CONTRACT HY/2009/15

CENTRAL – WAN CHAI BYPASS
TUNNEL (CAUSEWAY BAY TYPHOON SHELTER SECTION)

Noise Management Plan

Submission Status: For Approval

Revision	Description	Date
0	1st submission	20 October 2010
1	2nd submission	21 January 2011

Prepared by:	Anna Yu		21/01/2011
	Environmental Manager	Signature	Date
Checked by	Gene Cheung		21/01/2011
	Construction Manager	Signature	Date
Approved by:	K. Y. Leung		21/01/2011
	Contractor's Representative	Signature	Date

LIST OF CONTENT

1.0 Introduction

Central – Wan Chai Bypass – Tunnel (Causeway Bay Typhoon Shelter Section) (Contract No.: HY/2009/15) – as a part of the "temporary reclamation works including associated dredging works in Wan Chai Development Phase II (WDII) area" which is covered in the Environmental Permit No. EP-356/2009. Under the Part C of the EP, a noise management plan in order to fulfill the EP condition. Please refer to the site layout on Appendix A (The scale of layout is 1:1 000).

The purpose of this Noise Management Plan is to provide an evaluation of the potential noise impacts arising during construction phase of the project in the Causeway Bay Typhoon Shelter (CBTS) and ex-Wan Chai Public Cargo Working Area (ex-WCPCWA). Regarding the subsequent staged construction works for the reclamation in the CBTS and ex-WCPCWA, the Noise Management Plan would be updated accordingly.

2.0 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 Technical Memoranda:-

1. Technical Memorandum on Environmental impact Assessment Process (EIAO-TM);
2. Technical Memorandum on Noise from Construction Work other than Percussive Piling (GW-TM);
3. Technical Memorandum on Noise from Construction Work in Designated Areas (DA-TM); and
4. Technical Memorandum on Noise from Places other than Domestic Premises, Public Places or construction Sites (IND-TM).

3.0 Noise Limit

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 70dB(A) $L_{eq(30\ minutes)}$ at the facades of schools (65dB(A) during examinations). The construction noise criteria are summarized in Table 1.

Table 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 powered mechanical equipment (PME) for use 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 complied 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 2.

Table 2 Construction Noise Criteria for Activity other than Percussive Piling

Time Period	Basic noise Level (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 Identified Noise Sensitive Receivers (NSRs)

In order to evaluate the construction noise impacts from the project, representative noise sensitive receivers (NSRs) for this contract which are identified in the EIA report (Register No. AEIAR-125/2008) were selected for assessment and summarized in Table 3. The distances in below table refer to Appendix 4.1 of AEIAR-125/2008 and Appendix 4.2 of AEIAR-041-2001.

Table 3 Closest Distances between Noise Sensitive Receivers and Reclamation Zone

NSRs	Use	Dist. from Dredging Works for Mitigation of Odour (m)	Dist. from Closest Dredging and Seawall Construction Works (m)	Reclamation Zone
Elizabeth House (N6)	Residential	-	220	TPCWAW
Riviera Mansion (N7)	Residential	119	234	TCBR1W
Marco Polo Mansion (N8)	Residential	-	210	TCBR1W
Staff Quarters of FEHD (N15)	Residential	-	125	TCBR1E
Staff Quarters of FEHD (N15)	Residential	-	210	TCBR2
Marco Polo Mansion (N8)	Residential	-	280	TCBR3

5.0 Construction Noise

5.1 Construction Tasks

Below construction tasks will likely lead to emission of construction noise:

- Temporary sea wall construction, filling behind seawall, for whole of WDII construction;
- Diaphragm wall, excavation, construction of slabs and backfilling in CWB tunnel construction;
- Rock excavation at CWB tunnel (Cross Harbour Tunnel section); and
- Temporary diversion of cooling water pipeline at CBTS 4.

5.2 Uses of Powered Mechanical Equipment (PME)

Type and number of powered mechanical equipment which would be used on site are referred to Appendix 4.5 of AEIAR-125/2008 and grouped according to different stage of works. Detailed list of PME and specific noise impact of individual construction task will be reviewed in relevant method statement(s) via submission to Engineer.

6.0 Mitigation of Environmental Impacts

In order of further reduce the noise impacts to NSRs during normal daytime working hours, it is still recommended that the following noise reduction measures shall be considered as far as practicable during construction.

