

LEADER

俊和 - 利達聯營

CHUN WO - LEADER JOINT VENTURE

**Contract No. HK/2009/01
Wan Chai Development Phase II
Central – Wan Chai Bypass at Hong Kong Convention and
Exhibition Centre**

Noise Management Plan

Revision	Date of Issue	Remarks	Author	Approved
0	01 Mar 10	Initial issue	DW	WTH
1	22 Mar 10	Incorporating comments from ET & IEC	DW	WTH
2	10 Apr 10	Incorporating comments from ER, ET & IEC	DW	WTH

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1. GENERAL

1.1 *Introduction*

The CEDD Project, namely Wan Chai Development Phase II, Central – Wan Chai Bypass at Hong Kong Convention and Exhibition Centre is one of the major sub-projects of the Wan Chai Development Phase II Project and the scope of works include land formation and construction of the Central – Wan Chai Bypass tunnel as the water channel of Hong Kong Convention and Exhibition Centre (HKCEC), reprovisioning of cross harbour water mains from Wan Chai and Tsim Sha Tsui and waterfront cooling water pumping systems, construction of stormwater box culvert and associated hinterland drainage improvement works. The works commenced in December 2009 and will take 76 months to complete.

According to the requirement in the Environmental Permit, the Permit Holder shall submit a noise management plan (NMP) showing the noise mitigation measures to be adopted, at least 2 weeks prior to the commencement of construction of the corresponding components of the Project.

1.2 *Purpose of the Noise Management Plan*

This NMP identify major construction activities that might generate adverse noise impacts to the nearby public and lists mitigation measures that will ensure that the impacts that could result from construction works of the project will be as benign as possible. Chun Wo Leader JV (CWLJV) has the overall responsibility of ensuring that the environmental impacts are mitigated as specified.

It must be verified that the noise mitigation measures are accomplished in accordance with the NMP. This effort will encompass all monitoring activities needed to determine the success of the noise mitigation measures (e.g., to determine if they are implemented according to schedule, if they are producing the desired result, or if additional mitigation measures are needed). According to the Contract requirement, the Environmental Team (ET) shall be responsible for the

implementation of the EM&A Manual of the Project and conduct noise monitoring throughout the course of construction at locations proposed in the EM&A Manual. All aspects of the noise mitigation measure must be audited to ascertain compliance with requirements.

CWLJV also has the responsibility of reviewing the project to ensure that the impacts and mitigations presented in the NMP are appropriate to the planned activities. In addition to conducting the specific mitigation activities addressed in this NMP, all parties involved with or overseeing the project will comply with all applicable environmental laws, regulations and ordinances.

1.3 Summary of the Plan

This NMP addresses the pertinent mitigation measures as recommended in the EIA report of the project. This NMP does not repeat or present in-depth technical information. The presentation of noise mitigation actions in this NMP is organized by the resource categories. Major construction activities of the project will first be identified. Then powered mechanical equipments (PMEs) required for each particular major construction activities will be planned and the corrected noise level (CNL) at the nearest noise receivers will be assessed. Finally noise mitigation measures will be planned specifically in accordance with the assessment of PMEs to be used. The noise mitigation measures to be adopted will also be presented in layout plans.

1.4 Noise Sensitive Receivers

The project is located primarily in areas of mixed commercial and residential areas. Activities that generate noise levels above natural background include traffic on major road systems and local roadways across the site, marine traffic from Victoria Harbour, residential areas, other recreational locations and commercial operations. The nearest noise sensitive receivers as identified in the EIA report of the project is attached in Appendix A. Insignificant construction noise impacts are expected on the indoor environment of NSRs such as HKCEC extension, Grand Hyatt Hotel, Hong Kong Space Museum and Museum of Arts, which are close to the construction sites, as they have facades / fixed windows and are provided with central air conditioning, therefore they do not rely on openable windows for ventilation. Aim of noise mitigation

measures in this plan is to lower the noise level at the nearest noise sensitive receivers.

2. Noise Legislation and License Application

The main legislative instrument to control construction noise and the subsidiary regulations include:

- Noise Control (Construction Work) Regulation
- Noise Control (Construction Work Designated Areas) Notice
- Noise Control (Hand Held Percussive Breakers) Regulations
- Noise Control (Air Compressors) Regulations
- The Factories and Industrial Undertakings (Noise at Work) Regulations are also applicable

Under the Noise Control Ordinance (NCO), construction activities are grouped into two categories: general construction work and percussive piling (for example, piling by means of a hydraulic hammer or drop hammer). Each of these categories of works is controlled by means of a system of Construction Permits.

In relation to the construction noise permit system, three Technical Memoranda relevant to the construction noise provisions have been issued, namely the Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM), the Technical Memorandum on Noise from Construction Work in Designated Areas (DA-TM) and the Technical Memorandum on Noise from Percussive Piling (PP-TM).

Under the GW-TM, the contractor carrying out of general construction work using powered mechanical equipment during the restricted hours, that is between 7 p.m. and 7 a.m. or at any time on a general holiday (including Sunday), should require a valid Construction Noise Permit (CNP).

Under the DA-TM, the use of any specified powered mechanical equipment and the carrying out of any prescribed construction work within a designated area during the restricted hours should require a valid CNP.

Under the PP-TM, the carrying out of percussive piling is prohibited

between 7 p.m. and 7 a.m. and on holidays. Percussive piling during the daytime should require a valid CNP.

