

# **RE-SURVEY OF MULINU'U PENINSULA BEACH PROFILES, SAMOA 14-19 March 1998**

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## **SUMMARY**

In March 1998 a re-survey of the eight beach profiles along Mulinu'u Peninsula was carried out at the request of the Government of Samoa.

The task was to be completed by participants of a previous Coastal Monitoring Seminar (December 1993) however, due to resignations and staff movements assistance was requested from SOPAC.

The results indicated some significant change in the profiles

## **ACKNOWLEDGEMENTS**

Funds to permit Phil Woodward to travel were provided by the Australian Government. Apia Observatory also acknowledged for providing Lameko Talia and Happy Valley Patu for the survey and logistical support.

## **INTRODUCTION**

In December 1993 an in-country beach monitoring seminar was held at the Apia Observatory. Eight beach profiles were established along the eastern side of Mulinu'u Peninsula and four cross section profiles on the Cyclone Ofa banks. At that seminar a general recommendation that SOPAC continue to assist Samoa with the monitoring of this project was made (SOPAC Training Report 57).

The request to establish beach monitoring profiles on the eastern side of Mulinu'u Peninsula followed the initiation of suction/cutter dredging to remove inshore lagoon sediment for the large reclamation project at the southeast corner of Mulinu'u Peninsula inside Apia Harbour. Profiles across the coral rubble banks deposited on the reef edge nearby, during Cyclone Of a, were established as a project because the mining of these banks was being considered.

A second project under SOPAC's work program to investigate coastal changes and sand mining in the Apia area was conducted also in 1993. The beach monitoring data collected was included in SOPAC Technical Report 208.

A re-survey was carried out in December 1994 by a majority of the participants of the seminar. This survey encountered the large seawall which had been built along portions of the Mulinu'u Peninsula. It intersected six of the eight profiles (SOPAC Preliminary Report 76).

## **PERSONNEL INVOLVED**

Phillip Woodward  
Lameko Talia  
Happy Valley Patu  
Marilyn Woodward

SOPAC, Cartographer  
Apia Meterological Office, Scientific Officer  
Apia Observatory  
Accompanying spouse, Field Assistant.

## RESULTS

Data collected from the eight profiles along the eastern side of Mulinu'u Peninsula are presented in Appendix 1: Comparison graphs with the December 1993 and December 1994 data along with a location map and station summaries. Annotated photographs of the base stations are also presented for ease of future relocation.

The 4 cross section profiles of the Cyclone Ofa coral bank were not re-surveyed.

**Profile 1: North of Le Godinet.** This profile is influenced by the seawall. The HD was restored to the 1993 position, on the road 6m inland from a power pole. The fish trap constructed in 1994 has gone. There is no significant change to the profile since 1994. Between 15 and 25m the level remains comparable to 1994. Between 75 and 110m there is evidence of probable accretion.

**Profile 2: Monument opposite BP Fuel Depot.** This profile is influenced by the seawall. The 1994 and 1998 surveys are very similar. There is no significant change to the profile.

**Profile 3: House opposite Parliament.** This profile has no seawall although there is evidence of additional boulders being placed at the beach scarp. At 8m there is a definite change of 0.4m since 1994. The profile then remains the same showing no significant change. A new fish trap has been constructed parallel to the line of the profile. Readings ended at 130m, in the circular end of the trap during this survey.

**Profile 4: Large Tomb near WSBC.** This profile is not influenced by the seawall, although there is evidence of additional boulders being placed at the beach scarp. At 6m there is 0.7m height difference on the boulders. The remainder of the profile remains unchanged. The HD has been re-established to the original 1993 position of 10m from the coconut tree closest to the tomb, towards the line of the profile. The HD is on the road that runs parallel to the coastline.

**Profile 5: Beach at Observatory fence.** This profile is not influenced by the seawall, although there is evidence of the addition of more boulders at the beach scarp. At 30m there is 0.62m height difference. From 70m to 100m there is definite evidence of accretion, an average height increase of 0.28m. During the 1994 survey it was noted that this area had been dredged.

**Profile 6: Beach at sunshine recorder.** This profile is influenced by the seawall. The HD has been reverted to the original 1993 position, 10m from the verandah and in line with the poles. There is no significant change in the profile.

**Profile 7: End of Mulinu'u Peninsula.** This profile is influenced by the seawall. 40m to 60m along the profile shows a definite build up of sand (0.35m at 50m). Beyond 100m the seafloor dropped sharply.

**Profile 8: Beach at Ulberg's dredge site.** This profile is influenced by the seawall and runs parallel to the dredge site causeway. There is no significant change along the profile between surveys. Whilst working this site the Samoa Lands Department were surveying the area in preparation for wharf building.

## **Recommendation**

It is recommended the profiles continue to be monitored. A set of data collected mid year (June/July) for a seasonal comparison is recommended.

SOPAC continues to encourage the monitoring of the beach profiles and will assist the Government of Samoa in this project, particularly with the extension of the project to other areas of active coastal movement on Upolu and Savai'i.

