



PROJECT NO.: TCS/00553/11

**CONTRACT NO. DC/2010/02 –  
DRAINAGE IMPROVEMENT IN SHUEN WAN AND  
SHEK WU WAI**

**QUARTERLY ENVIRONMENTAL MONITORING AND  
AUDIT (EM&A) SUMMARY REPORT (NO.2) –  
OCTOBER TO DECEMBER 2011**

PREPARED FOR  
**KWAN LEE-KULY JOINT VENTURE**

Quality Index

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31 January 2012	TCS00553/11/600/R0085v2		
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Ver.	Date	Description
1	19 January 2012	First submission
2	31 January 2012	Amended against IEC's comments on 26 January 2012

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ENVIRON

Ref.: DSDSHUWNEM00\_0\_0326L.12

31<sup>st</sup> Jan 2012

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Attention : Mr. So Chi Ho (Engr/Drainage Projects 12)

Dear Mr. So,

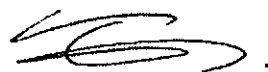
**Re: Agreement No. DP 01/2010**  
**Services as Independent Environmental Checker for the Drainage Improvement**  
**Works in Sha Tin and Tai Po under Contract No. DC/2010/02**  
**Quarterly Environmental Monitoring and Audit Report for Oct to Dec 2011**

Reference is made to Environment Team's submission of the Quarterly Environmental Monitoring and Audit Report for Oct to Dec 2011 by Email on 19<sup>th</sup> Jan 2012 (entitled "DC/2010/22 - Quarterly EM&A Summary Report (No.2) - October to December 2011") and the subsequent revision of the report by Email on 31<sup>st</sup> Jan 2012.

Please be informed that we have no further comment on the captioned revised report. We write to verify the captioned submission in accordance with Section 9.9 of EM&A Manual under EP-303/2008.

Thank you very much for your kind attention and please do not hesitate to contact the undersigned should you have any queries.

Yours sincerely,



Tony Cheng  
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## EXECUTIVE SUMMARY

ES.01. This is the 2<sup>nd</sup> Quarterly EM&A Summary Report under Environmental Permit No.EP-303/2008 (hereinafter “the EP”) for the Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai (hereinafter “the Project”), covering the period from **1 October to 31 December 2011** (hereinafter “Reporting Quarter”).

ES.02. Environmental monitoring activities under the EM&A programme in the Reporting Quarter are summarized in the following table.

Aspects	Environmental Monitoring Parameters / Inspection	Occasions
Construction Noise	Leq (30min) Daytime	65
Water Quality	Local Stream Water Sampling - W1 and W2	38
	Local Stream Water Sampling - W3 and W4	38
	Hydrological characteristics measurement – H1 and H2	13
	Hydrological characteristics measurement – H3 and H4	13
Inspection / Audit	Monthly Environmental Site Inspection and audit by Environmental Team and IEC	3
	Regular weekly Environmental inspection by the Contractor and Site Representative Engineer	13
Landscape & Visual	Bi-weekly Inspection by a registered Landscape	7

ES.03. Monitoring results demonstrated that no exceedance of environmental quality criteria of construction noise and hydrological characteristics.

ES.04. However, 133 Action/Limit Levels exceedances, namely 79 dissolved oxygen, 41 turbidity and 13 suspended solids were recorded in water quality monitoring in this Reporting Quarter. Investigation reports concluded that all registered exceedances were not related to the work under the Project. The statistics of environmental exceedance, NOE issued and investigation of exceedance are summarized in the following table.

Environmental Issues	Monitoring Parameters	Action Level	Limit Level	Event & Action		
				NOE Issued	Investigation	Corrective Actions
Construction Noise	Leq <sub>30min</sub> Daytime	0	0	0	0	0
Water Quality	Dissolved Oxygen	32	47	79	Not related Contract 2	Not required
	Turbidity	10	31	41		
	Suspended Solids	1	12	13		
Hydrological Characteristics	Water Flow	0	0	0	0	0
	Water Depth	0	0	0	0	0

ES.05. No documented complaint, notification of summons and successful prosecution was received during the Reporting Quarter.

