

4. NOISE

4.1 Introduction

- 4.1.1 Powered mechanical equipment will be used to form the tank farm, jetty and lay the pipeline for the PAFF. However, the Tuen Mun Area 38 site is located on newly formed reclaimed land in an area zoned for industrial use. The existing land adjacent to the site is occupied by the cement plant and Shui Wing Steel Mill, with Castle Peak Power Station further to the west. To the east, a further lot of reclaimed land is proposed for use as an EcoPark, and this is bordered by a sea area earmarked for formation in the near future. The River Trade Terminal is located further down the coast. The alignment of the pipeline passes through open sea away from the land. None of these are classed as noise sensitive receivers.
- 4.1.2 The closest noise sensitive receivers to the proposed PAFF are low rise residential properties at Lung Kwu Tan and high rise residential blocks at Butterfly Beach in Tuen Mun, both about 2km and 3km away respectively. In addition, these sensitive receivers are shielded from the PAFF site by topography and there will be no line of sight to the facility. There is also a planned Holiday Camp to the east along Lung Man Road but this is about 550m away and as such not within the study area.

4.2 Relevant Legislation

- 4.2.1 Non restricted hours include the daytime hours on working days which are not a Sunday or a public holiday between 07:00-19:00. The noise generated by the construction of the Project during the non-restricted daytime hours will be assessed with reference to Table 1B of Annex 5 of the TMEIA.
- 4.2.2 If construction works during restricted hours are specified in the construction programme or percussive piling is to be undertaken, a Construction Noise Permit (CNP) will be required for the works and the noise impacts will be assessed to ensure compliance with the relevant Noise Control Ordinance (NCO) noise limits as specified in Annex 5 of the TMEIA. Once applied for, the CNP will be assessed by the Noise Control Authority based upon the contemporary situation at the time of the application.
- 4.2.3 An application for a CNP for percussive piling is assessed in accordance with the Technical Memorandum on Noise from Percussive Piling under the NCO.
- 4.2.4 The CNP may contain permitted hours of operation as a condition with reference to the predicted noise levels at noise sensitive receivers. However, it is not anticipated that percussive piling works will be required during the construction of this project.
- 4.2.5 The NCO construction noise limits during restricted hours are determined with reference to the type of area within which a Noise Sensitive Receiver (NSR) is located. For village and low-density residential areas not affected by noise, an Area Sensitivity Rating (ASR) of 'A' is applied, while a low-density residential areas in which traffic noise is noticeable but not dominant, an ASR of 'B' is employed. For a similar area in which noise from a major road is readily noticeable and dominates the noise environment, an ASR of 'C' is applied. The definition of a major road is provided in the Technical Memorandum on Noise from Construction Work Other than Percussive Piling. The construction noise

criteria for each NSR are applied to the noise arising from operation of construction equipment.

4.3 Mitigation Measures During Construction

4.3.1 There are no sensitive receivers within designated 300m of the proposed site and works, with the closest being the proposed Holiday Camp some 550m away and other sensitive receivers are about 2km away. As such significant noise impacts during the construction phase are not predicted. Notwithstanding, measures to minimise noise levels as far as possible are recommended as follows. As no sensitive receivers will be affected by the project, the mitigation measures are advisory in nature only and will not form part of the Environmental Permit.

- ◆ use quiet equipment with suitable noise levels and labels;
- ◆ regular maintenance of equipment;
- ◆ ensure noise attenuation devices are fitted to plant and equipment such as:
 - fitting more efficient exhaust sound reduction equipment and ensuring the Manufacturers' enclosure panels are kept closed on dump trucks, lorries, excavators and cranes;
 - fitting suitably designed muffler or sound reduction equipment and using dampened bit to eliminate ringing on breakers; and
 - ensure all leaks in air lines are sealed on all pneumatic equipment.
- ◆ use temporary noise barriers where applicable;
- ◆ restrict or modify working hours to minimise high noise activities;
- ◆ provide awareness training in the need to minimise noise;
- ◆ proper planning of work area; and
- ◆ good site practice to limit noise emissions at source.

4.3.2 If additional measures are deemed necessary by the ETL, the Contractor shall liaise with the ETL regarding other mitigation measures and consult the IEC for their effectiveness, and then propose these measures to the ER for approval prior to the implementation of the measures.

4.4 EM&A Requirements

4.4.1 EM&A is recommended during the construction phase only and the effective management of noise during the construction phase will be monitored through the site audit programme.

4.4.2 The aims of the noise audit are:

- ◆ to ensure that appropriate measures, including but not limited to those measures stipulated above, as being implemented with the aim to minimise and control noise from the site; and
- ◆ to encourage good site practices.

