

Appendix D



Hebe Haven Yacht Club Development - Sediment Quality Report (September 1997)

Hebe Haven Yacht Club

HEBE HAVEN YACHT CLUB DEVELOPMENT

Sediment Quality Report

September 1997

HALCROW CHINA LIMITED

Hebe Haven Yacht Club

HEBE HAVEN YACHT CLUB DEVELOPMENT

Sediment Quality Report

September 1997

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Mr Martin Mannion, Design Team Leader

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**Hebe Haven Yacht Club
Hebe Haven Yacht Club Development**

Sediment Quality Report

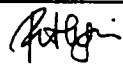
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This report has been issued and amended as follows:

Issue	Revision	Description	Date	Signed
1	0		September 1997	

Revisions to the document to be marked thus: |

1 INTRODUCTION

Hebe Haven Yacht Club is located on the western shore of Pak Sha Wan, near Sai Kung, New Territories. The Club propose to improve their existing cramped facilities by means of a development comprising :

- reclamation of some 4,392m² of land for hardstanding for boat storage and repair (see Drawings no. HHYC/H/001, 002 and 008);
- provision of boat removal/transport facility such as boat hoist;
- provision of approximately 46 no. berths in pontoon marina facility (see Drawing no. HHYC/H/001);
- associated dredging of pontoon area to increase water depth for boat access (see Drawing no. HHYC/H/004).

The dredging required is over an area some 100 metres by 70 metres at the pontoon area with existing seabed level of 0 to -2mPD. The depth will be increased to -2.25mPD, therefore dredging of up to 2 metre thickness of seabed at some locations will be required. The total estimated volume to be dredged is approximately 12,000m³.

This report summarises the records of sampling and the results of testing of marine mud vibrocore samples taken in October/November 1996. Testing and sampling was in accordance with Works Branch Technical Circular No. 22/92 and classification of test results was in accordance with Technical Circular No. (TC) No. 1-1-92.

2 LOCATION OF SEDIMENT SAMPLING

Liaison with EPD confirmed that testing in accordance with Works Branch Technical Circular No. 22/92 was appropriate in this case. Samples were taken between 0 and 2.5m below seabed at four borehole locations (MB1, MB2, MB3, MB4) between 30 October 1996 and 19 November 1996. The sample locations are shown in Drawing No. HHYC/H/004 together with the proposed dredging layout. An EPD representative visited site to witness the sampling.

The samples recovered were stored in air tight containers in chilled conditions using ice and immediately delivered to the laboratory for testing. A complete set of tests to determine metal content by atomic absorption spectroscopy were carried out.

3 RESULTS

The analytical methods used for detecting trace metals in the sediment samples were in accordance with the procedures outlined in Table A1 'Analytical Methodology' of Works Branch Technical Circular No. 22/92. Laboratory testing was carried out in accordance with the American Public Health Association (APHA) testing standards 3111 x 3112B and the American Society for Testing Materials (ASTM) D3974-81 (Practice B).

The results of tests are given in Table 3.1 and the assessment criteria in Table 3.2

4 CONCLUSIONS

The Environmental Protection Department Technical Circular No. (TC) NO 1-1-92 classifies dredged sediments according to their level of contamination by toxic metals. The sediments in Hebe Haven may generally be classified as Class A "Uncontaminated" as shown in Table 3.1 which requires no special dredging, transport or disposal methods beyond those which would normally be applied for the purpose of ensuring compliance with EPD's Water Quality Objectives, or for the protection of sensitive receptors near the dredging or disposal areas.

Two samples (MB2, 2.0 to 2.5m and MB3, 0 to 1.0m) fall marginally within Class B zinc contents. The limit for zinc concentrations is 150 mg/kg and the sample result for both samples (MB2 and MB3) was 150 mg/kg. This compares to values in the range 49 to 82 for the other samples.