6.1 Quality Powered Mechanical Equipment (QPME)

For the following construction tasks of the project, it is considered necessary to adopt quiet PME:

- Temporary sea wall construction, filling behind seawall, for whole of WDII construction;
- Diaphragm wall, excavation, construction of slabs and backfilling in CWB tunnel construction;
- Rock excavation at CWB tunnel (Cross Harbour Tunnel section); and
- Temporary diversion of cooling water pipeline at CBTS 4.

Uses of the following types of QPME will be considered during the construction phase of this project to reduce noise impacts:

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

6.2 Diaphragm Walls Construction

For the construction of diaphragm walls within Portions I, II, IV and VI (see Appendix C), temporary noise barriers (5 m in height) with cantilevered upper portion (3.5 m in length) within 5 m from any static or mobile plant. Unless otherwise agreed by the Engineer Representative, the temporary noise barriers shall consist of barrier material with a surface mass of not less than 14 kg/m^2 with 25 mm thick internal sound absorptive lining to achieve the maximum screening effect.

6.3 Construction Details and Mounting Details of the Acoustic Screen

Acoustic screen will be deployed if required to shield the noise sensitive receivers from the sources of noisy activities. The acoustic screen and sound insulation materials mounting for percussion breakers of excavators are shown in Appendix D.

6.4 Other Mitigation Measures

The following good practices will be adopted when practical to alleviate noise impacts:

- All PMEs to be used on site should be properly maintained;
- Mobile plants should be sited as far as away from NSRs as possible;
- Plants shall be avoided to start up all engines simultaneously;
- Install direct noise mitigation measures including silencers, acoustic louvers and movable acoustics enclosure where necessary; and
- PMEs known to emit noise strongly in one direction should, where possible, be orientated so that the noise is directed away from the nearby NSRs.

7.0 Appendices

Appendix A – Location Plan for Noise Sensitive Receivers
Appendix B – Construction Schedule
Appendix C – Portions of Site
Appendix D – Acoustic Screen and Sound Insulation Materials Mounting for Percussion Breakers of Excavators

Appendix A – Location Plan for Noise Sensitive Receivers

LEGEND:

WORKS AREA

DREDGING AREA FOR MITIGATION OF ODOUR(DP3)

SITE BOUNDARY

N6 NOISE SENSITIVE RECEIVER AT ELIZABETH HOUSE
N7 NOISE SENSITIVE RECEIVER AT RIVIERA MANSION
N8 NOISE SENSITIVE RECEIVER AT MARCO POLO MANSION
N15 NOISE SENSITIVE RECEIVER AT STAFF QUARTERS OF FEHD

TCBR1E
TCBR2 AND TCBR3
TCBR4
TCBR1W
TPCWAE
TPCWAW
DP3
125m
210m
280m.
234m
119m
220m
(N15)
(N8)
(N7)
(N6)

中國建築工程(香港)有限公司
CHINA STATE CONSTRUCTION ENGRG. (HONG KONG) LTD.

Highways Department
CONTRACT NO. HY/2009/15
CENTRAL–WAN CHAI BYPASS –TUNNEL
(CAUSEWAY BAY TYPHOON SHELTER SECTION)