4.4.3 The Contractor shall be required to pay attention to the environmental standard and guidelines detailed in Section 4.2 and carry out appropriate noise mitigation measures.

4.4.4 During the site inspections and the document review procedures as mentioned in Chapter 11 of this Manual, the ETL shall pay special attention to the issues relating to noise mitigation and check whether the Contractor has followed the relevant contract specifications and the procedures specified under the laws of Hong Kong (see above Section 4.2).

4.4.5 The action levels for construction noise is defined in Table 4.1. Should non-compliance of the criteria occur, the ETL, the IEC, the ER and the Contractor shall undertake their specified actions in accordance with the Action Plan shown in Table 4.2.

Table 4.1 Action Levels for Construction Noise

Time Period	Action
0700-1900 hrs on normal weekdays	When one documented complaint is received

4.4.6 Should any ad hoc noise monitoring be required in the even of a complaint, the construction noise level shall be monitored by the ES and shall be measured in terms of the A-weighted equivalent continuous sound pressure level (L_{eq}). $L_{eq(30\text{ min})}$ shall be used as the monitoring parameter for the time period between 0700-1900 hours on normal weekdays. In respect of all other time periods, $L_{eq(5\text{ min})}$ shall be employed for comparison with the Noise Control Ordinance criteria. A sample data record sheet is shown in Figure 4.1 for reference.

4.4.7 As referred to in the Technical Memorandum (TM) issued under the Noise Control Ordinance (NCO), sound level meters in compliance with the International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1) specifications shall be used for carrying out any noise monitoring.

4.4.8 Immediately prior to and following each noise measurement the accuracy of the sound level meter shall be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements may be accepted as valid only if the calibration level from before and after the noise measurement agree to within 1.0dB.

4.4.9 Noise measurements shall not be made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m/s. The Contractor shall ensure that noise measuring equipment and associated instrumentation are available for carrying out any ad hoc monitoring if required.

- 4.4.10 The locations for noise monitoring, if required shall be proposed by the Contractor in consultation with the ETL and verified with the Franchisee's Site Representative (FSR), the Independent Environmental Checker (IEC) and Environmental Protection Department (DEP).
- 4.4.11 The monitoring station shall normally be at a point 1m from the exterior of a building facade or in the case the measurement is not being carried out at a building, be at a position 1.2m above the ground.
- 4.4.12 For reference, a correction of +3dB(A) shall be made to the free field measurements. Noise levels shall be corrected in accordance with Section 2.10, 2.11 and 2.13 of the "Technical Memorandum on Noise From Construction Works Other Than Percussive Piling". The ETL shall agree with the IEC on the monitoring position and the corrections adopted prior to the commencement of the works.



Table 4.2 Event / Action Plan for Construction Noise

EVENT	ACTION			
	ETL	IEC	FSR	Contractor
Action Level	<ol style="list-style-type: none"> 1. Notify the IEC and the Contractor. 2. Carry out investigation. 3. Report the results of investigation to the IEC and the Contractor. 4. Discuss with the Contractor and formulate remedial measures. 5. Consider undertaking ad hoc monitoring to check mitigation effectiveness. 	<ol style="list-style-type: none"> 1. Review the analysed results submitted by the ET. 2. Review the proposed remedial measures by the Contractor and advise the FSR accordingly. 3. Supervise the implementation of remedial measures. 	<ol style="list-style-type: none"> 1. Confirm receipt of notification of failure in writing. 2. Notify the Contractor. 3. Require the Contractor to propose remedial measures for the analysed noise problem. 4. Ensure remedial measures are properly implemented. 	<ol style="list-style-type: none"> 1. Submit noise mitigation proposals to IEC 2. Implement noise mitigation proposals

Note: ETL – Environmental Team Leader, IEC – Independent Checker (Environmental), FSR – Franchisee’s Site Representative



Figure 4.1 Noise Monitoring Field Record Sheet

Monitoring Location:	
Description of Location:	
Date of Monitoring:	
Measurement Start Time (hh:mm):	
Measurement Time Length (min.):	
Noise Meter Model/Identification:	
Calibrator Model/Identification:	
Measurement Results	L ₉₀ (dB(A)):
	L ₁₀ (dB(A)):
	Leq (dB(A)):
Major Construction Noise Source(s) During Monitoring:	
Other Noise Source(s) During Monitoring:	
Remarks:	

	<u>Name & Designation</u>	<u>Signature</u>	<u>Date</u>
Recorded By :	_____	_____	_____
Checked By :	_____	_____	_____