### AECOM

### Gammon Construction Limited

### Contract No. HY/2014/07 Central Kowloon Route – Kai Tak West

#### **Construction Noise Mitigation Measures Plan**

Feb 2019

	Name	Signature
Prepared & Checked:	Y W Fung	7
Reviewed & Approved:	Y T Tang	- Capation

Version: D

Date: 18 February 2019

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AECOM Asia Co. Ltd. 15/F, Grand Central Plaza, Tower 1, 138 Shatin Rural Committee Road, Shatin, NT, Hong Kong Tel: (852) 3922 9000 Fax: (852) 2317 7609 www.aecom.com Gammon Construction Limited

## Contract No. HY/2014/07 Central Kowloon Route – Kai Tak West

Construction Noise Mitigation Measures Plan (CNMMP) (February 2019)

Certified by:	Y T Tang
Signature:	Capitati
Position:	Environmental Team Leader
Date:	18 February 2019





### Environmental Permit No. FEP-01/457/2013/C

### **Central Kowloon Route**

### Independent Environmental Checker Verification

Works Contract:	Kai Tak West (HY/2014/07)	

#### **Reference Document/Plan**

Document/Plan to be Certified / Verified:	Construction Noise Mitigation Measure Plan
Date of Report:	22 January 2019 (KTW/CNMMP/Version D)
Date received by IEC:	1 February 2019

#### **Reference EP Condition**

Environmental Permit Condition:

To further reduce the air-borne construction noise impacts on Yau Ma Tei Catholic Primary School (Hoi Wang Road), Tak Cheong Building, Prosperous Garden Block 1, The Coronation Tower 1, Ko Fai House of Kwun Fat Court, Grand Waterfront Tower 3 and Hang Chien Court Block J, the Permit Holder shall, no later than one month before the commencement of construction of the corresponding component(s) of the Project, submit to the Director for approval four hard copies and one electronic copy of an updated Construction Noise Mitigation Measure Plan (CNMMP). The plan shall include:-

2.9

(a) a schedule of construction works to be carried out at the works areas of the Project within 300m from the NSRs;

(b) an updated construction methodology of the construction works;

(c) an updated powered mechanical equipment (PME) list for the construction works;

(d) an updated proposal of air-borne construction noise mitigation measures for the Noise Sensitive

Receivers as mentioned above, including the provision of noise barriers, enclosures;

(e) other initiatives proposed by the Permit Holder; and

(f) an updated prediction of noise levels in accordance with the above updated information and mitigation proposals in place.

Before submission to the Director, the CNMMP shall be certified by the ET and verified by the IEC as conforming to the relevant information and recommendations contained in the EIA Report. The approved CNMMP shall be fully and properly implemented.

#### **IEC Verification**

I hereby verify that the above referenced document/plan complies with the above referenced condition of FEP-01/457/2013/C.

Mandy 20.

Ms Mandy To Independent Environmental Checker

Date:

15 February 2019

Our ref: 0436942\_IEC Verification Cert\_KTW\_CNMMP\_20190215.docx

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#### 1 INTRODUCTION

#### 1.1 **Project Description**

- 1.1.1 Central Kowloon Route (CKR) is a proposed dual 3-lane trunk road across central Kowloon linking the West Kowloon in the west and the proposed Kai Tak Development (KTD) in the east. The CKR will be about 4.7km long with an underground tunnel section of about 3.9km long, in particular, there will be an underwater tunnel of about 370m long in Kowloon Bay to the north of the To Kwa Wan Typhoon Shelter. It will connect the West Kowloon Highway at Yau Ma Tei Interchange with the road network at Kowloon Bay and the future Trunk Road T2 at KTD which will connect to the future Tseung Kwan O Lam Tin Tunnel (TKO-LTT) and Cross Bay Link (CBL). CKR, Trunk Road T2 and TKO-LTT will form a strategic highway link, namely Route 6, connecting West Kowloon and Tseung Kwan O.
- 1.1.2 The Environmental Impact Assessment (EIA) Report for CKR (Register No. AEIAR-171/2013) was approved on 11 July 2013 under the Environmental Impact Assessment Ordinance (EIAO). Following the approval of the EIA Report, an Environmental Permit (EP) was granted on 9 August 2013 (EP No. EP-457/2013) for the construction and operation. Variations of EP (VEP) were applied after the issuance of the EP. The latest VEP was applied on 20 December 2016, and the corresponding EP (EP-457/2013/C) was issued by the Director of Environmental Protection (DEP) on 16 January 2017. The construction of the CKR had been divided into different civil construction works contracts. Further EP (FEP) was applied on 30 January 2018 for Contract No. HY/2014/07 for Kai Tak West. EP No. FEP-01/457/2013/C for this Works Contract was subsequently issued by the DEP on 28 February 2018.
- 1.1.3 Contract No. HY/2014/07 for Kai Tak West (hereafter referred to as "the Project") involves the following construction activities:
  - (a) construction of an approximately 370m long underwater tunnel and the associated temporary reclamation in Kowloon Bay;
  - (b) construction of an approximately 160m long cut and cover tunnel in Ma Tau Kok;
  - (c) construction of an approximately 125m long depressed road and an approximately 170m long underpass in Kai Tak Development;
  - (d) construction and subsequent handover of access shaft, temporary traffic decking and associated noise enclosure in Ma Tau Kok to another contractor for the construction of the central tunnel section of Central Kowloon Route;
  - (e) reconstruction of Kowloon City Ferry Pier Public Transport Interchange;
  - (f) demolition and removal of the existing landside portion of the existing disused Kowloon City Vehicular Ferry Pier;
  - (g) demolition and subsequent reprovisioning of Ma Tau Kok Public Pier; and
  - (h) associated drainage and sewerage, waterworks and landscaping works.
- 1.1.4 This Works Contract was awarded to Gammon Construction Limited (the Contractor). EP No. FEP-01/457/2013/C was also granted to the Contractor.
- 1.1.5 As per Condition 2.9 of EP No. FEP-01/457/2013/C, a Construction Noise Mitigation Measures Plan (CNMMP) is required before the commencement of the Project.

#### 1.2 Purpose of this Construction Noise Mitigation Plan

- 1.2.1 Condition 2.9 of EP No. FEP-01/457/2013/C for CKR Kai Tak West (Contract No. HY/2014/07) stipulated that to further reduce the air-borne construction noise impacts on Grand Waterfront Tower 3 and Hang Chien Court Block J, the Permit Holder shall, no later than one month before the commencement of construction of the corresponding component(s) of the Project, submit to the Director for approval an updated Construction Noise Mitigation Measure Plan (CNMMP). The plan shall include:
  - (a) a schedule of construction works to be carried out at the works areas of the Project within 300m from the Noise Sensitive Receivers;

- (b) an updated construction methodology of the construction works;
- (c) an updated powered mechanical equipment (PME) list for the construction works;
- (d) an updated proposal of air-borne construction noise mitigation measures for the Noise Sensitive Receivers as mentioned above, including the provision of noise Movable Barriers, enclosures;
- (e) other initiatives proposed by the Permit Holder; and
- (f) an updated prediction of noise levels in accordance with the above updated information and mitigation proposals in place.
- 1.2.2 AECOM Asia Co. Ltd. was commissioned by Gammon Construction Limited, to prepare the CNMMP for the Project.
- 1.2.3 Version C of the CNMMP was submitted to EPD on 21 September 2018, and was approved by EPD on 23 October 2018. Gammon Construction Limited updated the construction programme and plant inventory in January 2019. The CNMMP is therefore revised based on the latest available information.
- 1.2.4 The layout of the Project and location of the NSRs are shown in **Figure 1**.

#### 2 CONSTRUCTION WORKS OF THE PROJECT

#### 2.1 Construction Activities

2.1.1 The major construction activities of the Project are summarised in Table 2.1.

#### Table 2.1 Summary of Construction Tasks for the Works

ltem	Major Construction Task
1.	Construction of an approximately 370m long underwater tunnel and the associated
	temporary reclamation in Kowloon Bay
2.	Construction of an approximately 160m long cut and cover tunnel in Ma Tau Kok
3.	Construction of an approximately 125m long depressed road and an approximately
	170m long underpass in Kai Tak Development
4.	Construction and subsequent handover of access shaft, temporary traffic decking and
	associated noise enclosure in Ma Tau Kok to another contractor for the construction
	of the central tunnel section of Central Kowloon Route
5.	Reconstruction of Kowloon City Ferry Pier Public Transport Interchange
6.	Demolition and removal of the existing landside portion of the existing disused
	Kowloon City Vehicular Ferry Pier
7.	Demolition and subsequent reprovisioning of Ma Tau Kok Public Pier
8.	Associated drainage and sewerage, waterworks and landscaping works

#### 2.2 Construction Programme

2.2.1 The construction works are expected to be conducted from April 2018 to 2023. An updated construction programme for the Project prepared by Gammon Construction Limited is shown in **Appendix 2.1**. The construction programme presents the construction activities to be undertaken and the tentative timeframe for each construction activity in corresponding worksites.

#### 2.3 Plant Inventory

2.3.1 As recommended in the Approved CKR EIA Report, quiet Powered Mechanical Equipment (PME) should be adopted for the construction works to minimise the noise impact at the NSRs. Based on the Approved CKR EIA Report, a list of quiet Powered Mechanical Equipment (PME) to be adopted for the construction works of the Project are shown in **Table 3.3**. A detailed plant inventory for individual construction activities under the Project, which the types, numbers, grouping and percentage usages of the PME, and the mitigation measures proposed for the PME have been confirmed to be reasonable and practicable by the Engineer and the Contractor, is presented in **Appendix 2.2**.

#### 3 AIRBORNE CONSTRUCTION NOISE ASSESSMENT

#### 3.1 Noise Sensitive Receiver

3.1.1 According to EP No. FEP-01/457/2013/C for CKR – Kai Tak West, CNMMP is required for two NSRs, Grand Waterfront Tower 3 and Hang Chien Court Block J. Locations of these two NSRs are shown in **Figure 1.** Details of the NSRs with the predicted noise results in the Approved CKR EIA Report are presented in **Table 3.1**.

Table 3.1	Summary of Predicted Noise Levels in the Approved CKR EIA Report
	ouninary of Fredetee Noise Levels in the Approved Otto EA Report

NSR ID NSR Description Landuse		Noise Criteria,		Maximum Construction Noise Levels, dB(A)			No. of months of
		L <sub>eq (30-min)</sub> , dB(A)	Unmitigated	Mitigated	Cumulative	exceedance (CKR only)	
E-N12	Grand Waterfront Tower 3	Residential	75	89	75	80	0
E-N21	Hang Chien Court Block J	Residential	75	94	79	82	6

Note:

[1] Bold values denote exceedance of the EIAO-TM criteria of 75 dB(A) for residential dwellings.

#### 3.2 Assessment Criteria

3.2.1 Noise impacts generated by the construction of this Project have been assessed in accordance with the criteria given in the Technical Memorandum on Environmental Impact Assessment Process (EIAO-TM). The construction noise standards are presented in **Table 3.2**.

#### Table 3.2 Daytime Construction Noise Criteria

Use	Noise Level in L <sub>eq (30-min)</sub> , dB(A)	
Residential	75	

#### 3.3 Assessment Methodology

- 3.3.1 The construction noise assessment has been conducted following the same methodology used in the Approved CKR EIA Report based on the updated construction programme and plant inventory provided by Gammon Construction Limited.
- 3.3.2 Noise impacts generated by the construction of this Project are assessed in accordance with the methodology given in the *Technical Memorandum on Noise from Construction Work Other Than Percussive Piling* (GW-TM) under the Noise Control Ordinance.
- 3.3.3 Sound power levels (SWLs) of the equipment have been made reference from Table 3 of GW-TM. Where no relevant SWL is found in the GW-TM, reference has been made to other approved EIA Reports. SWLs of the quiet PME have been made reference from EPD's Quality Powered Mechanical Equipment (QPME) labels, British Standard 5228: Part 1:2009 Noise Control on Construction and Open Sites, and other approved EIA Reports.
- 3.3.4 It is assumed that all PME items required for a particular construction activity would be located at the notional source position, as defined in GW-TM.
- 3.3.5 To predict the noise level, PME items has been divided into groups for each discrete construction task. The objective is to identify the worst case scenario representing those items of PME that would be in use concurrently at any given time. The sound pressure level (SPL) of each construction task at the NSRs is calculated based on the number of plant and the notional distance from the noise assessment points. The notional distances of the works area to the NSR are presented in **Appendix 3.1**. If there are concurrent construction tasks, the noise

levels at representative noise assessment points are predicted by adding up the SPLs of all concurrent construction tasks.

3.3.6 A positive 3 dB(A) façade correction has been added to the predicted noise levels in order to account for the façade effect at each noise assessment point. Noise impact at the worst affected sensitive façade of the NSR to the noise source is assessed.

#### 3.4 Cumulative Impacts

- 3.4.1 Based on the Approved CKR EIA Report, Shatin to Central Link Tai Wai to Hung Hom Section [SCL(TAW-HUH)], Trunk Road T2 and Infrastructure at South Apron, and Kai Tak Development (KTD) were identified to be concurrent projects of the works at CKR east portion.
- 3.4.2 The works areas and construction programme of SCL(TAW-HUH) have been reviewed based on latest available information. SCL Works Contracts 1108A - Kai Tak Barging Point Facilities, 1108 - Kai Tak Station and Associated Tunnels, and 1109 - Stations and Tunnels of Kowloon City Section are the closest works sites of SCL(TAW-HUH) to the Project site. According to Monthly Environmental Monitoring and Audit (EM&A) Report No.49 (Period 1 to 30 September 2016) for Works Contract 1108A, the construction works under the contract were completed on 29 September 2016, such that Works Contract 1108A is not a concurrent project. For Works Contracts 1108 and 1109, their works areas are beyond 300m of the NSRs of this Project. As for Trunk Road T2 and Infrastructure at South Apron, their works areas are also out of 300m of the NSRs of this Project. Therefore, cumulative construction noise impact from construction of SCL(TAW-HUH) and Trunk Road T2 and Infrastructure at South Apron is not anticipated.
- 3.4.3 For KTD, it is divided into multiple contracts with different works areas. According to the latest available information on the project website of KTD, only the works area for Contract No. KL/2012/03 Stage 4 infrastructure works at north apron area of Kai Tak Airport is within 300m of the NSRs. The contract commenced in 19 September 2013 and is estimated to complete before mid-2018. Therefore, cumulative construction noise impact from construction of KTD is anticipated from the commencement of the construction activities of this Project until mid-2018, i.e. from April to June 2018. Following the assumptions of the Approved CKR EIA Report, the noise level from KTD is assumed to be 78 dB(A) at both NSRs E-N12 and E-N21 for this assessment.

#### 3.5 Mitigation Measures

- 3.5.1 The noise mitigation measures proposed in the Approved CKR EIA Report have been considered and reviewed in this CNMMP, including use of quiet PME as summarised in **Table 3.3**, use of movable barriers/acoustic sheet barriers as summarised in **Table 3.4**, large full enclosure for mucking out point, and sequencing operation/grouping of PME.
- 3.5.2 Taking into account the latest construction programme and PME inventory provided by the Contractor, extra quiet PME for asphalt paver, dump truck, roller, vibratory, and spliter are proposed, in addition to the quiet PME proposed in the Approved CKR EIA Report. The quiet PME reference and SWL for road roller are updated as well. The quiet PME as listed in **Table 3.3** could be found in Hong Kong. However, if the exact model specified in the references of the listed quiet PME are not available during the construction period, the model with SWL not higher than the listed SWL shall be adopted.

Table 3.5 While I ME Recommended for Adoption during construction I hase				
PME	Reference <sup>[1]</sup>	SWL, dB(A)		
Asphalt paver	BS D8-24	101		
Breaker, excavator mounted, hydraulic	BS D8-13	110		
Bulldozer	Ref 4	102		
Crawler crane	BS D7-114	101		
Crawler crane on flat-top barge	BS D7-114	101		

 Table 3.3
 Quiet PME Recommended for Adoption during Construction Phase

PME	Reference [1]	SWL, dB(A)
Dump Truck	BS D9-39	103
Excavator / backhoe	BS C6-10	107
Hand held breaker	BS D8-12	106
Road roller	BS D8-30	101
Roller, vibratory	BS D3-116	106
Saw, circular wood	BS D7-79	103
Spliter	BS D8-2	118

Note:

[1] The SWLs are referred to the following references:

BS - British Standard 5228: Part 1:2009 Noise Control on Construction and Open Sites

Ref 4 - Table 4-14 of the approved EIA Report for Proposed Comprehensive Development at Wo Shang Wai, Yuen Long (Register No. AEIAR-120/2008)

3.5.3 Movable noise barriers/acoustic sheet barriers are proposed for certain PME as summarised in Table 3.4. The mitigation measures generally follow the suggestions in the Approved CKR EIA Report, except for the additional measures for air blower (electric), concrete pump truck, desander, HD90, mini backhoe (3 tonnes), mini excavator / backhoe, roller, vibratory, crawler mounted (hydraulic), spliter, vibratory hammer, hydraulic, rock drill, water pump, diesel, welding machine and welding set. Following the assumptions in the Approved CKR EIA Report, it is anticipated that suitably designed movable barriers/acoustic sheet barriers could achieve at least 5 to 10 dB(A) reduction. For a conservative assessment, only a reduction of 5 dB(A) is assumed. Movable barrier/acoustic sheet barrier material with surface mass at least 7kg/m<sup>2</sup> is recommended to achieve the predicted screening effect as suggested in the Approved CKR EIA Report. Movable barrier/acoustic sheet barrier should have no openings or gaps. Their locations should be adjusted where and when necessary taking into consideration the locations and type of PME involved and the NSRs intended to be protected.

РМЕ	Noise Mitigation Measures	Noise Reduction, dB(A)
Air blower (electric)	Movable barrier/acoustic sheet barrier	5
Air compressor	Movable barrier/acoustic sheet barrier	5
Asphalt paver	Movable barrier/acoustic sheet barrier	5
Breaker, excavator mounted, hydraulic	Movable barrier/acoustic sheet barrier	5
Bulldozer	Movable barrier/acoustic sheet barrier	5
Compactor, vibratory	Movable barrier/acoustic sheet barrier	5
Concrete lorry mixer	Movable barrier/acoustic sheet barrier	5
Concrete pump	Movable barrier/acoustic sheet barrier	5
Concrete pump truck	Movable barrier/acoustic sheet barrier	5
Crawler crane	Movable barrier/acoustic sheet barrier	5
Crusher, excavator mounted, hydraulic	Movable barrier/acoustic sheet barrier	5
Desander	Movable barrier/acoustic sheet barrier	5
Dump truck	Movable barrier/acoustic sheet barrier	5
Dump truck with grab	Movable barrier/acoustic sheet barrier	5
Dump truck, with or without grab	Movable barrier/acoustic sheet barrier	5
Excavator / backhoe	Movable barrier/acoustic sheet barrier	5
Generator	Movable barrier/acoustic sheet barrier	5
Grout mixer	Movable barrier/acoustic sheet barrier	5

#### Table 3.4 Noise Mitigation Measures for Certain PME during Construction Phase

РМЕ	Noise Mitigation Measures	Noise Reduction, dB(A)
Grout pump	Movable barrier/acoustic sheet barrier	5
Hand held breaker	Movable barrier/acoustic sheet barrier	5
HD90	Movable barrier/acoustic sheet barrier	5
Lorry with crane	Movable barrier/acoustic sheet barrier	5
Mini Backhoe (3 tonnes)	Movable barrier/acoustic sheet barrier	5
Mini Excavator / Backhoe	Movable barrier/acoustic sheet barrier	5
Pipe pile rig	Movable barrier/acoustic sheet barrier	5
Poker, vibratory, hand-held	Movable barrier/acoustic sheet barrier	5
Power pack	Movable barrier/acoustic sheet barrier	5
Road roller	Movable barrier/acoustic sheet barrier	5
Rock drill, crawler mounted (hydraulic)	Movable barrier/acoustic sheet barrier	5
Roller, vibratory	Movable barrier/acoustic sheet barrier	5
Saw, circular wood	Movable barrier/acoustic sheet barrier	5
Saw, wire	Movable barrier/acoustic sheet barrier	5
Spliter	Movable barrier/acoustic sheet barrier	5
Tractor with trailer	Movable barrier/acoustic sheet barrier	5
Vibratory hammer, hydraulic	Movable barrier/acoustic sheet barrier	5
Water pump, diesel	Movable barrier/acoustic sheet barrier	5
Welding machine	Movable barrier/acoustic sheet barrier	5
Welding set	Movable barrier/acoustic sheet barrier	5

- 3.5.4 As suggested in the Approved CKR EIA Report, large full enclosures are proposed to be installed at three mucking out points at the west, central and east portions of CKR to screen off the loading/unloading activities. Appropriate design would be adopted for any openings such as access, vents etc. to ensure the acoustic integrity of the enclosures. The full enclosure for the mucking out locations could be designed to achieved a minimum noise reduction of 15 dB(A). In order to further mitigate the noise nuisance, the full enclosure for the mucking out location would be further optimized to accommodate mobile construction plant such as lorries and dump trucks to stay inside during loading and unloading activities. According to the latest information provided by the Contractor, the mucking out point at the east portion, i.e. the area covered by the Contract, will be located within Portion 1A. The noise reduction by the large full enclosure is not considered in the calculations in this CNMMP for the worst case scenario.
- 3.5.5 Some plant items will operate sequentially within the same work site in order to minimise the noise impacts from the construction activities to the NSRs. The sequencing operation/grouping of PME as presented in **Appendix 2.2** is confirmed to be practicable by the Engineer and the Contractor.