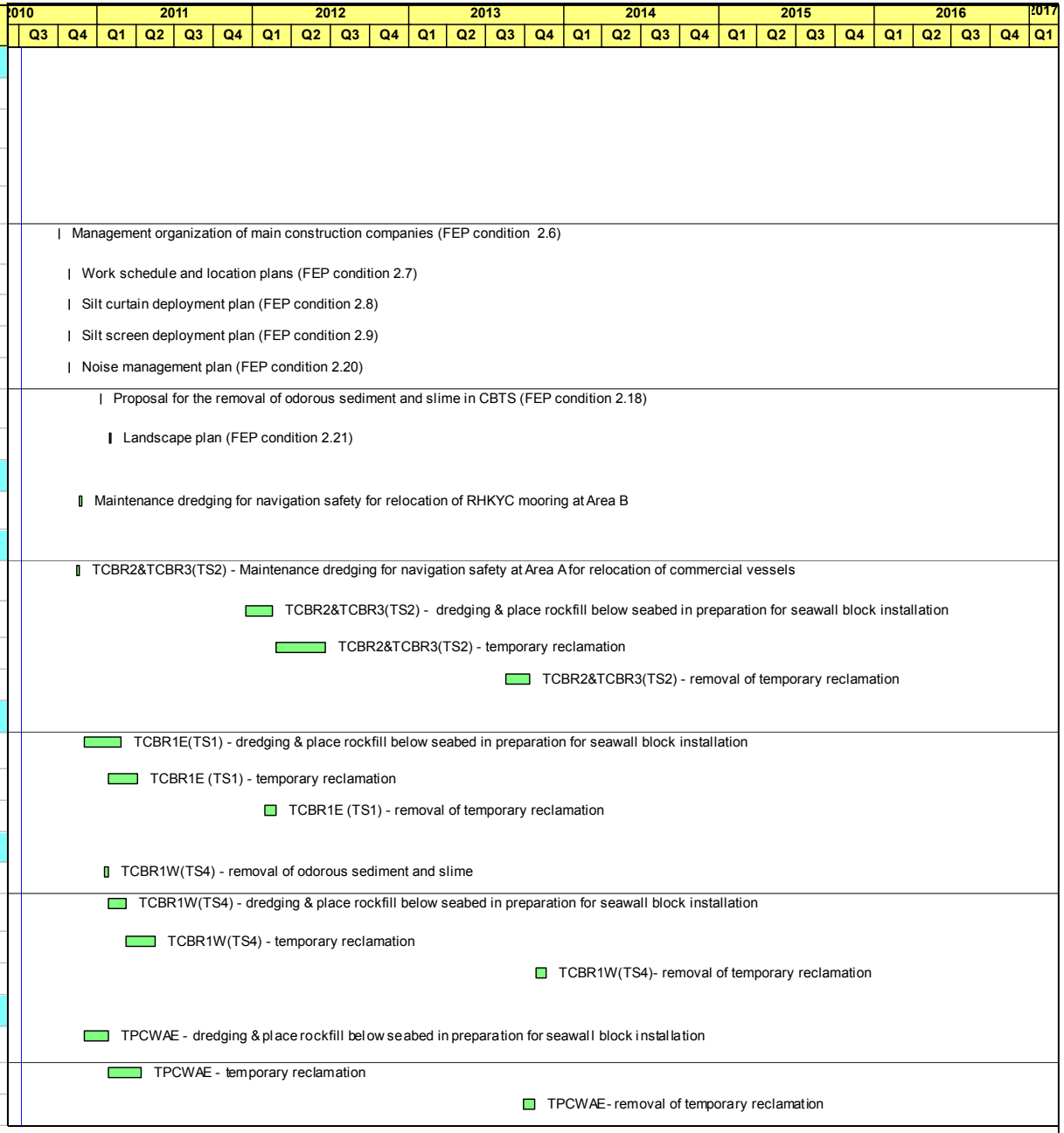
TITLE
LAYOUT PLAN FOR NOISE SENSITIVE RECEIVERS

DRG. NO.
CWBT/EPD/005B

SCALE	STATUS
N.T.S	
DIMENSIONS ARE IN MILLIMETERS	COPYRIGHT RESERVED

Appendix B – Construction Schedule

Activity ID	Activity Name	Original Duration	Start	Finish
SUBMISSIONS COMPLYING WITH EPs				
002	EM&A Manual (rely on the master EP's submission, EP-356/2009 condition 2.5)			
004	Baseline Monitoring Report (rely on the master EP's submission, EP-356/2009 condition 3.3)			
006	Monthly EM&A (rely on the master EP's submission, EP-356/2009 condition 3.4)			
008	A dedicated web site (rely on the master EP's submission, EP-356/2009 condition 4.2)			
010	Management organization of main construction companies (FEP condition 2.6)	1	02-Oct-10*	02-Oct-10
012	Work schedule and location plans (FEP condition 2.7)	1	27-Oct-10*	27-Oct-10
014	Silt curtain deployment plan (FEP condition 2.8)	1	27-Oct-10*	27-Oct-10
020	Silt screen deployment plan (FEP condition 2.9)	1	27-Oct-10*	27-Oct-10
030	Noise management plan (FEP condition 2.20)	1	27-Oct-10*	27-Oct-10
040	Proposal for the removal of odorous sediment and slime in CBTS (FEP condition 2.18)	1	10-Jan-11*	10-Jan-11
050	Landscape plan (FEP condition 2.21)	1	31-Jan-11*	31-Jan-11
TCBR4				
100	Maintenance dredging for navigation safety for relocation of RHKYC mooring at Area B	7	20-Nov-10*	26-Nov-10
TCBR2 + TCBR3 (TS2 Area)				
115	TCBR2&TCBR3(TS2) - Maintenance dredging for navigation safety at Area A for relocation of commercial vessels	5	15-Nov-10*	19-Nov-10
117	TCBR2&TCBR3(TS2) - dredging & place rockfill below seabed in preparation for seawall block installation	64	16-Dec-11*	17-Feb-12
120	TCBR2&TCBR3(TS2) - temporary reclamation	115	26-Feb-12*	19-Jun-12
160	TCBR2&TCBR3(TS2) - removal of temporary reclamation	57	18-Aug-13*	13-Oct-13
