



Contract No. ED/2018/04
Trunk Road T2 and Infrastructure Works
for Developments at the Former South Apron

PROJECT PLAN

Noise Mitigation Plan

DOCUMENT REFERENCE NUMBER:

HKT2	-	BTP	-	PLN	-	ALL	-	QE	-	000024	-	F
Project Code		Issuer Code		Doc. Type		Location		Subject		Sequential No.		Rev

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DATE	5/10/21	5/10/21	8/10/21	6/10/21	6 Oct 2021

DOCUMENT STATUS

Details of Revision

Revision	Rev. Date	Sections	Amendment Source and/or Details
A	11 Mar 2020	ALL	First Issue for Use
B	14 Apr 2020	2	Response as per EPD's comment
C	29 May 2020	2,3	Response as per EPD's comment
D	31 Oct 2020	1.1, 1.2, 2.3, 3.1 & App D	Response as per EPD's comment
E	12 May 2021	2.3, 3.1, 3.3, 3.4, 3.5	Response as per EPD's comment
F	3 Sep 2021	Table 2.3	Response as per EPD's comment

Status of Section Revision

Rev.	B	C	D	E	F
Section No.					
1			X		
2	X	X	X	X	X
3		X	X	X	

Rev.	B	C	D	E	F
Section No.					
Appendix A					
Appendix B					
Appendix C	X				
Appendix D			X		
Appendix E		X			



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Abbreviations List

BTP	Bouygues Travaux Publics
C&D	Construction & Demolition
CEDD	Civil Engineering and Development Department
CM	Construction Manager
CNP	Construction Noise Permit
EIA	Environmental Impact Assessment
EM&A	Environmental Monitoring & Audit
EMIS	Environmental Mitigation Implementation Schedule
EIAO	Environmental Impact Assessment Ordinance
EO	Environmental Officer
EPD	Environmental Protection Department
EP	Environmental Permit
ES	Environmental Supervisor
ET	Environmental Team
ETL	Environmental Team Leader
HMJV	Hyder Meinhardt Joint Venture
IEC	Independent Environmental Checker
NCO	Noise Control Ordinance
NSR	Noise Sensitive Receiver
PME	Power Mechanical Equipment
RHPTW	Restricted Hours Permit-To-Work System
TKO-LTT	Tseung Kwan O – Lam Tin Tunnel and Associated Works

1.0 INTRODUCTION

1.1. Scope of Works

Contract Title: Trunk Road T2 and Infrastructure Works for Developments at the Former South Apron

Contract No.: ED/2018/04

The works are to be executed for the Civil Engineering and Development Department (CEDD). The Trunk Road T2, together with the proposed Central Kowloon Route (CKR) and Tseung Kwan O- Lam Tin Tunnel (TKO-LTT) will form the Route 6 alignment in the Kowloon strategic road network. Route 6 will provide an east-west express link between West Kowloon and Tseung Kwan O and provide the necessary relief to the existing heavily utilized road network in the central and eastern Kowloon areas.

In this Noise Mitigation Plan (NMP), the Works Scope under EP-458/2013/C is Design and Construction of Drill-and-blast Tunnel (two tubes with cross passages) under Cha Kwo Ling, of approximately 0.4km in length with dual 2-lane carriageway connecting between Cha Kwo Ling landfall and Lam Tin Interchange. This section also includes the Branch Tunnel to accommodate the slip road connecting the eastbound carriageway of the Trunk Road T2 to the Lam Tin Interchange.

This Noise Mitigation Plan (NMP) is prepared to comply with Condition 2.5 of EP-458/2013/C. The general layout plan for the project under EP-458/2013/C is shown in **Appendix A**.

1.2. Background

- (i) Condition 2.5 of the EP-458/2013/C stated that The Permit Holder shall, no later than one month before the commencement of construction of the Project, submit to the Director for approval three hard copies and two electronic copies of Noise Mitigation Plan(s) detailing the temporary and permanent mitigation measures for the construction and operation phases traffic noise impacts arising from the Project. The Permit Holder shall implement all the noise mitigation measures as set out in the Noise Mitigation Plan agreed by the Director during the construction and operation phases of the Project. All noise mitigation measures implemented shall be properly maintained during construction and operation phases of the Project.
- (ii) This NMP is prepared to comply with Condition 2.5 of EP-458/2013/C.
- (iii) Refer to the Tseung Kwan O – Lam Tin Tunnel and Associated Works (TKO-LTT) EIA Report (AEIAR-173/2013) Figure 4.1, only a section of drill-and-blast tunnel is entrusted as our project

scope of works. In this NMP, only related noise mitigation measures and relevant contents refer to the Project will be included.

- (iv) Drill-and-blast Tunnel is a part of the Cha Kwo Ling Tunnel of approximately 0.2km in length to be constructed by drill-and-blast method for connecting the TBM Tunnel to the EVB at Lam Tin Interchange and includes the section of the Branch Tunnel to the interface with the civil and structural Branch Tunnel works completed by the contract NE/2015/01.

- (iv) Drill-and-blast tunnel section will be commenced on 4 May 2020.

1.3. Report Structure

- (I) Section 1 – Introduction
- (II) Section 2 – Construction Noise Mitigation Plan
- (III) Section 3 – Operational Noise Mitigation Plan

2.0 CONSTRUCTION NOISE MITIGATION PLAN

2.1 Noise Sources from Construction Activities

- (I) This section relates to the following environmental aspects;
- Air-borne noise from construction activities, such as road works;
 - Noise from movement of plant and vehicles;
 - Noise from operation of point source mechanical equipment;
 - Noise from blasting activities at Cha Kwo Ling area; and
 - Nuisance to sensitive receivers, as identified in the Environmental Permit/Project Profile/Environmental Impact Assessment Report.

2.2 Applicable License and Permit Requirements

- (i) Engineering and production staff shall determine the needs for restricted hours working as far as practicable prior to relevant construction activities in order to allow sufficient time to make submission to the Environmental Protection Department (EPD) to obtain a Construction Noise Permit (CNP).
- (ii) Plant lists shall be determined and noise calculations for groupings of equipment shall be conducted to determine whether the issue of a Construction Noise Permit is likely. Noise spreadsheet developed by Bouygues Travaux Publics will be used for estimation of predicted corresponding noise emission level.
- (iii) CNPs issued to Bouygues Travaux Publics by EPD shall be displayed outside of the site on the site hoarding, on the site notice board and issued to subcontractors under cover of letter. The conditions of CNPs shall also be communicated to the workforce, either main contractor production team or sub-contractors, through routine or specific toolbox trainings.
- (iv) If multiple CNPs are to be used on the project, a Restricted Hours Permit-To-Work (RHPTW) System will be implemented to ensure the conditions of all CNPs are being followed and complied. A sample of RHPTW Form is shown in **Appendix B**.
- (v) Noise Emission Labels shall be attached to all breakers over 10 kilograms and all compressors capable of supplying air at over 500 kilopascals. The relevant plant shall be checked on arrival on site by the relevant supervisory staff to make sure that the label is attached and valid.