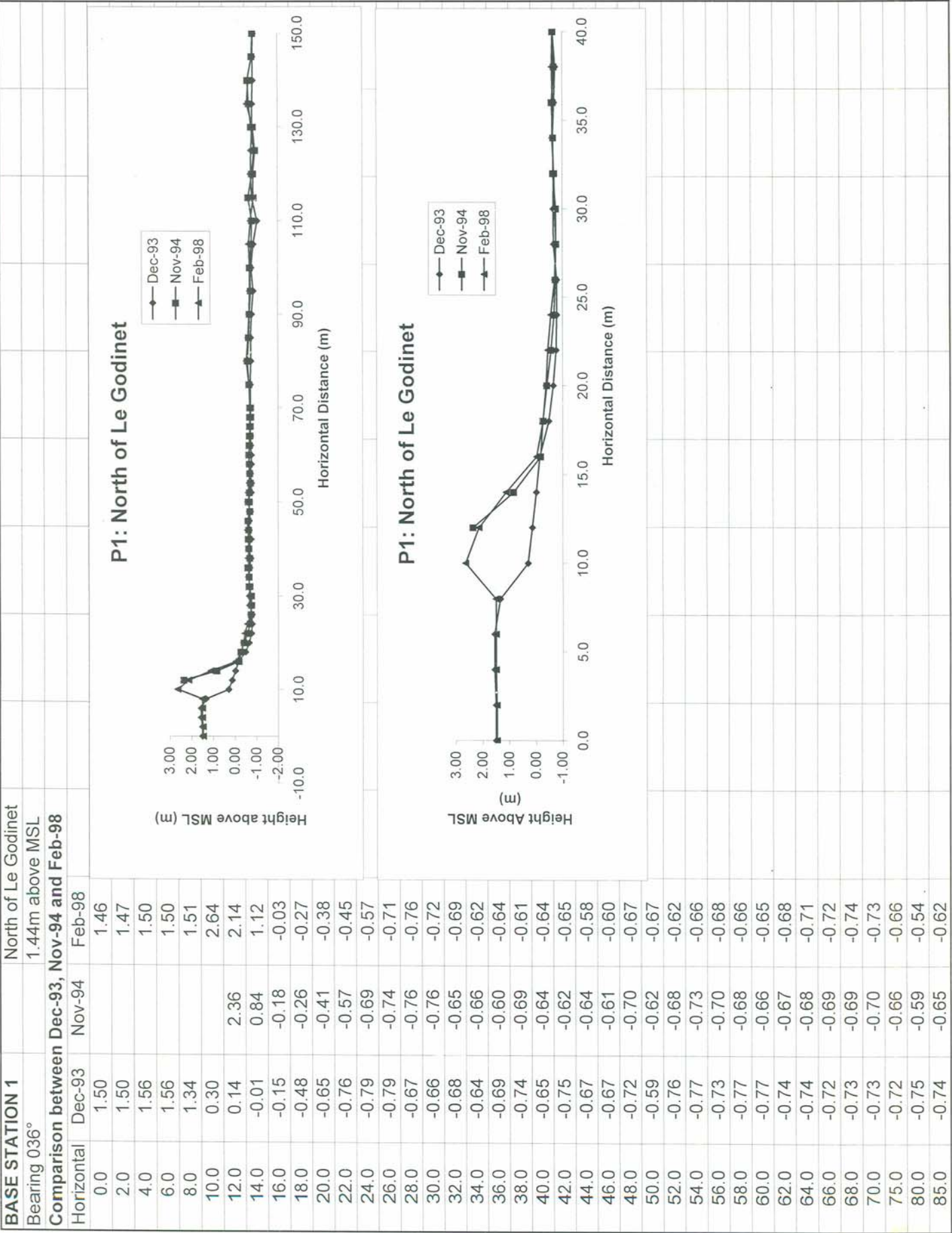
## **REFERENCES**

SOPAC Training Report 57: Howorth, R., Woodward, P. 1993. Report on Western Samoa in-country seminar: beach monitoring, 6-9 December 1993.

SOPAC Technical Report 208: Solomon, S.M. 1994. A review of coastal processes and analysis of historical coastal change in the vicinity of Apia, Western Samoa.

SOPAC Preliminary Report 76: Woodward, P. 1995. Re-survey of Mulinu'u Peninsula beach profiles, Western Samoa, 6-9 December 1994.

**Appendix 1: Beach Profile Data**

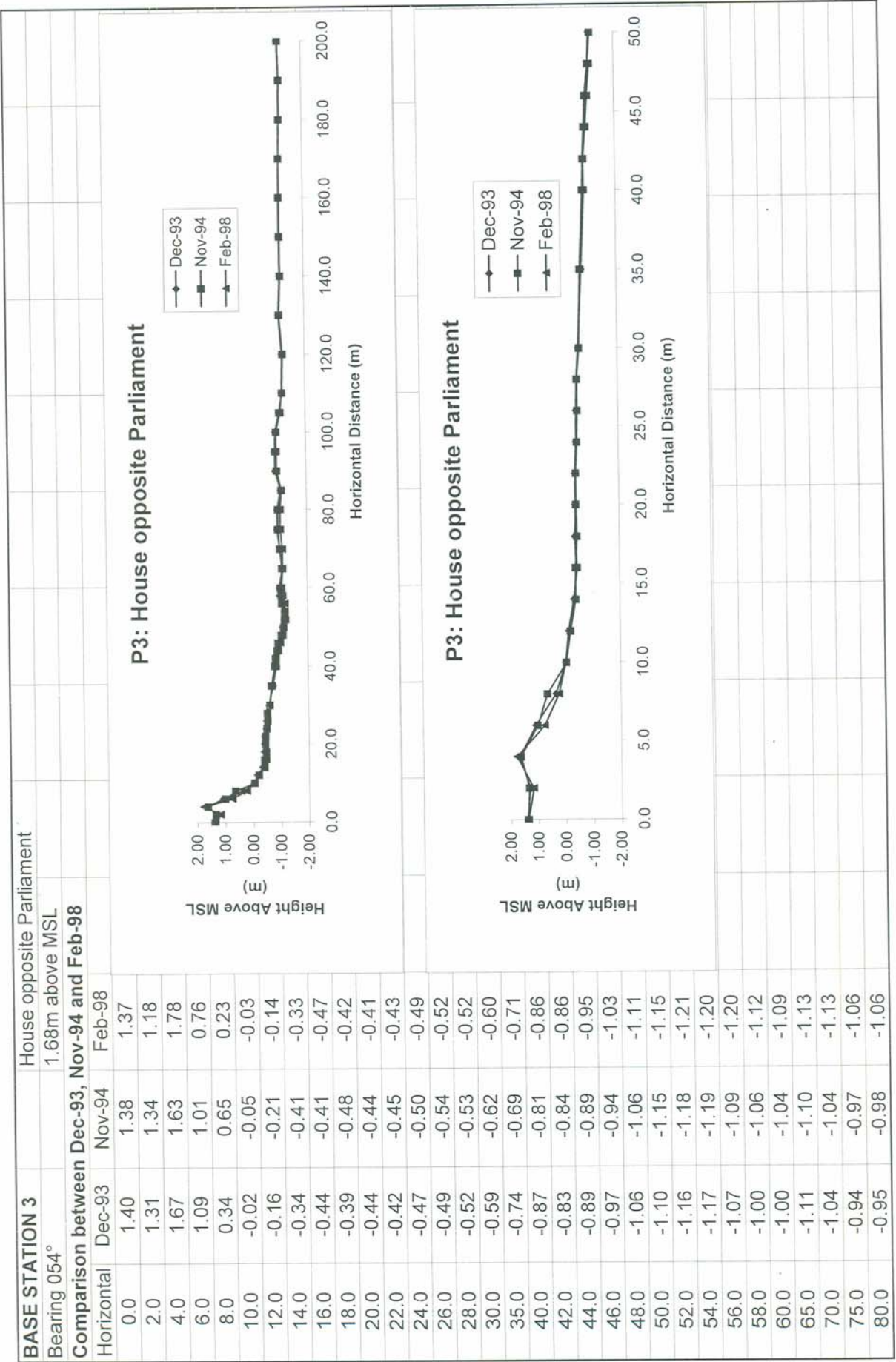


90.0	-0.79	-0.69	-0.67						
95.0	-0.87	-0.75	-0.70						
100.0	-0.77	-0.70	-0.70						
105.0	-0.87	-0.78	-0.66						
110.0	-1.05	-0.81	-0.74						
115.0	-0.81	-0.64	-0.88						
120.0	-0.75	-0.81	-0.86						
125.0	-0.77	-0.91	-0.95						
130.0	-0.82	-0.77	-0.85						
135.0	-0.82	-0.67	-0.58						
140.0	-0.85	-0.61	-0.65						
145.0	-0.84	-0.81							
150.0	-0.87	-0.85							