The Noise Control (Hand Held Percussive Breakers) and (Air Compressors) Regulations limit the noise emission from hand held breakers having a mass of above 10 kg and air compressor capable of supplying compressed air at 500kPa or above for carrying out construction work. The above equipment must be fitted with noise emission labels when in operation.

Followings are the license / permits to be applied / renewed:

- A CNP for the use of powered mechanical equipment for the carrying out construction work other than percussive piling
- A CNP for the carrying out of prescribed construction work
- A CNP for the carrying out of percussive piling
- Noise Emission Labels for each hand held breakers
- Noise Emission Labels for each air compressors

The following key activities may require CNPs for night work

Marine-based construction activities:

- i) Dredging of reclamation areas and seawalls
- ii) Dredging of cross harbour watermains
- iii) Filling of reclamation areas and behind seawalls
- iv) Filling of cross harbour watermains
- v) Connection of new pipe to existing section

Land-based construction activities:

- i) Connection of new pipe of cross harbour main at land portion, cooling water main and other utility services to existing section
- ii) Construction of concrete structure of utility tunnel, box culvert, manhole and pit.

3. Identification of Major Construction Activities

Major construction activities in this project consist of:

Item	Task	Construction Period	Main Construction Elements
1	HKCEC reclamation	Jul 10 to Sep 13	Pipe piling, dredging, seawalls and filling
2	CWB tunnel	Aug 10 to Jan 15	Diaphragm walls, piling, deep excavation & RC construction
3	Demolition works	Jun 10 to Jan 13	Wan Chai West Pier, Expo Drive East Bridge, existing pump houses and promenade piled deck along HKCEC water channel
4	Cross Harbour Watermains	Jun 10 to Oct 13	Dredging, pipe laying & filling
5	Waterworks on land, including fresh and salt watermains, cooling watermains	May 10 to Apr 15	Install ELS, excavation, pipe laying & backfilling
6	Drainage culvert	May 13 to Apr 15	Piling, RC construction & filling

4. Major Powered Mechanical Equipments to be Used

The following tables summarized the major PME's to be used and the estimated sound power level (SWL) and corrected noise level (CNL) at the nearest NSR for each major construction activities:

Without Noise Mitigation Measures:

Table 1. HKCEC Reclamation

Item	Task	PME	TM Ref.	SWL / Item dB(A)	No.	Total SWL dB(A)
1.1	Pipe piling	Excavator with breaker	CNP027	122	1	122
		Crane	CNP048	112	2	115
		Motor launch	--	105	1	105
		Vibration hammer	--	114	2	117

		Generator	CNP102	100	2	103
Total SWL						124
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						70
1.2	Dredging	Grab dredger	CNP063	112	1	112
		Derrick barge	CNP061	104	1	104
		Tug boat	CNP221	110	1	110
		Hopper barge	--	No noise emits	1	No noise emits
		Excavator	CNP081	112	1	112
		Dump truck	CNP067	117	5	124
		Motor launch	--	105	1	105
Total SWL						125
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						71
1.3	Seawall construction	Derrick barge	CNP061	104	1	104
		Tug boat	CNP221	110	1	110
		Hopper barge		No noise emits	1	No noise emits
		Crane Barge	CNP048	112	1	112
		Motor launch	--	105	1	105
Total SWL						115
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						61
1.4	Filling	Derrick barge	CNP061	104	1	104
		Tug boat	CNP221	110	1	110
		Hopper barge	--	No noise emits	1	No noise emits
		Motor launch	--	105	1	105
		Excavator	CNP081	112	2	115
		Bulldozer	CNP030	115	1	115
		Wheel loader	CNP081	112	1	112
		Roller	CNP186	108	1	108
Total SWL						120
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						66

Table 2. CWB Tunnel

Item	Task	PME	TM Ref.	SWL Item dB(A)	No.	Total SWL dB(A)
2.1	Diaphragm Wall	Diaphragm Wall, bentonite filtering plant	CNP162	105	1	105
		Diaphragm wall,hydraulic extractor	CNP163	90	2	93
		Crane	CNP048	112	4	118
		Excavator	CNP081	112	2	115
		Concrete lorry mixer	CNP044	109	2	112
		Dump truck	CNP067	117	2	120
		Generator	CNP102	100	2	103
		Water pump	CNP281	88	2	91

Total SWL						123
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						69
2.2	Piling	Crane	CNP048	112	2	115
		Piling, socketed H-pile rig	--	114	2	117
		Dump truck	CNP067	117	2	120
		Air compressor	CNP002	102	4	108
		Generator	CNP102	100	2	103
		Water pump	CNP281	88	2	91
Total SWL						123
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						69
2.3	Deep excavation	Crane	CNP048	112	2	115
		Excavator	CNP081	112	3	117
		Loader	CNP081	112	1	112
		Dump truck	CNP044	117	6	125
		Generator	CNP102	100	2	103
		Water pump	CNP281	88	4	94
Total SWL						126
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						72
2.4	RC construction	Crane	CNP048	112	2	115
		Bar bender and cutter	CNP021	90	2	93
		Chipper, hand held	CNP043	112	4	118
		Air compressor	CNP002	102	2	105
		Concrete lorry mixer	CNP044	109	2	112
		Generator	CNP102	100	2	103
		Water pump	CNP281	88	4	94
Total SWL						121
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						67
2.5	Backfilling	Crane	CNP048	112	1	112
		Excavator	CNP081	112	1	112
		Bulldozer	CNP030	115	1	115
		Wheel loader	CNP081	112	1	112
		Roller	CNP186	108	1	108
		Generator	CNP102	100	1	100
		Water pump	CNP281	88	1	88
Total SWL						119
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						65

