334

$$\text{ARC TAN AZ} = \frac{.649}{.689} = 43^{\circ} 17' 16''$$

$$+ 180$$

$$(223^{\circ} 17' 16'') \checkmark$$

$$223^{\circ} 14' 31''$$

$$h = \sqrt{(.689)^2 + (.649)^2}$$

$$h = 0.9465$$

$$\text{ARC TAN DIP} = \frac{0.334}{0.9465} = (+ 19^{\circ} 26' 13'') \checkmark$$

$$+ 19^{\circ} 26' 57''$$

B.S.	76-010	76-010	76-010	76-010	76-010	76-010	76-010
S.T.A.	L.P.-53	L.P.-53	L.P.-53	L.P.-53	L.P.-53	L.P.-53	L.P.-53
F.S.	COLLAR U-96	END U-96	COLLAR U-100	END U-100	COLLAR U-102	END U-102	COLLAR U-113
MEAS. DISTANCE	3.258	2.284	3.170	2.228	3.310	3.020	1.164
VERT. ANGLE	+10° 33' 30"	+6° 04' 10"	+30° 59' 45"	+28° 57' 35"	+58° 05' 20"	+55° 19' 05"	-18° 10' 20"
SINE - V.A.	0.183236	0.105878	0.514976	0.484194	0.848869	0.822323	0.3145153
COSINE - V.A.	0.983069	0.994379	0.857205	0.874961	0.528603	0.569021	0.666894
STA. ELEVATION	1160.089	1160.089	1160.089	1160.089	1160.089	1160.089	1160.089
H.I.	-2.660	-2.660	-2.660	-2.660	-2.660	-2.660	-2.660
INST. HEIGHT							
VERT. DISTANCE	+0.597	+0.263	+1.632	+1.079	+2.810	+2.483	-0.867
DIFF.							
H.P.	0	0	0	0	0	0	0
F.S. ELEVATION	1158.026 ✓	1157.692 ✓	1159.061 ✓	1158.508 ✓	1160.239 ✓	1159.912 ✓	1156.562 ✓
AZ. B.S. TO STA. ±180 - 00' - 00"							
AZ. STA. TO B.S.	133° 17' 59"	133° 17' 59"	133° 17' 59"	133° 17' 59"	133° 17' 59"	133° 17' 59"	133° 17' 59"
HORZ. ANGLE - 360 - 00' - 00"	123° 02' 10"	135° 16' 10"	107° 10' 20"	113° 07' 00"	121° 27' 30"	130° 10' 55"	232° 45' 40" NO 232° 45' 40"
AZ. STA. TO F.S.	256° 50' 39"	269° 04' 39"	210° 58' 19"	216° 54' 59"	258° 15' 29"	261° 28' 51"	306° 33' 39"
BEARING	S-76° 50' 39"-W	S-89° 04' 39"-W	S-60° 58' 19"-W	S-66° 54' 59"-W	S-78° 15' 29"-W	S-81° 28' 51"-W	N-6° 33' 39"-E
HORZ. DISTANCE	3.203	2.470	2.717	1.949	1.750	1.718	0.776 ✓
COSINE BEARING	0.227601	0.016100	0.485238	0.392071	0.203501	0.096165	0.993451
STA. LAT.	10,750.219	10,750.219	10,750.219	10,750.219	10,750.219	10,750.219	10,750.219
DIFF.	(-0.739) x	-0.040	-1.318	-0.764	-0.356	-0.165	+0.771
F.S. LAT.	10,749.520 ✓ N	10,750.209 ✓ N	10,748.931 ✓ N	10,749.485 ✓ N	10,749.893 ✓ N	10,750.084 ✓ N	10,751.020 ✓ N
SINE BEARING	0.973755	0.999870	0.874382	0.919934	0.979071	0.995365	0.114258
STA. DEP.	7,733.881	7,733.881	7,733.881	7,733.881	7,733.881	7,733.881	7,733.881
DIFF.	-3.119	-2.470	-2.376	-1.793	-1.713	-1.710	+0.089
F.S. DEP.	7,730.762 ✓ E	7,731.411 ✓ E	7,731.505 ✓ E	7,732.088 ✓ E	7,732.168 ✓ E	7,732.171 ✓ E	7,733.970 ✓ E
GRADE CALC.							
							N - 10751.020 E - 7733.970
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	LB	LB	LB	LB	LB	LB	LB
CHECKED BY:	RG	RG	RG	RG	RG	RG	RG
DATE	AUG 10 1976	AUG 10 1976	AUG 10 1976	AUG 10 1976	AUG 10 1976	AUG 10 1976	AUG 10 1976
FIELD PAGE NO.							

check survey

check survey

HOLE # U-106

	NORTHING	EASTING	ELEV.
U-106 (COLLAR)	10,752.187	7,734.611	1157.622
U-106 (END)	<u>10,751.759</u>	<u>7,734.202</u>	<u>1157.622</u>
	+ 0.428	+ 0.409	0

$$\text{ARC TAN AZ} = \frac{.409}{.428} = (45^{\circ}55'19'') \checkmark$$

NO DIFF IN ELEV ∴ DIP = (0° 00' 00" OR FLAT.) ✓

HOLE # U-100

	NORTHING	EASTING	ELEV.
U-100 (COLLAR)	10,748.931	7,731.505	1159.061
U-100 (END)	<u>10,749.485</u>	<u>7,732.088</u>	<u>1158.508</u>
	- 0.554	- 0.583	+ 0.553

$$\text{ARC TAN AZ} = \frac{.583}{.554} = N^{\circ} 27' 40''$$
$$+ 180$$
$$(226^{\circ} 27' 40'') \quad \checkmark$$

$$h = \sqrt{(.554)^2 + (.583)^2}$$
$$h = 0.8042$$

$$\text{ARC TAN DIP} = \frac{.553}{.8042} = (+34^{\circ} 30' 50'') \quad \checkmark$$

HOLE # U-102

	NORTHING	EASTING	ELEV.
U-102 (COLLAR)	10,749.893	7,732.168	1160.239
U-102 (END)	<u>10,750.084</u>	<u>7,732.171</u>	<u>1159.912</u>
	- 0.191	- 0.003	+ 0.327

$$\text{ARC TAN AZ} = \frac{.003}{.191} = 0^{\circ} 53' 59''$$
$$+ 180$$
$$(180^{\circ} 53' 59'') \quad \checkmark$$

$$h = \sqrt{(.191)^2 + (.003)^2}$$
$$h = 0.1910$$

$$\text{ARC TAN DIP} = \frac{.327}{.1910} = (+59^{\circ} 12' 39'') \quad \checkmark$$





B.S.	76-0A1	76-0A1	76-0A1	76-0A1	76-0A1	76-0A1	76-0A1
S.T.A.	L.P.-85	L.P.-85	L.P.-85	L.P.-85	L.P.-85	L.P.-85	L.P.-85
F.S.	COLLAR- U-161	END- U-161	COLLAR- U-1A1	END- U-1A1	COLLAR- U-1A1	END- U-1A1	COLLAR- U-1A3
MEAS. DISTANCE	9.274	9.122	9.264	9.202	9.312	9.214	10.054
VERT. ANGLE	-12° 21' 00"	-5° 30' 40"	-5° 36' 00"	-5° 10' 25"	+8° 50' 25"	+0° 21' 50"	-10° 18' 10"
SINE - V.A.	0.213883	0.096038	0.097583	0.098861	0.153680	0.001223	0.187429
COSINE - V.A.	0.976859	0.995378	0.995228	0.995101	0.988121	0.999914	0.982278
STA. ELEVATION	1182.910	1182.910	1182.910	1182.910	1182.910	1182.910	1182.910
H.I.	-3.442	-3.442	-3.442	-3.442	-3.442	-3.442	-3.442
INST. HEIGHT							
VERT. DISTANCE	-1.984	-0.876	-0.904	-0.910	+1.431	+0.067	-1.884
DIFF.							
H.P.	Ø	Ø	Ø	Ø	Ø	Ø	Ø
F.S. ELEVATION	1177.484 ✓	1178.592 ✓	1178.564 ✓	1178.558 ✓	1180.899 ✓	1179.535 ✓	1177.584 ✓
AZ. B.S. TO STA.	319° 10' 29"						
±180 - 00' - 00"	-180						
AZ. STA. TO B.S.	139° 10' 29"	139° 10' 29"	139° 10' 29"	139° 10' 29"	139° 10' 29"	139° 10' 29"	139° 10' 29"
HORZ. ANGLE	168° 14' 10"	179° 30' 10"	168° 32' 15"	175° 21' 00"	173° 50' 20"	182° 00' 00"	197° 15' 30"
- 360 - 00' - 00"							
AZ. STA. TO F.S.	307° 55' 09"	319° 11' 09"	308° 12' 44"	315° 01' 29"	313° 30' 49"	321° 10' 29"	336° 55' 59"
BEARING	N-52° 04' 51"-W	N-16° 18' 51"-W	N-51° 17' 16"-W	N-44° 58' 31"-W	N-46-29'-11"-W	N-38° 19' 31"-W	N-23° 04' 01"-W
HORZ. DISTANCE	9.059	9.080	9.220	9.157	9.201	9.214	9.876
COSINE BEARING	0.614519	0.756834	0.618576	0.707112	0.688527	0.781503	0.920018
STA. LAT.	10,576.079	10,576.079	10,576.079	10,576.079	10,576.079	10,576.079	10,576.079
DIFF.	+ 5.567	+ 6.872	+ 5.703	+ 6.478	+ 6.335	+ 7.228	+ 9.086
F.S. LAT.	10,581.646 ✓ N	10,582.951 ✓ N	10,581.782 ✓ N	10,582.557 ✓ N	10,582.114 ✓ N	10,583.307 ✓ N	10,585.165 ✓ N
SINE BEARING	0.788878	0.653608	0.785725	0.706801	0.725211	0.620125	0.391806
STA. DEP.	7,755.031	7,755.031	7,755.031	7,755.031	7,755.031	7,755.031	7,755.031
DIFF.	- 7.146	- 5.935	- 7.244	- 6.472	- 6.673	- 5.714	- 3.869
F.S. DEP.	7,747.885 ✓ E	7,749.096 ✓ E	7,747.787 ✓ E	7,748.559 ✓ E	7,748.358 ✓ E	7,749.317 ✓ E	7,751.162 ✓ E
GRADE CALC.							
F.S. GRADE ELV.	Recalc DJH.	Recalc DJH	Recalc DJH	Recalc. DJH.	Recalc DJH.	Recalc DJH.	Recalc DJH
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>	<i>LB</i>
CHECKED BY:	<i>R.G.</i>	<i>R.G.</i>	<i>R.G.</i>	<i>R.G.</i>	<i>R.G.</i>	<i>R.G.</i>	<i>R.G.</i>
DATE	SEP 7 1976	SEP 7 1976	SEP 7 1976	SEP 7 1976	SEP 7 1976	SEP 7 1976	SEP 7 1976
FIELD PAGE NO.							

