

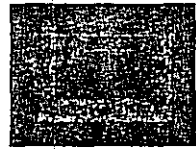
# UNDERHILL ENGINEERING LTD.

Consulting Engineers

Mailing address: P.O. Box 4068, Whitehorse, Yukon Y1A 3S9

Office: 312 B Hanson Street, Whitehorse

Telephone (403) 668-2048 ■ Telex 036-B-465



1983 10 25

003460

OUR FILE: Y-2678X

YOUR FILE:

Cyprus Anvil Mining Corporation  
P. O. Box 1000,  
Faro, Y.T.  
YDB 1KD

Attention: Mr. N.G. Cornish

Dear Sir:

Re: Deformation Study - Down-Valley Tailings Containment Project

From our recently completed field observation program, the data has been reduced and is enclosed herewith in the normal manner.

The elevation listings of the vertical monitoring stations have been updated to include Epoch "D" (September 1983) observations. Note the change of elevations in Epoch "C" (September 1982) for stations 158(1+9DOSP) and 408(2+04OSP). This change is a result of an error by the Cyprus Anvil staff during the vertical observation program in "Epoch "C". This error was detected during the computational procedures this October. As the elevation of points is used to reduce the distances in the horizontal observation program, this error affected the horizontal adjustment. More will be said about this later.

As requested by you on site, we observed an elevation at the low point on the centre of the canal dyke between instrument station numbers 2+200 CD and 2+260 CD. The elevation we observed was 1085.40 metres.

Now having the computing facilities in Whitehorse to perform the Least Squares Adjustment on the observation network, we have been better able to determine the a priori values for the standard deviations of the observations. Having this ability allows us to reduce the size of the 95% relative error ellipses. In other words, it gives more confidence in the positions of the observation points throughout the network. With this ability in mind, we re-adjusted Epoch "B" and "C" along with the primary adjustment of Epoch "D". This procedure better refines the 95% relative error ellipses between Epoch's "A" and "B", Epoch's "B" and "C" and Epoch's "C" and "D". This, of course, leads to refined coordinates of the observation stations, which in turn refines the displacement vectors.

.../2

1983 10 25  
Page Two

These refined results along with the values of Epoch "D" are presented herewith, in the usual manner. Using a direct comparison of these results and the results presented to you in October 1982, the refinement is readily apparent. The direct effect of the error in vertical information for stations 158(1+900SP) and 408(2+040SP) in Epoch "C" can be seen on the displacement vectors and 95% relative error ellipses for these stations. This indicates the importance of the vertical observation program.

It should be noted that during our observation program this September, station 416(0+460 C.V.C.D.) had been disturbed.

We trust this information meets your requirements. Please do not hesitate to contact me if you have any questions.

Yours very truly,

UNDERHILL ENGINEERING LTD.

Robert W. Gray, EIT

RWG/lc

FARO DEFORMATION SURVEY

CANAL DYKE

STATION	STATION DESCRIPTION	DEC./81 ELEVATION	APR./82 ELEVATION	SEPT./82 ELEVATION	SEPT./83 ELEVATION
411	2 + 365 CD	1086.055	1086.040	1085.959	1085.832
	2 + 460 CD	1085.673	1085.669	1085.670	1085.659
	2 + 600 CD	1085.672	1085.668	1085.665	1085.653
	2 + 765 CD	1085.365	1085.367	1085.359	1085.350
19	2 + 900 CD	1080.725	1080.732	1080.720	1080.709
99	3 + 000 CD	1075.332	1075.337	1075.300	1075.105
96	3 + 130 CD	1068.905	1068.895	1068.870	1068.843
97	3 + 360 CD	1060.502	1060.482	1060.490	1060.480
00	3 + 550 CD	1057.300	1057.291	1057.296	1057.290

