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	13 May 11	Initial issue	AM	PY
1	27 May 11	Incorporated comments from ET & IEC	AM	PY

Table of Content

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.

According to the requirement in the Environmental Permit No.EP-364/2009 and Further Environmental Permit No.FEP-02/364/2009 section 2.9, the Permit Holder shall submit a noise management plan (NMP) showing the noise mitigation measures to be adopted.

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. Noise mitigation measures will be planned specifically in accordance with the construction activities.

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. Table 1.1 shows the representative NSRs for this noise impact assessment as identified in the EIA report of the project. 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.

Table 1.1 Representative Existing Noise Sensitive Receivers

NSR	Section	Location	Use	Ground Elevantion (mPD)	No. of Floors
N1	Wanchai	HKAPA (Open Arena)	Performing Arts Centre	5.0	G/F
N2	Wanchai	Causeway Centre	Residential	4.0	42

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

3. Identification of Major Construction Activities

Major construction activities in this project consist of:

- Construction of new drainage culverts in the hinterland urban area
- Diversion of existing cooling water mains through the hinterland area
- Construction of upgraded sewerage pipelines along existing roads
- Construction of new water mains along existing roads
- Demolition of West Bridge
- Construction of a dual three-lane trunk road tunnel

The major powered mechanical equipments (PME) to be used on site are listed in Appendix 4.13 of EIA Report (Register No.: AEIAR-125/2008). Detailed list of PME will be proposed in corresponding method statement submitted to the Engineer.

4. Noise Mitigation Measures

4.1 Use of QPME and other noise mitigation measures will be made according to the PME schedules listed in Appendix 4.13 of EIA Report

and be proposed in corresponding method statement submitted to the Engineer.

4.2 CWLJV will take all reasonable precautions to avoid any nuisance arising from the construction works. All works will be carried out in a matter as to cause as little inconvenience as possible and to minimize adverse impacts on the indoor and outdoor environment during construction works.

4.3 A combination of noise mitigation measures will be utilized during the construction stage for the construction phase 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.

4.4 In according to the Section of 4.9.3 in EIA Report, 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 (S4.9.3 of EIA Report).

4.5 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:

i) Excavator with breaker
ii) Diaphragm wall rigs
iii) Poker vibrator
iv) Hand held pneumatic breaker
v) Generator
vi) Air compressor
vii) Concrete pump
viii) 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.

4.6 Quiet Power Mechanical Equipment (QPME) deployed on site will be effectively sound reduced (refer to S4.8.3 of EIA Report), 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.

4.7 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.

4.8 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.

4.9 Construction equipment such as excavator that is known to emit noise strongly in one direction will be orientated to face away from the NSRs.

4.10 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.

4.11 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.

4.12 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**).

4.13 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 is attached in **Appendix B**.