#### 3.6 Noise Assessment Results

- 3.6.1 The airborne construction noise impacts for the construction works under the Project have been assessed based on the updated construction programme and plant inventory and are summarised in **Table 3.5**. Detailed assessment results are provided in **Appendix 3.2**. The proposed mitigation measures described in **Section 3.5** have been included in the assessment and hence only the mitigated scenario is presented.
- 3.6.2 Having implemented all practicable noise mitigation measures as stated in **Section 3.5**, the predicted noise levels at both NSRs fully comply with the EIAO-TM noise criteria of 75 dB(A)

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for residential dwelling. The predicted noise levels at Grand Waterfront Tower 3 (E-N12) range from 51 to 75 dB(A). The maximum predicted noise level remains the same as the level of 75 dB(A) predicted in the Approved CKR EIA Report. For Hang Chien Court Block J (E-N21), the predicted noise levels range from 67 to 75 dB(A). Comparing to the Approved CKR EIA Report, the maximum predicted noise level reduces from 79 to 75 dB(A). The duration of noise exceedance at E-N21 reduces from 6 months to no exceedance.

NSR ID	NSR	Noise Criteria, L <sub>eq</sub> <sub>(30-min)</sub> , dB(A)	Predicted Noise Level, L <sub>eq (30-min)</sub> , dB(A)	Exceedance, L <sub>eq (30-min)</sub> , dB(A)	No. of months of exceedance
E-N12	Grand Waterfront Tower 3	75	51 – 75	0	0
E-N21	Hang Chien Court Block J	75	67 – 75	0	0

	Table 3.5	Summary	y of Noise /	Assessment	Result (	CKR only)	
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- 3.6.3 **Table 3.6** presents the cumulative noise level at the identified NSRs and details of the calculation are given in **Appendix 3.2**. Following the Approved CKR EIA Report, the noise impacts contributed by KTD is assumed to be 78 dB(A) at both NSRs E-N12 and E-N21, which is already exceeding the noise criteria of 75 dB(A) for residential dwellings. However, the EIA study of KTD indicated that all practicable mitigation measures have been fully explored and exhausted to reduce the noise impact arising from construction activities of KTD.
- 3.6.4 Cumulative noise impact with adverse residual impacts exceeding the construction noise criteria by 3 dB(A) at E-N12 for 3 months, and 3 to 5 dB(A) at E-N21 for 3 months is predicted. Comparing to the Approved CKR EIA Report, the maximum predicted cumulative noise level at E-N12 reduces from 80 to 78 dB(A), while for E-N21, the maximum predicted cumulative noise level reduces from 82 to 80 dB(A).

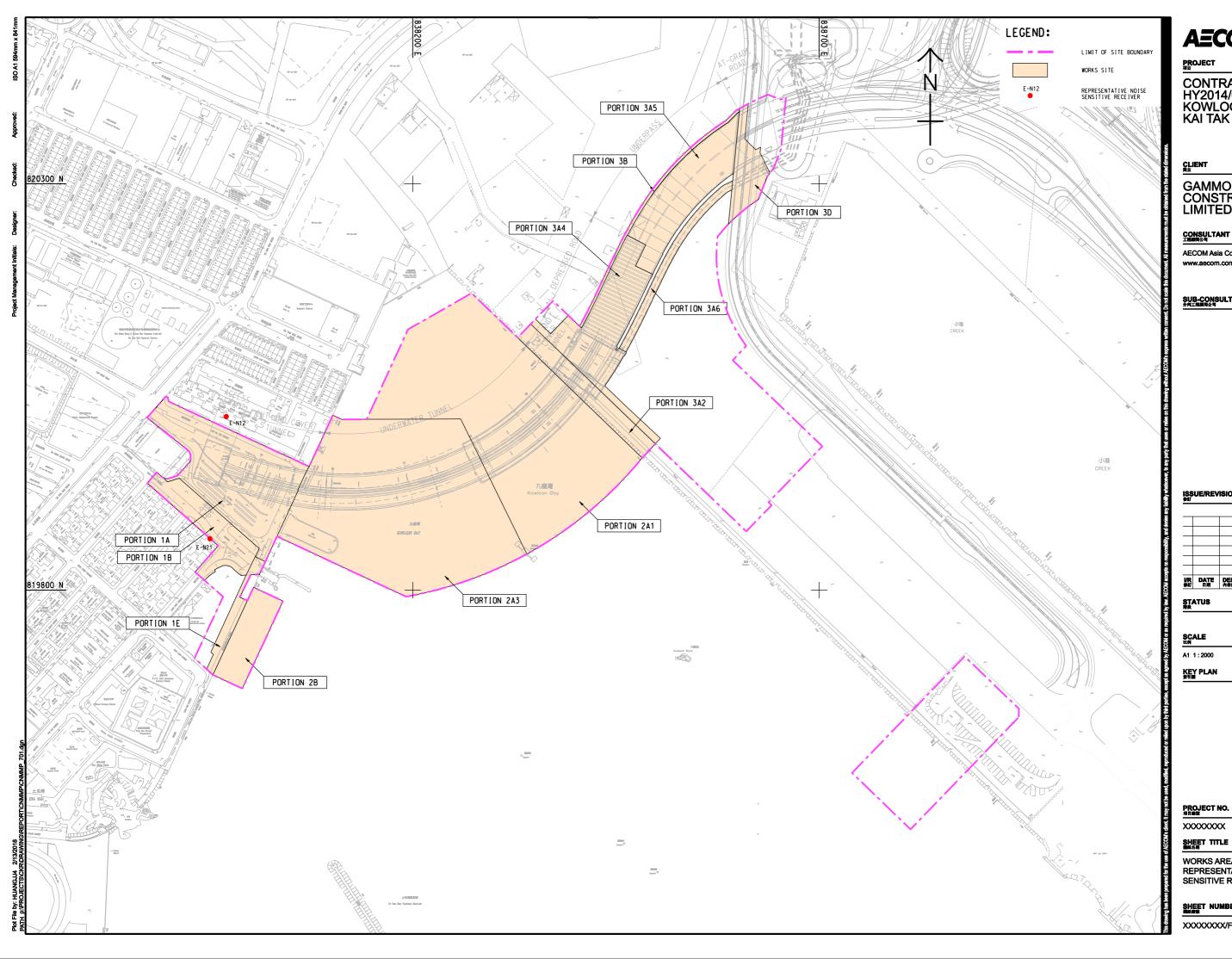
NSR ID	NSR		Predicted Noise Level, L <sub>eq (30-min)</sub> , dB(A)	Exceedance, L <sub>eq (30-min)</sub> , dB(A)	No. of months of exceedance
E-N12	Grand Waterfront Tower 3	(30-min) <b>, dB(A)</b> 75	51 – 78	3	3
E-N21	Hang Chien Court Block J	75	67 – 80	3 – 5	3

Table 3.6Summary of Noise Assessment Result (Cumulative)

#### 4 CONCLUSION

- 4.1.1 This CNMMP has predicted the construction noise impact from Contract No. HY/2014/07 to the two representative NSRs at Grand Waterfront Tower 3 (E-N12) and Hang Chien Court Block J (E-N21). This plan has taken into account the updated information on PME and works programme which would be adopted by the Contractor. With the implementation of mitigation measures in form of quiet plants, movable barriers/acoustic sheet barriers and sequencing operation/grouping of PME, comparing to the Approved CKR EIA Report, the maximum predicted noise level at Grand Waterfront Tower 3 (E-N12) remains at 75 dB(A). For Hang Chien Court Block J (E-N21), the maximum predicted noise levels at both representative NSRs are predicted to comply with the EIAO-TM noise criteria of 75 dB(A). For the cumulative impacts from KTD, comparing to the Approved CKR EIA Report, the maximum predicted cumulative noise level at Grand Waterfront Tower 3 (E-N12) reduces from 80 to 78 dB(A), while for Hang Chien Court Block J (E-N21), the maximum predicted noise level at Grand Waterfront Tower 3 (E-N12) reduces from 80 to 78 dB(A), while for Hang Chien Court Block J (E-N21), the maximum predicted noise level at Grand Waterfront Tower 3 (E-N12) reduces from 80 to 78 dB(A).
- 4.1.2 Where necessary, further review and update will be performed during the construction phase and liaison with affected parties is recommended to minimise the construction noise impacts as far as practicable.

Figure





PROJECT

CONTRACT NO. HY2014/07 CENTRAL KOWLOON ROUTE -KAI TAK WEST

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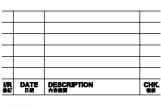
# GAMMON CONSTRUCTION LIMITED

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WORKS AREA AND LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS

#### SHEET NUMBER

XXXXXXXX/FIGURE 1

Tentative Construction Programme

**Tentative Construction Programme** 

					2018			2019			2020				2021			2022				2023	
ID	Construction Activities	Start	Finish	Δ M .I			ΕM	AMJJAS				SOND	) .I F	МАМ		SONI			ASO	ND.	F M A		
Kowloon City Vehicular Ferry Pier (Portion	1B)																						
S135, S136	Demolition of carpark building and ramp structure	02/06/18	18/07/18																				
S150	Reprovision of new parking facilities		03/09/18																				
Ma Tau Kok C&C tunnel & Access Shaft (Pe		10/01/10	00,00,10																				
S380, S420	Piling and kingposts	17/09/18	23/03/19										T										
S426	Install decking		31/05/19																				
S390, S391, S392, S393, S430, S431, S432	ELS work	01/04/19	11/05/22																				
S400	Construction of RC wall and temporary noise enclosure	02/07/20	20/08/20																				
S440	C&C Tunnel Structure	12/05/22	17/09/22																				
S910	Backfill	19/09/22	14/01/23																				
Landing Steps and Covered Walkway (Port																							
S470	Removal of existing seawall	04/01/19	31/10/19																				
S480, S490	Construction of landing steps and covered walkway	12/07/19	11/09/20																				
Marine Tunnel Stage1 (tunnel footprint of P	Portion 2A1)	-																					
S540	Construction of temp working platforms	01/11/18																					
S545, S550	Cofferdam construction of sheetpiles and pipepiles		31/07/19																				
S555	Temporary reclamation between pipepiles and sheetpiles		19/12/19																				
S560, S561, S562	ELS work		13/05/20																				
S570	Marine Tunnel Structure	09/05/20																					
S575, S576	Backfill	22/10/20																					
<u>\$580</u>	Removal of reclamation/ temp platforms	06/11/20																					
S585	Dredging for Stage 2 diversion	24/12/20	19/01/21																				
Marine Tunnel Stage2 (tunnel footprint of P		00/01/01	0.4/00/04			- I I			<u> </u>	<u> </u>		<u> </u>			<u> </u>		- <u></u>	<u> </u>					
S640	Construction of temp working platforms	20/01/21																					+ + + + +
S645, S650	Cofferdam construction of sheetpiles and pipepiles		23/09/21																				
S655 S660, S661, S662	Temporary reclamation between pipepiles and sheetpiles ELS work		08/11/21 07/06/22																				
S670	Marine Tunnel Structure	19/05/22																					+++++
S675, S676	Backfill	12/10/22																					
S677	Reprovision of MTK Public Pier	12/10/22																					
S680	Removal of reclamation/ temp platforms	10/12/22							+++														
Vertical Wall along depressed road at Porti		10/12/22	01/02/20																				
S200, S222	Pipepiles and sheetpiles	23/04/18	07/01/19										11										
Ventilation Adit at Eastern Interface(Portion		20/01/10	0.701710																				
S300	Piling and pumping test	28/04/18	07/11/18										ТТ										
S310	ELS work	08/11/18																					
S320	Ventilation Adit Structure		07/08/19																				
S325	Backfill	08/08/19	27/08/19																				
Kai Tak C&C Tunnel (Portion 3A2 & Part of	Portion 3A4)																						
S605	Piling and kingposts	05/04/18	13/12/18																				
S608	Install decking	14/12/18	28/01/19																				
S610, S611, S612	ELS work	21/01/20																					
S620	C&C Tunnel Structure	01/06/20																					
S623	Backfill	09/10/20	11/11/20																				
Depressed Road & Underpass at Kai Tak (F																							
S340, S345	Pipepiles & Kingposts & Sheetpiles		08/10/19																				
S350, S351	ELS work	09/10/19																					
S360	Depressed Rd, underpass, adit structure and backfill	30/07/20	07/05/21																				
U Trough Structures and At-grade Road at		05/10/0	00/10/01						<u> </u>						<u> </u>				1 1		<u> </u>		
S745	Sheetpiling	05/10/21				+ + + +		+ $+$ $+$ $+$ $+$ $+$				+			+ $+$ $+$ $+$					<b>   </b>	+ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$ $+$		++++
S750	ELS work	24/12/21						_		+ + +	+++				+						+ $+$ $+$	$\rightarrow$	++++
S760	Construct Trough Structure		15/11/22			+ + +			+ + +	+ + +	+++	+ $+$ $+$	+		+ $+$ $+$ $+$	+++	+++				++++	$\rightarrow$	++++
S770	Backfill & remove sheetpiles		31/01/23			+ $+$ $+$			+	$\left  \begin{array}{c} \\ \end{array} \right  \\ \left  \left  \begin{array}{c} \\ \end{array} \right  \\ \left  $			+	$\left  \right $	+ $+$ $+$ $+$	+ $+$ $+$	+++	+ $+$ $+$ $+$					+++++
S775	Roadwork for At-grade road	01/02/23	06/05/23																				

**Construction Plant Inventory** 

ID	Construction Activities	Group [1]	PME	Ref. <sup>[2]</sup>	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max S dB(A)
vloon 35,	City Vehicular Ferry P Demolition of carpark		B) Breaker, excavator mounted, hydraulic	BS D8-13	1	110	10%	-5	95	Γ
36	building and ramp		Crusher, excavator mounted, hydraulic	OCNP	1	103	30%	-5	93	
	structure			<b>DO DO 10</b>		110	450/	Total	97	
		2	Breaker, excavator mounted, hydraulic	BS D8-13	1	110	15%	-5	97	
		3	Crusher, excavator mounted, hydraulic	OCNP	2	103	40%	-5	97 97	
		5	Ordsher, excavator mounted, nydradiic	0011	2	105	4078	Total	97	
		4	Hand Held Breaker	BS D8-12	1	106	20%	-5	94	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	1	100	45%	-5	92	
			Saw, wire	OCNP	1	101	20%	-5	89	
								Total	97	
		5	Hand Held Breaker	BS D8-12	1	106	40%	-5	97	1
				0010		105	500/	Total	97	
		6	Dump truck with grab	OCNP	1	105	50%	-5	97	
		7	Dump truck with grab	OCNP	2	105	20%	-5	97 96	
		'	Dump track with grab	CON	2	105	2078	Total	96	-
		8	Dump truck with grab	OCNP	1	105	20%	-5	93	
		-	Crusher, excavator mounted, hydraulic	OCNP	1	103	50%	-5	95	
			·····, ····					Total	97	97
50	Reprovision of new	1	Asphalt paver	BS D8-24	1	101	15%	-5	88	
	parking facilities		Road roller	BS D8-30	1	101	20%	-5	89	
			Roller, vibratory	BS D3-116	1	106	20%	-5	94	
			Dump truck	BS D9-39	1	103	15%	-5	90	_
		2	Apphalt payor	DC D0 04	1	101	200/	Total	97	-
		4	Asphalt paver Roller, vibratory	BS D8-24 BS D3-116	1	101 106	30% 30%	-5 -5	91 96	1
				20 20-110	<u> </u>	100	50 /6	Total	96 97	1
		3	Asphalt paver	BS D8-24	1	101	30%	-5	91	1
		-	Road roller	BS D8-30	1	101	30%	-5	91	]
						-		Total	94	
		4	Dump truck with grab	OCNP	1	105	20%	-5	93	
								Total	93	97
	Kok C&C tunnel & Acce	ess Shaft (Po			4	114	200/	-	110	1
80, 20	Piling and kingposts	· ·	Pipe Pile Rig Air compressor, air flow > 30m3/min	CNP 167 CNP 003	4 12	114 104	30% 30%	-5 -5	110 105	-
20			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	104	100%	-5	98	
			Water pump, diesel	CNP 282	2	103	30%	-5	96	
				0111 202		100	0070	Total	111	
		2	Pipe Pile Rig	CNP 167	4	114	20%	-5	108	
			Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	14	102	25%	-5	102	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	9	100	50%	-5	102	
			Water pump, diesel	CNP 282	4	103	20%	-5	97	
			Crawler crane	BS D7-114	5	101	45%	-5	100	
			Air Blower (electric)	OCNP	10	95	50%	-5	97	
			Desander	CNP162	2	105	20%	-5	96	
			Grout mixer	OCNP OCNP	2	90	15% 10%	-5 0	80 98	
			Grout pump Vibratory hammer, hydraulic	OCNP	2	105 115	5%	-5	98 97	-
			Power pack	OCNP	1	100	5%	0	87	-
			Mini Excavator / Backhoe	OCNP	5	94	20%	0	94	
			HD90	OCNP	2	109	10%	-5	97	
			Welding Machine (electric)	Ref 1	12	95	20%	-5	94	
			Water pump, submersible	CNP 283	15	85	20%	0	90	
			Dump truck, with or without grab	OCNP	2	105	5%	0	95	
								Total	112	
		3	Pipe Pile Rig	CNP 167	2	114	20%	-5	105	
			Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	7	102	25%	-5	99	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	8	100	50%	-5	101	4
			Water pump, diesel	CNP 282	5	103	20%	-5	98	-
			Crawler crane	BS D7-114 CNP162	3	101 105	45% 20%	-5 -5	97 93	-
			Desander Grout mixer	OCNP162	4	105 90	20%	-5 -5	93 81	1
			Grout pump	OCNP	6	105	10%	-5	98	1
			Vibratory hammer, hydraulic	OCNP	1	115	5%	-5	97	1
			Power pack	OCNP	1	100	5%	0	87	1
			Mini Excavator / Backhoe	OCNP	3	94	20%	0	92	]
			HD90	OCNP	4	109	55%	-5	107	
			Welding Machine (electric)	Ref 1	10	95	20%	-5	93	1
			Water pump, submersible	CNP 283	10	85	20%	0	88	
			Dump truck, with or without grab	OCNP	2	105	5%	0	95	1
								Total	111	4
		4	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	0	103	4
			Grout mixer	OCNP	1	90	50%	0	87	-
			Grout pump	OCNP	1	105	50%	0	102	-
			Air Blower (electric) Water pump, submersible	OCNP CNP 282	2	95	100%	0	98 91	-
				CNP 283	4	85	100%	Total	91 106	1
		5	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	0	108	1
		5	Mini Backhoe (3 tonnes)	OCNP	1	94	70%	0	92	1
			Dump truck, with or without grab	OCNP	2	105	50%	0	105	1
			Water pump, submersible	CNP 283	4	85	100%	0	91	1
						•		Total	107	1
		6	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	0	103	]
			Mini Excavator / Backhoe	OCNP	1	94	70%	0	92	
			Dump truck, with or without grab	OCNP	2	105	20%	0	101	1
			Water pump, submersible	CNP 283	4	85	100%	0	91	
								Total	106	11
26	Install decking	1	Crawler crane	BS D7-114	1	101	70%	-5	94	1
			Tractor with trailer	CNP 222	1	118	30%	-5	108	4
			Generator, standard	CNP 101	1	108	100%	-5	103	4
								Total	109	4
		2	Crawler crane	BS D7-114	1	101	70%	-5	94	1
		2					0671	-	467	
		2	Flat-top Lorry Generator, standard	OCNP CNP 101	1	105 108	30% 100%	0 -5	100 103	