Table 3. Demolition Works

Item	Task	PME	TM Ref.	SWL Item dB(A)	No.	Total SWL dB(A)
3.1	Wan Chai West Pier	Crane	CNP048	112	1	112
		Breaker	CNP027	122	1	122

		Excavator	CNP081	112	1	112
		Derrick barge	CNP061	104	1	104
		Dump truck	CNP067	117	2	120
		Air compressor	CNP002	102	1	102
		Pneumatic breaker	CNP24	108	2	111
Total SWL						125
Total CNL at Nearest Noise Sensitive Receiver N2 (Causeway Center) 200m						74
3.2	Expo Drive East Bridge	Crane	CNP048	112	1	112
		Saw Cut Machine	--	112	2	115
		Breaker	CNP027	122	1	122
		Excavator	CNP081	112	1	112
		Dump truck	CNP067	117	2	120
		Air compressor	CNP002	102	1	102
		Pneumatic breaker	CNP24	108	2	111
Total SWL						125
Total CNL at Nearest Sensitive Receiver N2 (Causeway Center) 200m						74
3.3	Pump house	Breaker	CNP027	122	1	122
		Excavator	CNP081	112	1	112
		Dump truck	CNP067	117	3	122
		Air compressor	CNP002	102	1	102
		Pneumatic breaker	CNP24	108	2	111
Total SWL						125
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 280m						71
3.4	Promenade piled deck	Breaker	CNP027	122	1	122
		Excavator	CNP081	112	1	112
		Dump truck	CNP067	117	3	122
		Air compressor	CNP002	102	1	102
		Pneumatic breaker	CNP24	108	2	111
Total SWL						125
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 280m						71

Table 4. Cross Harbour Watermains

Item	Task	PME	TM Ref.	SWL Item dB(A)	No.	Total SWL dB(A)
4.1	Dredging	Grab dredger	CNP063	112	1	112
		Tug boat	CNP221	110	1	110
		Hopper barge	--	No noise emits	1	No noise emits
		Motor launch	--	105	1	105
Total SWL						115
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 460m						57

4.2	Pipe Laying	Crane barge	CNP048	112	1	112
		Flat top barge	--	No noise emits	1	No noise emits
		Tug boat	CNP221	110	2	113
		Motor launch	--	105	2	108
Total SWL						116
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 460m						58
4.3	Backfilling	Derrick barge	CNP061	104	1	104
		Tug boat	CNP221	110	1	110
		Hopper barge	--	No noise emits	1	No noise emits
		Motor launch	--	105	1	105
Total SWL						112
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 460m						54

Table 5. Water Works on Land

Item	Task	PME	TM Ref.	SWL/Item dB(A)	No.	Total SWL dB(A)
5.1	Excavation	Backhoe with breaker	CNP027	122	1	122
		Saw Cutter	CNP203	112	2	115
		Air Compressor	CNP002	102	1	102
		Pneumatic Breaker	CNP24	108	2	111
		Water pump	CNP283	85	1	85
		Dump truck	CNP067	117	4	123
Total SWL						126
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						72
5.2	Install ELS	Mobile Crane	CNP048	112	1	112
		Vibration hammer	-	115	1	115
		Power Packer	CNP168	100	1	100
		Boring Machine	-	115	1	115
		Generator	CNP101	108	1	108
Total SWL						119
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						65
5.3	Pipe laying	Mobile Crane	CNP048	112	1	112
Total SWL						112
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						58
5.4	Backfilling	Excavator	CNP081	112	1	112
		Compaction Roller	CNP186	108	1	108
		Dump truck	CNP067	117	4	123
Total SWL						123
Total CNL at Nearest Noise Sensitive Receiver N1 (HKAPA) 300m						69

Table 6. Drainage Culvert

Item	Task	PME	TM Ref.	SPL/Item dB(A)	No.	Total SPL dB(A)
6.1	Piling	Crane	CNP048	112	2	115
		Piling, minipile rig	--	114	2	117
		Dump truck	CNP067	117	2	120
		Air compressor	CNP002	102	2	105
		Generator	CNP102	100	2	103
		Water pump	CNP281	88	1	88
		Total SWL				
Total CNL at Nearest Noise Sensitive Receiver N2 (Causeway Center) 200m						72
6.2	RC construction	Crane	CNP048	112	1	112
		Bar bender and cutter	CNP021	90	2	93
		Chipper, hand held	CNP043	112	2	115
		Air compressor	CNP002	102	1	102
		Concrete lorry mixer	CNP044	109	2	112
		Generator	CNP102	100	2	103
		Water pump	CNP281	88	1	88
Total SWL						118
Total CNL at Nearest Noise Sensitive Receiver N2 (Causeway Center) 200m						67
6.3	Backfilling	Crane	CNP048	112	1	112
		Excavator	CNP081	112	2	115
		Bulldozer	CNP030	115	1	115
		Wheel loader	CNP081	112	1	112
		Roller	CNP186	108	1	108
		Generator	CNP102	100	1	100
		Water pump	CNP281	88	1	88
Total SPL						120
Total CNL at Nearest Noise Sensitive Receiver N2 (Causeway Center) 200m						69