ES.06. No major environmental impacts were observed during the weekly site inspection which indicated that the implemented mitigation measures for construction noise and water quality were effective. Minor deficiencies found in the weekly site inspection were in general rectified within the specified deadlines. The environmental performance of the Project was therefore considered satisfactory.

ES.07. No site inspection was undertaken by external parties i.e. EPD or AFCD within the Reporting Quarter.

ES.08. No reporting changes were made during the Reporting Quarter.

ES.09. During dry season, dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road would be a key issue in coming months. Nevertheless, special attention should be paid on the muddy water and other water quality pollutants via site surface water runoff into the local stream Wah Ha River. Mitigation measures for water quality should therefore be

fully implemented and maintained.

ES.10. On the other hand, construction noise should be other key environmental issue during sheet-piling process. The noise mitigation measures accordingly should be necessary to implement

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## 1.0 INTRODUCTION

### PROJECT BACKGROUND

- 1.01 Kwan Lee-Kuly Joint Venture (hereinafter ‘KLKJV’) has been awarded by Drainage Services Department (hereinafter ‘DSD’) of the Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai. The Project is scheduled to commence in May 2011 and complete in March 2014 for about 35 months.
- 1.02 The works to be executed under the Project are located in Shuen Wan and Shek Wu Wai. The works mainly comprise construction of about 735 metres long single-cell box culvert along Tung Tsz Road in Shuen Wan, Tai Po and construction of about 15 m long three-cell box culvert in Shek Wu Wai, Shatin.
- 1.03 This Project (hereinafter ‘the Contract 2’) is part of the Drainage Improvement works amongst Shatin and Tai Po and it is defined as a “Designated Project” which controlled under Environmental Permit EP-303/2008. Currently, DSD has another Contract DC/2009/22 (hereinafter ‘the Contract 1’) ongoing for construction at Shuen Wan working area which under the same Environmental Permit and the updated Environmental Monitoring and Audit Manual (hereinafter ‘the Updated EM&A Manual’). Both DSD contract’s site boundary at Shuen Wan are shown in *Appendix A*. On the other hand, Shek Wu Wai San Tin is a non-designated project work and no environmental monitoring and audit is requested to carry out.
- 1.04 In order to effectively implement the environmental protection measures stipulated in the Project Profile (hereinafter ‘the PP’), Environmental Impact Assessment Report (hereinafter “the EIAR”), Environmental Permit EP303/2008, a corresponding EM&A Manual have been prepared to outline the environmental monitoring and auditing (hereinafter ‘the EM&A’) programme undertake for the Contracts 1 and 2.
- 1.05 KLKJV has commissioned Action-United Environmental Services and Consulting (AUES) as an independent environmental team (hereinafter ‘the ET’) to implement the EM&A programme for the environmental protection of the Project. Due to the construction of Contracts 1 and 2 carry out is just about the time, a Proposal Environmental Monitoring Programme and Methodology (hereinafter the “PEMPM”) was prepared and submitted to describe EM&A programme would be undertaken during construction period of the Contract 2.
- 1.06 The baseline monitoring of EM&A programme has been performed by the Contract 1 ET. The Action and Limit Levels environmental performance criteria have also been established by the Contract 1. Therefore, no baseline monitoring was performed for the Contract 2 of Project. However, a new set of the Action/ Limit levels as used to Contract 2 were proposed by ET, it had been accepted by the IEC and also submitted to the EPD seek for endorsement.
- 1.07 This is the 2<sup>nd</sup> Quarterly EM&A Summary Report under Environmental Permit No.EP-303/2008 for the Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai, covering the period from **1 October to 31 December 2011**.

### REPORT STRUCTURE

- 1.08 The Monthly Environmental Monitoring and Audit (EM&A) Report is structured into the following sections:-

<b>SECTION 1</b>	<b>INTRODUCTION</b>
<b>SECTION 2</b>	<b>PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS AND SUBMISSION</b>
<b>SECTION 3</b>	<b>EM&amp;A PROGRAMME REQUIREMENT FOR THE PROJECT</b>
<b>SECTION 4</b>	<b>IMPACT MONITORING RESULTS</b>
<b>SECTION 5</b>	<b>WASTE MANAGEMENT</b>
<b>SECTION 6</b>	<b>SITE INSPECTIONS</b>
<b>SECTION 7</b>	<b>ENVIRONMENTAL COMPLAINTS AND NON-COMPLIANCE</b>
<b>SECTION 8</b>	<b>IMPLEMENTATION STATUES OF MITIGATION MEASURES</b>
<b>SECTION 9</b>	<b>CONCLUSIONS AND RECOMMENDATION</b>

## 2.0 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS AND SUBMISSION

### PROJECT ORGANIZATION AND MANAGEMENT STRUCTURE

- 2.01 Organization structure and contact details of relevant parties with respect to on-site environmental management are shown in *Appendix B*.