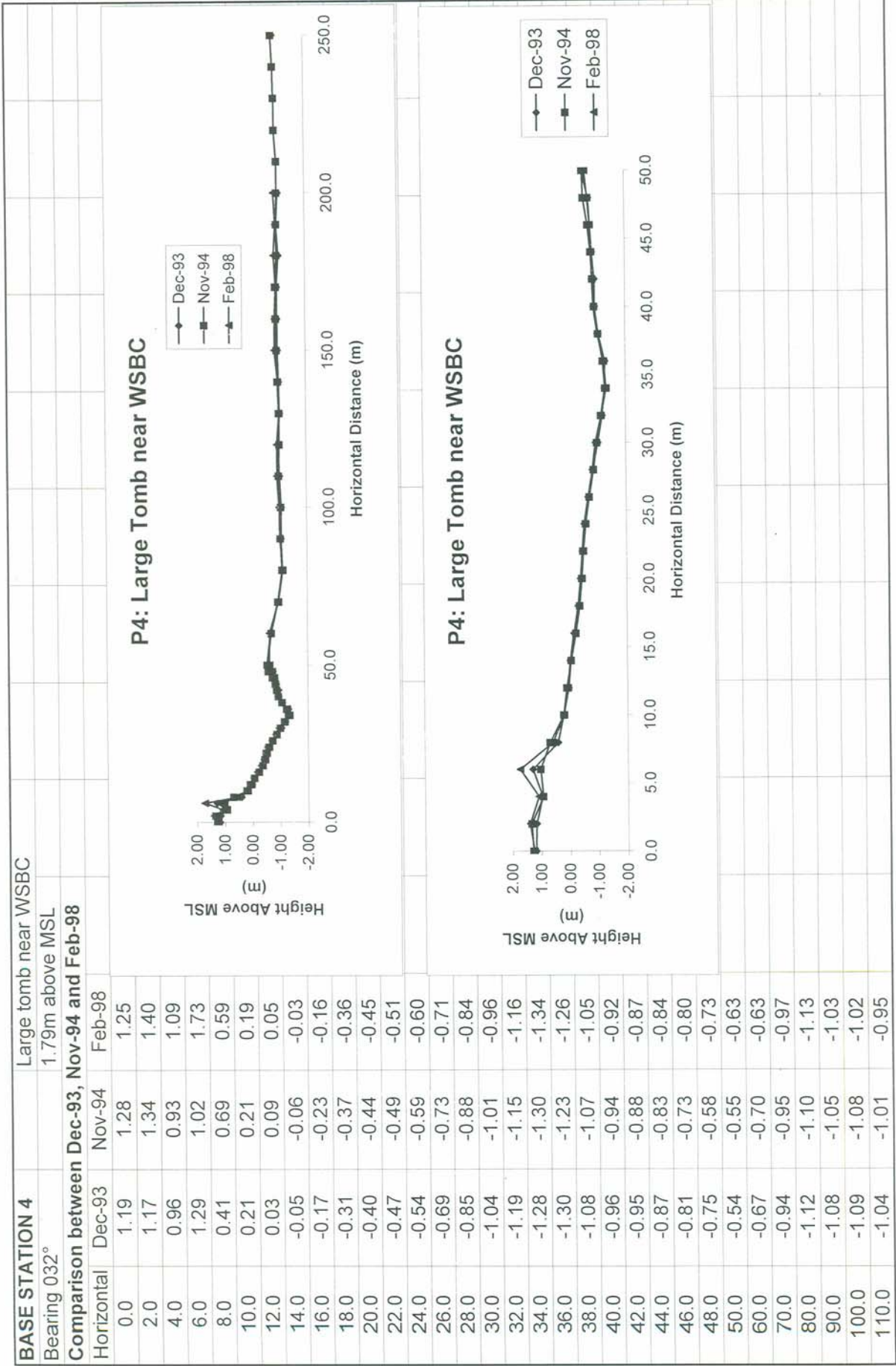




130.0	-1.34	-1.33
140.0	-1.38	-1.42
150.0	-1.35	-1.16
160.0	-1.34	-1.29
170.0	-1.49	-1.36
180.0	-1.54	-1.41
190.0	-1.59	-1.43
200.0	-1.52	-1.46



85.0	-1.09	-1.11	-1.11
90.0	-0.89	-0.95	-0.95
95.0	-0.89	-0.90	-0.94
100.0	-0.91	-0.94	-0.94
105.0	-1.06	-1.07	-1.10
110.0	-1.18	-1.18	-1.16
120.0	-1.19	-1.21	-1.20
130.0	-1.09	-1.10	-1.10
140.0	-1.15	-1.16	
150.0	-1.13	-1.15	
160.0	-1.13	-1.14	
170.0	-1.15	-1.15	
180.0	-1.17	-1.18	
190.0	-1.19	-1.20	
200.0	-1.15	-1.16	



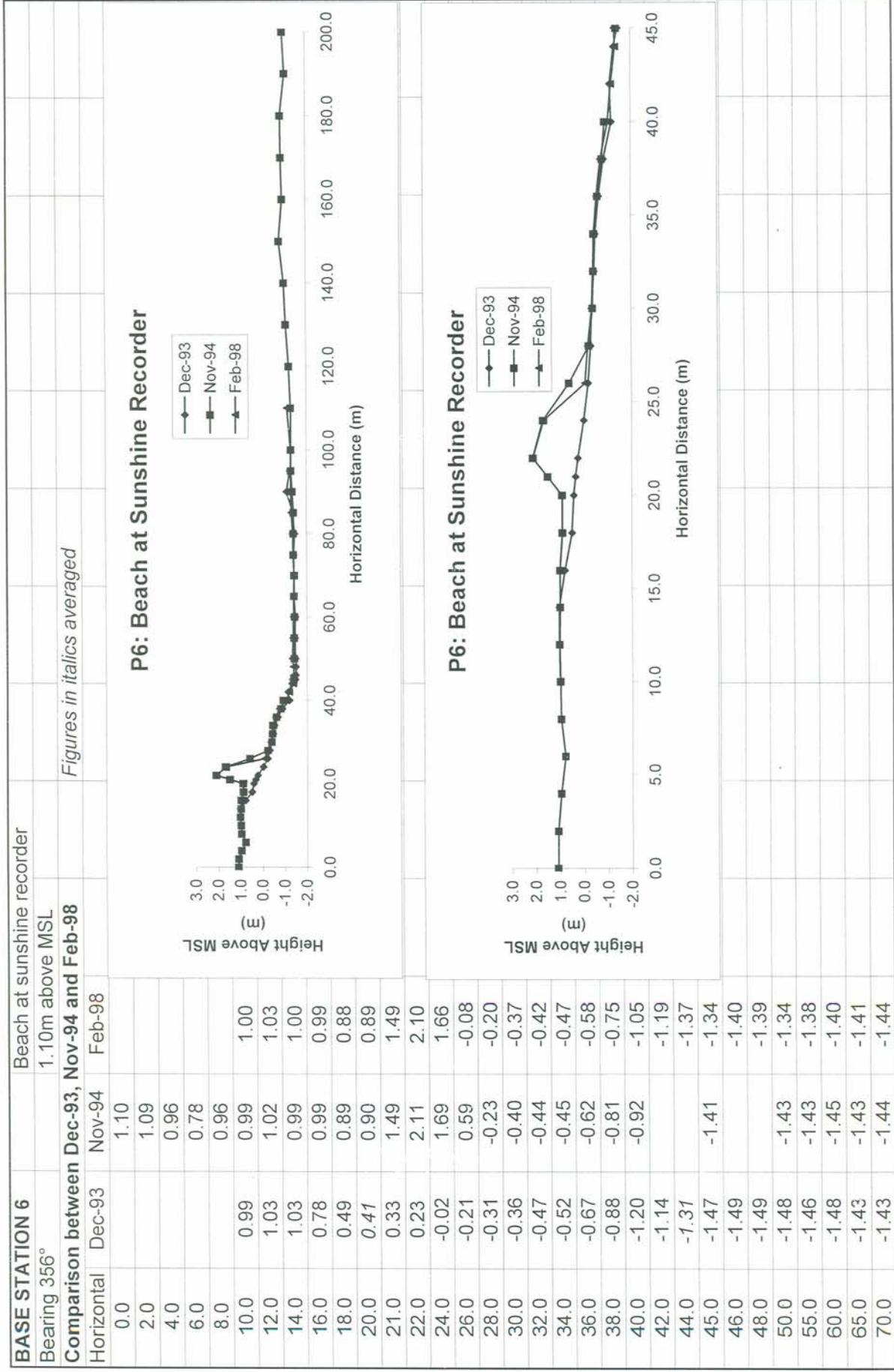
120.0	-1.01	-1.04	-0.96						
130.0	-1.06	-1.03	-1.04						
140.0	-1.03	-0.99	-1.00						
150.0	-1.00	-0.97	-0.89						
160.0	-0.99	-0.95	-0.91						
170.0	-0.98	-0.93	-0.95						
180.0	-1.05	-0.98	-0.88						
190.0	-0.98	-0.98	-0.95						
200.0	-1.04	-1.00	-0.89						
210.0		-1.01							
220.0		-0.93							
230.0		-0.92							
240.0		-0.90							
250.0	-0.89	-0.85							