5. Noise Mitigation Measures

- 5.1 CWLJV will take all reasonable precautions to avoid any nuisance arising from the construction works. All works will be carried out in a manner as to cause as little inconvenience as possible and to minimize adverse impacts on the indoor and outdoor environment during construction works.
- 5.2 A combination of noise mitigation measures will be utilized during the construction stage for the construction phase DP1, DP3 and DP6 which listed in the EM&A Manual. No single noise mitigation measure would be most effective at reducing noise levels. The following mitigation measures together are considered to offer the most potential for application to this project and incorporated into this plan as described below. Regular monitoring, inspection and audit will be conducted to ensure the effectiveness of the mitigation measures.
- 5.3 In accordance to the appendix A of the implementation schedule, stationary noise sources will be located as far as possible from NSRs. If stationary sources have to be located near NSRs, they will be adequately muffled and enclosed within temporary sheds, or movable noise barriers will be used (S4.8.3 – 4.8.4 of Appendix A, EM&A Manual).
- 5.4 In order to reduce the excessive noise impacts at the affected areas, movable noise barriers are proposed to be provided for particular items of plants and construction works. Movable noise barriers with cantilevered upper portion for the following items of plants:
- vi) Excavator with breaker
 - vii) Diaphragm wall rigs
 - viii) Poker vibrator
 - ix) Hand held pneumatic breaker
 - x) Generator
 - xi) Air compressor
 - xii) Concrete pump
 - xiii) Vibration hammer

Movable noise barrier with a cantilevered upper portion located within 5m from any static or mobile plant can provide 5 to 10 dB(A) noise reduction.

If required, temporary noise barriers (4m in height) including cantilevered upper portion are proposed in work sites to further reduce the noise level during construction phase.

The noise barrier (See **Appendix D**) shall have a surface mass of not less than 14kg/m² on skid footing with 25mm thick internal sound absorptive lining (See **Appendix C**) to achieve maximum screening effect.

- 5.5 Quiet Power Mechanical Equipment (QPME) deployed on site will be effectively sound reduced (refer to S4.8.3 – 4.8.4 of Appendix A, EM&A Manual), as required, to meet the appropriate standards. Sound reduction methods that may be considered are manufacturer recommended silencers, mufflers, acoustic linings or shields, acoustic sheds or screens or other means, as required avoiding disturbance to any nearby NSRs.
- 5.6 Construction equipment will be turned off when not in operation. Close all hoods, cover panels and inspection hatches of powered mechanical plant such as generators, air compressors, etc, during operation.
- 5.7 Construction equipment will be maintained in good condition in order to minimize noise emission during the Works. Daily inspection and repairs, when appropriate, will be made to ensure that equipment remains within compliance limits.
- 5.8 Construction equipment such as excavator that is known to emit noise strongly in one direction will be orientated to face away from the NSRs.
- 5.9 Quiet plant will be used whenever possible throughout the works. Giken silent piler will be used whenever possible to drive sheet piles by jacking mechanism, hence the noise and vibration generated will be significantly reduced. Concrete crusher will be used to replace breaker whenever possible for the demolition works in order to minimize noise pollution in the demolition area.
- 5.10 Equipment used for project construction will be hydraulically or electrically powered whenever possible to avoid noise associated with compressed air exhaust from pneumatically powered tools. However,

where use of pneumatically powered tools is unavoidable, an exhaust muffler on the compressed air exhaust will be used.

- 5.11 External jackets on the tools will be used where feasible. Breakers mounted on excavators will be surrounded by acoustic blanket to reduce the noise level (see **Appendix C**).
- 5.12 Quiet working methods will be adopted where feasible:
- i) Top down method to be adopted for the construction of CWB tunnel, hence most of the construction works will be inside the tunnel.
 - ii) Construct CWB tunnel in 3 stages (Western, Middle and Eastern portions), hence public fill excavated from the construction of CWB tunnel can be re-used for reclamation while construction proceeds from west to east. Less noise will be generated during the import of sorted public fill from outside and excavation will mainly be carried out inside the tunnel due to the adoption of top down method.
 - iii) Loading jetty for import of public fill to be constructed as far from the NSRs as possible to minimize the noise nuisance to the NSRs during unloading of public fill delivered to the site by barges.
 - iv) Float and sink method to be adopted for the laying of cross harbour watermains. Pipeline will be fabricated and welded together in sections of approximately 120 linear m off site. Hence on-site connection of pipes will be reduced significantly and no launching of pipeline is required on site
 - v) Precast method will be considered whenever possible to minimize on site casting of concrete. Example, utility tunnels, box culvert, etc.
 - vi) Adopt multi-phase construction schedules. Divide construction equipment into groups should the noise level at NSRs exceed the acceptable noise level and each time only utilize those groups which the noise level at the NSRs is within the acceptable level.

5.13 From the analysis conducted in Section 3 of this report, it is noticed that the noise level at the nearest NSRs arising from the following major construction activities exceeds or marginally within the statutory limits:

- i) Demolition Works – Wan Chai West Pier
- ii) Demolition Works – Expo Drive East Bridge

5.14 For the demolition of Wan Chai West Pier and Expo Drive East Bridge, it is proposed to surround air compressor and pneumatic breakers on three sides by movable noise barriers during the course of demolition works to reduce the noise level. Breakers of excavators will also be wrapped with acoustical material to further suppress the noise generated during breaking. Super quiet air compressor will also be used. It is anticipated that when properly placed the movable noise curtain will provide noise control of 5 dB(A) to each PME. Layout plans showing the proposed noise mitigation measures for those major construction activities identified in paragraph 5.13 is attached in **Appendix B**.