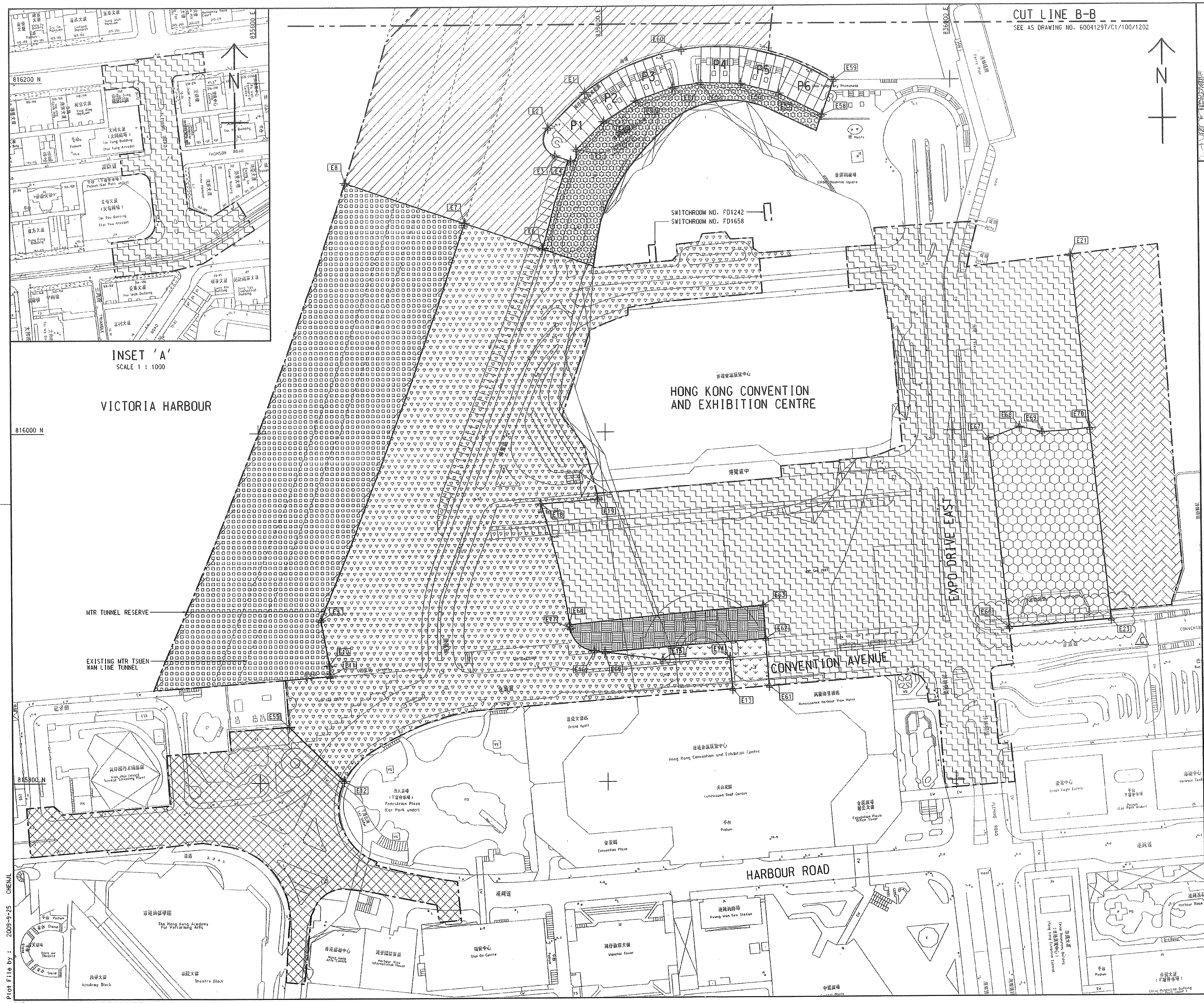
5. Impact Monitoring for Construction Noise

5.1 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.

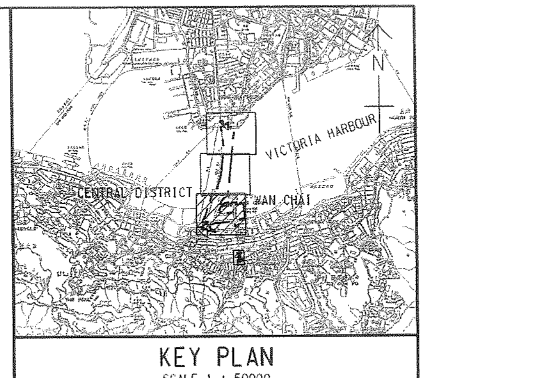
5.2 The Action and Limit levels for construction noise are defined in the EM&A report. Should non-compliance of the criteria occur, action in accordance with the Action Plan shall be carried out.

Appendix A

Site Plan



PATH P:\projects\60041297\DRAWING\C1\100\C1 1203.dgn



KEY PLAN
SCALE 1 : 50000

NOTE:

1. FOR NOTES AND LEGEND, REFER TO DRAWING NO. 60041297/C1/100/1201.

INT	COORDINATES	
	EASTING	NORTHING
E1	835789.616	816193.625
E2	835768.221	816173.423
E3	835772.245	816157.539
E4	835781.190	816154.561
E5	835784.307	816160.980
E6	835764.668	816104.805
E7	835719.865	816119.468
E8	835650.634	816142.586
E9	835635.452	815892.597
E10	835640.376	815866.613
E11	835640.808	815860.583
E12	835648.352	815800.926
E13	835872.033	815852.220
E14	835870.699	815870.154
E15	835832.157	815869.228
E16	835792.926	815874.548
E17	835778.993	815887.560
E18	835762.592	815958.848
E19	835795.276	815961.432
E21	836067.960	816100.037
E23	836089.674	815891.310
E49	835800.544	816176.885
E50	835819.095	816188.524
E51	835840.479	816196.224
E52	835856.663	816198.794
E55	835793.930	816094.736
E56	835879.380	816198.098
E57	835901.406	816192.490
E58	835925.945	816180.207
E59	835933.084	816199.916
E60	835845.670	816217.552
E61	835893.184	815853.864
E62	835891.382	815880.938
E63	835890.111	815900.033
E64	835778.723	815889.566
E65	835798.950	815873.731
E66	836030.939	815886.705
E67	836020.015	815995.209
E68	836037.837	816001.932
E69	836050.954	815998.893
E70	836078.264	816001.000

(C)

REV. 修訂	DESCRIPTION 內容摘要	D.E.	P.E. (CHECKED 審核)	DATE 日期
C	TENDER ADDENDUM NO.4	SWKM	JYL	SEP 09
B	TENDER ADDENDUM NO.3	SWKM	JYL	SEP 09
A	TENDER ADDENDUM NO.1	SWKM	JYL	SEP 09
-	TENDER DRAWING	SWKM	JYL	AUG 09