)	Construction Activities	Group <sup>[1]</sup>	РМЕ	Ref. <sup>[2]</sup>	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max S dB(A
		3	Lorry with crane	OCNP	1	105	60%	0	103	_
			Tractor with trailer Generator, standard	CNP 222 CNP 101	1	118 108	20% 100%	-5 -5	106 103	-
						100	10070	Total	109	
		4	Flat-top Lorry	OCNP	1	105	30%	0	100	
			Lorry with crane	OCNP	1	105	60%	0	103	
			Generator, standard	CNP 101	1	108	100%	-5	103	_
		5	Crawler crane	BS D7-114	1	101	70%	-5	<b>107</b> 94	-
		5	Drill, hand-held (electric)	CNP 065	2	98	70%	-5	94 99	
			Welding Machine (electric)	Ref 1	2	95	70%	0	96	-
			Water pump, submersible	CNP 283	4	85	70%	0	89	
			Generator, standard	CNP 101	1	108	100%	-5	103	
								Total	106	
		6	Drill, hand-held (electric)	CNP 065	2	98	70%	0	99	_
			Welding Machine (electric)	Ref 1	2	95	70%	0	96	-
			Water pump, submersible Lorry with crane	CNP 283 OCNP	4	85 105	70% 60%	0	89 103	-
			Generator, standard	CNP 101	1	103	100%	-5	103	-
						100	10070	Total	100	-
		7	Crawler crane	BS D7-114	2	101	70%	-5	97	
			Drill, hand-held (electric)	CNP 065	2	98	70%	0	99	
			Welding Machine (electric)	Ref 1	2	95	70%	0	96	
			Air Blower (electric)	OCNP	2	95	80%	0	97	
			Water pump, submersible	CNP 283	4	85	80%	0	90	_
			Lorry with crane	OCNP	3	105	30%	0	105	-
			Generator, standard	CNP 101	1	108	100%	-5 Total	103 109	10
0,	ELS work	1	Excavator / Backhoe	BS C6-10	2	107	70%	-5	109	10
1,		1	Breaker, excavator mounted, hydraulic	BS D8-13	2	110	30%	-5	103	]
2,			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	
3,			Air Blower (electric)	OCNP	2	95	100%	0	98	1
D,			Water pump, submersible	CNP 283	2	85	80%	0	87	4
1, 2				DC 22 15	C C	410	4001	Total	107	4
-		2	Breaker, excavator mounted, hydraulic Generator, silenced, 75 dB(A) at 7 m	BS D8-13 CNP 102	2	110 100	40% 100%	-5 -5	104 98	4
			Air Blower (electric)	OCNP 102	2	95	100%	-5	98	-
			Water pump, submersible	CNP 283	2	85	100%	0	88	-
				0.11 200	-	00	10070	Total	105	
		3	Excavator / Backhoe	BS C6-10	2	107	80%	-5	104	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	
			Dump truck, with or without grab	OCNP	2	105	20%	-5	96	
			Air Blower (electric)	OCNP	2	95	100%	-5	93	
			Water pump, submersible	CNP 283	2	85	100%	0	88	
				0110 001		100	0.00/	Total	106	
		4	Drill, percussive, hand-held (electric)	CNP 064 CNP 065	2	103 98	30% 30%	0	101 93	-
			Drill/ grinder, hand-held (electric) Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	93	-
			Welding Set	Ref 2	2	78	70%	0	79	-
			Air Blower (electric)	OCNP	2	95	100%	-5	93	-
			Water pump, submersible	CNP 283	2	85	70%	0	86	
								Total	104	
		5	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	_
			Lorry with crane	OCNP	1	105	60%	-5	98	-
			Air Blower (electric)	OCNP	2	95	100%	-5	93 88	-
			Water pump, submersible	CNP 283	2	85	100%	0 Total	102	-
		6	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	-
		Ũ	Crawler crane	BS D7-114	1	101	60%	-5	94	-
			Air Blower (electric)	OCNP	2	95	100%	-5	93	
			Water pump, submersible	CNP 283	2	85	100%	0	88	
-								Total	101	1
					3	100	100%	-5	100	
		7	Generator, silenced, 75 dB(A) at 7 m	CNP 102	-	100				
		7	Lorry with crane	OCNP	2	105	30%	-5	98	
		7	Lorry with crane Crawler crane	OCNP BS D7-114	2	105 101	40%	-5	98 95	
		7	Lorry with crane Crawler crane Welding Set	OCNP BS D7-114 Ref 2	2 2 5	105 101 78	40% 70%	-5 0	98 95 83	
		7	Lorry with crane Crawler crane Welding Set Air Blower (electric)	OCNP BS D7-114 Ref 2 OCNP	2 2 5 5	105 101 78 95	40% 70% 90%	-5 0 -5	98 95 83 97	-
		7	Lorry with crane Crawler crane Welding Set	OCNP BS D7-114 Ref 2	2 2 5	105 101 78	40% 70%	-5 0 -5 0	98 95 83	
		7	Lorry with crane Crawler crane Welding Set Air Blower (electric)	OCNP BS D7-114 Ref 2 OCNP	2 2 5 5	105 101 78 95	40% 70% 90%	-5 0 -5	98 95 83 97 95	-
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible	OCNP BS D7-114 Ref 2 OCNP CNP 283	2 2 5 5 10	105 101 78 95 85	40% 70% 90% 100%	-5 0 -5 0 Total	98 95 83 97 95 <b>104</b>	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck	OCNP BS D7-114 Ref 2 OCNP 283 BS C6-10 BS D7-114 BS D9-39	2 2 5 5 10 5 5 4	105 101 78 95 85 107 101 103	40% 70% 90% 100% 30% 30% 20%	-5 0 -5 0 <b>Total</b> -5 -5 0	98 95 83 97 95 <b>104</b> 104 98 102	-
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck	OCNP BS D7-114 Ref 2 OCNP CNP 283 BS C6-10 BS D7-114 BS D9-39 CNP 047	2 2 5 5 10 5 5 4 1	105 101 78 95 85 107 101 103 109	40% 70% 90% 100% 30% 20% 30%	-5 0 <b>Total</b> -5 -5 0 -5	98 95 83 97 95 <b>104</b> 104 98 102 99	-
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete truck	OCNP BS D7-114 Ref 2 OCNP CNP 283 BS C6-10 BS D7-114 BS D9-39 CNP 047 CNP 044	2 5 5 10 5 5 4 1 1	105 101 78 95 85 107 101 103 109 109	40% 70% 90% 100% 30% 20% 30% 30%	-5 0 -5 0 <b>Total</b> -5 -5 0 -5 -5 -5	98           95           83           97           95           104           98           102           99           99	-
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete truck Poker, vibratory, hand-held	OCNP BS D7-114 Ref 2 OCNP ENP 283 BS C6-10 BS D7-114 BS D9-39 CNP 047 CNP 044 OCNP	2 5 5 10 5 4 1 1 3	105 101 78 95 85 107 101 103 109 109 102	40% 70% 90% 100% 30% 20% 30% 30% 30% 30%	-5 0 <b>Total</b> -5 -5 0 -5 -5 -5 -5	98 95 83 97 95 <b>104</b> 104 98 102 99 99 99	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete pump truck Poker, vibratory, hand-held Lorry with crane	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS C6-10           BS D7-114           BS D9-39           CNP 047           CNP 044           OCNP           OCNP	2 5 5 10 5 4 1 1 3 1	105 101 78 95 85 107 101 103 109 109 109 102	40% 70% 90% 100% 30% 20% 30% 30% 30% 30% 20%	-5 0 -5 0 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 <b>104</b> 104 98 102 99 99 99 97 93	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete pump truck Concrete truck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min	OCNP           BS D7-114           Ref 2           OCNP           ES C6-10           BS D7-114           BS D7-114           BS D7-114           BS D9-39           CNP 047           CNP 044           OCNP           OCNP           OCNP           OCNP 003	2 5 5 10 5 4 1 1 3 1 2	105 101 78 95 85 107 101 103 109 109 109 102 105 104	40% 70% 90% 100% 30% 20% 30% 30% 30% 20% 20%	-5 0 -5 0 <b>Total</b> -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 <b>104</b> 104 98 102 99 99 99 99 99 93 95	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete runck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m	OCNP           BS D7-114           Ref 2           OCNP           ES C6-10           BS C6-10           BS D7-114           BS D9-39           CNP 047           CNP 044           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 043           OCNP           ONP 042	2 2 5 5 10 5 4 1 1 3 1 2 9	105 101 78 95 85 107 101 103 109 109 109 109 105 104 100	40% 70% 90% 100% 30% 30% 30% 30% 30% 20% 20% 30%	-5 0 <b>Total</b> -5 -5 0 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 <b>104</b> 104 98 102 99 99 97 93 95 99	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete truck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m Pipe Pile Rig	OCNP           BS D7-114           Ref 2           OCNP           BS D7-114           BS D7-114           BS D7-114           BS D9-39           CNP 047           CNP 044           OCNP           OCNP           OCNP 102           CNP 102           CNP 167	2 5 5 10 5 4 1 1 3 1 2	105 101 78 95 85 107 101 103 109 109 109 102 105 104 100 114	40% 70% 90% 100% 30% 20% 30% 30% 30% 20% 20%	-5 0 <b>Total</b> -5 -5 0 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 <b>104</b> 104 98 102 99 99 99 99 99 93 95	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete runck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m	OCNP           BS D7-114           Ref 2           OCNP           ES C6-10           BS C6-10           BS D7-114           BS D9-39           CNP 047           CNP 044           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 043           OCNP           ONP 042	2 5 5 10 5 4 1 1 3 1 2 9 2	105 101 78 95 85 107 101 103 109 109 109 109 105 104 100	40% 70% 90% 100% 30% 20% 30% 30% 20% 20% 20% 20% 20% 20%	-5 0 <b>Total</b> -5 -5 0 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 <b>104</b> 104 98 102 99 99 99 97 93 95 99 99 105	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete pump truck Concrete ruck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS C6-10           BS D7-114           BS D9-39           CNP 047           CNP 044           OCNP           OCNP 047           CNP 047           CNP 047           OCNP 102           CNP 102           CNP 167           CNP 282           CNP 162	2 5 5 10 5 4 1 1 3 1 2 9 9 2 7	105 101 78 95 85 107 101 103 109 109 102 105 104 104 100 114 102 103 105	40% 70% 90% 100% 30% 20% 30% 30% 20% 20% 20% 20% 20% 20%	-5 0 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 <b>104</b> 104 98 102 99 99 97 93 95 99 95 99 105 98	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete truck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min Water pump, diesel	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS C6-10           BS D7-114           BS D9-39           CNP 047           CNP 047           CNP 047           OCNP           OCNP 047           CNP 003           CNP 102           CNP 167           CNP 162           OCNP           CNP 162           OCNP	2 5 5 10 5 4 1 3 1 2 9 2 7 5 1 4	105 101 78 95 85 107 101 103 109 109 109 109 102 105 104 104 100 114 102 103 105 90	40% 70% 90% 100% 30% 20% 20% 30% 30% 30% 20% 20% 20% 20% 20% 20% 20% 20%	-5 0 <b>Total</b> -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 <b>104</b> 104 98 99 99 97 93 95 99 97 93 95 99 98 98 98 98 98	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete pump truck Concrete truck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min Water pump, diesel Desander Grout mixer Grout pump	OCNP           BS D7-114           Ref 2           OCNP           ES C6-10           BS D7-114           BS D7-114           BS D9-39           CNP 047           CNP 047           OCNP           OCNP 047           OCNP 047           OCNP 047           OCNP 102           CNP 1067           CNP 032           CNP 047           CNP 102           CNP 102           CNP 282           CNP 162           OCNP           OCNP	2 5 5 5 10 5 5 4 1 1 3 1 2 9 2 7 5 1 4 6	105 101 78 95 85 107 101 103 109 109 109 102 105 104 100 114 102 103 105 90 105	40% 70% 90% 100% 30% 20% 30% 30% 30% 20% 20% 20% 20% 20% 20% 20% 20% 20% 2	-5 0 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 104 98 102 99 97 99 97 93 95 99 90 95 98 98 98 98 98	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete truck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silencefl, of S dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min Water pump, diesel Desander Grout mixer Grout pump Vibratory hammer, hydraulic	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS C6-10           BS D7-114           BS D9-39           CNP 047           CNP 044           OCNP           OCNP 047           CNP 047           CNP 047           OCNP 02           CNP 03           CNP 102           CNP 102           CNP 167           CNP 162           OCNP           OCNP           OCNP	2 2 5 5 5 4 1 1 3 1 2 7 7 5 1 4 4 6 1	105 101 78 95 85 107 101 103 109 109 102 105 104 104 100 114 102 103 105 90 105 115	40% 70% 90% 100% 30% 20% 30% 30% 20% 20% 20% 20% 20% 20% 20% 20% 20% 2	-5 0 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 104 104 98 99 99 99 99 99 99 99 99 93 95 99 99 99 99 99 93 88 81 98 98 93 81 98	
			Lorry with crane Crawler crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete pump truck Concrete pump truck Concrete pump truck Concrete ruck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min Water pump, diesel Desander Grout mixer Grout mixer Grout pump Vibratory hammer, hydraulic Power pack	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS C6-10           BS D7-114           BS D9-39           CNP 047           CNP 02           CNP 102           CNP 102           CNP 162           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP	2 5 5 5 4 1 1 2 9 2 7 5 1 4 6 1 1	105 101 78 95 85 107 101 103 109 109 109 105 104 100 104 100 114 102 105 105 90 105 115 100	40% 70% 90% 100% 30% 20% 20% 30% 30% 20% 20% 20% 20% 20% 20% 20% 20% 5%	-5 0 <b>Total</b> -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 104 98 104 98 99 99 99 99 97 93 95 99 95 98 98 98 81 98 98 98 81 98	
			Lorry with crane Crawler crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete pump truck Concrete pump truck Concrete ruck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min Water pump, diesel Desander Grout mixer Grout pump Vibratory hammer, hydraulic Power pack Mini Excavator / Backhoe	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS D7-114           BS D7-114           BS D7-114           BS D9-047           CNP 044           OCNP           OCNP 003           CNP 102           CNP 102           CNP 167           CNP 162           OCNP	2 5 5 5 5 10 5 5 4 1 1 1 2 9 9 2 7 5 1 4 6 1 3	105 101 78 95 85 107 101 103 109 109 109 109 105 104 100 114 102 105 105 105 105 105 115 115 100 94	40% 70% 90% 100% 30% 20% 20% 30% 30% 30% 20% 20% 20% 20% 20% 20% 20% 5% 5% 5%	-5 0 <b>Total</b> -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 104 98 102 99 99 97 99 99 97 95 99 99 95 98 98 98 98 98 98 98 98 81 98 82 87	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete truck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silencefl, of 5 dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min Water pump, diesel Desander Grout mixer Grout pump Vibratory hammer, hydraulic Power pack Mini Excavator / Backhoe H090	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS D7-114           BS D7-114           BS D7-114           BS D9-39           CNP 047           CNP 047           CNP 047           OCNP           OCNP 102           CNP 102           CNP 102           CNP 102           CNP 282           CNP 162           OCNP	2 2 5 5 5 4 1 1 3 1 2 7 7 5 1 4 4 6 1 1 1 3 2 2	105 101 78 95 85 107 101 103 109 102 105 104 100 105 105 105 105 115 100 90 90 90 90 90 90 90 90 90 90 90 90 9	40% 70% 90% 100% 30% 20% 30% 30% 20% 20% 20% 20% 20% 20% 20% 20% 20% 2	-5 0 <b>Total</b> -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 104 104 99 99 99 99 99 99 99 99 99 99 99 99 99	
			Lorry with crane Crawler crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete pump truck Concrete pump truck Concrete pump truck Concrete ruck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min Water pump, diesel Desander Grout mixer Grout mixer Grout pump Vibratory hammer, hydraulic Power pack Mini Excavator / Backhoe HD90 Welding Machine (electric)	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS C6-10           BS D7-114           BS D9-39           CNP 047           CNP 047           CNP 047           OCNP           OCNP 047           CNP 047           CNP 047           CNP 047           CNP 047           CNP 047           CNP 02           CNP 102           CNP 102           CNP 162           OCNP	2 5 5 5 4 1 1 1 2 9 2 7 7 5 1 4 6 1 1 3 2 2 7 7 5 1 1 4 6 1 1 2 1 0	105 101 78 95 85 107 101 103 109 109 102 105 104 100 105 105 105 90 105 90 105 115 115 100 99 95	40% 70% 90% 100% 30% 20% 20% 30% 30% 30% 20% 20% 20% 20% 20% 20% 20% 20% 20% 2	-5 0 <b>Total</b> -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 104 98 99 99 99 97 99 99 95 99 95 98 98 98 98 98 98 98 98 98 98 98 98 98	
			Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete truck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silencefl, 75 dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min Water pump, diesel Desander Grout mixer Grout pump Vibratory hammer, hydraulic Power pack Mini Excavator / Backhoe H090	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS D7-114           BS D7-114           BS D7-114           BS D9-39           CNP 047           CNP 047           CNP 047           OCNP           OCNP 102           CNP 102           CNP 102           CNP 102           CNP 282           CNP 162           OCNP	2 2 5 5 5 4 1 1 3 1 2 7 7 5 1 4 4 6 1 1 1 3 2 2	105 101 78 95 85 107 101 103 109 102 105 104 100 105 105 105 105 115 100 90 90 90 90 90 90 90 90 90 90 90 90 9	40% 70% 90% 100% 30% 20% 30% 30% 20% 20% 20% 20% 20% 20% 20% 20% 20% 2	-5 0 <b>Total</b> -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 104 104 98 102 99 97 99 97 99 97 95 99 99 95 98 98 98 98 98 98 98 98 98 98 98 98 98	
		8	Lorry with crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete truck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min Water pump, diesel Desander Grout pump Vibratory hammer, hydraulic Power pack Mini Excavator / Backhoe H090 Welding Machine (electric) Water pump, submersible	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS D7-114           BS D7-114           BS D7-114           BS D9-39           CNP 047           CNP 047           CNP 047           OCNP           OCNP 102           CNP 282           OCNP           OCNP	2 2 5 5 5 4 1 1 3 1 2 7 5 1 4 4 6 1 1 1 3 2 2 7 5 1 1 4 6 1 1 1 3 2 2 10	105           101           78           95           85           107           101           103           109           102           105           104           102           103           104           105           105           105           105           105           105           105           105           105           105           105           105           105           105           105           105           109           95           85	40% 70% 90% 100% 30% 20% 30% 30% 20% 20% 20% 20% 20% 20% 20% 20% 20% 2	-5 0 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 104 104 98 99 99 97 93 99 97 93 95 98 98 98 98 93 81 105 98 93 81 105 98 93 81 112	
			Lorry with crane Crawler crane Crawler crane Welding Set Air Blower (electric) Water pump, submersible Excavator / Backhoe Crawler crane Dump truck Concrete pump truck Concrete pump truck Concrete pump truck Concrete pump truck Concrete ruck Poker, vibratory, hand-held Lorry with crane Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min Water pump, diesel Desander Grout mixer Grout mixer Grout pump Vibratory hammer, hydraulic Power pack Mini Excavator / Backhoe HD90 Welding Machine (electric)	OCNP           BS D7-114           Ref 2           OCNP           CNP 283           BS C6-10           BS D7-114           BS D9-39           CNP 047           CNP 047           CNP 047           OCNP           OCNP 047           CNP 047           CNP 047           CNP 047           CNP 047           CNP 047           CNP 050           CNP 102           CNP 102           CNP 162           OCNP	2 5 5 5 4 1 1 1 2 9 2 7 7 5 1 4 6 1 1 3 2 2 7 7 5 1 1 4 6 1 1 2 1 0	105 101 78 95 85 107 101 103 109 109 102 105 104 100 105 105 105 90 105 90 105 115 115 100 99 95	40% 70% 90% 100% 30% 20% 20% 30% 30% 30% 20% 20% 20% 20% 20% 20% 20% 20% 20% 2	-5 0 <b>Total</b> -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	98 95 83 97 95 104 104 98 102 99 97 99 97 99 97 95 99 99 95 98 98 98 98 98 98 98 98 98 98 98 98 98	

