Gammon Construction Limited

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

Construction Noise Mitigation Measures Plan

Sep 2018

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Version: C Date: 21 September 2018

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Gammon Construction Limited

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

Construction Noise Mitigation Measures Plan (CNMMP)
(September 2018)

Certified by:	Y T Tang		
Signature:	- Ap		
Position:	Environmental Team Leader		
Date:	21 September 2018		





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:	21 September 2018 (KTW/CNMMP/Version C)		
Date received by IEC:	21 September 2018		

Reference EP Condition

Environmental Permit Condition: 2.9

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:-

- (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
- 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.

Ms Mandy To

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Date: 21 September 2018

Independent Environmental Checker

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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;

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- (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 B of the CNMMP was submitted to EPD on 22 March 2018, and was approved by EPD on 27 April 2018. Gammon Construction Limited updated the construction programme and plant inventory in September 2018. 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**.

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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

Item	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**.

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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

NSR ID NSR L		Landuse	Noise Criteria,		Maximum Construction Noise Levels, dB(A)		
NONID	Description	Landuse	L _{eq (30-min)} , 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:

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 _{eq (30-min)} , 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

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

- 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 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 3.3 Quiet PME Recommended for Adoption during Construction Phase

PME	Reference [1]	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

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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:

- 3S 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/m² 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.

Table 3.4 Noise Mitigation Measures for Certain PME during Construction Phase

PME	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

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

PME	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
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) for residential dwelling. The predicted noise levels at Grand Waterfront Tower 3 (E-N12) range from 50 to 75 dB(A). The maximum predicted noise level remains the same as the level of 75

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dB(A) predicted in the Approved CKR EIA Report. For Hang Chien Court Block J (E-N21), the predicted noise levels range from 60 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.

Table 3.5 Summary of Noise Assessment Result (CKR only)

NSR ID	NSR	Noise Criteria, L _{eq} (30-min), dB(A)	Predicted Noise Level, L _{eq (30-min)} , dB(A)	Exceedance, L _{eq (30-min)} , 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

- 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).

Table 3.6 Summary of Noise Assessment Result (Cumulative)

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

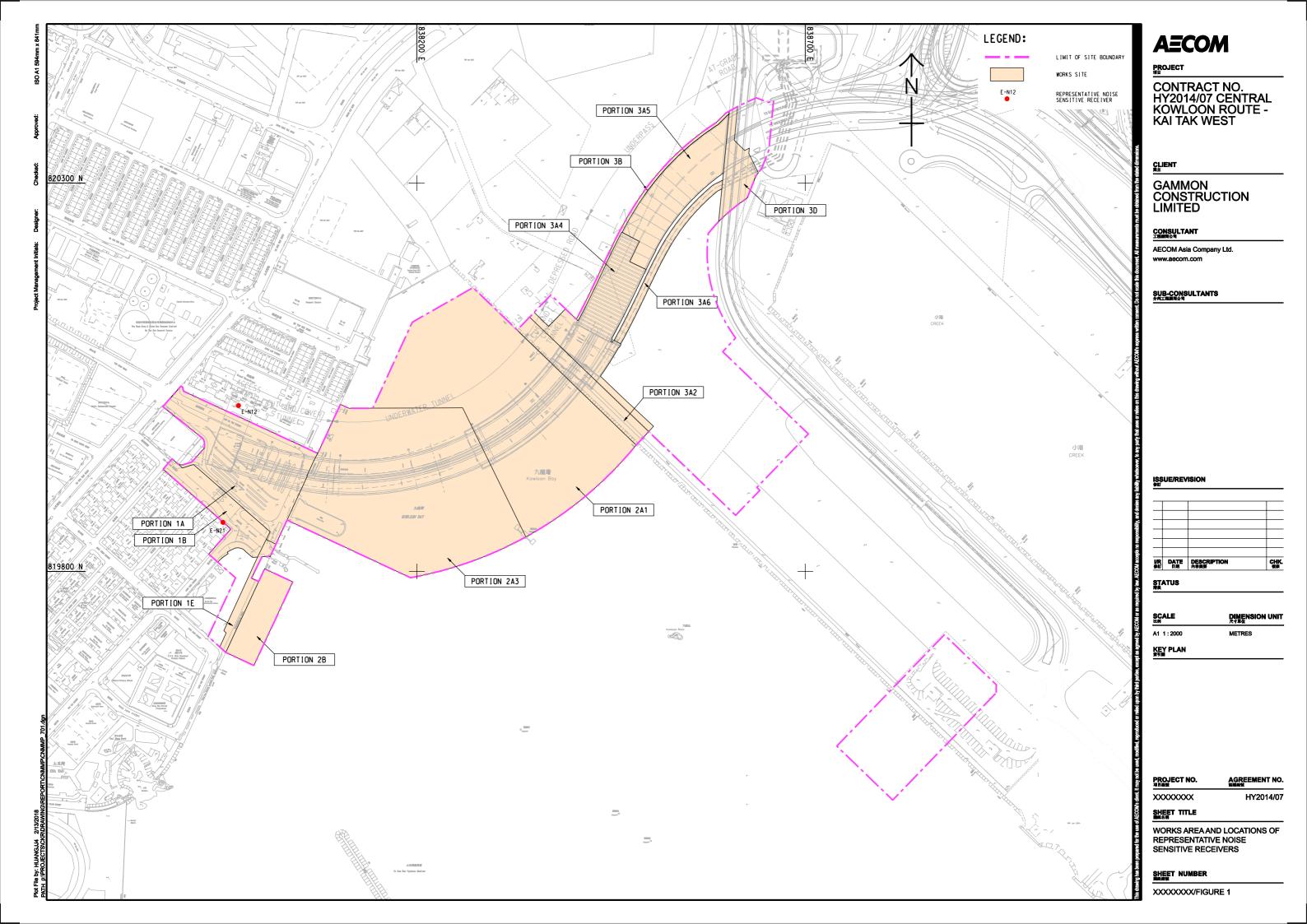
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4 CONCLUSION

- 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 level reduces from 79 to 75 dB(A). 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 reduces from 82 to 80 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.

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Figure	



Appendix 2.1

Tentative Construction Programme

Appendix 2.1 Tentative Construction Programme

					20	18			20	019				202	0			2(021		1	2	2022			202	3	
ID	Construction Activities	Start	Finish	A M			N D J	JFM			S O N	DJF	M A			D N D	JFM			O N D	J F M			ONE	JFM			D N C
Kowloon City Vehicular Ferry Pier (Portion	1B)																										\rightarrow	
S135, S136	Demolition of carpark building and ramp structure	02/06/18	18/07/18	П												T							\top				\top	\Box
S150	Reprovision of new parking facilities	19/07/18	03/09/18																									
Ma Tau Kok C&C tunnel & Access Shaft (Pe	ortion 1A)																											
S380, S420	Piling and kingposts	17/09/18	23/03/19	П																			$\overline{1}$	TIII			TTT	$\overline{}$
S426	Install decking	01/04/19																										
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		17/09/22																								\Box	\top
S910	Backfill	19/09/22																										+
Landing Steps and Covered Walkway (Port	ion 1E & Portion 2B)																											
S470	Removal of existing seawall	04/01/19	31/10/19	П			\Box							\Box				\Box					\top				\top	\top
S480, S490	Construction of landing steps and covered walkway	12/07/19		_																			+++				+	+
Marine Tunnel Stage1 (tunnel footprint of P		1.2,0.7.0	11/00/20																									
S540	Construction of temp working platforms	01/11/18	21/02/19															TT					\top				$\overline{\Box}$	\Box
S545, S550	Cofferdam construction of sheetpiles and pipepiles	28/01/19				+++					+++		\Box										+++				+++	+++
\$555	Temporary reclamation between pipepiles and sheetpiles	26/10/19				+++							\Box										+++				+++	+++
S560, S561, S562	ELS work	21/01/20					+									+							+++				+++	+++
S570	Marine Tunnel Structure	09/05/20				+++	++			+++	+++						+++	+					+++				+++	+++
S575, S576	Backfill	22/10/20							\vdash	+++	+		-										+++				+++	+
S580	Removal of reclamation/ temp platforms	06/11/20		1																			+++				+++	+
S585	Dredging for Stage 2 diversion	24/12/20		+ +																			+++				++++	+
Marine Tunnel Stage2 (tunnel footprint of P		24/12/20	13/01/21																									_
S640	Construction of temp working platforms	20/01/21	04/03/21	П	ПП	ТТ	$\overline{}$			ПП	1 1 1					T		TT					$\overline{}$	$\overline{}$			$\overline{}$	$\overline{}$
S645, S650	Cofferdam construction of sheetpiles and pipepiles		23/09/21	+ + -		+	+	+	$\overline{}$	+++	+	+	\vdash										+++				+++	+
S655	Temporary reclamation between pipepiles and sheetpiles		08/11/21	+ + -		+	+	+	$\overline{}$	+++	+	+	\vdash										+++				+++	+
S660, S661, S662	ELS work		07/06/22	+ + -		+	+	+	$\overline{}$	+++	+	+	\vdash				HHH	+					+++				+++	+
S670	Marine Tunnel Structure	19/05/22		+ + -		+	+	+	$\overline{}$	+++	+	+	\vdash				HHH	+					+				+++	+
S675, S676	Backfill	12/10/22		++						+++													+++				+++	+
S677	Reprovision of MTK Public Pier	12/10/22		++						+++	+	+											+					+
S680	Removal of reclamation/ temp platforms	10/12/22		+		+	+	+	$\overline{}$	+++	+	+	\vdash				HHH	+					+++				+++	+
Vertical Wall along depressed road at Porti	• •	10/12/22 1	04/02/23										\perp				\Box											\perp
S200, S222	Pipepiles and sheetpiles	23/04/18	07/01/10							 												 	$\overline{}$	 			$\overline{}$	$\overline{}$
Ventilation Adit at Eastern Interface(Portion		23/04/10 (07/01/19										\perp				\Box											\perp
S300		28/04/18	07/11/10							T T																	$\overline{}$	_
S310	Piling and pumping test ELS work	08/11/18								+++	+++	+	\vdash	++	+++		+++	++			++	+++	+++	+++			+++	+
\$310 \$320	Ventilation Adit Structure	01/02/19		_	+++	+++					+++	+	\vdash	++	+++	+	+++	++			++	+++	+++	+++			+++	+
S325	Backfill	08/08/19			+++	+++	+				+++	+	++		+++	+		++			++		+++	+++			+++	+
Kai Tak C&C Tunnel (Portion 3A2 & Part of		00/08/19	21/08/19										ш										444					
S605	Piling and kingposts	05/04/18	12/12/10																									
S608		14/12/18				+++				+++	+++	+	++		+++	+		++			++		+++	+++			+++	+
S610, S611, S612	Install decking	21/01/20			+++	+++				+++	+++				+++	++	+++	++					+++	++			+++	+++
	ELS work	01/06/20			+++	+++	++			++	+++						+++	++			++	+++	+++	+++	+		+++	+
\$620	C&C Tunnel Structure				+++	+++	++			++	+++	+	$\vdash\vdash$				+++	++			++	+++	+++	+++	+		+++	+
S623 Depressed Road & Underpass at Kai Tak (F	Backfill	09/10/20	11/11/20										ш										444					
		140/44/40	00/40/40														1 1 1								1 1 1		7	
S340, S345	Pipepiles & Kingposts & Sheetpiles	13/11/18			++	++	+					+			+	+	+++	+			\vdash	+	+++	++			+++	+++
S350, S351	ELS work	09/10/19			+++	+++	++	+	++	+++										++	++	+++	+++	+++	+		+++	+++
S360	Depressed Rd, underpass, adit structure and backfill	30/07/20	07/05/21		\perp		\perp						Ш				шш						444				444	
U Trough Structures and At-grade Road at		05465	00/46/5			1 1 1					1 1 1													 	1 1 1 1			
S745	Sheetpiling	05/10/21		+	+++	+++	++			+++	+	+	\square	\perp	+++	+	\square	+					+++	+++			+	+
S750	ELS work	24/12/21			+++	+	+			+++	+	\perp	\Box	\perp	+++		\Box	\perp					444				+++	+
S760	Construct Trough Structure	24/06/22			+++	+	$\perp \perp$	\perp	\Box	++	+	\perp	$\sqcup \sqcup$	\perp	+++	$\perp \perp$	$\sqcup \sqcup$	\perp			$\vdash \vdash$	+	444				+	+
\$770	Backfill & remove sheetpiles	03/09/22			$\perp \downarrow \downarrow$	$\perp \perp \perp$	$\perp \perp$			$\perp \perp \perp$	$\perp \perp \perp$	\perp	\Box	\perp	$\perp \perp \perp$	\perp		\perp				$\perp \perp \perp$	+ + +				$\perp \perp \downarrow$	$\perp \perp \perp$
S775	Roadwork for At-grade road	01/02/23	06/05/23																									

Appendix 2.2

Construction Plant Inventory

Appendix 2.2 Construction Plant Inventory

ID Towloon	Construction Activities City Vehicular Ferry P	Group [1]	PME	Ref. ^[2]	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max SPL, dB(A) ^[1]
<i>owioon</i> 3135, S136	Demolition of carpark building and ramp	1 1	Breaker, excavator mounted, hydraulic Crusher, excavator mounted, hydraulic	BS D8-13 OCNP	1	110 103	10% 30%	-5 -5	95 93	1
3130	structure				1			Total	97	
		2	Breaker, excavator mounted, hydraulic	BS D8-13		110	15%	-5 Total	97 97	
		3	Crusher, excavator mounted, hydraulic	OCNP	2	103	40%	-5 Total	97 97	
		4	Hand Held Breaker Generator, silenced, 75 dB(A) at 7 m	BS D8-12 CNP 102	1	106 100	20% 45%	-5 -5	94 92	
ļ			Saw, wire	OCNP	1	101	20%	-5	89	
		5	Hand Held Breaker	BS D8-12	1	106	40%	Total -5	97 97	
		6	Dump truck with grab	OCNP	1	105	50%	Total -5	97 97	
		7	Dump truck with grab	OCNP	2	105	20%	Total -5	97 96	
								Total	96	
		8	Dump truck with grab Crusher, excavator mounted, hydraulic	OCNP OCNP	1	105 103	20% 50%	-5 -5	93 95	
50	Reprovision of new	1	Asphalt paver	BS D8-24	1	101	15%	Total -5	97 88	97
	parking facilities	·	Road roller	BS D8-30	1	101	20%	-5	89	
			Roller, vibratory Dump truck	BS D3-116 BS D9-39	1	106 103	20% 15%	-5 -5	94 90	
		2	Asphalt paver	BS D8-24	1	101	30%	Total -5	97 91	
			Roller, vibratory	BS D3-116	1	106	30%	-5	96	
		3	Asphalt paver	BS D8-24	1	101	30%	Total -5	97 91	
			Road roller	BS D8-30	1	101	30%	-5 Total	91 94	
		4	Dump truck with grab	OCNP	1	105	20%	-5	93	
Tau	Kok C&C tunnel & Acc	ess Shaft (F	Portion 1A)					Total	93	97
80,	Piling and kingposts	1	Pipe Pile Rig Air compressor, air flow > 30m3/min	CNP 167 CNP 003	4 12	114 104	30% 30%	-5 -5	110 105	
120			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	
			Water pump, diesel	CNP 282	2	103	30%	-5 Total	96 111	
		2	Pipe Pile Rig Air compressor, air flow > 10m3/min and <= 30m3/min	CNP 167 CNP 002	4 14	114 102	20% 25%	-5 -5	108 102	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	9	100	50%	-5	102	
			Water pump, diesel Crawler crane	CNP 282 BS D7-114	- 4 - 5	103 101	20% 45%	-5 -5	97 100	
			Air Blower (electric) Desander	OCNP CNP162	10	95 105	50% 20%	-5 -5	97 96	
			Grout mixer	OCNP	2	90	15%	-5	80	
			Grout pump Vibratory hammer, hydraulic	OCNP OCNP	1	105 115	10% 5%	-5	98 97	
			Power pack Mini Excavator / Backhoe	OCNP OCNP	1 5	100 94	5% 20%	0	87 94	
			HD90	OCNP	2	109	10%	-5	97	
			Welding Machine (electric) Water pump, submersible	Ref 1 CNP 283	12 15	95 85	20% 20%	-5 0	94 90	
		3	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	Total -5	111 98	
		3	Grout mixer	OCNP	1	90	50%	-5	82	
			Grout pump Air Blower (electric)	OCNP OCNP	2	105 95	50% 100%	-5 -5	97 93	
			Water pump, submersible	CNP 283	4	85	100%	0 Total	91 102	
		4	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	
			Mini Backhoe (3 tonnes) Dump truck, with or without grab	OCNP OCNP	2	94 105	70% 50%	-5 -5	87 100	
			Water pump, submersible	CNP 283	4	85	100%	0 Total	91 103	
		5	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	
			Mini Excavator / Backhoe Dump truck, with or without grab	OCNP OCNP	2	94 105	70% 20%	-5 -5	87 96	
			Water pump, submersible	CNP 283	4	85	100%	0 Total	91 101	111
126	Install decking	1	Crawler crane	BS D7-114	1	101	70%	-5	94	
			Tractor with trailer Generator, standard	CNP 222 CNP 101	1	118 108	30% 100%	-5 -5	108 103	
		2	Crawler crane	BS D7-114	1	101	70%	Total -5	109 94	
		_	Flat-top Lorry	OCNP	1	105	30%	0	100	
			Generator, standard	CNP 101	1	108	100%	-5 Total	103 105	
								0	103	
		3	Lorry with crane	OCNP CNP 222	1	105	60%			
		3		OCNP CNP 222 CNP 101	1 1 1	105 118 108	60% 20% 100%	-5 -5	106 103	
		3	Lorry with crane Tractor with trailer	CNP 222	1	118	20%	-5	106	
		-	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane	CNP 222 CNP 101 OCNP OCNP	1 1 1	118 108 105 105	20% 100% 30% 60%	-5 -5 Total 0	106 103 109 100 103	
		4	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane Generator, standard	CNP 222 CNP 101 OCNP OCNP CNP 101	1 1 1 1	118 108 105 105 108	20% 100% 30% 60% 100%	-5 -5 Total 0 0 -5 Total	106 103 109 100 103 103 107	
		-	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane Generator, standard Crawler crane Drill, hand-held (electric)	OCNP 222 CNP 101 OCNP OCNP CNP 101 BS D7-114 CNP 065	1 1 1	118 108 105 105 108 101 98	20% 100% 30% 60% 100% 70%	-5 -5 Total 0 0 -5 Total -5 0	106 103 109 100 103 103 107 94	
		4	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane Generator, standard Crawler crane Drill, hand-held (electric) Welding Machine (electric)	OCNP 222 CNP 101 OCNP OCNP CNP 101 BS D7-114 CNP 065 Ref 1	1 1 1 1 1 1 2 2	118 108 105 105 108 101 98 95	20% 100% 30% 60% 100% 70% 70% 70%	-5 -5 Total 0 0 -5 Total -5 0	106 103 109 100 103 103 107 94 99	
		4	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane Generator, standard Crawler crane Drill, hand-held (electric)	OCNP 222 CNP 101 OCNP OCNP CNP 101 BS D7-114 CNP 065	1 1 1 1 1 1	118 108 105 105 108 101 98	20% 100% 30% 60% 100% 70%	-5 -5 Total 0 0 -5 Total -5 0 0	106 103 109 100 103 103 107 94 99 96 89	
		4	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane Generator, standard Crawler crane Drill, hand-held (electric) Welding Machine (electric) Water pump, submersible	OCNP 222 CNP 101 OCNP OCNP CNP 101 BS D7-114 CNP 065 Ref 1 CNP 283	1 1 1 1 1 1 2 2 4	118 108 105 105 108 101 98 95 85	20% 100% 30% 60% 100% 70% 70% 70% 70%	-5 -5 Total 0 0 -5 Total -5 0 0	106 103 109 100 103 103 107 94 99 96	
		4 5	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane Generator, standard Crawler crane Drill, hand-held (electric) Welding Machine (electric) Water pump, submersible Generator, standard Drill, hand-held (electric) Welding Machine (electric) Welding Machine (electric) Welding Machine (electric)	CNP 222 CNP 101 OCNP OCNP CNP 101 BS D7-114 CNP 065 Ref 1 CNP 283 CNP 101 CNP 065 Ref 1	1 1 1 1 1 1 2 2 4 1	118 108 105 105 108 101 98 95 85 108 98 95	20% 100% 30% 60% 100% 70% 70% 70% 100%	-5 -5 Total 0 0 -5 Total -5 0 0 0 -5 Total 0 0 0 0 0 0 0 0 0	106 103 109 100 103 103 107 94 99 96 89 103 106 109 99	
		4 5	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane Generator, standard Crawler crane Drill, hand-held (electric) Welding Machine (electric) Water pump, submersible Generator, standard Drill, hand-held (electric) Welding Machine (electric) Water pump, submersible Generator, standard Drill, hand-held (electric) Welding Machine (electric) Water pump, submersible Lorry with crane	CNP 222 CNP 101 OCNP OCNP OCNP 101 BS D7-114 CNP 065 Ref 1 CNP 283 CNP 101 CNP 065 Ref 1 CNP 283 CNP 101	1 1 1 1 1 2 2 4 1 2 2 4 1	118 108 105 105 108 101 101 98 95 85 108 98 95 85 108	20% 100% 30% 60% 100% 70% 70% 70% 100%	-5 -5 Total 0 0 -5 Total -5 0 0 0 -5 Total -5 0 0 0 0 0 0 0 0 0	106 103 109 100 103 103 103 107 94 99 96 89 103 106 99 96 89	
		4 5	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane Generator, standard Crawler crane Drill, hand-held (electric) Welding Machine (electric) Water pump, submersible Generator, standard Drill, hand-held (electric) Water pump, submersible Generator, standard Drill, hand-held (electric) Welding Machine (electric) Welding Machine (electric) Welding Machine (selectric) Water pump, submersible	CNP 222 CNP 101 OCNP OCNP CNP 101 BS D7-114 CNP 065 Ref 1 CNP 283 CNP 101 CNP 065 Ref 1 CNP 283	1 1 1 1 1 1 2 2 4 1	118 108 105 105 108 101 98 95 85 108 98 95 85	20% 100% 30% 60% 100% 70% 70% 100% 70% 70% 70% 70%	-5 -5 Total 0 0 -5 Total -5 0 0 0 -5 Total -5 0 0 0 -5 Total 0 0 0 0	106 103 109 100 103 103 107 94 99 96 89 103 106 99 96	
		4 5	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane Generator, standard Crawler crane Drill, hand-held (electric) Welding Machine (electric) Water pump, submersible Generator, standard Drill, hand-held (electric) Welding Machine (electric) Water pump, submersible Generator, standard Drill, hand-held (electric) Water pump, submersible Lorry with crane Generator, standard	CNP 222 CNP 101 OCNP OCNP OCNP 101 BS D7-114 CNP 065 Ref 1 CNP 283 CNP 101 CNP 065 Ref 1 CNP 065 Ref 1 CNP 065 Ref 1 CNP 283 CNP 101	1 1 1 1 1 1 2 2 4 1 1 2 2 4 1 1	118 108 105 105 108 101 98 95 85 108 98 95 85 108	20% 100% 30% 60% 100% 70% 70% 70% 100% 70% 70% 70% 70% 70%	-5 -5 -7 Total 0 0 -5 Total -5 0 0 0 -5 Total -5 0 0 -5 Total 0 -5 Total 0 0 0 -5 Total 0 0 0 0 0	106 103 109 100 103 107 94 99 96 89 103 106 99 96 89 103 103 103 103	
		5	Lorry with crane Tractor with trailer Generator, standard Flat-top Lorry Lorry with crane Generator, standard Crawler crane Drill, hand-held (electric) Welding Machine (electric) Water pump, submersible Generator, standard Drill, hand-held (electric) Water pump, standard Drill, hand-held (electric) Water pump, submersible Generator, standard Drill, hand-held (electric) Welding Machine (electric) Water pump, submersible Lorry with crane Generator, standard	CNP 222 CNP 101 OCNP OCNP OCNP 101 BS D7-114 CNP 065 Ref 1 CNP 283 CNP 101 CNP 065 Ref 1 CNP 283 CNP 101	1 1 1 1 1 2 2 4 1 1	118 108 105 105 108 101 98 95 85 108 98 95 85 108	20% 100% 30% 60% 100% 70% 70% 70% 100% 70% 60% 60%	-5 -5 -5 Total 0 0 -5 Total -5 0 0 0 -5 Total 0 0 0 -5 Total 0 0 -5 Total Total 0 0 0 Total	106 103 109 100 100 103 103 107 94 99 96 89 103 106 99 96 89 103 103 107	