TCBR1E (TS1 Area)				
105	TCBR1E(TS1) - dredging & place rockfill below seabed in preparation for seawall block installation	86	03-Dec-10*	26-Feb-11
110	TCBR1E (TS1) - temporary reclamation	69	28-Jan-11*	06-Apr-11
155	TCBR1E (TS1) - removal of temporary reclamation	27	30-Jan-12*	25-Feb-12
TCBR1W (TS4 Area)				
123	TCBR1W(TS4) - removal of odorous sediment and slime	10	17-Jan-11*	26-Jan-11
125	TCBR1W(TS4) - dredging & place rockfill below seabed in preparation for seawall block installation	40	28-Jan-11*	08-Mar-11
130	TCBR1W(TS4) - temporary reclamation	68	09-Mar-11	15-May-11
165	TCBR1W(TS4)- removal of temporary reclamation	26	27-Oct-13*	21-Nov-13
TPCWAE				
135	TPCWAE - dredging & place rockfill below seabed in preparation for seawall block installation	55	03-Dec-10*	26-Jan-11
140	TPCWAE - temporary reclamation	77	27-Jan-11	13-Apr-11
170	TPCWAE- removal of temporary reclamation	28	28-Sep-13*	25-Oct-13



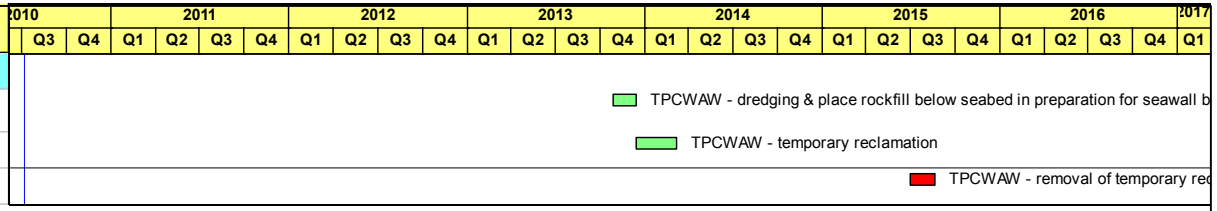
Actual Work
Remaining Work
Critical Remaining Work
Milestone

CHINA STATE CONSTRUCTION ENGG LTD

HY/2009/15 : Central-Wan Chai Bypass Tunnel (CBTS Section)

Date	Revision	Checked	Approved
06-Jan-11	Revision B		
	(File EP03)		
	(Layout EP03)		

Activity ID	Activity Name	Original Duration	Start	Finish
TPCWAW				
145	TPCWAW - dredging & place rockfill below seabed in preparation for seawall block installation	47	28-Oct-13*	13-Dec-13
150	TPCWAW - temporary reclamation	83	14-Dec-13	06-Mar-14
175	TPCWAW - removal of temporary reclamation	50	02-Jul-15*	20-Aug-15



Actual Work
Remaining Work
Critical Remaining Work
Milestone

CHINA STATE CONSTRUCTION ENGG LTD

HY/2009/15 : Central-Wan Chai Bypass Tunnel (CBTS Section)

Date	Revision	Checked	Approved
06-Jan-11	Revision B		
	(File EP03)		
	(Layout EP03)		