- (vi) Pursuant to Tseung Kwan O – Lam Tin Tunnel and Associated Works (TKO-LTT) EIA Report (AEIAR-173/2013) Section 4.2.13, there are no statutory procedures and criteria under the Noise Control Ordinance (NCO) and Environmental Impact Assessment Ordinance (EIAO) for assessing the blasting impacts and are therefore beyond the scope of the EIA. However, the administrative and procedural control of all blasting operations in Hong Kong is vetted in the Mines Division of the Civil Engineering and Development Department (CEDD). The Dangerous Goods (General) Regulations, Chapter 295 also stipulates that no person shall carry out blasting unless he possesses a valid mine blasting certificate to be issued by the Mines Division of CEDD. The Superintendent of Mines will review the application on a case-by-case basis before issuing the Mine Blasting Certificate. Blasting should be carried out outside sensitive hours as far as practicable, and the blasting schedule should be submitted to the concerned authority for approval prior for its implementation.

2.3 Construction Phase Noise Sensitive Receivers (NSRs)

- (i) Pursuant to TKO-LTT EIA Report (AEIAR-173/2013) Section 4.4 & Figure 4.1, the location of construction Noise Sensitive Receivers (NSRs) close to the project site boundaries are shown in the Table 2.1. The layout plan for those Noise Sensitive Receivers (NSRs) is shown in **Appendix C**.

Table 2.1. Construction Noise Sensitive Receivers (NSRs) under AEIAR-173/2013		
Noise Sensitive Receivers (NSR ID)	Location /Description	EIAO-TM Noise Criteria, Leq(30-min), dB(A)
NSR 3	Tin Hau Temple, Cha Kwo Ling	75
NSR 4	Physartrain 90's Sport & Leisure Centre	70/65 (Examination)
NSR 5	Cha Kwo Ling Tsuen	75

- (ii) For the Noise Sensitive Receivers (NSRs) listed under AEIAR-173/2013 (**Appendix C**), as our project scope of works included only a section of drill-and-blast tunnel section which will be commenced on 4 May 2020, only **NSR 3, NSR 4 & NSR5** which located less than 300m from the Project boundary will be considered.

2.4 Key Powered Mechanical Equipment Identified as Major Noise Sources

- (i) The Powered Mechanical Equipment (PME) list for the contract works that would result in elevation of construction noise impact is presented in **Table 2.3**, and these are considered to be the dominant noise sources.

Table 2.3 PMEs to be Adopted for Construction Activities

PME	SWL, dB(A)	Quantity
Lorry with Crane/grab, gross vehicle weight<=38 tonne	105	1
Crane, mobile (diesel)	112	1
QPME Excavator, wheeled/tracked (Serial No.: VCEC350DP00281351) (QPME Ref. Code.: EPD-09098)	106	1
Jumbo Drill	118	2
Shotcrete Spraying Unit	105	1
Breaker, excavator mounted (Hydraulic)	122	1
Telehandler	106	1
QPME Generator (Serial No.: FM022000) (QPME Ref. Code.: EPD-03667)	94	1
QPME Generator (Serial No.: JM028800) (QPME Ref. Code.: EPD-08205)	97	1
Power pack (diesel)	100	2
Water pump, Submersible (electric)	85	2
Water pump (Petrol)	103	1
Cherry Picker	98	1
Welding machine	94	1
Concrete lorry mixer	109	2
Air Compressor, air flow > 10m ³ /min and < 30m ³ /min	102	1
Poker, vibratory, hand-held	113	2
Loader, wheeled	112	1

Breaker, electric hand-held, 18kg ≤ mass ≤ 35kg	108	2
Drill, percussive, hand-held (electric)	103	2
Hydraulic Splitter	112	2
Ventilation Fan	108	3
Wastewater Treatment Plant	94	1
Dump truck, 5.5 tonne<gross vehicle weight<=38 tonne	105	1

- (ii) Most of these PME's are stationed in the drill-and-blast tunnel section, which is enclosed with blasting door. Only generator, cherry picker and water pumps would be operated outside the tunnel during preliminary stage (prior to construction of CKL tunnel) and the PME's will be updated during construction stage. There is no direct line of sight from the NSR to works inside the tunnel. Therefore, airborne noise generated by these noise sources can be eliminated by the blasting door.
- (iii) Regarding the noise criteria mentioned in the Technical Memorandum of EIAO, daytime noise criteria Leq(30-min) dB(A) is 75dB(A). As mentioned in Section 2.4 (ii), all construction works within the Project site boundaries are operated underground and blast door would be adopted as mitigation measure. Therefore, there is no direct impact of noise affecting the surrounding NSRs, so noise calculation for the project work can be omitted.
- (iv) A Construction Noise Permit (CNP) with the list of equipment as in Table 2.3 is approved by EPD on 30 April 2021 (Permit No. GW-RE0399-21). CNP and the list of equipment will be updated continuously. This secures the compliances of works during the nighttime.

2.5 Construction Noise Mitigation Measures for Airborne Noise

- (i) Details of our proposed mitigation measures and operating controls with respect to noise abatement for airborne noise are listed in the Environmental Mitigation Implementation Schedule (EMIS) of the AEIAR-173/2013 EIA Report that is included as **Appendix D**.
- (ii) The list of mitigation measures as proposed in the AEIAR-173/2013 EM&A Manual with a summary of achievement of the proposed mitigation measures are listed in **Table 2.4**.