Appendix 2.2 Construction Plant Inventory

Activities	Group [1]	PME	Ref. ^[2]	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)
		Generator, standard	CNP 101	1	108	100%	-5 Total	103 109
ELS work	1	Excavator / Backhoe	BS C6-10	2	107	70%	-5	103
		Breaker, excavator mounted, hydraulic Generator, silenced, 75 dB(A) at 7 m	BS D8-13 CNP 102	2	110 100	30% 100%	-5 -5	103 98
		Air Blower (electric)	OCNP	2	95	100%	0	98
		Water pump, submersible	CNP 283	2	85	80%	0 Total	87 107
	2	Breaker, excavator mounted, hydraulic	BS D8-13	2	110	40%	-5	104
		Generator, silenced, 75 dB(A) at 7 m Air Blower (electric)	CNP 102 OCNP	2	100 95	100% 100%	-5 -5	98 93
		Water pump, submersible	CNP 283	2	85	100%	0	88
	3	Excavator / Backhoe	BS C6-10	2	107	80%	Total -5	105 104
	3	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5 -5	98
		Dump truck, with or without grab	OCNP	2	105	20%	-5	96
		Air Blower (electric) Water pump, submersible	OCNP CNP 283	2	95 85	100% 100%	-5 0	93 88
							Total	106
	4	Drill, percussive, hand-held (electric) Drill/ grinder, hand-held (electric)	CNP 064 CNP 065	<u>2</u> 1	103 98	30% 30%	0	101 93
		Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98
		Welding Set Air Blower (electric)	Ref 2 OCNP	2	78 95	70% 100%	-5	79 93
		Water pump, submersible	CNP 283	2	85	70%	0	86
	5	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	Total -5	104 98
	3	Lorry with crane	OCNP	1	105	60%	-5	98
		Air Blower (electric)	OCNP	2	95	100%	-5	93
	L	Water pump, submersible	CNP 283	2	85	100%	0 Total	88 102
	6	Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98
		Crawler crane Air Blower (electric)	BS D7-114 OCNP	2	101 95	60% 100%	-5 -5	94 93
		Water pump, submersible	CNP 283	2	85	100%	0	88
	7	Generator, silenced, 75 dB(A) at 7 m	CNP 102	3	100	100%	Total -5	101 100
	'	Lorry with crane	OCNP	2	105	30%	-5	98
		Crawler crane Welding Set	BS D7-114 Ref 2	2 5	101 78	40% 70%	-5 0	95 83
		Air Blower (electric)	OCNP	5	95	90%	-5	97
		Water pump, submersible	CNP 283	10	85	100%	0 Total	95 104
	8	Excavator / Backhoe	BS C6-10	5	107	50%	-5	106
		Crawler crane	BS D7-114	3	101	50%	-5	98
		Dump truck Concrete pump truck	BS D9-39 CNP 047	4 1	103 109	30% 40%	-5 -5	99 100
		Concrete truck	CNP 044	1	109	40%	-5	100
		Poker, vibratory, hand-held Lorry with crane	OCNP OCNP	3 1	102 105	50% 50%	-5 -5	99 97
		Air compressor, air flow > 30m3/min	CNP 003	2	104	70%	-5	100
		Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	70%	-5 Total	96 110
	9	Breaker, excavator mounted, hydraulic	BS D8-13	5	110	20%	-5	105
		Rock drill, crawler mounted (hydraulic) Spliter	CNP 182 BS D8-2	1	123 118	10% 10%	-5 -5	108 103
							Total	111
	10	Excavator / Backhoe Crawler crane	BS C6-10 BS D7-114	5 3	107 101	30% 30%	-5 -5	104 96
		Dump truck	BS D9-39	4	103	25%	-5	98
		Concrete pump truck Concrete truck	CNP 047 CNP 044	1	109 109	20% 15%	-5 -5	97 96
		Poker, vibratory, hand-held	OCNP	3	102	20%	-5	95
		Lorry with crane Breaker, excavator mounted, hydraulic	OCNP BS D8-13	1 8	105 110	20% 10%	-5 -5	93 104
		Rock drill, crawler mounted (hydraulic)	CNP 182	1	123	8%	-5 -5	107
		Spliter	BS D8-2 CNP 003	1 2	118 104	8%	-5	102 97
		Air compressor, air flow > 30m3/min Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	30% 25%	-5 -5	92
		5 ()			107		Total	112
	11	Excavator / Backhoe Crawler crane	BS C6-10 BS D7-114	5 3	107 101	30% 30%	-5 -5	104 96
		Dump truck	BS D9-39	4	103	25%	-5	98
		Concrete pump truck Concrete truck	CNP 047 CNP 044	1	109 109	20% 15%	-5 -5	97 96
		Poker, vibratory, hand-held	OCNP	3	102	20%	-5	95
		Lorry with crane Breaker, excavator mounted, hydraulic	OCNP BS D8-13	1 10	105 110	20% 8%	-5 -5	93 104
		Rock drill, crawler mounted (hydraulic)	CNP 182	1	123	8%	-5	107
		Spliter Air compressor, air flow > 30m3/min	BS D8-2 CNP 003	1 2	118 104	8% 30%	-5 -5	102 97
		Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	104	25%	-5	92
	12	Everypter / Parkhan	BC 06 40		107		Total	112 101
	12	Excavator / Backhoe Crawler crane	BS C6-10 BS D7-114	5 3	107	15% 30%	-5 -5	96
		Dump truck	BS D9-39	4	103	15%	-5	96
		Concrete pump truck Concrete truck	CNP 047 CNP 044	1	109 109	30% 30%	-5 -5	99 99
		Poker, vibratory, hand-held	OCNP	3	102	30%	-5	97
		Lorry with crane Breaker, excavator mounted, hydraulic	OCNP BS D8-13	4	105 110	30% 15%	-5 -5	95 103
		Rock drill, crawler mounted (hydraulic)	CNP 182	1	123	8%	-5	107
		Spliter Air compressor, air flow > 30m3/min	BS D8-2 CNP 003	2	118 104	8% 30%	-5 -5	102 97
		Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	30%	-5	93
	40	Breaker exceptor mounted budgettie	DC D0 40	2	110	20%	Total	111 101
	13	Breaker, excavator mounted, hydraulic Concrete pump truck	BS D8-13 CNP 047	2	109	25%	-5 -5	101
			CNP 044	2	109	30%	-5	102
		Concrete truck		^	100	0001	-	^-
		Poker, vibratory, hand-held	OCNP	3	102 104	30% 60%	-5 -5	97 100
				3 2 2 1		30% 60% 50% 8%	-5 -5 -5 -5	97 100 95 107

Appendix 2.2 Construction Plant Inventory

)	Construction Activities	Group [1]	PME	Ref. ^[2]	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max S dB(A
		14	Breaker, excavator mounted, hydraulic	BS D8-13	8	110	8%	-5	103	
			Excavator / Backhoe Crawler crane	BS C6-10 BS D7-114	5 3	107 101	15% 45%	-5 -5	101 97	
			Dump truck	BS D9-39	4	103	30%	-5	99	
			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	40%	-5	94	1
			Rock drill, crawler mounted (hydraulic)	CNP 182	1	123	8%	-5	107	
			Spliter	BS D8-2	1	118	8%	-5	102	
								Total	111	112
00	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	_
				•				Total	107	
		3	Crawler crane	BS D7-114	1	101	60%	0	99	
			Tractor with trailer	CNP 222	1	118	20%	-5	106	
			Generator, standard	CNP 101	2	108	100%	-5	106	
				1 00115				Total	109	
		4	Lorry with crane	OCNP	1	105	60%	0	103	
			Tractor with trailer	CNP 222	1	118	20%	-5	106	
			Generator, standard	CNP 101	2	108	100%	-5	106	
								Total	110	-
		5	Crawler crane	BS D7-114	1	101	60%	0	99	
			Lorry with crane	OCNP	1	105	60%	0	103	
			Generator, standard	CNP 101	2	108	100%	-5	106	1
		_	Concrete Lorny Miyer	CNID 044		100	E00/	Total	108	1
- [6	Concrete Lorry Mixer	CNP 044	1	109	50%	-5	101	1
- [Poker, vibratory, hand-held	OCNP CNP 101	1	102	50%	-5 -5	94 106	1
- [Generator, standard	CNP 101	2	108	100%	-5 Total	106	1
1		7	Lorry with crane	OCNP	1	105	60%	Total 0	107	-
J		7								1
- [Welding Set	Ref 2	2	78 105	50%	-5	73	-
1			Cherry picker / Scissor platform	Ref 3	2	105	50%	0	105	1
1			Generator, standard	CNP 101	2	108	100%	-5	106 110	-
		8	Crawler crane	BS D7-114	- 1	101	60%	Total 0	99	-
		ď	Crawler crane Welding Set	Ref 2	2	78	50%	-5	73	1
- [Cherry picker / Scissor platform	Ref 2	2	105	50%	-5 0	105	1
			Generator, standard	CNP 101	2	108	100%	-5	106	-
			Generator, standard	CIVI 101		100	10070	Total	109	
		9	Mini Backhoe (3 tonnes)	OCNP	1	94	60%	-5	87	1
		9	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%	-5	105	4
			Generator, standard	CNP 101	2	108	100%	-5	106	4
			Generator, Standard	CINF 101		100	100 /6	Total	109	
		10	Winch	CNP 262	1	95	100%	0	95	-
		10	Concrete pump truck	CNP 047	1	109	50%	-5	101	-
			Concrete truck	CNP 044	2	109	50%	-5	104	1
			Poker, vibratory, hand-held	OCNP	3	102	50%	-5	99	-
			Lorry with crane	OCNP	1	105	100%	-5	100	-
			Lorry with crane	OCINE		105	10076	Total	108	
		11	Mobile crane	CNP 048	2	112	30%	0	110	1
			Lorry with crane	OCNP	1	105	80%	-5	99	1
			Scissor platform	Ref 3	2	105	50%	0	105	1
			October platform	11010	_		0070	Total	111	11
0 C	C&C Tunnel Structure	1	Bar bender and cutter	CNP 021	2	90	70%	0	91	T
, I,		· ·	Saw, circular wood	BS D7-79	2	103	50%	-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	93	1
			vvator pamp, submersible	0141 200		- 00	0070	Total	102	
J		2	Concrete Lorry Mixer	CNP 044	2	109	80%	-5	106	1
J		-	Concrete pump	CNP 047	2	109	80%	-5	106	1
			Poker, vibratory, hand-held	OCNP	3	102	50%	-5	99	
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	
			Water pump, submersible	CNP 283	4	85	80%	0	90	
								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	
- [Water pump, submersible	CNP 283	8	85	80%	0	93	1
- [Total	102	
		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	93	1
					_			Total	102	
		5	Bar bender and cutter	CNP 021	2	90	50%	0	90	1
			Drill/ grinder, hand-held (electric)	CNP 065	1	98	30%	0	93	4
			Saw, circular wood	BS D7-79	4	103	50%	-5	101	4
			Air Blower (electric)	OCNP	2	95	80%	-5	92	4
			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	-
				T	_			Total	104	
		6	Crawler Crane	BS D7-114	2	101	100%	-5	99	1
			Lorry with crane	OCNP	1	105	100%	-5	100	1
			Generator, silenced, 75 dB(A) at 7 m	CNP 102	2	100	100%	-5	98	1
			Air Blower (electric)	OCNP	2	95	80%	-5	92	4
- 1			Poker, vibratory, hand-held	OCNP	3	102	50%	-5	99	4
			Concrete pump truck	CNP 047	1	109	100%	-5	104	1
			Concrete truck	CNP 044	2	109	80%	-5	106	1
								Total	110	
		7	Crawler Crane	BS D7-114	5	101	100%	-5	103	
								Total	103	11
		1	Dump truck, with or without grab	OCNP	2	105	50%	-5	100	
)	Backfill									7
)	Backfill		Generator, standard	CNP 101	2	108	100%	-5	106	
)	Backfill		Generator, standard Mini Excavator / Backhoe	CNP 101 OCNP	2	108 94	100% 80%	-5 -5	106 91	
)	Backfill									
)	Backfill		Mini Excavator / Backhoe	OCNP	2	94	80%	-5 0	91	
0	Backfill	2	Mini Excavator / Backhoe	OCNP	2	94	80%	-5	91 91	

