Response to Comments from EPD

Comments received via email on 17 Oct 2011:		Responses:
1.	It seems that the noise barrier mentioned in the 3rd para. under Section 8.2 of the NMP should fall into the measures of "movable/temporary noise barriers" under Condition 2.9 (c) (i.e. to be implemented where appropriate rather than strictly implemented as suggested in Section 8.0). Please revise accordingly.	Section 8.2 has been revised.

CONTRACT HY/2009/19

CENTRAL – WAN CHAI BYPASS – TUNNEL (NORTH POINT SECTION)
AND
ISLAND EASTERN CORRIDOR LINK

Noise Management Plan

(Pursuant to the Further Environmental Permit - No. FEP-07/364/2009/A)

Rev	2	Prepared By:	Reviewed By	Approved By:
Date	25 Oct 2011			
Name		Simon Wong	M.H. Isa	K.C. Cheung
Designation		Environmental Engineer	Environmental Officer	Site Agent

REGISTRY OF NOISE MANAGEMENT PLAN AMENDED

Rev. No.	Amendment Date	Amendment Section	Content	Amended by
0	18 Mar 2011	All	Initial Revision incorporated ET and ICE comment	Simon Wong
1	12 Sep 2011	Appendix E	Construction Works Programme	M.H. Isa
		Sections 8.0,10.0,11.0	Responses to comments (1) received from EPD	
2	25 Oct 2011	Section 8.2	Movable / Temporary Noise Barrier	M.H. Isa

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List of Appendixes

1.0 Purpose of this Plan

Pursuant to the Further Environmental Permit (No. FEP-07/364/2009/A), Part C, Special Condition, Clause 2.9, Noise Management Plan (NMP) is developed by Permit Holder (Chun Wo – CRGL - MBEC Joint Venture) to demonstrate clearly the management of construction noise nuisance generated in the execution of works for the Project. The mitigation measures specified in this NMP shall be implemented on site to reduce and/or minimise the nuisance to the publics and nearest noise sensitive receivers.

2.0 Project Description

This designated Project (HY/2009/19) is a part of the CWB project, which shall provide relief to the existing congestion along the East-West corridor and cater for the anticipate growth of traffic on Hong Kong Island.

Scope of Works

The scope of the Project mainly includes:

- Construction of a 300-metre-long tunnel at North Point;
- Construction of an approach road to the tunnel;
- Modification of the section of Island Eastern Corridor between Hing Fat Street and Po Leung Kuk Yu Lee Mo Fan Memorial School;
- Modification of the junction of Victoria Park Road and Hing Fat Street;
- Demolition of Rumsey Street Flyover eastbound in Central;
- Sub-structure works of the East Ventilation Building and the foundation works of the Administration Building; and
- Associated works including landscaped deck, noise barriers, noise semi-enclosures, road drainage and landscaping works.

3.0 Environmental Legislation, Policies, Plans, Standards and Criteria

Noise impacts have been assessed in accordance with the criteria and methodology given in the Technical Memoranda (TM) made under the Noise Control Ordinance (NCO) and the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM).

The NCO provides the statutory framework for noise control. Assessment procedures and standards are set out in the following TM:

- EIAO-TM;
- TM on Noise from Construction Work other than Percussive Piling (GW-TM);
- TM on Noise from Construction Work in Designation Area (DA-TM); and
- TM on Noise from Places other than Domestic Premises, Public Places or Construction Sites (IND-TM).

The NCO provides the statutory framework for noise control of construction work other than percussive piling using Powered Mechanical Equipment (PME) between the hours of 1900 to 0700 or at any time on Sundays and a general holiday (that is, restricted hours). Noise control on construction activities taking place at other times is subject to the Criteria for evaluating Noise Impact stated in Table 1B of Annex 5 in the EIAO-TM. The noise limit is 75dB(A) $L_{eq(30\ minutes)}$ at the facades of dwellings and 70 dB(A) $L_{eq(30\ minutes)}$ at the facades of schools (65dB(A) during examination). The construction noise criteria are summarized in Table 3-1.

Table 3-1: Daytime Construction Noise Criteria

Uses	Noise Level in Leq (30-minutes), dB(A)
Domestic Premises	75
Educational Institution	70
Educational Institution (during examination)	65

Between 1900 and 0700 hours and all day on Sundays and public holidays, activities involving the use of PME for the purpose of carrying out construction work is prohibited unless a Construction Noise Permit (CNP) has been obtained. A CNP may be granted provided that the Acceptable Noise Level (ANL) for the Noise Sensitive Receivers (NSRs) can be compiled with. ANLs are assigned depending upon the Area Sensitivity Ratings (ASRs). The corresponding Basic Noise Levels (BNLs) for evening and night time periods are given in Table 3-2.

Table 3-2: Construction Noise Criteria for Activity other than Percussive Piling

Time Period	Basic Noise Levels (BNLs)		
	ASR A	ASR B	ASR C
Evening (1900 to 2300 hours)	60	65	70
Night (2300 to 0700 hours)	45	50	55

4.0 Noise Sensitive Receivers (NSRs)

In order to evaluate the construction noise impacts from the Project, representative existing NSRs of the Project are identified in the EIA (AEIAR-125/2008), and are summarized in Table 4-1. The location plan of the NSRs is shown in Figure 1 in **Appendix A.**

Table 4-1: Representative Existing Noise Sensitive Receivers

NSR	Section	Location	Use
N9	Tin Hau	Viking Garden	Residential
N10		Victoria Court	
N11		Mayson Garden	
N12		Gordon House	
N13		Belle House	
N14		Hoi Tao Building	
N15		Staff Quarters of FEHD	
N16		Victoria Centre	
N17		Harbour Heights	
N18	North Point	City Garden, Block 10	
N19		City Garden, Block 7	
N20		HK Baptist Church Henrietta Sec. School	Educational Institution
N21		Provident Centre, Blk 1	Residential
N22		Provident Centre, Blk 6	
N23		Provident Centre, Blk 17	
N24*		PLK Yu Lee Mo Fan Memorial School	Educational Institution

Note: * Not being identified as representative NSR in the EIA.

5.0 Identification of Noise Impacts

Potential noise impacts of the Project are likely arise from the following activities:

- Diaphragm wall and tunnel construction;
- Substructure and superstructure for landscape deck, connection of IECL;
- Demolition of superstructure, including the IEC structure; and
- Road formation, earth works, drainage culvert construction

6.0 Assessment Methodology

In accordance with the EIAO, the methodology outlined in the GW-TM has been used for the assessment of construction noise (excluding percussive piling). Sound Power Levels (SWLs) of the equipment were taken form Table 3 of this TM.