FARO DEFORMATION SURVEY

CANAL BACKSLOPE

UEL STATION	STATION DESCRIPTION	DEC./81 ELEVATION	APR./82 ELEVATION	SEPT./82 ELEVATION	SEPT./83 ELEVATION
	0 + 150 BS	1095.842	1095.840	1095.842	1095.838
557	0 + 400 BS	1094.034	1094.031	1094.040	1094.028
	0 + 610 BS	1104.451	1104.444	1104.434	1104.406
555	0 + 960 BS	1092.575	1092.570	1092.583	1092.565
	1 + 110 BS	1089.122	1089.124	1089.133	1089.114
	1 + 200 BS	1099.009	1099.000		1098.958
	1 + 300 BS	1096.793	1096.787	1096.799	1096.775
840	1 + 530 BS	1088.505	1088.502	1088.515	1088.488
414	1 + 900 BS	1098.417	1098.410	1098.412	1098.334
559	2 + 100 BS	1094.985	1095.029	1095.032	1094.993
	2 + 260 BS	1094.494	1094.493	1094.502	1094.478
	2 + 460 BS	1094.236	1094.227	1094.240	1094.185
	2 + 560 BS	1091.540	1091.539	1091.547	1091.526
	2 + 760 BS	1090.442	1090.453	1090.451	1090.446
553	2 + 900 BS(Lower)	1087.892	1087.899	1087.881	1087.879
552	2 + 900 BS(Upper)	1092.556	1092.557	1092.557	1092.548
551	3 + 000 BS	1083.006	1083.003	1082.977	1082.904
	3 + 130 BS	1081.645	1081.646	1081.639	1081.605
495	3 + 240 BS	1065.520	1065.511	1065.516	1065.477
498	3 + 550 BS	1057.805	1057.801	1057.798	1057.800

## FARO DEFORMATION SURVEY

## SPOIL PILES

UCL STATION	STATION DESCRIPTION	DEC./81 ELEVATION	APR./82 ELEVATION	SEPT./82 ELEVATION	SEPT./8 ELEVATIO
154	0 + 990 SP	1088.794	1088.769	1088.776	1088.655
157	1 + 530 SP	1093.097	1093.053	1093.042	1092.982
158	1 + 900 SP	1083.253	1083.230	1082.905	1082.813
408	2 + 040 SP	1083.974	1083.924	1083.663	1083.655
418	2 + 950 SP	1079.416	1079.411	1079.384	1079.318

FARO DEFORMATION SURVEY

CROSS VALLEY DAM

UEL STATION	STATION DESCRIPTION	DEC./81 ELEVATION	APR./82 ELEVATION	SEPT/82 ELEVATION	SEPT/8 ELEVATION
502	0 + 180 CVDC	1065.833	1065.830	1065.816	
	0 + 204	1065.800	1065.792	1065.775	1065.746
	SP "A"	1067.223	1067.215	1067.213	1067.202
	0 + 210	1065.873	1065.865	1065.848	
	0 + 240	1065.804	1065.795		
	0 + 270	1066.050	1066.044	1066.026	
	0 + 300	1065.974	1065.965	1065.948	
415	0 + 330	1065.965	1065.950	1065.933	
	0 + 338 CVDC	1066.027	1066.007	1065.985	1065.881
	SP "B"	1066.737	1066.717	1066.707	
	0 + 360	1065.915	1065.893	1065.877	
	0 + 390	1065.888		1065.852	
	0 + 420	1065.799			
	0 + 450	1065.752	1065.745	1065.714	
416	0 + 460 CVDC	1065.983	1065.971	1065.939	1065.872
	SP "C"	1066.520	1066.509	1066.509	1066.496
	0 + 480	1065.882	1065.872	1065.852	
	0 + 510	1065.830	1065.820	1065.796	
	0 + 540	1065.890			
417	0 + 568 CVDC	1065.971	1065.967	1065.938	1065.918
	SP "D"	1067.158	1067.140	1067.129	1067.103
	0 + 570	1065.829	1065.815	1065.785	1065.766
	0 + 600	1065.973	1065.958	1065.923	
	0 + 630	1065.734			