Table 2.4 Summary Table of Mitigation Measures to be Implemented under AEIAR-173/2013

ID No.	Construction Phase Mitigation Measures	Summary of Achievement of the Proposed Mitigation Measures
S4.8	<p>Use of quiet PME. Use of movable noise barriers for Excavator, Lorry, Dump Truck, Mobile Crane, Compactor, Concrete Mixer Truck, Concrete Lorry Mixer, Breaker, Mobile Crusher, Backhoe, Vibratory Poker, Saw, Asphalt Paver, Vibratory Roller, Vibrolance, Hydraulic Vibratory Lance and Piling (Vibration Hammer). Use of full enclosure for Air Compressor, Compressor, Bar Bender, Generator, Drilling Rig, Chisel, Large Diameter Bore Piling, Grout Mixer & Pump and Concrete Pump.</p>	<p>QPME will be used on site, and placed inside the Tunnel.</p> <p>Movable noise barrier will be adopted on site, especially the direction towards NSRs. The catalog of movable noise barrier is enclosed in Appendix E.</p> <p>Full enclosure of power pack and generator will be used on site.</p> <p>Other proper mitigation measures will be implemented on site, and blast door will be installed for blockage of noise from tunnel.</p>
S4.9	<p>Good Site Practice:</p> <ul style="list-style-type: none"> - Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program. - Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. - Mobile plant, if any, should be sited as far away from NSRs as possible. - Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. - Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. - Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. 	<p>All good site practice had been implemented on site. Only well-maintained plant will be used on-site. Routine maintenance will be applied to all machineries.</p> <p>Silencers or mufflers will be implemented when necessary.</p> <p>Most of mobile plant will be sited inside tunnel only and avoid to place in open area.</p> <p>Plant will be shut down if not in use. Periodically review the necessity of use of equipment on site.</p> <p>Noise screening/ movable noise barrier will be applied to the direction towards NSRs. Noisy equipment will be avoided.</p> <p>The site is surrounded by 3-sides high-rise slope which act as screening of noise towards Cha Kwo Ling village. Besides, blast door will be installed on site, and blocked the direction towards the nearby NSR – Yau Lai Estate.</p>

S4.9	Scheduling of Construction Works during School Examination Period	Construction works shall be scheduled outside school examination period to less intrusive periods.

2.6 Construction Noise Mitigation Measures for Ground-borne Noise

- (i) No mitigation measures and operating controls with respect to noise abatement for Ground-borne noise are in the EMIS of the AEIAR-173/2013 EM&A Manual. Further actions will be conducted in order to minimize the ground-borne noise, as follows:
 - Re-schedule drilling, breaking and blasting works to less sensitive hours as far as practicable.

2.7 Mitigation Measures for Blasting Works

- (i) The tunnel section at Cha Kwo Ling which belongs to TKO – LTT project is now entrusted to our T2 Project. As such, drill and blast method would be adopted for the tunnelling works which is governed as our scope of works. According to AEIAR-173/2013 – EIA Report Section 4.6.4, the hand-held drillers would be used to make holes for installation of dynamite and this activity for tunnel works have been taken into account in the construction noise calculation. All the detonation will be conducted underground within the tunnels. As blasting is under the control of the Dangerous Goods Ordinance, BTP will obtain a valid blasting permit from the Mines Division of CEDD before carrying out the blasting. BTP will enclose a method statement including manner of work and protective measures to protect adjacent land and property when blasting is carried out. It is noted that each blast would only last for a few seconds.

2.8 Restricted Hours Permit-To-Work (RHPTW) System for Construction Noise Permit Management

- (i) The environmental officer in conjunction with the construction manager will operate a permit-to-work system for all restricted hours working under a Construction Noise Permit. Proper implementation of the system will ensure the collective noise impact of site activities is properly and effectively managed within the conditions prescribed by Environmental Protection Department.
- (ii) Restricted hours include 1900-0700 hours on normal workdays and anytime during general holidays including Sundays.



- (iii) Any party intended to carry out a construction activity during restricted hours shall apply for a Restricted Hours Permit-To-Work (RHPTW) prior to the commencement of the construction activity in restricted hours.
- (iv) The applicant shall hold ultimate responsibility for ensuring their compliance with the approved RHPTW and the relevant Construction Noise Permit conditions.
- (v) Construction managers shall be appointed by the person in charge of the project with authority for overall control of construction activities for the whole construction site. The construction manager shall hold ultimate responsibility for implementation of the RHPTW system.
- (vi) Project Environmental Officer (EO) or his delegate will audit the RHPTW system from time to time, for ensuring the effectiveness of the system, and have the right to stop the Works if there is any violation of the rules and requirements.
- (vii) No construction activity shall be carried out by any party during restricted hours without holding a valid RHPTW.

2.9 Detailed Workflow of RHRTW

- (i) The applicant shall complete Part I of the RHPTW Application form and submit to BTP representative and project EO for review and endorsement on each Monday. The period of application should cover the whole week's times. Ad-hoc application is only considered on a case-by-case basis.
- (ii) Applicant shall also supply, as an attachment to the application form, a site layout plan highlighting the location of Powered Mechanical Equipment to be used and any Prescribed Construction Work to be carried out.
- (iii) EO or his delegate shall check compliance of the information in the Application Form against condition(s) of valid Construction Noise Permit(s) and complete Part II of the Form.
- (iv) Responsible Officer/ Site Foreman/Site Engineer shall review of the application and complete Part III of the form and issued the. RHPTW to the related responsible staff or sub-contractors.

- (v) The related person-in-charge of the Work shall acknowledge and details of the RHPTW and completed the Part IV of the form. The application form shall be returned to environmental officer for record purposes.
- (vi) The original of the RHPTW should be issued to the applicant and their foreman. Copies of the RHPTW should be sent to construction manager, environmental officer and relevant site management for record.

3.0 OPERATIONAL PHASE NOISE MITIGATION PLAN

3.1 Study Area

The Operational Road Traffic Noise Study Area (ORTNSA) for assessment covers a distance of 300m from the Contract Works. The Study Area is shown in **Appendix F**.

3.2 Noise Sensitive Receivers

Only the first layer of NSRs located closest to the noise sources have been identified for assessment as they would be worst affected. There are six representatives existing NSRs (i.e. NSR 1, NSR 2, NSR 3, NSR 4, NSR 5, NSR 6) and a representative planned NSR PNSR 1 assessed in the approved Project EIA Report have been identified within the ORTNSA on Lam Tin side, which have been considered to be mostly affected by the new roads. No NSRs has been identified within the ORTNSA on Tseung Kwan O side as the NSRs are located outside the ORTNSA. The updated representative NSRs are listed in **Table 3.1**.