A negative correction of 10dB(A) was made to the calculated result by eliminating the line of sight from the receivers along the construction areas.

A positive correction of 3dB(A) was made to the calculated result in order to allow for façade effect.

7.0 Prediction and Evaluation of Noise Impacts

In accordance with the EIA (AEIAR-125/2008), exceedences of the construction noise criteria as stated in Table 3-1 are predicted at representative NSRs in the absence of mitigation measures. A summary of the unmitigated construction noise levels of the representative NSRs during normal daytime working hours within the construction period of the Project is summarized in Table 7-1.

Table 7-1: Summary of Unmitigated Construction Noise Level at Representative NSRs during Normal Daytime Working Hours

Representative NSRs	Predicted Unmitigated Construction Noise Levels during Normal Daytime Working Hour ($L_{eq\ (30\text{-}minutes)}$ dB(A))
N11	57 – 101
N13	60 – 84
N15	66 – 88
N17	63 – 96
N18	62 – 98
N20#	65 – 90
N22	64 - 79

Note: # For normal daytime working hours, the noise criteria are 70 dB(A) and 65 dB(A) for normal teaching periods and examination periods, respectively.

Noise mitigation measures should therefore be required to reduce noise levels to the stipulated standard.

8.0 Mitigation of Adverse Environmental Impacts

In order to reduce the noise impacts to NSRs during normal daytime working hours, it is recommended that the following noise reduction measures shall be implemented during the construction phase.

8.1 Restriction on use of Pneumatic Breaker

The use of pneumatic breakers, if required to demolish the existing IEC, shall be confined to the period from 0900 to 1700 hours on weekdays (Monday to Friday), and the pneumatic breakers shall not be used any time on Saturdays, Sundays and general holidays, and during examination hours of the schools affected by the works site, including:

(1) HK Baptist Church Henrietta Secondary School;

(2) PLK Yu Lee Mo Fan Memorial School

To ensure no pneumatic breakers shall be used during the examination period, CW-CRGL-MBEC JV shall:

- closely liaise with the schools to address their environmental concerns during the course of construction works;
- check the examination schedule and re-schedule the works during the examination period, where practicable, to avoid noise nuisance to the students; and
- join the briefing sessions / visits held by Highways Department or the Engineer to the schools to provide them more updating information about the upcoming construction activities of the Project.

8.2 Movable / Temporary Noise Barrier

Movable / Temporary noise barriers (5m in height) with cantilevered upper portion (3.5m in length); and temporary noise barriers with height up to the soffit of the bridge deck area shall be installed along the existing IEC structure during the demolition and construction of substructure for the IEC and construction of adjacent tunnel approach ramp structure, as shown in Figure 2 in **Appendix B**.

Besides, movable / temporary noise barriers shall be provided on temporary working platforms on piers or pile caps for the demolition works of existing piers and crossheads for the marine section of the existing IEC as shown in Figure 3 in **Appendix C**.

Movable / Temporary noise barriers are also proposed for static plant, such as generator, air compressor and concrete pump where appropriate to reduce noise impact. These PME shall be totally screened when viewed from the NSR, a negative correction of 5 to 10 dB(A) noise reduction shall be achieved. The barrier material shall have a surface mass of not less than 14 kg/m^2 on skid footing with 25mm thick internal sound absorptive lining to achieve the maximum screening effect. A typical section view of the barrier for static plants and to be placed at location where construction works are in progress is shown in **Appendix D**.

In addition, the following noise reduction measures will be considered as far as practicable.

8.3 Quality Powered Mechanical Equipment (QPME)

The following types of QPME are proposed to be used during the construction phase of the Project:

- Bulldozer, wheeled
- Bulldozer, tracked
- Excavator, wheeled / tracked
- Loader, tracked
- Loader, wheeled
- Asphalt paver
- Road roller
- Roller, vibratory
- Power rammer (petrol)
- Compactor, vibratory
- Crane, mobile
- Generator

8.4 Good Site Practices

The following good site practices should be adopted to further ameliorate the impacts where appropriate:

- Only well-maintained plant shall be operated on-site and plant shall be serviced regularly during the construction program;
- Silencers or mufflers on construction equipment shall be utilized and shall be properly maintained during the construction program;
- Mobile plant, if any, shall be sited as far away from NSRs as applicable;
- Machines and plant (such as trucks) that may be in intermittent use must be shut down between works periods or shall be throttled down to a minimum;
- Plant known to emit noise strongly in one direction shall, wherever possible, be orientated so that the noise is directed away from the nearby NSRs; and
- Material stockpiles and other structures shall be effectively utilized, wherever practicable, in screening noise from on-site construction activities.

8.5 Multi-Phase Construction Schedules

Proactive planning of working sequences could minimize the total sound power levels generated by PMEs during normal daytime working hours. Construction Works Programme shown in **Appendix E** demonstrates the implementation of multi-phase construction schedules for the Project.

PME grouping as noise mitigation measures shall be implemented at NSR N11, N13, N17, N18 and N20. In order to minimize the noise impact to the surrounding NSRs, either Group 1 or 2 shall be operated at any one time under the construction schedule. The mitigation measures for the items of PME for each construction tasks are shown in **Appendix F**. At this stage, the EIA prediction would still be valid.

Detailed list of PME and specific noise impact of individual construction work shall be reviewed in relevant method statement via submission to the Engineer.

9.0 Evaluation of Mitigated Noise Impacts

With the implementation on use of QPME, temporary noise barriers and PME grouping, the overall noise levels at NSRs shall be reduced by 7 to 31 dB(A) $L_{eq(30\text{-}minutes)}$, depending on the type of construction activities. With the exception of NSRs N11, N17, N18 and N20, the predicted construction noise levels arising from the Project at all other NSRs selected for noise impact assessment shall comply with the EIAO-TM construction noise criteria. A summary for mitigated

noise levels during normal daytime working hours at representative NSRs is shown in Table 9-1.

Table 9-1: Summary of Mitigated Construction Noise Levels at Representative NSRs during Normal Daytime Working Hours

Representative NSRs	Predicted Mitigated Construction Noise Levels ($L_{eq(30\text{-}minutes)}$ dB(A))
N11	44 – 70 (Group 1 PME)
N11	51 – 85 (Group 2 PME)
N13	55 – 71 (Group 1 PME)
N13	55 – 71 (Group 2 PME)
N15	62 – 75
N17	58 – 80 (Group 1 PME)
N17	58 – 80 (Group 2 PME)
N18	54 – 84 (Group 1 PME)
N18	54 – 84 (Group 2 PME)
N20#	60 – 77 (Group 1 PME)
N20#	60 - 77 (Group 2 PME)
N22	62 - 72

Note: # For normal daytime working hours, the noise criteria are 70 dB(A) and 65 dB(A) for normal teaching
periods and examination periods, respectively.