FARO DEFORMATION SURVEY

INTERMEDIATE DAM

UEL STATION	STATION DESCRIPTION	DEC./81 ELEVATION	APR./82 ELEVATION	SEPT./82 ELEVATION	SEPT./83 ELEVATION
501	0 + 250 ID	1064.563	1064.570	1064.571	1064.592
412	0 + 450 ID	1064.249	1064.260	1064.260	1064.283
413	0 + 627 ID	1065.112	1065.116	1065.100	1065.093
814	<del>814</del>	1067.772	1067.782	1067.771	1067.767

FARO DEFORMATION SURVEY

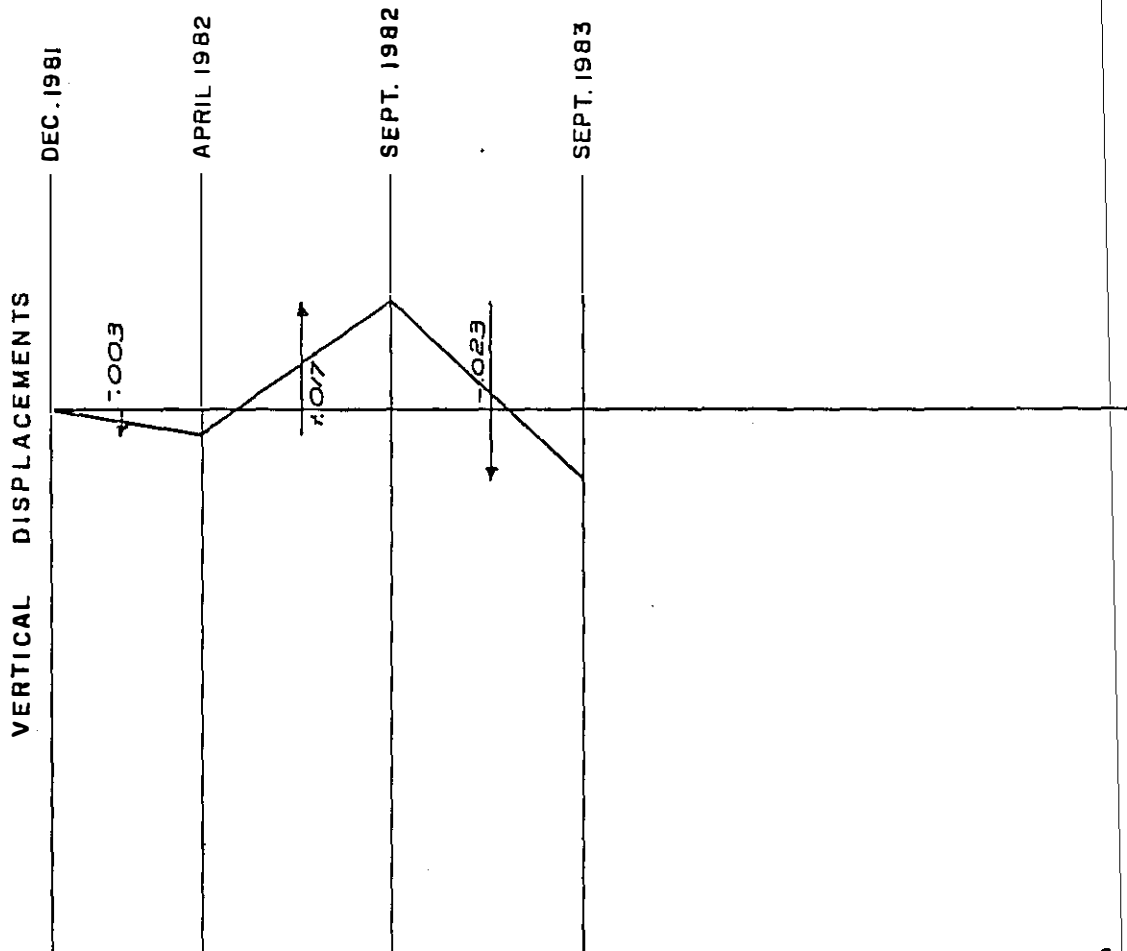
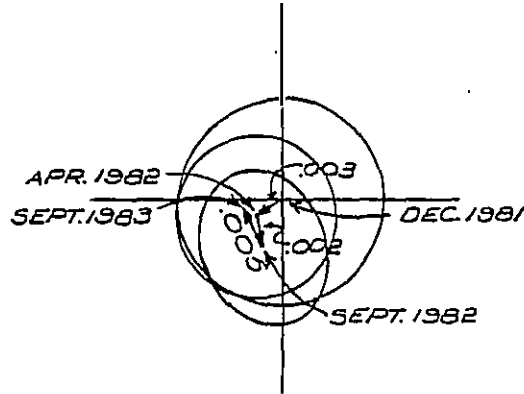
INCREMENTAL SETTLEMENT INSTALLATIONS