Appendix 2.2 Construction Plant Inventory

_	Construction Activities	Group [1]	PME	Ref. ^[2]	No of items	SWL / Item dB(A)	On-time %	Correction, dB(A)	SPL, dB(A)	Max S dB(A
			Generator, standard Mini Excavator / Backhoe	CNP 101 OCNP	2	108 94	100% 80%	-5 -5	106 88	
			Road roller	BS D8-30	1	101	60%	0	99	
			Water pump, submersible	CNP 283	4	85	100%	0	91	
		3	Bulldozer	Ref 4	1	102	80%	Total -5	107 96	
			Compactor, vibratory	CNP 050	1	105	60%	-5	98	
			Dump truck, with or without grab	OCNP	11	105	20%	-5	93	
			Generator, standard Mini Excavator / Backhoe	CNP 101 OCNP	1	108 94	100% 80%	-5 -5	106 88	-
			Water pump, submersible	CNP 283	4	85	100%	0	91	1
				•				Total	107	
		4	Bulldozer Compactor, vibratory	Ref 4 CNP 050	3	102 105	80% 60%	-5 -5	99 103	4
			Generator, standard	CNP 050	2	108	100%	-5 -5	106	-
			Water pump, submersible	CNP 283	4	85	100%	0	91	
				OND OSO		105	000/	Total	108	
		5	Compactor, vibratory Generator, standard	CNP 050 CNP 101	2	105 108	60% 100%	-5 -5	103 106	-
			Road roller	BS D8-30	4	101	60%	-5	100	1
			Water pump, submersible	CNP 283	4	85	100%	0	91	
		6	Bulldozer	Ref 4	2	102	80%	Total -5	108 99	4
		0	Generator, standard	CNP 101	2	108	100%	-5	106	1
			Road roller	BS D8-30	4	101	60%	-5	100	
			Water pump, submersible	CNP 283	4	85	100%	0	91	
		7	Mini Excavator / Backhoe	OCNP	1	94	80%	Total -5	108 88	
			Compactor, vibratory	CNP 050	3	105	60%	-5	103	1
			Generator, standard	CNP 101	2	108	100%	-5	106	4
			Water pump, submersible	CNP 283	4	85	100%	0 Total	91 108	1
		8	Mini Excavator / Backhoe	OCNP	1	94	80%	-5	88	1
			Generator, standard	CNP 101	2	108	100%	-5	106	1
			Road roller Water pump, submersible	BS D8-30 CNP 283	4	101 85	60% 100%	-5 0	100 91	1
		<u>L</u>	Tracer partip, auditiciable	CINF 203		00	100 /0	Total	107	
		9	Bulldozer	Ref 4	2	102	80%	-5	99	1
			Generator, standard Mini Excavator / Backhoe	CNP 101 OCNP	2 1	108 94	100% 80%	-5 -5	106 88	-
			Water pump, submersible	CNP 283	4	85	100%	0	91	1
				•		•	•	Total	107	10
	Steps and Covered W			DC D0 40	1	440	700/	-	100	
70	Removal of existing seawall	1	Breaker, excavator mounted, hydraulic Dump truck with grab	BS D8-13 OCNP	1	110 105	70% 20%	-5 0	103 98	-
	Scawaii		Derrick lighter	CNP 061	1	104	80%	0	103	i
			Tug boat	CNP 221	1	110	80%	0	109	Ι.
80,	Construction of	1	Bar bender and cutter	CNP 021	1	90	20%	Total 0	111 83	1
90	landing steps and	'	Concrete Lorry Mixer	CNP 021	1	109	70%	-5	102	1
	covered walkway		Concrete pump	CNP 047	1	109	70%	-5	102	
	•		Poker, vibratory, hand-held	OCNP	1	102 103	50%	-5 0	94	4
			Saw, circular wood	BS D7-79	'	103	20%		96 106	10
	unnel Stage1 (tunnel	footprint of I	Portion 2A1)					Total	106	10
	Construction of temp	footprint of I	Portion 2A1) Crawler crane on flat-top barge	BS D7-114	2	101	70%	Total 0	106	10
ine T 40		footprint of I	Portion 2A1) Crawler crane on flat-top barge Derrick lighter	BS D7-114 CNP 061		101 104	70% 70%	0 0	106 102 105	10
	Construction of temp	1	Crawler crane on flat-top barge Derrick lighter Tug boat	BS D7-114 CNP 061 CNP 221	2 2	101 104 110	70% 70% 20%	Total 0	106	10
	Construction of temp	footprint of I	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge	BS D7-114 CNP 061 CNP 221 BS D7-114	2 2 1	101 104 110	70% 70% 20%	0 0 0 0 Total	106 102 105 103 109 98	11
	Construction of temp	1	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061	2 2 1	101 104 110 101 104	70% 70% 20% 50% 50%	O	106 102 105 103 109 98 101	10
	Construction of temp	1	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 222	2 2 1	101 104 110	70% 70% 20%	0 0 0 0 Total	106 102 105 103 109 98	10
	Construction of temp	1	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP	2 2 1 1 1 1 1 2 2	101 104 110 101 101 110 115 100	70% 70% 20% 50% 50% 5% 30% 30%	Total 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0	106 102 105 103 109 98 101 97 113 98	10
	Construction of temp	1	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric)	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1	2 2 1 1 1 1 1 2 2	101 104 110 101 104 110 115 100 95	70% 70% 20% 50% 50% 5% 30% 30% 50%	Total 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	106 102 105 103 109 98 101 97 113 98 95	10
	Construction of temp	1	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP	2 2 1 1 1 1 1 2 2	101 104 110 101 101 110 115 100	70% 70% 20% 50% 50% 5% 30% 30%	Total 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0	106 102 105 103 109 98 101 97 113 98	
5,	Construction of temp	1	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283	2 2 1 1 1 1 2 2 2 4	101 104 110 101 101 104 110 115 100 95 85	70% 70% 20% 50% 50% 5% 30% 30% 50% 80%	Total	106 102 105 103 109 98 101 97 113 98 95 90 113 96	
5,	Construction of temp working platforms Cofferdam construction of	2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP OCNP Ref1 CNP 283 BS D7-114 CNP 061	2 2 1 1 1 1 2 2 2 2 4	101 104 110 101 101 101 115 100 95 85	70% 70% 20% 50% 50% 50% 30% 30% 30% 80%	Total	106 102 105 103 109 98 101 97 113 98 95 90 103	
5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283	2 2 1 1 1 1 2 2 2 4	101 104 110 101 101 104 110 115 100 95 85	70% 70% 20% 50% 50% 5% 30% 30% 50% 80%	Total	106 102 105 103 109 98 101 101 97 113 98 95 90 113 96 103 103	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of	2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 221 CNP 061 CNP 221	2 2 1 1 1 1 1 2 2 2 4	101 104 110 101 101 101 115 100 95 85 101 104 110	70% 70% 20% 50% 50% 50% 30% 30% 30% 80% 80%	Total	106 102 105 103 109 98 101 97 113 98 95 90 103 103 103 103 106 118	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 221 CNP 061 CNP 221	2 2 1 1 1 1 2 2 2 4 1 1 1 1 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 101 101 110 115 100 95 85 101 104 110 110	70% 70% 20% 50% 50% 5% 30% 50% 80% 50% 80% 50%	Total	106 102 105 103 109 98 101 97 113 98 95 90 113 96 103 103 106 1105	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 CNP 221 CNP 283 BS D7-114 CNP 061 CNP 221 CNP 167 CNP 003 CNP 101	2 2 1 1 1 1 1 2 2 2 4 1 1 1 1 1 1 5 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 101 101 104 110 115 100 95 85 101 104 110 114 110 104 108	70% 70% 20% 50% 50% 50% 30% 30% 80% 30% 80%	Total	106 102 105 103 109 98 101 97 113 98 95 90 113 98 103 103 103 103 103 109 118 109 119 119 119 119 119 119 119	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 061 CNP 061 CNP 07 CNP 003 CNP 101 BS D7-111	2 2 1 1 1 1 1 2 2 2 4 1 1 1 1 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 101 101 110 115 100 95 85 101 104 110 110 114 104 110	70% 70% 20% 50% 50% 50% 30% 30% 80% 80% 50% 80%	Total	106 102 105 103 109 98 101 97 113 98 95 90 113 96 103 103 106 1105	
5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Water pump, diesel Vibratory hammer, hydraulic	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 CNP 221 CNP 283 BS D7-114 CNP 061 CNP 221 CNP 167 CNP 280 CNP 101 CNP 282 OCNP	2 2 1 1 1 1 1 2 2 2 4 1 1 1 1 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 101 101 104 110 115 100 95 85 101 104 110 114 104 108 101 103 115	70% 70% 20% 50% 50% 50% 30% 30% 80% 20% 50% 80% 50% 50% 50% 50% 50% 50%	Total	106 102 105 103 109 98 101 113 98 95 90 113 103 103 103 108 118 108 10	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 061 CNP 061 CNP 07 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP	2 2 1 1 1 1 1 2 2 2 4 1 1 1 1 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 101 101 110 110 110 110 95 85 101 104 110 114 104 108 101 101 103 115 94	70% 70% 20% 50% 50% 55% 30% 50% 80% 50% 80% 50% 80% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	Total	106 102 105 109 98 101 101 97 113 98 95 90 113 103 106 118 107 111 118 107 1113 108	
5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Uibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Uibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Uipratory lighter Uipratory hammer, sydraulic Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric)	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP AF 1 CNP 283 BS D7-114 CNP 061 CNP 221 CNP 101 BS D7-114 CNP 003 CNP 101 BS D7-114 CNP 007 CNP 007 CNP 007 CNP 007 CNP 288	2 2 1 1 1 1 2 2 2 4 1 1 1 1 5 1 1 2 2 2 4 8 8 8 8 8 8 8 8 8 8 9 1 1 1 1 1 1 1 1 1	101 104 110 101 104 110 115 100 95 85 101 104 110 114 104 110 108 101 103 115 94 95	70% 70% 20% 50% 50% 50% 30% 30% 80% 20% 50% 80% 60% 50% 80% 50% 80%	Total	106 102 105 103 109 98 101 197 113 98 95 90 113 103 106 118 107 111 108 107 111 108 1007 112 113 100	
5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 061 CNP 061 CNP 07 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP	2 2 1 1 1 1 1 2 2 2 4 1 1 1 1 1 5 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 101 101 110 110 110 110 95 85 101 104 110 114 104 108 101 101 103 115 94	70% 70% 20% 50% 50% 55% 30% 50% 80% 50% 80% 50% 80% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	Total	106 102 105 109 98 101 97 113 98 95 90 113 103 106 113 107 111 108 107 113 109 98 96 96 96	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 1 2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric)	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP CNP 283 BS D7-114 CNP 061 CNP 283 CNP 101 BS D7-114 CNP 003 CNP 101 BS D7-114 CNP 007 CNP 007 CNP 007 CNP 107 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283	2 2 1 1 1 1 2 2 2 4 1 1 1 1 5 1 1 2 2 2 4 8 8 8 8 5 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 101 104 110 115 100 95 85 101 104 110 110 110 108 101 103 115 94 95 100 85	70% 70% 70% 20% 50% 50% 5% 30% 80% 80% 80% 50% 80% 80% 80% 80% 80% 80% 80% 80% 80% 8	Total	106 102 105 103 109 98 101 17 17 17 18 96 103 106 118 107 111 108 107 111 108 100 102 98 96 103 104 107 115 107 116 117 117 118 109 107 118 100 107 118 100 107 118 100 107 118 100 107 118 100 107 118 100 107 118 100 107 118 100 107 118 100 107 118 100 107 107 118 100 107 107 107 108 108 109 109 109 109 109 109 109 109 109 109	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Welding Machine (electric) Power pack Water pump, submersible	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 261 CNP 061 CNP 221 CNP 167 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP OCNP OCNP OCNP OCNP CNP 283	2 2 1 1 1 1 1 2 2 4 1 1 1 1 5 1 1 2 2 4 8 8 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 104 110 110 115 100 95 85 101 114 110 114 108 101 103 115 95 85	70% 70% 20% 50% 50% 50% 30% 30% 80% 20% 50% 80% 50% 80% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	Total	106 102 105 103 109 98 101 101 97 1113 98 95 90 113 103 1003 106 118 107 111 108 109 109 109 109 111 112 112 112 112 112	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 1 2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 283 CNP 101 BS D7-114 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	2 2 1 1 1 1 2 2 4 1 1 1 1 5 12 8 8 8 5 2 15 10 2 11 10 10 10 10 10 10 10 10 10 10 10 10	101 104 110 101 104 110 115 100 95 85 101 104 110 110 108 101 103 115 94 95 100 85	70% 70% 20% 50% 50% 50% 30% 30% 80% 20% 50% 80% 60% 50% 80% 60% 50% 80% 60% 50% 80% 60% 70% 70%	Total	106 102 105 103 109 98 101 113 98 90 113 96 103 106 118 107 111 108 107 111 108 107 111 109 102 111 100 102 111 100 102 102 102 102	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 1 2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 281 CNP 061 CNP 221 CNP 167 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP Ref 1 OCNP OCNP CNP 282 OCNP CNP 283	2 2 1 1 1 1 1 2 2 4 1 1 1 1 5 1 1 2 2 8 8 8 5 5 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 104 110 110 110 115 100 95 85 101 104 110 104 110 104 108 103 115 104 110 104 110 104 110 104 110 111 104 110 110	70% 70% 20% 50% 50% 50% 50% 30% 50% 80% 50% 80% 50% 80% 50% 50% 80% 50% 80% 50% 50% 80% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	Total	106 102 105 109 98 101 101 97 113 98 95 90 113 103 103 106 118 107 111 1107 111 1109 102 98 96 121 112 97 106 101	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 1 2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, submersible Vibratory hammer, submersible Vibratory hammer, submersible Vibratory hammer, submersible Vibratory standard Water pump, diesel Crawler crane on flat-top barge	BS D7-114 CNP 061 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP 061 CNP 221 OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 283 CNP 101 BS D7-114 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP Ref 1 OCNP Ref 1 OCNP CNP 101 CNP 101 CNP 101 CNP 101 CNP 282	2 2 1 1 1 1 1 2 2 2 4 4 1 1 1 1 1 5 5 1 2 8 8 8 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 101 104 110 115 100 95 85 101 104 110 110 110 108 101 103 115 95 100 85 101 104 110 108 101 103 115 100 104 104 100 100 100 100 100 100 100	70% 70% 20% 50% 50% 50% 50% 80% 50% 80% 50% 80% 50% 80% 50% 50% 80% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	Total	106 102 105 103 109 98 101 97 113 98 95 90 103 106 118 107 111 110 102 98 96 121 112 97 106 101 96	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 1 2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 281 CNP 061 CNP 221 CNP 167 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP Ref 1 OCNP OCNP CNP 282 OCNP CNP 283	2 2 1 1 1 1 1 2 2 4 1 1 1 1 5 1 1 2 2 8 8 8 5 5 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 104 110 110 110 115 100 95 85 101 104 110 104 110 104 108 103 115 104 110 104 110 104 110 104 110 111 104 110 110	70% 70% 20% 50% 50% 50% 50% 30% 50% 80% 50% 80% 50% 80% 50% 50% 80% 50% 80% 50% 50% 80% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	Total	106 102 105 109 98 101 101 97 113 98 95 90 113 103 103 106 118 107 