In according to the EIA (AEIAR-125/2008), the on-site survey has revealed that NSR N20 (HK Baptist Church Henrietta Secondary School) has already been noise insulated with air-conditioners. With the provision of air-conditioners, it is considered that the noise impact shall be minimized by keeping the windows closed during the construction activities. Notwithstanding this, due to a limited buffer distance and a more stringent noise criterion of 65 dB(A), it is proposed that particularly noisy construction activities, especially those associated with the demolition of the ICE structures, shall be scheduled to avoid examination periods as far as practicable.

10.0 Impact Monitoring during Construction

External Monitoring

Environmental Monitoring and Audit (EM&A) Manual serves as a guideline to set up of an EM&A programme to ensure compliance with the EIA study recommendations, to assess the effectiveness of the recommended mitigation measures and to identify any further need for additional mitigation measures or remedial action.

The Environmental Team Leader and his team member shall be responsible for the set-up, implement and maintain of EM&A system. The real-time on-site monitoring of noise level around the work sites areas shall be carried out by Environmental Team during the construction phase.

The monitoring station(s) may subject to change with respect to the availability of the measurement location and/or other related factors. The relevant location(s) should refer to the latest EM&A Manual via the Project website at the below link:

http://www.wd2-cwb.com/documents/manual/htm.

Remedy mitigation measures shall be immediately implemented once the construction noise level exceeded the limit and action levels under the Manual's requirement.

11.0 Conclusion

The predicted unmitigated noise level shall range from 57 to 101 dB(A) at the respectively NSRs. With the use of QPME, temporary barriers and PME grouping for construction tasks under the Project, the noise levels at the NSRs selected for construction noise impact assessment except N11, N17, N18 and N20 shall comply with the construction noise standard.

Having exhausted practicable noise mitigation measures, the predicted noise level at N11 (i.e Mayson Garden) shall exceed the noise standard of 75dB(A) by 10 dB(A) with Group 2 PME. For N17 (i.e Harbour Heights), the predicted noise level shall exceed the noise standard of 75 dB(A) by up to 5 dB(A) with Group 1 or Group 2 PME. For N18 (i.e City Garden), the predicted noise level shall exceed the noise standard of 75 dB(A) by up to 9 dB(A) with Group 1 or Group 2 PME. For N20 (i.e HK Baptist Church Henrietta Secondary School), the predicted noise level with Group 1 or Group 2 PME shall exceed the noise standard of 65 dB(A) by up to 12 dB(A) for Group 1 or Group 2 PME during examination periods. For the normal teaching period, the noise level shall exceed the noise standard of 70 dB(A) by 7 dB(A) with Group 1 or Group 2 PME. However, the school has been noised insulated with air conditioners and, by keeping the windows closed during construction activities, noise impacts at the indoor environment can be avoided. Notwithstanding this, the particularly noisy construction activities shall be scheduled to avoid examination period as far as practicable.

Whilst the prediction does indicate some noise exceedance for limited periods of time, even with the consideration of all practicable mitigation measures, during the actual construction period as much as practically possible shall be done to reduce construction noise still further, and there shall be on-going liaison with all concerned parties and site monitoring to deal with and minimize any exceedances. Community Liaison Group (CLG) will facilitate communication, enquires and complaint handling on all environmental issues. Regular meeting will be setup for the CLG to update the latest cumulative environmental impact due to the project.

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NOISE MANAGEMENT PLAN

FOR

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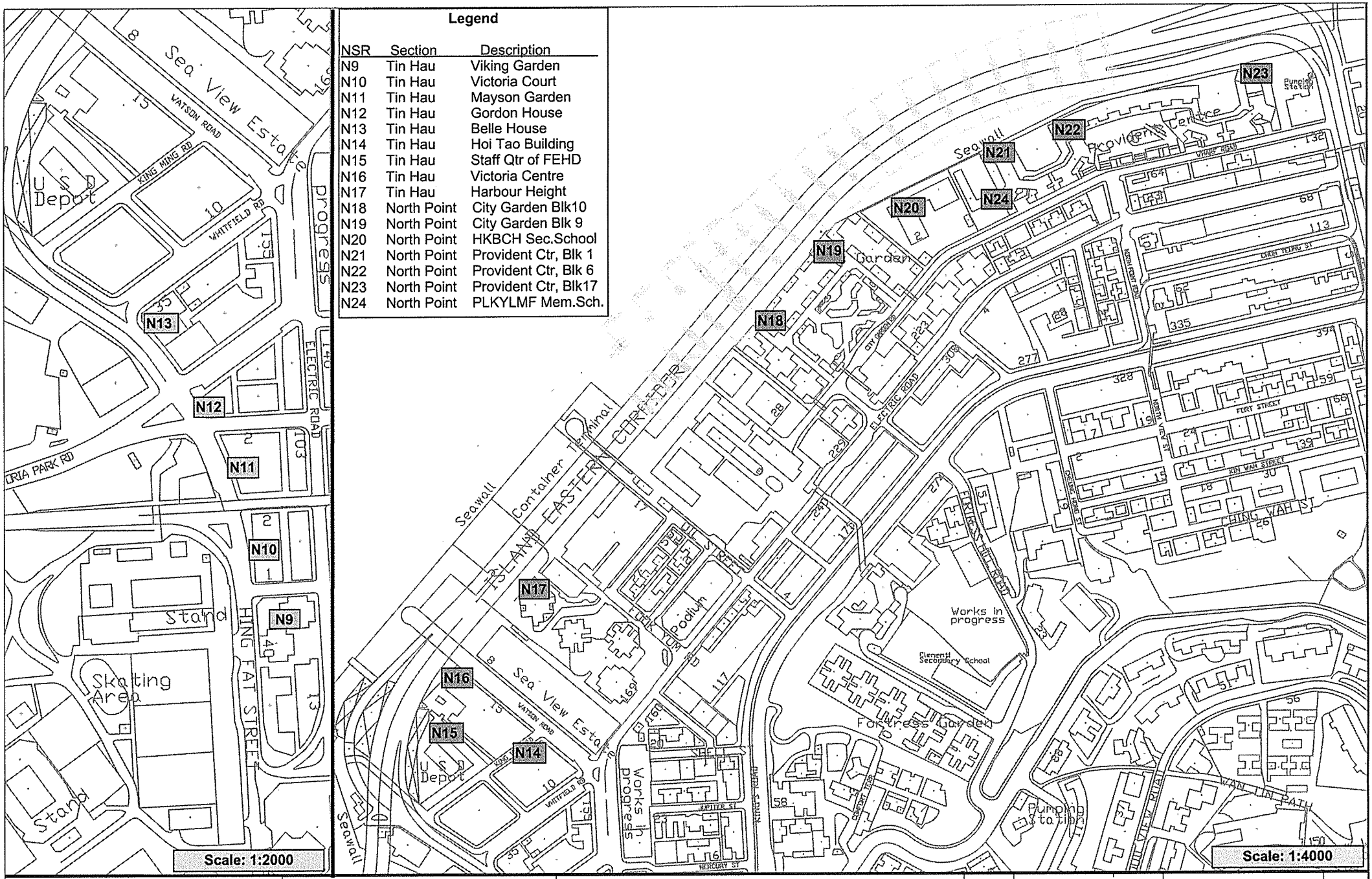
Central – Wan Chai Bypass Tunnel (North Point Section) and Island Eastern Corridor Link