5.15 The following tables summarized the SPL of the proposed PEMs and CNL at the nearest NSR after the implementation of proposed noise mitigation measures for those major construction activities which are likely to produce noise exceeding the statutory limit:

With Proposed Noise Mitigation Measures:

Table 3.1. Demolition Works (with noise mitigation measures -5 dB(A))

Item	Task	PME	TM Ref.	SWL / Item dB(A)	SWL / Item dB(A) with measures	No.	Total SPL dB(A)
3.1	Wan Chai West Pier	Crane	CNP048	112	----	1	112
		Breaker	CNP027	122	117	1	117
		Excavator	CNP081	112	107	1	107
		Derrick barge	CNP061	104	----	1	104
		Dump truck	CNP067	117	117	2	120
		Air compressor	CNP002	102	97 (with acoustic jacket)	1	97
		Pneumatic breaker	CNP24	108	103	2	106
Total SWL							123
Total CNL at Nearest Noise Sensitive Receiver (Causeway Center) 200m							72
3.2	Expo Drive East	Crane	CNP048	112	----	1	112

Bridge								
	Saw Cut Machine	--	112	107	2	110		
	Breaker	CNP027	122	117	1	117		
	Excavator	CNP081	112	107	1	107		
	Dump truck	CNP067	117	----	2	120		
	Super Quiet Air compressor	CNP002	102	97 (with acoustic jacket)	1	97		
	Pneumatic breaker	CNP24	108	103	2	106		
Total SWL							123	
Total CNL at Nearest Sensitive Receiver (Causeway Center) 200m							72	

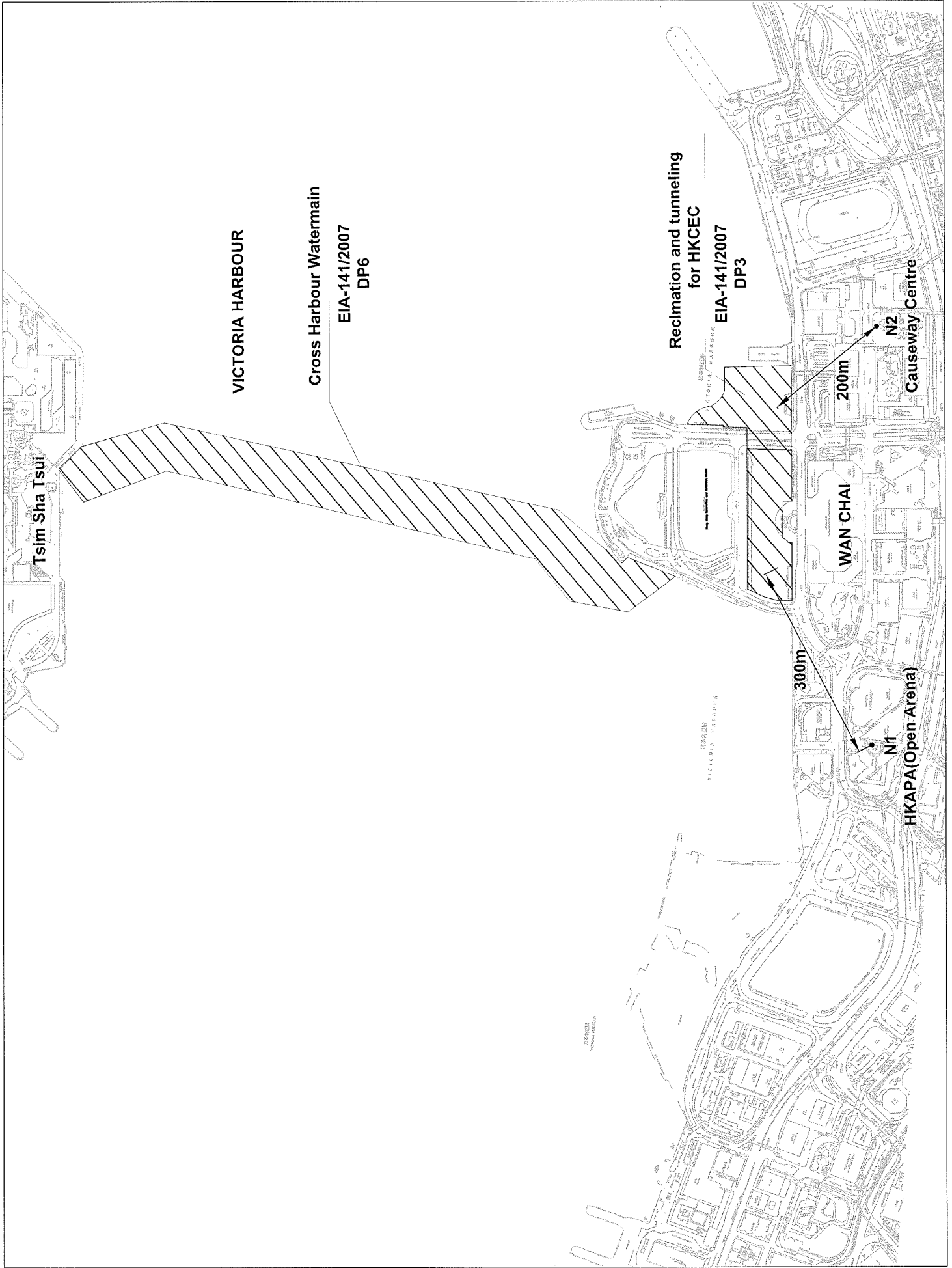
6. Impact Monitoring for Construction Noise

- 6.1 During the construction period, monitoring of noise levels shall be carried out at the agreed monitoring locations by ET in accordance with the EM&A report.
- 6.2 The Action and Limit levels for construction noise are defined in the EM&A report. Should non-compliance of the criteria occur, action in accordance with the Action Plan shall be carried out.