土木工程拓展署
CEDD Civil Engineering and Development Department

WAN CHAI DEVELOPMENT PHASE II

WAN CHAI DEVELOPMENT PHASE II - CENTRAL - WAN CHAI BYPASS AT HONG KONG CONVENTION AND EXHIBITION CENTRE

AREAS OF THE SITE

SHEET 3 OF 3

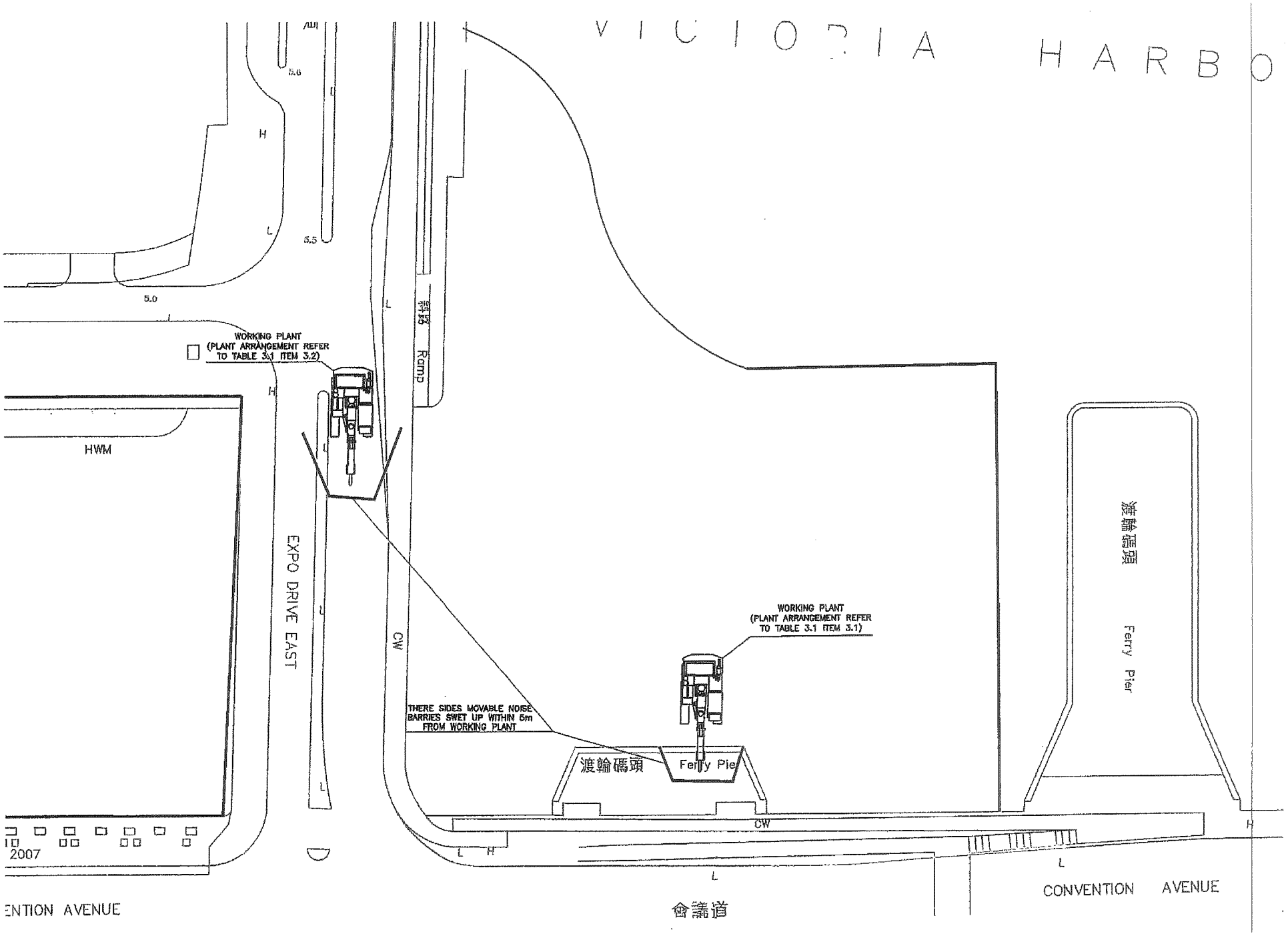
AECOM

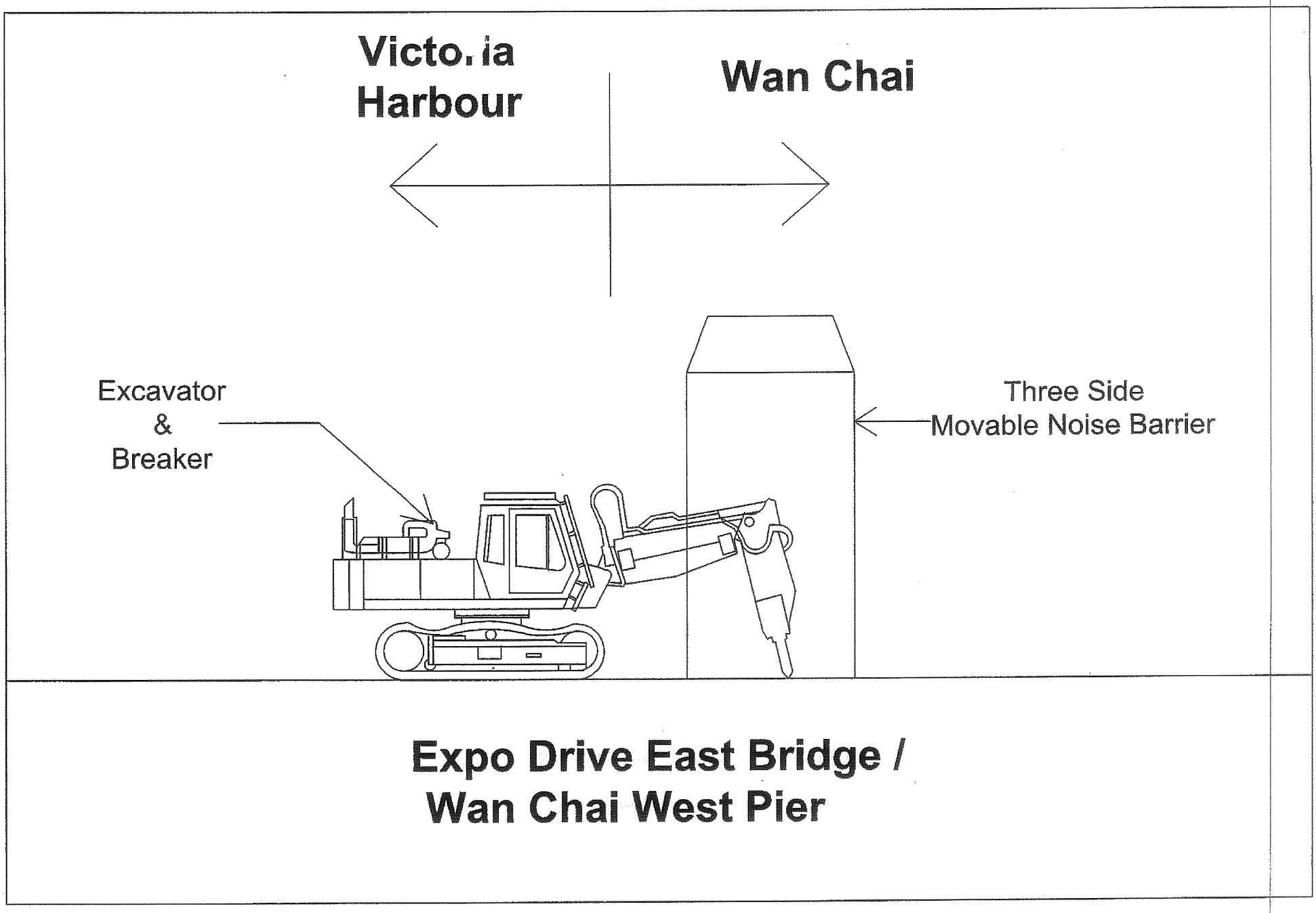
DRG.NO. 圖紙編號 60041297/C1/100/1203C

DESIGNED BY 設計 AWSY	CONTRACT NO. 合約編號 HK/2009/01	P. Dir. APPROVED 批准人 PMC
DRAWN BY 繪圖 ADC	STATUS 階段	
SCALE 比例 A1 1:1000		
DIMENSIONS ARE IN 尺寸單位 METRES		

Appendix B

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

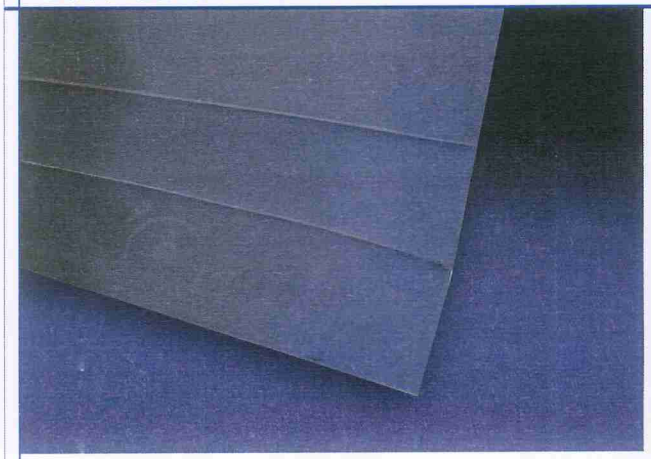

VICTORIA HARBO
5.6
5.5
5.0
WORKING PLANT
(PLANT ARRANGEMENT REFER
TO TABLE 3.1 ITEM 3.2)