Appendix A

Location Plan for Noise Sensitive Receiver



CLIENT	CONTRACTOR: 俊和 中國中鐵 俊和-中國中鐵-中鐵大橋局聯營 CHUN WO - CRGL - MBEC JOINT VENTURE	JOB TITLE: **Location Plan of Noise Sensitive Receivers (NSRs)**
ENGINEER'S REPRESENTATIVE	PROJECT: CONTRACT NO. HY/2009/19 CENTRAL - WAN CHAI BYPASS TUNNEL (NORTH POINT SECTION) AND ISLAND EASTERN CORRIDOR LINK	SCALE: As shown at A4 · DATE · DRAWN · DESIGNED · CHECKED · APPROVED · Sheet of · Figure 1 · REV 0

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NOISE MANAGEMENT PLAN

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Central – Wan Chai Bypass
Tunnel (North Point Section)
and
Island Eastern Corridor Link

Appendix B

Location Plan of Temporary Noise Barrier during Construction Phase in North Point Waterfront

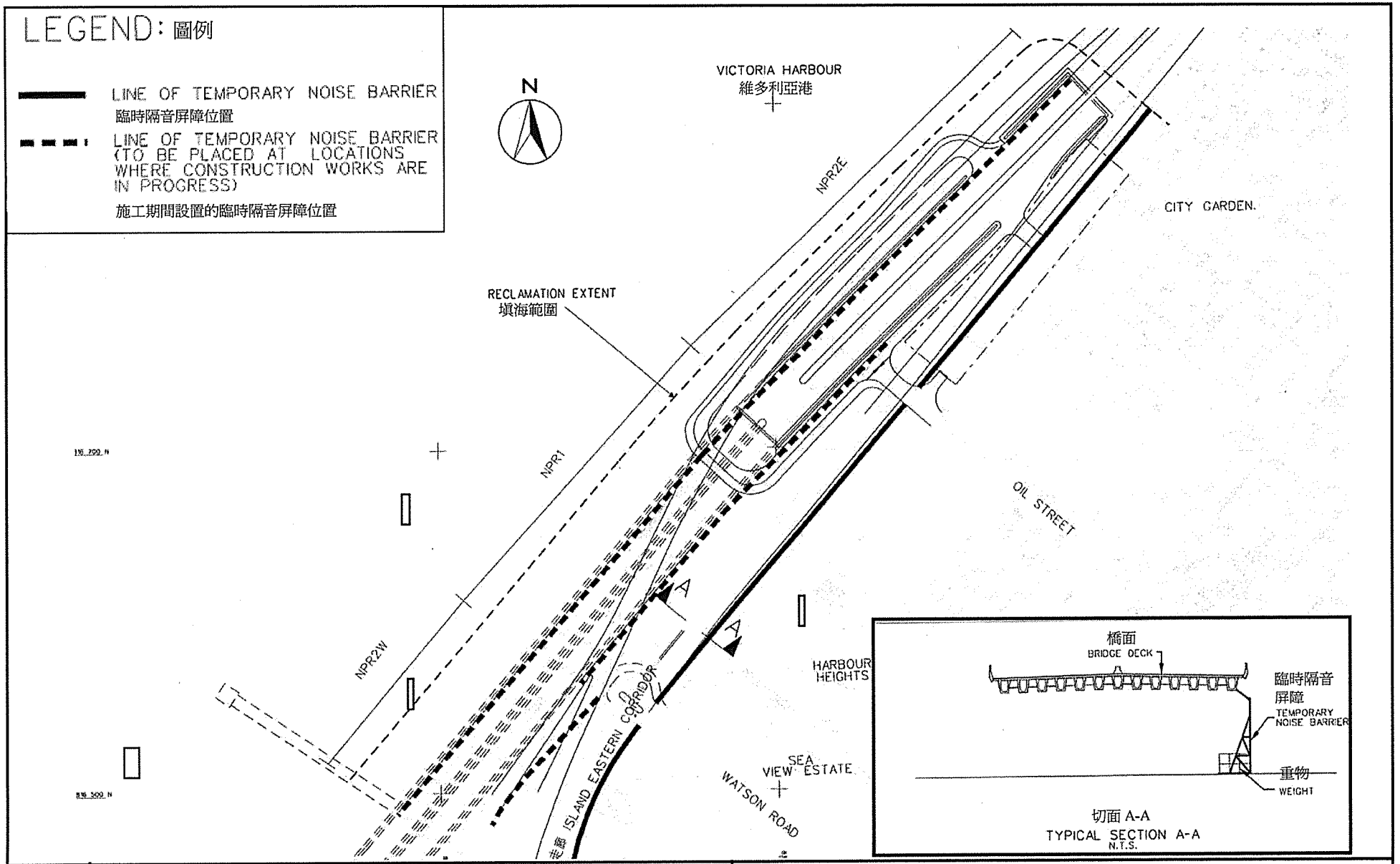

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Figure 2: Location of Temporary Noise Barriers during Construction Phase in North Point Waterfront
圖 2: 在北角海旁施工期間的臨時隔音屏障位置圖

(This figure was prepared based on Figure 4.9 of the WDII&CWB EIA report (Register No.: AEIAR-125/2008))
(本圖是根據 WDII&CWB 環評報告（登記冊編號 AEIAR-125/2008）圖 4.9 編製)