CALCULATION FOR DIP & BEARING D.D.H.s @  $66^{\circ}2' \frac{1}{2} N$

CALC BY: L. BETTOL  
DATE: SEPT. 8, 1976

HOLE # U-161

	NORTHING	EASTING	ELEV.
U-161 (COLLAR)	10,581.646	7,747.885	1177.481
U-161 (END)	<u>10,582.951</u>	<u>7,749.096</u>	<u>1178.592</u>
	- 1.305	- 1.211	- 1.108

$$\text{ARC TAN AZ} = \frac{1.211}{1.305} = 42^{\circ}51'37''$$

$$(222^{\circ}51'37'') \checkmark$$

$$h = \sqrt{(1.305)^2 + (1.211)^2}$$

$$h = 1.780$$

$$\text{ARC TAN DIP} = \frac{-1.108}{1.780} (-31^{\circ}51'01'') \checkmark$$

HOLE # U-1A1

	NORTHING	EASTING	ELEV.
U-1A1 (COLLAR)	10,581.782	7,747.781	1178.561
U-1A1 (END)	<u>10,582.557</u>	<u>7,748.559</u>	<u>1178.558</u>
	- 0.775	- 0.772	+ 0.006

$$\text{ARC TAN AZ} = \frac{.772}{.775} = 41^{\circ}53'20''$$

$$(221^{\circ}53'20'') \checkmark$$

$$h = \sqrt{(.775)^2 + (.772)^2}$$

$$h = 1.094$$

$$\text{ARC TAN DIP} = \frac{.006}{1.094} = (+0^{\circ}18'51'') \checkmark$$

HOLE # U-147

	NORTHING	EASTING	ELEV.
U-147 (COLLAR)	10,582.411	7,718.358	1180.899
U-147 (END)	<u>10,583.307</u>	<u>7,719.317</u>	<u>1179.535</u>
	- 0.893	- 0.959	+ 1.364

$$\text{ARC TAN AZ} = \frac{.959}{.893} = 47^{\circ} 02' 28'' \\ (+ 180) \\ (227^{\circ} 02' 28'') \checkmark$$

$$h = \sqrt{(.893)^2 + (.959)^2} \\ h = 1.3104$$

$$\text{ARC TAN DIP} = \frac{+ 1.364}{1.3104} = (+ 46^{\circ} 08' 53'') \checkmark$$

HOLE # U-159

	NORTHING	EASTING	ELEV
U-159 (COLLAR)	10,583.518	7,750.604	1181.584
U-159 (END)	<u>10,582.768</u>	<u>7,750.151</u>	<u>1179.471</u>
	+ 0.780	+ 0.453	+ 2.113

$$\text{ARC TAN AZ} = \frac{.453}{.780} = 30^{\circ} 08' 48'' \checkmark$$

$$h = \sqrt{(.78)^2 + (.453)^2} \\ h = 0.902$$

$$\text{ARC TAN DIP} = \frac{+ 2.113}{.902} = (+ 66^{\circ} 52' 60'') \checkmark$$

U-161 ; U-141

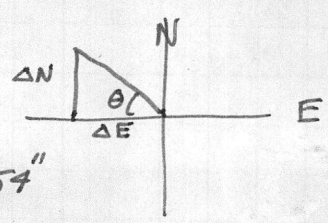
- LP 85 ✓
- 76-033 ✓

BS	76024	76033	76-041	"	"	"
STA	76029	76041	LP-85	"	"	"
FS	76033	LP-85	U-161 c	U-161 E	U-141 c	U-141 E
M. DIST	13.128	2.304	9.274	9.122	9.264	9.202
V $\angle$	+02° 19' 25"	-8° 27' 35"	-12° 21' 00"	-5° 30' 40"	-5° 36' 00"	-5° 40' 25"
STA. ELEV.	1177.664	1183.251	1182.802	"	"	"
H.I.	-2.070	-3.200	-3.442	"	"	"
H.P	+3.900	+3.090	$\phi$	"	"	"
F.S. ELEV	(1180.026)	(1182.802)	(1177.377)	(1178.484)	(1178.456)	(1178.450)
AZ. STA. TO BS	311° 09' 19"	323° 06' 54"	141° 51' 14"	"	"	"
HOR. $\angle$	188° 34' 10"	358° 44' 20"	168° 14' 40"	179° 30' 40"	168° 32' 15"	175° 21' 00"
AZ STA TO FS	139° 43' 29"	321° 51' 14"	310° 05' 54"	321° 21' 54"	310° 23' 29"	317° 12' 14"
HOR. DIST.	13.117	2.279	9.059	9.080	9.220	9.157
STA LAT.	10,608.611	10,569.122	10,570.914	"	"	"
F.S. LAT.	(10,598.603)	(10,570.914)	(10,576.749)	(10,578.007)	(10,576.889)	(10,577.633)
STA DEP.	7,721.449	7,752.052	7,750.644	"	"	"
F.S. DEP	(7,729.929)	(7,750.644)	(7,743.714)	(7,744.975)	(7,743.622)	(7,744.423)

$\Delta N = -1.258$  (AZ = 225° 04')      $\Delta N = -0.744$  (AZ = 227° 06')  
 $\Delta E = -1.261$  (DIP = 31° 52')      $\Delta E = -0.801$  (DIP = 70° 19')  
 $\Delta EI = -1.107$      HD = 1.093

calc. of az 76-041 to 76-033

$\Delta N = +29.481$   
 $\Delta E = -22.123$   
 $\theta = \tan^{-1} \left( \frac{29.481}{22.123} \right) = 53^\circ 06' 54''$   
 az = 323° 06' 54"





-re-calc. because of screw-up on 2 NE  
incline.

~~U-161~~ U-147, U-143, U-159

- LP 85  
- 76-033

BS	76-041	"	"	"	"
STA	LP-85	"	"	"	"
FS	U-147 C	U-147 E	U-143 C	U-159 C	U-159 E
M. DIST	9.312	9.214	10.054	8.936	8.280
V $\angle$	+8°50'25"	+0°24'50"	-10°48'10"	+13°42'00"	+0°01'15"
STA. ELEV.	1182.802	"	"	"	"
HI.	-3.442	"	"	"	"
H.P	$\phi$	"	"	"	"
F.S. ELEV	<1180.791>	<1179.427>	<1177.476>	<1181.476>	<1179.363>
AZ. STA. TO BS	141°51'14"	"	"	"	"
HOR. $\angle$	173°50'20"	182°00'00"	197°15'30"	189°40'15"	184°12'40"
AZ STA TO FS	315°41'34"	323°51'14"	339°06'44"	331°31'29"	326°03'54"
HOR. DIST.	9.201	9.214	9.876	8.682	8.280
STA LAT.	10570.914	"	"	"	"
F.S. LAT.	<10577.498>	<10578.355>	<10,580.141>	<10,578.546>	<10,577.784>
STA DEP.	7750.644	"	"	"	"
F.S. DEP	<7744.217>	<7745.209>	<7747.123>	<7746.505>	<7746.022>

$\Delta N = -0.857$   $\langle \alpha Z = 229^{\circ}10'$   
 $\Delta E = -0.992$   $229^{\circ}11'$   
 $\Delta EI = 1.364$   $\langle \text{DIP} = 46^{\circ}08' \rangle$   
 $HD = 1.311$

$\Delta E = +0.483$   $\langle \alpha Z = 32^{\circ}22' \rangle$   
 $\Delta N = +762$   $\langle \text{DIP} = 66^{\circ}53' \rangle$   
 $\Delta EI = 2.113$   
 $HD = 0.902$

TJH.

note.

- looks as though H.I. from TP-1 should be plus 1.560m. not minus 1.560m. as shown on this calculation sheet.
  - T.P.-s are set on the floor and not the back as other H.I.'s from TP are plus values
  - 1.56 m  $\approx$  5.1 ft = average height of int. from floor.
  - also the new elevations calculated using +1.56 agree with the X section plots.
- ∴ I have recalculated the elevations for U-135, U-140, U-142, U-144, U-146  
- also U-153, U-151, U-150

B.S.	L.P.-63	L.P.-64	L.P.-64	L.P.-64	L.P.-64	L.P.-64	
S.T.A.	L.P.-64	T.P.-1	T.P.-1	T.P.-1	T.P.-1	T.P.-1	
F.S.	T.P.-1	COLLAR - 11-153	END - 11-153	COLLAR - 11-151	COLLAR 11-150	END 11-150	
MEAS. DISTANCE	13.556	10.156	9.290	10.680	8.178	8.214	
VERT. ANGLE	-12° 52' 55"	-4° 23' 15"	-2° 36' 00"	+9° 21' 15"	-9° 11' 10"	-5° 19' 40"	
SINE - V.A.	0.222943	0.076501	0.045363	0.163397	0.169110	0.092853	
COSINE - V.A.	0.974832	0.997070	0.998971	0.986560	0.985597	0.995680	
STA. ELEVATION	1121.369	1115.525	1115.525	1115.525	1115.525	1115.525	
H.I.	-2.822	(-1.199)	(-1.199)	(-1.199)	(-1.199)	(-1.199)	
INST. HEIGHT							
VERT. DISTANCE	-3.022	-0.800	-0.121	+1.745	-1.134	-0.763	
DIFF.							
H.P.	0	0 (1116.22)	0 (1116.60)	0 (1118.77)	0 (1115.59)	0 (1116.26)	
F.S. ELEVATION	1115.525	1113.226	1113.605	1115.771	1112.592	1113.263	
AZ. B.S. TO STA.		282° 15' 10"					
± 180 - 00' - 00"		-180°					
AZ. STA. TO B.S.	152° 40' 50"	102° 15' 10"	102° 15' 10"	102° 15' 10"	102° 15' 10"	102° 15' 10"	
HORZ. ANGLE	129° 34' 20"	140° 28' 20"	146° 58' 50"	141° 55' 15"	143° 08' 40"	143° 16' 40"	
- 360 - 00' - 00"							
AZ. STA. TO F.S.	282° 15' 10"	242° 13' 30"	245° 14' 00"	244° 10' 25"	245° 23' 50"	246° 01' 50"	
BEARING	N-77° 11' 50"-W	S-62° 13' 30"-W	S-65° 14' 00"-W	S-64° 10' 25"-W	S-65° 23' 50"-W	S-66° 01' 50"-W	
HORZ. DISTANCE	13.215	10.125	9.280	10.536	8.356	8.179	
COSINE BEARING	0.212225	0.158262	0.118924	0.135616	0.116325	0.106250	
STA. LAT.	10,881.072	10,883.877	10,883.877	10,883.877	10,883.877	10,883.877	
DIFF.	+2.805	-4.777	-3.888	-4.590	-3.479	-3.323	
F.S. LAT.	10,883.877 N	10,879.100 N	10,879.989 N	10,879.287 N	10,880.398 N	10,880.554 N	N
SINE BEARING	0.977221	0.888817	0.908021	0.900118	0.909216	0.913762	
STA. DEP.	7,165.717	7,152.803	7,152.803	7,152.803	7,152.803	7,152.803	
DIFF.	-12.914	-9.266	-8.126	-9.184	-7.597	-7.174	
F.S. DEP.	7,152.803 E	7,143.537 E	7,144.377 E	7,143.319 E	7,145.206 E	7,145.329 E	E
GRADE CALC.							
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R	P. M	L. R	P. M	L. R.
CALCULATED BY:	<u>LB</u>	<u>LB</u>	<u>LB</u>	<u>LB</u>	<u>LB</u>	<u>LB</u>	<u>LB</u>
CHECKED BY:	<u>R.G.</u>	<u>R.G.</u>	<u>R.G.</u>	<u>R.G.</u>	<u>R.G.</u>	<u>R.G.</u>	<u>R.G.</u>
DATE	SEP 8 1976	SEP 8 1976	SEP 8 1976	SEP 8 1976	SEP 8 1976	SEP 8 1976	SEP 8 1976
FIELD PAGE NO.							