Ramp
HWM
EXPO DRIVE EAST
CW
WORKING PLANT
(PLANT ARRANGEMENT REFER
TO TABLE 3.1 ITEM 3.1)
THERE SIDES MOVABLE NOISE
BARRIES SWET UP WITHIN 5m
FROM WORKING PLANT
渡輪碼頭
Ferry Pier
渡輪碼頭
Ferry Pier
2007
ENTION AVENUE
會議道
CONVENTION AVENUE



Expo Drive East Bridge / Wan Chai West Pier

Appendix C

Sound Insulating Material for Noise Barrier and Plant External Acoustic Jacket



聲默牌（NoiseStop BM4)產品說明書

概述

NoiseStop Barrier Mat- BM4 可對建築構件、設備或汽車配件降噪處理，可作為隔聲屏障減小雜訊的傳輸,被廣泛應用於建築工業，火車，汽車等交通降噪治理。BM4 以卷裝出售，標準尺寸為 1mx10m/卷安裝位置和其他細節請參考圖紙。

系統描述

1.材料質輕超薄,有效控制建築空間和重量.
2.柔軟,拉伸強度大,有效滿足各不規則面的需求,降低施工難度.
3.環保健康,已通過環保部門相關認證,對環境不造成任何污染.
4.強烈抑制中低頻聲波的傳播，在降噪領域起到積極作用。
5.使用方式多樣複合使用時,隔聲氈彌補了各板材在共振及吻合效應隔聲性能大大降低的不足。
6.有卓越的阻燃性能。