Appendix A

Nearest Noise Sensitive Receivers Identified in EIA

Report



Tsim Sha Tsui

VICTORIA HARBOUR

Cross Harbour Watermain

EIA-141/2007
DP6

Reclamation and tunneling
for HKCEC

EIA-141/2007
DP3

WAN CHAI

200m

N2
Causeway Centre

300m

N1

HKAPA (Open Arena)

Appendix B

**Layout plans showing the proposed noise mitigation
measures for those major construction activities likely
to exceed statutory limit**

維多利亞港
VICTORIA HARBOUR

香港會議展覽中心
Hong Kong Convention and Exhibition Centre

博覽館中

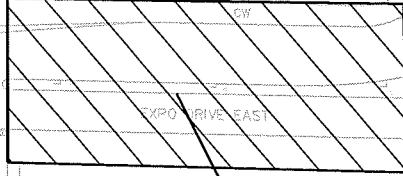


Table 3 item 3.2
Demolition Works
for Expo Drive East Bridge



Table 3 item 3.1
Demolition Works
for Wan Chai West Pier



CONVENTION AVENUE

CONVENTION AVENUE

瑰麗海景酒店
Renaissance Harbour View Hotel

羅林明道
FLEMING ROAD

巴士總站
Bus Terminus

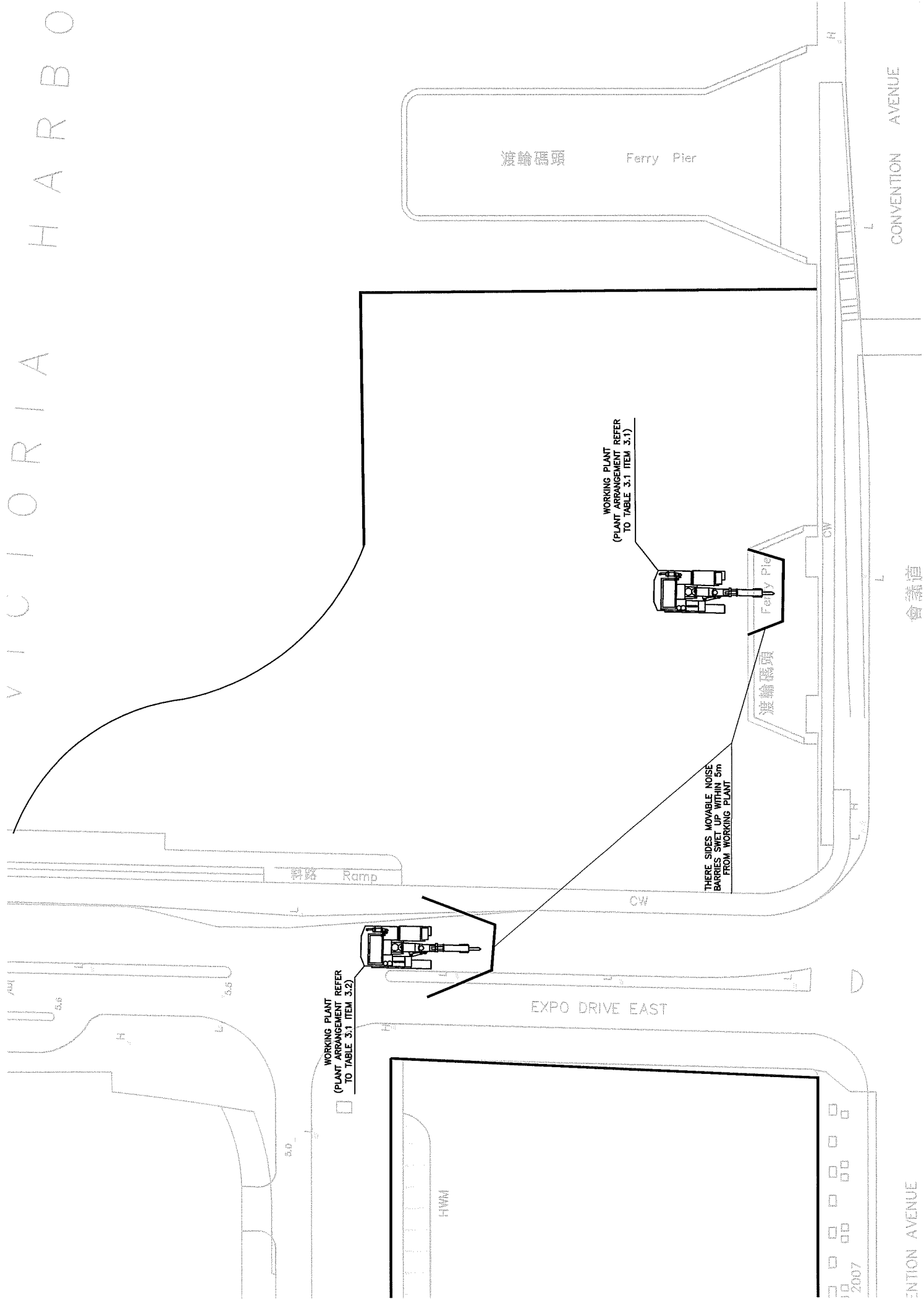
灣仔碼頭
Harbour Road Sports

香港會議展覽中心
Hong Kong Convention and Exhibition Centre

天台花園
Landscape Roof Garden

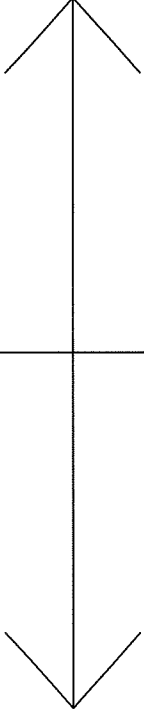
