

China Harbour Engineering Company (Group)

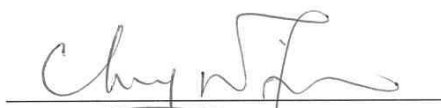
Contract No. CV/2002/09

**Tai O Development
Sheltered Boat Anchorage**

**Construction Noise Mitigation Proposal
(Version 3.0)**

December 2003

Certified By



(Environmental Team Leader)

REMARKS:

The information supplied and contained within this report is, to the best of our knowledge, correct at the time of printing.

CINOTECH accepts no responsibility for changes made to this report by third parties.

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1 INTRODUCTION

- 1.1 Cinotech Consultants Limited was commissioned by China Harbour Engineering Company (Group) (hereinafter called “the Contractor”) to undertake the Environmental Monitoring and Audit (EM&A) works and provide environmental consultant services for the Project “Tai O Development – Sheltered Boat Anchorage” (hereinafter called “the Project”).
- 1.2 In accordance with Condition 2.4 of Environmental Permit No. EP-144/2002 for the Project, a Construction Noise Mitigation Proposal (hereinafter called “the Proposal”) was submitted to EPD in March 2003. The purpose of the Proposal is to propose mitigation measures to mitigate the construction noise impact arising from the Project on the Tai O Primary School at Tai O Market Street.
- 1.3 Tai O Primary School (the School) was identified as one of the noise sensitive receivers (NSRs) in the Environmental Impact Assessment Report of the Project. It is located at Tai O Market Street beside the coast. The location of the School is indicated in **Figure 1**.
- 1.4 Due to the change of construction programme, the Proposal was revised to review the noise impact arising from the Project on the School and to propose mitigation measures accordingly.

2 NOISE IMPACT ASSESSMENT

- 2.1 Noise impact arising from the Project on the School during normal daytime working hours has been assessed in the EIA Report and reviewed in the Environmental Review Report (ERR) as submitted in August 2002. Noise control measures have been proposed to mitigate the noise levels to the noise criteria as stipulated in **Section 3**.
- 2.2 Details of the updated construction programme and the associated deployment schedule of powered mechanical equipments (PME) are presented in **Appendices A and B**. Locations of the work sites are shown in **Figure 1**.

Assessment Methodology

- 2.3 The methodology for assessment of noise impact associated with construction activities and equipment used is generally based on the Technical Memorandum on Noise from Construction Works Other Than Percussive Piling (GW-TM).
- 2.4 According to the EIAO-TM noise criteria, the limit noise levels for educational institutes are 70 dB(A) during non-examination period and 65 dB(A) during examination period.

Examination Period of the School

- 2.5 As consulted with the Principal of the Tai O Primary School, three examinations will be held in March, June and December of each year. Each examination will normally last for 3 days and be held in the morning. The coming examination will be held on 24th, 25th and 26th March 2004.
- 2.6 The Environmental Team will be responsible for confirming with the Principal of the School for the exact examination period before each academic year. If the exact schedule is deviated from the above-mentioned months, the Proposal shall be evaluated and revised, if necessary, to confirm that the noise levels during the examination are less 65dB(A).

Unmitigated Noise Impact

- 2.7 The unmitigated noise levels at the School during different construction stages have been predicted based on the updated construction programme and plant inventory. The sample noise calculations are provided in **Appendix B** and the assessment results are summarized in **Table 2.1**.
- 2.8 According to the assessment results, the unmitigated noise levels during certain construction stages exceed the construction noise criterion of 70 dB(A) during non-examination period and 65 dB(A) during examination period.

Table 2.1 Summary of Unmitigated Construction Noise Levels

Unmitigated Noise Level, dB(A)	Year	
	2004	2005
January	72	73
February	73	73
March	<u>72</u>	<u>73</u>
April	73	74
May	73	71
June	<u>74</u>	
July	73	
August	70	
September	70	
October	70	
November	73	
December	<u>73</u>	

Note:

1. Bolded values: exceedance of 70 dB(A) during non-examination period
2. Bolded & underlined values: exceedance of 65 dB(A) during examination period

3 PROPOSED MITIGATION MEASURE

3.1 In order to reduce the excessive noise impacts, adoption of quiet plants was proposed in the EIA Report and the ERR. This noise mitigation measure will also be adopted to conform the recommendations in the ERR.

Quiet Plant

3.2 According to the ERR, silenced PME's were recommended in reference to the EIA Report and *British Standard 5228: Part 1: 1997*. The recommended silenced PME's are listed in **Table 3.1**.