產品應用

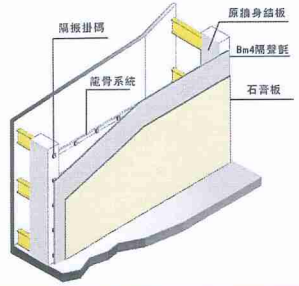
建築隔聲治理施工圖(牆體,吊頂)

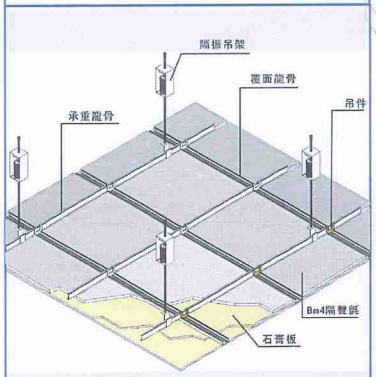
1.與各類板材複合,增加牆體與樓板的隔聲量,拉大聲的寬頻,降低雜訊.
2.在分離空腔內填充多孔性吸聲材料（如岩棉玻璃棉等）,可加寬降噪頻帶,提高整體的隔聲效果.
3.安裝時加大隔聲構件空氣的厚度,可提高隔聲效果。
4.在安裝板材時,板材之間搭接部位應錯開.對接縫,釘子位置進行勾縫處理。

系統描述

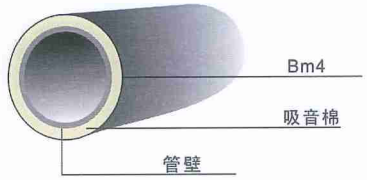
BM4 由高聚合物、金屬粉和各種輔助材料混合製成。在建築業，它被廣泛用於隔斷牆（例如石膏板）的隔聲處理。 材料品質輕,超薄,柔軟,拉伸強度大;施工方便,成本低;阻燃,防潮,防蛀;其最突出的特點時:材料環保,內阻尼大,隔聲性能強,減震效果好,是一種高性能阻尼性隔聲材料.

施工示意圖



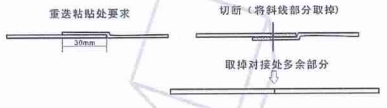


管道特殊處理管道包紮一般由三層材料構成,內層為柔軟的 吸音棉,起保溫防水作用BM4隔聲氈材料,起隔聲作用,最後用具有保護裝飾性的包裝帶包紮牢固。



施工示意圖

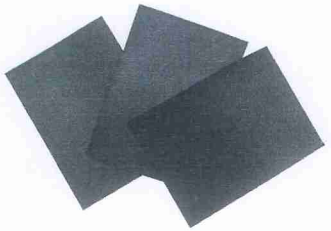
1.天花板與牆壁,牆壁與地板交接處需留100mm以上材料重 連接
2.木質牆體的施工,在龍骨,柱子上,每隔200mm用螺絲 或釘子固定板材



質保對於特定的項目，提交供應商和建築聲學（集團）有限公司提供的保證書。所有材料應帶有生產商提供的生產標準。本地專業承建商應與生產商聯繫以獲取1年的產品保修。
為確保最終用戶利益，產品銷售和安裝指導應是通過授權認可的供應商或權威安裝商進行。所有保修承諾的賠償責任，應直接由建築聲學（集團）有限公司發佈為准。