CALCULATIONS FOR DIP & BEARING @ 80W + 3N

CALC. BY: L. BETTIOL  
DATE: SEPT. 8, 1976.

HOLE # 11-153

	NORTHING	EASTING	ELEV.
11-153 (COLLAR)	10,879.100	7,113.537	1113.226
11-153 (END)	<u>10,879.989</u>	<u>7,114.377</u>	<u>1113.605</u>
	-0.889	-0.840	-0.379

$$\text{ARC TAN AZ} = \frac{.840}{.889} = 43^{\circ} 22' 36''$$

$$+ 180$$

$$(223^{\circ} 22' 36'')$$

$$h = \sqrt{(.889)^2 + (.840)^2}$$

$$h = 1.223$$

$$\text{ARC TAN DIP} = \frac{-.379}{1.223} = (-17^{\circ} 13' 04'')$$

HOLE # 11-150

	NORTHING	EASTING	ELEV.
11-150 (COLLAR)	10,880.398	7,115.206	1112.592
11-150 (END)	<u>10,880.554</u>	<u>7,115.329</u>	<u>1113.263</u>
	-0.156	-0.123	-0.671

$$\text{ARC TAN AZ} = \frac{.123}{.156} = 38^{\circ} 15' 16''$$

$$+ 180$$

$$(218^{\circ} 15' 16'')$$

$$h = \sqrt{(.123)^2 + (.156)^2}$$

$$h = 0.199$$

$$\text{ARC TAN DIP} = \frac{-.671}{.199} = (-73^{\circ} 28' 52'')$$

B.S.	<u>L.P.-72</u>	<u>76-028</u>	<u>76-028</u>	<u>76-028</u>	<u>76-028</u>	<u>76-028</u>	
S.T.A.	<u>76-028</u>	<u>TP-1</u>	<u>TP-1</u>	<u>TP-1</u>	<u>TP-1</u>	<u>TP-1</u>	
F.S.	<u>TP-1</u>	<u>COLLAR-11-135</u>	<u>COLLAR-11-140</u>	<u>END-11-140</u>	<u>COLLAR-11-142</u>	<u>END-11-142</u>	
MEAS. DISTANCE	<u>16.524</u>	<u>4.666</u>	<u>4.748</u>	<u>3.975</u>	<u>4.492</u>	<u>4.194</u>	
VERT. ANGLE	<u>-14° 03' 55"</u>	<u>-25° 57' 15"</u>	<u>-25° 05' 00"</u>	<u>-5° 17' 30"</u>	<u>-22° 12' 10"</u>	<u>-11° 13' 25"</u>	
SINE - V.A.	<u>0.243027</u>	<u>0.437653</u>	<u>0.423936</u>	<u>0.092226</u>	<u>0.377885</u>	<u>0.194638</u>	
COSINE - V.A.	<u>0.970020</u>	<u>0.899145</u>	<u>0.905692</u>	<u>0.995738</u>	<u>0.925852</u>	<u>0.980875</u>	
STA. ELEVATION	<u>1121.776</u>	<u>1114.477</u>	<u>1114.477</u>	<u>1114.477</u>	<u>1114.477</u>	<u>1114.477</u>	
H.I.	<u>-3.283</u>	<u>(-1.560)</u>	<u>(-1.560)</u>	<u>(-1.560)</u>	<u>(-1.560)</u>	<u>(-1.560)</u>	
INST. HEIGHT							
VERT. DISTANCE	<u>-4.016</u>	<u>-2.042</u>	<u>-2.013</u>	<u>-0.367</u>	<u>-1.697</u>	<u>-0.816</u>	
DIFF.							
H.P.	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
F.S. ELEVATION	<u>1114.477</u>	<u>1110.875 (1114.00)</u>	<u>1110.904 (1114.02)</u>	<u>1112.550 (1115.67)</u>	<u>1111.22 (1114.39)</u>	<u>1112.101 (1115.221)</u>	
AZ. B.S. TO STA. ±180 - 00' - 00"		<u>313° 54' 51"</u> <u>-180</u>					
AZ. STA. TO B.S.	<u>133° 49' 36"</u>	<u>133° 54' 51"</u>	<u>133° 54' 51"</u>	<u>133° 54' 51"</u>	<u>133° 54' 51"</u>	<u>133° 54' 51"</u>	
HORZ. ANGLE - 360 - 00' - 00"	<u>180° 05' 15"</u>	<u>210° 19' 05"</u>	<u>212° 40' 50"</u>	<u>199° 37' 15"</u>	<u>166° 39' 40"</u>	<u>188° 18' 20"</u>	
AZ. STA. TO F.S.	<u>313° 54' 51"</u>	<u>344° 13' 56"</u>	<u>346° 35' 41"</u>	<u>333° 32' 06"</u>	<u>300° 34' 31"</u>	<u>322° 13' 11"</u>	
BEARING	<u>N-46° 05' 09"-W</u>	<u>N-15° 46' 04"-W</u>	<u>N-13° 24' 19"-W</u>	<u>N-26° 27' 54"-W</u>	<u>N-59° 25' 29"-W</u>	<u>N-37° 46' 49"-W</u>	
HORZ. DISTANCE	<u>16.029</u>	<u>4.195</u>	<u>4.300</u>	<u>3.958</u>	<u>4.159</u>	<u>4.114</u>	
COSINE BEARING	<u>0.693580</u>	<u>0.962371</u>	<u>0.972755</u>	<u>0.895207</u>	<u>0.508670</u>	<u>0.790366</u>	
STA. LAT.	<u>10,963.184</u>	<u>10,974.301</u>	<u>10,974.301</u>	<u>10,974.301</u>	<u>10,974.301</u>	<u>10,974.301</u>	
DIFF.	<u>+11.117</u>	<u>+4.037</u>	<u>+4.183</u>	<u>+3.543</u>	<u>+2.116</u>	<u>+3.252</u>	
F.S. LAT.	<u>10,974.301</u> N	<u>10,978.338</u> N	<u>10,978.484</u> N	<u>10,977.844</u> N	<u>10,976.417</u> N	<u>10,977.553</u> N	N
SINE BEARING	<u>0.720380</u>	<u>0.271739</u>	<u>0.231837</u>	<u>0.445651</u>	<u>0.860961</u>	<u>0.612635</u>	
STA. DEP.	<u>7,553.230</u>	<u>7,541.683</u>	<u>7,541.683</u>	<u>7,541.683</u>	<u>7,541.683</u>	<u>7,541.683</u>	
DIFF.	<u>-11.547</u>	<u>-1.140</u>	<u>-0.997</u>	<u>-1.764</u>	<u>-3.581</u>	<u>-2.520</u>	
F.S. DEP.	<u>7,541.683</u> E	<u>7,540.543</u> E	<u>7,540.686</u> E	<u>7,539.919</u> E	<u>7,538.102</u> E	<u>7,539.163</u> E	E
GRADE CALC.							
			<u>Δ EL. = -1.646</u>	<u>Δ E (140) = 50° 09' 28"</u>	<u>Δ EL. = -0.881</u>	<u>Δ E (142) = 223° 02' 41"</u>	
			<u>Δ N = +0.64</u>	<u>Dip (140) = 58° 44' 48"</u>	<u>Δ N = -1.136</u>	<u>Dip (142) = 29° 32' 36"</u>	
			<u>Δ E = +0.767</u>		<u>Δ E = -1.061</u>		
F.S. GRADE ELV.							
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	<u>RG</u>	<u>RG</u>	<u>RG</u>	<u>RG</u>	<u>RG</u>	<u>RG</u>	<u>RG</u>
CHECKED BY:	<u>RG</u>	<u>RG</u>	<u>RG</u>	<u>RG</u>	<u>RG</u>	<u>RG</u>	<u>RG</u>
DATE	<u>SEP 9 1976</u>	<u>SEP 9 1976</u>	<u>SEP 9 1976</u>	<u>SEP 9 1976</u>	<u>SEP 9 1976</u>	<u>SEP 9 1976</u>	<u>SEP 9 1976</u>
FIELD PAGE NO.							