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NOISE MANAGEMENT PLAN

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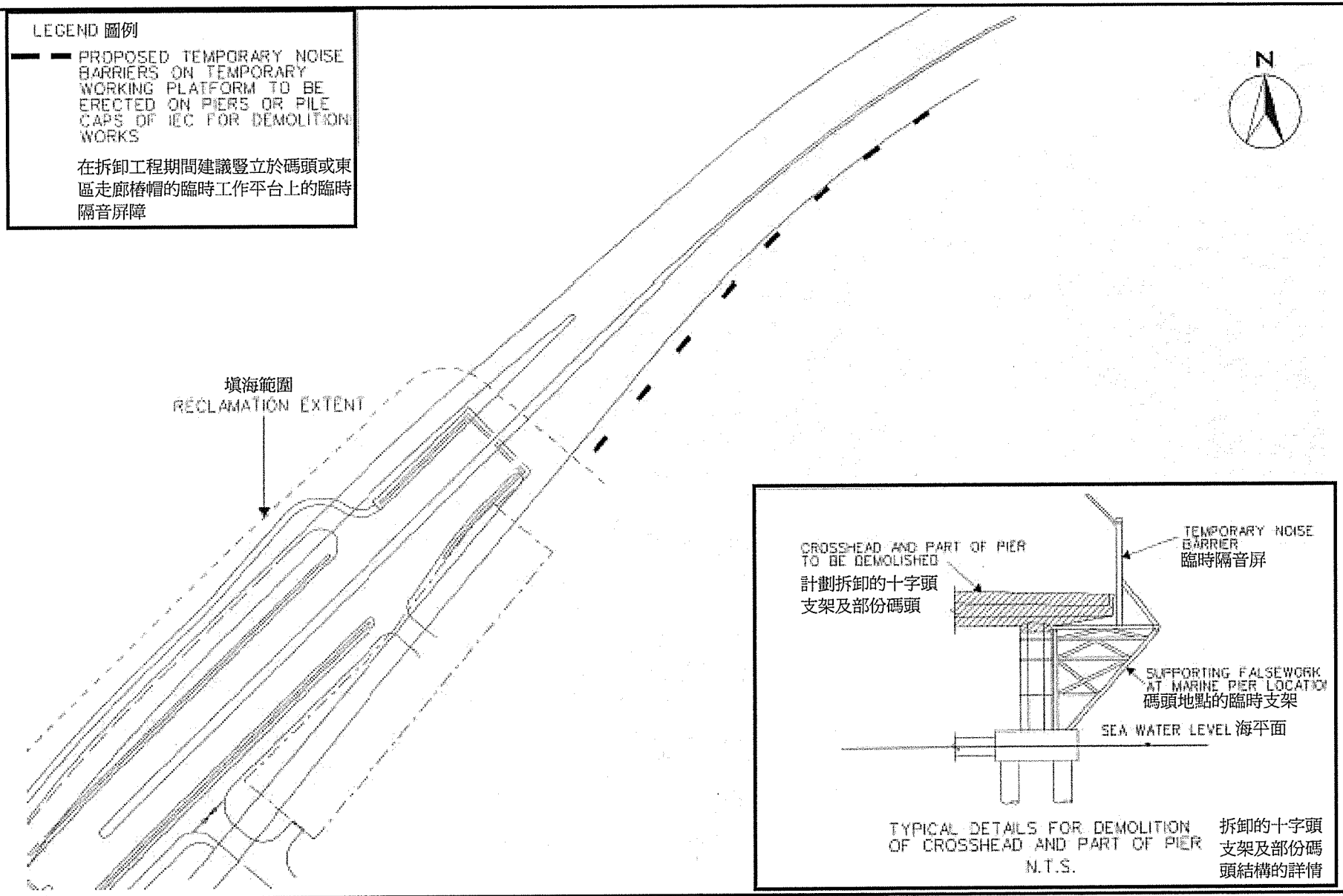
Central – Wan Chai Bypass Tunnel (North Point Section) and Island Eastern Corridor Link

Appendix C

Location Plan of Temporary Noise Barrier during Demolition of Existing Piers and Crossheads in Marine Section of IEC



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Central - Wan Chai Bypass - Tunnel (North Point Section) and Island Eastern Corridor Link

Figure 3: Location of Temporary Noise Barriers during Demolition of Existing Piers and Crossheads in Marine Section of IEC

圖 3: 拆卸現有碼頭及東區走廊海面十字頭支架期間的臨時隔音屏障位置圖

(This figure was prepared based on Figure 4.9a of the WDII&CWB EIA report (Register No.: AEIAR-125/2008))
(本圖是根據 WDII&CWB 環評報告（登記冊編號 AEIAR-125/2008）圖 4.9a 編製)

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NOISE MANAGEMENT PLAN

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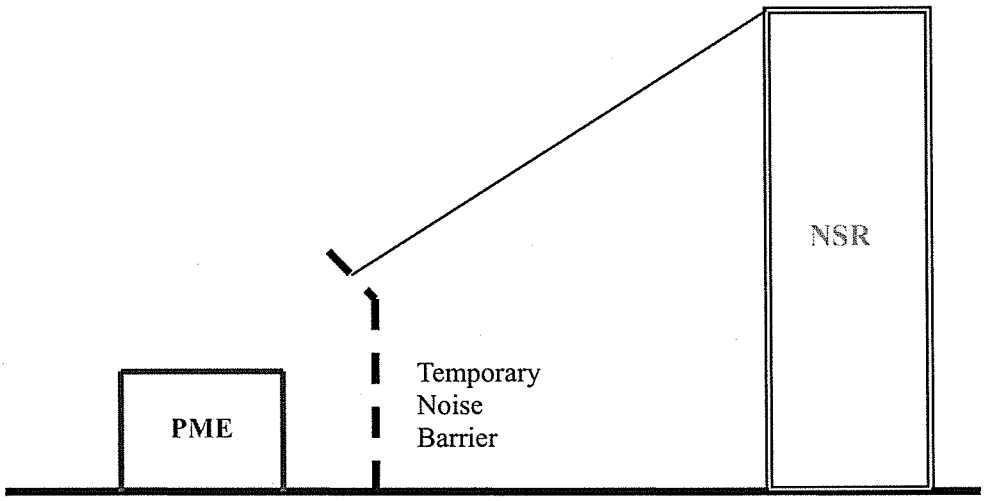
Central – Wan Chai Bypass Tunnel (North Point Section) and Island Eastern Corridor Link

Appendix D

Layout Plan of Temporary Noise Barrier during Construction Phase

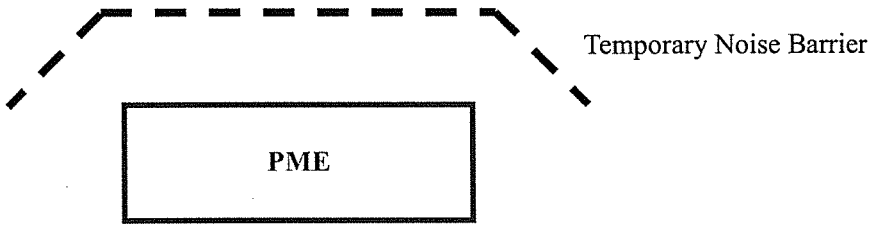
A-4

Section View of Temporary Noise Barrier



Temporary Noise Barrier comprised of a surface mass of not less than 14 kg/m^2 on skid footing with 25mm thick internal sound absorptive lining backing with a cantilevered upper portion located within 5m from any static plant. The PME shall be totally screened when viewed from the NSR.