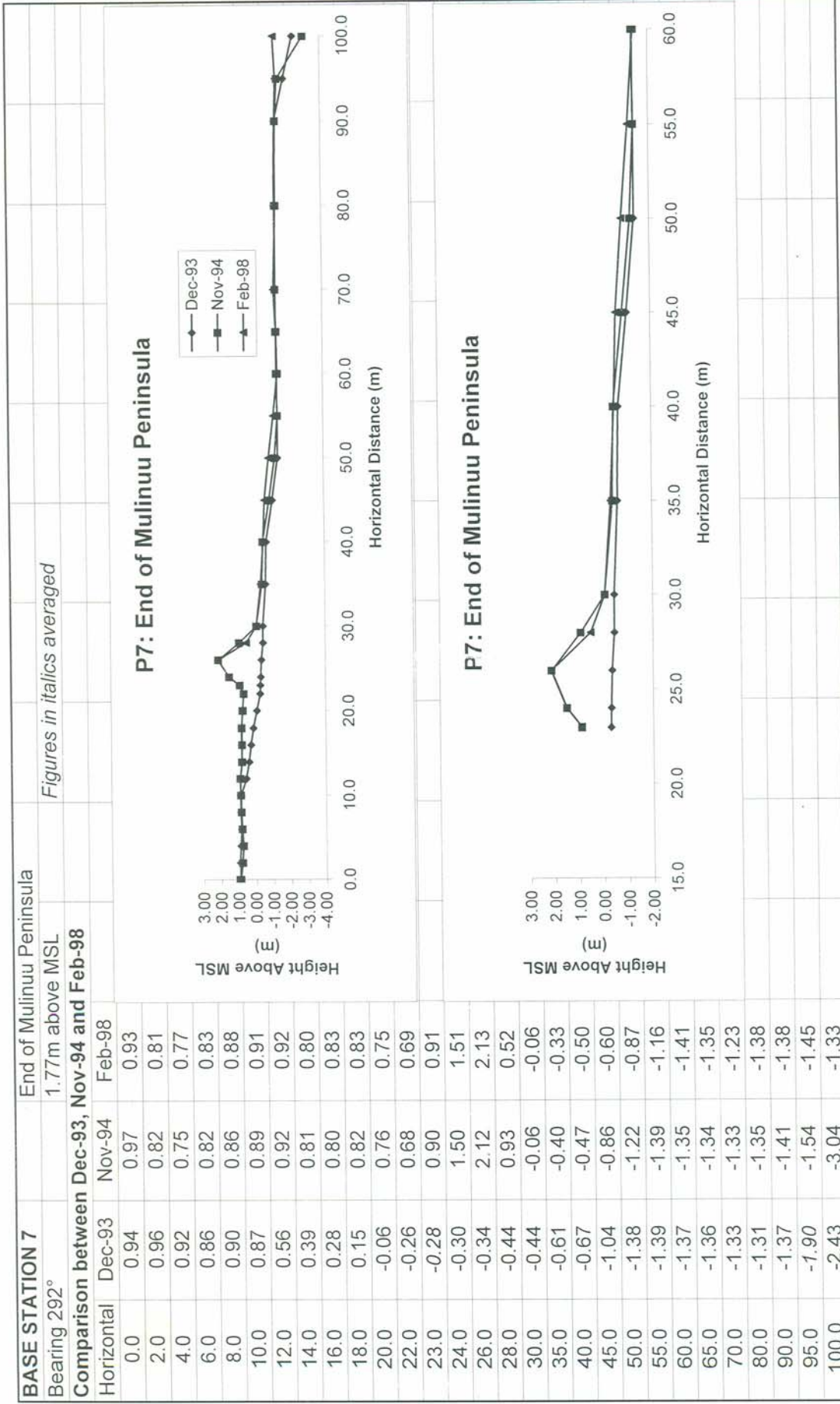
BASE STATION 5			
Bearing 030°		Beach at Observatory fence	
1.96m above MSL			
Comparison between Dec-93, Nov-94 and Feb-98			
Horizontal	Dec-93	Nov-94	Feb-98
0.0		1.96	
2.0		1.49	
4.0		1.52	
6.0		1.51	
8.0		1.54	
10.0		1.70	
12.0		1.51	
14.0		1.53	
16.0		1.56	
18.0		1.58	
20.0	1.52	1.56	1.61
22.0	1.50	1.50	1.55
24.0	1.65	1.39	1.46
26.0	1.45	1.37	1.63
28.0	1.57	1.55	1.54
30.0	1.01	1.26	1.63
35.0	0.49	0.58	0.43
40.0	0.33	-0.03	0.16
42.0	0.21	-0.06	-0.04
44.0	0.12	-0.09	-0.30
46.0	0.03	-0.25	-0.36
48.0	-0.07	-0.35	-0.36
50.0	-0.21	-0.40	-0.38
55.0	-0.27	-0.60	-0.47
60.0	-0.34	-0.54	-0.49
65.0	-0.41	-0.69	-0.89
70.0	-0.49	-1.14	-1.06
80.0	-0.46	-1.34	-1.16
90.0	-0.56	-1.28	-1.10
100.0	-0.77	-1.19	-1.07
110.0	-0.95	-1.19	-1.02
120.0	-1.05	-1.15	-0.91