111 1107 111 1109 102 98 96 121 112 97 106 101	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 2 2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Crawler crane on flat-top barge Welder / Generator Water pump, submersible	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 221 CNP 167 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP OCNP CNP 283 CNP 101 CNP 282 CNP 107 CNP 282	2 2 1 1 1 1 2 2 2 4 1 1 1 1 5 5 12 8 8 8 5 5 10 2 15 10 10 10 10 10 10 10 10 10 10 10 10 10	101 104 110 101 104 110 111 104 110 95 85 101 104 110 110 108 101 103 115 95 101 104 109 101 100 95 85	70% 70% 70% 20% 50% 50% 50% 50% 80% 80% 50% 80% 80% 60% 50% 80% 60% 50% 80% 70% 100% 70% 100% 70% 80%	Total	106 102 105 103 109 98 101 197 113 96 103 106 118 107 111 108 107 111 108 98 96 101 107 111 109 98 96 101 107 111 100 98 101 100 99 100 100 94	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 1 2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, submersible Crawler crane Water pump, submersible Crawler or and submersible Crawler or and submersible Crawler or and submersible Generator, standard Water pump, diesel Crawler or and submersible Generator, standard	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 221 CNP 101 BS D7-114 CNP 003 CNP 101 BS D7-114 CNP 283 CNP 101 CNP 282 CNP 101 CNP 282 CNP 101 CNP 282 CNP 101 CNP 282 CNP 101 CNP 283	2 2 1 1 1 1 1 2 2 4 4 1 1 1 1 5 5 1 2 8 8 8 5 1 1 1 1 2 1 1 1 1 2 1 1 1 1 1 1 1 1 1	101 104 110 101 104 110 115 100 95 85 101 104 110 110 108 101 103 115 94 95 100 85 114 104 108 101 100 85	70% 70% 70% 20% 50% 50% 50% 30% 30% 80% 80% 80% 60% 50% 80% 60% 50% 80% 70% 30% 80% 80% 80% 100%	Total	106 102 105 103 109 98 101 113 98 90 113 96 103 106 118 107 111 108 107 111 108 107 111 109 102 98 96 101 107 111 109 94 114 106	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 2 2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Crawler crane on flat-top barge Welder / Generator Water pump, submersible Generator, standard Water pump, submersible	BS D7-114 CNP 061 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 281 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP Ref 1 OCNP OCNP Ref 1 OCNP 282 OCNP CNP 282 OCNP CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 285 CNP 101	2 2 1 1 1 1 2 2 2 4 1 1 1 1 5 5 12 8 8 8 5 5 10 2 15 10 10 10 10 10 10 10 10 10 10 10 10 10	101 104 110 101 104 110 110 115 100 95 85 101 104 110 114 104 103 115 103 115 100 85 100 85	70% 70% 70% 20% 50% 50% 50% 30% 80% 80% 50% 80% 50% 80% 50% 80% 50% 50% 80% 50% 50% 80% 50% 50% 80% 50% 50% 80% 50% 50% 50% 50% 50% 80% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	Total	106 102 105 109 98 101 97 113 98 95 90 113 96 103 106 114 107 111 108 107 111 109 96 100 100 102 98 101 100 102 98 101 100 102 98 101 100 102 111 106 101 107 111 108 109 109 109 109 109 109 109 109 109 109	
	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 2 2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, submersible Crawler crane Water pump, submersible Crawler or and submersible Crawler or and submersible Crawler or and submersible Generator, standard Water pump, diesel Crawler or and submersible Generator, standard	BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 221 CNP 101 BS D7-114 CNP 003 CNP 101 BS D7-114 CNP 283 CNP 101 CNP 282 CNP 101 CNP 282 CNP 101 CNP 282 CNP 101 CNP 282 CNP 101 CNP 283	2 2 1 1 1 1 1 2 2 2 4 4 1 1 1 1 5 5 1 2 8 8 8 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 101 104 110 115 100 95 85 101 104 110 110 108 101 103 115 94 95 100 85 114 104 108 101 100 85	70% 70% 20% 50% 50% 50% 50% 30% 80% 20% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 80% 80% 80% 80% 80% 80% 80% 80% 8	Total	106 102 105 109 98 101 101 97 113 98 95 90 113 103 103 1003 106 118 107 111 1107 111 100 102 98 96 121 112 97 106 101 107 109 106 111 118 107 109 106 111 119 107 109 106 111 109 100 100 100 100 100 100 100 100	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 2 2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane on flat-top barge Welder / Generator Water pump, diesel Crawler crane on flat-top barge Welder / Generator Water pump, submersible Generator, standard Vibratory hammer, hydraulic Power pack Crawler crane on flat-top barge Welder / Generator	BS D7-114 CNP 061 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 281 CNP 167 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP OCNP Ref 1 OCNP CNP 282 OCNP CNP 282 OCNP CNP 282 OCNP CNP 282 OCNP CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283	2 2 1 1 1 1 1 2 2 2 4 4 1 1 1 1 1 5 5 12 8 8 8 5 10 2 10 10 10 10 10 10 10 10 10 10 10 10 10	101 104 110 101 104 110 115 100 95 85 101 104 110 110 110 110 103 115 100 95 85 101 104 110 101 103 115 100 85 101 101 101 101 103 103 105 105 105 105 105 105 105 105 105 105	70% 70% 70% 20% 50% 50% 50% 80% 50% 80% 50% 80% 50% 50% 80% 50% 80% 50% 50% 80% 50% 50% 50% 80% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	Total	106 102 105 109 98 101 97 113 98 95 90 113 96 103 106 1118 107 111 1108 107 1113 108 107 111 109 98 96 1001 101 102 98 96 101 106 101 106 101 96 1001	
‡0 ‡5,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 2 2	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Crawler Crawler Crawler Crawler Crawler Welder / Generator Water pump, diesel Crawler crane on flat-top barge Welder / Generator Water pump, submersible Generator, standard Vibratory hammer, hydraulic Power pack Generator crane on flat-top barge	BS D7-114 CNP 061 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 GNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 261 CNP 261 CNP 261 CNP 27 CNP 061 CNP 27 CNP 061 CNP 282 CNP 101 BS D7-114 CNP 282 OCNP OCNP CNP 283 CNP 101 CNP 283	2 2 1 1 1 1 1 2 2 2 4 4 1 1 1 1 5 5 1 2 8 8 8 5 5 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 104 110 110 115 100 95 85 101 114 104 110 104 110 101 103 115 100 85 101 101 100 85	70% 70% 20% 50% 50% 50% 50% 30% 80% 20% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 80% 80% 80% 80% 80% 80% 80% 80% 8	Total	106 102 105 103 109 98 101 197 113 98 95 90 113 106 118 107 111 108 107 111 108 100 102 98 96 103 100 106 118 100 107 111 108 100 100 94 114 106 116 101 96 98	1
\$5, 550	Construction of temp working platforms Cofferdam construction of sheetpiles and pipepiles	1 2 3 3	Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Crawler crane Generator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Crawler crane on flat-top barge Welder / Generator Water pump, submersible Generator, standard Vibratory hammer, hydraulic Power pack Crawler crane on flat-top barge Welder / Generator Water pump, submersible	BS D7-114 CNP 061 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 GNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 221 CNP 061 CNP 261 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP OCNP CNP 003 CNP 101 CNP 282 OCNP CNP 282 CNP 167 CNP 003 CNP 101 CNP 283 CNP 167 CNP 003 CNP 101 CNP 283 CNP 167 CNP 003 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 282 CNP 101 CNP 283 CNP 101 CNP 282 CNP 101 CNP 283	2 2 1 1 1 1 1 2 2 2 4 4 1 1 1 1 1 5 5 12 8 8 8 5 10 2 10 10 10 10 10 10 10 10 10 10 10 10 10	101 104 110 104 110 110 110 115 100 95 85 101 104 110 104 110 104 110 103 115 104 109 103 115 104 101 103 115 104 101 103 115 100 85	70% 70% 70% 20% 50% 50% 50% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 80% 50% 80% 80% 80% 80% 80% 80% 80%	Total	106 102 105 109 98 101 101 97 113 96 103 108 100 100 100 100 100 100 100 100 100	1
15,	Construction of temp working platforms Cofferdam construction of sheetpiles and	1 2 2	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, submarsible Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Vipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Crawler crane on flat-top barge Welder / Generator Water pump, submersible Generator, standard Vibratory hammer, hydraulic Power pack Crawler crane on flat-top barge Welder / Generator Water pump, submersible Crawler crane on flat-top barge Welder / Generator Water pump, submersible	BS D7-114 CNP 061 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 281 CNP 167 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP OCNP Ref 1 OCNP CNP 282 OCNP CNP 282 OCNP CNP 282 OCNP CNP 282 OCNP CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 283	2 2 1 1 1 1 1 2 2 4 4 1 1 1 1 5 1 2 2 4 4 1 1 1 1 2 2 2 1 1 1 1 1 1 1 1	101 104 110 101 104 110 115 100 95 85 101 104 110 110 110 110 103 115 100 95 85 101 104 110 101 103 115 100 85 101 101 101 101 103 103 105 105 105 105 105 105 105 105 105 105	70% 70% 70% 20% 50% 50% 50% 50% 80% 80% 80% 80% 80% 80% 80% 80% 80% 8	Total	106 102 105 103 109 98 101 97 113 98 95 90 113 96 103 106 118 107 111 108 107 111 108 100 102 98 96 103 107 111 109 101 101 96 100 94 114 106 116 101 96 98 94 117 101	1
40 45, 50	Construction of temp working platforms Cofferdam construction of sheetpiles and pipepiles Temporary reclamation between pipepiles and	1 2 3 3	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Crawler crane Crawler crane Crawler crane Usater pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Crawler crane on flat-top barge Welder / Generator Water pump, submersible Generator, standard Vibratory hammer, hydraulic Power pack Crawler crane on flat-top barge Welder / Generator Water pump, submersible Crawler crane Under / Generator Crawler crane on flat-top barge Welder / Generator Water pump, submersible	BS D7-114 CNP 061 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP QCNP Ref 1 CNP 283 BS D7-114 CNP 282 OCNP 101 BS D7-114 CNP 282 OCNP Ref 1 CNP 282 OCNP CNP 003 CNP 101 CNP 282 OCNP Ref 1 CNP 282 OCNP CNP 003 CNP 101 CNP 283 CNP 101 CNP 283 CNP 107 CNP 003 CNP 101 CNP 283 CNP 107 CNP 003 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 282 BS D7-114 Ref 1 CNP 283 CNP 101 CNP 283	2 2 1 1 1 1 1 2 2 2 4 4 1 1 1 1 5 1 2 2 2 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 104 110 110 110 110 110 110	70% 70% 70% 20% 50% 50% 50% 50% 80% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 55% 80% 55% 80% 55% 80% 55% 80% 55% 80% 55% 80% 55% 50% 80% 50% 50% 50% 50% 50%	Total	106 102 105 109 98 101 107 113 98 95 90 113 96 103 106 118 107 111 107 1113 108 109 96 100 100 100 101 97 101 101 101 98 94 114 106 101 994 114 106 101 998 994 117 101 101 103	1
5,	Construction of temp working platforms Cofferdam construction of sheetpiles and pipepiles Temporary reclamation between	1 2 3 3	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Crawler crane on flat-top barge Welder / Generator Water pump, submersible Generator, standard Vibratory hammer, hydraulic Power pack Crawler crane on flat-top barge Welder / Generator Water pump, submersible Crawler crane Tug boat Derrick lighter Bulldozer	BS D7-114 CNP 061 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP Ref 1 CNP 283 BS D7-114 CNP 061 CNP 201 CNP 167 CNP 003 CNP 101 BS D7-114 CNP 282 OCNP Ref 1 OCNP Ref 1 OCNP Ref 1 OCNP CNP 282 CNP 101 CNP 282 CNP 101 CNP 282 CNP 101 CNP 282 CNP 101 CNP 282 BS D7-114 Ref 1 CNP 283 CNP 101 CNP 283	2 2 1 1 1 1 2 2 2 4 4 1 1 1 1 1 5 5 12 8 8 8 5 2 1 5 1 1 1 1 2 2 1 1 1 1 1 1 1 1 1 1	101 104 110 101 104 110 111 104 110 115 100 95 85 85 101 104 110 110 108 101 103 115 100 95 85 101 104 110 108 101 103 115 100 95 85 101 101 103 103 104 105 105 105 105 105 105 105 105 105 105	70% 70% 70% 20% 50% 50% 50% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 50% 80%	Total	106 102 105 103 109 98 101 107 113 96 103 106 118 107 111 107 111 108 109 100 102 98 96 101 100 102 98 96 101 100 102 98 97 106 101 106 106	11
\$5, 550	Construction of temp working platforms Cofferdam construction of sheetpiles and pipepiles Temporary reclamation between pipepiles and	1 2 3 3	Portion 2A1) Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Vibratory hammer, hydraulic Power pack Welding Machine (electric) Water pump, submersible Crawler crane on flat-top barge Derrick lighter Tug boat Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Water pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Crawler crane Crawler crane Crawler crane Crawler crane Usater pump, diesel Vibratory hammer, hydraulic Mini Excavator / Backhoe Welding Machine (electric) Power pack Water pump, submersible Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Crawler crane on flat-top barge Welder / Generator Water pump, submersible Generator, standard Vibratory hammer, hydraulic Power pack Crawler crane on flat-top barge Welder / Generator Water pump, submersible Crawler crane Under / Generator Crawler crane on flat-top barge Welder / Generator Water pump, submersible	BS D7-114 CNP 061 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 BS D7-114 CNP 061 CNP 221 OCNP OCNP QCNP Ref 1 CNP 283 BS D7-114 CNP 282 OCNP 101 BS D7-114 CNP 282 OCNP Ref 1 CNP 282 OCNP CNP 003 CNP 101 CNP 282 OCNP Ref 1 CNP 282 OCNP CNP 003 CNP 101 CNP 283 CNP 101 CNP 283 CNP 107 CNP 003 CNP 101 CNP 283 CNP 107 CNP 003 CNP 101 CNP 283 CNP 101 CNP 283 CNP 101 CNP 282 BS D7-114 Ref 1 CNP 283 CNP 101 CNP 283	2 2 1 1 1 1 1 2 2 2 4 4 1 1 1 1 5 1 2 2 2 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1	101 104 110 104 110 110 110 110 110 110	70% 70% 70% 20% 50% 50% 50% 50% 80% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 50% 80% 55% 80% 55% 80% 55% 80% 55% 80% 55% 80% 55% 80% 55% 50% 80% 50% 50% 50% 50% 50%	Total	106 102 105 109 98 101 107 113 98 95 90 113 96 103 106 118 107 111 107 1113 108 109 96 100 100 100 101 97 101 101 101 98 94 114 106 101 994 114 106 101 998 994 117 101 101 103	11