STATION NO.	STATION DESCRIPTION	SEPT./82 ELEVATION	SEPT./83 ELEVATION
CD-4	0 + 400 CD(s)	1090.10	1089.95
CD-10	0 + 990 CD(s)	1088.92	1088.82
CD-15	1 + 530 CD(s)	1087.61	1087.55
CD-19	1 + 900 CD(s)	1086.90	1086.89
CD-21	2 + 100 CD(s)	1086.43	1086.41
CD-27	2 + 765 CD(s)	1085.54	1085.53
CD-28	2 + 900 CD(s)	1080.48	1081.06
CD-29	3 + 000 CD(s)	1075.40	1075.44
BS-2	0 + 400 BS(s)	1094.63	1094.55
BS-5	0 + 960 BS(s)	1092.81	1092.79
BS-9	1 + 530 BS(s)	1088.52	1088.48
BS-10	1 + 900 BS(s)	1098.61	1098.51
BS-11	2 + 100 BS(s)	1095.28	1095.33
BS-17	2 + 900 BS(s)	1088.21	1088.22
BS-18	3 + 000 BS(s)	1083.33	1083.38
SP-2	1 + 530 SP(s)	1093.07	1092.99
SP-3	1 + 900 SP(s)	1083.29	1083.24
SP-5	2 + 950 SP(s)	1079.60	1079.10

NOTE: Elevations are taken to the top of the casing caps.

INSTRUMENT STATION NUMBER  
0 + 990 C.D.