B.S.	<i>75-051</i>						
S.T.A.	<i>76-008</i>						
F.S.	<i>COLLAR-U-195</i>	<i>END-U-195</i>	<i>COLLAR-U-193</i>	<i>END-U-193</i>	<i>COLLAR-U-191</i>	<i>END-U-191</i>	
MEAS. DISTANCE	<i>14.946</i>	<i>14.712</i>	<i>14.912</i>	<i>14.706</i>	<i>15.284</i>	<i>15.044</i>	
VERT. ANGLE	<i>+7° 53' 30"</i>	<i>+7° 49' 20"</i>	<i>+7° 28' 00"</i>	<i>+7° 22' 15"</i>	<i>+17° 18' 50"</i>	<i>+11° 44' 05"</i>	
SINE - V.A.	<i>0.137300</i>	<i>0.136099</i>	<i>0.129919</i>	<i>0.128435</i>	<i>0.297606</i>	<i>0.203380</i>	
COSINE - V.A.	<i>0.990530</i>	<i>0.990695</i>	<i>0.991521</i>	<i>0.991718</i>	<i>0.954689</i>	<i>0.979100</i>	
STA. ELEVATION	<i>1167.182</i>	<i>1167.182</i>	<i>1167.182</i>	<i>1167.182</i>	<i>1167.182</i>	<i>1167.182</i>	
H.I.	<i>-2.875</i>	<i>-2.875</i>	<i>-2.875</i>	<i>-2.875</i>	<i>-2.875</i>	<i>-2.875</i>	
INST. HEIGHT							
DISTANCE	<i>+2.052</i>	<i>+2.002</i>	<i>+1.938</i>	<i>+1.889</i>	<i>+4.549</i>	<i>+3.060</i>	
DIFF.							
H.P.	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	
F.S. ELEVATION	<i>1166.359</i>	<i>1166.309</i>	<i>1166.245</i>	<i>1166.196</i>	<i>1168.856</i>	<i>1167.367</i>	
AZ. B.S. TO STA.	<i>136° 21' 23"</i>						
±180 - 00' - 00"	<i>+180</i>						
AZ. STA. TO B.S.	<i>316° 21' 23"</i>	<i>316° 21' 23"</i>	<i>316° 21' 23"</i>	<i>316° 21' 23"</i>	<i>316° 21' 23"</i>	<i>316° 21' 23"</i>	
HORZ. ANGLE	<i>171° 32' 10"</i>	<i>178° 06' 55"</i>	<i>189° 59' 45"</i>	<i>183° 31' 25"</i>	<i>185° 50' 40"</i>	<i>178° 59' 40"</i>	
- 360 - 00' - 00"							
AZ. STA. TO F.S.	<i>127° 57' 03"</i>	<i>131° 31' 18"</i>	<i>146° 21' 08"</i>	<i>139° 55' 18"</i>	<i>142° 15' 03"</i>	<i>135° 21' 03"</i>	
BEARING	<i>S-52° 02' 57"-E</i>	<i>S-15° 28' 42"-E</i>	<i>S-33° 35' 52"-E</i>	<i>S-40° 01' 12"-E</i>	<i>S-37° 41' 57"-E</i>	<i>S-41° 35' 57"-E</i>	
HORZ. DISTANCE	<i>14.804</i>	<i>14.575</i>	<i>14.786</i>	<i>14.584</i>	<i>14.591</i>	<i>14.730</i>	
COSINE BEARING	<i>0.614985</i>	<i>0.701179</i>	<i>0.832913</i>	<i>0.765259</i>	<i>0.190699</i>	<i>0.712036</i>	
STA. LAT.	<i>10,645.904</i>	<i>10,645.904</i>	<i>10,645.904</i>	<i>10,645.904</i>	<i>10,645.904</i>	<i>10,645.904</i>	
DIFF.	<i>-9.104</i>	<i>-10.220</i>	<i>-12.316</i>	<i>-11.161</i>	<i>-11.537</i>	<i>-10.488</i>	
F.S. LAT.	<i>10,636.800 N</i>	<i>10,635.684 N</i>	<i>10,633.588 N</i>	<i>10,634.743 N</i>	<i>10,634.367 N</i>	<i>10,635.416 N</i>	<i>N</i>
SINE BEARING	<i>0.788539</i>	<i>0.712985</i>	<i>0.553359</i>	<i>0.613723</i>	<i>0.612205</i>	<i>0.702143</i>	
STA. DEP.	<i>7,663.170</i>	<i>7,663.170</i>	<i>7,663.170</i>	<i>7,663.170</i>	<i>7,663.170</i>	<i>7,663.170</i>	
DIFF.	<i>+11.674</i>	<i>+10.392</i>	<i>+8.182</i>	<i>+9.388</i>	<i>+8.933</i>	<i>+10.343</i>	
F.S. DEP.	<i>7,674.844 E</i>	<i>7,673.562 E</i>	<i>7,671.352 E</i>	<i>7,672.558 E</i>	<i>7,672.103 E</i>	<i>7,673.513 E</i>	<i>E</i>
GRADE CALC.							
	<i>DEL = +0.05</i>	<i>Az = 18° 57' 36"</i>	<i>DEL = 0.049</i>	<i>Az = 226° 14' 15"</i>	<i>DEL = +1.189</i>	<i>Az = 233° 21' 06"</i>	
	<i>AN = +1.116</i>	<i>Dip = +01° 41' 05"</i>	<i>AN = -1.155</i>	<i>Dip = +01° 40' 50"</i>	<i>AN = -1.049</i>	<i>Dip = +10° 16' 19"</i>	
F.S. GRADE ELV.	<i>AE = +1.282</i>		<i>AE = -1.206</i>		<i>AE = -1.410</i>		
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
CHECKED BY:	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	<i>[Signature]</i>	
DATE	<i>Sept. 26, '76</i>	<i>Sept. 26, '76</i>	<i>Sept. 26, '76</i>	<i>Sept. 26, '76</i>	<i>Sept. 26, '76</i>	<i>Sept. 26, '76</i>	
FIELD PAGE NO.							



B.S.	75-037						
S.T.A.	75-044						
F.S.	Collar-U-203	END U-203	Collar-U-202	END U-202	Collar-U-201	END U-201	
MEAS. DISTANCE	5.506	4.734	10.458	10.000	10.516	9.364	
VERT. ANGLE	-1°36'20"	-5°08'15"	-1°58'35"	-2°01'20"	-2°02'05"	-2°12'50"	
SINE - V.A.	0.080295	0.089691	0.034487	0.035287	0.035505	0.038630	
COSINE - V.A.	0.996771	0.995970	0.999105	0.999377	0.999370	0.999254	
STA. ELEVATION	1155.943	1155.943	1155.943	1155.943	1155.943	1155.943	
H.I.	-2.735	-2.735	-2.735	-2.735	-2.735	-2.735	
INST. HEIGHT							
✓ DISTANCE	-0.442	-0.425	-0.361	-0.353	-0.373	-0.362	
DIFF.							
H.P.	0	0	0	0	0	0	
F.S. ELEVATION	1152.766	1152.783	1152.847	1152.856 x	1152.835	1152.846	
AZ. B.S. TO STA. ±180 - 00' - 00"							
AZ. STA. TO B.S.	37°08'38" ✓	37°08'38"	37°08'38"	37°08'38"	37°08'38"	37°08'38"	
HORZ. ANGLE - 360 - 00' - 00"	89°42'00"	100°14'40"	149°51'25"	156°06'00"	150°26'10"	153°36'10"	
AZ. STA. TO F.S.	126°50'38"	137°23'18"	187°00'03"	193°14'38"	187°35'18"	190°45'18"	
BEARING	S-53°09'22"-E	S-42°36'42"-E	S-7°00'03"-W	S-13°14'38"-W	S-7°35'18"-W	S-10°45'18"-W	
HORZ. DISTANCE	5.488	4.715	10.452	9.994	10.509	9.357	
COSINE BEARING	0.599637	0.735959	0.992544	0.973104	0.991243	0.982434	
STA. LAT.	10,729.259	10,729.259	10,729.259	10,729.259	10,729.259	10,729.259	
DIFF.	-3.291	-3.470	-10.374	-9.728	-10.417	-9.193	
F.S. LAT.	10,725.968 N	10,725.789 N	10,718.885 N	10,719.531 N	10,718.842 N	10,720.066 N	N
SINE BEARING	0.800272	0.677026	0.121884	0.229096	0.132054	0.186610	
STA. DEP.	7,635.943	7,635.943	7,635.943	7,635.943	7,635.943	7,635.943	
DIFF.	+4.392	+3.192	-1.274	-2.290	-1.388	-1.746	
F.S. DEP.	7,640.335 E	7,639.135 E	7,634.669 E	7,633.653 E	7,634.555 E	7,634.197 E	E
GRADE CALC.							
Δ EL. = - 0.017	Δ EL. = - 0.017	Δ EL. = - 0.009 x	Δ EL. = - 0.009 x	Δ EL. = - 0.011	Δ EL. = - 0.011	Δ EL. = - 0.011	
Δ E = + 1.200	Δ E = + 1.200	Δ E = + 1.016	Δ E = + 1.016	Δ E = + 0.358	Δ E = + 0.358	Δ E = + 0.358	
F.S. GRADE ELV.	Δ N = + 0.179	Δ N = - 0.646	Δ N = - 0.646	Δ N = - 1.224	Δ N = - 1.224	Δ N = - 1.224	
GRADE CHAIN	H.D. = 1.213	H.D. = 1.204	H.D. = 1.204	H.D. = 1.275	H.D. = 1.275	H.D. = 1.275	
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	LB	LB	LB	LB	LB	LB	
CHECKED BY:	JL	JL	JL	JL	JL	JL	
DATE	Oct 3, '76	Oct 3, '76	Oct 3, '76	Oct 3, '76	Oct 3, '76	Oct 3, '76	
FIELD PAGE NO.							

B.S.	76-02A						
S.T.A.	76-029						
F.S.	COLLAR U-189	END-U-189	COLLAR U-185	END U-185	COLLAR-U-187	END-U-187	
MEAS. DISTANCE	7.230	7.090	8.244	7.745	7.790	7.226	
VERT. ANGLE	-5° 39' 00"	-2° 08' 40"	-0° 57' 30"	-1° 15' 50"	-5° 17' 20"	-1° 09' 00"	
SINE - V.A.	0.098451	0.037419	0.016725	0.022057	0.092177	0.020070	
COSINE - V.A.	0.995123	0.999300	0.999860	0.999757	0.995743	0.999799	
STA. ELEVATION	1177.664	1177.664	1177.664	1177.664	1177.664	1177.664	
H.I.	-2.165	-2.165	-2.165	-2.165	-2.165	-2.165	
INST. HEIGHT							
DISTANCE	-0.712	-0.265	-0.138	-0.171	-0.718	-0.149	
DIFF.							
H.P.	0	0	0	0	0	0	
F.S. ELEVATION	1174.781	1175.234	1175.261	1175.328	1174.781	1175.350	
AZ. B-S TO STA.	131° 09' 19"						
±180 - 00' - 00"	+180						
AZ. STA. TO B.S.	311° 09' 19"	311° 09' 19"	311° 09' 19"	311° 09' 19"	311° 09' 19"	311° 09' 19"	
HORZ. ANGLE	174° 29' 55"	178° 27' 00"	209° 57' 05"	205° 16' 25"	210° 43' 20"	205° 15' 45"	
- 360 - 00' - 00"							
AZ. STA. TO F.S.	125° 59' 14"	129° 36' 19"	161° 06' 24"	153° 25' 44"	161° 52' 39"	156° 25' 04"	
BEARING	S-54° 00' 46"-E	S-50° 23' 41"-E	S-18° 53' 36"-E	S-26° 32' 16"-E	S-18° 07' 21"-E	S-23° 31' 56"-E	
HORZ. DISTANCE	7.195	7.085	8.243	7.743	7.757	7.225	
COSINE BEARING	0.587605	0.637495	-0.946123	0.894380	0.950394	0.916487	
STA. LAT.	10,608.611	10,608.611	10,608.611	10,608.611	10,608.611	10,608.611	
DIFF.	-4.228	-4.517	-7.799	-6.925	-7.372	-6.805	
F.S. LAT.	10,604.383 N	10,604.094 N	10,600.812 N	10,601.686 N	10,601.239 N	10,601.806 N	N
SINE BEARING	0.809148	0.770454	0.323807	0.447308	0.311050	0.400064	
STA. DEP.	7,721.449	7,721.449	7,721.449	7,721.449	7,721.449	7,721.449	
DIFF.	+5.822	+5.459	+4.669	+3.464	+2.413	+2.970	
F.S. DEP.	7,727.271 E	7,726.908 E	7,724.118 E	7,724.913 E	7,723.862 E	7,724.419 E	E
GRADE CALC.	DEL. - 0.447		DEL. + 0.033		DEL. - 0.569		
	ΔE: +0.363	AZ. 51° 28' 31" ✓	ΔE: - 0.795	AZ. 222° 17' 24"	ΔE: - 0.557	AZ. 222° 29' 25"	
	ΔN: +0.289	Dip: -13° 55' 51" Ⓢ	ΔN: - 0.874	Dip: +1° 36' 02" ✓	ΔN: - 0.567	Dip: -35° 35' 32"	
F.S. GRADE ELV.	H.D. = 0.464		H.D. = 1.181		H.D. = 0.795		
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:							
CHECKED BY:							
DATE	Oct 4, 1976	Oct 4, 1976	Oct 4, 1976	Oct 4, 1976	Oct 4, 1976	Oct 4, 1976	
FIELD PAGE NO.							