Appendix 2.2 Construction Plant Inventory

62	Activities	Group [1]	PME	Ref. ^[2]	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max S dB(A
			Welder / Generator	Ref 1	1	100	100%	0	100	
			Dump truck with Grab Welding Set	OCNP Ref 2	1	105 78	100% 60%	0	105 76	-
			Lorry with crane	OCNP	1	105	30%	0	100	
			Crawler crane	BS D7-114	1	101	30%	0	96	
			Air Blower (electric)	OCNP	2	95	100%	0	98	
			Dump truck Derrick lighter	BS D9-39 CNP 061	1	103 104	20% 50%	0	96 101	
			Bulldozer	Ref 4	1	102	20%	0	95	
			Water pump, submersible	CNP 283	12	85	100%	0	96	
						•		Total	113	
		2	Derrick lighter	CNP 061	11	104	40%	0	100	
			Tug boat	CNP 221	1	110	40%	0	106	- 44
0	Marine Tunnel	1	Bar bender and cutter	CNP 021	2	90	50%	Total 0	107 90	11
۰	Structure	'	Saw, circular wood	BS D7-79	2	103	20%	0	99	-
	Olidolaic		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	4
			Water pump, submersible	CNP 283	12	85	100%	0 Total	96 108	
		2	Concrete Lorry Mixer	CNP 044	8	109	70%	0	116	-
		_	Concrete pump	CNP 047	3	109	70%	Ö	112	
			Poker, vibratory, hand-held	OCNP	3	102	50%	0	104	
			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	
		3	Tug boat	CNP 221	1	110	40%	Total 0	118 106	
		3	Tug boat	CINF 221	<u> </u>	110	40 /6	Total	106	
		4	Concrete Lorry Mixer	CNP 044	1	109	70%	0	107	1
		1	Concrete pump	CNP 047	1	109	70%	0	107	1
			Poker, vibratory, hand-held	OCNP	1	102	50%	0	99	1
			Crawler crane	BS D7-114	2	101	20%	0	97	1
			Air Blower (electric)	OCNP CNR 101	2	95	100%	0	98	1
			Generator, standard Water pump, submersible	CNP 101 CNP 283	2 12	108 85	100% 100%	-5 0	106 96	1
			vvater purity, submersible	UNF 203	12	00	100%	Total	112	i
		5	Bar bender and cutter	CNP 021	1	90	50%	0	87	1
			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	4
			Saw, circular wood Crawler crane	BS D7-79 BS D7-114	1	103 101	20% 20%	0	96 94	
			Air Blower (electric)	OCNP	2	95	100%	0	98	
			Generator, standard	CNP 101	2	108	100%	-5	106	1
			Water pump, submersible	CNP 283	12	85	100%	0	96	
								Total	110	
		6	Bar bender and cutter	CNP 021	1	90	50%	0	87	
			Concrete Lorry Mixer	CNP 044	1	109	30%	0	104	4
			Concrete pump Poker, vibratory, hand-held	CNP 047 OCNP	1	109 102	30% 20%	0	104 95	
			Saw, circular wood	BS D7-79	1	102	20%	0	96	
			Lorry with crane	OCNP	1	105	20%	Ö	98	1
			Air Blower (electric)	OCNP	2	95	100%	0	98	
			Generator, standard	CNP 101	2	108	100%	-5	106	
					12	85	100%	0	96	
			Water pump, submersible	CNP 283				T-4-1	440	
5	Pookfill	1		•	2	102	50%	Total	110	11
5, '6	Backfill	1	Bulldozer	Ref 4	2	102 105	50% 50%	0	102	11
	Backfill	1		•	2 3 4	102 105 105	50% 50% 80%			11
	Backfill	1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard	Ref 4 CNP 050	3	105 105 108	50% 80% 100%	0	102 107	11
	Backfill	1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller	Ref 4 CNP 050 OCNP CNP 101 CNP 185	3 4 2 2	105 105 108 108	50% 80% 100% 100%	0 0 0 -5 0	102 107 110 106 111	11
	Backfill	1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard	Ref 4 CNP 050 OCNP CNP 101	3 4 2	105 105 108	50% 80% 100%	0 0 0 -5 0	102 107 110 106 111 96	11
	Backfill		Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283	3 4 2 2 12	105 105 108 108 85	50% 80% 100% 100% 100%	0 0 0 -5 0 Total	102 107 110 106 111 96 115	11
	Backfill	1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283	3 4 2 2 12	105 105 108 108 85	50% 80% 100% 100% 100%	0 0 0 -5 0 0 Total	102 107 110 106 111 96 115	11
	Backfill		Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283	3 4 2 2 12	105 105 108 108 85	50% 80% 100% 100% 100%	0 0 0 -5 0 Total	102 107 110 106 111 96 115	
6	Backfill Removal of		Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081	3 4 2 2 12 11	105 105 108 108 85 104 110	50% 80% 100% 100% 100% 40% 80%	0 0 0 -5 0 0 Total 0 0 Total	102 107 110 106 111 96 115 100 106 107	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283 CNP 283 CNP 281 CNP 061 CNP 221	3 4 2 2 12 11 1 1	105 105 108 108 108 85 104 110	50% 80% 100% 100% 100% 40% 40% 80% 30%	0 0 0 -5 0 0 Total 0 0 Total	102 107 110 106 111 96 115 100 106 107 111	
6	Removal of	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 061 CNP 081 CNP 081 OCNP BS D7-114	3 4 2 2 12 11 1 1	105 105 108 108 108 85 104 110 110	50% 80% 100% 100% 100% 40% 40% 80% 30% 30%	0 0 0 -5 0 Total 0 0 Total 0 0	102 107 110 106 111 96 115 100 106 107 111 100 96	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 081 CNP 081 CNP 081 CNP 081 CNP 081	3 4 2 2 12 1 1 1 1 1	105 105 108 108 108 85 104 110 112 105 101 104	50% 80% 100% 100% 100% 40% 40% 80% 30% 30% 30%	0 0 0 -5 0 Total 0 0 Total 0	102 107 110 106 111 96 115 100 106 107 111 100 96	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 061 CNP 081 CNP 081 OCNP BS D7-114	3 4 2 2 12 11 1 1	105 105 108 108 108 85 104 110 110	50% 80% 100% 100% 100% 40% 40% 80% 30% 30%	0 0 0 -5 0 Total 0 0 Total 0 0 0	102 107 110 106 111 96 115 100 106 107 111 100 96 99	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 081 CNP 081 CNP 081 CNP 081 CNP 081	3 4 2 2 12 1 1 1 1 1	105 105 108 108 108 85 104 110 112 105 101 104	50% 80% 100% 100% 100% 40% 40% 80% 30% 30% 30%	0 0 0 -5 0 Total 0 0 Total 0	102 107 110 106 111 96 115 100 106 107 111 100 96	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Welder / Generator	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283 CNP 281 CNP 061 CNP 061 CNP 061 CNP 061 CNP 061 Ref 1	3 4 2 2 12 11 1 1 1 1 1 1 1 1	105 105 108 108 108 85 104 110 110 110 105 101 104 100	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 50%	0 0 0 -5 0 Total 0 0 Total 0 0 0 Total 0 0 0 Total	102 107 110 106 111 96 115 100 106 107 111 109 99 98 111 94 97	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Excavator / Backhoe Crawler crane on flat-top barge Crawler crane on flat-top barge	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 OCNP BS D7-114 CNP 061 Ref 1 BS D7-114	3 4 2 2 12 11 1 1 1 1 1 1	105 105 108 108 85 104 110 112 105 101 101 104 100	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 60%	0 0 0 -5 0 0 Total 0 0 0 Total 0 0 0 0 Total 0 0 0 Total 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 107 110 106 1111 96 107 111 100 96 99 98 112 94 97	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 OCNP BS D7-114 CNP 061 Ref 1 CNP 061 CNP 221	3 4 2 2 12 11 1 1 1 1 1 1 1 1	105 105 108 108 85 104 110 112 105 101 104 100 101 104 110	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 60%	0 0 0 -5 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 Total 0 Total 0 Total	102 107 110 110 106 1115 100 106 115 107 111 100 96 99 98 112 94 97 103 104	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Urawler crane on flat-top barge Derrick lighter Derrick lighter Tug boat Excavator / Backhoe	Ref 4 CNP 050 CNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061	3 4 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1	105 105 108 108 108 85 104 110 111 105 101 104 100 100 101 110	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 30% 50% 70%	0 0 0 1 5 0 Total 0 Total 0 Total 0 0 Total 0	102 107 110 106 111 96 115 100 106 107 111 100 96 99 98 112 94 97 103 104 113	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Derrick lighter Tug boat Excavator / Backhoe Derrick lighter Tug boat	Ref 4 CNP 050 CCNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061 CNP 061 CNP 221 CNP 081 CNP 061	3 4 2 2 12 11 1 1 1 1 1 1 1 1	105 105 108 108 85 104 110 112 105 101 104 100 101 101 101 101 101 101 101	50% 80% 100% 100% 100% 40% 40% 80% 30% 30% 60% 20% 20% 70% 60%	0 0 0 -5 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 Total 0 Total 0 Total	102 107 110 110 106 1115 100 106 115 107 111 100 96 99 98 112 94 97 103 104	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Urawler crane on flat-top barge Derrick lighter Derrick lighter Tug boat Excavator / Backhoe	Ref 4 CNP 050 CNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061	3 4 2 2 12 11 1 1 1 1 1 1 1 1 1 1 1 1	105 105 108 108 108 85 104 110 111 105 101 104 100 100 101 110	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 30% 50% 70%	0 0 0 -5 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 Total	102 107 110 110 106 111 196 115 100 106 107 111 110 96 99 98 112 94 97 103 104 116	
6	Removal of reclamation/ temp	2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard	Ref 4 CNP 050 CNP 0CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061	3 4 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 1 2 1	105 105 108 108 85 104 110 112 105 101 104 100 101 104 110 111 112 105 108	50% 80% 100% 100% 100% 40% 40% 80% 30% 30% 50% 60% 20% 20% 20% 60%	0 0 0 -5 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 Total	102 107 110 110 106 111 96 107 111 100 96 98 112 94 97 103 104 113 106 106 107 111 110 100 96 97 111 100 106 111 100 106 111 100 106 107 111 100 100 100 100 100 100 100 100	
6	Removal of reclamation/ temp	2 1 2 3	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Crawler crane on flat-top barge	Ref 4 CNP 050 CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061 CNP 061 Ref 1 BS D7-114 CNP 061 CNP 221 CNP 081 CNP 201 CNP 081 CNP 061 CNP 221 CNP 081 CNP 081 CNP 081 CNP 081 CNP 081 CNP 081 CNP 101	3 4 2 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 105 108 108 108 85 104 110 111 105 101 104 100 110 111 112 105 101 101 104 110 110 110 110 110 110 110	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 50% 20% 20% 20% 20% 50%	0 0 0 1-5 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 Total 0 Total 0 Total 0 0 Total 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 0 0 0 Total 0 0 0 0 0 Total 0 0 0 0 0 0 Total 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 107 110 106 1115 100 96 107 111 100 96 98 112 99 98 112 103 104 113 106 106 115 110 99 99 98	
6	Removal of reclamation/ temp	2 1 2 3	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Crawler crane on flat-top barge Derrick lighter	Ref 4 CNP 050 CNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 081 CNP 061	3 4 2 2 12 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 105 108 108 85 104 110 110 110 105 101 104 110 110 111 112 105 101 110 110 1110 11	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 20% 20% 20% 100%	0 0 0 1-5 0 0 Total 0 Total 0 Total 0 Total 0 0	102 107 110 110 106 1111 96 107 1111 100 96 99 98 112 94 103 104 105 106 107 1111 100 96 99 112 94 103 106 106 107 1111 109 109 109 109 109 109 109 109 10	
6	Removal of reclamation/ temp	2 1 2 3	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Crawler crane on flat-top barge	Ref 4 CNP 050 CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061 CNP 061 Ref 1 BS D7-114 CNP 061 CNP 221 CNP 081 CNP 201 CNP 081 CNP 061 CNP 221 CNP 081 CNP 081 CNP 081 CNP 081 CNP 081 CNP 081 CNP 101	3 4 2 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 105 108 108 108 85 104 110 111 105 101 104 100 110 111 112 105 101 101 104 110 110 110 110 110 110 110	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 50% 20% 20% 20% 20% 50%	0 0 0 -5 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 Total 0 Total 0 0 Total 0 0 Total 0 Tot	102 107 110 110 106 1111 96 100 106 107 111 100 96 98 112 94 97 103 104 113 106 106 107 111 110 98 98 98 112 99 97 103 104 113 106 106 106 107 107 107 108 109 109 109 109 109 109 109 109 109 109	11
0	Removal of reclamation/ temp platforms	2 1 2 3	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Grawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Crawler crane on flat-top barge Derrick lighter Generator, standard	Ref 4 CNP 050 OCNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061 CNP 101	3 4 2 2 12 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 105 108 108 108 85 104 110 110 110 101 104 110 111 112 105 101 101 104 110 110 110 110 110 110 110	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 50% 60% 20% 20% 20% 50% 60% 100%	0 0 0 1-5 0 0 Total 0 0 0 Total 0 0 0 Total	102 107 110 106 1115 100 96 107 111 100 96 99 98 112 94 97 103 106 106 115 108 115 109 99 98 112 99 113 106 106 107 111 111 100 106 106 107 107 108 109 109 109 109 109 109 109 109 109 109	11
0	Removal of reclamation/ temp	2 1 2 3 4	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Crawler crane on flat-top barge Derrick lighter	Ref 4 CNP 050 CNP CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 081 CNP 061	3 4 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 105 108 108 85 104 110 110 110 105 101 104 110 110 111 112 105 101 110 110 1110 11	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 20% 20% 20% 100%	0 0 0 -5 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 Total 0 Total 0 0 Total 0 0 Total 0 Tot	102 107 110 110 106 1111 96 100 106 107 111 100 96 98 112 94 97 103 104 113 106 106 107 111 110 98 98 98 112 99 97 103 104 113 106 106 106 107 107 107 108 109 109 109 109 109 109 109 109 109 109	11
0	Removal of reclamation/ temp platforms	2 1 2 3 4	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Drirck lighter Generator, standard Derrick lighter Generator, standard	Ref 4 CNP 050 CNP 050 CNP 101 CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061 Ref 1 CNP 061 CNP 221 CNP 061 Ref 1 CNP 061 CNP 221 CNP 061	3 4 2 2 12 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 108 108 108 85 104 110 111 112 105 101 104 110 110 111 112 105 108	50% 80% 100% 100% 100% 40% 40% 40% 30% 30% 30% 50% 50% 100%	0 0 0 1-5 0 0 Total 0 0 0 Total 0	102 107 110 106 1115 100 106 1115 100 96 99 98 112 99 103 106 106 107 111 110 99 98 112 99 103 106 106 107 111 111 100 96 97 103 106 106 107 107 108 109 109 109 109 109 109 109 109 109 109	11
0	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion	2 1 2 3 4 1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Dump truck, with or without grab Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard	Ref 4 CNP 050 CNP 050 CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061 Ref 1 BS D7-114 CNP 061 CNP 221 CNP 081 CNP 061 Ref 1 CNP 061	3 4 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 1 2 1	105 108 108 108 85 104 110 111 112 105 101 104 110 110 111 112 105 101 104 110 110 110 110 110 110 110 110	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 50% 20% 20% 20% 50% 60% 50%	0 0 0 -5 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 Total 0	102 107 110 106 1111 96 107 1115 100 96 98 91 112 99 94 97 103 106 106 112 99 91 107 111 111 100 96 99 98 112 96 91 100 100 100 100 100 100 100 100 100	11
0 0 55	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion	2 1 2 3 4	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Crawler crane on flat-top barge Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard	Ref 4 CNP 050 CNP 0CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061 Ref 1 BS D7-114 CNP 061 CNP 221 CNP 081 CNP 081 CNP 061 Ref 1 CNP 061 CNP 221 CNP 081 CNP 061 CNP 221 CNP 081 CNP 081 CNP 221 CNP 081 CNP 221 CNP 081 CNP 101	3 4 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 108 108 108 108 85 104 110 111 105 101 104 100 110 111 112 105 101 104 110 110 110 110 110 110 110 110	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 50% 20% 20% 20% 20% 100%	0 0 0 1-5 0 0 7otal 0 0 0 0 0 7otal 0 0 0 7otal 0 0 0 7otal 0 0 -5 Total 0 0 0 Total	102 107 110 110 106 1111 96 100 106 107 111 100 96 98 112 99 94 97 103 106 106 115 110 99 98 112 99 100 100 100 100 100 100 100 100 100	11
0 0 55	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion Funnel Stage2 (tunnel Construction of temp	2 1 2 3 4 1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Dump truck, with or without grab Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard	Ref 4 CNP 050 CNP 050 CNP 101 CNP 185 CNP 283 CNP 061 CNP 061 CNP 081 CNP 081 CNP 061 CNP 221	3 4 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 1 2 1	105 105 108 108 108 85 104 110 1110 1112 105 101 104 110 1112 105 108 112 108 112 108 112 110 104 1108 1110 1104 1108 1110 1104 1110 1110	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 30% 50% 60% 100% 70% 60% 100%	0 0 0 1-5 0 0 Total 0 0 0 Total	102 107 110 106 111 108 1115 100 106 107 111 110 96 99 98 112 97 103 106 115 110 106 115 110 106 115 110 107 111 111 100 100 100 100 100 100	11
6 0 0 5 5 Ene T	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion	2 1 2 3 4	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Dump truck, with or without grab Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge	Ref 4 CNP 050 CNP 050 CCNP 101 CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 OCNP 85 CNP 061 Ref 1 CNP 061	3 4 2 2 12 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 108 108 108 108 85 104 110 112 105 101 104 110 112 105 101 104 110 112 105 108 112 112 108 112 110 1110 1110 1110	50% 80% 100% 100% 100% 40% 40% 40% 80% 30% 30% 30% 60% 100% 70% 60% 100%	0 0 0 0 -5 0 0 Total 0 0 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 Total	102 107 110 110 106 111 96 107 111 100 96 99 98 112 94 97 103 106 106 115 109 99 98 112 94 112 99 110 106 107 111 100 96 99 98 112 100 100 100 100 100 100 100 100 100	11
60 60 F55	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion Funnel Stage2 (tunnel Construction of temp	2 1 2 3 4	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Dump truck, with or without grab Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard	Ref 4 CNP 050 CNP 050 CNP 101 CNP 185 CNP 283 CNP 061 CNP 061 CNP 081 CNP 081 CNP 061 CNP 221	3 4 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 2 2 2 1 2 1	105 105 108 108 108 85 104 110 1110 1112 105 101 104 110 1112 105 108 112 108 112 108 112 110 104 1108 1110 1104 1108 1110 1104 1110 1110	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 30% 50% 60% 100% 70% 60% 100%	0 0 0 1-5 0 0 7-5 0 0 0 7-5 0 0 0 0 0 0 0 7-5 0 0 0 0 7-5 7-5 1-5 1-5 1-5 1-5 1-5 1-5 1-5 1-5 1-5 1	102 107 110 108 1111 96 1115 100 106 107 111 100 96 99 98 112 97 103 106 115 110 98 102 106 108	11
0 0 55	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion Funnel Stage2 (tunnel Construction of temp	2 1 2 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Crawler crane on flat-top barge Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Grab dredger Tug boat Dortion 2A3) Crawler crane on flat-top barge Derrick lighter Tug boat	Ref 4 CNP 050 CNP 050 CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061 CNP 061 CNP 061 CNP 061 CNP 221 CNP 061	3 4 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 108 108 108 108 85 104 110 112 105 101 104 110 110 111 104 108 108 104 110 110 1104 1108 1104 1108 1104 1108	50% 80% 100% 100% 100% 40% 40% 30% 30% 30% 30% 50% 60% 100% 70% 60% 100%	0 0 0 1-5 0 0 7-5 0 0 7-5 0 0 0 7-7-0-1 0 0 0 0 7-7-0-1 0 0 0 0 7-7-0-1 0 0 0 0 7-7-0-1 0 0 0 0 7-5 7-7-0-1 0 0 0 7-5 7-7-0-1 0 0 0 7-7-1 0 0 0 0 7-7-1 0 0 0 0 7-7-1 0 0 0 0 7-7-1 0 0 0 0 7-7-1 0 0 0 0 0 7-7-1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 107 110 1106 1111 96 1115 100 106 1115 1100 96 99 98 112 97 103 106 115 110 106 115 110 106 107 111 100 107 111 100 100 100 100 100	11
0 0 55	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion Funnel Stage2 (tunnel Construction of temp	2 1 2 3 4	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Dump truck, with or without grab Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge	Ref 4 CNP 050 CNP 050 CCNP 101 CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 OCNP 85 CNP 061 Ref 1 CNP 061	3 4 2 2 12 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 108 108 108 108 85 104 110 112 105 101 104 110 112 105 101 104 110 112 105 108 112 112 108 112 110 1110 1110 1110	50% 80% 100% 100% 100% 40% 40% 40% 80% 30% 30% 30% 60% 100% 70% 60% 100%	0 0 0 1-5 0 0 7-5 0 0 0 7-5 0 0 0 0 0 0 0 7-5 0 0 0 0 7-5 7-5 1-5 1-5 1-5 1-5 1-5 1-5 1-5 1-5 1-5 1	102 107 110 108 1111 96 1115 100 106 107 111 100 96 99 98 112 97 103 106 115 110 98 102 106 108	11
0 0 55	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion Funnel Stage2 (tunnel Construction of temp	2 1 2 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Dump truck, with or without grab Generator, standard Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge	Ref 4 CNP 050 CNP 050 CCNP 101 CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 OCNP 061 Ref 1 BS D7-114 CNP 061 CNP 221 CNP 081 CNP 061 CNP 221 CNP 081 CNP 061 CNP 221 CNP 081 CNP 221 CNP 081 CNP 221 CNP 081 CNP 221 CNP 081 BS D7-114 CNP 061 CNP 221 CNP 081 BS D7-114 CNP 061 CNP 101 CNP 061 CNP 063 CNP 221	3 4 2 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 108 108 108 108 109 104 110 112 105 101 104 110 112 105 108 111 105 108 112 105 108 112 101 104 110 110 1110 1110 1110 1110	50% 80% 100% 100% 100% 40% 40% 80% 30% 30% 60% 20% 20% 20% 100% 70% 50% 100%	0 0 0 0 -5 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 Total	102 107 110 106 1111 96 1115 100 106 107 111 100 96 99 98 112 112 97 103 106 115 110 116 117 110 106 117 110 106 117 110 106 107 111 100 96 98 98 102 103 104 113 106 106 106 107 110 107 107 107 107 107 107 107 107	11
0 0 55	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion Funnel Stage2 (tunnel Construction of temp	2 1 2 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Dump truck, with or without grab Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Vibratory hammer, hydraulic Power pack Welding Machine (electric)	Ref 4 CNP 050 CNP 050 CCNP 101 CNP 185 CNP 283 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061	3 4 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 108 108 108 108 108 85 104 110 1110 1112 105 101 104 110 1104 110 1112 105 108 1112 105 108 1112 110 104 110 104 110 104 110 104 110 104 110 107 108 108 109 101 104 110 109 101 104 110 101 101 101 101 101 101 101	50% 80% 100% 100% 100% 100% 40% 40% 40% 30% 30% 50% 50% 50% 60% 20% 70% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	0 0 0 -5 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 Total	102 107 110 108 1111 96 1115 100 106 107 111 100 96 98 112 99 94 113 106 106 107 111 100 96 100 96 98 112 97 103 108 109 100 100 110 100 100 100 100 100 100	11
60 60 F55	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion Funnel Stage2 (tunnel Construction of temp	2 1 2 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Crawler crane on flat-top barge Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat	Ref 4 CNP 050 CNP 050 CNP 101 CNP 185 CNP 283 CNP 281 CNP 081 CNP 221 CNP 081 CNP 081 CNP 221 CNP 081	3 4 2 2 12 11 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 105 108 108 108 85 104 110 111 105 101 104 110 111 105 108 101 100 101 104 110 101 104 110 101 104 110 101 104 110 101 104 110 101 104 110 101 104 110 101 104 110	50% 80% 100% 100% 100% 100% 40% 40% 30% 30% 30% 50% 50% 50% 50% 50% 70% 50% 70% 70% 70% 70% 70% 70% 70%	0 0 0 0 1-5 0 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 Total	102 107 110 108 1111 109 96 107 1111 100 96 109 98 112 97 103 106 115 110 106 115 110 107 111 100 96 98 112 97 103 108 109 102 106 110 107 107 108 109 98 110 109 109 109 109 109 109 109 109 109	111
0 5 5 me 7 0 0	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion Funnel Stage2 (tunnel) Construction of temp working platforms	2 1 2 3 4 4 1 1 1 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Dump truck, with or without grab Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat	Ref 4 CNP 050 CNP 050 CCNP 101 CNP 101 CNP 185 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061 Ref 1 CNP 061 CNP 221 CNP 081 CNP 221 CNP 081 CNP 083 CNP 221 BS D7-114 CNP 081 CNP 081 CNP 221	3 4 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 105 108 108 108 85 104 110 112 105 101 104 100 101 104 110 108 101 104 110 101 104 108 109 101 101 104 110 101 104 110 104 110 104 110 105 108	50% 80% 100% 100% 100% 100% 40% 40% 40% 30% 30% 30% 50% 70% 60% 100% 50% 100% 50% 70% 70% 70% 70% 70% 70% 70% 80%	0 0 0 0 -5 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 Total	102 107 110 106 111 96 115 100 106 107 111 100 98 99 98 112 94 97 103 104 113 106 115 110 106 107 111 100 98 112 91 101 101 101 101 101 101 101 101 101	11:
0 0 55	Removal of reclamation/ temp platforms Dredging for Stage 2 diversion Funnel Stage2 (tunnel Construction of temp	2 1 2 3 3 4 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Welder / Generator Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Crawler crane on flat-top barge Derrick lighter Tug boat Excavator / Backhoe Dump truck, with or without grab Generator, standard Excavator / Backhoe Dump truck, with or without grab Generator, standard Derrick lighter Generator, standard Derrick lighter Generator, standard Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge Derrick lighter Grab dredger Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Derrick lighter Tug boat Crawler crane on flat-top barge Vibratory hammer, hydraulic Power pack Welding Machine (electric)	Ref 4 CNP 050 CNP 050 CCNP 101 CNP 185 CNP 283 CNP 283 CNP 061 CNP 221 CNP 081 CNP 061	3 4 2 2 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	105 108 108 108 108 108 85 104 110 1110 1112 105 101 104 110 1104 110 1112 105 108 1112 105 108 1112 110 104 110 104 110 104 110 104 110 104 110 107 108 108 109 101 104 110 109 101 104 110 101 101 101 101 101 101 101	50% 80% 100% 100% 100% 100% 40% 40% 40% 30% 30% 50% 50% 50% 60% 20% 70% 50% 50% 50% 50% 50% 50% 50% 50% 50% 5	0 0 0 0 1-5 0 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 Total	102 107 110 108 1111 109 96 107 1111 100 96 109 98 112 97 103 106 115 110 106 115 110 107 111 100 96 98 112 97 103 108 109 102 106 110 107 107 108 109 98 110 109 109 109 109 109 109 109 109 109	111