Therefore it is considered that the mud in the area to be dredged should be treated as uncontaminated for disposal purposes. Discussions with EPD have confirmed that treatment as uncontaminated is appropriate in this case.

**Table 3.1
Sediment Sample Results**

Sample No.	Depth (metres)	Pollutant Concentration (mg/kg)						
		Copper	Cadmium	Chromium	Lead	Nickel	Zinc	Mercury
MB1	0-1.0	18.0	<0.2	5.0	12.0	1.1	49	<0.05
MB2	2-2.5	1.4	<0.2	4.6	6.1	<1.0	150	<0.05
MB3	0-1.0	33.0	<0.2	25.0	36.0	3.8	150	0.09
MB4	0-1.0	18.0	<0.2	9.9	16.0	1.6	82	<0.05

**Table 3.2
Assessment Criteria**

	Copper	Cadmium	Chromium	Lead	Nickel	Zinc	Mercury
Class A	0 - 54	0 - 0.9	0 - 49	0 - 64	0 - 34	0 - 140	0 - 0.7
Class B	55 - 64	1.0 - 1.4	50 - 79	65 - 74	35 - 39	150 - 190	0.8 - 0.9

**APPENDIX A
LABORATORY TEST RESULTS**

MATERIALLAB LIMITED5 Lok Yi Street,
17 M.S. Castle Peak Road,
Tai Lam, Tuen Mun,
N.T., Hong Kong.Tel : (852) 2450 8233
Fax : (852) 2450 6138**MaterialLab****HOKLAS**
REGISTRATION NO. 15

Our Ref. No. : 960999EN70048

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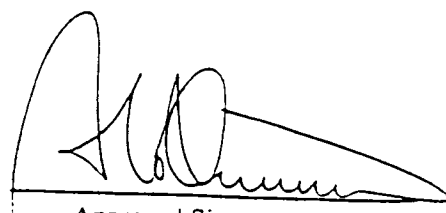
Results :

Sample Identification	Copper Content mg/kg	Cadmium Content mg/kg	Chromium Content mg/kg	Lead Content mg/kg	Nickel Content mg/kg	Zinc Content mg/kg	Mercury Content mg/kg	Classification of contamination level (*)
MB1 0-1.0m	18	<0.2	5.0	12	1.1	49	<0.05	A
MB2 2.0-2.5m	1.4	<0.2	4.6	6.1	<1	150	<0.05	B
MB3 0-1.0m	33	<0.2	25	36	3.8	150	0.09	B
MB4 0-1.0m	18	<0.2	9.9	16	1.6	82	<0.05	A

- Remarks :
- Results are based on mass of sample dried at 103-105°C.
 - Testings of the seven heavy metals contents of sediment are accredited by HOKLAS.
 - * The classification of contamination level of sediment is an opinion of the laboratory, based on the following table issued by EPD and is not covered under the HOKLAS accreditation

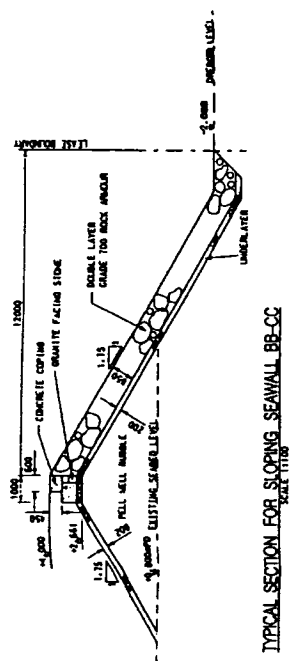
Table 1 - Classification of Sediments by Metal Content (mg/kg dry weight)

	Cd	Cr	Cu	Hg	Ni	Pb	Zn
Class A	0.0-0.9	0-49	0-54	0.0-0.7	0-34	0-64	0-140
Class B	1.0-1.4	50-79	55-64	0.8-0.9	35-39	65-74	150-190
Class C	1.5 or more	80 or more	65 or more	1.0 or more	40 or more	75 or more	200 or more