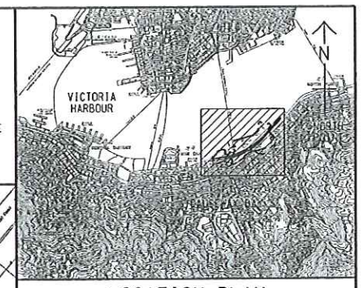
Appendix C – Portions of Site

CONTROLLED COPY
FOR CONSTRUCTION

SETTING OUT TABLE

SETTING OUT POINT	COORDINATES EASTING	COORDINATES NORTHING
510	837513.213	816469.562
532	836906.849	816039.640
533	836804.724	816016.848
535	836613.393	815957.865
559	836785.748	816072.558
560	836866.859	816091.900
561	836901.826	816102.210
562	836923.715	816109.289
579	837356.196	816557.044
580	837394.450	816601.057
581	837473.505	816478.110
589	837496.712	816446.217
590	837467.249	816509.512
591	836814.181	816018.689
592	836877.999	816090.137
593	836901.024	816078.037
594	836915.185	816074.194
595	836801.868	816022.852
596	836793.533	816027.336
597	836787.441	816027.109
607	836921.201	816098.947
614	837486.101	816493.127
615	837507.092	816461.059
616	837448.946	816494.635
617	836781.898	816071.794
618	836778.621	816033.592
619	836738.340	816012.453
620	836898.346	815964.070
621	836906.232	815941.018
622	836918.629	815936.415
623	836955.096	816011.630
625	836912.225	816043.885
631	837479.213	816484.867
632	837488.808	816478.353
633	837490.705	816481.238
634	837494.867	816478.401
635	837492.949	816475.496
636	837507.069	816465.603
637	837504.453	816457.285
638	836787.101	816038.031
639	836787.425	816013.280
640	836726.919	816006.420
641	836785.182	816087.750
642	836689.060	815966.319
643	836622.837	815931.497
644	836619.483	815940.862

NOTES:
1. ALL COORDINATES GIVEN ACCORDING TO HONG KONG (1980) GRID IN METERS.
2. COORDINATES TO BE VERIFIED WITH THE ENGINEER ON SITE.
3. THE COORDINATES OF SITE BOUNDARY SHALL REFER TO DRAWING 60095653/T1/1101.
4. THE COORDINATES OF 3A, 3B, 3C, 3D, 4D, 5C, 6B, 6E SHALL REFER TO DRAWING 60095653/T1/1221.
5. THE COORDINATES OF P3, 4E, 4F, P5, P6 REFER TO DRG. 60095653/T1/6000.



LOCATION PLAN
SCALE A1 1 : 50000
A3 1 : 100000

LEGEND:
- SITE BOUNDARY
- PORTION I
- PORTION II
- PORTION III
- PORTION IV
- PORTION V
- PORTION VI
- PORTION VII
- PORTION VIII
- PORTION IX
- PORTION X
- PORTION XI
- PORTION XII
- PORTION XIII A, PORTION XIII B
- PORTION XIV A, PORTION XIV B
- PORTION XV
- PORTION XVI
- PORTION XVII
- PORTION XVIII
- PORTION XIX
- PORTION XX A, PORTION XX B
- PORTION XXI
- PORTION XXII
- PORTION XXIII
- 501 SETTING OUT POINT

12 OCT 2010

REV. 修訂	DESCRIPTION 內容摘要	CHECKED 核對	DATE 日期
B	WORKING DRAWING	RPCM BCC	OCT 10
B	TENDER DRAWING	JTCL BCC	MAY 10

Highways Department 路政署
Major Works Project Management Office

CENTRAL - WAN CHAI BYPASS AND IEC LINK

PWP ITEM NO. 工務計劃項目編號 579 TH

CENTRAL WAN CHAI BYPASS - TUNNEL (CAUSEWAY BAY TYPHOON SHELTER SECTION)

PORTIONS OF SITE

AECOM

DRG NO. 圖紙編號 60095653/T1/1201C

DESIGNED BY 設計	CONTRACT NO. 合約編號	P. D'R. APPROVED 負責人
VLMK	HY/2009/15	CW
DRAWN BY 繪圖 NHP	STATUS 狀態	
SCALE 比例 A1 1 : 2000 A3 1 : 4000	WORKING DRAWING	
DIMENSIONS ARE IN 尺寸單位 METRES	© COPYRIGHT RESERVED 版權所有	

Plot File by : NHP2 2010-5-12

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Appendix D – Acoustic Screen and Sound Insulation Materials Mounting for Percussion Breakers of Excavators

The acoustic wrapping for the percussion breakers of excavators and the noise barrier comprise of minimum 50mm thick sound absorbing lining with a hard backing plate for the noise barrier.