Appendix 2.2 Construction Plant Inventory

	Group [1]	PME	Ref. ^[2]	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max S dB(A
pipepiles	2	Pipe Pile Rig	CNP 167	2	114	70%	Total 0	106 115	-
		Air compressor, air flow > 30m3/min	CNP 003	2	104	70%	-5	100	
		Generator, standard Water pump, diesel	CNP 101 CNP 282	2	108 103	100% 70%	-5 0	106 104	
		Welder / Generator	Ref 1	2	100	50%	0	100	
		Water pump, submersible	CNP 283	10	85	80%	0	94	
	3	Pipe Pile Rig	CNP 167	1	114	70%	Total 0	116 112	
	3	Air compressor, air flow > 30m3/min	CNP 003	1	104	70%	-5	97	1
		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 Welder / Generator	BS D7-114 Ref 1	2	101 100	30% 50%	0	96 100	
		Water pump, submersible	CNP 283	10	85	80%	0	94	
			Lavinia				Total	114	
	4	Generator, standard Vibratory hammer, hydraulic	CNP 101 OCNP	2	108 115	100% 70%	-5 0	106 116	-
		Power pack	OCNP	2	100	70%	0	101	1
		Crawler crane on flat-top barge	BS D7-114	1	101	30%	0	96	
		Welder / Generator	Ref 1	2	100	30%	0	98	
		Water pump, submersible	CNP 283	10	85	80%	0 Total	94	117
5 Temporary	1	Crawler crane	BS D7-114	2	101	50%	0	101	1
reclamation between	n	Tug boat	CNP 221	1	110	20%	0	103	
pipepiles and		Derrick lighter	CNP 061	2	104	50%	0	104	
sheetpiles		Bulldozer Compactor, vibratory	Ref 4 CNP 050	2	102 105	50% 80%	0	102 107	-
		Compactor, vibratory	CINF 030		103	80 /8	Total	111	111
), ELS work	1	Excavator / Backhoe	CNP 081	1	112	80%	0	111	
,		Drill, hand-held (electric)	CNP 065	1	98	20%	0	91	
2		Welder / Generator	Ref 1	1	100	100%	0	100	4
		Dump truck with Grab Welding Set	OCNP Ref 2	1	105 78	100% 60%	0	105 76	1
1		Lorry with crane	OCNP	1	105	30%	0	100	1
		Crawler crane	BS D7-114	1	101	30%	0	96	1
1		Air Blower (electric)	OCNP	2	95	100%	0	98	4
		Dump truck Derrick lighter	BS D9-39 CNP 061	1	103 104	20% 50%	0	96 101	4
		Bulldozer	Ref 4	1	104	20%	0	95	1
		Water pump, submersible	CNP 283	12	85	100%	0	96	
					1		Total	113	
	2	Derrick lighter	CNP 061	1	104	50%	0	101	
		Tug boat	CNP 221		110	20%	Total	103 105	11:
Marine Tunnel	1	Bar bender and cutter	CNP 021	2	90	50%	0	90	1
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) Generator, standard	OCNP CNP 101	2	95 108	100% 100%	-5	98 106	-
		Water pump, submersible	CNP 283	12	85	100%	0	96	1
							Total	108	
	2	Concrete Lorry Mixer	CNP 044	8	109	70%	0	116	
		Concrete pump Poker, vibratory, hand-held	CNP 047 OCNP	3	109 102	70% 50%	0	112 104	-
		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	
	3	Tug boat	CNP 221	1	110	40%	Total 0	118 106	4
	3	rug boat	CINP 221	-	110	40%	Total	106	
		Concrete Lorry Mixer	CNP 044	1	109	70%	0	107	
	4	0		1		700/	0		
	4	Concrete pump	CNP 047		109	70%		107	4
	4	Poker, vibratory, hand-held	OCNP	1	102	50%	0	99	
	4	Poker, vibratory, hand-held Crawler crane	OCNP BS D7-114	1 2	102 101	50% 20%	0	99 97	
	4	Poker, vibratory, hand-held	OCNP	1	102	50%	0	99	
	4	Poker, vibratory, hand-held Crawler crane Air Blower (electric)	OCNP BS D7-114 OCNP	1 2 2	102 101 95	50% 20% 100%	0 0 0 -5 0	99 97 98 106 96	
		Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible	OCNP BS D7-114 OCNP CNP 101 CNP 283	1 2 2 2 2 12	102 101 95 108 85	50% 20% 100% 100% 100%	0 0 0 -5 0 Total	99 97 98 106 96 112	
	5	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter	OCNP BS D7-114 OCNP CNP 101 CNP 283	1 2 2 2 2 12	102 101 95 108 85	50% 20% 100% 100% 100%	0 0 0 -5 0 Total	99 97 98 106 96 112 87	
		Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044	1 2 2 2 2 12	102 101 95 108 85 90 109	50% 20% 100% 100% 100% 50% 30%	0 0 0 -5 0 Total 0	99 97 98 106 96 112 87	
		Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter	OCNP BS D7-114 OCNP CNP 101 CNP 283	1 2 2 2 2 12	102 101 95 108 85	50% 20% 100% 100% 100%	0 0 0 -5 0 Total	99 97 98 106 96 112 87	-
		Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79	1 2 2 2 2 12 1 1 1 1 1	102 101 95 108 85 90 109 109 102 103	50% 20% 100% 100% 100% 50% 30% 30% 20%	0 0 0 -5 0 Total 0 0 0	99 97 98 106 96 112 87 104 104 95	
		Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 BS D7-119	1 2 2 2 12 11 1 1 1 1 1	102 101 95 108 85 90 109 109 102 103 101	50% 20% 100% 100% 100% 50% 30% 30% 20% 20%	0 0 0 -5 0 Total 0 0 0	99 97 98 106 96 112 87 104 104 95 96	-
		Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric)	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 BS D7-114 OCNP	1 2 2 2 12 11 1 1 1 1 1 1 2	102 101 95 108 85 90 109 109 102 103 101 95	50% 20% 100% 100% 100% 50% 30% 30% 20% 20% 100%	0 0 0 -5 0 Total 0 0 0	99 97 98 106 96 112 87 104 104 95 96 94	- - - - - - - - - - - -
		Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 BS D7-114 OCNP CNP 101	1 2 2 2 12 11 1 1 1 1 1	102 101 95 108 85 90 109 109 102 103 101	50% 20% 100% 100% 100% 50% 30% 30% 20% 20%	0 0 0 -5 0 Total 0 0 0	99 97 98 106 96 112 87 104 104 95 96	- - - - - - - - - - - - - - - - - - -
		Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 BS D7-114 OCNP CNP 101 CNP 283	1 2 2 2 12 11 1 1 1 1 1 1 1 2 2	102 101 101 95 108 85 90 109 109 102 103 101 95 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 20% 100% 100%	0 0 0 -5 0 Total 0 0 0 0	99 97 98 106 96 112 87 104 104 95 96 94 98	-
		Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 BS D7-114 OCNP CNP 101 CNP 283	1 2 2 2 12 11 1 1 1 1 1 1 2 2 12	102 101 95 108 85 90 109 109 102 103 101 95 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 20% 100% 100%	0 0 0 -5 0 Total 0 0 0 0 0 0 0 0 0 Total	99 97 98 106 96 112 87 104 95 96 94 98 106 96 110 98	
	5	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-19 BS D7-114 OCNP CNP 101 CNP 283	1 2 2 2 12 11 1 1 1 1 1 1 2 2 12	102 101 95 108 85 90 109 109 102 103 101 95 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 50% 30%	0 0 0 -5 0 Total 0 0 0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 104 104 95 96 94 98 106 96 110 97 106 98	
	5	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Corry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 021 CNP 044 CNP 044 CNP 044 CNP 047	1 2 2 2 12 1 1 1 1 1 1 1 2 2 12	102 101 101 95 108 85 90 109 109 102 103 101 95 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 50% 30% 30%	0 0 0 -5 0 Total 0 0 0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 104 95 96 94 98 110 87 110 87	
	5	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 BS D7-114 OCNP CNP 101 CNP 283	1 2 2 2 12 11 1 1 1 1 1 1 2 2 12	102 101 95 108 85 90 109 109 102 103 101 95 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 50% 30%	0 0 0 -5 0 Total 0 0 0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 104 104 95 96 94 98 106 96 110 97 106 98	
	5	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lory Mixer Concrete Lory Mixer Concrete, vibratory, hand-held Saw, circular wood Lory with crane	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 021 CNP 044 CNP 047 OCNP CNP 101 CNP 283	1 2 2 2 12 1 1 1 1 1 1 1 2 2 12 1 1 1 1	102 101 95 108 85 90 109 109 102 103 101 95 108 85 90 109 109 109 109 109 109 109 109 109	50% 20% 100% 100% 100% 50% 30% 20% 20% 20% 100% 100% 100% 50% 30% 30% 20% 20% 20% 20% 20% 20% 20% 20% 20% 2	0 0 0 -5 0 Total 0 0 0 0 0 Total 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 104 95 96 94 98 106 87 104 106 95 96 110 87 104 104 95 96	
	5	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric)	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 047 OCNP BS D7-79 BS D7-79 OCNP CNP 101 CNP 283	1 2 2 2 12 1 1 1 1 1 1 1 2 12 12 1	102 101 95 108 85 90 109 109 102 103 101 95 108 85 90 109 109 109 109 109 109 109 109	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 50% 30% 20% 20% 20% 20% 20% 20% 20% 20% 20% 2	0 0 0 -5 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 104 95 96 94 98 106 96 110 87 104 104 104 96 96 96	
	5	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete yump Poker, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric) Generator, standard	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 CNP 101 CNP 283 CNP 044 OCNP CNP 101 CNP 283 CNP 047 OCNP CNP 101 CNP 283	1 2 2 2 12 12 1 1 1 1 1 1 1 1 1 1 1 1 1	102 101 95 108 85 90 109 109 102 103 101 95 108 85 90 109 109 109 109 109 109 109 109 109	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 50% 30% 20% 100% 100%	0 0 0 1 5 0 0 7 7 1 0 0 0 0 0 0 0 0 0 0 7 7 1 0 0 0 0	99 97 98 106 96 96 112 87 104 104 95 96 98 106 87 104 104 95 96 98 106 96 98 98 106 96 96 98 109 96 96 96 96 96 96 97 98 98 98 98 98 98 98 98 98 98	
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, Backfill	5	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete Jump Poker, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric) Generator, standard Water pump, submersible	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 CNP 101 CNP 283 CNP 021 CNP 047 OCNP CNP 101 CNP 283 CNP 021 CNP 047 OCNP CNP 101 CNP 283 CNP 047 OCNP RS D7-79 OCNP RS D7-79 OCNP CNP 101 CNP 283	1 2 2 2 12 12 1 1 1 1 1 1 1 1 1 1 1 1 1	102 101 95 108 85 90 109 109 102 103 101 95 108 85 90 109 109 109 109 109 109 109 109 109	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 50% 30% 20% 100% 100% 50%	0 0 0 1 5 0 0 0 7 7 0 0 0 0 0 0 0 0 0 0 7 7 0	99 97 98 106 96 112 87 104 104 95 96 98 106 97 104 104 98 106 99 98 106 99 99 99 99 99 99 99 99 99 9	11:
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	6	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Generator, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric) Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 021 CNP 047 OCNP CNP 101 CNP 283 CNP 021 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 OCNP CNP 0CNP CNP 0CNP CNP 101 CNP 283	1 2 2 2 12 11 1 1 1 1 1 1 1 1 1 1 1 1 1	102 101 101 95 108 85 90 109 109 102 103 101 95 108 85 90 109 109 102 103 105 95 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 50% 30% 30% 100% 50% 30% 30% 30% 30% 100%	0 0 0 -5 0 Total 0 0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 Total 0 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total	99 97 98 106 96 112 87 104 95 96 94 98 106 96 110 87 104 104 95 96 110 97 104 98 106 96 110 107 110 107 110 108 109 109 109 109 109 109 109 109	11
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	6	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Jump Poker, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric) Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-114 OCNP BS D7-79 BS D7-79 BS D7-79 CNP 101 CNP 283 CNP 021 CNP 044 CNP 050 OCNP CNP 0CNP CNP 0CNP CNP 101 CNP 283	1 2 2 2 12 1 1 1 1 1 1 2 2 12 12 12 12 1	102 101 101 101 95 108 85 109 109 109 102 103 101 95 108 85 90 109 102 103 101 108 85 109 109 102 103 105 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 20% 100% 100% 50% 30% 50% 30% 50% 50% 30% 20% 20% 100% 50% 50% 100% 100% 100% 100%	0 0 0 -5 0 Total 0 0 0 0 0 0 0 0 0 0 Total 0 0 0 0 Total 0 0 Total 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 104 95 96 96 110 87 104 104 95 96 110 97 104 104 98 106 99 98 106 96 110 110 110 110 110 110 110 11	111
	6	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric) Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 BS D7-114 OCNP 283 CNP 021 CNP 021 CNP 044 CNP 047 CNP 050 CNP 101 CNP 283	1 2 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1	102 101 101 95 108 85 90 109 109 1003 101 95 108 85 90 109 109 109 1002 103 101 105 95 108 85 1005 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 50% 30% 50% 30% 30% 100% 100% 50% 30% 40%	0 0 0 1-5 0 0 0 0 7-5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 95 96 96 1100 96 1100 97 1001 98 1001 1001 1001 1001 1001 1001 1	11
	6	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Jump Poker, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric) Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-114 OCNP BS D7-79 BS D7-79 BS D7-79 CNP 101 CNP 283 CNP 021 CNP 044 CNP 050 OCNP CNP 0CNP CNP 0CNP CNP 101 CNP 283	1 2 2 2 12 11 1 1 1 1 1 1 1 1 1 1 1 1 1	102 101 101 101 95 108 85 109 109 109 102 103 101 95 108 85 90 109 102 103 101 108 85 109 109 102 103 105 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 20% 100% 100% 50% 30% 50% 30% 50% 50% 30% 20% 20% 100% 50% 50% 100% 100% 100% 100%	0 0 0 1-5 0 0 0 0 1-5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 104 95 96 96 110 106 96 110 106 111 106 1115 100	
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Reprovision of MT	6	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete pump Doker, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric) Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Breaker, excavator mounted, hydraulic	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 BS D7-114 OCNP 283 CNP 021 CNP 021 CNP 044 CNP 047 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 OCNP BS D7-79 OCNP CNP 101 CNP 283 Ref 4 CNP 050 OCNP CNP 101 CNP 283 CNP 105 CNP 283 CNP 050 CNP 107 CNP 108 CNP 109 CNP 109 CNP 283 CNP 109 CNP 101 CNP 283 CNP 105 CNP 105 CNP 105 CNP 105 CNP 105 CNP 105 CNP 283	1 2 2 2 12 1 1 1 1 1 1 1 1 1 1 1 1 1 1	102 101 101 95 108 85 90 109 109 1003 101 95 108 85 90 109 109 109 1002 103 101 105 95 108 85 102 105 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 50% 30% 30% 30% 100% 50% 30% 30% 30% 30% 40% 50% 50% 50% 80% 100% 100%	0 0 0 1-5 0 0 0 0 1-5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 104 95 96 110 96 110 104 104 104 104 104 106 110 106 110 106 111 106 111 106 110 106 110 106 107	
6	6	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Jump Poker, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric) Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-114 OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 OCNP CNP 101 CNP 283 Ref 4 CNP 050 OCNP CNP 101 CNP 283 Ref 4 CNP 050 OCNP CNP 101 CNP 101 CNP 101 CNP 185 CNP 283	1 1 2 2 2 12 11 1 1 1 1 1 1 1 1 1 1 1 1	102 101 101 95 108 85 90 109 100 101 95 108 85 90 109 109 102 103 101 95 108 85 90 109 102 103 101 105 95 108 85 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 100% 50% 30% 30% 30% 100% 100% 100% 50% 100% 100% 100% 100	0 0 0 -5 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 104 95 96 96 110 87 104 95 96 110 107 110 106 111 96 111 96 111 96 111 96 111 96 111 96 111 96 111 96 110 110 110 110 110 110	
7 Reprovision of MT	6	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Lord Lord Lord Lord Lord Lord Lord Lord	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-114 OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 OCNP CNP 101 CNP 283 Ref 4 CNP 050 OCNP CNP 101 CNP 283 Ref 4 CNP 105 CNP 101 CNP 185 CNP 201 CNP 101 CNP 281	1 2 2 2 12 11 1 1 1 1 1 2 2 12 12 12 12	102 101 101 95 108 85 90 109 102 103 101 95 108 85 90 109 109 109 109 109 109 102 103 105 108 85 108 85 104 110	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 100% 100% 100% 50% 50% 50% 80% 100% 100% 100% 50% 50% 50% 50% 50% 50% 50% 50% 50%	0 0 0 1-5 0 0 0 0 1-5 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	99 97 98 106 96 112 87 104 104 95 96 96 110 96 110 97 100 106 111 96 115 100 106 107 101 85 103	118
7 Reprovision of MT	6	Poker, vibratory, hand-held Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Lorry Mixer Concrete pump Poker, vibratory, hand-held Saw, circular wood Crawler crane Air Blower (electric) Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete Jump Poker, vibratory, hand-held Saw, circular wood Lorry with crane Air Blower (electric) Generator, standard Water pump, submersible Bulldozer Compactor, vibratory Dump truck, with or without grab Generator, standard Road roller Water pump, submersible Derrick lighter Tug boat Breaker, excavator mounted, hydraulic Concrete crusher, excavator mounted	OCNP BS D7-114 OCNP CNP 101 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-114 OCNP BS D7-19 BS D7-19 BS D7-19 CNP 283 CNP 021 CNP 101 CNP 283 CNP 011 CNP 283 CNP 021 CNP 044 CNP 047 OCNP BS D7-79 OCNP CNP 101 CNP 283 Ref 4 CNP 050 OCNP CNP 101 CNP 283 CNP 101 CNP 283 CNP 061 CNP 283 CNP 061 CNP 283	1 1 2 2 1 1 1 1 1 1 1 2 2 1 1 2 1 2 1	102 101 101 95 108 85 90 109 102 103 101 95 108 85 90 109 109 102 103 101 95 108 85 109 109 102 103 101 101 101 105 95 108 85 106 107 108 108 85	50% 20% 100% 100% 100% 50% 30% 20% 20% 100% 100% 50% 100% 50% 50% 100% 100%	0 0 0 1-5 0 Total 0 0 0 0 0 0 0 0 0 0 0 Total 0 0 0 0 Total 0 0 0 Total 0 0 0 Total 0 Total 0 Total 0 Total 0 Total	99 97 98 106 96 112 87 104 104 95 96 96 110 87 1004 95 96 110 107 110 96 111 96 111 96 111 96 110 106 107 107 107	