Plan View of Temporary Noise Barrier



Static plant that shall be totally screened when viewed from the NSR

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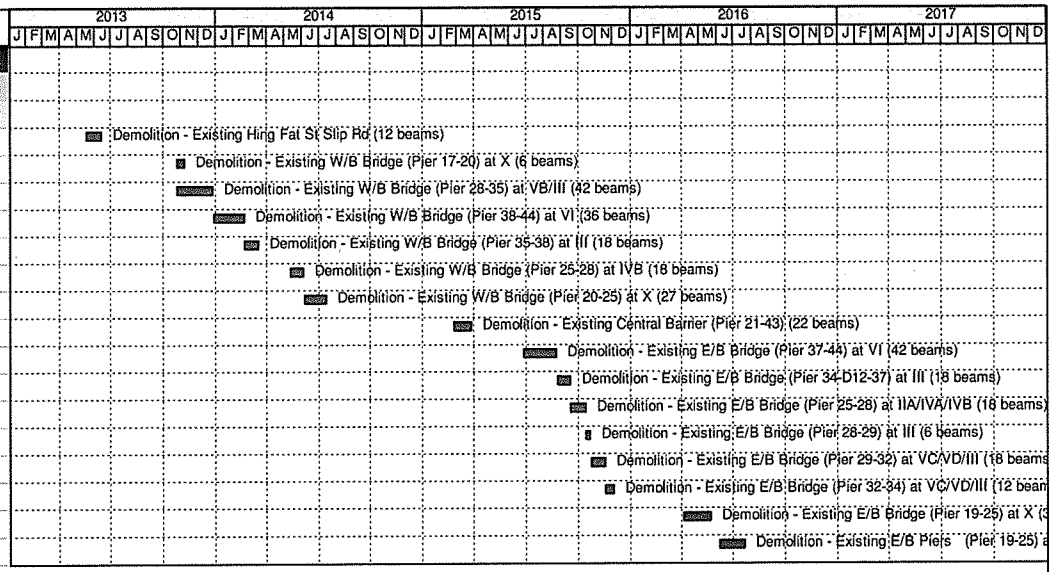
Appendix E

Construction Works Programme

Activity ID	Activity Name	Orig Dur	Start	Finish	Total Float
Contract HY/2009/19 - DWP					
10 - SECTION X OF THE WORKS					
10.4 - Bridge Deck Demolition					
1042-1010	Demolition - Existing Hing Fat St Slip Rd (12 beams)	24	18-May-13	15-Jun-13	0
1041-1070	Demolition - Existing W/B Bridge (Pier 17-20) at X (6 beams)	12	26-Oct-13	08-Nov-13	46
1041-1020	Demolition - Existing W/B Bridge (Pier 28-35) at VB/III (42 beams)	54	26-Oct-13	28-Dec-13	0
1041-1030	Demolition - Existing W/B Bridge (Pier 38-44) at VI (36 beams)	42	30-Dec-13	20-Feb-14	0
1041-1040	Demolition - Existing W/B Bridge (Pier 35-38) at III (18 beams)	21	21-Feb-14	17-Mar-14	0
1041-1050	Demolition - Existing W/B Bridge (Pier 25-28) at IVB (18 beams)	21	12-May-14	05-Jun-14	0
1041-1060	Demolition - Existing W/B Bridge (Pier 20-25) at X (27 beams)	32	06-Jun-14	14-Jul-14	0
1042-1020	Demolition - Existing Central Barrier (Pier 21-43) (22 beams)	28	24-Feb-15	27-Mar-15	0
1042-1025	Demolition - Existing E/B Bridge (Pier 37-44) at VI (42 beams)	49	27-Jun-15	24-Aug-15	0
1042-1030	Demolition - Existing E/B Bridge (Pier 34-D12-37) at III (18 beams)	21	25-Aug-15	17-Sep-15	0
1042-1050	Demolition - Existing E/B Bridge (Pier 25-28) at IIA/IVA/IVB (18 beams)	21	18-Sep-15	14-Oct-15	0
1042-1060	Demolition - Existing E/B Bridge (Pier 28-29) at III (6 beams)	7	15-Oct-15	23-Oct-15	0
1042-1070	Demolition - Existing E/B Bridge (Pier 29-32) at VC/VD/III (18 beams)	21	24-Oct-15	17-Nov-15	0
1042-1075	Demolition - Existing E/B Bridge (Pier 32-34) at VC/VD/III (12 beams)	14	18-Nov-15	03-Dec-15	0
1042-1080	Demolition - Existing E/B Bridge (Pier 19-25) at X (36 beams)	42	05-Apr-16	23-May-16	3
1042-1100	Demolition - Existing E/B Piers (Pier 19-25) at X	36	07-Jun-16	20-Jul-16	3



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NOISE MANAGEMENT PLAN

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Appendix F

Mitigation Measures for Powered Mechanical Equipment (PME) for the different Construction Tasks during Normal Daytime Working Hours

Appendix F

Appendix 4.13 **Powered Mechanical Equipment (PME) for the Different Construction Tasks during Normal Daytime Working Hours (With Mitigation Measures)**

6.0 Construction of HECL
6.2 HEC Connection Work
6.2A Substructures(Group 1 and 2 PME)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Concrete Lorry Mixer*#	Table C6/35	2	100.0	100.0%	10.0	93.0
Poker Vibrator*#	TableC6/32	2	100.0	70.0%	10.0	91.5
Crane*#	TableC7/114	1	101.0	70.0%	10.0	89.5
Air Compressor*#	TableC7/16	5	96.0	100.0%	10.0	93.0
Excavator*#	TableC3/97	2	105.0	70.0%	10.0	96.5
Water Pump#	CNP 281	6	88.0	100.0%	10.0	85.8
Concrete Pump*#	TableC6/35	2	100.0	100.0%	10.0	93.0
Piling, Large diameter bored#	CNP 164	1	115.0	100.0%	10.0	105.0
					Total	106.5

6.2A Substructures(Group 1 PME)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Concrete Lorry Mixer*#	TableC6/35	1	100.0	70.0%	10.0	88.5
Poker Vibrator*#	TableC6/32	1	100.0	70.0%	10.0	88.5
Crane*#	TableC7/114	1	101.0	70.0%	10.0	89.5
Compressor*#	TableC7/16	1	96.0	100.0%	10.0	86.0
Concrete Pump*#	TableC6/36	1	106.0	100.0%	10.0	96.0
					Total	98.2