Construction Activities	Group <sup>[1]</sup>	РМЕ	Ref. <sup>[2]</sup>	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max S dB(A
	10	Excavator / Backhoe	BS C6-10	5	107	15%	-5	101	
		Crawler crane	BS D7-114 BS D9-39	3	101	20% 20%	-5	94 97	
		Dump truck Concrete pump truck	CNP 047	4	103	20%	-5 -5	97	
		Concrete truck	CNP 047 CNP 044	1	109	5%	-5	91	
		Poker, vibratory, hand-held	OCNP 044	3	109	5%	-5	89	
		Lorry with crane	OCNP	1	102	15%	-5	92	
		Breaker, excavator mounted, hydraulic	BS D8-13	5	110	10%	-5	102	
		Rock drill, crawler mounted (hydraulic)	CNP 182	3	123	5%	-5	110	
		Spliter	BS D8-2	1	118	5%	-5	100	
		Air compressor, air flow > 30m3/min	CNP 003	2	104	20%	-5	95	
		Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	20%	-5	91	
			0111 102	L	100	2070	Total	112	
	11	Excavator / Backhoe	BS C6-10	5	107	30%	-5	104	
		Crawler crane	BS D7-114	3	101	30%	-5	96	
		Dump truck	BS D9-39	4	103	25%	-5	98	
		Concrete pump truck	CNP 047	1	109	20%	-5	97	
		Concrete truck	CNP 044	1	109	15%	-5	96	
		Poker, vibratory, hand-held	OCNP	3	103	20%	-5	95	
		Lorry with crane	OCNP	1	105	20%	-5	93	
		Breaker, excavator mounted, hydraulic	BS D8-13	10	110	8%	-5	104	
		Rock drill, crawler mounted (hydraulic)	CNP 182	1	123	8%	-5	104	
					118	8%	-5	102	
		Spliter	BS D8-2	1					
		Air compressor, air flow > 30m3/min	CNP 003	2	104	30%	-5	97	
		Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	25%	-5	92	
	10		DO 00 10	-	107	450/	Total	112	
	12	Excavator / Backhoe	BS C6-10	5	107	15%	-5	101	1
		Crawler crane	BS D7-114	3	101	30%	-5	96	-
		Dump truck	BS D9-39	4	103	15%	-5	96	1
		Concrete pump truck	CNP 047	1	109	30%	-5	99	1
		Concrete truck	CNP 044	1	109	30%	-5	99	1
		Poker, vibratory, hand-held	OCNP	3	102	30%	-5	97	1
		Lorry with crane	OCNP	1	105	30%	-5	95	1
		Breaker, excavator mounted, hydraulic	BS D8-13	4	110	15%	-5	103	1
		Rock drill, crawler mounted (hydraulic)	CNP 182	1	123	8%	-5	107	
		Spliter	BS D8-2	1	118	8%	-5	102	
		Air compressor, air flow > 30m3/min	CNP 003	2	104	30%	-5	97	
		Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	30%	-5	93	
							Total	111	
	13	Breaker, excavator mounted, hydraulic	BS D8-13	2	110	20%	-5	101	
		Concrete pump truck	CNP 047	2	109	25%	-5	101	
		Concrete truck	CNP 044	2	109	30%	-5	102	
		Poker, vibratory, hand-held	OCNP	3	102	30%	-5	97	
		Air compressor, air flow > 30m3/min	CNP 003	2	104	60%	-5	100	
		Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	50%	-5	95	
		Rock drill, crawler mounted (hydraulic)	CNP 182	1	123	8%	-5	107	
		Spliter	BS D8-2	1	118	8%	-5	102	
			000002			070	Total	111	
	14	Breaker, excavator mounted, hydraulic	BS D8-13	8	110	8%	-5	103	
	14	Excavator / Backhoe	BS C6-10	5	107	15%	-5	100	
		Crawler crane	BS D7-114	3	101	45%	-5	97	
		Dump truck	BS D9-39	4	103	30%	-5	99	
		Air compressor, air flow > 30m3/min	CNP 003	2	100	60%	-5	100	
		Generator, silenced, 75 dB(A) at 7 m	CNP 003 CNP 102		104	40%	-5	94	
				2					
		Rock drill, crawler mounted (hydraulic)	CNP 182	1	123	8%	-5	107	
		Spliter	BS D8-2	1	118	8%	-5	102	
							Total	111	111
Construction of RC	1	Mini Excavator / Backhoe	OCNP	1	94	80%	-5	88	
wall and temporary		Water pump, submersible	CNP 283	2	85	100%	0	88	
noise enclosure		Generator, standard	CNP 101	2	108	100%	-5	106	
					-		Total	106	
	2	Mini Excavator / Backhoe	OCNP	1	94	80%	-5	88	
		Dump truck, with or without grab	OCNP	1	105	20%	0	98	
		Generator, standard	CNP 101	2	108	100%	-5	106	1
							Total	107	1
	3	Crawler crane	BS D7-114	1	101	60%	0	99	1
		Tractor with trailer	CNP 222	1	118	20%	-5	106	1
		Generator, standard	CNP 101	2	108	100%	-5	106	1
							Total	109	
	4	Lorry with crane	OCNP	1	105	60%	0	103	1
		Tractor with trailer	CNP 222	1	118	20%	-5	106	J
		Generator, standard	CNP 101	2	108	100%	-5	106	
						1	Total	110	]
	5	Crawler crane	BS D7-114	1	101	60%	0	99	1
		Lorry with crane	OCNP	1	105	60%	0	103	1
		Generator, standard	CNP 101	2	108	100%	-5	106	1
					-	·	Total	108	1
	6	Concrete Lorry Mixer	CNP 044	1	109	50%	-5	101	1
	-	Poker, vibratory, hand-held	OCNP	1	102	50%	-5	94	1
1		Generator, standard	CNP 101	2	108	100%	-5	106	1
				-			Total	107	1
	7	Lorry with crane	OCNP	1	105	60%	0	103	1
1	·	Welding Set	Ref 2	2	78	50%	-5	73	1
1		Cherry picker / Scissor platform	Ref 3	2	105	50%	0	105	1
		Generator, standard	CNP 101	2	105	100%	-5	105	1
		Gonorator, standard		2	100	100 /6		110	1
1	0	Crowler erene	DC D7 111		101	600/	Total		1
	8	Crawler crane	BS D7-114	1	101	60%	0	99	1
		Welding Set	Ref 2	2	78	50%	-5	73	-
		Cherry picker / Scissor platform	Ref 3	2	105	50%	0	105	1
		Generator, standard	CNP 101	2	108	100%	-5	106	1
1							Total	109	
		Mini Backhoe (3 tonnes)	OCNP	1	94	60%	-5	87	
		Welding Set	Ref 2	2	78	50%	-5	73	]
1		Air Blower (electric)	OCNP	2	95	100%	-5	93	1
		Cherry picker / Scissor platform	Ref 3	2	105	50%	0	105	1
		A for a second descent of the second se							
		Generator, standard	CNP 101	2	108	100%	-5	106	

ID	Construction Activities	Group <sup>[1]</sup>	РМЕ	Ref. <sup>[2]</sup>	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max SP dB(A) <sup>[</sup>
		10	Winch	CNP 262	1	95	100%	0	95	
			Concrete pump truck Concrete truck	CNP 047 CNP 044	1	109	50% 50%	-5 -5	101 104	
			Poker, vibratory, hand-held	OCNP	3	109	50%	-5	99	
			Lorry with crane	OCNP	1	105	100%	-5	100	
			Lony with orano	0011		100	10070	Total	108	
		11	Mobile crane	CNP 048	2	112	30%	0	110	
			Welding Set	Ref 2	2	78	50%	-5	73	
			Lorry with crane	OCNP	1	105	80%	-5	99	
			Scissor platform	Ref 3	2	105	50%	0	105	
						•		Total	111	111
6440	C&C Tunnel Structure	1	Bar bender and cutter	CNP 021	2	90	70%	0	91	
			Saw, circular wood	BS D7-79	2	103	50%	-5	98	
			Air Blower (electric)	OCNP	2	95	80%	-5	92	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	
			Water pump, submersible	CNP 283	8	85	80%	0	93	
		2	Concrete Lorry Mixer	CNP 044	2	109	80%	Total -5	102 106	-
		2	Concrete pump	CNP 044	2	109	80%	-5	106	
			Poker, vibratory, hand-held	OCNP	3	102	50%	-5	99	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	102	100%	-5	98	
			Water pump, submersible	CNP 283	4	85	80%	0	90	
				0111 200		00	0070	Total	110	
		3	Crawler crane	BS D7-114	2	101	50%	-5	96	
		-	Air Blower (electric)	OCNP	2	95	100%	-5	93	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	
	1		Water pump, submersible	CNP 283	8	85	80%	0	93	
	1							Total	102	
	1	4	Lorry with crane	OCNP	1	105	60%	-5	98	-
	1		Air Blower (electric)	OCNP	2	95	80%	-5	92	-
	1		Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	-
	1		Water pump, submersible	CNP 283	8	85	80%	0 Total	93	-
	1	_	Par bandar and auttor		<u>^</u>		E00/	Total	102	-
		5	Bar bender and cutter Drill/ grinder, hand-held (electric)	CNP 021 CNP 065	2	90 98	50% 30%	0	90 93	-
	1			BS D7-79	1 4	98 103	30% 50%	0 -5	93	-
			Saw, circular wood Air Blower (electric)	OCNP	2	95	50% 80%	-5 -5	92	1
	1		Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	92	1
			Water pump, submersible	CNP 283	8	85	80%	0	93	
					, ž			Total	104	
		6	Crawler Crane	BS D7-114	2	101	100%	-5	99	
		-	Lorry with crane	OCNP	1	105	100%	-5	100	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	
			Air Blower (electric)	OCNP	2	95	80%	-5	92	
			Poker, vibratory, hand-held	OCNP	3	102	50%	-5	99	
			Concrete pump truck	CNP 047	1	109	100%	-5	104	
			Concrete truck	CNP 044	2	109	80%	-5	106	
					-			Total	110	
		7	Crawler Crane	BS D7-114	5	101	100%	-5	103	
910	Backfill	1	Dump truck, with or without grab	OCNP	2	105	50%	Total -5	103 100	110
510	Dackiii		Generator, standard	CNP 101	2	103	100%	-5	100	
			Mini Excavator / Backhoe	OCNP	2	94	80%	-5	91	
			Water pump, submersible	CNP 283	4	85	100%	0	91	
								Total	107	
		2	Bulldozer	Ref 4	1	102	80%	-5	96	
			Dump truck, with or without grab	OCNP	1	105	20%	-5	93	
			Generator, standard	CNP 101	2	108	100%	-5	106	
			Mini Excavator / Backhoe	OCNP	1	94	80%	-5	88	
			Road roller	BS D8-30	1	101	60%	0	99	
			Water pump, submersible	CNP 283	4	85	100%	0	91	
						100	0.001	Total	107	
		3	Bulldozer	Ref 4	1	102	80%	-5	96	
	1		Compactor, vibratory Dump truck, with or without grab	CNP 050	1	105	60%	-5	98	-
	1		Generator, standard	OCNP CNP 101	1	105 108	20% 100%	-5 -5	93 106	-
	1		Generator, standard Mini Excavator / Backhoe	OCNP 101	2	108 94	100%	-5 -5	88	-
	1		Water pump, submersible	CNP 283	4	94 85	100%	-5	91	1
	1			5111 200			.00/0	Total	107	1
	1	4	Bulldozer	Ref 4	2	102	80%	-5	99	1
			Compactor, vibratory	CNP 050	3	105	60%	-5	103	1
			Generator, standard	CNP 101	2	108	100%	-5	106	1
			Water pump, submersible	CNP 283	4	85	100%	0	91	1
	1							Total	108	
	1	5	Compactor, vibratory	CNP 050	3	105	60%	-5	103	1
	1		Generator, standard	CNP 101	2	108	100%	-5	106	1
	1		Road roller	BS D8-30	4	101	60%	-5	100	-
	1		Water pump, submersible	CNP 283	4	85	100%	0	91	-
	1		Dullateren	<b>B</b> ( )	^	105	0.001	Total	108	-
	1	6	Bulldozer Generater standard	Ref 4	2	102	80%	-5	99	-
	1		Generator, standard	CNP 101 BS D8-30	2	108	100% 60%	-5 -5	106 100	-
	1		Road roller Water pump, submersible	BS D8-30 CNP 283	4	85	100%	-5 0	91	1
				0141 200	- 7		10070	Total	108	1
		7	Mini Excavator / Backhoe	OCNP	1	94	80%	-5	88	1
			Compactor, vibratory	CNP 050	3	105	60%	-5	103	1
	1		Generator, standard	CNP 101	2	108	100%	-5	106	1
			Water pump, submersible	CNP 283	4	85	100%	0	91	1
	1							Total	108	]
		8	Mini Excavator / Backhoe	OCNP	1	94	80%	-5	88	]
	1		Generator, standard	CNP 101	2	108	100%	-5	106	
			Road roller	BS D8-30	4	101	60%	-5	100	1
			Water pump, submersible	CNP 283	4	85	100%	0	91	]
								Total	107	1
		9	Bulldozer	Ref 4	2	102	80%	-5	99	1
			Generator, standard	CNP 101	2	108	100%	-5	106	1
			Mini Excavator / Backhoe Water pump, submersible	OCNP CNP 283	1 4	94 85	80% 100%	-5 0	88 91	

<i>anding</i> S470	Construction Activities	Group <sup>[1]</sup>	PME	Ref. <sup>[2]</sup>	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max Sl dB(A)
	Steps and Covered Wa Removal of existing	alkway (Port	on 1E & Portion 2B) Breaker, excavator mounted, hydraulic	BS D8-13	1	110	70%	-5	103	r
	seawall		Dump truck with grab	OCNP	1	105	20%	0	98	
			Derrick lighter	CNP 061	1	104	80%	0	103	
			Tug boat	CNP 221	1	110	80%	0	109	
								Total	111	
		2	Pipe Pile Rig	CNP 167	1	114	70%	0	112	
			Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 002	3	102	70%	0	105	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	50%	0	100	
			Crawler crane	BS D7-114	1	101	60%	0	99	
			Mini Excavator / Backhoe	OCNP	1	94	40%	0	90	
			HD90	OCNP	2	109	40%	0	108	
			Welding Machine (electric)	Ref 1	4	95	20%	0	94	
			Water pump, submersible	CNP 283	2	85	20%	0	81	
								Total	115	115
480,	Construction of	1	Bar bender and cutter	CNP 021	1	90	20%	0	83	
490	landing steps and		Concrete Lorry Mixer	CNP 044	1	109	70%	-5	102	
	covered walkway		Concrete pump	CNP 047	1	109	70%	-5	102	
			Poker, vibratory, hand-held	OCNP	1	102	50%	-5	94	
			Saw, circular wood	BS D7-79	1	103	20%	0	96	
								Total	106	106
rine T	unnel Stage1 (tunnel fo	potprint of P	ortion 2A1)							
540	Construction of temp	1	Crawler crane on flat-top barge	BS D7-114	2	101	70%	0	102	
	working platforms		Derrick lighter	CNP 061	2	104	70%	0	105	
			Tug boat	CNP 221	1	110	20%	0	103	
								Total	109	
		2	Crawler crane on flat-top barge	BS D7-114	1	101	50%	0	98	
		1	Derrick lighter	CNP 061	1	104	50%	0	101	1
		1	Tug boat	CNP 221	1	110	5%	0	97	1
		1	Vibratory hammer, hydraulic	OCNP	2	115	30%	0	113	1
		1	Power pack	OCNP	2	100	30%	0	98	1
		1	Welding Machine (electric)	Ref 1	2	95	50%	0	95	1
		1	Water pump, submersible	CNP 283	4	85	80%	0	90	1
		1		0111 203		00	50 /8	Total	90 113	113
45,	Cofferdam	1	Crawler crane on flat-top barge	BS D7-114	1	101	30%	0	96	1 13
45, 550	construction of	· ·	Derrick lighter	CNP 061	1	101	30%	0	103	1
	sheetpiles and			CNP 061 CNP 221	1	104	80% 20%	0	103	-
	pipepiles	1	Tug boat	GNP 221	<u> </u>	110	20%		103 106	-
	p.popiloo	2	Pipe Pile Rig	CNP 167	5	114	50%	Total 0	106	-
		2						-5		-
			Air compressor, air flow > 30m3/min	CNP 003	12	104	50%		107	-
			Generator, standard	CNP 101	8	108	80%	-5	111	-
			Crawler crane	BS D7-114	8	101	60%	0	108	-
			Water pump, diesel	CNP 282	5	103	50%	0	107	
			Vibratory hammer, hydraulic	OCNP	3	115	30%	0	115	
			Mini Excavator / Backhoe	OCNP	5	94	80%	0	100	
			Welding Machine (electric)	Ref 1	14	95	55%	0	104	
			Power pack	OCNP	2	100	30%	0	98	
			Water pump, submersible	CNP 283	15	85	80%	0	96	
								Total	121	4
		3	Pipe Pile Rig	CNP 167	1	114	70%	0	112	1
			Air compressor, air flow > 30m3/min	CNP 003	1	104	70%	-5	97	
			Generator, standard	CNP 101	2	108	100%	-5	106	
			Water pump, diesel	CNP 282	1	103	70%	0	101	
			Crawler crane on flat-top barge	BS D7-114	1	101	30%	0	96	
			Welder / Generator	Ref 1	2	100	50%	0	100	
			Water pump, submersible	CNP 283	10	85	80%	0	94	
								Total	114	
		4	Generator, standard	CNP 101	2	108	100%	-5	106	
			Vibratory hammer, hydraulic	OCNP	2	115	70%	0	116	
			Power pack	OCNP	2	100	70%	0	101	
			Crawler crane on flat-top barge	BS D7-114	1	101	30%	0	96	
		1	Welder / Generator	Ref 1	2	100	30%	0	98	1
		1	Water pump, submersible	CNP 283	10	85	80%	0	98	1
		1		0111 203	iv	00	50 /8	Total	94 117	121
55	Temporary	1	Crawler crane	BS D7-114	2	101	50%	0	101	121
	reclamation between	· ·	Tug boat	CNP 221	2	101	20%	0	101	1
	pipepiles and	1	Derrick lighter	CNP 221 CNP 061	2	104	20%	0	103	1
	sheetpiles		Bulldozer	Ref 4	2	104	50% 50%	0	104	-
		1	Compactor, vibratory	CNP 050	2	102	80%	0	102	1
		1		UNP 050	2	105	00 /6	Total	107 111	111
60.	ELS work	1	Excavator / Backhoe	CNP 081	1	112	80%	0	111	
60, 61,	LLO WUIK					98	80% 20%	0	91	1
62		1	Drill, hand-held (electric)	CNP 065 Ref 1	1	98	20%	0	91 100	1
52			Welder / Generator Dump truck with Grab		1					-
		1		OCNP Bof 2	1	105	100%	0	105	-
		1	Welding Set	Ref 2	1	78	60%	0	76	-
			Lorry with crane	OCNP	1	105	30%	0	100	4
		1	Crawler crane	BS D7-114	1	101	30%	0	96	4
		1	Air Blower (electric)	OCNP	2	95	100%	0	98	4
		1	Dump truck	BS D9-39	1	103	20%	0	96	4
		1	Derrick lighter	CNP 061	1	104	50%	0	101	1
		1	Bulldozer	Ref 4	1	102	20%	0	95	1
			Water pump, submersible	CNP 283	12	85	100%	0	96	1
								Total	113	1
				CNP 061	1	104	40%	0	100	1
		2	Derrick lighter			110	40%	0	106	1
		2	Derrick lighter Tug boat	CNP 221	1			<b>T</b>		113
		2						Total	107	
70	Marine Tunnel	2			2	90	50%	l otal 0	<b>107</b> 90	116
70	Marine Tunnel Structure		Tug boat	CNP 221		90 103	•			
70			Tug boat Bar bender and cutter	CNP 221 CNP 021	2		50%	0	90	
70			Tug boat Bar bender and cutter Saw, circular wood Crawler crane	CNP 221 CNP 021 BS D7-79 BS D7-114	2 2 2	103 101	50% 20% 20%	0 0 0	90 99 97	-
70			Tug boat Bar bender and cutter Saw, circular wood Crawler crane Air Blower (electric)	CNP 221 CNP 021 BS D7-79 BS D7-114 OCNP	2 2 2 2 2	103 101 95	50% 20% 20% 100%	0 0 0 0	90 99 97 98	-
570			Tug boat Bar bender and cutter Saw, circular wood Crawler crane Air Blower (electric) Generator, standard	CNP 221 CNP 021 BS D7-79 BS D7-114 OCNP CNP 101	2 2 2 2 2 2	103 101 95 108	50% 20% 20% 100%	0 0 0 -5	90 99 97 98 106	-
70			Tug boat Bar bender and cutter Saw, circular wood Crawler crane Air Blower (electric)	CNP 221 CNP 021 BS D7-79 BS D7-114 OCNP	2 2 2 2 2	103 101 95	50% 20% 20% 100%	0 0 0 -5 0	90 99 97 98 106 96	
570		1	Tug boat Bar bender and cutter Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible	CNP 221 CNP 021 BS D7-79 BS D7-114 OCNP CNP 101 CNP 283	2 2 2 2 2 2 12	103 101 95 108 85	50% 20% 20% 100% 100% 100%	0 0 0 -5 0 Total	90 99 97 98 106 96 <b>108</b>	
70			Tug boat Bar bender and cutter Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Concrete Lorry Mixer	CNP 221 CNP 021 BS D7-79 BS D7-114 OCNP CNP 101 CNP 283 CNP 044	2 2 2 2 2 12 8	103 101 95 108 85 109	50% 20% 20% 100% 100% 100%	0 0 0 -5 0 <b>Total</b> 0	90 99 97 98 106 96 <b>108</b> 116	
70		1	Tug boat Tug boat Bar bender and cutter Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Concrete Lorry Mixer Concrete pump	CNP 221 CNP 021 BS D7-79 BS D7-114 OCNP CNP 101 CNP 283 CNP 044 CNP 047	2 2 2 2 2 12 8 3	103 101 95 108 85 109 109	50% 20% 20% 100% 100% 100% 70% 70%	0 0 -0 -5 0 <b>Total</b> 0 0	90 99 97 98 106 96 <b>108</b> 116 112	
70		1	Tug boat Tug boat Bar bender and cutter Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held	CNP 221 CNP 021 BS D7-79 BS D7-114 OCNP CNP 101 CNP 283 CNP 044 CNP 047 OCNP	2 2 2 2 2 12 8 3 3	103 101 95 108 85 109 109 102	50% 20% 20% 100% 100% 100% 70% 70% 50%	0 0 0 -5 0 <b>Total</b> 0 0 0	90 99 97 98 106 96 <b>108</b> 116 112 104	
70		1	Tug boat Tug boat Bar bender and cutter Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Air Blower (electric)	CNP 221 CNP 021 BS D7-79 BS D7-114 OCNP CNP 101 CNP 283 CNP 044 CNP 047 OCNP OCNP OCNP	2 2 2 2 12 8 3 3 2	103 101 95 108 85 109 109 102 95	50% 20% 20% 100% 100% 70% 70% 50% 100%	0 0 0 -5 0 <b>Total</b> 0 0 0 0	90 99 97 98 106 96 <b>108</b> 116 112 104 98	-
70		1	Tug boat Tug boat Bar bender and cutter Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Air Blower (electric) Generator, standard	CNP 221 CNP 021 BS D7-79 BS D7-114 OCNP CNP 101 CNP 283 CNP 044 CNP 047 OCNP OCNP OCNP OCNP	2 2 2 2 12 8 3 3 2 2 2	103 101 95 108 85 109 109 109 95 108	50% 20% 100% 100% 100% 70% 50% 100%	0 0 0 -5 0 <b>Total</b> 0 0 0 0 -5	90 99 97 98 106 96 108 116 112 104 98 106	-
\$\$570		1	Tug boat Tug boat Bar bender and cutter Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Air Blower (electric)	CNP 221 CNP 021 BS D7-79 BS D7-114 OCNP CNP 101 CNP 283 CNP 044 CNP 047 OCNP OCNP OCNP	2 2 2 2 12 8 3 3 2	103 101 95 108 85 109 109 102 95	50% 20% 20% 100% 100% 70% 70% 50% 100%	0 0 0 -5 0 <b>Total</b> 0 0 0 0	90 99 97 98 106 96 <b>108</b> 116 112 104 98	