Appendix 2.2 Construction Plant Inventory

	Construction Activities	Group [1]	PME	Ref. ^[2]	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max SF dB(A)
			Water pump, submersible Generator, standard	CNP 283 CNP 101	1	85 108	100% 100%	-5	85 103	_
			Saw, wire	OCNP	1	101	80%	0	100]
		3	Breaker, excavator mounted, hydraulic	BS D8-13	1	110	50%	Total 0	108 107	4
		3	Lorry with crane	OCNP	1	105	80%	0	104	
			Water pump, submersible	CNP 283	1	85	100%	0	85	
			Generator, standard Saw, wire	OCNP	1	108 101	100% 80%	-5 0	103 100	1
				•				Total	110	
		4	Concrete crusher, excavator mounted	OCNP BS D7-114	1	103 101	20%	0	96	1
			Crawler crane Water pump, submersible	CNP 283	1	85	50% 100%	0	98 85	_
			Generator, standard	CNP 101	1	108	100%	-5	103	
			Saw, wire	OCNP	1	101	80%	0 Total	100 106	ł
		5	Breaker, excavator mounted, hydraulic	BS D8-13	1	110	50%	0	107	1
			Crawler crane	BS D7-114	1	101	50%	0	98	
			Water pump, submersible Generator, standard	CNP 283 CNP 101	1	85 108	100% 100%	-5	85 103	4
			Saw, wire	OCNP	1	101	80%	0	100	
			Down to the second second	OCNE	- 4	405	200/	Total	109	Į.
		6	Dump truck, with or without grab Mini Excavator / Backhoe	OCNP OCNP	1	105 94	30% 30%	0	100 89	-
			Water pump, submersible	CNP 283	1	85	100%	0	85	
			Generator, standard	CNP 101	1	108	100%	-5 T-4-1	103	
		7	Lorry with crane	OCNP	1	105	80%	Total 0	105 104	
			Bar Bender	CNP 021	1	90	40%	0	86	
			Generator, standard	CNP 101	1 2	108	100%	-5 0	103	-
			Welding Set Water pump, submersible	Ref 2 CNP 283	1	78 85	50% 100%	0	78 85	1
							•	Total	107	
		8	Concrete Lorry Mixer	CNP 044	1	109	50%	0	106	-
			Lorry mounted concrete pump Concrete Poker Vibrator	CNP 047 CNP 170	1	109 113	50% 50%	0	106 110	1
			Generator, standard	CNP 101	1	108	100%	-5	103	1
1	Pomoval of	1	Eveavator / Rackhoe	CNP 081	2	110	70%	Total	113	11
) re	Removal of clamation/ temp	'	Excavator / Backhoe Dump truck with Grab	OCNP	2	112 105	20%	0	113 101	1
''	platforms		Dump Truck	BS D9-39	2	103	30%	0	101	1
			Crawler crane on flat-top barge	BS D7-114 CNP 061	1	101 104	50% 50%	0	98 101	1
			Derrick lighter Generator, standard	CNP 061 CNP 101	1	104	100%	-5	101	1
			Welding Set	Ref 2	4	78	50%	0	81	1
		2	Crawler crane on flat-top barge	BS D7-114	1	101	20%	Total 0	115 94	4
		_	Derrick lighter	CNP 061	1	101	20%	0	97	1
			Tug boat	CNP 221	1	110	20%	0	103] .
cal Wall	along depressed	road at Port	on 3B					Total	104	11
0,	Pipepiles and	1	Pipe Pile Rig	CNP 167	1	114	80%	0	113	
2	sheetpiles		Air compressor, air flow > 30m3/min Generator, standard	CNP 003 CNP 101	1	104 108	80% 100%	-5 -5	98	1
1						100	10070	u		
			Water pump, diesel	CNP 282	1	103	80%	0	103 102	
			Water pump, diesel Mini Backhoe (3 tonnes)	CNP 282 OCNP	1	94	80% 50%	0	102 91	
			Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab	OCNP OCNP		94 105	80% 50% 30%	0 0 0	102 91 100	
			Water pump, diesel Mini Backhoe (3 tonnes)	CNP 282 OCNP	1	94	80% 50%	0	102 91	
			Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible	OCNP OCNP OCNP OCNP CNP CNP CNP 283	1 1 1 1 4	94 105 90 105 85	80% 50% 30% 30% 30% 100%	0 0 0 0 0	102 91 100 85 100 91	
			Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic	OCNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP	1 1 1 1 4	94 105 90 105 85 115	80% 50% 30% 30% 30% 100% 30%	0 0 0 0 0 0	102 91 100 85 100 91	- - - - - - -
			Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible	OCNP OCNP OCNP OCNP CNP CNP CNP 283	1 1 1 1 4	94 105 90 105 85	80% 50% 30% 30% 30% 100%	0 0 0 0 0	102 91 100 85 100 91	11
	dit at Eastern Intel		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP	1 1 1 1 4 1	94 105 90 105 85 115 100	80% 50% 30% 30% 30% 100% 30%	0 0 0 0 0 0 0 0 0 Total	102 91 100 85 100 91 110 95 116	11
	ing and pumping	rface(Portion	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 287 CNP 287 CNP 287	1 1 1 4 1 1	94 105 90 105 85 115 100	80% 50% 30% 30% 30% 100% 30% 30%	0 0 0 0 0 0 0 0 Total	102 91 100 85 100 91 110 95 116	11
			Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 2.346) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 CNP OCNP CNP 287 CNP 167 CNP 167 CNP 003 CNP 101	1 1 1 1 4 1 1 1	94 105 90 105 85 115 100	80% 50% 30% 30% 30% 100% 30% 30% 80% 80%	0 0 0 0 0 0 0 0 Total	102 91 100 85 100 91 110 95 116 113 101 103	11
	ing and pumping		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 2346) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 CNP 101 CNP 101 CNP 282	1 1 1 1 4 1 1 1	94 105 90 105 85 115 100 114 104 108 103	80% 50% 30% 30% 30% 100% 30% 30% 80%	0 0 0 0 0 0 0 0 Total	102 91 100 85 100 91 110 95 116 113 101 103 102	11
	ing and pumping		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3.346) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, niesel Mini Backhoe (3 tonnes)	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 167 CNP 101 CNP 101 CNP 282	1 1 1 1 4 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94	80% 50% 30% 30% 30% 100% 30% 30% 80% 80% 80% 60%	0 0 0 0 0 0 0 0 Total	102 91 100 85 100 91 110 95 116 113 101 103 102 92	11
	ing and pumping		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer	CNP 282 OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP CNP 167 CNP 003 CNP 101 CNP 282 OCNP OCNP	1 1 1 1 4 1 1 1 2 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90	80% 50% 30% 30% 30% 100% 30% 30% 80% 80% 60% 80%	0 0 0 0 0 0 0 Total	102 91 100 85 100 91 1110 95 116 113 101 103 102 92 100 89	11
	ing and pumping		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3.346) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 167 CNP 101 CNP 101 CNP 282 OCNP OCNP OCNP OCNP	1 1 1 1 4 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90	80% 50% 30% 30% 30% 30% 30% 30% 30% 80% 100% 80% 30% 80% 100%	0 0 0 0 0 0 0 0 Total	102 91 100 85 100 91 116 113 101 103 102 92 100 89 105	11
	ing and pumping		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer	CNP 282 OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP CNP 167 CNP 003 CNP 101 CNP 282 OCNP OCNP	1 1 1 1 4 1 1 1 2 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90	80% 50% 30% 30% 30% 100% 30% 30% 80% 80% 60% 80%	0 0 0 0 0 0 0 Total	102 91 100 85 100 91 110 95 116 113 101 103 102 100 89 100 89 100 89	-
) Pili	ing and pumping		Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3.346) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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 OCNP OCNP CNP 283 OCNP OCNP CNP 167 CNP 003 CNP 101 CNP 282 OCNP OCNP OCNP CNP 283	1 1 1 1 4 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90	80% 50% 30% 30% 30% 30% 30% 30% 30% 80% 100% 80% 30% 80% 100%	0 0 0 0 0 0 0 0 Total	102 91 100 85 100 91 116 113 101 103 102 92 100 89 105	
) Pili	ing and pumping test	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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 OCNP OCNP CNP 283 OCNP OCNP CNP 101 CNP 101 CNP 282 OCNP OCNP OCNP CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90 105 85	80% 50% 30% 30% 30% 100% 30% 30% 80% 80% 60% 30% 80% 100% 80% 100% 80% 80% 100%	0 0 0 0 0 0 0 Total	102 91 100 85 100 95 110 95 116 103 102 92 100 89 115 115	-
Pili	ing and pumping test	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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 OCNP OCNP CNP 283 OCNP CNP 101 CNP 203 CNP 101 CNP 282 OCNP OCNP CNP 282 OCNP OCNP CNP 282 CNP 282 CNP 282 CNP 283 CNP 065	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90 105 85 112 110 98	80% 50% 30% 30% 30% 30% 30% 30% 80% 100% 80% 60% 30% 80% 100% 100%	0 0 0 0 0 0 0 Total	102 91 100 85 100 91 110 95 116 113 101 103 102 92 100 89 105 94 111 105 91	-
Pili	ing and pumping test	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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 OCNP CNP 283 OCNP CNP 262 CNP 262 CNP 263 CNP 101 CNP 282 OCNP OCNP OCNP CNP 282 OCNP OCNP CNP 283 CNP 283 CNP 081 CNP 081 CNP 081 CNP 085 Ref 1 OCNP	1 1 1 1 1 1 1 1 2 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90 105 85	80% 50% 30% 30% 30% 100% 30% 80% 60% 80% 100% 80% 100% 80% 100% 100% 100%	0 0 0 0 0 0 Total	102 91 100 85 100 91 110 95 116 113 101 102 92 100 89 105 94 115 111 105 94 1105 94 1105 94 1105 1100 110	-
) Pili	ing and pumping test	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer 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 OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 112 110 98 100 105 85	80% 50% 30% 30% 30% 30% 30% 30% 80% 100% 80% 60% 30% 80% 100% 100% 100% 30% 30% 30%	0 0 0 0 0 0 0 Total	102 91 100 85 100 91 110 91 1113 101 103 102 92 100 89 105 94 111 105 94 1110 105 94 1110 105 94 1100 97 1100 98 1100 99 1100 1	-
Pili	ing and pumping test	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3.346) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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 Welder / Generator	CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 CNP 101 CNP 101 CNP 282 OCNP OCNP CNP 283 CNP 101 CNP 282 OCNP OCNP CNP 283 CNP 101 CNP 282 CNP 101 CNP 282 CNP 101 CNP 282 CNP 101 CNP 283 CNP 065 Ref 1 OCNP Ref 2 OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 112 110 98 100 105 78	80% 50% 30% 30% 30% 30% 30% 30% 80% 80% 100% 80% 30% 80% 100% 100% 100% 100% 30% 30%	0 0 0 0 0 0 0 0 Total	102 91 100 85 100 91 110 95 116 113 101 103 102 92 105 94 115 111 105 91 100 100 100 100 100 100 100	-
Pili	ing and pumping test	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer 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 OCNP OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 112 110 98 100 105 85	80% 50% 30% 30% 30% 30% 30% 30% 80% 100% 80% 60% 30% 80% 100% 100% 100% 30% 30% 30%	0 0 0 0 0 0 0 Total	102 91 100 85 100 91 110 91 1110 95 116 113 101 103 102 92 100 94 115 91 111 105 94 111 105 91 100 100	-
Pili	ing and pumping test	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, diesel Mini Backhoe (because) 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 Ventilation fan Dump truck Ventilation fan Dump truck Ventilation fan Dump truck	CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 114 108 103 94 105 85 115 100 105 85 110 110 98 100 105 78 105 106 101 108	80% 30% 30% 30% 30% 30% 100% 30% 80% 80% 60% 30% 80% 100% 100% 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 91 100 85 110 91 110 95 116 113 101 102 92 100 89 105 94 115 111 105 91 105 91 105 91 100 100 100 100 100 100 100	-
) Pili	ing and pumping test	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer 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 CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90 105 85 112 110 98 100 105 78 105 105 101 108	80% 50% 30% 30% 30% 30% 30% 30% 80% 80% 60% 30% 60% 30% 100% 100% 100% 30% 30% 30% 30% 30% 30% 30%	0 0 0 0 0 0 0 0 0 0 0 -5 -5 -5 0 0 0 0 0	102 91 100 85 85 110 91 110 95 116 113 101 103 102 92 100 88 91 105 91 100 73 100 96 107 98 93	111
) Pili	ing and pumping test	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3.346) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP CNP 283 OCNP CNP 283 OCNP CNP 283 CNP 101 CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 110 98 100 105 78 100 105 78 101 108 103 85	80% 50% 30% 30% 30% 30% 100% 30% 80% 80% 100% 80% 60% 30% 80% 100% 80% 100% 30% 30% 80% 100% 80% 80% 100% 80% 80% 80% 80% 100% 80% 80% 80% 80% 100% 80% 80% 80% 80% 80% 100% 80% 80% 80% 100% 80% 80% 80% 100% 80% 80% 80% 100% 80% 80% 100% 80% 80% 100% 80% 80% 100% 80% 100% 80% 80% 80% 100% 80% 80% 80% 80% 80% 80% 80%	0 0 0 0 0 0 0 0 Total	102 91 100 91 100 85 110 91 110 95 116 113 101 102 92 100 89 105 94 115 111 100 73 100 96 107 98 93 114 99	111
) Pili	ing and pumping test	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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 OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 282 OCNP OCNP CNP 282 OCNP OCNP OCNP OCNP OCNP CNP 282 OCNP OCNP CNP 282 OCNP OCNP CNP 282 OCNP CNP 283 CNP 065 Ref 1 OCNP Ref 2 O	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 112 110 100 105 85 110 100 105 85 90 105 98	80% 50% 30% 30% 30% 30% 30% 30% 80% 80% 60% 30% 400% 100% 100% 20% 100% 30% 30% 30% 30% 30% 30% 30% 30% 50% 50%	0 0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 85 100 91 110 95 116 113 101 103 102 92 100 89 105 94 115 111 100 96 100 97 110 100 100 100 100 100 100 10	111
) Pili	ing and pumping test ELS work	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3.36) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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 Bar bender and cutter Concrete Lorry Mixer Concrete pump	CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 283 CNP 101 CNP 282 OCNP OCNP OCNP OCNP CNP 283 CNP 081 BS D8-13 CNP 085 Ref 1 OCNP BS D7-114 CNP 281 BS D9-39 CNP 283 CNP 283	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90 105 85 112 110 98 100 105 85 101 100 105 85 90 109	80% 50% 30% 30% 30% 30% 30% 30% 80% 80% 60% 30% 80% 100% 100% 100% 100% 100% 50% 30% 80% 50% 50% 50% 70%	0 0 0 0 0 0 0 Total 0 0 0 Total 0 0 0 0 Total 0 0 0 Total 0 0 Total 0 0 Total 0 0 0 Total 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 85 100 91 110 95 116 113 101 103 102 92 100 89 105 94 115 111 105 94 110 100 98 91 110 100 100 100 100 100 100	111
) Pili	ing and pumping test ELS work	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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 OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 282 OCNP OCNP CNP 282 OCNP OCNP OCNP OCNP OCNP CNP 282 OCNP OCNP CNP 282 OCNP OCNP CNP 282 OCNP CNP 283 CNP 065 Ref 1 OCNP Ref 2 O	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 112 110 100 105 85 110 100 105 85 90 105 98	80% 50% 30% 30% 30% 30% 30% 30% 80% 80% 60% 30% 400% 100% 100% 20% 100% 30% 30% 30% 30% 30% 30% 30% 30% 50% 50%	0 0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 85 100 91 110 95 116 113 101 103 102 92 100 89 105 94 115 111 100 96 100 97 110 100 100 100 100 100 100 10	111
) Pili	ing and pumping test ELS work	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 13A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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 Lory Mixer Concrete Lory Mixer Concrete pump Poker, vibratory, hand-held Sare, vicrualr wood Crawler crane Ventilation fan Demp truck Concrete Lory Mixer Concrete Lory Mixer Concrete Lory Mixer Concrete Jump Poker, vibratory, hand-held Sarwicroune	CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90 105 85 112 110 98 100 105 85 101 108 103 85 109 109 109 109 102 103 101	80% 30% 30% 30% 30% 30% 100% 30% 80% 80% 60% 30% 80% 100% 100% 30% 30% 30% 30% 30% 30% 30% 30% 30%	0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 85 85 110 91 110 95 116 113 101 103 99 105 91 115 111 110 91 100 91 100 91 91 91 91 91 91 91 91 91 91 91 91 91	111
) Pili	ing and pumping test ELS work	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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, winstory, hand-held Saw, circular wood Crawler crane Ventilation fan Deventing wood Crawler crane Ventilation yenden wood Crawler crane Ventilation yenden wood Crawler crane Ventilation fan Deventing wood Crawler crane Ventilation fan Deventing wood Crawler crane Ventilation fan Deventing wood Crawler crane Ventilation fan	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP CNP 283 OCNP CNP 283 OCNP CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 115 100 105 85 110 105 85 110 100 105 105 101 108 100 105 101 108 100 100 105 101 108	80% 50% 30% 30% 30% 30% 30% 100% 30% 80% 80% 100% 80% 80% 100% 80% 80% 50% 80% 80% 80% 80% 80% 80% 80% 80% 80% 8	0 0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 85 110 85 1110 91 1110 95 116 113 101 103 92 100 98 91 115 111 100 100 96 97 110 99 91 110 110 99 91 110 99 99	11
) Pili	ing and pumping test ELS work	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 13A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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 Lory Mixer Concrete Lory Mixer Concrete pump Poker, vibratory, hand-held Sare, vicrualr wood Crawler crane Ventilation fan Demp truck Concrete Lory Mixer Concrete Lory Mixer Concrete Lory Mixer Concrete Jump Poker, vibratory, hand-held Sarwicroune	CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90 105 85 112 110 98 100 105 85 101 108 103 85 109 109 109 109 102 103 101	80% 30% 30% 30% 30% 30% 100% 30% 80% 80% 60% 30% 80% 100% 100% 30% 30% 30% 30% 30% 30% 30% 30% 30%	0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 85 85 110 91 110 95 116 113 101 103 99 105 91 115 111 110 91 100 91 100 91 91 91 91 91 91 91 91 91 91 91 91 91	11
) Pili	ELS work Ventilation Adit Structure	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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, winstory, hand-held Saw, circular wood Crawler crane Ventilation fan Denerator, Standard Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP CNP 283 OCNP CNP 283 OCNP CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 112 110 105 85 105 105 101 108 103 109 100 105 101 108 103 85	80% 50% 30% 30% 30% 30% 30% 30% 30% 80% 100% 80% 60% 30% 100% 30% 100% 80% 100% 80% 100% 30% 30% 30% 30% 30% 30% 30% 30% 30%	0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 85 110 101 101 103 102 92 100 89 105 91 111 103 102 92 100 89 105 91 111 105 91 100 73 100 98 90 110 107 98 93 114 99 94 115 110 110 110 99 94 110 99 94 110 99 91 110 99 94 110 99 94 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 110 99 91 1115	11
) Pili	ing and pumping test ELS work	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer 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, wibratory, standard Water pump, submersible	CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 115 100 105 85 105 105 85 100 109 109 109 109 101 108 108 85	80% 50% 30% 30% 30% 30% 30% 30% 80% 100% 80% 60% 30% 60% 30% 30% 30% 30% 30% 30% 30% 3	0 0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 85 100 85 100 91 1110 95 116 113 101 103 102 92 100 89 105 94 115 91 110 100 100 100 100 100 100 100 100	11
) Pili	ELS work Ventilation Adit Structure	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3.346) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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, wibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bar bender and cutter Concrete Lorry Mixer Concrete pump Poker, wibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 115 100 105 85 110 100 105 85 1110 100 105 78 105 101 108 103 85 109 109 109 109 109 109 109 108 108 108 108 108 108 108 108 108 108	80% 50% 30% 30% 30% 30% 30% 30% 80% 80% 80% 80% 80% 80% 80% 80% 80% 8	0 0 0 0 0 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 91 110 85 110 91 110 95 116 113 101 103 99 105 91 100 90 100 91 115 111 100 90 90 90 90 90 90 90 90 90 90 90 90 9	11
) Pili	ELS work Ventilation Adit Structure	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Weider / 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	CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90 105 85 112 110 98 100 105 85 112 110 100 105 85 101 101 108 103 85 101 108 103 85	80% 50% 30% 30% 30% 30% 30% 30% 80% 100% 80% 60% 30% 60% 30% 30% 50% 100%	0 0 0 0 0 0 0 0 0 Total 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 85 100 85 100 91 1110 95 116 113 101 103 102 92 100 89 105 94 115 91 110 100 96 107 98 93 114 90 110 110 103 99 91 110 110 103 99 91 110 110 110 110 110 110 110 110 1	11
) Pili	ELS work Ventilation Adit Structure	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard 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, wibratory, hand-held Saw, circular wood Crawler crane Ventilation fan Generator, standard Water pump, submersible Bar bender and cutter Concrete pump Concrete pump Vender, 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	CNP 282 OCNP OCNP OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP CNP 283 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 85 115 100 105 85 110 100 105 85 1110 98 100 105 78 101 108 103 85 109 109 109 109 109 109 109 109 109 109	80% 50% 30% 30% 30% 30% 30% 100% 30% 80% 80% 100% 80% 80% 100% 80% 80% 100% 80% 80% 80% 100% 80% 80% 80% 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 91 100 85 91 110 85 110 91 1110 95 116 113 101 103 99 105 91 110 100 96 107 73 110 100 96 107 98 93 111 110 110 110 110 110 110 110 110 11	111:
00 Pili	ELS work Ventilation Adit Structure	1	Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout pump Water pump, submersible Vibratory hammer, hydraulic Power pack 3A6) Pipe Pile Rig Air compressor, air flow > 30m3/min Generator, standard Water pump, diesel Mini Backhoe (3 tonnes) Dump truck, with or without grab Grout mixer Grout mixer Grout pump Water pump, submersible Excavator / Backhoe Breaker, excavator mounted, hydraulic Drill, hand-held (electric) Weider / 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	CNP 282 OCNP OCNP OCNP OCNP OCNP OCNP OCNP OCNP	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	94 105 90 105 85 115 100 114 104 108 103 94 105 90 105 85 112 110 98 100 105 85 112 110 100 105 85 101 101 108 103 85 101 108 103 85	80% 50% 30% 30% 30% 30% 30% 30% 80% 100% 80% 60% 30% 60% 30% 30% 50% 100%	0 0 0 0 0 0 0 0 0 Total 0 0 0 0 Total 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	102 91 100 85 100 85 100 91 1110 95 116 113 101 103 102 92 100 89 105 94 115 91 110 100 96 107 98 93 114 90 110 110 103 99 91 110 110 103 99 91 110 110 110 110 110 110 110 110 1	1

Appendix 2.2 Construction Plant Inventory

ID	Construction Activities	Group [1]	PME	Ref. ^[2]	No of items	SWL / Item dB(A)	On-time %	Barrier Correction, dB(A)	SPL, dB(A)	Max S dB(A
			Air compressor, air flow > 30m3/min Generator, standard	CNP 003 CNP 101	2	104 108	80% 100%	-5 -5	104 106	
			Water pump, diesel	CNP 282	2	103	80%	0	105	
			Mini Backhoe (3 tonnes)	OCNP	1	94	80%	0	93	
			Dump truck, with or without grab Grout mixer	OCNP OCNP	1	105 90	70% 60%	0	106 88	
			Grout pump	OCNP	1	105	60%	0	103	
			Water pump, submersible	CNP 283	4	85	100%	0	91	
8	Install decking	1	Crawler crane	BS D7-114	1	101	80%	Total 0	118 100	11
0	install decking	'	Tractor with trailer	CNP 222	1	118	20%	0	111	1
			Flat-top Lorry	OCNP	1	105	70%	0	103	
			Drill, hand-held (electric) Welder / Generator	CNP 065	2	98	80%	0	100	
			Generator, standard	Ref 1 CNP 101	2 1	100 108	80% 100%	-5	102 103	1
					·			Total	113	11
0,	ELS work	1	Excavator / Backhoe	CNP 081	2	112	80%	0	114	
1,			Breaker, excavator mounted, hydraulic Drill, hand-held (electric)	BS D8-13 CNP 065	1	110 98	30% 20%	0	105 91	-
12			Welder / Generator	Ref 1	2	100	80%	0	102	1
			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	101	30%	0	96	1
			Ventilation fan	CNP 241	2	108	80%	0	110	1
			Dump truck	BS D9-39	1	103	30%	0	98	
			Water pump, submersible	CNP 283	8	85	80%	0 Total	93 116	4.
20	C&C Tunnel Structure	1	Bar bender and cutter	CNP 021	2	90	50%	0	90	11
-			Concrete Lorry Mixer	CNP 044	2	109	80%	0	111	1
			Concrete pump	CNP 047	2	109	80%	0	111	4
			Poker, vibratory, hand-held Saw, circular wood	OCNP BS D7-79	<u>3</u>	102 103	50% 50%	0	104 106	1
			Crawler crane	BS D7-114	2	103	50%	0	100	1
			Ventilation fan	CNP 241	2	108	50%	0	108	
			Generator, standard	CNP 101	2	108	100%	-5	106	-
			Water pump, submersible	CNP 283	8	85	80%	0 Total	93 116	1
23	Backfill	1	Bulldozer	Ref 4	2	102	50%	0	102	<u> </u>
			Compactor, vibratory	CNP 050	2	105	50%	0	105]
			Dump truck with Grab Generator, standard	OCNP CNP 101	2	105 108	50% 100%	-5	105 106	
			Road roller	CNP 185	2	108	50%	0	108	
			Water pump, submersible	CNP 283	4	85	100%	0	91	
	15 1011 1	. K : T !	(D. 1 (D. 1) 0.0410 D. 1) 0.45)					Total	113	1
ess 0,	Pipepiles &	at Kai Tak i	(Part of Portion 3A4 & Portion 3A5) Pipe Pile Rig	CNP 167	2	114	80%	0	116	ı
5	Kingposts, sheetpiles		Air compressor, air flow > 30m3/min	CNP 003	4	104	80%	-5	104	
	-		Generator, standard	CNP 101	2	108	100%	-5	106	
			Water pump, diesel Mini Backhoe (3 tonnes)	CNP 282 OCNP	2 1	103 94	80% 60%	0	105 92	1
			Dump truck, with or without grab	OCNP	2	105	30%	0	103	
			Grout mixer	OCNP	1	90	60%	0	88	
			Grout pump Vibratory hammer, hydraulic	OCNP OCNP	1	105 115	60% 60%	0	103 113	-
			Power pack	OCNP	1	100	60%	0	98	
			Water pump, submersible	CNP 283	4	85	80%	0	90	
60,	ELS work	1	Excavator / Backhoe	CNP 081	2	112	80%	Total 0	119 114	1
50, 51	ELS WOIK	'	Breaker, excavator mounted, hydraulic	BS D8-13	1	110	30%	0	105	
			Drill, hand-held (electric)	CNP 065	1	98	30%	0	93	
			Welder / Generator Dump truck with Grab	Ref 1 OCNP	2	100 105	80% 20%	0	102 101	-
			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	
			Ventilation fan Dump truck	CNP 241 BS D9-39	2	108 103	80% 30%	0	110 98	1
			Water pump, submersible	CNP 283	8	85	80%	0	93	1
							0001	Total	116	1
0	Depressed Rd,	1	Bar bender and cutter Concrete Lorry Mixer	CNP 021 CNP 044	2	90 109	30% 80%	0	88 111	1
	underpass, adit structure and backfill		Concrete pump	CNP 044 CNP 047	2	109	80%	0	111	1
	2 30ta o ana baokiii		Poker, vibratory, hand-held	OCNP	3	102	80%	0	106	1
			Saw, circular wood	BS D7-79	4	103	20%	0	102	-
			Crawler crane Ventilation fan	BS D7-114 CNP 241	2	101 108	20% 80%	0	97 110	1
			Generator, standard	CNP 101	2	108	100%	-5	106	1
			Water pump, submersible	CNP 283	8	85	80%	0	93	
			Bulldozer Compactor, vibratory	Ref 4	2	102 105	50% 50%	0	102 105	4
			Compactor, vibratory Dump truck with Grab	OCNP	2	105	20%	0	105	1
			Generator, standard	CNP 101	2	108	100%	-5	106]
			Road roller	CNP 185	2	108	30%	0	106	4
			Water pump, submersible	CNP 283	4	85	80%	0 Total	90 118	1
	h Structures and At-gra	nde Road at								
5	Sheetpiling	1	Vibratory hammer, hydraulic	OCNP	2	115 100	80% 80%	0	117 102	1 _
			Power pack Flat-top Lorry	OCNP OCNP	2	100	80%	0	102	1
				•		•		Total	118	1
0	ELS work	1	Excavator / Backhoe	CNP 081	2	112	80%	0	114	
			Breaker, excavator mounted, hydraulic Drill, hand-held (electric)	BS D8-13 CNP 065	1	110 98	30% 20%	0	105 91	1
			Welder / Generator	Ref 1	2	100	80%	0	102	1
			Dump truck with Grab	OCNP	2	105	30%	0	103	1
			Welding Set	Ref 2	2	78	30%	0	76	1
			Lorry with crane Crawler crane	OCNP BS D7-114	1	105 101	20% 20%	0	98 94	1
			Ventilation fan	CNP 241	2	101	80%	0	110	1
			Dump truck	BS D9-39	1	103	30%	0	98	1
				CNP 283	8	85	80%	0	93	1
			Water pump, submersible	CINF 203	-					1
1	Construct T	4						Total	116	11
0	Construct Trough Structure	1	Bar bender and cutter Concrete Lorry Mixer	CNP 021 CNP 044	2 2	90	30% 70%			11