SURVEY STATION NUMBER  
153

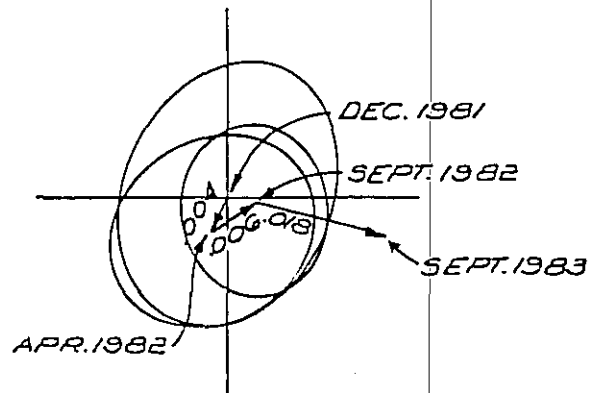
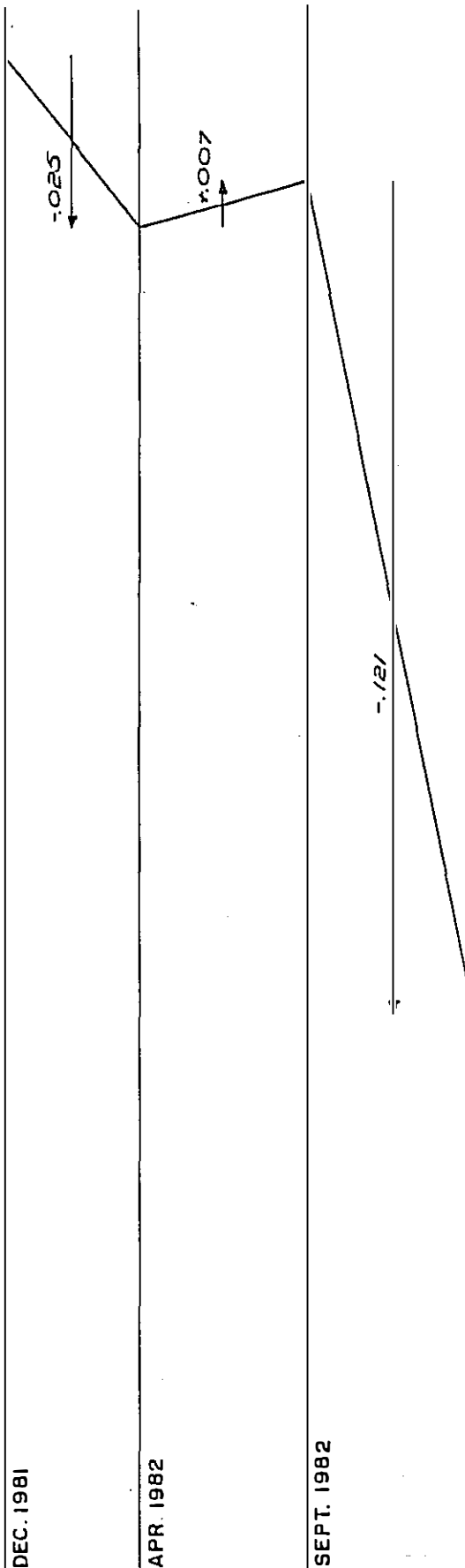


CLIENT CYPRUS ANVIL MINING CORP.	UNDERHILL ENGINEERING LTD.		
PROJECT CYPRUS ANVIL DOWN VALLEY TAILINGS CONTAINMENT PROJECT	JOB NO. Y - 2678	SHEET /	OF 38
	DATE SEPTEMBER 1983	DRAWING NUMBER	
	SCALE 1 : 1	134 - 3	

INSTRUMENT STATION NUMBER  
0+990 S.P.

SURVEY STATION NUMBER  
154

VERTICAL DISPLACEMENTS



CLIENT CYPRUS ANVIL MINING CORP.

UNDERHILL ENGINEERING LTD.