D	Construction Activities	Group <sup>[1]</sup>	РМЕ	Ref. <sup>[2]</sup>	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max SI dB(A)
T		3	Tug boat	CNP 221	1	110	40%	0 Total	106 106	
		4	Concrete Lorry Mixer	CNP 044	1	109	70%	0	107	-
			Concrete pump	CNP 047	1	109	70%	0	107	
			Poker, vibratory, hand-held	OCNP	1	102	50%	0	99	_
			Crawler crane Air Blower (electric)	BS D7-114 OCNP	2	101 95	20% 100%	0	97 98	
			Generator, standard	CNP 101	2	108	100%	-5	106	
			Water pump, submersible	CNP 283	12	85	100%	0	96	
				01/0 00/			500/	Total	112	-
		5	Bar bender and cutter Concrete Lorry Mixer	CNP 021 CNP 044	1	90 109	50% 30%	0	87 104	-
			Concrete pump	CNP 047	1	109	30%	0	104	
			Poker, vibratory, hand-held	OCNP	1	102	20%	0	95	
			Saw, circular wood	BS D7-79	1	103	20%	0	96	-
			Crawler crane Air Blower (electric)	BS D7-114 OCNP	1	101 95	20% 100%	0	94 98	-
			Generator, standard	CNP 101	2	108	100%	-5	106	-
			Water pump, submersible	CNP 283	12	85	100%	0	96	
								Total	110	
		6	Bar bender and cutter	CNP 021 CNP 044	1	90 109	50% 30%	0	87 104	-
			Concrete Lorry Mixer Concrete pump	CNP 044 CNP 047	1	109	30%	0	104	-
			Poker, vibratory, hand-held	OCNP	1	102	20%	0	95	
			Saw, circular wood	BS D7-79	1	103	20%	0	96	
			Lorry with crane	OCNP	1	105	20%	0	98	
			Air Blower (electric) Generator, standard	OCNP	2	95	100%	0	98	_
			Water pump, submersible	CNP 101 CNP 283	2 12	108 85	100% 100%	-5 0	106 96	-
				2.1. 200			/ .	Total	110	11
75,	Backfill	1	Bulldozer	Ref 4	2	102	50%	0	102	
76			Compactor, vibratory	CNP 050	3	105	50%	0	107	4
			Dump truck, with or without grab	OCNP CNP 101	4	105	80%	0	110	-
			Generator, standard Road roller	CNP 101 CNP 185	2	108 108	100% 100%	-5 0	106 111	-
			Water pump, submersible	CNP 185 CNP 283	12	85	100%	0	96	1
			, p/					Total	115	1
		2	Derrick lighter	CNP 061	1	104	40%	0	100	
			Tug boat	CNP 221	1	110	40%	0	106	
80	Removal of	1	Excavator / Backhoe	CNP 081	1	112	80%	Total 0	107 111	11
	reclamation/ temp	'	Dump truck, with or without grab	OCNP	1	105	30%	0	100	-
	platforms		Crawler crane on flat-top barge	BS D7-114	1	101	30%	0	96	
			Derrick lighter	CNP 061	1	104	30%	0	99	
			Welder / Generator	Ref 1	1	100	60%	0	98	
		0	Ourseller success on flat tag haven	D0 D7 444		404	000/	Total	112	-
		2	Crawler crane on flat-top barge Derrick lighter	BS D7-114 CNP 061	1	101 104	20% 20%	0	94 97	-
			Tug boat	CNP 221	1	110	20%	0	103	
			149 504	0111 221		110	2070	Total	104	-
		3	Excavator / Backhoe	CNP 081	2	112	70%	0	113	
			Dump truck, with or without grab	OCNP	2	105	60%	0	106	_
			Generator, standard	CNP 101	2	108	100%	-5 Total	106 115	-
		4	Excavator / Backhoe	CNP 081	1	112	70%	0	110	
			Crawler crane on flat-top barge	BS D7-114	1	101	50%	0	98	
			Derrick lighter	CNP 061	1	104	60%	0	102	
			Generator, standard	CNP 101	2	108	100%	-5	106	
25 D	Predging for Stage 2	1	Derrick lighter	CNP 061	1	104	20%	Total 0	112 97	11
5 0	diversion	'	Grab dredger	CNP 063	1	112	20%	0	105	
			Tug boat	CNP 221	1	110	20%	0	103	-
								Total	108	10
	nnel Stage2 (tunnel fo			BS D7-114	0	101	700/	0	100	<u> </u>
	Construction of temp working platforms	1	Crawler crane on flat-top barge Derrick lighter	BS D7-114 CNP 061	2	101 104	70% 70%	0	102 105	1
	3		Tug boat	CNP 221	1	110	20%	0	103	1
						•		Total	109	]
		2	Crawler crane on flat-top barge	BS D7-114	2	101	70%	0	102	4
			Vibratory hammer, hydraulic Power pack	OCNP OCNP	2	115 100	70% 70%	0	116 101	-
			Welding Machine (electric)	Ref 1	2	95	70%	0	96	1
			Water pump, submersible	CNP 283	4	85	80%	0	90	1
								Total	117	11
5,	Cofferdam	1	Crawler crane on flat-top barge	BS D7-114	1	101	30%	0	96	4
0	construction of sheetpiles and		Derrick lighter Tug boat	CNP 061 CNP 221	1	104 110	80% 20%	0	103 103	-
	pipepiles			UNI 221	<u> </u>	110	2070	Total	103	1
		2	Pipe Pile Rig	CNP 167	2	114	70%	0	115	1
			Air compressor, air flow > 30m3/min	CNP 003	2	104	70%	-5	100	1
			Generator, standard	CNP 101	2	108	100%	-5	106	-
			Water pump, diesel Welder / Generator	CNP 282 Ref 1	2	103 100	70% 50%	0	104 100	-
			Water pump, submersible	CNP 283	10	85	50% 80%	0	94	1
								Total	116	1
		3	Pipe Pile Rig	CNP 167	1	114	70%	0	112	]
			Air compressor, air flow > 30m3/min	CNP 003	1	104	70%	-5	97	4
			Generator, standard	CNP 101	2	108	100%	-5	106	-
			Water pump, diesel Crawler crane on flat-top barge	CNP 282 BS D7-114	1	103 101	70% 30%	0	101 96	-
			Welder / Generator	BS D7-114 Ref 1	1	101	30% 50%	0	100	1
			Water pump, submersible	CNP 283	10	85	80%	0	94	1
						•		Total	114	]
		4	Generator, standard	CNP 101	2	108	100%	-5	106	]
			Vibratory hammer, hydraulic	OCNP	2	115	70%	0	116	1
			Power pack	OCNP	2	100	70%	0	101	-
			Crawler crane on flat-top barge Welder / Generator	BS D7-114 Ref 1	1	101 100	30% 30%	0	96 98	-
1			Water pump, submersible	CNP 283	10	85	30% 80%	0	98 94	1
				0 200			5570	5		

ID	Construction Activities	Group <sup>[1]</sup>	РМЕ	Ref. <sup>[2]</sup>	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max S dB(A)
655	Temporary	1	Crawler crane	BS D7-114	2	101	50%	0	101	
	reclamation between pipepiles and		Tug boat Derrick lighter	CNP 221 CNP 061	1	110 104	20% 50%	0	103 104	
	sheetpiles		Bulldozer	Ref 4	2	102	50%	0	104	-
			Compactor, vibratory	CNP 050	2	105	80%	0	102	
			······································					Total	111	11
60,	ELS work	1	Excavator / Backhoe	CNP 081	1	112	80%	0	111	
61,			Drill, hand-held (electric)	CNP 065	1	98	20%	0	91	
62			Welder / Generator	Ref 1	1	100	100%	0	100	
			Dump truck with Grab	OCNP	1	105	100%	0	105	
			Welding Set Lorry with crane	Ref 2 OCNP	1	78 105	60% 30%	0	76 100	
			Crawler crane	BS D7-114	1	103	30%	0	96	
			Air Blower (electric)	OCNP	2	95	100%	0	98	
			Dump truck	BS D9-39	1	103	20%	0	96	
			Derrick lighter	CNP 061	1	104	50%	0	101	
			Bulldozer	Ref 4	1	102	20%	0	95	
			Water pump, submersible	CNP 283	12	85	100%	0	96	
		2	Derriek liebter	CNP 061	1	104	50%	Total 0	113 101	-
		2	Derrick lighter Tug boat	CNP 061 CNP 221	1	104	20%	0	101	
			Tug boat	0111 221		110	2078	Total	105	11
570	Marine Tunnel	1	Bar bender and cutter	CNP 021	2	90	50%	0	90	
	Structure		Saw, circular wood	BS D7-79	2	103	20%	0	99	
			Crawler crane	BS D7-114	2	101	20%	0	97	
			Air Blower (electric)	OCNP	2	95	100%	0	98	
			Generator, standard	CNP 101	2	108	100%	-5	106	
			Water pump, submersible	CNP 283	12	85	100%	0	96	-
		0	Conoroto Lorry Miyor		0	100	700/	Total	108	-
		2	Concrete Lorry Mixer Concrete pump	CNP 044 CNP 047	8	109 109	70% 70%	0	116 112	-
			Poker, vibratory, hand-held	OCNP 047	3	109	50%	0	104	1
			Air Blower (electric)	OCNP	2	95	100%	0	98	1
			Generator, standard	CNP 101	2	108	100%	-5	106	]
			Water pump, submersible	CNP 283	12	85	100%	0	96	
								Total	118	4
		3	Tug boat	CNP 221	1	110	40%	0 Total	106	-
		4	Concrete Lorry Mixer	CNP 044	1	109	70%	Total 0	106 107	
		4	Concrete pump	CNP 044	1	109	70%	0	107	
			Poker, vibratory, hand-held	OCNP	1	103	50%	0	99	
			Crawler crane	BS D7-114	2	101	20%	0	97	
			Air Blower (electric)	OCNP	2	95	100%	0	98	
			Generator, standard	CNP 101	2	108	100%	-5	106	
			Water pump, submersible	CNP 283	12	85	100%	0	96	
		-					500/	Total	112	
		5	Bar bender and cutter Concrete Lorry Mixer	CNP 021 CNP 044	1	90 109	50% 30%	0	87 104	
			Concrete pump	CNP 047	1	109	30%	0	104	
			Poker, vibratory, hand-held	OCNP	1	103	20%	0	95	
			Saw, circular wood	BS D7-79	1	103	20%	0	96	
			Crawler crane	BS D7-114	1	101	20%	0	94	
			Air Blower (electric)	OCNP	2	95	100%	0	98	
			Generator, standard	CNP 101	2	108	100%	-5	106	
			Water pump, submersible	CNP 283	12	85	100%	0 Totol	96 110	
		6	Bar bender and cutter	CNP 021	1	90	50%	Total 0	87	
		0	Concrete Lorry Mixer	CNP 044	1	109	30%	0	104	
			Concrete pump	CNP 047	1	109	30%	0	104	
			Poker, vibratory, hand-held	OCNP	1	102	20%	0	95	
			Saw, circular wood	BS D7-79	1	103	20%	0	96	
			Lorry with crane	OCNP	1	105	20%	0	98	
			Air Blower (electric)	OCNP	2	95	100%	0	98	-
			Generator, standard	CNP 101 CNP 283	2 12	108	100% 100%	-5 0	106 96	-
			Water pump, submersible	UNF 283	12	85	100%	Total	96 110	11
75,	Backfill	1	Bulldozer	Ref 4	2	102	50%	0	102	
76		· ·	Compactor, vibratory	CNP 050	3	105	50%	0	102	1
			Dump truck, with or without grab	OCNP	4	105	80%	0	110	1
			Generator, standard	CNP 101	2	108	100%	-5	106	1
			Road roller	CNP 185	2	108	100%	0	111	4
			Water pump, submersible	CNP 283	12	85	100%	0	96	-
		2	Derrick lighter	CNP 061	1	104	40%	Total 0	115 100	-
		2	Tug boat	CNP 061 CNP 221	1	104	40%	0	100	1
								Total	107	11
77	Reprovision of MTK	1	Breaker, excavator mounted, hydraulic	BS D8-13	1	110	50%	0	107	1
	Public Pier		Concrete crusher, excavator mounted	OCNP	1	103	70%	0	101	
			Water pump, submersible	CNP 283	1	85	100%	0	85	4
			Generator, standard	CNP 101	1	108	100%	-5	103	-
		0	Concrete crusher, excevator mounted	OCNID	1	102	20%	Total	109	-
		2	Concrete crusher, excavator mounted Lorry with crane	OCNP OCNP	1	103 105	20%	0	96 104	-
			Water pump, submersible	CNP 283	1	85	100%	0	85	1
			Generator, standard	CNP 101	1	108	100%	-5	103	1
			Saw, wire	OCNP	1	101	80%	0	100	]
								Total	108	
		3	Breaker, excavator mounted, hydraulic	BS D8-13	1	110	50%	0	107	4
		Ű	Lorry with crane	OCNP	1	105	80%	0	104	4
		Ū		CNP 283	1	85	100%	0	85	1
		Ū	Water pump, submersible		- 1		1000/			
		Ū	Water pump, submersible Generator, standard	CNP 101	1	108	100%	-5	103	
		Ū	Water pump, submersible		1	108 101	100% 80%	0	100	
		4	Water pump, submersible Generator, standard Saw, wire	CNP 101 OCNP		101	80%		100 <b>110</b>	-
			Water pump, submersible Generator, standard	CNP 101	1			0 Total	100	-
			Water pump, submersible Generator, standard Saw, wire Concrete crusher, excavator mounted Crawler crane Water pump, submersible	CNP 101 OCNP OCNP BS D7-114 CNP 283	1	101 103 101 85	80% 20% 50% 100%	0 Total 0 0 0	100 <b>110</b> 96 98 85	-
			Water pump, submersible Generator, standard Saw, wire Concrete crusher, excavator mounted Crawler crane	CNP 101 OCNP OCNP BS D7-114	1 1 1	101 103 101	80% 20% 50%	0 Total 0 0	100 <b>110</b> 96 98	-