Appendix 2.2 Construction Plant Inventory

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

 [2] 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

 CNP Sound power levels of other commonly used PME obtained from http://www.epd.gov.hk/epd/english/application_for_licences/guidance/files/OtherSWLe.pdf

 Ref 1 Appendix 8.4 of the approved EIA Report for Shatin to Central Link Stabling Sidings at Hung Hom Freight Yard (Register No.: AEIAR-164/2012)

 Ref 2 Appendix 5.1 of the approved EIA Report for Thong 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 Tai 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)

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

Appendix 3.1

Notional Distance of Works Area to NSR

Appendix 3.1 Notional Distance of Works Area to NSRs

Portion	Distance to Notiona	al 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 3.2

Detailed Noise Calculation

NSR: E-N12 Grand Waterfront Tower 3

		Τ.		1	Т.				2018				2019			1		2020				-	2021				2022		$\overline{}$		2023	3	$\overline{}$
ID	Construction Activities	Portion [[1][2] SI	NL Dis	t. SPL ^l	Start Start	Finish	A M J		SON	D J	F M A			OND	JE	MAN		ASC) N D	JEM			SON	D J F	MA			ND	J F M A) N D
Kowloon City Vehicular Ferry Pier (Portion	1B)							17111113	13 171	0 0 11	12131	. 10.171	11111313	771 0	0 11 2		71 11	. 3 3	,,,,,,,	, ,,, ,	3 1 111	1711111	, 13 , , 1	0 0 1.	5 5 7 5	1.0. 7.1	5 5	17.1010	110 21	<u> </u>	1 3 3	1711010	1112
S135, S136	Demolition of carpark building and ramp structure	1B	- 1	7 110	51	02/06/18	18/07/18	5	1 51	\Box		\top				\Box	\Box							$\overline{}$					\Box	$\overline{}$	\top		\Box
S150	Reprovision of new parking facilities	1B		7 110	_				<u>51</u> 51	51																			\Box			$\overline{}$	+
Ma Tau Kok C&C tunnel & Access Shaft (Po																																	
S380, S420	Piling and kingposts	1A	1	11 37	75	17/09/18	23/03/19			75 75 75	75 75	75 75			\Box		\Box										\Box		\Box	$\overline{}$	\top		\Box
S426	Install decking	1A		09 37			31/05/19				1 1	73	73																+			$\overline{}$	+
S390, S391, S392, S393, S430, S431, S432	ELS work	1A		12 37	_								75 75 75	75 75	75 75 75	75 75	75 75 75	5 75 75	75 75 75	5 75 75	75 75 75	75 75 7	5 75 75	75 75 75	75 75 75	5 75 75	75		+			+++	+
S400	Construction of RC wall and temporary noise enclosure	1A		11 37	_		20/08/20					1				1.3	10/10/11	75					111111		101.0	11111			+			+++	+
S440	C&C Tunnel Structure	1A		10 37	_		17/09/22																			1 1 1	74 74 74	1 74 74	+		+	++++	+
S910	Backfill	1A		08 37	_		14/01/23									+		+++								+++			72 72	72	+++	+++	+
Landing Steps and Covered Walkway (Porti				00 07	1 /-	17/07/22	1 1/0 1/20																					1 12-11	1.5 1.5				
S470	Removal of existing seawall	1E & 2I	B 1	11 187	61	04/01/19	31/10/19		ПП	TT	ПП	61	61 61 61	61 61	61	ТП	TT			ТП		ПП	ТП			ТП	TT	TIT	$\overline{\Box}$	$\overline{}$	$\overline{\Box}$	$\overline{\Box}$	$\overline{}$
S480, S490	Construction of landing steps and covered walkway	1E & 2I		06 187	_		11/09/20				 	- J				56 56	56 56 56	56 56	56 56				+						+ + +		+++	+++	+
Marine Tunnel Stage1 (tunnel footprint of P		12 0 21		00 10	1 30	12/07/17	11/07/20						1 130	7 30 30	00 00 00	3 30 30	50 50 50	5 50 50	30 30														
S540	Construction of temp working platforms	2A1	1	13 22	62	01/11/12	21/02/19			62	62 62	62																	\Box	$\overline{}$		$\overline{}$	
S545, S550	Cofferdam construction of sheetpiles and pipepiles	2A1		21 22	_				+++	1 102	-		69 69 69	,	+	++	+	+++		+			+++	+		+++	+		+++	+++	+++	+++	+++
S555	Temporary reclamation between pipepiles and sheetpiles	2A1		11 22	_		19/12/19		+++		1 07	07 07 09	37 37 05		59 59 59			+		+		+++	+	+		+++			+++	+++	+++	+++	+
S560, S561, S562	ELS work	2A1		13 22			13/05/20		+++						<u> </u>		61 61 61	1		+		+++	+	+		+++			+++	+++	+++	+++	+
S570	Marine Tunnel Structure	2A1		18 22			29/10/20		+++					+++		01 01			66 66 66			+++	+	+		+++			+++	+++	+++	+++	+
S575, S576	Backfill	2A1	_	15 22	_		05/11/20										100	00 00	6	3 63									+++	+++	+++	+++	+
\$580	Removal of reclamation/ temp platforms	2A1		15 22				++-	+		+++					+		+++		63 63	62		+			+			+	+++	+++	+++	+
S585	Dredging for Stage 2 diversion	2A1		08 22				++-	+		+++					+		+++		11 11	56		+			+			+	+++	+++	+++	+
Marine Tunnel Stage2 (tunnel footprint of P		ZAI		00 22	30	24/12/20	19/01/21													30	30												
S640		2A3	1	17 165	67	20/01/21	04/03/21														67 67 67								$\overline{}$	$\overline{}$	$\overline{}$	$\overline{}$	_
S645, S650	Construction of temp working platforms Cofferdam construction of sheetpiles and pipepiles	2A3		17 165			23/09/21	++-	+		+++					+		+++		+	** ** **		8 68 68	40		+			+	+++	+++	+++	+
S655		2A3		11 165				++	+		+++					+		+++			00 00	00 00 0		62 62 62		+			+	-	+++	+++	+
S660, S661, S662	Temporary reclamation between pipepiles and sheetpiles ELS work	2A3		13 165			07/06/22				+															4 64 64	4 4 4 4		+++	+++	+	+++	+
S670	Marine Tunnel Structure	2A3		18 165			11/10/22				+														04 04 04			69 69 69	+	+++	+	+++	+
S675, S676	Backfill	2A3 2A3		15 165		12/10/22	09/12/22				+																09 09 09		6 66 66	+++	+	+++	+
S677	Reprovision of MTK Public Pier	2A3	_	15 165	_	12/10/22	09/12/22				+																		6 66 66		+	+++	+
S680	Removal of reclamation/ temp platforms	2A3 2A3		15 165	_						+																	00		65 65	+	+++	+
		ZAS		10 100	65	10/12/22	04/02/23																						1 00	33 03			
Vertical Wall along depressed road at Portic \$200, \$222		3B	I 1	16 >30	n I	22/04/10	07/01/19											1 1 1								1 1 1			$\overline{}$	$\overline{}$	$\overline{}$	$\overline{}$	
Ventilation Adit at Eastern Interface(Portion	Pipepiles and sheetpiles	JB		16 >30	0 -	23/04/18	07/01/19	- - -	- -	- - -	1-1-1					\perp									\Box								
,		3A6	I 1	15 >30	<u>. T</u>	20/04/10	07/11/18											1 1 1								1 1 1			$\overline{}$	$\overline{}$	$\overline{}$	$\overline{}$	
S300 S310	Piling and pumping test ELS work	3A6		14 >30	_	08/11/18			1-1-	- - -	+																		+++	+++	+	+++	+
S320	Ventilation Adit Structure	3A6	_	15 >30	_	01/02/19	07/08/19	+++	+		1-1-1					+				+			+			+			+++	+++	+++	+++	+
S325	Backfill	3A6		10 >30			27/08/19	+++	+		 					+	+	+++		+			+			+			+++	+++	+++	+++	+
Kai Tak C&C Tunnel (Portion 3A2 & Part of		3A0		10 >30	<u> </u>	00/00/19	21/00/19							1-11																			
S605	Piling and kingposts	3A2 & 3/	Λ4 I 1	18 >30	n I	05/04/18	13/12/18																						$\overline{}$	$\overline{}$	$\overline{}$	$\overline{}$	_
S608	Install decking	3A2 & 3/		13 >30	_	14/12/18			1-1-		++++					+		+++		+			+			+			+	+++	+++	+++	+
S610, S611, S612	ELS work	3A2 & 3/		16 >30		21/01/20	30/05/20	++-	+		1-1-					+		+++		+			+			+			+	+++	+++	+++	+
S620	C&C Tunnel Structure	3A2 & 3/		16 >30	_	01/06/20		++-	+		+++					1 -		+++		+			+			+			+	+++	+++	+++	+
S623	Backfill	3A2 & 3/		13 >30		09/10/20	11/11/20	+++	+		 					+	+		- - -	+			+			+			+++	+++	+++	+++	+H
Depressed Road & Underpass at Kai Tak (F		JAZ & J	A4 1	13 >30	<u> </u>	09/10/20	11/11/20													1-													
S340, S345	Pipepiles & Kingposts & Sheetpiles	3A4 & 3/	ΛΕ I 1	19 >30	n I	13/11/18	08/10/19																						$\overline{}$	$\overline{}$	$\overline{}$	$\overline{}$	_
S350, S351	ELS work	3A4 & 3/		16 >30		09/10/19	30/07/20	++	+		1-1-1				-	+	+	+++		+			+			+			+++	+++	+++	+++	+H
S360				18 >30		30/07/20					+						- - -												+++	+++	+	+++	+
U Trough Structures and At-grade Road at	Depressed Rd, underpass, adit structure and backfill	3A4 & 3	ηυ I I	10 >30	υ <u> </u>	30/0//20	07/05/21											1 - 1 - 1	- - -	1-1-1	- - -	1-1-1											
S745	Sheetpiling	3D	1	18 >30	n I	05/10/21	23/12/21		1 1 1			T			11		11							T		1 1 1				$\overline{}$	$\overline{\Box}$		
	ELS work	3D 3D				24/12/21		++	+++	++	+++	++	++	++	++	++	++	++		+		+++	+++	+	-	+++	+	++	+++	+++	+++	+++	+
S750 S760					_		23/06/22	++	+++	+	+++	+	\vdash	+++	+	++	+	+	\vdash	+		++	+	+		1-1-	- -	++	+++	+++	+++	+++	+
S770	Construct Trough Structure	3D 3D		16 >30 19 >30		24/06/22 03/09/22	15/11/22 31/01/23	++	+++		+++	+	\vdash	+++	-	+++	+	+		+		+++	+	+		+++		- -	+	+++	+++	+++	+
\$770 \$775	Backfill & remove sheetpiles				_			++	+++		+++	+	\vdash	+++	-	+++	+	+		+		++	+	+		+++	-	1	+-+-		+++	+++	+
3113	Roadwork for At-grade road	3D		15 >30		01/02/23		ш_	1 54 54 1	75 75 75	75 77	7/ 7/ 7-	70 77 -	7, 7,	7/ 75	7/ 7/	7/ 7/ -	, 7, 75	70.71	, ,, ,,	7/ 77	7/ 7/ -	/ 7/ 7/	7/ 7/ 7:	7/ 7/ -	/ 7/ 7/	70.75	75 33 -		70 (5	1-11		ш
					Total	SPL (CKR on	ily), dB(A)[*]:	5	1 54 51	/5 /5 75	/5 /6	16 16 78	18 16 76	16 /6	<i>16 /5 75</i>	0 /6 /6	16 16 76	5 /6 /8	18 16 76	6 /6 /6	16 11 77	16 16 7	6 /6 /6	16 16 76	16 16 70	6 /6 /6	18 /5 75) /5 // 75	, 14 14	73 65			

Range (CKR only), dB(A): 51 - 75

[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".

- S135, S136 and S150 - S390, S391, S392, S393, S430, S431, S432 and any other activities

- S380, S420 and S545, S550 - S400 and any other activities

- S440 and S910 - S150 and S380, S420

[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.

NSR: E-N21 Hang Chien Court Block J

ID	Constanting Astivities	D [1][2]	CMI	Diet /	op. [3]	Ctant	Finink		201	8	Т		20)19				20	20		1		20	021				20	22				2023		
ID	Construction Activities	Portion [1][2]	SWL	Dist.	SPL [3]	Start	Finish	A M .	JA	S 0 1	N D J	FM	A M J	JAS	0 N	D J F	MA	A M J	JA	SON	N D J	F M	A M J	JA	S 0	N D J	F M	A M J	J A S	ONI	D J F	M A N	1 J J	A S O	N D
Kowloon City Vehicular Ferry Pier (Porti	on 1B)																																		
S135, S136	Demolition of carpark building and ramp structure	1B	97	7	75	02/06/18	18/07/18	7	5 75		П						П			\Box	\top						ПП								П
S150	Reprovision of new parking facilities	1B	97	7	75	19/07/18	03/09/18		75 75	75																									
Ma Tau Kok C&C tunnel & Access Shaft				1																															
S380, S420	Piling and kingposts	1A	111	58	71	17/09/18	23/03/19			71 71 7	1 71 7	1 71 71					TI			\Box															
S426	Install decking	1A	109	58	69	01/04/19	31/05/19					1 6	59 69																						
S390, S391, S392, S393, S430, S431, S43	2 ELS work	1A	112	58	71	01/04/19	11/05/22					7	71 71 71	71 71 7	1 71 71	71 71 7	1 71 71	1 71 71	71 71	71 71 7	1 71 71	1 71 71	71 71 71	71 71	71 71	71 71 71	71 71 7	71 71							
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																					70 70	70 70 70						
S910	Backfill	1A	108	58	68	19/09/22	14/01/23																						68	68 68 6	68 68				
Landing Steps and Covered Walkway (P	ortion 1E & Portion 2B)																																		
S470	Removal of existing seawall	1E & 2B	111	63	70	04/01/19	31/10/19				\top	7	70 70 70	70 70 70	0 70		TI			\Box															
S480, S490	Construction of landing steps and covered walkway	1E & 2B	106	63	65	12/07/19	11/09/20							65 65 65	5 65 65	65 65 6	5 65 65	5 65 65	65 65 6	65															
Marine Tunnel Stage1 (tunnel footprint of	of Portion 2A1)	_																																	
S540	Construction of temp working platforms	2A1	113	293	59	01/11/18	21/02/19	$\Box \Box \Box$			9 59 59	9 59				T					\Box		TT			TT			TT		T				
S545, S550	Cofferdam construction of sheetpiles and pipepiles	2A1	121	_	66	28/01/19	31/07/19				66	6 66 66 6	66 66 66	66							$\top \top$				\Box										П
S555	Temporary reclamation between pipepiles and sheetpiles	2A1	111			26/10/19	19/12/19				11	1717			57 57	57								Ш											ΠŤ
S560, S561, S562	ELS work	2A1	113	293	59	21/01/20	13/05/20									59 5	9 59 59	9 59																	
S570	Marine Tunnel Structure	2A1	118	293	64	09/05/20	29/10/20	1										64 64	64 64	64 64	$\top \top$														
S575, S576	Backfill	2A1	115	293	61	22/10/20	05/11/20													61 6	1														
S580	Removal of reclamation/ temp platforms	2A1	115	293	60	06/11/20	08/01/21														0 60 60														П
S585	Dredging for Stage 2 diversion	2A1	108	293	53	24/12/20	19/01/21														53 53	3													
Marine Tunnel Stage2 (tunnel footprint of	of Portion 2A3)																				<u> </u>														
S640	Construction of temp working platforms	2A3	117	133	69	20/01/21	04/03/21		П		TT						П				69	69 69													П
S645, S650	Cofferdam construction of sheetpiles and pipepiles	2A3	117	133	70	10/02/21	23/09/21															70 70	70 70 70	70 70	70										П
S655	Temporary reclamation between pipepiles and sheetpiles	2A3	111	133	63	24/09/21	08/11/21																		63 63	63									
S660, S661, S662	ELS work	2A3	113	133	66	07/12/21	07/06/22																			66 66	66 66 6	66 66 66							П
S670	Marine Tunnel Structure	2A3	118	133	71	19/05/22	11/10/22																						71 71 71	71					
S675, S676	Backfill	2A3	115	133	68	12/10/22	09/12/22																							68 68 6	68				
S677	Reprovision of MTK Public Pier	2A3	115	133	68	12/10/22	09/12/22																							68 68 6	68				
S680	Removal of reclamation/ temp platforms	2A3	115	133	67	10/12/22	04/02/23																							6	67 67 67				
Vertical Wall along depressed road at Po	ortion 3B																																		
S200, S222	Pipepiles and sheetpiles	3B	116	>300	-	23/04/18	07/01/19														\Box														П
Ventilation Adit at Eastern Interface(Port	tion 3A6)																																		
S300	Piling and pumping test	3A6	115	>300	-	28/04/18	07/11/18				.																								
S310	ELS work	3A6	114	>300	-	08/11/18	31/01/19																												
S320	Ventilation Adit Structure	3A6	115	>300	-	01/02/19	07/08/19				\perp						\perp	$\perp \mid \mid \mid$			\perp														
S325	Backfill	3A6	110	>300	-	08/08/19	27/08/19		П		Ш			-			Ш	Ш																Ш	Ш
Kai Tak C&C Tunnel (Portion 3A2 & Part	of Portion 3A4)																																		
S605	Piling and kingposts	3A2 & 3A4	118	>300	-]	05/04/18	13/12/18		- -		. -T																								
S608	Install decking	3A2 & 3A4		>300	-	14/12/18	28/01/19		Ш	Ш	- -						Ш				Ш														
S610, S611, S612	ELS work	3A2 & 3A4		>300	-	21/01/20	30/05/20						\Box				- - -	. - 🗍			$\perp \perp \Gamma$			$\Box \Box$			\Box						$\perp \perp \perp$		
S620	C&C Tunnel Structure	3A2 & 3A4		>300	- 7	01/06/20	08/10/20											-																	
S623	Backfill	3A2 & 3A4	113	>300	-]	09/10/20	11/11/20														-														
Depressed Road & Underpass at Kai Tal																																			
S340, S345	Pipepiles & Kingposts & Sheetpiles	3A4 & 3A5		>300	-]		08/10/19				· - -		- - -		- -]						\Box	$\Box \Box$		$\Box \Box$									$\perp \perp \downarrow \downarrow$		
S350, S351	ELS work	3A4 & 3A5		>300	-		30/07/20						$\perp \perp \perp$		-	- - -	- - -	- - -	-		$\perp \perp$														
S360	Depressed Rd, underpass, adit structure and backfill	3A4 & 3A5	118	>300	-]	30/07/20	07/05/21	$\perp \perp \perp$												- - -	- - -		- -												
U Trough Structures and At-grade Road	at Kai Tak (Portion 3D)																																		
S745	Sheetpiling	3D	_	>300		05/10/21		\Box		$\Box\Box$		\Box	$\perp \perp $		\Box			\Box			\Box	\Box		$\sqcup \sqcup \Box$		- -	$\sqcup \sqcup \Box$	$\perp \perp \perp$		\Box			$\perp \perp \perp$		$\sqcup \!\!\! \perp$
S750	ELS work	3D	116	>300	_		23/06/22			$\Box \bot \bot$			$\perp \perp \perp$								$\perp \perp$						- -	- - -							
S760	Construct Trough Structure	3D	116	>300	-	24/06/22	15/11/22	$\sqcup \sqcup$		$\sqcup \sqcup$	$\perp \perp$		$\perp \perp \perp$					$\perp \perp $			$\perp \perp$		\perp	Ш		$\perp \perp$	$\sqcup \sqcup$	-					$\perp \perp \perp$		$\sqcup \!\!\! \perp$
S770	Backfill & remove sheetpiles	3D	119	>300	-	03/09/22	31/01/23				$\perp \perp$		$\perp \perp \perp$								$\perp \perp$							$\perp \perp \perp$	-		- -				
S775	Roadwork for At-grade road	3D	115	>300	-	01/02/23	06/05/23																												
						I (CVD only	[4]																71 71 71												

Range (CKR only), dB(A): 67 - 75

[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

- S135, S136 and S150

- S380, S420 and S545, S550 - S400 and any other activities - S440 and S910 - S150 and S380, S420

[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.