Table 3.1 Representative Noise Sensitive Receivers

NSR ID	Description	Nature of Uses
NSR 1	Yau Lai Estate Phase 1	Residential
NSR 2	Yau Lai Estate Phase 5	Residential
NSR 3	Tin Hau Temple	Place of Public Worship
NSR 4	Physartrain 90's Sport & Leisure Centre	Educational
NSR 5	Cha Kwo Ling Tsuen	Residential
NSR 6	CCC Kei Faat & Kei Hin Primary School	Educational
PNSR 1	Planned Residential Site at Ex-Cha Kwo Ling Kaolin Mine Site	Residential

3.3 Proposed Mitigation Measures

3.3.1. Existing Noise Sensitive Receivers

As mentioned in 1.2 (iii), only a section of drill-and-blast tunnel is entrusted as our project scope of works. In our scope of works, only tunnel portal and other corresponding structure will be involved, no road works will be included. The preliminary design of tunnel portal will be constructed with aluminum cladding, which act as noise screen for reduction of noise from tunnel towards NSR2 and NSR6. The detailed design of tunnel portal will be finalized in Q1 2022.

For the rest of the proposed mitigation measures of NSRs listed in Table 3.1, please refer to the Final Noise Mitigation Plan of Contract No. NE/2015/01 – Tseung Kwan O Lam Tin Tunnel – Main Tunnel and Associated Works.

3.3.2. Planned Noise Sensitive Receivers

According to the approved Project EIA Report, road traffic noise exceedances were predicted at the representative Planned NSR PNSR 1. An approximately 80 m of full-enclosure (FE5) will be provided by other Contract on road EHC4 to mitigate the predicted road traffic noise impact from the road EHC4. Its design will make reference to the design requirements shown Figure 2 of the current EP (EP-458/2013/C).

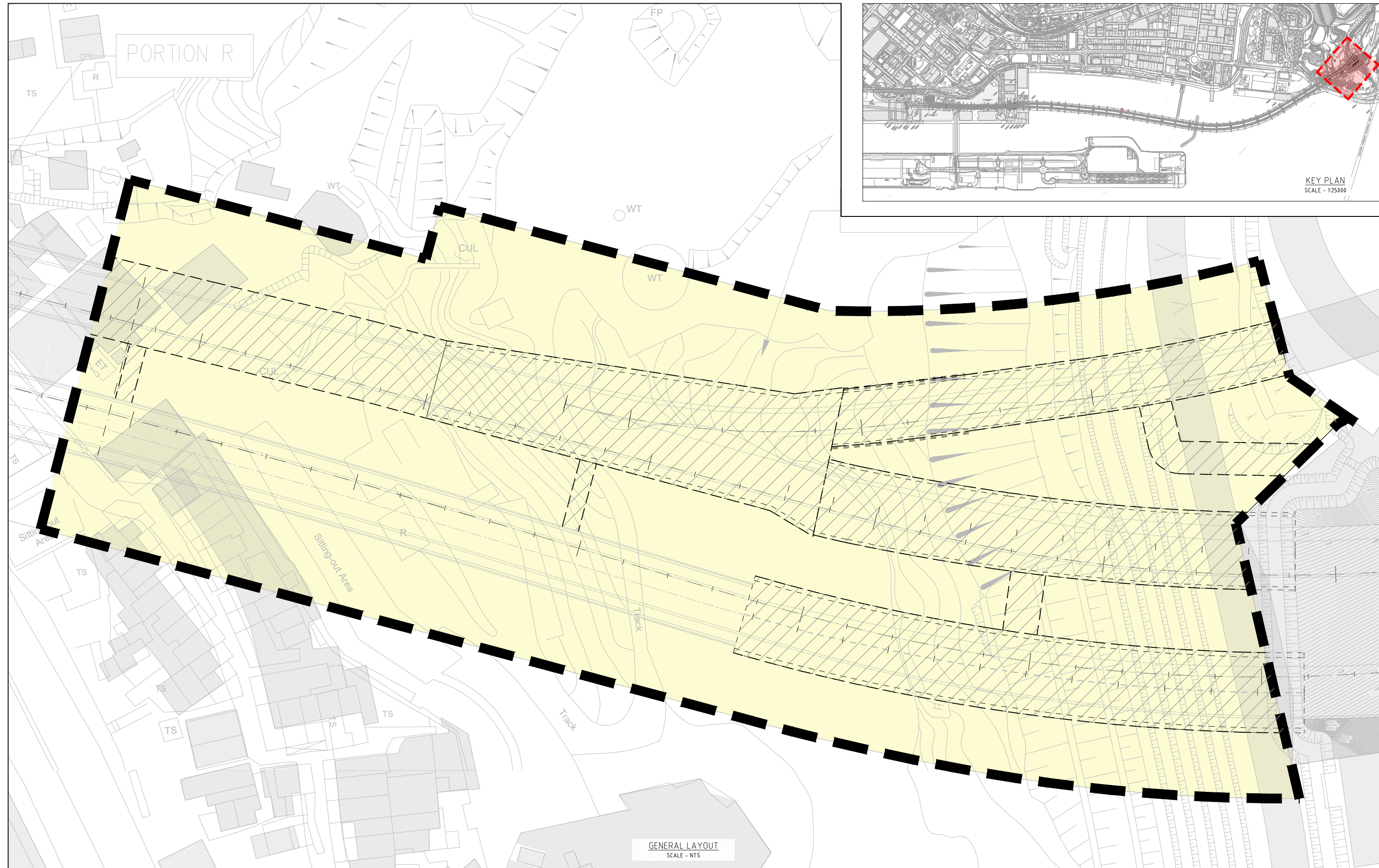
3.4 Operation Noise Mitigation Measures

- (i) Eastern Ventilation Building is a part of Trunk Road T2 project, its operation phase noise impact has been conducted under the EIA of T2 project, which is not related to TKO-LTT project. In addition, Noise Mitigation Plan is not required under EP-451/2013.
- (ii) Assessment for operation phase noise impact for the new road has been conducted under the EIA of TKO-LTT project. The extent of new road can refer to Figure 4.3a of the TKO-LTT EIA Report (AEIAR-173/2013), extent of new road includes the Cha Kwo Ling Tunnel (which entrusted to ED/2018/04).
- (iii) Details of proposed mitigation measures and operating controls with respect to noise abatement are provided in the Environmental Mitigation Implementation Schedule (EMIS) of the EM&A Manual that is included as **Appendix D** to this plan.