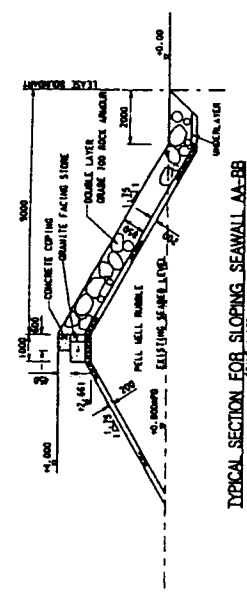
Supervised by : K.F. Wong Certified by : 
Approved Signatory : K.M. HoDate : 9/1/97

DRAWINGS

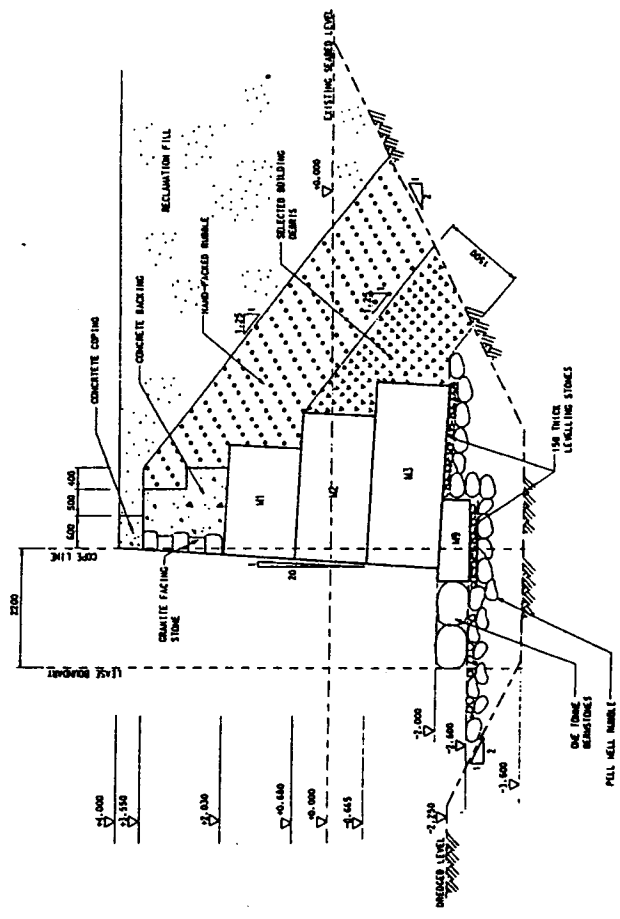
NOTES
 1. ALL DIMENSIONS ARE SHOWN IN METRES AND ALL LEVELS ARE SHOWN IN METRES RELATIVE TO HONG KONG MEAN SEA LEVEL.
 2. THIS DRAWING TO BE READ IN CONJUNCTION WITH DRAWING NO. H/0000.
 3. CROSS SECTION DETAILS AND APPROXIMATE SUBJECT TO BE OBTAINED FROM THE ARCHITECT.