### CONSTRUCTION PROGRESS

- 2.02 The master and three month rolling construction programme are enclosed in *Appendix C* and the major construction activities undertaken in this report period are listed below:-

Reporting Month	Construction activities
October 2011	<ul style="list-style-type: none"> <li>• Excavation permit for chainage 0-250</li> <li>• Fixing of reinforcement for base slab of Bay 21 &amp; 22</li> <li>• Erection of formwork for base slab of Bay 21 &amp; 22</li> <li>• Concrete casting of base slab of Bay 21 &amp; Bay 22</li> <li>• Fixing of reinforcement for walls of Bay 20 &amp; Bay 22</li> <li>• Fixing of reinforcement for top slab of Bay 20</li> <li>• Erection of formwork for walls and top slab of Bay 20</li> <li>• 36 nos. of trees have been fell</li> </ul>
November 2011	<ul style="list-style-type: none"> <li>• Fixing of reinforcement of top slab &amp; side walls – Bay 21</li> <li>• Erection and removal of formwork – Bay 21</li> <li>• Concrete casting of top slab &amp; side walls – Bay 21</li> <li>• Backfill the soft material between sheetpile and box culvert – Bay 21</li> <li>• Fixing of reinforcement of top slab of box culvert – Bay 22</li> <li>• Erection and removal for top slab &amp; side walls – Bay 22</li> <li>• Concrete casting of top slab – Bay 22</li> <li>• Install shorting for fill soft material between sheet pile and box culvert – Bay 22</li> <li>• Backfill with soft material – Bay 22</li> <li>• Excavation of soft material – Bay 23 &amp; 24</li> <li>• Install sheetpile and shoring – Bay 23 &amp; 24</li> </ul>
December 2011	<ul style="list-style-type: none"> <li>• Backfilling – Bay 20 to 22</li> <li>• Removal of shoring and sheetpile – Bay 20 to 22</li> <li>• Driving sheetpile for bays - Bay 23 to 27</li> <li>• Excavation and installation of lateral shoring system - Bay 23 to 27</li> <li>• Erection of formwork for base slab - Bay 23 to 27</li> <li>• Fixing of reinforcement for base slab - Bay 23 to 27</li> <li>• Laying of rockfill - Bay 23 to 26</li> <li>• Laying of blinding - Bay 23 to 26</li> <li>• Concrete casting of base slab – Bay 23 to 24</li> </ul>

### SUMMARY OF ENVIRONMENTAL SUBMISSIONS

- 2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Quarter is presented in *Table 2-1*.

**Table 2-1 Status of Environmental Licenses and Permits**

Item	Description	License/Permit Status
1	Air Pollution Control (Construction Dust)	Notified EPD on 17 October 2011
2	Chemical Waste Producer Registration (WPN5213-727-K2972-02)	Approved on 28 October 2011



Item	Description	License/Permit Status
3	Water Pollution Control Ordinance (Discharge License) WT00009528-2011	Valid to 31 July 2016
4	Billing Account for Disposal of Construction Waste (Account No.: 7012838)	Effective

- 2.04 The “Proposal Environmental Monitoring Programme and Methodology (R0006 Version 2)” was set out in accordance with the Updated Environmental Monitoring and Audit Manual. It was approved by the ER and agreed with the Independent Environmental Checker (IEC) and submitted to the EPD for endorsement.
- 2.05 For Contract 2 of the Project, no Baseline Monitoring Report was issued by the ETL. However, a new set of the Action/ Limit levels as used to Contract 2 were proposed by ET, it had been accepted by the IEC and also submitted to the EPD seek for endorsement.