B.S.	76-041						
S.T.A.	76-044						
F.S.	COLLAR U-165	END U-165	COLLAR U-163	END U-163	COLLAR U-167	END U-167	
MEAS. DISTANCE	8.988	8.804	9.234	8.968	9.378	9.014	
VERT. ANGLE	-1° 31' 20"	+3° 00' 00"	+2° 10' 45"	+2° 21' 20"	+12° 41' 20"	+10° 08' 50"	
SINE - V.A.	0.026564	0.052336	0.038024	0.041101	0.253570	0.176178	
COSINE - V.A.	0.999617	0.998630	0.999277	0.999155	0.967317	0.984358	
STA. ELEVATION	1188.251	1188.251	1188.251	1188.251	1188.251	1188.251	
H.I.	-3.116	-3.116	-3.116	-3.116	-3.116	-3.116	
INST. HEIGHT							
DISTANCE	-0.239	+0.461	+0.351	+0.369	+2.378	+1.588	
DIFF.							
H.P.	0	0	0	0	0	0	
F'S ELEVATION	1184.896	1185.596	1185.186	1185.504	1187.513	1186.723	
AZ. B.S. TO STA.	142° 39' 19"						
±180 - 00' - 00"	+180°						
AZ. STA. TO B.S.	322° 39' 19"	322° 39' 19"	322° 39' 19"	322° 39' 19"	322° 39' 19"	322° 39' 19"	
HORZ. ANGLE	188° 53' 50"	183° 22' 50"	189° 48' 40"	183° 39' 00"	187° 52' 00"	182° 35' 40"	
- 360 - 00' - 00"							
AZ. STA. TO F.S.	151° 33' 39"	146° 02' 39"	152° 28' 29"	146° 18' 19"	150° 31' 19"	145° 15' 29"	
BEARING	S-28° 46' 21"-E	S-33° 51' 21"-E	S-27° 31' 31"-E	S-33° 41' 11"-E	S-29° 28' 11"-E	S-34° 14' 31"-E	
HORZ. DISTANCE	8.985	8.792	9.227	8.960	9.071	8.873	
COSINE BEARING	0.879323	0.829469	0.886807	0.832086	0.870616	0.821727	
STA. LAT.	10,536.678	10,536.678	10,536.678	10,536.678	10,536.678	10,536.678	
DIFF.	-7.901	-7.293	-8.183	-7.455	-7.897	-7.291	
F.S. LAT.	10,528.777 N	10,529.385 N	10,528.495 N	10,529.223 N	10,528.781 N	10,529.387 N	N
SINE BEARING	0.476225	0.558551	0.462140	0.551617	0.491963	0.569881	
STA. DEP.	7,776.800	7,776.800	7,776.800	7,776.800	7,776.800	7,776.800	
DIFF.	+4.279	+4.911	+4.264	+4.970	+4.463	+5.057	
F.S. DEP.	7,781.079 E	7,781.711 E	7,781.064 E	7,781.770 E	7,781.263 E	7,781.857 E	E
GRADE CALC.	ΔEL. = -0.700		ΔEL. = -0.018		ΔEL. = +0.790		
	ΔN. = -0.608	Δz = 226° 06' 32"	ΔN. = -0.728	Δz = 224° 07' 16"	ΔN. = -0.594	Δz = <del>225° 31' 23"</del> = 225° 31' 23"	
	ΔE. = -0.632	Dip = <del>1° 01' 01"</del>	ΔE. = -0.706	Dip = -1° 01' 01"	ΔE. = -0.606	Dip = <del>1° 01' 01"</del> = +12° 56' 18"	
F.S. GRADE ELV.	H.D. = 0.877	-38° 35' 46"	H.D. = 1.014		H.D. = 0.849		
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:							
CHECKED BY:							
DATE	Oct 4, 1976	Oct 4, 1976	Oct 4, 1976	Oct 4, 1976	Oct 4, 1976	Oct 4, 1976	
FIELD PAGE NO.							







B.S.	L.P. - 16						
S.T.A.	76-001						
F.S.	COLLAR U-207	END U-207	COLLAR U-208	END - U-208	COLLAR U-209	END U-209	
MEAS. DISTANCE	11.938	11.722	11.656	11.136	12.021	11.814	
VERT. ANGLE	-8° 55' 45"	-9° 05' 35"	-12° 10' 35"	-8° 19' 35"	-12° 51' 20"	-9° 36' 05"	
SINE - V.A.	0.155213	0.158038	0.253359	0.144812	0.257226	0.166792	
COSINE - V.A.	0.987881	0.987133	0.967372	0.989159	0.966351	0.985992	
STA. ELEVATION	1151.088	1151.088	1151.088	1151.088	1151.088	1151.088	
H.I.	-1.787	-1.787	-1.787	-1.787	-1.787	-1.787	
INST. HEIGHT							
DISTANCE	-1.853	-1.853	-2.953	-1.656	-3.095	-1.970	
DIFF.							
H.P.	0	0	0	0	0	0	
F.S. ELEVATION	1150.448 ✓	1150.448 ✓	1149.348 ✓	1150.645 ✓	1149.206 ✓	1150.331 ✓	
AZ. B-S TO STA.							
± 180 - 00' - 00"							
AZ. STA. TO B.S.	316° 10' 31"	316° 10' 31"	316° 10' 31"	316° 10' 31"	316° 10' 31"	316° 10' 31"	
HORZ. ANGLE	15° 38' 00"	9° 48' 15"	11° 37' 35"	9° 19' 10"	7° 27' 20"	7° 28' 10"	
- 360 - 00' - 00"							
AZ. STA. TO F.S.	322° 18' 31" ✓	326° 28' 16" ✓	328° 18' 06" ✓	326° 00' 11" ✓	321° 07' 51" ✓	321° 09' 11" ✓	
BEARING	N-27° 11' 29"-W	N-33° 31' 14"-W	N-31° 11' 51"-W	N-33° 59' 49"-W	N-35° 52' 09"-W	N-35° 50' 49"-W	
HORZ. DISTANCE	11.793	11.575	11.276	11.315	11.629	11.619	
COSINE BEARING	0.885164	0.833688	0.850826	0.829067	0.810357	0.810584	
STA. LAT.	10,800.702	10,800.702	10,800.702	10,800.702	10,800.702	10,800.702	
DIFF.	+10.442	+9.650	+9.594	+9.381	+9.424	+9.412	
F.S. LAT.	10,811.144 ✓ N	10,810.352 ✓ N	10,810.296 ✓ N	10,810.083 ✓ N	10,810.126 ✓ N	10,810.144 ✓ N	N
SINE BEARING	0.464709	0.552236	0.525117	0.559119	0.585936	0.585622	
STA. DEP.	7,679.304	7,679.304	7,679.304	7,679.304	7,679.304	7,679.304	
DIFF.	-5.480	-6.392	-5.925	-6.327	-6.814	-6.822	
F.S. DEP.	7,673.824 ✓ E	7,672.912 ✓ E	7,673.379 ✓ E	7,672.977 ✓ E	7,672.490 ✓ E	7,672.482 ✓ E	E
GRADE CALC.							
DEL. 0			DEL. = -1.297		DEL. = -1.125 ✓		
DE = +0.912		AL. = 19° 01' 12"	DE = +0.403	AL. = 62° 04' 59"	DE = +0.008 ✓	AL. = 156° 02' 15"	156-02-15
F.S. GRADE ELV.	AN = +0.792	D.P. = 0° 00' 00"	AN = +0.213	D.P. = -70° 10' 07" ✓	AN = -0.018 ✓	D.P. = -88° 58' 53" ✓	
GRADE CHAIN	H.D. = 1.208		H.D. = 0.155		H.D. = 0.020 ✓		
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	LB	LB	LB	LB	LB	LB	
CHECKED BY:	JL	JL	JL	JL	JL	JL	
DATE	Oct 6, 1976	Oct 6, 1976	Oct 6, 1976	Oct 6, 1976	Oct 6, 1976	Oct 6, 1976	
FIELD PAGE NO.							