TYPICAL SECTION FOR SLOPING SEAWALL BB-CC
 SCALE 1:100






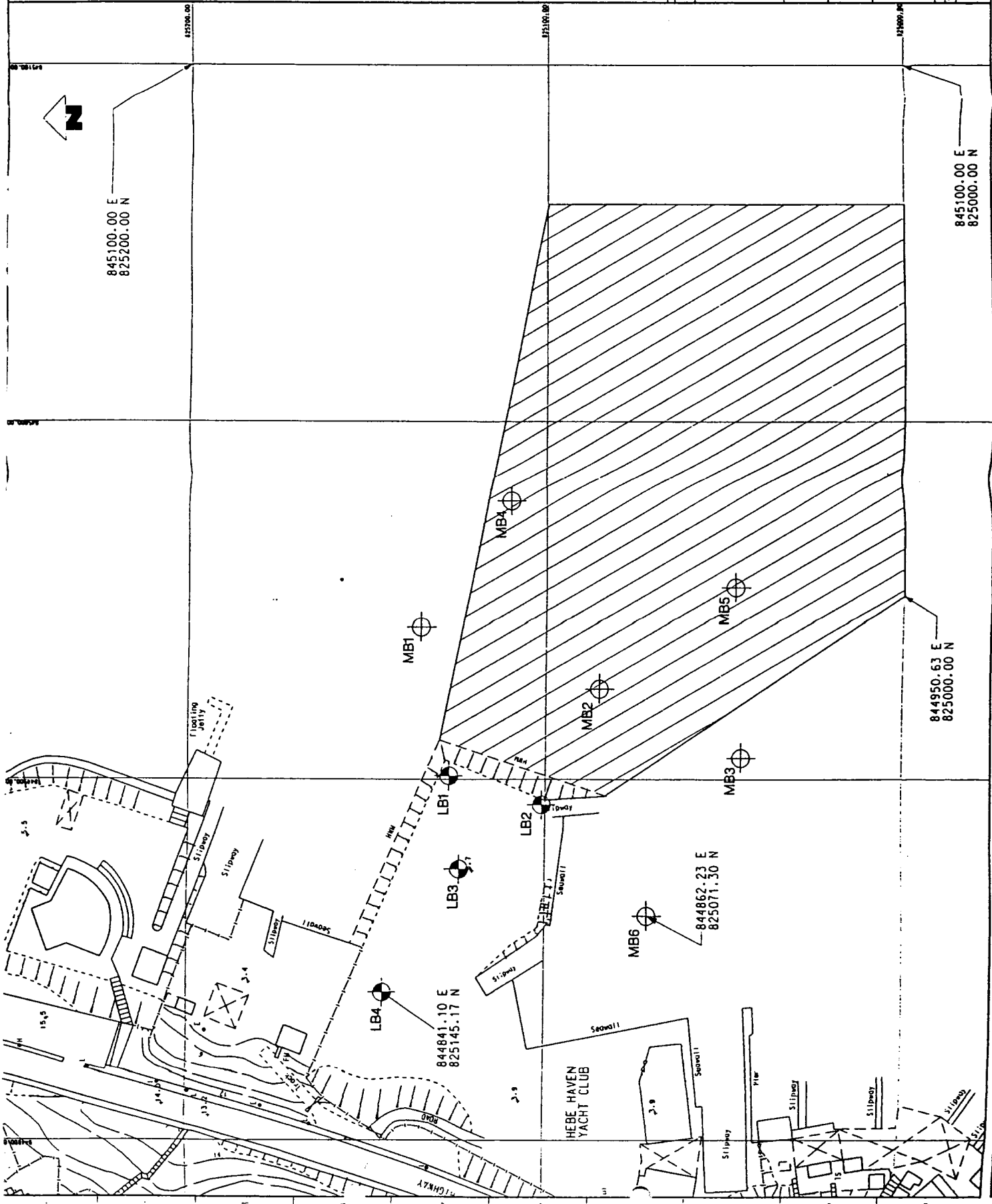
TYPICAL SECTION FOR SLOPING SEAWALL AA-BB
 SCALE 1:100



Notes

1. This topographical plan is reproduced from the Government Survey Map and should be used for reference only.

- Legend :
-  Land Borehole No.
 -  Marine Borehole No.
 -  Approximate Dredge Area



HEBE HAVEN YACHT CLUB
 PROJECT
 HEBE HAVEN YACHT CLUB DEVELOPMENT
 DRAWING NO.

HEBE HAVEN YACHT CLUB

HALCROW
 Consulting Engineers
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PROJECT
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 DRAWING NO.

PLAN OF DREDGE AREA

DATE	SCALE	PROJECT NO.	REV.
11/11/00	1:1000	HHYC/H/004	REV