Appendix A


General Site Layout




Rev.	Date	Drawn	Design.	Verif.	Description	Approved
A1	03/FEB/20	HTa	Yya	ECa	First issue	ASc

Client
 土木工程拓展署
 Civil Engineering and
 Development Department
 東拓展處
 East Development Office

Main Contractor


Supervising Officer
 Hyder - MEINHARDT
 Hyder - Meinhardt JV

Contractor's Designer


Project
 Contract No. ED/2018/04
 Trunk Road T2 and Infrastructure Works
 for Developments at the Former South Apron

Drawing Title
 TUNNEL DRILL & BLAST
 GENERAL SITE LAYOUT UNDER EP-458/2013/C
 GENERAL LAYOUT

Drawing no. HKT2-BTP-MDWG-LTA-GEN-050003-A1-DFT	Revision A1
Scale 1:750 @ A3	Sheet 01/01
CADD Ref. LTA-GEN-050003-A1-DFT	Issue Status DRAFT (DFT)



Appendix B

Standard Form of Restricted Hours Permit-to-Work (RHPTW)



Contract No. ED/2018/04
Trunk Road T2 and Infrastructure Works for
Developments at the Former South Apron

Restricted Hours Permit-To-Work
- Use of PME's during Restricted
Hour
使用機動設備許可證 (限制施工時段)

Permit to Work No. : 許可證編號

For Environmental Dept Use Only REF CODE

DATE CODE

CONTRACTOR – Production Team

PERMIT CONDITION 許可證條件

Part I				
Workplace 工作地點				
Description of work 工程敘述				
	PME 機動設備	Nos. 數量	PME 機動設備	Nos. 數量
Equipment to be used	Derrick Barge 躉船吊機		Tug Boat 拖船	
需用之工具	Hopper Barge 卸泥躉船		Flat Top Barge 平面躉船	
	Dredger, Grab 挖泥機, 抓斗式		Motor Sampan 機動舢板	
	Generator, Silence ≤75dB(A) at 7m 發電機, 低噪音型在 7 米距離時 75 分貝(A)		Excavator, tracked 挖土機, 履帶式	
	Bulldozer 推土機		Dump Truck, 5.5ton < gross vehicle weight ≤ 38 ton 卸土車, 總重量≤38 噸	
	Roller, Vibratory 滾壓機, 震盪型		Barge with conveyor belt 輸送帶式運沙船	
	Piling and drill rig 鑽樁機		Double rotary drill 雙旋轉式鑽機	
	Crane, crawler mounted (Diesel) 起重機, 履帶式 (油渣)		Vibrating Clamp 震動鉗	
	Welding Machine (Electric) 焊接機(電動)		Piling, large diameter bored, reverse circulation drill 大直徑鑽孔樁, 循環式鑽機	
	Water pump (Electric) 水泵		Water pump, submersible (Electric) 潛水泵	
	Crane, Mobile (Diesel) 起重機 (油渣)		Piling, diaphragm wall, hydraulic extractor 膜牆樁, 油壓拔取機	
	Piling, diaphragm wall, bentonite filtering plant 膜牆樁, 漿土隔濾機		Piling, large diameter bored, grab and chisel 大直徑鑽孔樁, 抓斗及鑿	
	Concrete Lorry Mixer 混凝土攪拌車		Bar Bender and Cutter (Electric) 鋼筋彎曲機及切割機(電動)	
	Lorry with Crane, 5.5 ton < gross vehicle weight < 38 ton 吊臂貨車, 總重量≤38 噸		Poker, vibratory, hand-held 混凝土震動機, 手提型	
	Concrete pump, stationary/lorry mounted 混凝土泵, 裝在貨車上		Tractor 拖拉車	
	Scissor Platform (Electric) 鉸剪升降台(電動)		Cherry Picker (Electric) 升降台(電動)	
	Drill, hand-held (Electric) 鑽, 手提型 (電動)		Screw driver (Electric) 起子機, 手提型 (電動)	



Contract No. ED/2018/04
Trunk Road T2 and Infrastructure Works for
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Permit to Work – Use of PMEs
during Restricted Hour
使用機動設備許可證 (限制施工時段)

	Breaker, hand-held, mass<=10kg 破碎機, 手提型, 重量<=10 千克		Air Blower (electric) 吹風機	
	Excavator, mini-robot mounted 挖土機, 裝在迷你機械人上		Air compressor, air flow<=10m ³ /min 空氣壓縮機	
	Power Pack (diesel) 獨立電源		Light Tower 燈車	
	Others, please specify 其他, 請列明			
	Reminder: Only one group of PMEs can be operated at the same time 請注意: 同一時間內只可使用同一組別的機動設備			
Date:				
日期:				
Working Time:				
工作時間:				



Part II

CONTRACTOR – Environmental Team

VERIFICATION OF PERMIT CONDITION

確認許可證條款

Project Environmental Officer

項目環保主任

I confirm that the use of PMEs are in line with the model and the number of approved construction noise permit (CNP No: _____), the Permit to Work can be issued.

本人確認所使用之機械符合建築噪音許可證 (編號: _____) 內核准的款式及數量之內, 此使用機動設備許可證可發出。

Name of Environmental Officer

環保主任姓名

Post

職位

Time of Issue

確認時間

Signature

簽署

Part III

CONTRACTOR – Production Team

ISSUE OF PERMIT

發出許可證

Responsible Officer/ Site Foreman/ Site Engineer

授權人仕 / 負責管工 / 工程師

I confirm that the subcontractor will comply with all environmental regulations, and to ensure that the use of PMEs are in line with the model and the number of approved construction noise permit, the permit can be issued.

本人確認獲授權之分判商將會遵守一切有關環保條例, 並確保所使用之機械符合建築噪音許可證內核准的款式及數量之內, 許可證可發出。

Name of Responsible Staff:

負責人仕姓名

Sub-contractor

工程所屬分判商

Contact Number:

聯絡電話

Signature

簽署

Name of Construction Manager:

負責人仕姓名

Signature

簽署

Part IV

SUB-CONTRACTOR

ACKNOWLEDGED RECEIPT OF PERMIT

確認接收許可證

Person-in-charge of the Work

工程負責人

I declare that all staff must comply with the requirements of the construction noise permit and declare that I will control and surveillance the relevant / required measures, fully implemented and closely monitored prior to and during the actual work.