B.S.	<u>76-047</u>			<u>L.P.-86</u>	<u>76-042</u>		
S.T.A.	<u>76-045</u>			<u>76-042</u>	<u>TP1</u>		
F.S.	<u>COLLAR U-178</u>	<u>END - U-178</u>	<u>COLLAR U-176</u>	<u>TP-1</u>	<u>COLLAR U-180</u>	<u>END U-180</u>	
MEAS. DISTANCE	<u>6.762</u>	<u>6.078</u>	<u>5.702</u>	<u>11.913</u>	<u>16.171</u>	<u>16.100</u>	
VERT. ANGLE	<u>+25° 10' 00"</u>	<u>+16° 15' 20"</u>	<u>-12° 39' 00"</u>	<u>-2° 17' 50"</u>	<u>+1° 21' 25"</u>	<u>+3° 12' 50"</u>	
SINE - V.A.	<u>0.433131</u>	<u>0.288289</u>	<u>0.218995</u>	<u>0.048801</u>	<u>0.076970</u>	<u>0.056063</u>	
COSINE - V.A.	<u>0.901329</u>	<u>0.957511</u>	<u>0.975726</u>	<u>0.998809</u>	<u>0.997110</u>	<u>0.998127</u>	
STA. ELEVATION	<u>1104.653</u>	<u>1104.653</u>	<u>1104.653</u>	<u>1103.815</u>	<u>1099.051</u>	<u>1099.051</u>	
H.I.							
INST. HEIGHT	<u>+2.929</u>	<u>+1.752</u>	<u>-1.219</u>	<u>-2.193</u>	<u>+3.531</u>	<u>+2.601</u>	
VERT. DISTANCE	<u>-2.686</u>	<u>-2.686</u>	<u>-2.686</u>	<u>-2.571</u>	<u>+1.151</u>	<u>+1.151</u>	
DIFF.							
H.P.	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	<u>0</u>	
F.S. ELEVATION	<u>1104.896</u> ✓	<u>1103.719</u> ✓	<u>1100.718</u> ✓	<u>1099.051</u> ✓	<u>1104.036</u> ✓	<u>1103.106</u> ✓	
AZ. B.S. TO STA. ±180 - 00' - 00"					<u>221° 55' 30"</u> <u>-180°</u>		
AZ. STA. TO B.S.	<u>56° 56' 15"</u>	<u>56° 56' 15"</u>	<u>56° 56' 15"</u>	<u>13° 18' 00"</u>	<u>11° 55' 30"</u>	<u>11° 55' 30"</u>	
HORZ. ANGLE - 360 - 00' - 00"	<u>0° 32' 00"</u>	<u>0° 35' 20"</u>	<u>359° 57' 55"</u>	<u>181° 07' 30"</u>	<u>358° 13' 10"</u>	<u>358° 16' 10"</u>	
AZ. STA. TO F.S.	<u>57° 28' 15"</u> ✓	<u>57° 32' 05"</u> ✓	<u>56° 51' 10"</u> ✓	<u>221° 55' 30"</u> ✓	<u>13° 39' 10"</u> ✓	<u>13° 12' 10"</u> ✓	
BEARING	<u>N-57° 28' 15"-E</u>	<u>N-57° 32' 05"-E</u>	<u>N-56° 51' 10"-E</u>	<u>S-11° 55' 30"-W</u>	<u>N-13° 39' 10"-E</u>	<u>N-13° 12' 10"-E</u>	
HORZ. DISTANCE	<u>6.095</u>	<u>5.820</u>	<u>5.561</u>	<u>11.889</u>	<u>16.310</u>	<u>16.327</u>	
COSINE BEARING	<u>0.537606</u>	<u>0.536789</u>	<u>0.515910</u>	<u>0.708032</u>	<u>0.723537</u>	<u>0.722934</u>	
STA. LAT.	<u>11,049.811</u>	<u>11,049.811</u>	<u>11,049.811</u>	<u>11,020.003</u>	<u>10,988.220</u>	<u>10,988.220</u>	
DIFF.	<u>+3.277</u>	<u>+3.121</u> ✓	<u>+3.038</u>	<u>-31.783</u>	<u>+33.529</u>	<u>+33.191</u>	
F.S. LAT.	<u>11,053.118</u> ✓ N	<u>11,052.965</u> ✓ N	<u>11,052.879</u> ✓ N	<u>10,988.220</u> ✓ N	<u>11,021.719</u> ✓ N	<u>11,021.711</u> ✓ N	N
SINE BEARING	<u>0.813196</u>	<u>0.813717</u>	<u>0.837825</u> ✓	<u>0.706180</u>	<u>0.690286</u>	<u>0.690917</u>	
STA. DEP.	<u>7,111.008</u>	<u>7,111.008</u>	<u>7,111.008</u>	<u>7,112.267</u>	<u>7,380.567</u>	<u>7,380.567</u>	
DIFF.	<u>+5.139</u>	<u>+1.910</u>	<u>+1.661</u>	<u>-31.700</u>	<u>+31.988</u>	<u>+32.008</u>	
F.S. DEP.	<u>7,116.147</u> ✓ E	<u>7,115.918</u> ✓ E	<u>7,115.669</u> ✓ E	<u>7,380.567</u> ✓ E	<u>7,112.555</u> ✓ E	<u>7,112.575</u> ✓ E	E
GRADE CALC.							
	<u>ΔE1 = +1.177</u> ✓	<u>ΔE2 = 56° 15' 08"</u> ✓	<u>APPROX. COLLAR</u>		<u>ΔE1 = +0.930</u> ✓		
	<u>ΔE = +0.229</u> ✓	<u>Dip = +77° 04' 13"</u> ✓	<u>LOCATION.</u>		<u>ΔE = -0.020</u> ✓	<u>ΔE = 332° 11' 29"</u> ✓	
F.S. GRADE ELV.	<u>ΔN = +0.153</u> ✓				<u>ΔN = +0.038</u> ✓	<u>Dip = +87° 21' 10"</u> ✓	
GRADE CHAIN	<u>H.D. = 0.275</u> ✓				<u>H.D. = 0.043</u> ✓		
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	<u>LB</u>	<u>LB</u>	<u>LB</u>	<u>LB</u>	<u>LB</u>	<u>LB</u>	<u>LB</u>
CHECKED BY:							
DATE	<u>Oct. 11, 1976</u>	<u>Oct. 11, 1976</u>	<u>Oct. 11, 1976</u>	<u>Oct. 11, 1976</u>	<u>Oct. 11, 1976</u>	<u>Oct. 11, 1976</u>	
FIELD PAGE NO.							

B.S.	76-042						
S.T.A.	TP-1						
F.S.	COLLAR U-170	END U-170	COLLAR U-186	END - U-186	COLLAR U-184	COLLAR U-182	
MEAS. DISTANCE	46.344	46.320	8.124	7.574	10.098	6.968	
VERT. ANGLE	-0° 17' 50"	+0° 16' 20"	+18° 42' 00"	+11° 08' 40"	-9° 33' 15"	-13° 19' 05"	
SINE - V.A.	0.013914	0.013177	0.320613	0.193283	0.165980	0.238839	
COSINE - V.A.	0.999903	0.999909	0.947210	0.981123	0.986129	0.971059	
STA. ELEVATION	1099.051	1099.051	1099.051	1099.051	1099.051	1099.051	
H.I.	+1.154	+1.154	+1.154	+1.154	+1.154	+1.154	
INST. HEIGHT							
VERT. DISTANCE	-0.615	+0.624	+2.605	+1.164	-1.676	-1.664	
DIFF.							
H.P.	0	0	0	0	0	0	
F.S. ELEVATION	1099.860 ✓	1101.129 ✓	1103.110 ✓	1101.969 ✓	1098.829 ✓	1098.821 ✓	
AZ. B.S. TO STA.							
±180 - 00' - 00"							
AZ. STA. TO B.S.	11° 55' 30"	11° 55' 30"	11° 55' 30"	11° 55' 30"	11° 55' 30"	11° 55' 30"	
HORZ. ANGLE	358° 33' 20"	358° 31' 10"	181° 11' 20"	139° 19' 40"	150° 06' 35"	136° 08' 20"	
- 360 - 00' - 00"							
AZ. STA. TO F.S.	13° 28' 50" ✓	13° 30' 10" ✓	186° 06' 50" ✓	182° 15' 10" ✓	195° 02' 05" ✓	181° 03' 50" ✓	
BEARING	N-13° 28' 50"-E	N-13° 30' 10"-E	S-6° 06' 50"-W	S-1° 15' 10"-W	S-15° 02' 05"-W	S-1° 03' 50"-W	
HORZ. DISTANCE	46.310	46.316	7.695	7.431	9.958	6.766	
COSINE BEARING	0.725608	0.725311	0.994312	0.997217	0.965769	0.999828	
STA. LAT.	10,988.220	10,988.220	10,988.220	10,988.220	10,988.220	10,988.220	
DIFF.	+33.625	+33.595	-7.651	-7.411	-9.617	-6.765	
F.S. LAT.	11,021.845 ✓ N	11,021.815 ✓ N	10,980.569 ✓ N	10,980.809 ✓ N	10,978.603 ✓ N	10,981.155 ✓ N	N
SINE BEARING	0.688108	0.688389	0.106505	0.074157	0.259104	0.018567	
STA. DEP.	7,380.567	7,380.567	7,380.567	7,380.567	7,380.567	7,380.567	
DIFF.	+31.887	+31.883	-0.820	-0.551	-2.583	-0.126	
F.S. DEP.	7,412.454 ✓ E	7,412.450 ✓ E	7,379.747 ✓ E	7,380.016 ✓ E	7,377.984 ✓ E	7,380.441 ✓ E	E
GRADE CALC.							
	ΔE1. - 1.269 x		ΔE1. + 1.121		APPROXIMATE	APPROXIMATE	
	ΔE = +0.004 ✓	ΔE = 7° 35' 11" ✓	ΔE = -0.269	ΔE = 228° 15' 39" ✓	COLLAR LOCATION	COLLAR LOCATION	
F.S. GRADE ELV.	ΔN = +0.030 ✓	Dip = -88° 38' 15"	ΔN = -0.210	Dip = +72° 26' 36"			
GRADE CHAIN	H.D. = 0.030 ✓		H.D. = 0.361				
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	<i>JB</i>	<i>JB</i>	<i>JB</i>	<i>JB</i>	<i>JB</i>	<i>JB</i>	
CHECKED BY:	<i>JE</i>	<i>JE</i>	<i>JE</i>	<i>JE</i>	<i>JE</i>	<i>JE</i>	
DATE	Oct 11, 1976	Oct 11, 1976	Oct 11, 1976	Oct 11, 1976	Oct 11, 1976	Oct 11, 1976	
FIELD PAGE NO.							