	Construction Activities	Group <sup>[1]</sup>	РМЕ	Ref. <sup>[2]</sup>	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max SP dB(A) <sup>[</sup>
		5	Breaker, excavator mounted, hydraulic	BS D8-13 BS D7-114	1	110 101	50% 50%	0	107 98	_
			Crawler crane Water pump, submersible	CNP 283	1	85	100%	0	96 85	
			Generator, standard	CNP 101	1	108	100%	-5	103	
			Saw, wire	OCNP	1	101	80%	0	100	
								Total	109	
		6	Dump truck, with or without grab	OCNP	1	105	30%	0	100	
			Mini Excavator / Backhoe	OCNP	1	94	30%	0	89	
			Water pump, submersible	CNP 283	1	85	100%	0	85	
			Generator, standard	CNP 101	1	108	100%	-5 Tetel	103 105	
		7	Lorry with crane	OCNP	1	105	80%	Total 0	105	
		'	Bar Bender	CNP 021	1	90	40%	0	86	
			Generator, standard	CNP 101	1	108	100%	-5	103	
			Welding Set	Ref 2	2	78	50%	0	78	
			Water pump, submersible	CNP 283	1	85	100%	0	85	
				_	_			Total	107	
		8	Concrete Lorry Mixer	CNP 044	1	109	50%	0	106	
			Lorry mounted concrete pump	CNP 047	1	109	50%	0	106	
			Concrete Poker Vibrator	CNP 170	1	113 108	50%	0	110	
			Generator, standard	CNP 101	1	108	100%	-5 Total	103 113	115
680	Removal of	1	Excavator / Backhoe	CNP 081	2	112	70%	0	113	115
000	reclamation/ temp	·	Dump truck with Grab	OCNP	2	105	20%	0	101	
	platforms		Dump Truck	BS D9-39	2	103	30%	0	101	
			Crawler crane on flat-top barge	BS D7-114	1	101	50%	0	98	
			Derrick lighter	CNP 061	1	104	50%	0	101	
		1	Generator, standard	CNP 101	1	108	100%	-5	103	1
			Welding Set	Ref 2	4	78	50%	0	81	
		<u> </u>		00.07				Total	115	-
		2	Crawler crane on flat-top barge	BS D7-114	1	101	20%	0	94	-
		1	Derrick lighter	CNP 061	1	104	20%	0	97	-
		1	Tug boat	CNP 221	1	110	20%	0 Total	103 104	115
tical	Wall along depressed r	nad at Portic	n 3B					TUIAI	104	1 115
00,	Pipepiles and	1	Pipe Pile Rig	CNP 167	1	114	80%	0	113	
22	sheetpiles	l .	Air compressor, air flow > 30m3/min	CNP 003	1	104	80%	-5	98	1
		1	Generator, standard	CNP 101	1	108	100%	-5	103	1
		1	Water pump, diesel	CNP 282	1	103	80%	0	102	
			Mini Backhoe (3 tonnes)	OCNP	1	94	50%	0	91	
			Dump truck, with or without grab	OCNP	1	105	30%	0	100	
			Grout mixer	OCNP	1	90	30%	0	85	
			Grout pump	OCNP	1	105	30%	0	100	
			Water pump, submersible	CNP 283	4	85	100%	0	91	
			Vibratory hammer, hydraulic	OCNP	1	115	30%	0	110	
			Power pack	OCNP	1	100	30%	0	95	440
ntilati	on Adit at Eastern Inter	faco/Portion	246)					Total	116	116
300	Piling and pumping	1	Pipe Pile Rig	CNP 167	1	114	80%	0	113	1
300	test		Air compressor, air flow > 30m3/min	CNP 107	2	104	80%	-5	101	-
					1	108				
			Generator, standard	CNP 101			100%	-5	103	
			Generator, standard Water pump, diesel	CNP 101 CNP 282	1	108	100% 80%	-5 0	103 102	
			Water pump, diesel	CNP 282			80%			-
					1	103		0	102	-
			Water pump, diesel Mini Backhoe (3 tonnes)	CNP 282 OCNP	1 1	103 94	80% 60%	0	102 92	-
			Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump	CNP 282 OCNP OCNP	1 1 1	103 94 105	80% 60% 30%	0 0 0	102 92 100 89 105	-
			Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer	CNP 282 OCNP OCNP OCNP	1 1 1 1	103 94 105 90	80% 60% 30% 80%	0 0 0 0	102 92 100 89 105 94	-
			Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible	CNP 282 OCNP OCNP OCNP OCNP CNP 283	1 1 1 1 1 8	103 94 105 90 105 85	80% 60% 30% 80% 100% 100%	0 0 0 0 0 0 Total	102 92 100 89 105 94 <b>115</b>	115
310	ELS work	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe	CNP 282 OCNP OCNP OCNP OCNP CNP 283 CNP 081	1 1 1 1 8	103 94 105 90 105 85 112	80% 60% 30% 100% 100% 80%	0 0 0 0 0 0 <b>Total</b> 0	102 92 100 89 105 94 <b>115</b> 111	115
310	ELS work	-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic	CNP 282 OCNP OCNP OCNP OCNP CNP 283 CNP 081 BS D8-13	1 1 1 1 8 1 1 1	103 94 105 90 105 85 112 110	80% 60% 30% 100% 100% 80% 30%	0 0 0 0 0 <b>Total</b> 0 0	102 92 100 89 105 94 <b>115</b> 111 105	115
10	ELS work	-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric)	CNP 282 OCNP OCNP OCNP OCNP CNP 283 CNP 081 BS D8-13 CNP 065	1 1 1 1 8 1 1 1 1	103 94 105 90 105 85 112 110 98	80% 60% 30% 80% 100% 100% 80% 30% 20%	0 0 0 0 0 <b>Total</b> 0 0 0	102 92 100 89 105 94 <b>115</b> 111 105 91	115
10	ELS work	-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator	CNP 282 OCNP OCNP OCNP CNP 283 CNP 081 BS D8-13 CNP 065 Ref 1	1 1 1 1 8 1 1 1 1 1	103 94 105 90 105 85 112 110 98 100	80% 60% 30% 80% 100% 100% 80% 30% 20% 100%	0 0 0 0 0 <b>Total</b> 0 0 0 0	102 92 100 89 105 94 <b>115</b> 111 105 91 100	
10	ELS work	-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout nixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab	CNP 282 OCNP OCNP OCNP CNP 283 CNP 081 BS D8-13 CNP 065 Ref 1 OCNP	1 1 1 1 8 8 1 1 1 1 1 1	103 94 105 90 105 85 112 110 98 100 105	80% 60% 30% 100% 100% 80% 20% 100% 30%	0 0 0 0 0 0 <b>Total</b> 0 0 0 0 0	102 92 100 89 105 94 <b>115</b> 111 105 91 100 100	- - - - - - -
10	ELS work	-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set	CNP 282           OCNP           CNP 081           BS D8-13           CNP 065           Ref 1           OCNP           Ref 2	1 1 1 1 8 1 1 1 1 1 1 1 1	103 94 105 90 105 85 112 110 98 100 105 78	80% 60% 30% 100% 100% 80% 30% 20% 100% 30% 30%	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 105 91 100 100 73	115
10	ELS work	-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane	CNP 282         OCNP           OCNP         OCNP           OCNP         OCNP           OCNP         OCNP           OCNP         OSNP           Ref 1         OCNP           OCNP         Ref 2           OCNP         OCNP	1 1 1 1 8 8 1 1 1 1 1 1	103 94 105 90 105 85 112 110 98 100 105 78 105	80% 60% 30% 80% 100% 100% 80% 30% 30% 30% 30%	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 105 91 100 100 73 100	115
10	ELS work	-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set	CNP 282           OCNP           CNP 081           BS D8-13           CNP 065           Ref 1           OCNP           Ref 2	1 1 1 1 1 8 8 1 1 1 1 1 1 1 1 1	103 94 105 90 105 85 112 110 98 100 105 78	80% 60% 30% 100% 100% 80% 30% 20% 100% 30% 30%	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 105 91 100 100 73	115
10	ELS work	-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout nixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane	CNP 282         OCNP           OCNP         OCNP           OCNP         OCNP           OCNP         OCNP           CNP 081         BS D8-13           CNP 065         Ref 1           OCNP         OCNP           Ref 1         OCNP           OCNP         Ref 2           OCNP         BS D7-114	1 1 1 1 8 8 1 1 1 1 1 1 1 1 1 1	103 94 105 90 105 85 112 110 98 100 105 78 105 101	80% 60% 30% 80% 100% 100% 30% 30% 30% 30% 30% 30% 30%	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 94 115 111 105 91 100 100 73 100 96	- - - - - - - - - - - - - - - -
10	ELS work	-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan	CNP 282         OCNP           OCNP         OCNP           OCNP         OCNP           OCNP         SB20           CNP 081         BS D8-13           CNP 065         Ref 1           OCNP         OCNP           OCNP         BS D7-114           CNP 241         CNP 241	1 1 1 1 8 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 90 105 85 112 110 98 100 105 78 105 101 108	80% 60% 30% 100% 100% 30% 20% 20% 100% 30% 30% 30% 30% 80%	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 <b>115</b> 111 100 100 73 100 96 107	115
		-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible	CNP 282         OCNP           OCNP         OCNP           OCNP         OCNP           OCNP         BS D8-13           CNP 081         BS D8-13           CNP 065         Ref 1           OCNP         OCNP           BS D8-13         OCNP 065           Ref 1         OCNP           OCNP         BS D7-114           CNP 241         BS D9-39           CNP 283         CNP 283	1 1 1 1 1 8 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 90 105 85 112 110 98 100 105 78 105 105 101 108 103 85	80%           60%           30%           80%           100%           20%           100%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           80%	0 0 0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 91 111 100 100 73 100 100 73 100 96 107 98 93 114	
	Ventilation Adit	-	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Dill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter	CNP 282           OCNP           SDP-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 241           BS D9-39           CNP 283           CNP 021	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 90 105 85 112 110 98 100 105 78 105 105 101 108 103 85 90	80% 60% 30% 80% 100% 100% 80% 20% 100% 30% 30% 30% 30% 30% 80% 50%	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 91 100 73 100 73 100 73 100 96 98 93 114 90	
			Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer	CNP 282 OCNP OCNP OCNP CNP 283 CNP 081 BS D8-13 CNP 085 Ref 1 OCNP BS D7-114 CNP 241 BS D9-39 CNP 283 CNP 021 CNP 021 CNP 044	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 90 105 85 112 110 98 100 105 78 105 101 101 108 103 85 90 109	80% 60% 30% 80% 100% 100% 80% 20% 100% 30% 30% 30% 30% 30% 80% 80% 50% 70%	0 0 0 0 7 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 100 96 107 3 100 96 97 98 93 114 90 110	
	Ventilation Adit		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump	CNP 282           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 081           BS D8-13           CNP 065           Ref 1           OCNP           OCNP           BS D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 241           BS D9-39           CNP 283           CNP 021           CNP 041           CNP 044	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 78 101 105 105 101 108 103 85 90 109	80%           60%           30%           80%           100%           20%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           70%	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 1000 89 105 94 115 111 100 100 100 73 100 96 107 98 93 93 114 90 110	-
	Ventilation Adit		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held	CNP 282           OCNP           BS D8-13           CNP 081           BS D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 241           BS D9-39           CNP 283           CNP 021           CNP 044           CNP 044           ONP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 78 105 78 105 105 105 105 105 103 85 90 109 109 102	80%           60%           30%           80%           100%           30%           20%           100%           30%           50%           70%           60%	0 0 0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 73 100 96 97 107 98 93 114 90 110 110	
	Ventilation Adit		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood	CNP 282           OCNP           OCNP 081           BS D8-13           CNP 085           Ref 1           OCNP           BS D7-114           CNP 243           CNP 021           CNP 021           CNP 044           CNP 045           OCNP           BS D7-79	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 78 105 101 105 105 101 108 103 85 90 109 109 102 103	80% 60% 30% 80% 100% 100% 80% 30% 30% 30% 30% 30% 30% 80% 30% 50% 70% 70% 60% 22%	0 0 0 0 7 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 73 100 96 107 73 100 96 93 110 99 93 110 110 110 99 99	-
	Ventilation Adit		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane	CNP 282           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 081           BS D8-13           CNP 065           Ref 1           OCNP           OCNP           BS D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 021           CNP 023           CNP 044           CNP 047           OCNP           BS D7-79           BS D7-114	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 78 101 105 101 108 103 85 90 109 102 103 101	80%           60%           30%           80%           100%           20%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           20%           20%	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 100 100 73 100 98 93 93 114 90 110 110 103 99 94	-
	Ventilation Adit		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan	CNP 282           OCNP           BS D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 047           OCNP           BS D7-114           CNP 041           CNP 241	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 112 110 98 100 105 78 105 105 105 105 105 105 101 108 90 109 109 109 102 103 101 108	80%           60%           30%           80%           100%           30%           20%           100%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           20%           20%           20%           20%           20%           20%           20%           20%           20%           20%           20%           20%           20%           20%	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 100 73 100 96 98 93 107 98 93 114 90 110 103 99 94 107	-
	Ventilation Adit		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Joury Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard	CNP 282           OCNP           BS D8-13           OCNP           BS D7-114           BS D9-39           CNP 021           CNP 021           CNP 044           CNP 041           CNP 241           CNP 241           CNP 241           CNP 101	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 105 105 105 105 105 105 105 103 85 90 109 109 102 103 103 85	80% 60% 30% 80% 100% 100% 80% 30% 30% 30% 30% 30% 30% 30% 30% 30% 3	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 96 107 73 100 96 93 110 99 93 110 110 110 110 99 99 94 107	
	Ventilation Adit		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan	CNP 282           OCNP           BS D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 047           OCNP           BS D7-114           CNP 041           CNP 241	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 112 110 98 100 105 78 105 105 105 105 105 105 101 108 90 109 109 109 102 103 101 108	80%           60%           30%           80%           100%           30%           20%           100%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           20%           20%           20%           20%           20%           20%           20%           20%           20%           20%           20%           20%           20%           20%	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 73 100 73 100 73 100 73 100 73 100 107 98 93 114 90 91 110 110 100 93 93 94	111
20	Ventilation Adit	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible	CNP 282           OCNP           BS D8-13           OCNP           BS D7-114           CNP 021           CNP 047           OCNP           BS D7-79           BS D7-714           CNP 241           CNP 047           OCNP           BS D7-114           CNP 241           CNP 243	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 112 110 98 100 105 78 105 78 105 101 108 103 85 90 109 109 109 102 103 101 108 85	80%           60%           30%           80%           100%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           80%           50%           70%           60%           20%           80%           100%           80%           100%           80%	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 73 100 96 93 107 98 93 107 107 98 93 90 110 100 100 96 93 115	111
20	Ventilation Adit Structure		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Joury Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard	CNP 282           OCNP           BS D8-13           OCNP           BS D7-114           BS D9-39           CNP 021           CNP 021           CNP 044           CNP 041           CNP 241           CNP 241           CNP 241           CNP 101	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 105 105 105 105 105 105 105 103 85 90 109 109 102 103 103 85	80% 60% 30% 80% 100% 100% 80% 30% 30% 30% 30% 30% 30% 30% 30% 30% 3	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 73 100 73 100 73 100 73 100 73 100 107 98 93 114 90 91 110 110 100 93 93 94	111
20	Ventilation Adit Structure	1	Water pump, diesel Mini Backhoe (3 lonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Joury Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bulldozer	CNP 282           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 081           BS D8-13           CNP 085           Ref 1           OCNP           BS D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 021           CNP 047           OCNP 283           CNP 101           CNP 283           Ref 4	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 105 105 105 105 105 105 105 105	80% 60% 30% 80% 100% 100% 80% 30% 30% 30% 30% 30% 30% 30% 30% 30% 3	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 96 107 73 100 96 107 73 98 93 114 90 110 103 99 99 94 107 106 93 115	114
20	Ventilation Adit Structure	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Jump Poker, vibratory, hand-held Saw, circular wood Carwler crane Ventilation fan Generator, standard Water pump, submersible Bulldozer Compactor, vibratory	CNP 282           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 081           BS D8-13           CNP 065           Ref 1           OCNP           OCNP           BS D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 021           CNP 044           CNP 047           OCNP           BS D7-714           CNP 283           Ref 4           CNP 050	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 78 101 105 105 101 108 85 90 109 102 103 101 108 85 101 108 85 102 105	80%           60%           30%           80%           100%           20%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           80%           50%           70%           60%           20%           80%           100%           80%           60%           60%	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102           92           100           89           105           94           115           111           100           73           100           73           100           98           91           100           73           100           93           114           90           110           103           93           115           100           103	114
20	Ventilation Adit Structure	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Jump Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Bar benerator, standard	CNP 282           OCNP           BS D8-13           OCNP           BS D7-114           ONP 241           BS D7-9           BS D7-79           BS D7-714           CNP 241           CNP 241           CNP 241           CNP 241           CNP 241           CNP 243           BS D7-79           BS D7-714           CNP 241           CNP 241           CNP 241           CNP 243           Ref 4           CNP 050           OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 112 110 98 100 105 78 105 101 108 103 85 90 109 109 102 103 101 108 108 85 85 101 108 108 108 108 108 105 105	80% 60% 30% 80% 100% 100% 20% 20% 30% 30% 30% 30% 30% 30% 30% 30% 30% 80% 50% 70% 60% 80% 80% 80% 80% 80%	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 73 100 96 93 107 98 93 107 98 93 114 90 110 103 99 94 94 107 106 93 115 100 107 106 93 115 100 107 94 94 107 94 94 107 94 94 107 94 94 107 94 94 107 94 94 107 94 94 107 94 94 107 94 94 107 94 94 107 94 94 107 94 95 107 96 96 107 97 107 98 99 107 98 99 107 90 107 98 99 107 98 99 107 99 107 98 99 107 99 107 90 107 98 99 107 98 90 107 107 98 90 107 107 90 107 90 107 107 90 107 107 90 107 107 90 107 107 90 107 107 90 107 107 107 107 107 107 107 107 107 10	111
20	Ventilation Adit Structure	1	Water pump, diesel         Mini Backhoe (3 tonnes)         Dump truck, with or without grab         Grout mixer         Grout pump         Water pump, submersible         Excavator / Backhoe         Breaker, excavator mounted, hydraulic         Drill, hand-held (electric)         Welder / Generator         Dump truck with Grab         Welding Set         Lorry with crane         Crawler crane         Ventilation fan         Dump truck         Water pump, submersible         Bar bender and cutter         Concrete Lorry Mixer         Concrete Lorry Mixer         Concrete pump         Poker, vibratory, hand-held         Saw, circular wood         Crawler crane         Ventilation fan         Generator, standard         Water pump, submersible	CNP 282           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 081           BS D8-13           CNP 085           Ref 1           OCNP           BS D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 021           CNP 044           CNP 047           OCNP           BS D7-714           CNP 041           CNP 041           CNP 042           CNP 041           CNP 042           OCNP 283           Ref 4           CNP 050           OCNP	1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           1           2           3           1           1           1	103 94 105 85 112 110 98 100 105 105 105 105 105 103 85 90 109 109 102 103 85 90 109 102 103 85 105 101 108 108 108	80% 60% 30% 80% 100% 100% 30% 30% 30% 30% 30% 30% 30% 30% 30%	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 73 100 96 93 107 98 93 107 107 98 93 114 107 106 99 99 99 99 93 115 100 103 106 87	11.
20	Ventilation Adit Structure Backfill	1	Water pump, diesel         Mini Backhoe (3 tonnes)         Dump truck, with or without grab         Grout mixer         Grout pump         Water pump, submersible         Excavator / Backhoe         Breaker, excavator mounted, hydraulic         Drill, hand-held (electric)         Welder / Generator         Dump truck with Grab         Welding Set         Lorry with crane         Crawler crane         Ventilation fan         Dump truck         Water pump, submersible         Bar bender and cutter         Concrete Lorry Mixer         Concrete Lorry Mixer         Concrete pump         Poker, vibratory, hand-held         Saw, circular wood         Crawler crane         Ventilation fan         Generator, standard         Water pump, submersible	CNP 282           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 081           BS D8-13           CNP 065           Ref 1           OCNP           OCNP           BS D7-114           CNP 021           CNP 044           CNP 047           OCNP 283           CNP 041           CNP 047           OCNP 283           CNP 101           CNP 283           Ref 4           CNP 050           OCNP 200	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 78 100 105 78 101 108 103 85 90 109 109 109 102 103 101 108 103 85 102 103 101 108 108	80% 60% 30% 100% 100% 20% 20% 30% 30% 30% 30% 30% 30% 30% 30% 30% 20% 20% 20% 20% 20% 20% 60% 60% 60% 60%	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102           92           100           89           105           94           115           111           100           73           100           73           100           98           93           114           90           110           103           99           93           115           100           103           104           105           106	111
20 25	Ventilation Adit Structure Backfill C&C Tunnel (Portion 3/	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Bulldozer Compactor, standard Bullozer Compactor,	CNP 282           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 081           BS D8-13           CNP 065           Ref 1           OCNP           OCNP           BS D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 241           BS D7-114           CNP 044           CNP 047           OCNP           BS D7-714           CNP 047           OCNP 283           Ref 4           CNP 050           OCNP 105           CNP 185           CNP 185           CNP 185           CNP 185           CNP 283	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 78 100 105 78 105 101 108 85 109 109 109 109 102 103 101 108 85 102 105 108 85 105 108 85	80%           60%           30%           80%           100%           100%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           80%           50%           70%           60%           80%           100%           80%           60%           80%           100%           60%           80%           100%           60%           80%	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102           92           100           89           105           94           115           111           100           73           100           73           100           98           93           114           90           110           103           99           93           115           100           103           104           105           106           87           110	11.
20 25	Ventilation Adit Structure Backfill	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Road roller Portion 3A4) Pipe Pile Rig	CNP 282           OCNP           SB D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 021           CNP 047           OCNP           BS D7-79           BS D7-114           CNP 241           CNP 241           CNP 101           CNP 050           OCNP           CNP 283	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 112 100 105 78 105 78 105 105 101 108 103 85 90 109 109 102 103 101 108 103 85 105 105 105 105 105 105 105 105 108 85 108	80% 60% 30% 100% 100% 20% 100% 30% 30% 30% 30% 30% 30% 80% 30% 80% 20% 20% 20% 20% 20% 80% 100% 80% 80%	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 100 89 105 94 115 111 100 100 100 73 100 96 93 93 107 98 93 114 90 110 107 106 99 93 115 100 103 104 103 104 103 104 103 104 110 103	111
20 25	Ventilation Adit Structure Backfill C&C Tunnel (Portion 3/	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Joury Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Road roller Water pump, submersible Portion 344) Pipe Pile Rig Air compressor, air flow > 30m3/min	CNP 282 OCNP OCNP OCNP CNP 283 CNP 081 BS D8-13 CNP 085 Ref 1 OCNP BS D7-114 CNP 281 OCNP BS D7-114 CNP 283 CNP 021 CNP 021 CNP 044 CNP 047 OCNP 283 CNP 044 CNP 047 OCNP 283 CNP 044 CNP 047 OCNP 283 CNP 044 CNP 047 CNP 047 CNP 044 CNP 047 CNP 101 CNP 283 CNP 050 OCNP CNP 101 CNP 105 CNP 105 CNP 101 CNP 105 CNP 107 CNP 107 CN	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 78 100 105 78 105 101 108 103 85 90 109 109 109 109 109 109 109 109 102 103 101 108 85 105 105 105 105 105 105 105 105 105 10	80% 60% 30% 100% 100% 20% 20% 20% 30% 30% 30% 30% 30% 30% 30% 30% 30% 3	0 0 0 0 <b>Total</b> 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102           92           100           89           105           94           115           111           100           100           73           100           96           973           107           98           93           110           103           106           93           115           100           103           106           87           103           106           87           103           106           110           103           106           87           110	11.
20 25	Ventilation Adit Structure Backfill C&C Tunnel (Portion 3/	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, Mand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Bulldozer Compactor, vibratory Dump truck with Grab Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Potron 3A4) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard	CNP 282           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 081           BS D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 021           CNP 021           CNP 044           CNP 047           OCNP           BS D7-714           CNP 047           OCNP 283           Ref 4           CNP 050           OCNP 283           CNP 101           CNP 1050           OCNP 107           CNP 108           CNP 107           CNP 107           CNP 107	1 1 1 1 1 1 1 1 1 1 1 1 1 1	103 94 105 85 112 110 98 100 105 78 100 105 78 101 108 103 85 90 109 109 109 109 109 109 109 109 102 103 101 108 85 105 105 108 85 108 85	80%           60%           30%           80%           100%           100%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           80%           80%           20%           80%           60%           80%           100%           80%           80%           80%           80%           80%           80%           80%           80%           80%           80%           80%           80%           80%           80%	0 0 0 0 7 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102           92           105           94           115           111           100           73           100           98           93           107           98           93           110           100           93           110           103           99           93           115           100           103           104           103           106           87           110           106           87           116           106	111
20 25	Ventilation Adit Structure Backfill C&C Tunnel (Portion 3/	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Poker, standard Portion 3A4) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard	CNP 282           OCNP           SB D8-13           CNP 065           Ref 1           OCNP           BS D7-114           CNP 021           CNP 047           OCNP           BS D7-79           BS D7-7114           CNP 047	1         2         2         2         2         2         2         1         1         1         1         2          2          2    <	103 94 105 85 112 110 98 100 105 78 105 78 105 105 105 103 85 90 109 109 102 103 101 108 103 85 105 105 105 105 105 105 105 105 105 10	80% 60% 30% 80% 100% 20% 100% 30% 30% 30% 30% 30% 30% 30% 80% 80% 20% 20% 20% 20% 20% 80% 100% 80% 80% 80% 80% 80% 80%	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102           92           105           94           115           111           105           91           100           994           1100           100           91           100           100           100           98           93           110           103           99           107           98           93           110           103           104           103           104           103           104           105	111
20 25	Ventilation Adit Structure Backfill C&C Tunnel (Portion 3/	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck with Grab Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Joury Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Buildozer Compactor, vibratory Dump truck with Grab Generator, standard Road roller Water pump, submersible Portion 344) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes)	CNP 282 OCNP OCNP OCNP OCNP CNP 283 CNP 081 BS D8-13 CNP 085 Ref 1 OCNP BS D7-114 CNP 241 BS D9-39 CNP 241 BS D7-114 CNP 241 BS D7-114 CNP 241 CNP 044 CNP 243 CNP 044 CNP 047 OCNP 047 CNP 044 CNP 047 CNP 047 CNP 044 CNP 047 CNP 04	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         2         2         2         2         2         2         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         2         4         2         1         1         1         1         1         1         1         2         4         2      1	103 94 105 85 112 112 110 98 100 105 78 105 105 105 105 103 85 90 109 109 109 109 109 109 109 109 109	80% 60% 30% 100% 100% 20% 100% 30% 30% 30% 30% 30% 30% 30% 80% 20% 20% 20% 20% 80% 20% 20% 80% 20% 80% 100% 80% 80% 100% 80% 80%	0 0 0 0 7 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102           92           100           89           105           94           115           111           100           100           73           100           96           973           107           98           93           110           103           106           93           115           100           103           106           93           110           103           106           93           116           107           108           93           116           107	111
20	Ventilation Adit Structure Backfill C&C Tunnel (Portion 3/	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Raad roller Porton 3A4) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dum tuck, with or without grab	CNP 282 OCNP OCNP OCNP OCNP CNP 283 CNP 081 BS D8-13 CNP 065 Ref 1 OCNP BS D7-114 CNP 241 BS D9-39 CNP 283 CNP 021 CNP 044 CNP 021 CNP 044 CNP 044 CNP 047 OCNP BS D7-714 CNP 241 BS D7-714 CNP 241 BS D7-714 CNP 241 CNP 044 CNP 047 OCNP 044 CNP 047 OCNP 283 CNP 101 CNP 105 CNP 105 CNP 103 CNP 103 CNP 103 CNP 103 CNP 101 CNP 105 CNP 103 CNP 103 CNP 103 CNP 101 CNP 283	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         2         2         2         2         1         1         1         1         1         1         1         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         1         2         2         1         2         2         1         2          1          2 <td>103 94 105 85 112 110 98 100 105 78 100 105 78 101 108 103 85 90 109 109 109 109 109 109 100 103 101 108 85 105 105 105 105 108 85 102 105 108 108 108 108 108 108 108 108 108 105 105 105 105 105 105 105 105 105 105</td> <td>80%           60%           30%           80%           100%           100%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           80%           80%           20%           20%           20%           20%           20%           20%           20%           80%           100%           80%  &lt;</td> <td>0 0 0 0 7 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>102           92           105           94           115           111           100           73           100           73           100           93           107           98           93           110           103           99           93           115           100           103           994           107           108           93           115           100           103           104           105           91           106           87           116           106           105           93           106</td> <td>111</td>	103 94 105 85 112 110 98 100 105 78 100 105 78 101 108 103 85 90 109 109 109 109 109 109 100 103 101 108 85 105 105 105 105 108 85 102 105 108 108 108 108 108 108 108 108 108 105 105 105 105 105 105 105 105 105 105	80%           60%           30%           80%           100%           100%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           80%           80%           20%           20%           20%           20%           20%           20%           20%           80%           100%           80%  <	0 0 0 0 7 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102           92           105           94           115           111           100           73           100           73           100           93           107           98           93           110           103           99           93           115           100           103           994           107           108           93           115           100           103           104           105           91           106           87           116           106           105           93           106	111
20 25	Ventilation Adit Structure Backfill C&C Tunnel (Portion 3/	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck with Grab Bar bender and cutter Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Water pump, submersible Potion 3A4) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diseel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer	CNP 282           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           OCNP           CNP 081           BS D8-13           CNP 065           Ref 1           OCNP           OCNP 047           OCNP 283           CNP 021           CNP 047           OCNP 047           OCNP 047           OCNP 101           CNP 047           OCNP 101           CNP 047           OCNP 101           CNP 1050           OCNP 101           CNP 105           CNP 105           CNP 105           CNP 105           CNP 1067           CNP 107           CNP 108           CNP 101           CNP 282           OCNP           OCNP           OCNP           OCNP	1         2         2         2         2         2         1         1         1         1         2         2         2         2         2         2         2         2         2         2         2         4         2         1         2         2         4         2         1         2         1         2         1         1         2 <td>103 94 105 90 105 85 112 110 98 100 105 78 105 78 105 105 105 103 85 90 109 109 109 102 103 101 108 108 85 105 105 105 105 105 105 105 108 85 105 108 108 85 105 105 108 108 108 108 108 108 108 109 105 105 105 105 105 105 105 105 105 105</td> <td>80% 60% 30% 100% 100% 20% 100% 30% 30% 30% 30% 30% 30% 30% 30% 30%</td> <td>0 0 0 0 7 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>102 92 105 94 115 111 105 91 100 100 73 100 96 107 98 93 107 98 93 114 90 110 103 99 110 103 99 107 100 107 98 93 115 100 103 104 103 104 103 104 103 104 103 104 105 87 110 105 88 1115 111 105 93 106 88 88</td> <td>112</td>	103 94 105 90 105 85 112 110 98 100 105 78 105 78 105 105 105 103 85 90 109 109 109 102 103 101 108 108 85 105 105 105 105 105 105 105 108 85 105 108 108 85 105 105 108 108 108 108 108 108 108 109 105 105 105 105 105 105 105 105 105 105	80% 60% 30% 100% 100% 20% 100% 30% 30% 30% 30% 30% 30% 30% 30% 30%	0 0 0 0 7 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 92 105 94 115 111 105 91 100 100 73 100 96 107 98 93 107 98 93 114 90 110 103 99 110 103 99 107 100 107 98 93 115 100 103 104 103 104 103 104 103 104 103 104 105 87 110 105 88 1115 111 105 93 106 88 88	112
20 25 Tak	Ventilation Adit Structure Backfill C&C Tunnel (Portion 3/	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Welder / Generator Dump truck with Grab Welding Set Lorry with crane Crawler crane Ventilation fan Dump truck Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck with Grab Generator, standard Raad roller Porton 3A4) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dum tuck, with or without grab	CNP 282 OCNP OCNP OCNP OCNP CNP 283 CNP 081 BS D8-13 CNP 065 Ref 1 OCNP BS D7-114 CNP 241 BS D9-39 CNP 283 CNP 021 CNP 044 CNP 021 CNP 044 CNP 044 CNP 047 OCNP BS D7-714 CNP 241 BS D7-714 CNP 241 BS D7-714 CNP 241 CNP 044 CNP 047 OCNP 044 CNP 047 OCNP 283 CNP 101 CNP 105 CNP 105 CNP 103 CNP 103 CNP 103 CNP 103 CNP 101 CNP 105 CNP 103 CNP 103 CNP 103 CNP 101 CNP 283	1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         1         2         2         2         2         1         1         1         1         1         1         1         2         2         2         2         2         2         2         2         2         2         2         2         2         2         2         1         2         2         1         2         2         1         2          1          2 <td>103 94 105 85 112 110 98 100 105 78 100 105 78 101 108 103 85 90 109 109 109 109 109 109 100 103 101 108 85 105 105 105 108 85 105 108 85 105 108 108 108 108 108 108 108 108 105 105 105 105 105 105 105 105 105 105</td> <td>80%           60%           30%           80%           100%           100%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           80%           80%           20%           20%           20%           20%           20%           20%           20%           80%           100%           80%  &lt;</td> <td>0 0 0 0 7 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0</td> <td>102           92           105           94           115           111           100           73           100           73           100           93           107           98           93           110           103           99           93           115           100           103           994           107           108           93           115           100           103           104           105           91           106           87           116           106           105           93           106</td> <td>115</td>	103 94 105 85 112 110 98 100 105 78 100 105 78 101 108 103 85 90 109 109 109 109 109 109 100 103 101 108 85 105 105 105 108 85 105 108 85 105 108 108 108 108 108 108 108 108 105 105 105 105 105 105 105 105 105 105	80%           60%           30%           80%           100%           100%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           30%           80%           80%           20%           20%           20%           20%           20%           20%           20%           80%           100%           80%  <	0 0 0 0 7 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102           92           105           94           115           111           100           73           100           73           100           93           107           98           93           110           103           99           93           115           100           103           994           107           108           93           115           100           103           104           105           91           106           87           116           106           105           93           106	115