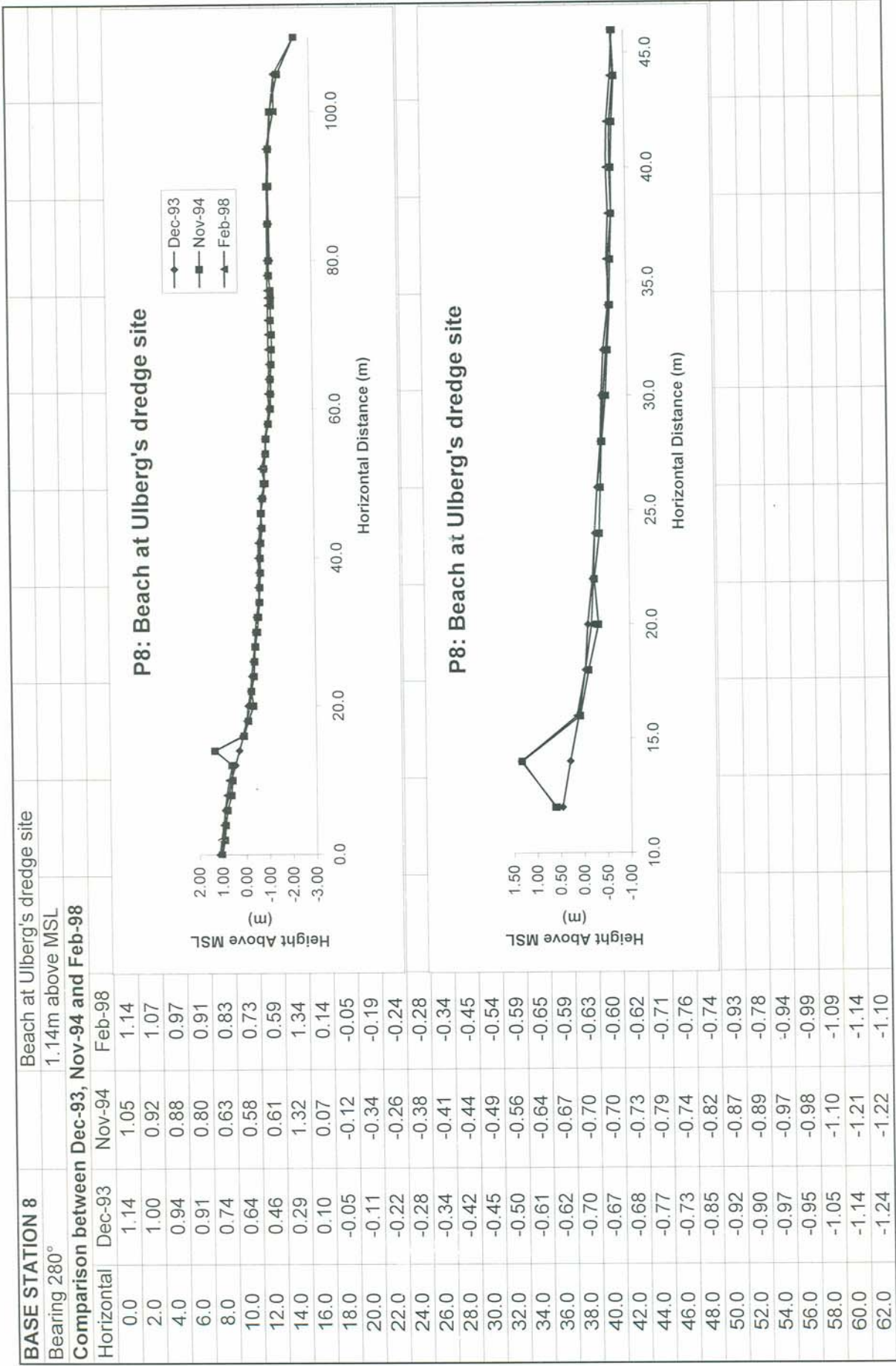
130.0	-1.12	-1.16	-1.01
140.0	-1.05	-1.13	-0.93
150.0	-1.14	-1.13	-0.86
160.0	-1.12	-0.97	
170.0	-1.11	-1.02	
180.0	-1.00	-0.93	
190.0	-1.02	-0.91	
200.0	-1.00	-0.86	





75.0	-1.42	-1.41	-1.40						
80.0	-1.46	-1.41	-1.38						
85.0	-1.39	-1.42	-1.32						
90.0	-1.11	-1.36	-1.30						
95.0	-1.26	-1.31	-1.30						
100.0		-1.31	-1.30						
110.0		-1.30	-1.14						
120.0		-1.22							
130.0		-1.10							
140.0		-1.02							
150.0		-0.80							
160.0		-0.95							
170.0		-0.90							
180.0		-0.87							
190.0		-1.07							
200.0		-0.98							





64.0	-1.23	-1.22	-1.14
66.0	-1.26	-1.26	-1.17
68.0	-1.28	-1.28	-1.14
70.0	-1.29	-1.29	-1.14
72.0		-1.25	-1.14
74.0		-1.27	-1.14
75.0	-1.29	-1.27	-1.14
76.0		-1.26	-1.13
78.0		-1.20	-1.12
80.0	-1.25	-1.20	-1.13
85.0	-1.22	-1.18	-1.14
90.0	-1.19	-1.14	-1.21
95.0	-1.24	-1.22	-1.14
100.0	-1.32	-1.30	-1.47
105.0	-1.50	-1.65	-1.49
110.0	-2.36	-2.36	