3.3 Apart from the quiet equipments recommended in the ERR, noise measurement was conducted to determine the sound power levels of two grab dredgers and a tug boat for the Project. The sound power levels of those three PME's, as listed in **Table 3.1**, were lower than those stated in GW-TM.

3.4 The above silenced PME's will still be adopted in the Project and the noise levels with the adoption of the silenced PME's are presented in **Appendix C**.

Table 3.1 Proposed Silenced PME's and Their Maximum SWL

Silenced PME	Ref.	Maximum SWL, dB(A)
Concrete Lorry Mixer	EIA	100
Concrete Pump	EIA	106
Air Compressor	CNP 001	100
Vibratory Poker	EIA	102
Bulldozer	EIA	109
Backhoe	EIA	109
Dump Truck	BS C9/27	105
Crawler Crane	BS C7/116	108
Generator, super silenced	CNP 103	95
Dredger (GD-853 40305V)	Report: <i>Noise Assessment for Grab Dredger (GD-853 40305V) June 2003</i>	110
Dredger (GD-1102 40357V)	Report: <i>Noise Assessment for Grab Dredger (GD-1102 40357V) Sept 2003</i>	110
Tug Boat (HKD T-7 5873)	Report: <i>Noise Assessment for Tug Boat (HKD T-7 5873) June 2003</i>	100

Note:

1. CNP: Table 3 in GW-TM
2. EIA: the Tai O Sheltered Boat Anchorage EIA Report
3. BS: *British Standard 5228: Part 1: 1997*
4. The noise assessment reports for the two grab dredgers and the tug boat are attached in **Appendix E**.

- 3.5 After the adoption of the above mitigation measure, the predicted noise levels can comply with the noise criteria during non-examination period, as shown in Table 3.2.

Table 3.2 Summary of Mitigated Construction Noise Levels

Mitigated Noise Level, dB(A)	Year	
	2004	2005
January	70	66
February	70	66
March	<u>70</u>	<u>66</u>
April	70	70
May	70	66
June	<u>70</u>	
July	66	
August	66	
September	66	
October	66	
November	65	
December	<u>66</u>	

Note:

1. Bolded & underlined values: exceedance of 65 dB(A) during examination period

Additional Mitigation Measures During Examination Period

- 3.6 However, during certain examination periods, exceedance of 65 dB(A) is predicted and additional mitigation measures are needed to be adopted as illustrated in Table 3.3

Table 3.3 Additional Mitigation Measures during Examination Period

Work Site	Construction activities	Implementation period	Mitigation Measures
A7	Demolition / Clearance Works	December 2004 and March 2005	Restriction of use of concrete breaker.
A7	Piling Works	March 2004 and June 2004	Restriction of use of Crawler Crane and Vibrator Hammer.
A8	Piling Works	March 2004 and June 2004	Restriction of use of Crawler Crane and Oscillator.

- 3.7 As illustrated in **Appendix D**, the predicted noise levels can comply with the noise criteria during examination period after adoption of the additional mitigation measures. In addition, regular noise monitoring performed by ET will be scheduled on the date of examination to check the effectiveness of the proposed mitigation measures. If exceedance is recorded, actions will be taken by relevant parties as mentioned in Sections 3.8 and 3.9.

Evaluation of the Effectiveness Proposed Mitigation Measure

- 3.8 In order to evaluate the effectiveness of the mitigation measure, noise monitoring will be conducted at the School in accordance with the EM&A Manual. If noise exceedance is recorded, the Event / Action Plan for Construction Noise will be triggered in accordance with the EM&A Manual.
- 3.9 The Contractor will liaise with the ET on other mitigation measures, propose these measures to the Engineers and the Independent Environmental Checker (IEC) for approval, and carry out the mitigation measures as necessary.

4 CONCLUSIONS

- 4.1 Noise arising from the construction activities of the Project would have potential impact on Tai O Primary School at Tai O Market Street. Predicted results of unmitigated construction noise levels at the School show that exceedance of noise criteria would occur.
- 4.2 With the implementation of these mitigation measures, the construction noise levels during non-examination period will comply with the noise criteria of 70 dB(A).
- 4.3 In order to reduce the noise levels during certain examination period to noise criteria of 65 dB(A), additional mitigation measures have to be implemented during the examination period.
- 4.4 Regular noise monitoring works at the School will be conducted in accordance with the EM&A Manual. The monitoring results will be evaluated to check whether the noise criteria are met.