本人聲明已根據環保條例中的一切限制, 管制及監察工程內之員工必須遵守建築噪音許可證之要求, 及於上述工序進行前及進行中緊密地監察。

Name of Person-in-charge

工地負責人姓名

Name of Sub-contractor

分判商名稱

Time of Issue

確認時間

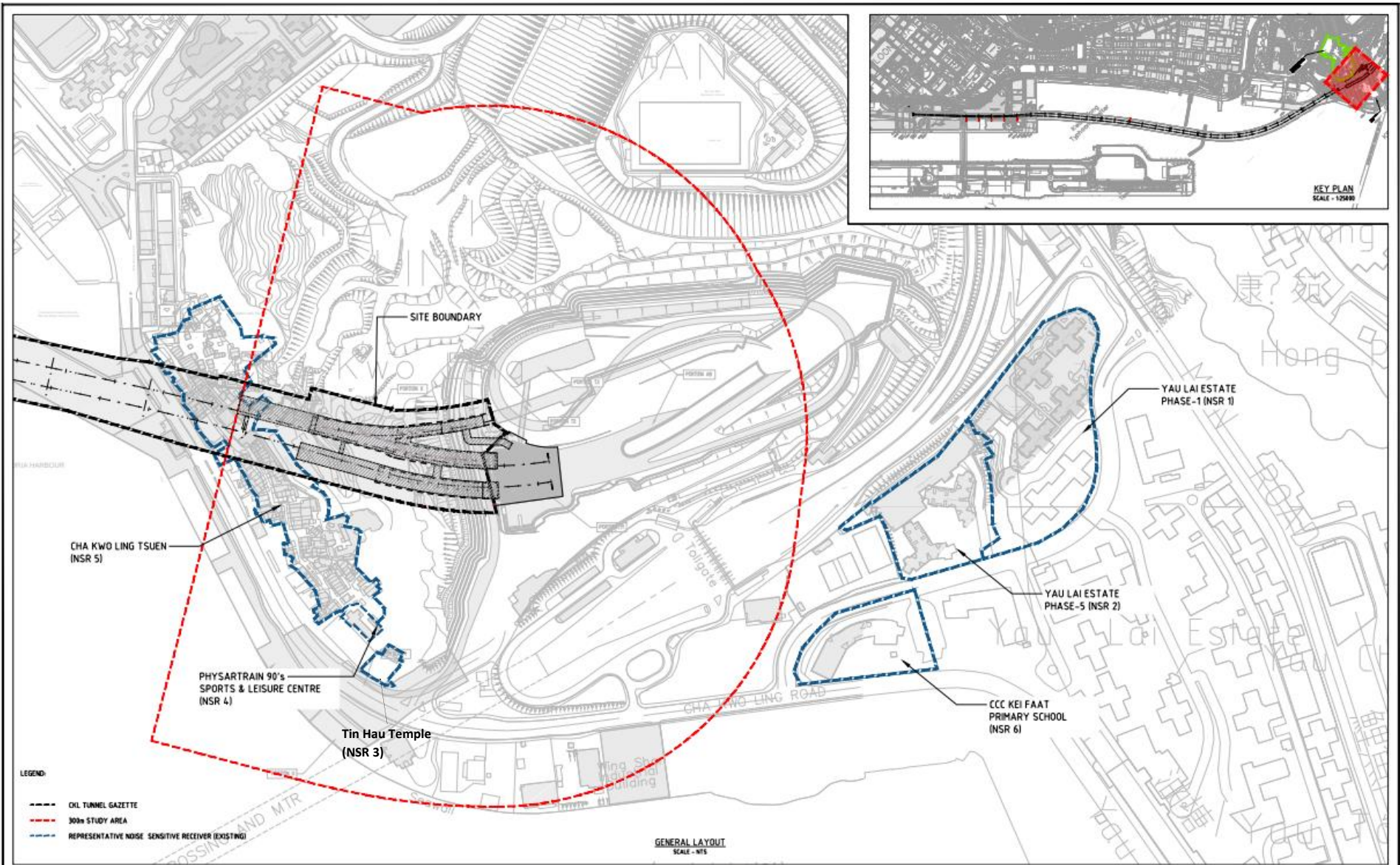
Signature

簽署



Appendix C

Layout Plan of Noise Sensitive Receiver (Construction Phase)



- LEGEND:
- OIL TUNNEL GAZETTE
 - 300m STUDY AREA
 - REPRESENTATIVE NOISE SENSITIVE RECEIVER (EXISTING)

GENERAL LAYOUT
SCALE - NTS

Rev.	Date	Drawn	Design	Ward	Description	Approved
A5	17/MAY/21	Hfs	Yfa	Eda	Study area revised	ASc
A4	04/FEB/21	Hfs	Yfa	Eda	Study area revised	ASc
A3	03/FEB/21	Hfs	Yfa	Eda	Study area revised	ASc
A2	03/DEC/20	Hfs	Yfa	Eda	NSR 1 added	ASc
A1	30/NOV/20	Hfs	Yfa	Eda	First issue	ASc

Client: 土木工程拓展署
Civil Engineering and Development Department
香港政府
Head of Department's Office

Site Contributor:

Supervising Office:

Contractor's Designer:

Project: Contract No. ED/2018/04
Trunk Road T2 and Infrastructure Works
for Developments at the Former South Apron

Drawing Title: TUNNEL DRILL & BLAST
LOCATIONS OF STUDY AREA & NOISE SENSITIVE RECEIVERS
(CONSTRUCTION PHASE)

Drawing No. HKT2-BTP-MDWG-LTA-GEN-050002-A5-DFT	
Scale: NTS @ A3	Sheet: A5
Drawing Title: LTA-GEN-050002-A5-DFT	Revision: 01/02
Drawing Status: DRAFT (DFT)	

Plan No. HKT2-BTP-MDWG-A5 (Aug 2020)

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Appendix D

Environmental Mitigation Implementation Schedule (EMIS)

Agreement No. CE 42/2008 (CE)
Tseung Kwan O – Lam Tin Tunnel
and Associated Works – Investigation

Reference Section in the Noise Mitigation Plan	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
Noise Impact						
Construction Phase						
S2.5	Use of quiet PME. Use of movable noise barriers for Excavator, Lorry, Dump Truck, Mobile Crane, Compactor, Concrete Mixer Truck, Concrete Lorry Mixer, Breaker, Mobile Crusher, Backhoe, Vibratory Poker, Saw, Asphalt Paver, Vibratory Roller, Vibrolance, Hydraulic Vibratory Lance and Piling (Vibration Hammer). Use of full enclosure for Air Compressor, Compressor, Bar Bender, Generator, Drilling Rig, Chisel, Large Diameter Bore Piling, Grout Mixer & Pump and Concrete Pump.	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Sites	Construction Phase	EIAO-TM, NCO

Agreement No. CE 42/2008 (CE)
Tseung Kwan O – Lam Tin Tunnel
and Associated Works – Investigation