ID	Construction Activities	Group <sup>[1]</sup>	РМЕ	Ref. <sup>[2]</sup>	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max SP dB(A) <sup>[1</sup>
608	Install decking	1	Crawler crane Tractor with trailer	BS D7-114 CNP 222	1	101 118	80% 20%	0	100 111	
			Flat-top Lorry	OCNP 222	1	105	70%	0	103	
			Drill, hand-held (electric)	CNP 065	2	98	80%	0	100	
			Welder / Generator	Ref 1	2	100	80%	0	102	
			Generator, standard	CNP 101	1	108	100%	-5	103	
610,	ELS work	1	Excavator / Backhoe	CNP 081	4	112	80%	Total 0	113 117	113
611,	LES WORK		Breaker, excavator mounted, hydraulic	BS D8-13	1	110	30%	0	105	
612			Drill, hand-held (electric)	CNP 065	1	98	20%	0	91	
			Welder / Generator	Ref 1	2	100	80%	0	102	
			Dump truck with Grab	OCNP	2	105	30%	0	103	
			Welding Set Lorry with crane	Ref 2 OCNP	2	78 105	30% 30%	0	76 100	
			Crawler crane	BS D7-114	1	103	30%	0	96	
			Ventilation fan	CNP 241	2	108	80%	0	110	
			Dump truck	BS D9-39	1	103	30%	0	98	-
			Water pump, submersible	CNP 283	10	85	80%	0	94	110
620	C&C Tunnel Structure	1	Bar bender and cutter	CNP 021	2	90	50%	Total 0	118 90	118
020			Concrete Lorry Mixer	CNP 044	2	109	80%	0	111	
			Concrete pump	CNP 047	2	109	80%	0	111	
			Poker, vibratory, hand-held	OCNP	3	102	50%	0	104	
			Saw, circular wood	BS D7-79	4	103	50%	0	106	
			Crawler crane	BS D7-114	2	101	50% 50%	0	101 108	
			Ventilation fan Generator, standard	CNP 241 CNP 101	2	108	100%	0	108	
			Water pump, submersible	CNP 283	10	85	80%	0	94	
								Total	117	117
23	Backfill	1	Bulldozer	Ref 4	2	102	50%	0	102	
			Compactor, vibratory Dump truck with Grab	CNP 050 OCNP	2	105 105	50% 50%	0	105 105	-
			Generator, standard	CNP 101	2	105	100%	0	105	
			Road roller	CNP 185	2	108	50%	0	108	
			Water pump, submersible	CNP 283	4	85	100%	0	91	
								Total	114	114
<i>ress</i> 40,	Pipepiles & Underpass a Pipepiles & Kingposts,	at Kai Tak (F 1	Part of Portion 3A4 & Portion 3A5) Pipe Pile Rig	CNP 167	5	114	80%	0	120	r
+0, 45	sheetpiles	'	Air compressor, air flow > 30m3/min	CNP 003	16	104	80%	0	115	
	oncorpiloo		Generator, standard	CNP 101	9	108	100%	0	118	
			Crawler crane	BS D7-114	6	101	80%	0	108	
			Water pump, diesel	CNP 282	5	103	80%	0	109	
			Mini Backhoe	OCNP	5	94	60%	0	99	
			Dump truck, with or without grab	OCNP	2	105	30%	0	103	
			Grout mixer	OCNP	2	90	60%	0	91	
			Grout pump	OCNP	3	105	60%	0	108	
			Vibratory hammer, hydraulic	OCNP OCNP	1	115 100	60% 60%	0	113 98	
			Power pack Welding Machine (electric)	Ref 1	14	95	30%	0	101	
			Water pump, submersible	CNP 283	8	85	80%	0	93	
								Total	124	124
50,	ELS work	1	Excavator / Backhoe	CNP 081	6	112	80%	0	119	
51			Breaker, excavator mounted, hydraulic	BS D8-13	1	110	30%	0	105	
			Drill, hand-held (electric)	CNP 065	1	98	30%	0	93 102	
			Welder / Generator Dump truck with Grab	Ref 1 OCNP	2	100 105	80% 20%	0	102	-
			Welding Set	Ref 2	4	78	30%	0	79	
			Lorry with crane	OCNP	1	105	20%	0	98	
			Crawler crane	BS D7-114	2	103	20%	0	97	
			Ventilation fan	CNP 241	2	108	80%	0	110	
			Dump truck	BS D9-39	1	103	30%	0	98	
			Water pump, submersible	CNP 283	54	85	80%	0	101	
			Decker and extrem		0	00	000/	Total	120	120
60	Depressed Rd, underpass, adit	1	Bar bender and cutter Concrete Lorry Mixer	CNP 021 CNP 044	2	90 109	30% 80%	0	88 111	
	structure and backfill		Concrete pump	CNP 044 CNP 047	2	109	80%	0	111	1
			Poker, vibratory, hand-held	OCNP OCNP	3	103	80%	0	106	1
			Saw, circular wood	BS D7-79	4	103	20%	0	102	
			Crawler crane	BS D7-114	3	101	20%	0	99	
			Ventilation fan	CNP 241	2	108	80%	0	110	1
			Generator, standard	CNP 101	2	108	100%	-5	106	4
			Water pump, submersible	CNP 283	8	85	80%	0	93	
			Bulldozer	Ref 4	2	102	50%	0	102	-
			Compactor, vibratory Dump truck with Grab	CNP 050 OCNP	2	105 105	50% 20%	0	105 101	ł
			Generator, standard	CNP 101	2	105	20%	0 -5	101	1
			Road roller	CNP 185	2	108	30%	-5	106	1
			Water pump, submersible	CNP 283	8	85	80%	0	93	
								Total	118	118
	h Structures and At-gra			001/2			0001	-		
15	Sheetpiling	1	Vibratory hammer, hydraulic	OCNP OCNP	2	115	80%	0	117	ł
			Power pack Flat-top Lorry	OCNP	2	100 105	80% 80%	0	102 107	
				CONF	4	100	00 /0	Total	107	118
50	ELS work	1	Excavator / Backhoe	CNP 081	2	112	80%	0	114	
1			Breaker, excavator mounted, hydraulic	BS D8-13	1	110	30%	0	105	1
			Drill, hand-held (electric)	CNP 065	1	98	20%	0	91	
			Welder / Generator	Ref 1	2	100	80%	0	102	
			Dump truck with Grab	OCNP	2	105	30%	0	103	
			Welding Set	Ref 2	2	78	30%	0	76	
			Lorry with crane	OCNP	1	105	20%	0	98	
			Crawler crane	BS D7-114	1	101	20%	0	94	4
			Ventilation fan	CNP 241 BS D9-39	2	108 103	80% 30%	0	110 98	
					1	103	30%			
			Dump truck Water pump, submersible	CNP 283	8	85	80%	0	93	•

ID	Construction Activities	Group <sup>[1]</sup>	РМЕ	Ref. <sup>[2]</sup>	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max SPL, dB(A) <sup>[1]</sup>
S760	Construct Trough	1	Bar bender and cutter	CNP 021	2	90	30%	0	88	
	Structure		Concrete Lorry Mixer	CNP 044	2	109	70%	0	110	1
			Concrete pump	CNP 047	2	109	70%	0	110	1
			Poker, vibratory, hand-held	OCNP	3	102	60%	0	105	
			Saw, circular wood	BS D7-79	4	103	20%	0	102	
			Crawler crane	BS D7-114	2	101	30%	0	99	
			Ventilation fan	CNP 241	2	108	80%	0	110	
			Generator, standard	CNP 101	2	108	100%	-5	106	
			Water pump, submersible	CNP 283	8	85	80%	0	93	
								Total	116	116
S770	Backfill & remove	1	Bulldozer	Ref 4	2	102	60%	0	103	
	sheetpiles		Compactor, vibratory	CNP 050	2	105	60%	0	106	
			Dump truck with Grab	OCNP	2	105	80%	0	107	
			Generator, standard	CNP 101	2	108	100%	-5	106	
			Road roller	CNP 185	2	108	80%	0	110	
			Water pump, submersible	CNP 283	4	85	100%	0	91	
			Vibratory hammer, hydraulic	OCNP	2	115	80%	0	117	
			Power pack	OCNP	2	100	80%	0	102	
			Flat-top Lorry	OCNP	2	105	50%	0	105	
			Welder / Generator	Ref 1	2	100	30%	0	98	
				-				Total	119	119
S775	Roadwork for At-grade		Asphalt paver	CNP 004	1	109	80%	0	108	
	road		Bar bender and cutter	CNP 021	1	90	30%	0	85	
			Bulldozer	Ref 4	1	102	30%	0	97	
			Concrete Lorry Mixer	CNP 044	1	109	80%	0	108	
			Generator, standard	CNP 101	2	108	100%	-5	106	
			Dump truck	BS D9-39	4	103	20%	0	102	
			Poker, vibratory, hand-held	OCNP	1	102	80%	0	101	
			Road roller	CNP 185	1	108	80%	0	107	1
			Roller, vibratory	BS D3-116	1	106	80%	0	105	
			Crawler crane	BS D7-114	1	101	20%	0	94	
								Total	115	115

Notes:

[1] PME in separate groups will not be operated at the same time. The group with the highest SWL is adopted in this assessment as the worst-case scenario.