6.2A Substructures(Group 2 PME)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Crane*#	TableC7/114	1	101.0	70.0%	10.0	89.5
Excavator*#	TableC3/97	1	105.0	50.0%	10.0	92.0
Water Pump#	CNP 281	1	88.0	100.0%	10.0	78.0
Piling, Large diameter bored#	CNP 164	1	115.0	100.0%	10.0	105.0
					Total	105.3

6.2B Superstructures

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Concrete Lorry Mixer#	TableC6/35	2	100.0	100.0%	0.0	103.0
Poker Vibrator*#	TableC6/32	2	100.0	70.0%	5.0	96.5
Crane*	TableC7/114	1	101.0	70.0%	0.0	99.5
Compressor*#	TableC7/16	5	96.0	100.0%	10.0	93.0
Excavator*#	TableCJ/97	2	105.0	70.0%	5.0	101.5
Water Pump#	CNP 281	6	88.0	100.0%	10.0	85.8
Concrete Pump*#	TableC6/35	2	100.0	100.0%	10.0	93.0
Bar Bender#	CNP 021	2	90.0	100.0%	10.0	83.0
					Total	107.1

6.2A Substructures(Group 1 and 2 PME)(For Marine Works)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Concrete Lorry Mixer*#	Table C6/35	2	100.0	100.0%	0.0	103.0
Poker Vibrator*#	TableC6/32	2	100.0	70.0%	5.0	96.5
Crane*#	TableC7/114	1	101.0	70.0%	0.0	99.5
Air Compressor*#	TableC7/16	5	96.0	100.0%	10.0	93.0
Water Pump#	CNP 281	6	88.0	100.0%	10.0	85.8
Concrete Pump*#	TableC6/35	2	100.0	100.0%	10.0	93.0
Piling, Large diameter bored#	CNP 164	1	115.0	100.0%	5.0	110.0
Tug boat	CNP 221	1	110.0	50.0%	0.0	107.0
Barges	-	2	0.0	100.0%	0.0	0.0
					Total	112.7

*Use of QPME
#Use of Barrier
**EPD website (www.epd.gov.hk/epd-bin/npg/qpme/search.geo.pl)
Note: No noise emits from barges during dredging

Information Source: Appendix 4.13 of EIA (AEIAR-125/2008)

6.2A Substructures(Group 1 PME)(For Marine Works)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Concrete Lorry Mixer*#	TableC6/35	1	100.0	70.0%	0.0	98.5
Poker Vibrator*#	TableC6/32	1	100.0	70.0%	5.0	93.5
Crane*#	TableC7/114	1	101.0	70.0%	0.0	99.5
Compressor*#	TableC7/16	1	96.0	100.0%	10.0	86.0
Concrete Pump*#	TableC6/36	1	106.0	100.0%	10.0	96.0
Tug boat	CNP 221	1	110.0	50.0%	0.0	107.0
Barges	-	1	0.0	100.0%	0.0	0.0
					Total	108.6

6.2A Substructures(Group 2 PME)(For Marine Works)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Crane*#	TableC7/114	1	101.0	70.0%	0.0	99.5
Water Pump#	CNP 281	1	88.0	100.0%	10.0	78.0
Piling, Large diameter bored#	CNP 164	1	115.0	100.0%	5.0	110.0
Tug boat	CNP 221	1	110.0	50.0%	0.0	107.0
Barges	-	1	0.0	100.0%	0.0	0.0
					Total	112.0

6.2B Superstructures(For Marine Works)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Concrete Lorry Mixer#	TableC6/35	2	100.0	100.0%	0.0	103.0
Poker Vibrator*#	TableC6/32	2	100.0	70.0%	5.0	96.5
Crane*	TableC7/114	1	101.0	70.0%	0.0	99.5
Compressor*#	TableC7/16	5	96.0	100.0%	10.0	93.0
Excavator*#	TableC3/97	2	105.0	70.0%	5.0	101.5
Water Pump#	CNP 281	6	88.0	100.0%	10.0	85.8
Concrete Pump*#	TableC6/35	2	100.0	100.0%	10.0	93.0
Bar Bender#	CNP 021	2	90.0	100.0%	10.0	83.0
Tug boat	CNP 221	1	110.0	50.0%	0.0	107.0
Barges	-	2	0.0	100.0%	0.0	0.0
					Total	110.1

6.2C Demolition of Structure (For IEC E/B)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Breaker, excavator mounted*#	TableC8/13	2	110.0	80.0%	5.0	107.0
Hand-held Breaker*#	Table C2/10	2	110.0	100.0%	5.0	108.0
Backhoe*	TableC3/97	2	105.0	70.0%	5.0	101.5
Dump Truck*	TableC9/27	4	105.0	70.0%	0.0	109.5
Crane*	TableC7/114	1	101.0	100.0%	0.0	101.0
					Total	113.6

6.2C Demolition of Structure (For IEC W/B)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Breaker, excavator mounted*#	TableC8/13	1	110.0	80.0%	5.0	104.0
Hand-held Breaker*#	Table C2/10	1	110.0	100.0%	5.0	105.0
Backhoe*	TableC3/97	1	105.0	70.0%	5.0	98.5
Dump Truck*	TableC9/27	2	105.0	70.0%	0.0	106.5
Crane*	TableC7/114	1	101.0	100.0%	0.0	101.0
					Total	110.8

6.2C Demolition of Structure (For IEC E/B)(For Marine Works)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Breaker, excavator mounted*#	TableC8/13	2	110.0	80.0%	5.0	107.0
Hand-held Breaker*#	Table C2/10	2	110.0	100.0%	5.0	108.0
Backhoe*	TableC3/97	2	105.0	70.0%	5.0	101.5
Dump Truck*	TableC9/27	4	105.0	70.0%	0.0	109.5
Tug boat	CNP 221	1	110.0	100.0%	0.0	110.0
Barges	-	2	0.0	100.0%	0.0	0.0
Crane*	TableC7/114	1	101.0	100.0%	0.0	101.0
					Total	115.2

*Use of QPME
#Use of Barrier
**EPD website (www.epd.gov.hk/cgi-bin/npg/qpme/search.gen.pl)
Note: No noise emits from barges during dredging

Information Source: Appendix 4.13 of EIA (AEIAR-125/2008)

6.2C Demolition of Structure (For IEC W/B)(For Marine Works)