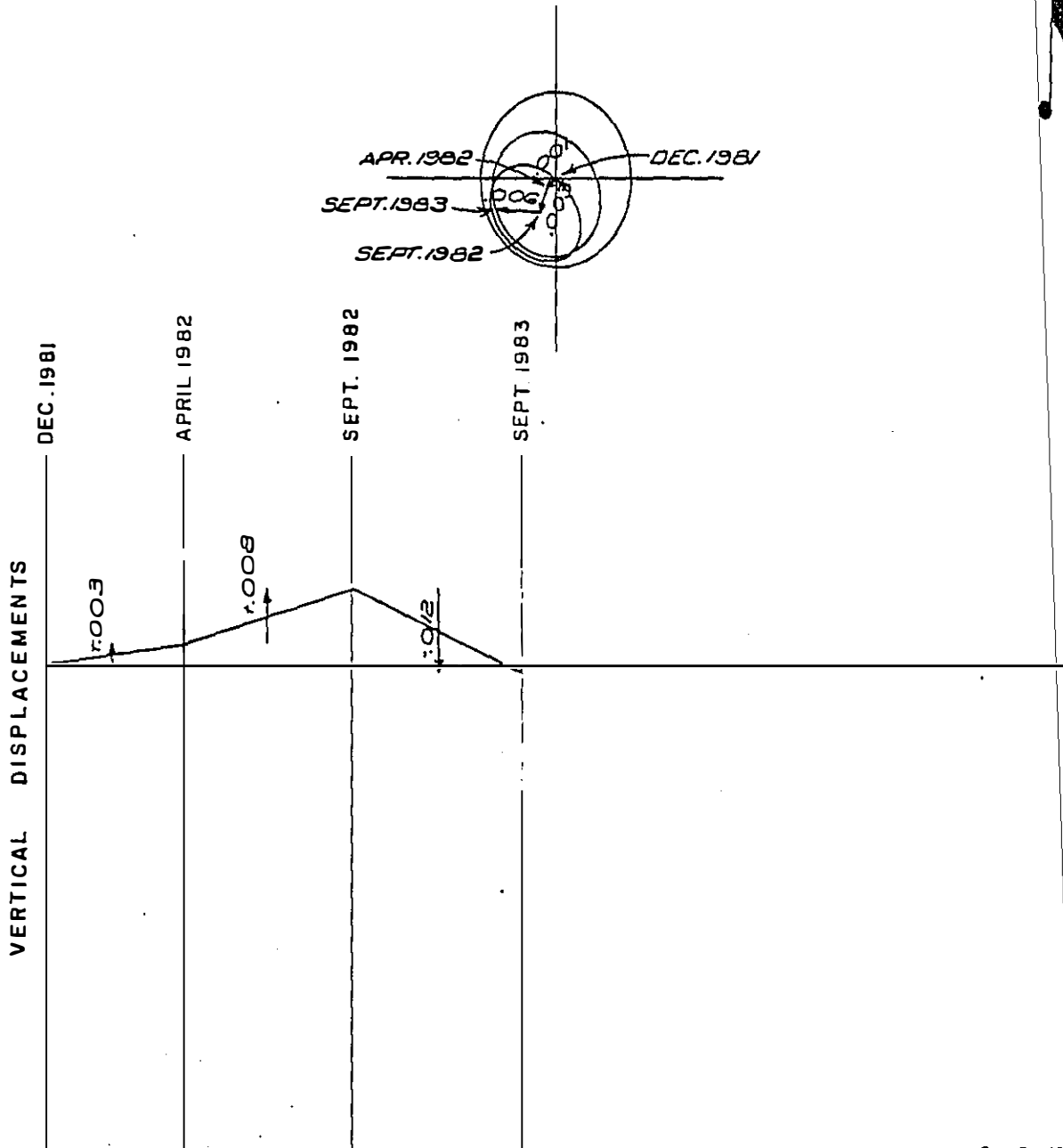
PROJECT  
CYPRUS ANVIL  
DOWN VALLEY TAILINGS  
CONTAINMENT PROJECT

JOB NO. Y-2678  
DATE SEPTEMBER 1983  
SCALE 1:1

SHEET 2 OF 38  
DRAWING NUMBER  
134-3

INSTRUMENT STATION NUMBER  
1+350 C.D.

SURVEY STATION NUMBER  
155



CLIENT CYPRUS ANVIL MINING CORP.

UNDERHILL ENGINEERING LTD.