B.S.	L.P. 51							
S.T.A.	76-011							
F.S.	COLLAR U-214	END U-214	COLLAR U-215	END - U-215	COLLAR U-216	END U-216		
MEAS. DISTANCE	7.006	6.115	5.623	4.952	4.570	4.314		
VERT. ANGLE	-5° 54' 20"	-6° 30' 00"	-7° 31' 50"	-8° 56' 45"	-22° 35' 20"	-8° 26' 10"		
SINE - V.A.	0.102889	0.113203	0.350707	0.155500	0.386104	0.146850		
COSINE - V.A.	0.991693	0.993572	0.936485	0.987896	0.909317	0.989159		
STA. ELEVATION	1122.903	1122.903	1122.903	1122.903	1122.903	1122.903		
H.I.	-3.023	-3.023	-3.023	-3.023	-3.023	-3.023		
INST. HEIGHT								
VERT. DISTANCE	-0.721	-0.692	-1.972	-0.770	-1.902	-0.634		
DIFF.								
H.P.	0	0	0	0	0	0		
F.S. ELEVATION	1139.159 ✓	1139.188 ✓	1137.908 ✓	1139.110 ✓	1137.978 ✓	1139.246 ✓		
AZ. B.S. TO STA.								
± 180 - 00' - 00"								
AZ. STA. TO B.S.	313° 28' 16"	313° 28' 16"	313° 28' 16"	313° 28' 16"	313° 28' 16"	313° 28' 16"		
HORZ. ANGLE	75° 07' 20"	68° 06' 20"	65° 17' 10"	60° 37' 40"	36° 20' 00"	38° 27' 25"		
- 360 - 00' - 00"								
AZ. STA. TO F.S.	25° 35' 36" ✓	21° 34' 36" ✓	18° 15' 26" ✓	12° 05' 56" ✓	249° 18' 16" ✓	351° 55' 11" ✓		
BEARING	N-25° 35' 36"-E	N-21° 34' 36"-E	N-18° 15' 26"-E	N-12° 05' 56"-E	N-10° 11' 11"-W	N-8° 01' 19"-W		
HORZ. DISTANCE	6.969	6.076	5.266	4.892	4.156	4.267		
COSINE BEARING	0.901883	0.929926	0.946890	0.969877	0.981209	0.990093		
STA. LAT.	10,854.171	10,854.171	10,854.171	10,854.171	10,854.171	10,854.171		
DIFF.	+6.285	+5.650	+4.986	+4.745	+4.090	+4.225		
F.S. LAT.	10,860.456 ✓ N	10,859.821 ✓ N	10,859.157 ✓ N	10,858.916 ✓ N	10,858.261 ✓ N	10,858.396 ✓ N	N	
SINE BEARING	0.431981	0.367746	0.321558	0.213596	0.177008	0.140816		
STA. DEP.	7,631.075	7,631.075	7,631.075	7,631.075	7,631.075	7,631.075		
DIFF.	+3.010	+2.234	+1.693	+1.192	-0.736	-0.599		
F.S. DEP.	7,637.085 ✓ E	7,636.309 ✓ E	7,635.768 ✓ E	7,635.267 ✓ E	7,633.339 ✓ E	7,633.476 ✓ E	E	
GRADE CALC.								
	ΔEL. = -0.029		ΔEL. = -1.202		ΔEL. = -1.268			
	ΔE. = +0.776	Az. = 50° 12' 24" ✓	ΔE. = +0.501	Az. = 61° 18' 38" ✓	ΔE. = -0.137	Az. = 225° 25' 17" ✓		
F.S. GRADE ELV.	ΔN. = +0.635	Dip. = -1° 39' 22" ✓	ΔN. = +0.211	Dip. = -65° 10' 35" ✓	ΔN. = -0.135	Dip. = -81° 23' 23" ✓		
GRADE CHAIN	H.D. = 1.003		H.D. = 0.556		H.D. = 0.192			
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.	
CALCULATED BY:	[Signature]		[Signature]		[Signature]		[Signature]	
CHECKED BY:	[Signature]		[Signature]		[Signature]		[Signature]	
DATE	Oct. 11, 1976		Oct. 11, 1976		Oct. 11, 1976		Oct. 11, 1976	
FIELD PAGE NO.								

B.S.	LP 47		LP 47		LP-47		76-026	
S.T.A.	76-003		76-003		76-003		LP 70	
F.S.	Collar U-192	End U-192	Collar U-194	End U-194	Collar U-196	End U-196	Collar U 149	
MEAS. DISTANCE	5.584	5.003	5.384	4.974	5.240	4.938	12.548	
VERT. ANGLE	-27° 04' 20"	-14° 40' 40"	-28° 42' 40"	-14° 29' 00"	-28° 59' 10"	-18° 54' 40"	-5° 32' 45"	
SINE - V.A.	-0.455113	-0.253383	-0.480394	-0.250098	-0.484598	-0.324101	-0.096642	
COSINE - V.A.	0.890434	0.967366	0.877053	0.968220	0.874737	0.946023	0.995319	
STA. ELEVATION	1145.392	1145.392	1145.392	1145.392	1145.392	1145.392	1121.426	
H.I.	-2.673	-2.673	-2.673	-2.673	-2.673	-2.673	-3.285	
INST. HEIGHT								
VERT. DISTANCE	-2.541	-1.268	-2.586	-1.244	-2.539	-1.600	-1.213	
DIFF.								
H.P.	∅	∅	∅	∅	∅	∅	∅	
F.S. ELEVATION	1140.178 ✓	1141.451 ✓	1140.133 ✓	1141.475 ✓	1140.180 ✓	1141.119 ✓	1116.928 ✓	
AZ. B.S. TO STA.							43° 46' 30"	
±180 - 00' - 00"							+180	
AZ. STA. TO B.S.	313° 39' 29" ✓	313° 39' 29"	313° 39' 29"	313° 39' 29"	313° 39' 29"	313° 39' 29"	223° 46' 30"	
HORZ. ANGLE	27° 21' 35"	21° 43' 40"	16° 29' 15"	16° 07' 25"	0° 56' 40"	6° 36' 20"	185° 41' 40"	
-360 - 00' - 00"							-360	
AZ. STA. TO F.S.	341° 01' 04"	335° 23' 09"	330° 08' 44"	329° 46' 54"	314° 36' 09"	320° 15' 49"	49° 28' 10"	
BEARING	N 18° 58' 56" W ✓	N 24° 36' 51" W ✓	N 29° 51' 16" W ✓	N 30° 13' 06" W ✓	N 45° 23' 51" W ✓	N 39° 44' 11" W ✓	N 49° 28' 10" E ✓	
HORZ. DISTANCE	4.972	4.840	4.722	4.816	4.584	4.671	12.489	
COSINE BEARING	0.945620	0.909133	0.867293	0.864114	0.702184	0.768994	0.645853	
STA. LAT.	10781.315	10781.315	10781.315	10781.315	10781.315	10781.315	10931.417	
DIFF.	4.702	4.400	4.095	4.162	3.219	3.592	8.116	
F.S. LAT.	10786.017 ✓ N	10785.715 ✓ N	10785.410 ✓ N	10785.477 ✓ N	10784.534 ✓ N	10784.907 ✓ N	10939.533 ✓ N	
SINE BEARING	-0.325275	-0.416506	-0.497798	-0.503296	-0.711995	-0.639256	0.760060	
STA. DEP.	7567.479	7567.479	7567.479	7567.479	7567.479	7567.479	7493.137	
DIFF.	-1.617	-2.016	-2.351	-2.424	-3.264	-2.986	9.492	
F.S. DEP.	7565.862 ✓ E	7565.463 ✓ E	7565.128 ✓ E	7565.055 ✓ E	7564.215 ✓ E	7564.493 ✓ E	7502.629 ✓ E	
GRADE CALC.	∆EI -1.273	Azimuth	∆EI -1.342	Az.	∆EI -0.939	Az		
	∆N +0.302	N 52° 52' 42" E ✓	∆N -0.067	132° 32' 45" ✓	∆N -0.373	216° 41' 51" ✓	Approx.	
	∆E +0.399	Dip	∆E +0.073	Dip	∆E -0.278	Dip		
F.S. GRADE ELV.	HD 0.500	-68° 33' 23" ✓	HD 0.099	-85° 46' 51" ✓	HD 0.465	-63° 39' 18" ✓		
GRADE CHAIN								
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.	
CALCULATED BY:	<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>	
CHECKED BY:	<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>		<i>[Signature]</i>	
DATE	Oct. 16/76	Oct. 16/76	Oct. 16/76	Oct. 16/76	Oct. 16/76	Oct. 16/76	Oct. 17/76.	
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4/6 D.D.Hs @ 3' N of 78'