### 3.0 EM&A PROGRAMME REQUIREMENT FOR THE PROJECT

3.01 The EM&A requirements set out in the PP, EIAR, Environmental Permit EP303/2008 (hereinafter ‘the EP’), and the associated updated EM&A Manual, are presented below sub-section.

#### MONITORING PARAMETERS

3.02 According to the EIAR and the updated EM&A Manual, the monitoring parameters of each environmental aspect summarized in **Table 3-1** will be performed as under the Project.

**Table 3-1 Summary of Monitoring Parameters**

Environmental Aspect	Parameters	
Construction Noise	<ul style="list-style-type: none"> <li>A-weighted equivalent continuous sound pressure level (30min) (hereinafter ‘Leq(30min)’ during the normal working hours; and</li> <li>A-weighted equivalent continuous sound pressure level (5min) (hereinafter ‘Leq(5min)’ for construction work during the restricted hours.</li> </ul>	
Water Quality	In Situ Measurement	Temperature, Dissolved Oxygen, Dissolved Oxygen Saturation, pH and Turbidity
	Laboratory Analysis	Suspended Solids (hereinafter ‘SS’)
Hydrological	The water flow and depth measurement onsite	
*Ecology	Monitor and audit the proper implementation of mitigation measures stipulated in EIA report and the updated EM&A Manual	
Landscape & Visual	Inspect and audit the implementation and maintenance of landscape and visual mitigation measures	

Remarks: \* the monitoring is carried out by IEC

#### MONITORING LOCATIONS

3.03 Monitoring locations have been proposed in the updated EM&A Manual and the location map is shown show in **Appendix D** and summarized in **Table 3-2**.

**Table 3-2 Designated Monitoring Locations of the EM&A Programme**

Aspect	Location ID	Address
Construction Noise	M1	14, Shuen Wan Chim Uk
	AL1	Joint Village Office for Villages in Shuen Wan, Tai PO
	M2	150, San Tau Kok
	M3	31, Wai Ha
	M4	Block 15, Treasure Spot Garden
Water Quality	(#) W1	Between the Shuen Wan Marsh and ECA (Co-ordinates: E 839301, N 836386; and Existing River Bed Level: +1.75mPD).
	W2	Between Tolo Harbour and Proposed Penstock (Co-ordinates: E839542, N 836184; and Existing River Bed Level: +1.48mPD)
	(*) W3	Upstream of Tung Tze Shan Road (Co-ordinates: E 838760, N 836714; and Existing River Bed Level: +5.08mPD)
	W4	Wai Ha Village 29D (Co-ordinates: E 838865, N 836621; and Existing River Bed Level: +4.05mPD)
Hydrological	H1	Between the Shuen Wan Marsh and ECA (Coordinates: E 839306, N 836379)
	H2	Route 10 Sam Kung Temple (Coordinates: E 839163, N 836433)
	H3	Upstream of Tung Tze Shan Road (Coordinates: E 838760, N 836714)
	H4	Wai Ha Village 29D (Coordinates: E 838865, N 836621)
Ecology	Areas within 100m of the works boundary under Contract 2	
Landscape & Visual	As within and adjacent to the construction sites and works areas under the Contract 2,	

Remarks:

(#) Control Station of Contract 1, however impact station of Contract 2

(\*) Control Station of Contract 2

### MONITORING FREQUENCY

- 3.04 The monitoring frequency and duration as specified in the updated EM&A Manual are summarized below.

#### Construction Noise

Frequency: Once a week during 0700-1900 on normal weekdays for Leq30min

If the construction work is undertaken at restricted hour, the monitoring frequency of construction noise will be conducted in accordance with the related Construction Noise Permit requirement issued by EPD as follow

- 3 consecutive Leq5min at restricted hour from 1700 – 2300;
- 3 consecutive Leq5min for restricted hour from 2300 – 0700 next day;
- 3 consecutive Leq5min for Sunday or public holiday from 0700 – 1900;

Duration: Throughout the construction period when the major construction activities are undertaken

#### Water Quality

Frequency: Three times a week. The interval between 2 sets monitoring are not less than 36 hours

Duration: During the construction phase of Contract 2 to undertake (in accordance with the Updated EM&A Manual Section 4.27).