WAN CHAI

VICTORIA HARBOUR

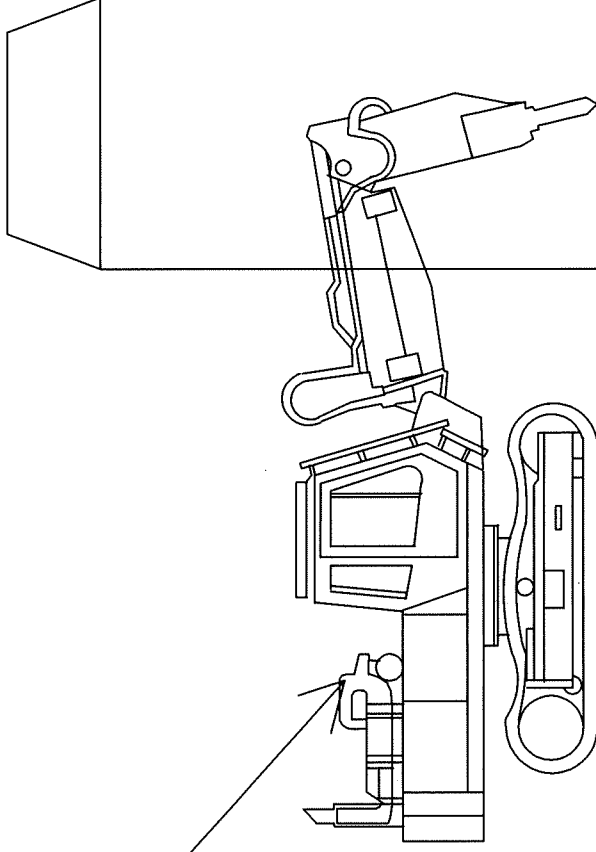


**Victoria
Harbour**

Wan Chai



**Excavator
&
Breaker**



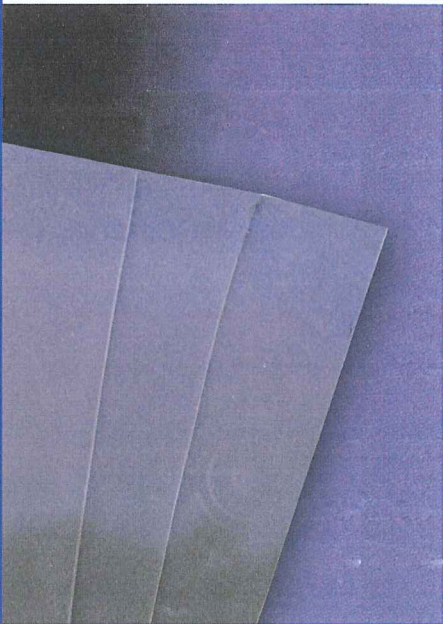
**Three Side
Movable Noise Barrier**

**Expo Drive East Bridge /
Wan Chai West Pier**

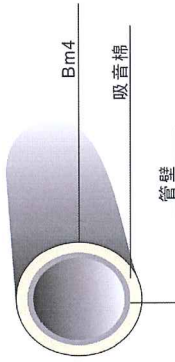
Appendix C

Sound Insulating Material for Noise Barrier and Plant

External Acoustic Jacket

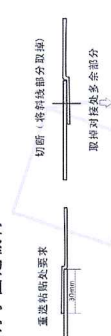


管道特殊处理 管道包扎一般由三层材料构成,内层为柔软的吸音棉,起保温防水作用;BM4隔声毡材料,起隔声作用,最后用具有保护装饰性的包装带包扎牢固。



施工示意图

1. 天花板与墙壁、墙壁与地板交接处需留100mm以上材料量,连接
2. 木质墙体的施工,在龙骨、柱子上,每隔200mm用螺丝或钉子固定板材



材料

型号1: BM4
颜色: 黑色, 无饰面
尺寸: 1. 23 x 10m 或 1. 23 x 5m/ 卷
厚度: 2. 0mm
密度: 3. 95kg/m²

防火性能

经BS476:Part7,测试,符合3级建筑标准。

产品应用

- 建筑隔声治理施工图(墙体、吊顶)
1. 与各类板材复合,增加墙体与楼梯的隔声量,拉大声孔性吸声带,降低噪音。
 2. 在分离空腔内填充岩棉或玻璃棉等,增加吸声效果。
 3. 安装时加大隔声构件空气的厚度,可提高隔声量。
 4. 在应错开对接缝,钉子位置进行勾缝处理。

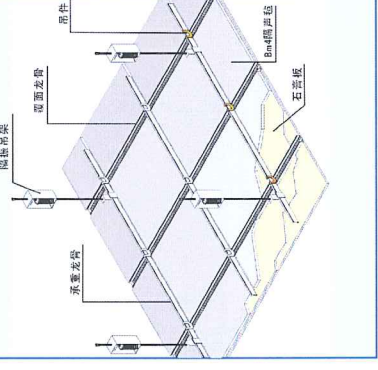
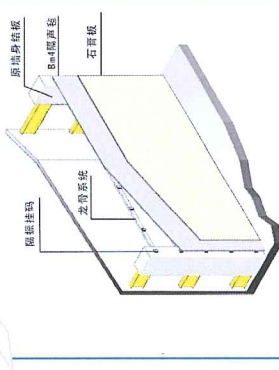
产品特性