PROJECT  
CYPRUS ANVIL  
DOWN VALLEY TAILINGS  
CONTAINMENT PROJECT

JOB NO. Y-2678

DATE SEPTEMBER 1983

SCALE 1:1

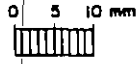
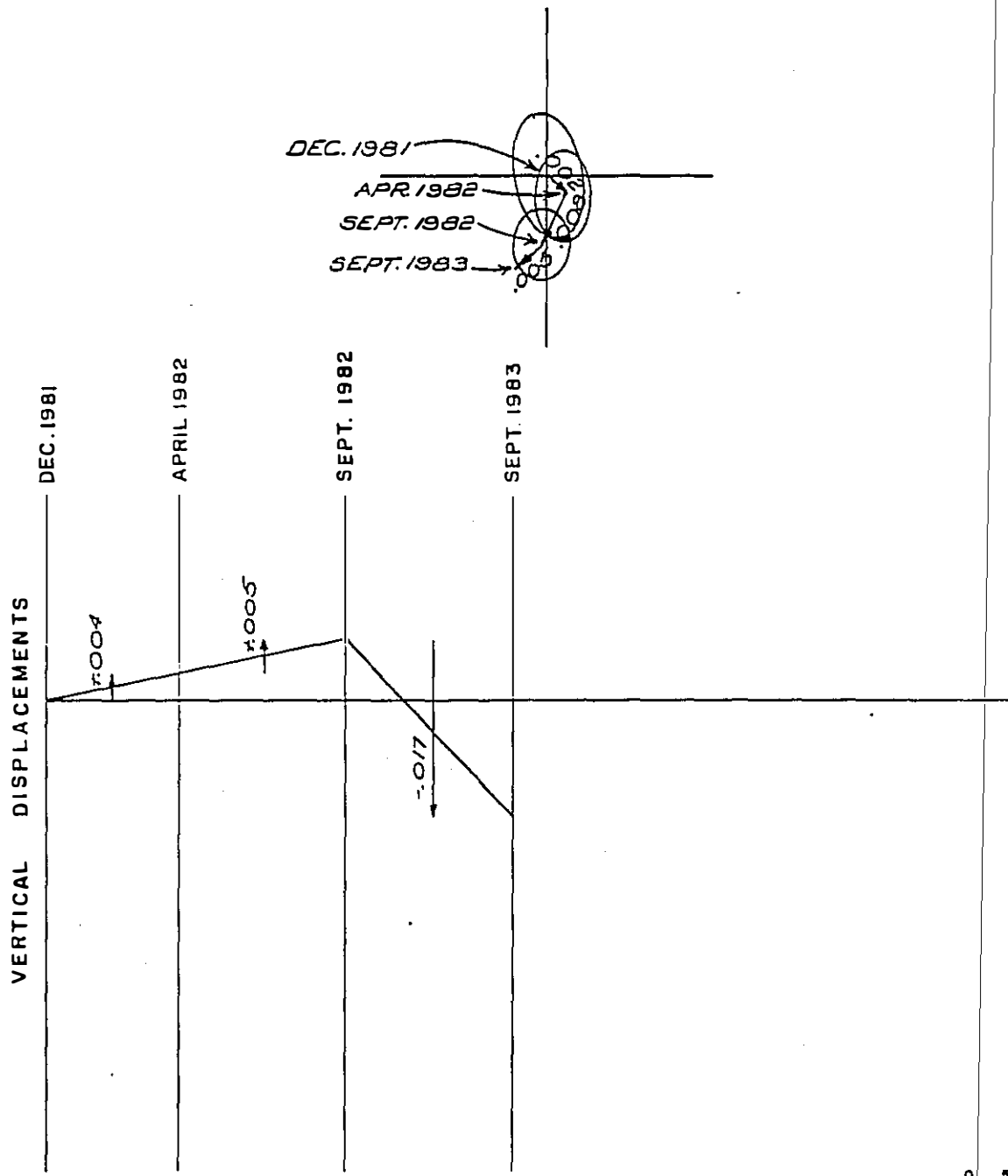
SHEET 3 OF 38  
DRAWING NUMBER