#### Hydrological Characteristics

Frequency: Once per week at mid-flood and mid-ebb tides

Duration: During the construction phase of Contract 2 to undertake; and one year after the construction is complete as operation phase monitoring (in accordance with the Updated EM&A Manual Section 4.32).

#### Ecology

- 3.05 In accordance with Section 6.17 of the Updated EM&A Manual, ecological monitoring should be conducted by the Independent Environmental Checker (hereinafter 'IEC'). Monitoring programme details should be agreed with the Agriculture, Fisheries and Conservation Department (AFCD). Moreover, the IEC should submit reports on the findings of each monitoring trip, and a final report summarizing the monitoring results over the entire monitoring period to AFCD and Environmental Protection Department (EPD). Hence, no monitoring or surveying should be carried out by ET of the Project.

#### Landscape & Visual

- 3.06 According to Section 7.4 of the Updated EM&A Manual, site inspection bi-weekly should be performed to check the implementation and maintenance of landscape and visual mitigation measures whether to fully realize.

### MONITORING EQUIPMENT

#### Noise Monitoring

- 3.07 Sound level meter in compliance with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications shall be used for noise monitoring. The sound level meter shall be checked with an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter which capable to measure wind speed in m/s.

#### Water Quality Monitoring

- 3.08 **Dissolved Oxygen and Temperature Measuring Equipment** – The instrument should be a portable and weatherproof dissolved oxygen (DO) measuring instrument complete with cable and sensor, and use a DC power source. The equipment should be capable of measuring DO level in the range of 0 – 20mg L<sup>-1</sup> and 0 – 200% saturation; and temperature of 0 – 45 degree Celsius.
- 3.09 **pH Meter** – The instrument shall consist of a potentiometer, a glass electrode, a reference electrode and a temperature-compensating device. It shall be readable to 0.1 pH in arrange of 0

to 14.

- 3.10 **Turbidity (NTU) Measuring Equipment** – The instrument should be a portable and weatherproof turbidity measuring instrument using a DC power source. It should have a photoelectric sensor capable of measuring turbidity between 0 - 1000 NTU.
- 3.11 **Water Sampling Equipment** – A water sampler should comprise a transparent PVC cylinder, with a capacity of not less than 2 litres, which can be effectively sealed with latex cups at both ends. The sampler should have a positive latching system to keep it open and prevent premature closure until released by a messenger when the sampler is at the selected water depth.
- 3.12 **Water Depth Detector** – A portable, battery-operated echo sounder should be used for the determination of water depth at each designated monitoring station. The unit can either be hand held or affixed to the bottom of the work boat.
- 3.13 **Sample Containers and Storage** – Water samples for SS should be stored in high density polythene bottles with no preservative added, packed in ice (cooled to 4°C without being frozen).
- 3.14 **Suspended Solids Analysis** – Analysis of suspended solids shall be carried out in a HOKLAS or other international accredited laboratory.

**Hydrological Characteristics**

- 3.15 **Water Depth Detector** - A portable, battery-operated echo sounder shall be used for the determination of water depth at each designated monitoring station.
- 3.16 **Stream water flow Equipment** –A portable, battery-operated flow meter should be used for the determination of water flow rate at each designated monitoring location and record in m<sup>3</sup>/s.
- 3.17 The monitoring equipment using for the Project’s EM&A programme were proposed by the ET and verified by the IEC prior commencement of the monitoring. Details of the equipment used for impact monitoring are listed in **Table 3-3**.

**Table 3-3 Monitoring Equipment Used in EM&A Programme**

Equipment	Model
<b>Construction Noise</b>	
Integrating Sound Level Meter	B&K Type 2238
Calibrator	B&K Type 4231
Portable Wind Speed Indicator	Testo Anemometer
<b>Water quality</b>	
Water Depth Detector	Eagle Sonar
Water Sampler	A transparent PVC cylinder / bucket
Thermometer & DO meter	DO Meter YSI 55
pH meter	Extech EC500
Turbidimeter	Hach 2100Q
Sample Container	High density polythene bottles (provided by laboratory)
Storage Container	‘Willow’ 33-litre plastic cool box
Suspended Solids	HOKLAS-accredited laboratory (ALS Technichem (HK) Pty Ltd)
<b>Hydrological Characteristics</b>	
Water flow meter	GLOBAL WATER model FP211
Water Depth Detector	Eagle Sonar or an appropriate steel ruler or rope with appropriate weight