## **Appendix 2: Base Station Summaries**





**PROFILE 1**  
Bearing 036°

VD top of HW vent on road  
1.44m above MSL

Strainer pole set in  
concrete at wall

HD 6m from inland power pole,  
on road, in line with profile

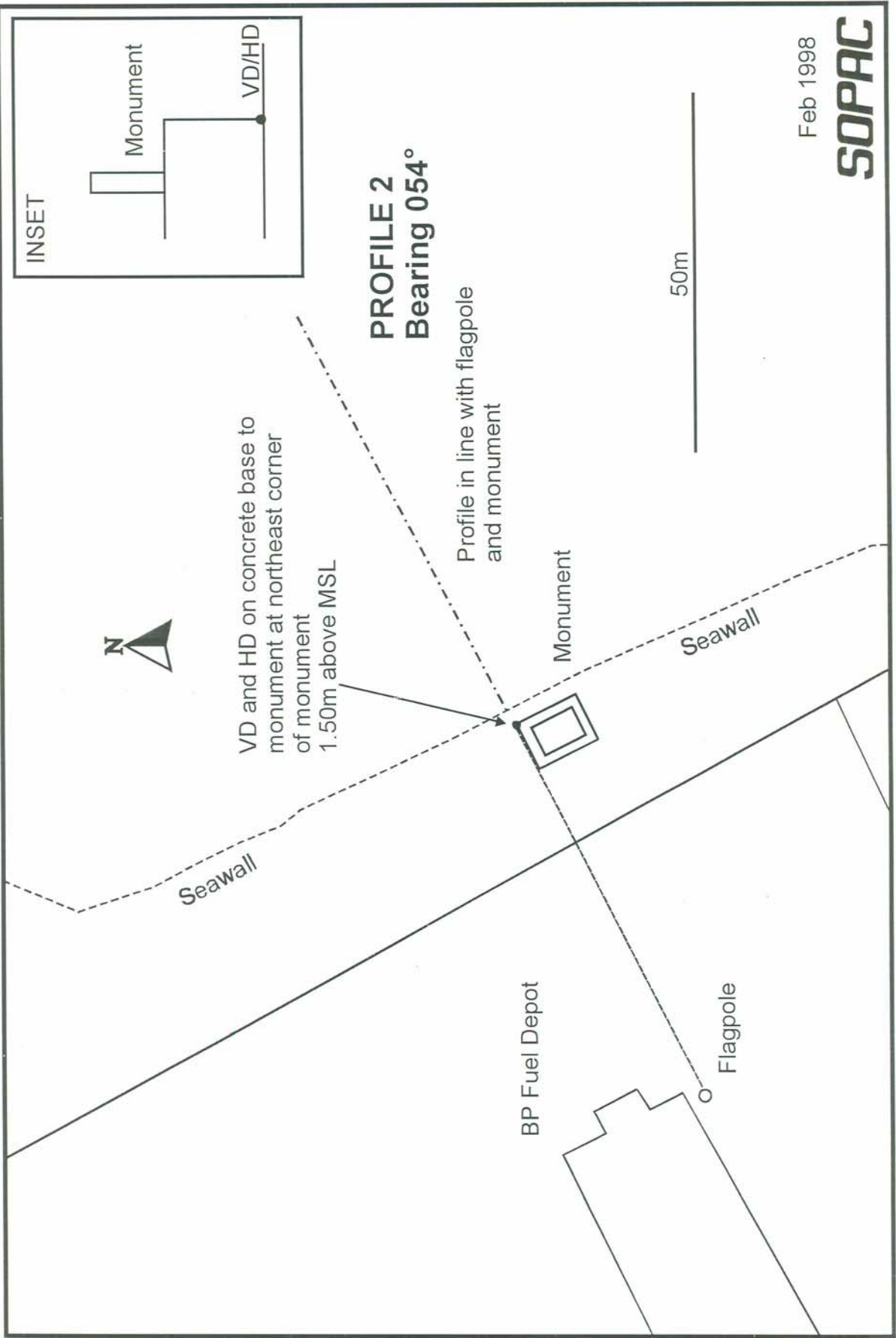
Seawall

50m

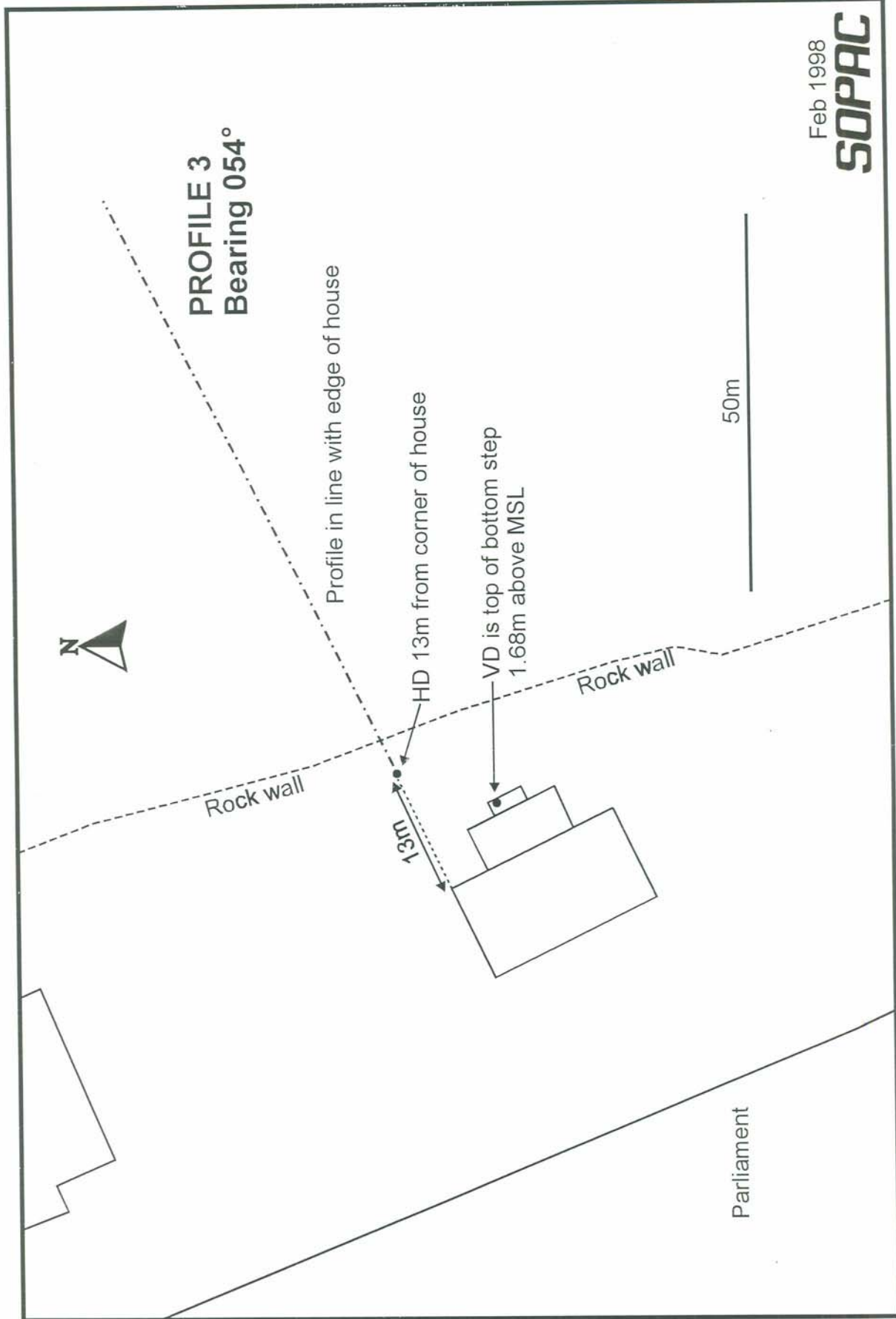
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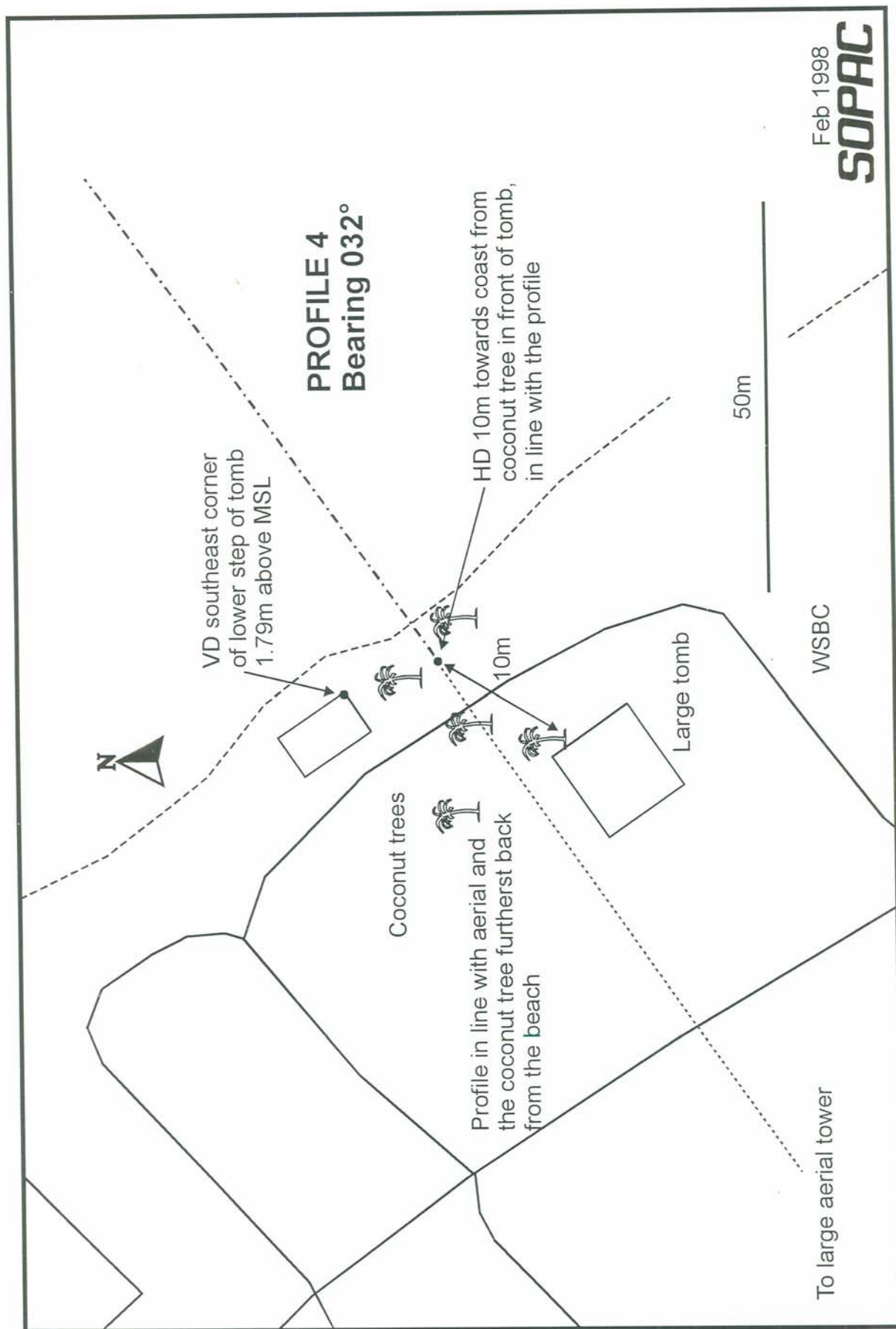
LE GODINET