PME in separate groups will not be operated at the same time. The group with the highest SWL is adopted in this assessment as the worst-case scenario.
 The SWLs are referred to the following references:
 CNP - Table 3 - Sound Power Levels for Items of Powered Mechanical Equipment (PME) of Technical Memorandum on Noise from Construction Work Other Than Percussive Piling (GW-TM) issued by Noise Control Authority, Environmental Protection Department
 OCNP - Sound power levels of the ropmonly used PME obtained from http://www.epd.gov.hk/epd/english/application\_for\_licences/guidance/files/OtherSWLe.pdf
 Ref 1 - Appendix 8.1 of the approved EIA Report for Shain to Central Link - Stabling Sidings at Hung Hom Freight Yard (Register No.: AEIAR-164/2012)
 Ref 2 - Appendix 8.3 of the approved EIA Report for Hong Kong Section of Guangzhou - Shenzhen - Hong Kong Express Rail Link (Register No.: AEIAR-143/2009)
 Ref 3 - Appendix 8.3 of the approved EIA Report for Tail Wai to Hung Hom Section (Register No.: AEIAR-167/2012)
 Ref 4 - Table 4-14 of the approved EIA Report for Proposed Comprehensive Development at Wo Shang Wai, Yuen Long (Register No.: AEIAR-120/2008)
 BS - British Standard 5228: Part 1:2009 Noise Control on Construction and Open Sites

Notional Distance of Works Area to NSRs

Appendix 5	. I Notional Distance of Works Area to	N JRS
Portion	Distance to Notiona	I Source Position, m
Fortion	E-N12 Grand Waterfront Tower 3	E-N21 Hang Chien Court Block J
1A	37	58
1B	110	7
1E	187	63
2A1	221	293
2A3	165	133
2B	239	104
3A2	>300	>300
3A4	>300	>300
3A5	>300	>300
3A6	>300	>300
3B	>300	>300
3D	>300	>300

Appendix 3.1 Notional Distance of Works Area to NSRs

**Detailed Noise Calculation** 

#### Detailed Noise Calculation

NSR:

#### E-N12 Grand Waterfront Tower 3

		-				-				010				010					0000					001					000					0000		
ID	Construction Activities	Portion	<sup>[1][2]</sup> S	WL Di	st. SPL	[3] Start	Finis	h		018 A S O	ND			2019	slo		EM		2020		ND			021	50		1 5		2022					2023	ASC	ND
Kowloon City Vehicular Ferry Pier (Portion	n 1R)								VI J J	A 3 0	NUU		A   IVI   J	JJA	30		FIVI	A IVI .	JJJP	130				JA	30	NU	JF			<u>  A  5</u>					<u>A 3 0</u>	ND
S135, S136	Demolition of carpark building and ramp structure	1B		97 1	0 51	02/06/1	8 18/07	18	51 51		11	1 1 1		TT								TT										$\overline{\mathbf{T}}$		<b>TTT</b>		
S150	Reprovision of new parking facilities	1B			0 51		_		51	51 51																			+++	++-	++++	++-'		++++		
Ma Tau Kok C&C tunnel & Access Shaft (F				<u>   .</u>	0 01																															
S380, S420	Piling and kingposts	1A	1	12 3	7 75	17/09/1	3 23/03	/19		75 75	75 75 7	5 75 75																	TT		$\square$	TT	$\square$	$\square$		$\square$
S426	Install decking	1A	1	09 3	7 73	01/04/1	31/05	/19					73 73																++-	++-		++-		+++		
S390, S391, S392, S393, S430, S431, S432	ELS work	1A	1	12 3	7 75	01/04/1	9 11/05	22					75 75 7	5 75 75	75 75	75 75 75	5 75 75	75 75 7	75 75 7	5 75 75	75 75 7	5 75 75	75 75 7	5 75 75	75 75	75 75	75 75	75 75 7	5							
S400	Construction of RC wall and temporary noise enclosure	1A	1	11 3	7 75	02/07/2	20/08	20											75 75	5																
S440	C&C Tunnel Structure	1A	1	10 3	7 74	12/05/2	2 17/09	22																				7	4 74 7	'4 74 74	t					
S910	Backfill	1A	1	08 3	7 72	19/09/2	2 14/01	23																						72	72 72 7	2 72				
Landing Steps and Covered Walkway (Por																													<b></b>							
S470	Removal of existing seawall	1E & 1				04/01/1					6	<u>4 64 64</u>	<u>64 64 64</u>	<u>4 64 64</u>	<u>64</u> 64															$\downarrow$		'				
S480, S490	Construction of landing steps and covered walkway	1E & 1	2B 1	06 18	37 56	12/07/1	9 11/09	20						<u>56 56</u>	56 56 5	<u>56 56 56</u>	<u>6 56 56</u>	56 56 5	<u>56 56 5</u>	6 56																
Marine Tunnel Stage1 (tunnel footprint of																													<del></del>	4- <i></i> -				4		
S540	Construction of temp working platforms	2A1		13 22	21 62						62 62 6	2 62	(0) (0) (1)																		+	<u> </u>	$\vdash$	++++		<u> </u>
S545, S550	Cofferdam construction of sheetpiles and pipepiles	2A1		21 22							6	9 69 69	69 69 6	9 69	50	-0.50															+	<u> </u>	$\vdash$	++++		<u> </u>
S555	Temporary reclamation between pipepiles and sheetpiles	2A1		11 22					+	+		+ $+$ $+$		+	593	27 27	1 41 44	(1 / 1	+	+ $+$	$\vdash$	+ +	$\left  \right $	+			$\vdash$		++	++-	+++	++-'	+++	+++	++	++
S560, S561, S562	ELS work	2A1 2A1		13 22 18 22				-	+ $+$ $+$	+++		+ $+$ $+$			+ +	61	10101		66 66 6	6 66 11	$\vdash$		$\left  \right $					-+	++	++-	+++	++-'	+++	+++	++	++
S570 S575, S576	Marine Tunnel Structure Backfill	2A		18 2					+			+			$\vdash$			00 0	00 00 00	00 00 00 62	63		$\left  \right $				$\vdash$		++	++-	+++	++-'	$\vdash$	+++	++	++
S580	Removal of reclamation/ temp platforms	2A1 2A1		15 22		06/11/2	_		+++		++	+ $+$ $+$		+	$\left  \right $		+ $+$	$\vdash$	++	03	63 62 6	2	$\left  \right $	+			$\vdash$		++	++-	+++	++-'	+++	+++	++	++
S585	Dredging for Stage 2 diversion	2A1			21 56		_		+						$\vdash$			$\left  \right $			56 5	6					$\vdash$		++	++-	+++	++-'	$\vdash$	+++	++-	$\square$
Marine Tunnel Stage2 (tunnel footprint of		24	· '	24	. 50	24/12/2		~ 1													1 20 3	<u> </u>														
S640	Construction of temp working platforms	2A3	3 1	17 10	5 67	20/01/2	1 04/03	21	1 1 1												6	7 67 67							$\overline{\mathbf{T}}$					TTT	TT	ETT.
S645, S650	Cofferdam construction of sheetpiles and pipepiles	2A3			5 68																	68 68	68 68 6	3 68 68	68				++	++-		++				
S655	Temporary reclamation between pipepiles and sheetpiles	2A3			5 62																				62 62	62			++-	++-		++-				
S660, S661, S662	ELS work	2A3	3 1	13 10	5 64	07/12/2	1 07/06	22																		64	64 64	64 64 64	4 64							
S670	Marine Tunnel Structure	2A3	3 1	18 10	5 69	19/05/2	2 11/10	22																				6	9 69 6	9 69 69	69					
S675, S676	Backfill	2A3	3 1	15 10	5 66	12/10/2	2 09/12	22																							66 66 6	6				
S677	Reprovision of MTK Public Pier	2A3	3 1	15 10	5 66	12/10/2	2 09/12	22																							66 66 6	6				
S680	Removal of reclamation/ temp platforms	2A3	3 1	15 10	5 65	10/12/2	2 04/02	23																							6	65 65 65				
Vertical Wall along depressed road at Port	tion 3B																																			
S200, S222	Pipepiles and sheetpiles	3B	1	16 >3	- 00	23/04/1	3 07/01	19 -				·																								
Ventilation Adit at Eastern Interface(Portion		-			_	-	-																						444	<b></b> _				<u> </u>		
S300	Piling and pumping test	3A6			- 00	28/04/1	_	-			-																		++	++	+++	'				
S310	ELS work	3A6		14 >3		08/11/1						·																	++	++-	++++	<u>++</u> '		+		⊢
S320	Ventilation Adit Structure	3A6			- 00	01/02/1																								+		++	+++	+		<u> </u>
S325	Backfill	3A6	) 1	10 >3	- 00	08/08/1	9 27/08	19						-   -															╧╧╧			'		╧╧╧╧		
Kai Tak C&C Tunnel (Portion 3A2 & Part o S605	,	242.0	244 1	18 >3	00	05/04/1	12/12	10			- T	1 1 1		1 1		1	1 1 1					1 1		1 1								<del></del>		<del></del>	<u> </u>	
S608	Piling and kingposts Install decking	3A2 & 3A2 & 3		10 >3		05/04/1	_	-																					++-	++-	++++	++-'	$\vdash$	++++		
S610, S611, S612	ELS work	3A2 &		18 >3		21/01/2			+ + +																				++-	++-	++++	++-'	$\vdash$	++++		$ \rightarrow $
S620	C&C Tunnel Structure	3A2 &		17 >3		01/06/2	_																						++-	+	+	++-'	$\vdash$	++++		
S623	Backfill	3A2 &		14 >3		09/10/2		-												-	-								++	+	+++	++-'		++++		
Depressed Road & Underpass at Kai Tak		5/12/01				0/10/2																														
S340, S345	Pipepiles & Kingposts & Sheetpiles	3A4 &	3A5 1	24 >3	- 00	13/11/1	8 08/10	19																					$\top \top$	$\top$		TT		TTT		
S350, S351	ELS work	3A4 &	3A5 1	20 >3	- 00	09/10/1	9 30/07	20																					+++							
S360	Depressed Rd, underpass, adit structure and backfill	3A4 &	3A5 1	18 >3	- 00	30/07/2	07/05	21																												
U Trough Structures and At-grade Road a	t Kai Tak (Portion 3D)																																			
S745	Sheetpiling	3D	1	18 >3	- 00	05/10/2	1 23/12	21																	-											
S750	ELS work	3D		16 >3		24/12/2																				-			·   - [		$\square$		$\square$	$\perp \Box$		
S760	Construct Trough Structure	3D		16 >3			2 15/11																													
S770	Backfill & remove sheetpiles	3D		19 >3		03/09/2																											$\square$	$\square$		$\square$
S775	Roadwork for At-grade road	3D	1	15 >3		01/02/2																											<u> - -</u>			
						SPL (CKR																														
				Co	rected S	PL (CKR on	ly), dB(A) <sup>l</sup>	<sup>4][5]</sup> : -	- 51 51	51 75 75	75 75 7	5 75 75	75 75 75	5 75 75	75 75	75 75 75	5 75 75	75 75 7	75 75 7	5 75 75	75 75 7	5 75 75	75 75 7	5 75 75	75 75	75 75	75 75	75 75 7	5 75 7	5 75 75	75 74 7	4 73 65				
						dance (CKF	J/- (/																													
						Range (CKF																														
			SPL f	rom Kai	Tai Devel	opment (K1	D) <sup>[5][6]</sup> , dB	(A): 78 7	78 78 -																											
				Cu	mlative S	PL (CKR + 1	Hh <sup>[6]</sup> (TT)	(A): 78 7	78 78 51	51 75 75	75 75 7	5 75 75	75 75 7	5 75 75	75 75	75 75 75	5 75 75	75 75 7	75 75 7	5 75 75	75 75 7	5 75 75	75 75 7	5 75 75	75 75	75 75	75 75	75 75 7	5 75 7	5 75 75	75 74 7	/4 73 65				
			Cum	nulative l	xceedan	ice (CKR + I	(D) <sup>[6]</sup> dE	(A)· 3	33-																											
Notes:			Gui	anativo I		55 (SIXI T I	, , uL																													

Notes:

[1] For works that would be conducted in more than one works sites, the distance of the works site closer to the NSR is adopted in the assessment as the worst-case scenario.

[2] Works located outside 300m boundary of the NSR are not assessed.

[3] For the calculation of sound pressure levels (SPL), the PMEs are assumed to be placed at the notional source position according to the "Technical Memorandum on Noise from Construction Work other than Percussive Piling" by EPD.

[4] Bold values denote exceedanc of the EIAO-TM criteria of 75 dB(A) for residential dwellings.

[5] The following construction activities are scheduled to be conducted in the same month but will not be conducted on the same days, thus should not be added up. The the activities with the lower SPL (underlined) are omitted in the "corrected SPL".

- S390, S391, S392, S393, S430, S431, S432 and any other activities

S400 and any other activities
S150 and S380, S420

- S135, S136 and S150 - S380, S420 and S545, S550 - S440 and S910

[6] The concurrent work that is within 300m of the NSR, Contract No. KL/2012/03 - Stage 4 infrastructure works at north apron area of Kai Tak Airport under KTD, is estimated to complete before mid-2018. Following the Approved CKR EIA Report, the noise level from KTD is assumed to be 78 dB(A) for this assessment. [7] S470 and S545, S550 will be conducted concurrently. The concurrent noise level from these two activities at E-N12 from January to July 2019 will be 70dB(A), compling with the noise criteria of 75 dB(A).

#### Detailed Noise Calculation

NSR:

#### E-N21 Hang Chien Court Block J

	1																								-								
ID	Construction Activities	Portion [1][2]	SWL D	ist. S	SPL [3]	Start	Finish		2018				2019					2020				2021					2022					2023	
Kowloon City Vehicular Ferry Pier (Portio	n 1R)					I	I	AINIJJJ	A 5	UINIL	JJF		MIJJJ	A 5 0		JIFIN		JJJA	3 0 1		- IVI A		A S	UINIL	JJF		VIJJJ	A S		JJJF			ASON
S135, S136	Demolition of carpark building and ramp structure	1B	97	7	75 02	/06/18	18/07/18	75 75	5		1 1 1						1 1 1			<u> </u>					TT			T T T	(TTT				<b>TTTT</b>
S150	Reprovision of new parking facilities	1B	97	7	75 10	/00/10	03/09/18	75 75	5 75 75																				++			+++	+++++++++++++++++++++++++++++++++++++++
Ma Tau Kok C&C tunnel & Access Shaft (		10	77	<i>'</i>	/3 1/		03/07/10		5//5//5/											<u> </u>	1 1				1 1							┢━┷╼┶╸	
S380, S420	Piling and kingposts	1A	112	58	71 17	/09/18	23/03/19		71	71 71 7	1 71 71	71																		TT			
S426	Install decking	1A					31/05/19					69.6	69																				
S390, S391, S392, S393, S430, S431, S432	5	1A		58			11/05/22					72 7	72 72 72	72 72 72	72 72	72 72 7	2 72 72	72 72 72	72 72 7	2 72 72 7	2 72 72	72 72 72	2 72 72	72 72 7	2 72 72	72 72 7	2						
S400	Construction of RC wall and temporary noise enclosure	1A	111	58	71 02	/07/20	20/08/20											71 71															
S440	C&C Tunnel Structure	1A	110 !	58	70 12	/05/22	17/09/22																			7	0 70 70	0 70 70					
S910	Backfill	1A	108	58	68 19	/09/22	14/01/23																					68	68 68 6	o8 68			
Landing Steps and Covered Walkway (Pc	rtion 1E & Portion 2B)																																
S470	Removal of existing seawall	1E & 2B		_			31/10/19				<u>74</u> <u>74</u>	<u>74 74 7</u>	74 74 74	74 74 74																			
S480, S490	Construction of landing steps and covered walkway	1E & 2B	106 0	63	65 12	/07/19	11/09/20						65	65 65 65	65 65	65 65 6	5 65 65	65 65 65	65														
Marine Tunnel Stage1 (tunnel footprint of	,				50 00	14.4.4.0	04/00/40			50 5											1 1		1 1		1			<u> </u>	<u> </u>	4		<u> </u>	
S540	Construction of temp working platforms	2A1	113 2		59 01		21/02/19			59 5	9 59 59	(7 (7 (					+ $+$ $+$ $+$														+++-	+++-+-	
\$545, \$550	Cofferdam construction of sheetpiles and pipepiles	2A1 2A1			67 28 57 26		31/07/19 19/12/19		+		0/0/	0/0/0	0/0/0/	E7	57 57	$\vdash$	+ $+$ $+$	+			++-			$\rightarrow$	+	+++	++	+ $+$ $+$	+++	++	+++	+++	++++
S555 S560, S561, S562	Temporary reclamation between pipepiles and sheetpiles ELS work	2A1 2A1					13/05/20		+		+			5/	3/ 3/	50 50 5	0 50 50		+	+	+ +				+	+++	+	+ $+$ $+$	_++-	++	+++-	+++	++++
S500, S501, S502 S570	Marine Tunnel Structure	2A1 2A1		-	-		29/10/20		+			+ +			++	37 37 3	7 <u>37</u> <u>39</u> 6/	64 64 64	64 64	+	+					+++	++	+ $+$ $+$	_+++	++	+++	+++	++++
S575, S576	Backfill	2A1 2A1	-	-			05/11/20								$\left  \right $		04	01 04 04	61.6	1						+++	+	+ $+$	_++	++-	+++-	+++	++++
S580	Removal of reclamation/ temp platforms	2A1		_	60 06		08/01/21								++		+++		6	0 60 60				++		+++		+ $+$ $+$	_+++	++	+++	+++	++++
S585	Dredging for Stage 2 diversion	2A1		_	53 24		19/01/21													53 53									,	++		+++	+
Marine Tunnel Stage2 (tunnel footprint of					[2]														1 1	122122	<u> </u>				<u> </u>								
S640	Construction of temp working platforms	2A3	117 1	33	69 20	/01/21	04/03/21													69 6	9 69												
S645, S650	Cofferdam construction of sheetpiles and pipepiles	2A3	117 1	33	70 10	/02/21	23/09/21													7	0 70 70	70 70 70	0 70 70										
S655	Temporary reclamation between pipepiles and sheetpiles	2A3	111 1	33	63 24	/09/21	08/11/21																<u>63</u>	63 63									
S660, S661, S662	ELS work	2A3	113 1	33	66 07	/12/21	07/06/22																	6	66 66	66 66 6	<u>66 66</u>						
S670	Marine Tunnel Structure	2A3		33		/05/22	11/10/22																			7	<u>1 71 7</u>	1 71 71					
S675, S676	Backfill	2A3					09/12/22																						68 68 6				
S677	Reprovision of MTK Public Pier	2A3			68 12		09/12/22										+ $+$ $+$ $+$												68 68 6				
S680	Removal of reclamation/ temp platforms	2A3	115 1	33	67 10	/12/22	04/02/23																						6	67 67 67			
Vertical Wall along depressed road at Pol		20		200	1.00	04/10	07/01/10		<u> </u>		1 1 1						<u> </u>	- T - T - T		- <b>-</b>	1 1		1 1		1	<u> </u>		<del></del>	<u> </u>				
S200, S222	Pipepiles and sheetpiles	3B	116 >	300	- 23	/04/18	07/01/19	-   -   -   -		-   -   -	-   -																						
Ventilation Adit at Eastern Interface(Porti S300	Piling and pumping test	3A6	115 >	300	20	/04/18	07/11/18		1 1 1		1 1 1		1 1				<u> </u>			<u>, , , , , , , , , , , , , , , , , , , </u>	1 1		1 1	- T T	1		<u> </u>	1 1 1		<del></del>			
S310	ELS work	3A6		300			31/01/19										+ + +														+++	+++	++++
S320	Ventilation Adit Structure	3A6		300			07/08/19							-																			
S325	Backfill	3A6	-	300			27/08/19							-																			
Kai Tak C&C Tunnel (Portion 3A2 & Part of	of Portion 3A4)				1 **																							<u> </u>					
S605	Piling and kingposts	3A2 & 3A4	118 >	300	- 05	/04/18	13/12/18				-																						
S608	Install decking	3A2 & 3A4	113 >	300	- 14	/12/18	28/01/19																										
S610, S611, S612	ELS work	3A2 & 3A4		300			30/05/20																										
S620	C&C Tunnel Structure	3A2 & 3A4		300	-		08/10/20								$\square$		+		-   -							$\square$				$\perp$		+++	+++
S623	Backfill	3A2 & 3A4	114 >	300	- 09	/10/20	11/11/20													·													
Depressed Road & Underpass at Kai Tak		244.0.245	124	200	1 40	/11/10	00/10/10				1 1 1		1 1				1 1 1								1								
S340, S345	Pipepiles & Kingposts & Sheetpiles	3A4 & 3A5		300			08/10/19										+ $+$ $+$ $+$														+	+++-+-	
S350, S351 S360	ELS work Depressed Rd, underpass, adit structure and backfill	3A4 & 3A5 3A4 & 3A5		300 300			30/07/20 07/05/21													+				++		+++		+	_++-	++	+++-	+++	++++
U Trough Structures and At-grade Road a		3A4 & 3A3	110 >	300	- 30	10//20	07/05/21													•   •   •   •		-			1						┝─┶───	┶┶┶┶	
S745	Sheetpiling	3D	118 >	300	. 05	/10/21	23/12/21																		T				<u> </u>	TT		<b></b>	<u> </u>
\$750	ELS work	3D		300			23/06/22																		1.				_++	++-	+++	+++	++++
S760	Construct Trough Structure	3D 3D		300			15/11/22																							++	+++	+++	
S770	Backfill & remove sheetpiles	3D	119 >		- 03																							-			+++	+++	++++
\$775	Roadwork for At-grade road	3D	115 >																										,	++-			
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		51	 	mlativ	P SPI (Ck	R + KTD)	<sup>[6]</sup> dR(Δ)·	78 78 80 7																									
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Notes:

[1] For works that would be conducted in more than one works sites, the distance of the works site closer to the NSR is adopted in the assessment as the worst-case scenario.

[2] Works located outside 300m boundary of the NSR are not assessed.

[3] For the calculation of sound pressure levels (SPL), the PMEs are assumed to be placed at the notional source position according to the "Technical Memorandum on Noise from Construction Work other than Percussive Piling" by EPD.

[4] Bold values denote exceedanc of the EIAO-TM criteria of 75 dB(A) for residential dwellings.

[5] The following construction activities are scheduled to be conducted in the same month but will not be conducted on the same days, thus should not be added up. The the activities with the lower SPL (underlined) are omitted in the "corrected SPL".

- S390, S391, S392, S393, S430, S431, S432 and any other activities

S400 and any other activities
S150 and S380, S420

- S135, S136 and S150 - S380, S420 and S545, S550 - S440 and S910

[6] The concurrent work that is within 300m of the NSR, Contract No. KL/2012/03 - Stage 4 infrastructure works at north apron area of Kai Tak Airport under KTD, is estimated to complete before mid-2018. Following the Approved CKR EIA Report, the noise level from KTD is assumed to be 78 dB(A) for this assessment. [7] S470 and S545, S550 will be conducted concurrently. The concurrent noise level from these two activities at E-N21 from January to July 2019 will be 74dB(A), compling with the noise criteria of 75 dB(A).