**MONITORING METHODOLOGY**

**Noise Monitoring**

- 3.18 Noise measurements were taken in terms of the A-weighted equivalent sound pressure level (L<sub>eq</sub>) measured in decibels (dB). Supplementary statistical results (L<sub>10</sub> and L<sub>90</sub>) were also obtained for reference.
- 3.19 Sound level meter as listed in **Table 3-3** are complied with the *International Electrotechnical Commission Publications 651: 1979 (Type 1) and 804: 1985 (Type 1)* specifications, as

recommended in Technical Memorandum (TM) issued under the *Noise Control Ordinance (NCO)*.

- 3.20 During the monitoring, all noise measurements were performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level ( $L_{eq}$ ).  $L_{eq(30min)}$  in six consecutive  $L_{eq(5min)}$  measurements were used as the monitoring parameter for the time period between 0700-1900 hours on weekdays; and also  $L_{eq(15min)}$  in three consecutive  $L_{eq(5min)}$  measurements is used as monitoring parameter for other time periods (e.g. during restricted hours), if necessary.
- 3.21 During the course of measurement, the sound level meter is mounted on a tripod with a height of 1.2m above ground and placed at the assessment point and oriented such that the microphone is pointed to the site with the microphone facing perpendicular to the line of sight. The windshield is fitted for all measurements. The assessment point is normally set as free-field situation for the measurement.
- 3.22 Prior to noise measurement, the accuracy of the sound level meter is checked by an acoustic calibrator which generated a known sound pressure level at a known frequency. The checking was performed before and after the noise measurement.

### Water Quality

- 3.23 Water quality monitoring are conducted at the depth below:-
- Three depths: 1m below water surface, 1m above river bed and at mid-depth when the water depth exceeds 6m, or
  - If the water depth is between 3m and 6m, two depths: 1m below water surface and 1m above river bed, and or
  - If the water depth is less than 3m, 1 sample at mid-depth is taken
- 3.24 Water depths are determined prior to measurement and sampling, using a portable battery operated depth detector, brand named 'Eagle Sonar', if the depths exceed 1.5 meter. If the depth between 1.5 meter and 1 meter, plastic tape measurement tied with appropriate weight are used the depth estimation. For the depth well below 1 meter, an appropriate steel ruler or rope with appropriate weight are used for the depth measurement.
- 3.25 A transparent PVC cylinder, with a capacity of not less than 2 litres, is used for water sampling. The water sampler is lowered into the water body at a predetermined depth. The trigger system of the sampler is activated with a messenger and opening ends of the sampler are closed accordingly then the sample of water is collected. If the water depth is less than 500mm, a water bucket is be used as a water sampler to minimize the possibility of the latching system disturbing sediment during water sampling
- 3.26 A portable YSI 55 DO Meter is used for in-situ DO measurement. The DO meter is capable of measuring DO in the range of 0 - 20 mg/L and 0 - 200 % saturation and checked against water saturated ambient air on each monitoring day prior to monitoring. Although the DO Meter automatically compensates ambient water temperature to a standard temperature of 20<sup>0</sup>C for ease of comparison of the data under the changing reality, the temperature readings of the DO Meter are be recorded in the field data sheets. The equipment calibration is performed on quarterly basis.
- 3.27 A portable Extech EC500 pH Meter is used for in-situ pH measurement. The pH meter is capable of measuring pH in the range of 0 – 14 and readable to 0.1. Standard buffer solutions of pH 7 and pH 10 are used for calibration of the instrument before and after measurement. The equipment calibration is performed on quarterly basis.
- 3.28 A portable Hach 2100Q Turbidity Meter is be used for in-situ turbidity measurement. The turbidity meter is capable of measuring turbidity in the range of 0 – 1000 NTU. The equipment calibration is performed on quarterly basis.