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Breaker, excavator mounted*#	TableC8/13	1	110.0	80.0%	5.0	104.0
Hand-held Breaker*#	Table C2/10	1	110.0	100.0%	5.0	105.0
Backhoe*	TableC3/97	1	105.0	70.0%	5.0	98.5
Dump Truck*	TableC9/27	2	105.0	70.0%	0.0	106.5
Tug boat	CNP 221	1	110.0	100.0%	0.0	110.0
Barges	-	2	0.0	100.0%	0.0	0.0
Crane*	TableC7/114	1	101.0	100.0%	0.0	101.0
					Total	113.4

6.3 East Portal and IEC Connection Work

6.3.1 Substructures

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Concrete Lorry Mixer*	TableC6/35	2	100.0	100.0%	10.0	93.0
Poker Vibrator*#	TableC6/32	2	100.0	70.0%	10.0	91.5
Crane*	TableC7/114	1	101.0	70.0%	10.0	89.5
Air Compressor*#	TableC7/16	5	96.0	100.0%	10.0	93.0
Excavator*#	TableC3/97	2	105.0	70.0%	10.0	96.5
Water Pump#	CNP 281	6	88.0	100.0%	10.0	85.8
Concrete Pump*#	TableC6/36	2	106.0	100.0%	10.0	99.0
Piling, Large diameter bored#	CNP 164	1	115.0	100.0%	10.0	105.0
					Total	107.0

6.3.2 Retaining Structures

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Concrete Lorry Mixer*#	TableC6/35	2	100.0	100.0%	0.0	103.0
Poker Vibrator*#	TableC6/32	2	100.0	70.0%	5.0	96.5
Crane*#	TableC7/114	1	101.0	70.0%	0.0	99.5
Air Compressor*#	TableC7/16	5	96.0	100.0%	10.0	93.0
Excavator*#	TableC3/97	2	105.0	70.0%	5.0	101.5
Water Pump#	CNP 281	6	88.0	100.0%	10.0	85.8
Concrete Pump*#	TableC6/36	2	106.0	100.0%	10.0	99.0
Piling, Large diameter bored#	CNP 164	1	115.0	100.0%	5.0	110.0
					Total	112.0

6.3.3 Demolition of Structure

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Breaker, excavator mounted*#	TableC8/13	2	110.0	70.0%	5.0	106.5
Excavator*#	TableC3/97	2	105.0	80.0%	5.0	102.0
Hand-held Breaker*#	TableC2/10	2	110.0	100.0%	5.0	108.0
Dump Truck*	TableC9/27	4	105.0	70.0%	0.0	109.5
Crane*	TableC7/114	1	101.0	100.0%	0.0	101.0
					Total	113.5

9.0 Tunnel Building and Installation

9.0 Tunnel Building and Installation at East Ventilation Building, Administartion Building, & Central Ventilation Building, West Ventilation Building

9.0A Substructures

Powered Mechanical Equipment (PME)	TM Ref./ other Ref.	No. Items	SWL/Item dB(A)	On-time %	Noise Barrier Reduction	Total SWL dB(A)
Concrete Lorry Mixer*	TableC6/35	2	100.0	100.0%	0.0	103.0
Poker Vibrator*#	TableC6/32	2	100.0	70.0%	5.0	96.5
Crane*	TableC7/114	1	101.0	70.0%	0.0	99.5
Compressor*#	TableC7/16	5	96.0	100.0%	10.0	93.0
Excavator*#	TableC3/97	2	105.0	70.0%	5.0	101.5
Water Pump#	CNP 281	6	88.0	100.0%	10.0	85.8
Concrete Pump*#	TableC6/35	2	100.0	100.0%	10.0	93.0
Piling, Large diameter bored#	CNP 164	1	115.0	100.0%	5.0	110.0
					Total	111.8

*Use of CPME
#Use of Barrier
**EPD website (www.epd.gov.hk/epd-bin/nap/qpme/search.gen.pl)
Note: No noise emits from barges during dredging

Information Source: Appendix 4.13 of EIA (AEIAR-125/2008)

Lam Geotechnics Limited
Ground Investigation & Instrumentation Professionals

華益土力有限公司

Ref : G1001/CS/L480/FEP-07/364/2009/A
Date : 27 October 2011

Chun Wo – CRGL – MBEC Joint Venture **By Post and Fax (2570 8013)**
Unit 2803-2804,
28/F, Citicorp Centre,
18 Whitefield Road,
North Point, Hong Kong

Attn: Mr. Rayland Lee

Dear Sir,

FEP-07/364/2009/A
Contract No. HY/2009/19
Central- Wan Chi Bypass – Tunnel (North Point Section) & Island Eastern Corridor Link
Noise Management Plan (Revision 2)

Referring to your submission of the captioned plan (Revision 2 dated 25 October 2011) received through email on 25 October 2011, we have reviewed your submitted details and hereby certify this submission in accordance with Condition 2.9 of Further Environmental Permit no. FEP-07/364/2009/A.

Should you have any enquiry, please feel free to contact the undersigned at 2839 5666.

Yours faithfully,

Raymond Dai
Environmental Team Leader

c.c.	*CEDD*	*- Mr. Patrick Keung*	*(By Fax: 2577 5040)*
	HyD	*- Mr. Jones Lai*	*(By Fax 2714 5289)*
	AECOM CWB	*- Mr. Peter Poon*	*(By Fax: 3529 2829)*
	AECOM WDII	*- Mr. Frankie Fan*	*(By Fax: 2587 1877)*
	ENVIRON	*- Mr. David Yeung*	*(By Fax: 3548 6988)*

ENVIRON

Ref.: AACWBIECEM00_0_2014L.11 27 October 2011

Chun Wo – CRGL – MBEC Joint Venture By Post and Fax (2570 8013)
Unit 2803-2804
28/F, Citicorp Centre
18 Whitefield Road
North Point, Hong Kong

Attention: Mr. Rayland Lee

Dear Sir,

Re: FEP-07/364/2009/A
Contract No. HY/2009/19
Central – Wan Chai Bypass – Tunnel (North Point Section) & Island Eastern Corridor Link
Noise Management Plan (Revision 2)

Reference is made to your submission of the Noise Management Plan (Revision 2 dated 25 October 2011) to us through E-mail on 25 October 2011 for our review and comment.

Please be informed that we have no further comments on the captioned submission. We write to verify the captioned submission in accordance with Condition 2.9 of FEP-07/364/2009/A.

Please feel free to contact the undersigned should you have any queries.

Yours sincerely,

David Yeung
Independent Environmental Checker

c.c.	HyD	Mr. Jones Lai	by fax: 2714 5289
	CEDD	Mr. Patrick Keung	by fax: 2577 5040
	AECOM (CWB)	Mr. Peter Poon	by fax: 3529 2829
	AECOM	Mr. Kelvin Cheng	by fax: 2691 2649
	LAM	Mr. Raymond Dai (ETL)	by fax: 2882 3331

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