1. 材料质轻超薄,有效控制建筑空间和重量。
2. 柔软,拉伸强度大,有效满足各种不规则面的需求,降低施工难度。
3. 环保健康,已通过环保部门相关认证,对环境不造成任何污染。
4. 强烈抑制中低频声波,防止传播,在降噪领域起到积极作用。
5. 使用方式多样,复合使用时,隔声效果互补,在共振及低频的不合声效应上性能大大降低。
6. 有卓越的阻燃性能。

系统描述

BM4 由高聚合物质、金属粉和建筑辅料制成,在建筑(例如石膏板)的隔声处理,材料重量超轻,方便施工,强度高,防火防蛀,环保,成本突出,隔音性能原大,防潮,防霉,内果好,是一种高性能环保隔声材料。

施工示意图



质保对于特定的项目,提交供应商和建筑声学(国际)有限公司提供的保证书。所有材料应带有生产商提供的生产标准。本地专业承建商应与生产商联系以获取产品的产品保修。

为确保最终用户利益,产品销售和安装指导应是通过授权认可的供应商或权威安装商进行。所有保修责任的,应由建筑声学(国际)有限公司发布为准。

技术数据对被提议的系统,提交生产商的技术要求、技术数据、安装说明和相关测试标准。

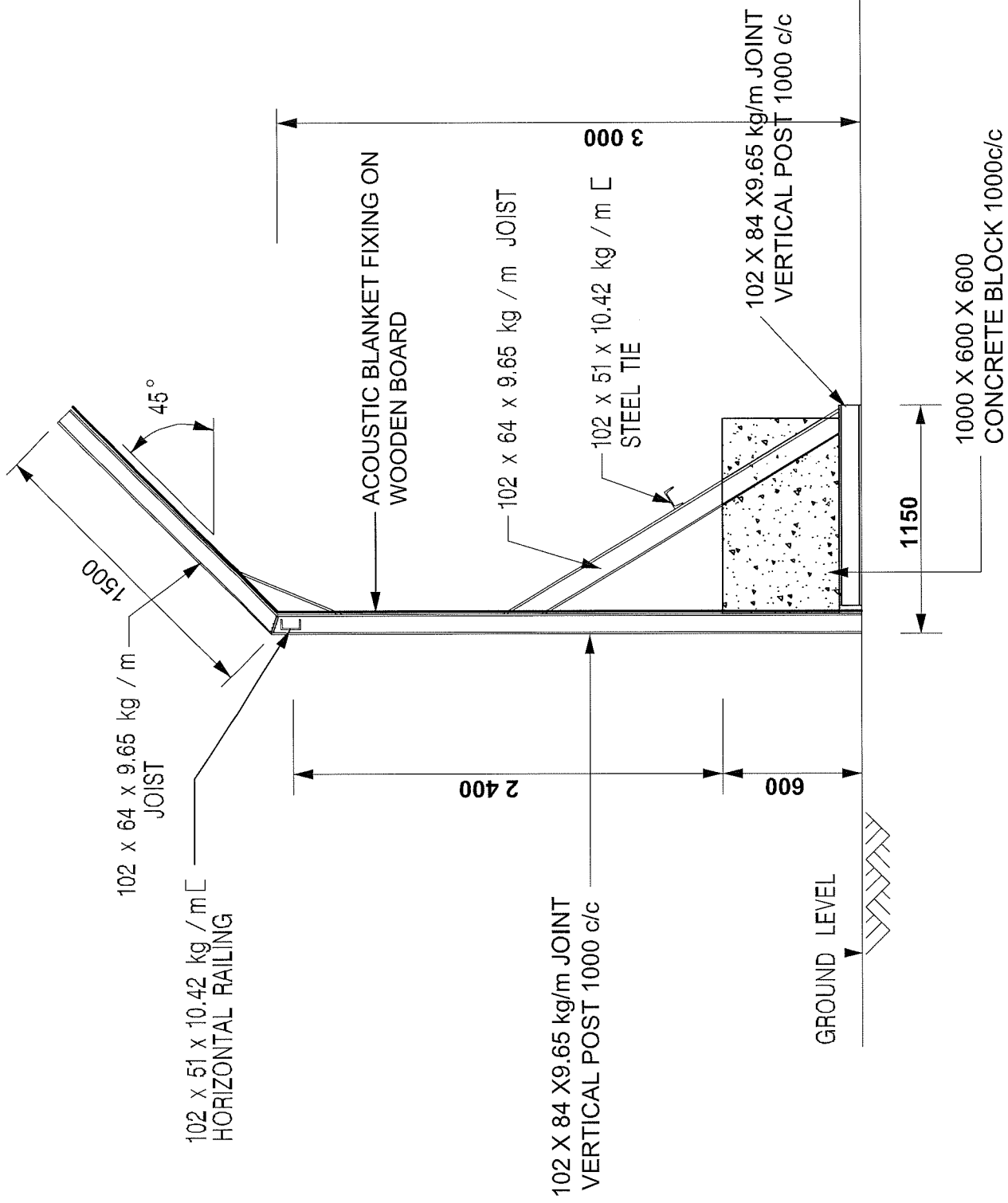
中心频率(Hz)	125	250	500	1k	2k	4k
传声损失dB	13	19	22	27	32	37

本地供应商

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Appendix D

Details of Noise Barrier



DETAIL FOR NOISE BARRIER