S2.5	<p>Good Site Practice:</p> <ul style="list-style-type: none"> • Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program. • Silencers or mufflers on construction equipment should be utilized and should be properly maintained during the construction program. • Mobile plant, if any, should be sited as far away from NSRs as possible. • Machines and plant (such as trucks) that may be in intermittent use should be shut down between works periods or should be throttled down to a minimum. • Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. • Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities. 	To minimize construction noise impact arising from the Project at the affected NSRs	Project Proponent	Work Sites	Construction Period	EIAO-TM,NCO
S2.5	Scheduling of Construction Works during School Examination Period	To minimize construction noise impact arising from the Project at the affected NSRs	Contractor	Work Site near school	Construction Period	EIAO-TM, NCO

Reference Section in the Noise Mitigation Plan	Recommended Mitigation Measures	Objectives of the Recommended Measures & Main Concern to Address	Who to implement the measures?	Location of the measure	When to implement the measures?	What requirements or standards for the measure to achieve
Operation Phase (Traffic Noise)						
S3.4 (Not Applicable to this Contract)	Direct mitigation measures for existing NSRs: <ul style="list-style-type: none"> • VB4-1: about 10m of 4m High Vertical NoiseBarrier on Cha Kwo Ling Road; • VB4-2: about 40m of 4m High Vertical NoiseBarrier on Cha Kwo Ling Road; • CT1: about 100m of 6m High Cantilever Noise Barrier with 4.2m Cantilever (at 45 °)on Cha Kwo Ling Road; • CT2: about 80m of 6m High Cantilever NoiseBarrier with 3.7m Cantilever (at 90°) on road EHC2; • FE1: about 400m Landscape deck provided onthe entire extent of the Main line (Cha Kwo Ling Side); • FE2: about 130m of Full-enclosure providedon road S2; • FE3: about 120m of Full-enclosure providedon road EHC4; • FE4: about 200m of Full-enclosure providedon road P2; • SE1: about 310m of Semi-enclosure 	To reduce traffic noise impact at nearby Existing NSRs	CEDD	Cha Kwo Ling Road; Lam Tin Interchange;	Design stage & before commencement of operation phase	EIAO-TM

Agreement No. CE 42/2008 (CE)
Tseung Kwan O – Lam Tin Tunnel
and Associated Works – Investigation

	<p>provided on road EHC2;</p> <ul style="list-style-type: none"> • SE2: about 180m of Semi-enclosure provided on road S2; • SE3: about 30m of Semi-enclosure provided on road EHC4; • VB5-1: about 130m of 5m High Vertical Noise Barrier provided at road EHC4; • VB5-2: about 50m of 5m High Vertical Noise Barrier provided at road EHC4; • VB5-3: about 80m of 5m High Vertical Noise Barrier provided at road EHC1; • VB5-4: about 70m of 5m High Vertical Noise Barrier provided at road EHC1; • VB5-5: about 170m of 5m High Vertical Noise Barrier provided at road S3; • VB5-6: about 180m of 5m High Vertical Noise Barrier provided at road S1; • LNS1: about 190m of Low Noise Surfacing on North and South Bound Road P2; • LNS2: about 100m of Low Noise Surfacing on East and West Bound Po Yap Road; and • LNS3: about 200m of Low Noise Surfacing on East and West Bound Po Yap Road <p>It should be noted that the exact length of the mitigation measures would be subject to minor refinement during the detailed design stage.</p>			<p>Road P2 and Po Yap Road</p>		
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Agreement No. CE 42/2008 (CE)
Tseung Kwan O – Lam Tin Tunnel
and Associated Works – Investigation

<p>S3.4 (Not Applicable to this Contract)</p>	<p>Direct mitigation measures for planned NSRs:</p> <ul style="list-style-type: none"> FE5: about 80m of Full-enclosure on road EHC4 <p>It should be noted that the exact length of the mitigation measures would be subject to minor refinement during the detailed design stage.</p>	<p>To reduce traffic noise impact at nearby Planned NSRs</p>	<p>Project Proponent</p>	<ul style="list-style-type: none"> Road EHC4 	<p>Before occupation of Planned Residential Site at Ex-Cha Kwo Ling Kaolin Mine Site and TKO Area 66</p>	<p>EIAO-TM</p>
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Appendix E

Catalog of Movable Noise Barrier



Acoustics Innovation

SilentUP® Retractable Noise Barrier

PATENTED



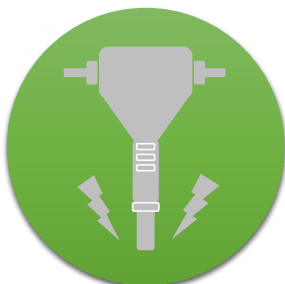
Product of Hong Kong
**THE WORLD'S FIRST
RETRACTABLE NOISE BARRIER**
27dB(A) NOISE REDUCTION*

* Tested with white noise source with SilentUP® STC24

Happy Valley Race Course



Roadworks



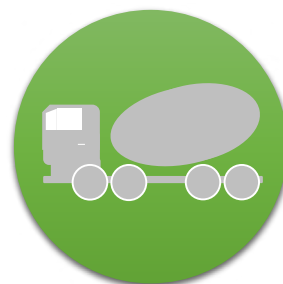
Breaking
Drilling



Piling



Loading
Unloading



Concreting

aihk.hk

info@aihk.hk

(852) 2702-2007

R&D Division of





Acoustics Innovation

SilentUP®

Product Description

SilentUP® is a patented retractable noise barrier for construction works and outdoor music events. It can be easily installed and mobilized by people without using any machines. No concrete foundation is required and the installation process is quiet enough to be conducted even at night time. The panels are installed upwards from ground level and connected by magnetic gap sealing.

Our product has been widely used in Hong Kong. Visit our website for the job references aihk.hk/SilentUP/reference.

Benefits

- ▶ Minimize noise complaints
- ▶ Quiet and manual installation
- ▶ No concrete foundation required
- ▶ Flexible construction site planning
- ▶ Facilitate Construction Noise Permit (CNP) application process

Technical Information

SilentUP® noise barrier material conforms to the flammability requirement specifications.

BS5867-2:2008 TYPE B
GF8624

Product Specification

STC	18	24
Insertion Loss*	22 dB(A)	27 dB(A)
Modular Weight	5kg	8kg
Maximum Height	7m	5m
Modular Size	1m(H) x1.35m(W)	
Standard Colour	Grey	
Panel Thickness	100mm on edges	

* Tested with white noise source



CITF 建造業
創科基金

CITF Pre-approved Product

Eligible contractors can apply for CITF.

citf.cic.hk

Installation videos available at aihk.hk/youtube

aihk.hk

info@aihk.hk

(852) 2702-2007

R&D Division of



Care has been taken to ensure the provided information is accurate, but Acoustics Innovation Ltd, does not accept responsibility or liability for errors or information which is found to be misleading.