技術資料對被提議的系統，提交生產商的技術要求、技術資料、安裝說明和相關測試標準。

樣品在大批發送之前，系統所有部件的樣品和授權店圖紙所指出配件的樣品應向建築師提交以獲得認可。之後發送的貨品應與樣品一致。



材料

型號l：BM4
顏色：黑色，無飾面
尺寸：1mx10m/卷
厚度：2.0mm
密度：5kg/m²

防火性能

經BS476:Part7,測試，符合3級建築標準。

聲學性能

中心頻率(Hz)	125	250	500	1k	2k	4k
傳聲損失dB	13	19	22	27	32	37

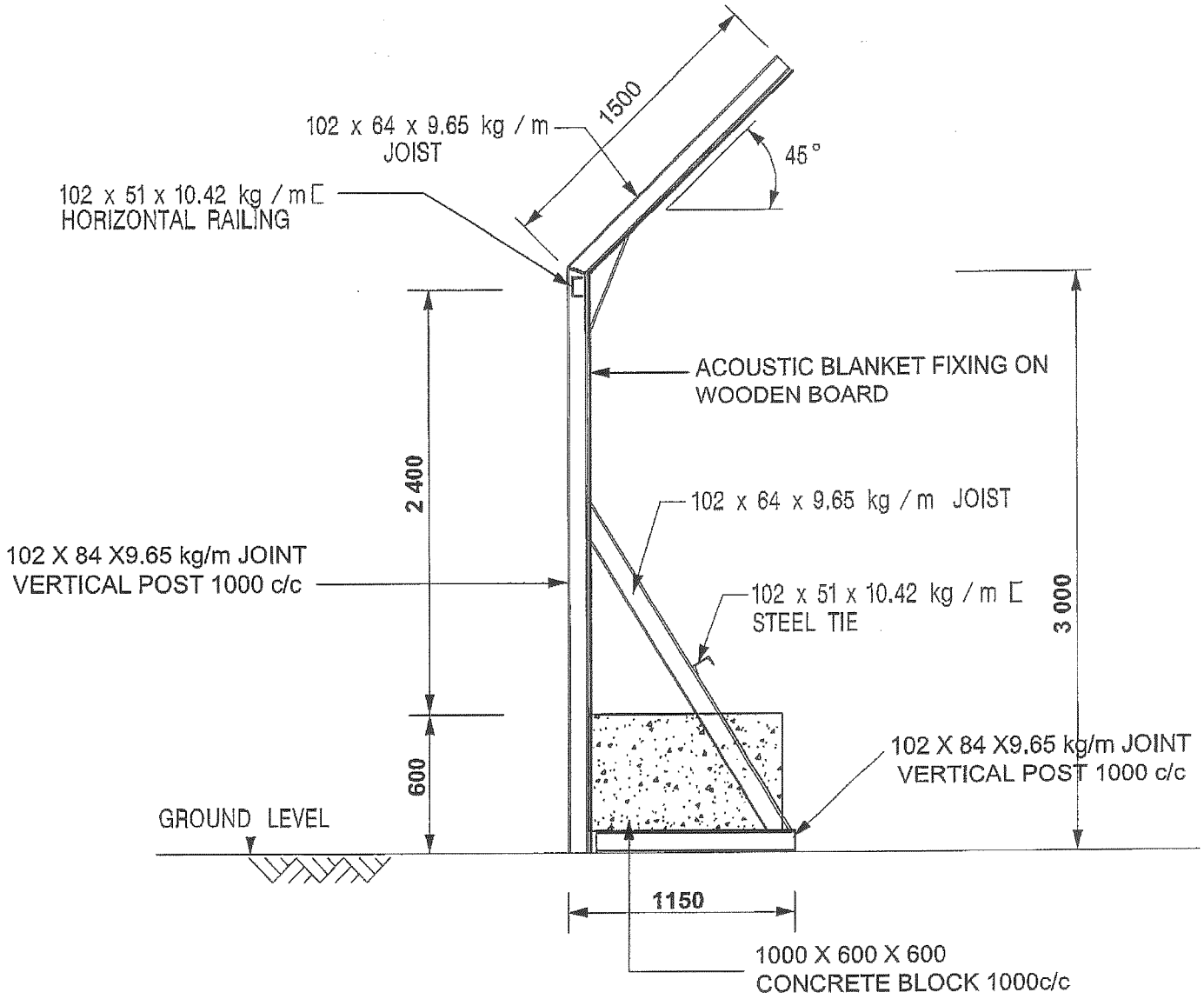
本地供應商

建築聲學（集團）有限公司
香港尖沙咀實勒巷29號實昌商業大廈二樓
電話：（852）23673232
傳真：（852）27248001

聲默

Appendix D

Details of Noise Barrier



DETAIL FOR NOISE BARRIER