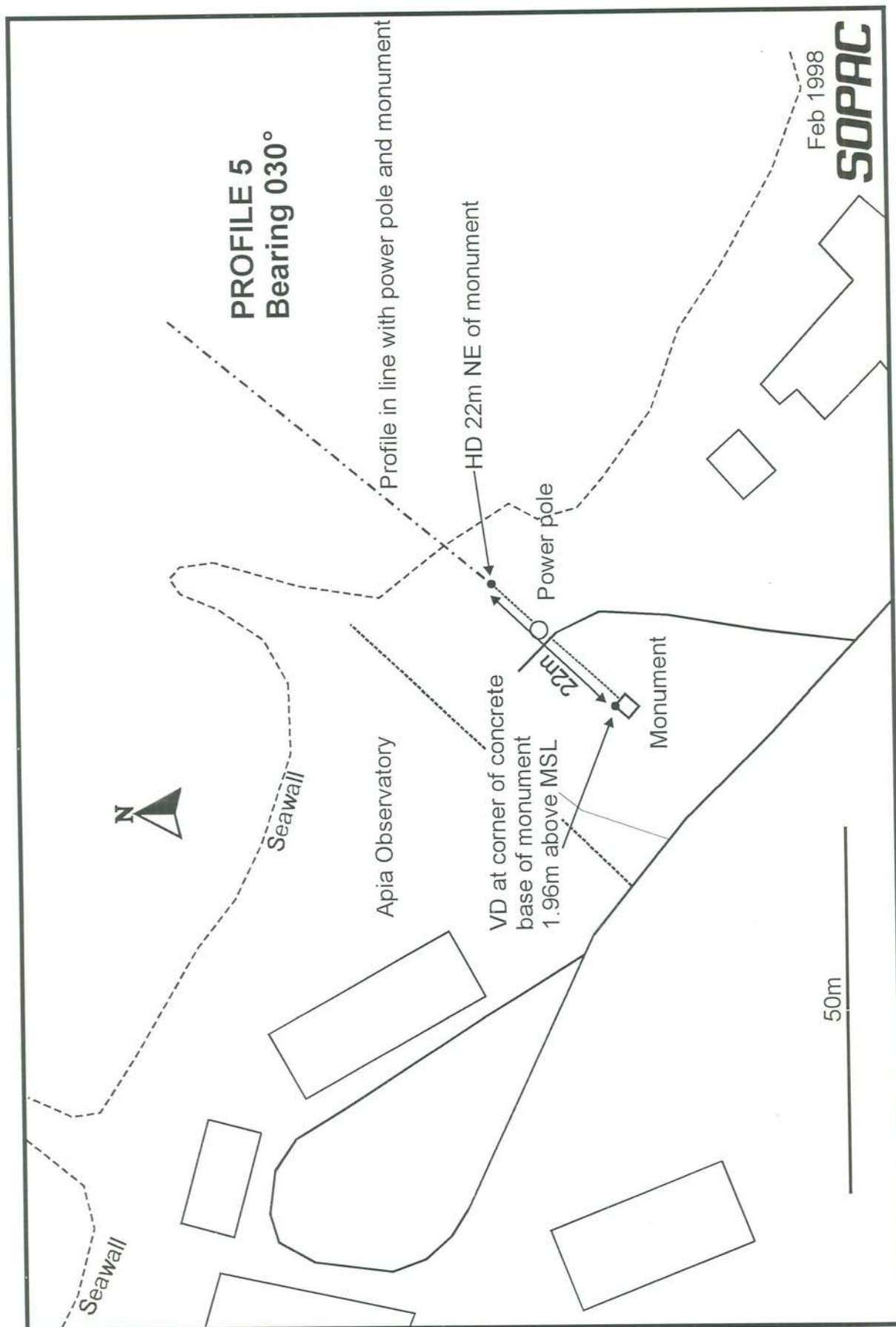
**SOPAC**





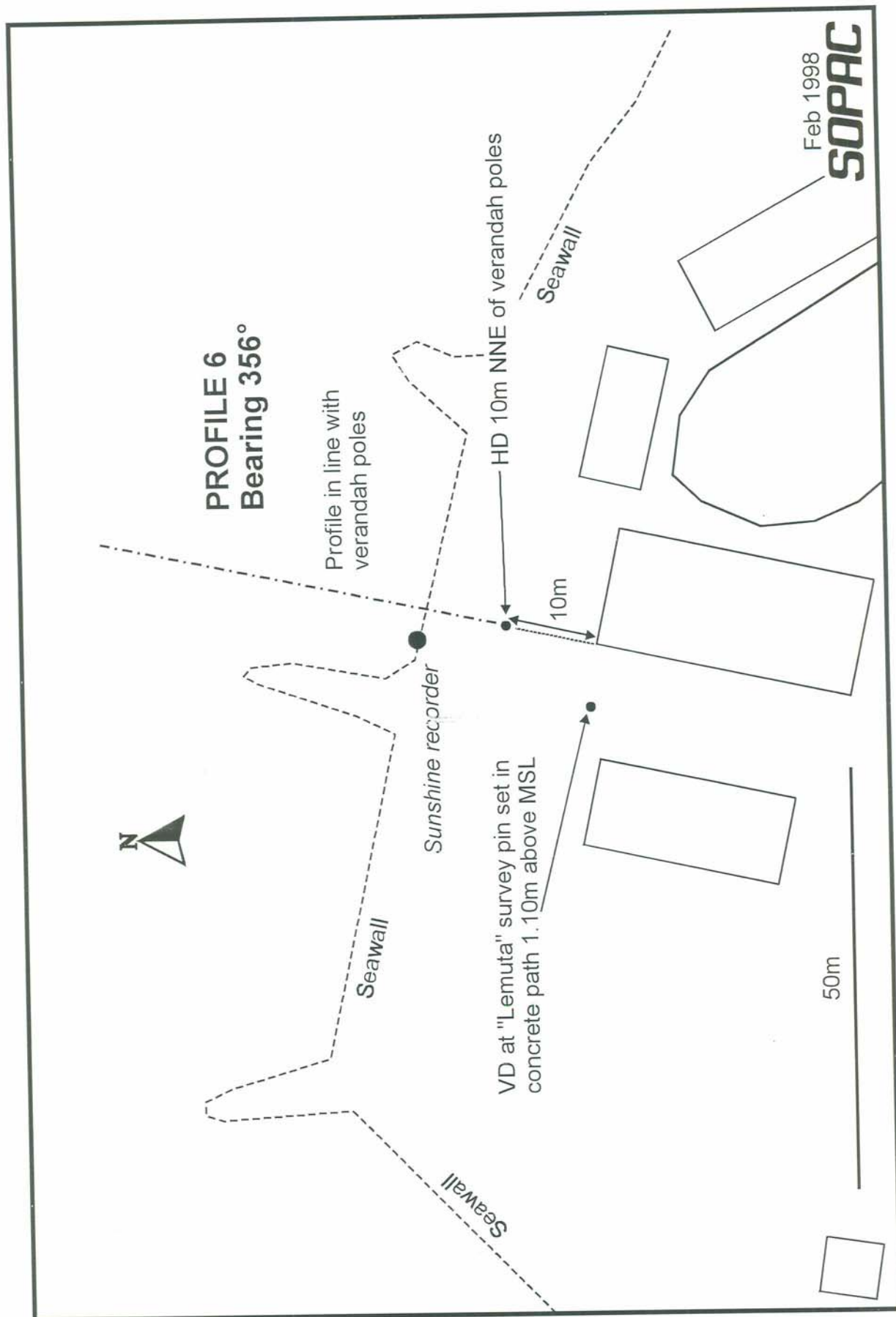


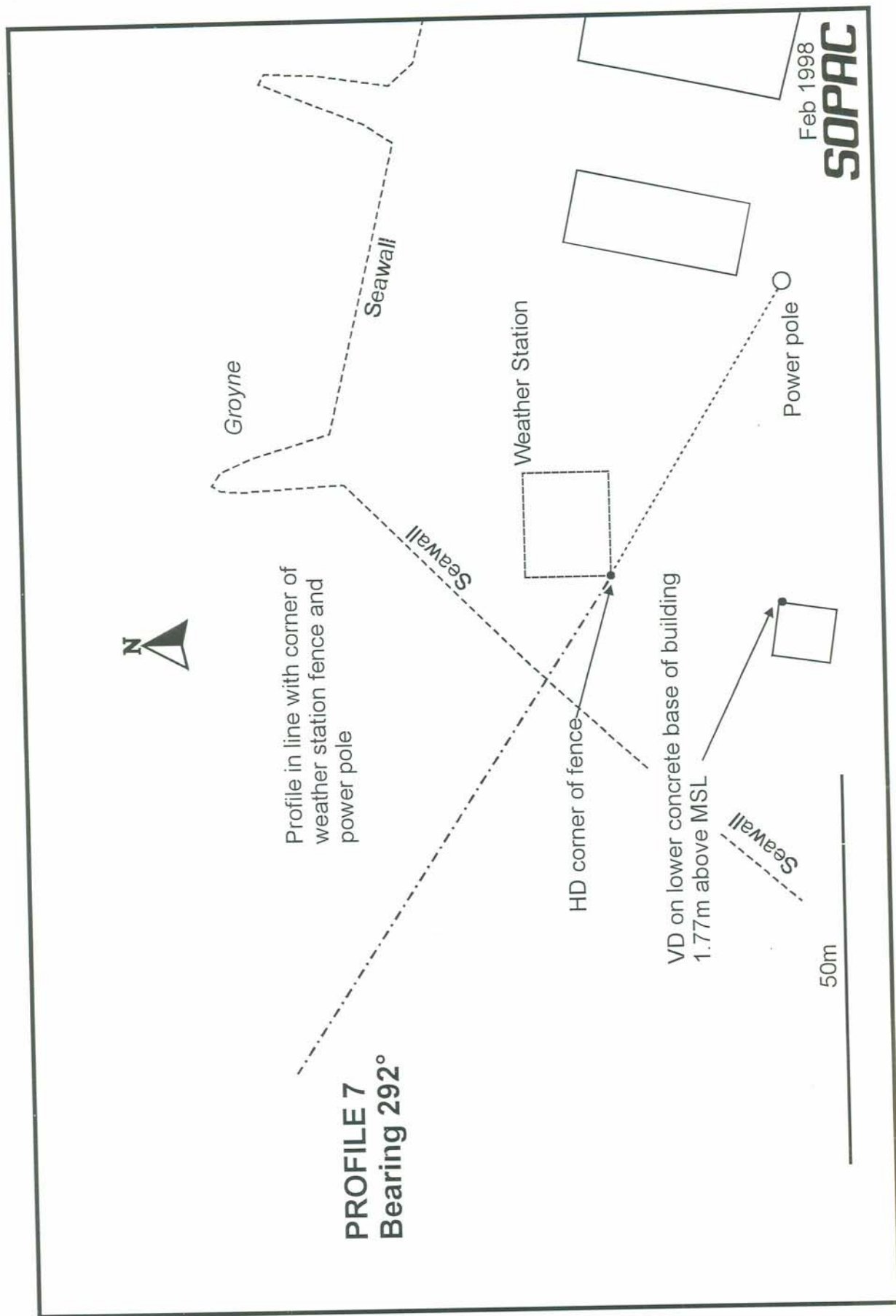




Feb 1998

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**PROFILE 8**  
**Bearing 280°**

Row of small  
coconut planted  
along seawall

Profile in line with measured  
position on concrete pad,  
parallel to causeway

Seawall



VD and HD on concrete pad  
1.14m above MSL

Old concrete foundation pad

0.3m in from  
rear left corner

1.5m in from  
front left corner

Seawall



Thickly vegetated - pad covered

*Ulberg's Mining Causeway*

50m

### **Appendix 3: Base Station Photographs**









PROFILE 4: LARGE TOMB NEAR WSBC (HD)