134-3

APPENDIX

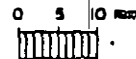
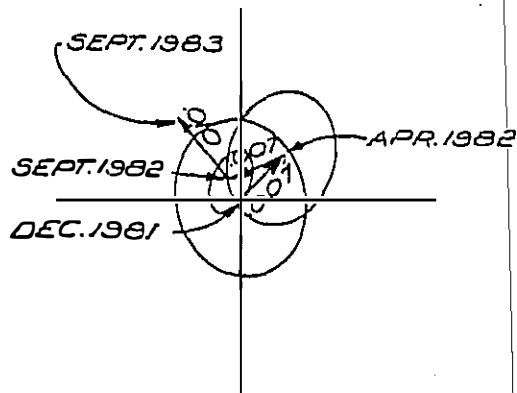
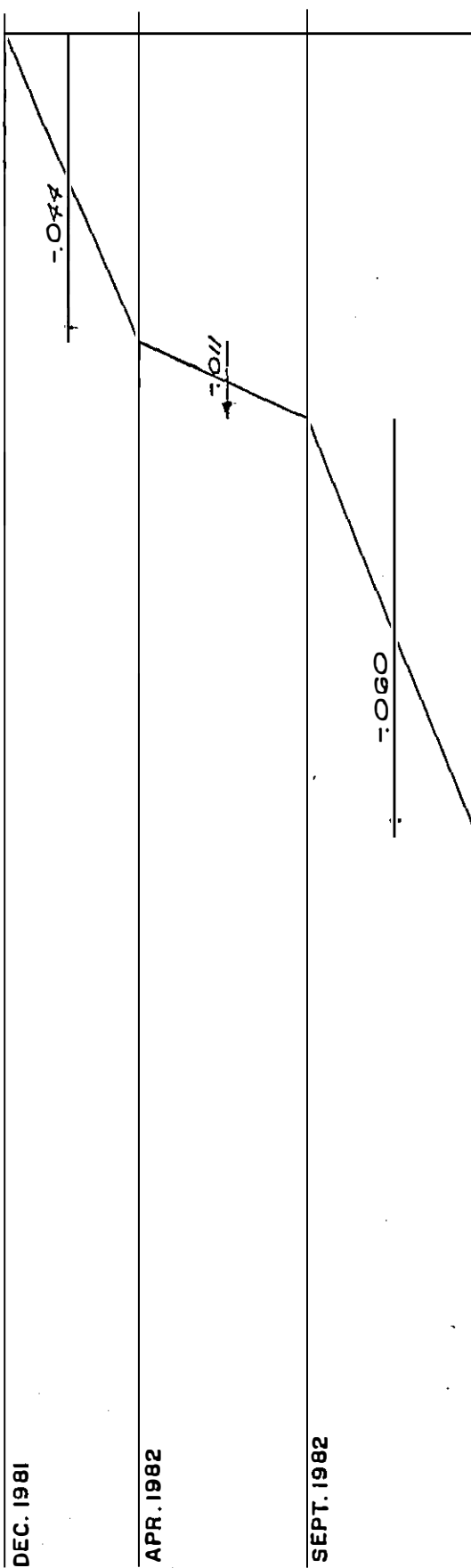
INSTRUMENT STATION NUMBER  
1+530 C.D.

SURVEY STATION NUMBER  
156



CLIENT CYPRUS ANVIL MINING CORP.		UNDERHILL ENGINEERING LTD.	
PROJECT CYPRUS ANVIL DOWN VALLEY TAILINGS CONTAINMENT PROJECT	JOB NO. Y-2678	SHEET 4 OF 38	
	DATE SEPTEMBER 1983	DRAWING NUMBER	
	SCALE 1:1		134-3

VERTICAL DISPLACEMENTS



CLIENT CYPRUS ANVIL MINING CORP.		UNDERHILL ENGINEERING LTD.	
PROJECT CYPRUS ANVIL DOWN VALLEY TAILINGS CONTAINMENT PROJECT	JOB NO. Y-2678	SHEET 5 OF 38	
	DATE SEPTEMBER 1983	DRAWING NUMBER	
	SCALE 1:1	134-3	