B.S.	LP-20	LP-20	LP35		LP35		LP 35
S.T.A.	75-025	75-025	75-042		75-042		75-042
F.S.	Collar U-217	Collar U-198	Collar U213	End U213	Collar U-212	End U 212	Collar 211
MEAS. DISTANCE	15.214	16.264	13.564	13.290	13.570	13.306	13.268
VERT. ANGLE	-05° 12' 20"	-4° 50' 45"	-14° 45' 05"	-10° 53' 35"	-14° 37' 15"	-8° 52' 30"	-14° 50' 20"
SINE - V.A.	-0.090729	-0.084475	-0.254625	-0.188976	-0.252421	-0.154279	-0.256102
COSINE - V.A.	0.995876	0.996426	0.967040	0.981982	0.967617	0.988027	0.966650
STA. ELEVATION	1177.644	1177.644	1155.619	1155.619	1155.619	1155.619	1155.619
H.I.	-3.430	-3.430	-2.670	-2.670	-2.670	-2.670	-2.670
INST. HEIGHT							
VERT. DISTANCE	-1.380	-1.374	-3.454	-2.511	-3.425	-2.053	-3.398
DIFF.							
H.P.	∅	∅	∅	∅	∅	∅	∅
F.S. ELEVATION	1172.834 ✓	1172.840 ✓	1149.495 ✓	1150.438 ✓	1149.524 ✓	1150.896 ✓	1149.551 ✓
AZ. B.S. TO STA. ±180 - 00' - 00"							
AZ. STA. TO B.S.	233° 00' 03"	233° 00' 03"	134° 18' 15"	134° -18' 15"	134° 18' 15"	134° 18' 15"	134° 18' 15"
HORZ. ANGLE - 360 - 00' - 00"	116° 39' 00"	123° 09' 55"	191° 14' 35"	189° 20' 00"	184° 43' 05"	184° 17' 05"	179° 52' 05"
AZ. STA. TO F.S.	349° 39' 03"	356° 09' 58"	325° 32' 50"	323° 38' 15"	319° 01' 20"	318° 35' 20"	314° 10' 20"
BEARING	N 10° 20' 57" W ✓	N 3° 50' 02" W ✓	N 34° 27' 10" W ✓	N 36° 21' 45" W ✓	N 40° 58' 40" W ✓	N 41° 24' 40" W ✓	N 45° 49' 40" W ✓
HORZ. DISTANCE	15.151	16.206	13.117	13.051	13.131	13.147	12.826
COSINE BEARING	0.983731	0.997762	0.824593	0.805282	0.754964	0.749983	0.696817
STA. LAT.	10693.073	10693.073	10733.839	10733.839	10733.839	10733.839	10733.839
DIFF.	14.906	16.170	10.816	10.510	9.913	9.860	8.937
F.S. LAT.	10707.979 N	10709.243 N	10744.655 N	10744.349 N	10743.752 N	10743.699 N	10742.776 N
SINE BEARING	-0.179646	-0.066864	-0.565727	-0.592892	-0.655766	-0.661457	-0.717249
STA. DEP.	7470.623	7470.623	7617.294	7617.294	7617.294	7617.294	7617.294
DIFF.	-2.722	-1.084	-7.421	-7.738	-8.611	-8.696	-9.199 ✓
F.S. DEP.	7467.901 ✓ E	7469.539 ✓ E	7609.873 ✓ E	7609.556 ✓ E	7608.683 ✓ E	7608.598 ✓ E	7608.095 ✓ E
GRADE CALC.			ΔE1 -0.943	A2.	ΔE1 -1.372	A2.	
	Approx.	Approx.	ΔN +0.306	N46° 00' 42" E ✓	ΔN +0.053	N58° 03' 19" E ✓	Collar Only.
			ΔE +0.317	Dip	ΔE +0.085	Dip	
F.S. GRADE ELV.			HD 0.441	-64° 56' 12" ✓	HD 0.100	-85° 49' 53" ✓	
GRADE CHAIN							
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.
CALCULATED BY:	<i>JL</i>	<i>JL</i>	<i>JL</i>	<i>JL</i>	<i>JL</i>	<i>JL</i>	<i>JL</i>
CHECKED BY:	<i>HB</i>	<i>HB</i>	<i>HB</i>	<i>HB</i>	<i>HB</i>	<i>HB</i>	<i>HB</i>
DATE	Oct. 16/76	Oct. 16/76	Oct. 16/76	Oct. 16/76	Oct. 16/76	Oct. 16/76	Oct. 16/76
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B.S.	75-048	75-050				
S.T.A.	75-050	TP-1				
F.S.	TP-1	COLLAR U-206	END - U-206	COLLAR U-205	END U-205	COLLAR U-20A
MEAS. DISTANCE	19.471	12.308	12.020	9.541	9.482	10.906
VERT. ANGLE	-0°28'15"	+17°31'00"	+13°22'15"	-2°32'05"	-2°12'40"	-5°59'40"
SINE - V.A.	0.008217	0.301815	0.231253	0.044224	0.047300	0.104432
COSINE - V.A.	0.999966	0.953367	0.972894	0.999022	0.998881	0.994532
STA. ELEVATION	1157.251	1154.609	1154.609	1154.609	1154.609	1154.609
H.I.	-2.482	+1.325	+1.325	+1.325	+1.325	+1.325
INST. HEIGHT						
VERT. DISTANCE	-0.160	+3.715	+2.780	-0.122	-0.418x	-1.139
DIFF.						
H.P.	0	0	0	0	0	0
F.S. ELEVATION	1154.609 ✓	1159.649 ✓	1158.714 ✓	1155.512 ✓	1155.486x	1154.795 ✓
AZ. B.S. TO STA.	60°40'19"	103°16'01"				
±180 - 00' - 00"	+180°	+180°				
AZ. STA. TO B.S.	240°40'19"	283°16'01"	283°16'01"	283°16'01"	283°16'01"	283°16'01"
HORZ. ANGLE	223°05'42"	218°16'15"	218°12'05"	201°07'00"	208°05'20"	217°09'00"
-360 - 00' - 00"						
AZ. STA. TO F.S.	103°16'01" ✓	142°02'16" ✓	141°58'06" ✓	124°53'01" ✓	131°51'21" ✓	140°55'01" ✓
BEARING	S-76°13'59"-E ✓	S-37°57'44"-E ✓	S-38°01'54"-E ✓	S-55°06'59"-E ✓	S-48°08'39"-E ✓	S-39°01'59"-E ✓
HORZ. DISTANCE	19.470	11.734	11.694	9.532	9.471	10.816
COSINE BEARING	0.237973	0.788417	0.787671	0.571912	0.667259	0.776233
STA. LAT.	10,780.219	10,775.586	10,775.586	10,775.586	10,775.586	10,775.586
DIFF.	-4.633	-9.251	-9.211	-5.451	-6.320	-8.419
F.S. LAT.	10,775.586 ✓ N	10,766.335 ✓ N	10,766.315 ✓ N	10,770.135 ✓ N	10,769.266 ✓ N	10,767.167 ✓ N
SINE BEARING	0.971272	0.615122	0.616097	0.820315	0.744826	0.630446
STA. DEP.	7,689.829	7,708.740	7,708.740	7,708.740	7,708.740	7,708.740
DIFF.	+18.911	+7.218	+7.205	+7.819	+7.054	+6.838
F.S. DEP.	7,708.740 ✓ E	7,715.958 ✓ E	7,715.945 ✓ E	7,716.559 ✓ E	7,715.794 ✓ E	7,715.578 ✓ E
GRADE CALC.		DEL. +0.935		DEL. +0.026		Approx.
F.S. GRADE ELV.		DE. +0.013	Az. = 161°59'45" ✓	DE. +0.765	Az. = 41°21'29" ✓	
GRADE CHAIN		AN. -0.04	Dip = +87°25'41" ✓	AN. +0.869	Dip = +1°17'10"	
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.
CALCULATED BY:						
CHECKED BY:						
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B.S.	LP 58		LP 63			76-026		
S.T.A.	76-015		76-020			LP-70		
F.S.	Collar U148	End U148	Collar U154	End U154	Collar U156	Collar U152	End U152	
MEAS. DISTANCE	17.950	17.753	19.184	19.298	19.374	12.568	12.310	
VERT. ANGLE	-12° 59' 05"	-11° 16' 40"	+3° 13' 00"	-0° 20' 45"	-7° 47' 20"	+15° 58' 40"	+11° 00' 00"	
SINE - V.A.	-0.224691	-0.195566	0.056112	-0.006036	-0.135523	0.275265	0.190809	
COSINE - V.A.	0.974430	0.980691	0.998424	0.999982	0.990774	0.961369	0.981627	
STA. ELEVATION	1131.470	1131.470	1121.620	1121.620	1121.620	1121.426	1121.426	
H.I.	-2.563	-2.563	-2.740	-2.740	-2.740	-3.285	-3.285	
INST. HEIGHT								
VERT. DISTANCE	-4.033	-3.472	+1.076	-0.116	-2.626	+3.460	+2.349	
DIFF.								
H.P.	Ø							
F.S. ELEVATION	1124.874 ✓	1125.435 ✓	1119.956 ✓	1118.764 ✓	1116.254 ✓	1121.601 ✓	1120.490 ✓	
AZ. B.S. TO STA. ±180 - 00' - 00"						43° 46' 30"		
AZ. STA. TO B.S.	133° 47' 20"	133° 47' 20"	133° 46' 15"	133° 46' 15"	133° 46' 15"	223° 46' 30"	223° 46' 30"	
HORZ. ANGLE - 360 - 00' - 00"	191° 01' 05"	188° 32' 20"	223° 38' 20"	223° 49' 00"	223° 27' 45"	186° 06' 40"	185° 52' 00"	
AZ. STA. TO F.S.	324° 48' 25"	322° 19' 40"	357° 24' 35"	357° 35' 15"	357° 14' 00"	49° 53' 10"	49° 38' 30"	
BEARING	N35° 11' 35" W ✓	N37° 40' 20" W ✓	N2° 35' 25" W ✓	N2° 24' 45" W ✓	N2° 46' 00" W ✓	N49° 53' 10" E ✓	N49° 38' 30" E ✓	
HORZ. DISTANCE	17.491	17.410	19.154	19.298	19.195	12.082	12.084	
COSINE BEARING	0.817215	0.791520	0.998978	0.999114	0.998834	0.644309	0.647566	
STA. LAT.	10834.691	10834.691	10878.390	10878.390	10878.390	10931.417	10931.417	
DIFF.	14.294	13.780	19.134	19.281	19.173	7.785	7.825	
F.S. LAT.	10848.985 ✓ N	10848.471 ✓ N	10897.524 ✓ N	10897.671 ✓ N	10897.563 ✓ N	10939.202 ✓ N	10939.242 ✓ N	
SINE BEARING	-0.576333	-0.611143	-0.045193	-0.042094	-0.048269	0.764765	0.762009	
STA. DEP.	7510.165	7510.165	7466.003	7466.003	7466.003	7493.137	7493.137	
DIFF.	-10.081	-10.640	-0.866	-0.812	-0.927	9.240	9.208	
F.S. DEP.	7500.084 ✓ E	7499.525 ✓ E	7465.137 ✓ E	7465.191 ✓ E	7465.076 ✓ E	7502.377 ✓ E	7502.345 ✓ E	
GRADE CALC.	ΔE1 -0.561 ΔN 0.514 ΔE 0.559 HD 0.759	Azimuth 47° 24' 05" ✓ Dip -36° 28' 09" ✓	ΔE1 +1.192 ΔN -0.147 ΔE -0.054 HD 0.157	Azimuth 200° 10' 14" ✓ Dip +82° 29' 48" ✓	Approx.	ΔE1 +1.111 ΔN -0.040 ΔE +0.032 HD 0.051	Azimuth 141° 20' 25" ✓ Dip +87° 22' 18" ✓	
F.S. GRADE ELV.								
GRADE CHAIN								
OFFSETS	LEFT RIGHT	PLUS MINUS	L. R.	P. M.	L. R.	P. M.	L. R.	
CALCULATED BY:								
CHECKED BY:								
DATE	Oct. 17/76	Oct. 17/76	Oct. 17/76	Oct. 17/76	Oct. 17/76	Oct. 17/76	Oct. 17/76	
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~~U-101~~

U-38

~~57-55~~  
~~76-008~~

	BS	LP43	"
	STA	76-008	"
	FS	U-38-C	U-38-E
①	M. DIST	22.786	21.384
②	V $\angle$	9°56'40"	9°52'00"
③	STA. ELEV.	1167.182	"
④	H.I.	-3.330	-3.330
⑤	H.P	$\phi$	$\phi$
	F.S. ELEV	<del>1167.787</del>	<del>1167.516</del>
⑥	AZ. STA. TO BS	316°-14'48"	"
⑦	HOR. $\angle$	178°20'00"	180°-25'00"
	AZ STA TO FS	134°34'48"	136°39'48"
	HOR. DIST.	22.444	21.068
⑧	STA LAT.	10,645.904	"
	F.S. LAT.	<del>10,630.151</del>	<del>10630.581</del>
⑨	STA DEP.	7663.170	"
	F.S. DEP	<del>7679.156</del>	<del>7677.628</del>

$az = 105^{\circ}43'$   
 $dip = 9^{\circ}41'$

1120  
 1116.39  
 3.7  
 1116.39  
 9.50  
 1116.39  
 4.01