Client Feedback

“Some of our contractors have used the retractable noise barriers to facilitate CNP application. They have found this innovative product useful - lightweight, easy to manoeuvre, and fit for purpose.”

Richard Kwan
Former Environment Manager
MTR Corporation Ltd

“We are impressed by SilentUP’s quick installation and relocation, it is definitely one of the best innovations and practicable “ approaches for the noise mitigation measures for the construction activities. ”

Lighting Chan
Environmental Compliance Support Manager,
Leighton Asia Ltd

“We are happy with Acoustics Innovation’s professional service (SilentUP Noise Barrier) in helping us achieve our noise mitigation goals.”

Ronald Fung
Project QA & Environmental Manager
Kier - Laing O’Rourke - Kaden Joint Venture

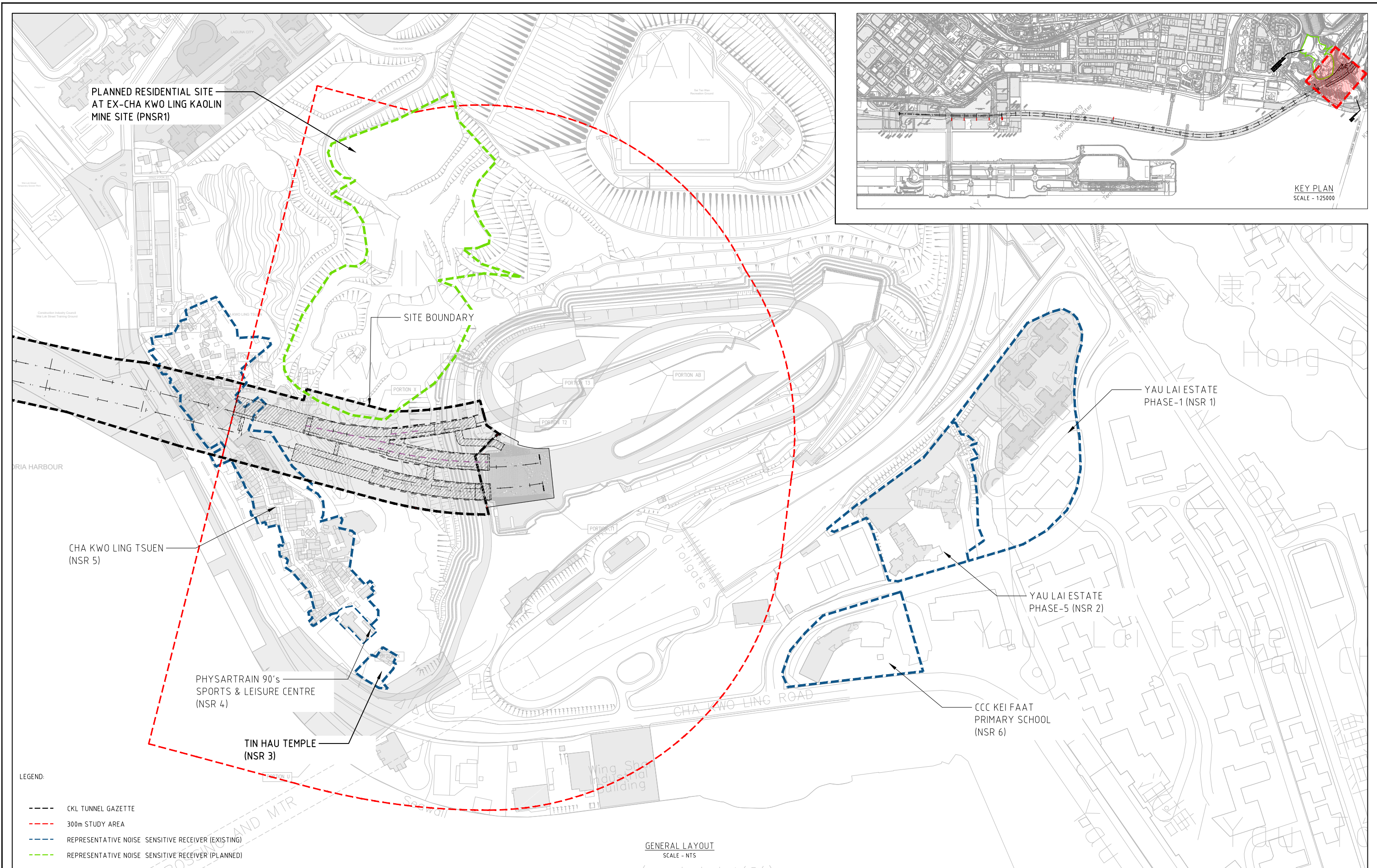
“SilentUP is definitely a useful tool to minimize the noise pollution. We successfully obtained a CNP and most importantly no complaint has been received from the NSRs.”

Clarence Yeung
Environmental Officer
Chun Wo Construction and Engineering Co. Ltd



Appendix F

Locations of Study Area & Noise Sensitive Receivers (Operational Phase)



Rev.	Date	Drawn	Design	Verif.	Description	Approved
A5	17/MAY/21	HTa	YYa	ECa	Study area revised	ASc
A4	04/FEB/21	HTa	YYa	ECa	Study area revised	ASc
A3	03/FEB/21	HTa	YYa	ECa	Study area revised	ASc
A2	03/DEC/20	HTa	YYa	ECa	PNSR 1 added	ASc
A1	30/NOV/20	HTa	YYa	ECa	First issue	ASc

Client



土木工程拓展署
Civil Engineering and
Development Department
東拓展處
East Development Office

Main Contractor



Supervising Officer



Contractor's Designer



Project

Contract No. ED/2018/04
Trunk Road T2 and Infrastructure Works
for Developments at the Former South Apron

Drawing Title

TUNNEL DRILL & BLAST
LOCATIONS OF STUDY AREA & NOISE SENSITIVE RECEIVERS
(OPERATIONAL PHASE)

Drawing no.

HKT2-BTP-MDWG-LTA-GEN-050002-A5-DFT

Scale

NTS @ A3

CADD Ref.

LTA-GEN-050002-A5-DFT

Issue Status

DRAFT (DFT)

Revision

A5

Sheet

02/02