- 3.29 Water samples are contained in screw-cap PE (Poly-Ethylene) bottles, which are provided and pretreated and ‘PE’ (Poly-Ethylene) sampling bottles provided and pre-treated according to corresponding analytical requirements. Where appropriate, the sampling bottles are rinsed with the water to be contained. Water sample is then transferred from the sampler to the sample bottles.
- 3.30 One liter or 500 mL water sample are collected from each depth for SS determination. The collected samples are stored in a cool box maintained at 4<sup>0</sup>C and delivered to laboratory upon completion of the sampling by end of each sampling day.
- 3.31 All water samples are analyzed with Suspended Solids (SS) as specified in the updated *EM&A Manual* by a local HOKLAS-accredited testing laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration no. 66). SS are determined by the laboratory upon receipt of the water samples using HOKLAS accredited analytical method. The detection limits and testing method are shown below in **Table 3-4**. The certificate of ALS Technichem (HK) Pty Ltd is provided in the relevant Monthly EM&A Reports .

**Table 3-4 Testing Method and Detection limit of SS to be provided by the Laboratory**

Determinant	Testing Method	Detection Limit
Suspended solid	Determination use HOKLAS accredited analytical methods namely ALS Method EA-025 (based on APHA 2540 D)	2mg/L

**Hydrological Characteristics**

- 3.32 A portable, water flow meter, brand named “*GLOBAL WATER model FP211*” are used to determine the water current flow at the designated monitoring stations. A water flow velocity is measured at mid depth of current water body or 0.5m below water level.
- 3.33 Water depths are determined prior to measurement, using a portable battery operated depth detector, brand named ‘Eagle Sonar’, if the depths exceed 1.5 meter. If the depth between 1.5 meter and 1 meter, plastic tape measurement tied with appropriate weight are used the depth estimation. For the depths well below 1 meter, an appropriate steel ruler or rope with appropriate weight are used for the depth measurement.

**DATA MANAGEMENT AND DATA QA/QC CONTROL**

- 3.34 The impact monitoring data are handled by the ET’s systematic data recording and management, which complies with in-house Quality Management System. Standard Field Data Sheets (FDS) are used in the impact monitoring programme.
- 3.35 The monitoring data recorded in the equipment e.g. noise meter and Multi-parameter Water Quality Monitoring System are downloaded directly from the equipment at the end of each monitoring day. The downloaded monitoring data are input into a computerized database properly maintained by the ET. The laboratory results are input directly into the computerized database and QA/QC checked by personnel other than those who input the data. For monitoring activities require laboratory analysis, the local laboratory follows the QA/QC requirements as set out under the HOKLAS scheme for all laboratory testing.

**OTHERS MONITORING IMPLEMENTATION FOR THE CONTRACT**

**Ecology**

- 3.36 Ecological monitoring and reporting should be performed by IEC. No equipment and procedure are presented in the EM&A Monthly Report.

**Landscape and Visual**

- 3.37 A registered Landscape Architect as member of the ET is employed by the Contractor to undertake site inspection. Site inspection will undertake at least once every two weeks throughout the construction period to ensure compliance with the intended aims of the mitigation measures are proposed in the EIA and the updated EM&A Manual, implemented by the Contractor.



**DETERMINATION OF ACTION/LIMIT (A/L) LEVELS**

3.38 According to the Updated Environmental Monitoring and Audit Manual, the performance criteria for construction noise, water quality and hydrological, namely Action and Limit levels were established by Contract DC/2009/22. The Action/Limit Levels proposed by DC/2009/22 are listed in *Tables 3-5, 3-6, and 3-7*.

**Table 3-5 Action and Limit Levels for Construction Noise**

Location	Time Period	Action Level in dB(A)	Limit Level in dB(A)
M1, AL1, M2, M3, M4	Daytime 0700 – 1900 hrs on normal weekdays	When one documented complaint is received	> 75* dB(A)
	1900 – 2300 on all days and 0700 – 2300 on general holidays (including Sundays)		60/65/70 dB(A)**
	2300 – 0700 on all days		45/50/55 dB(A)**

Note: \* Reduces to 70dB(A) for schools and 65dB(A) during the school examination periods.

\*\* To be selected based on the Area Sensitivity Rating of A/B/C, and the conditions of the applicable CNP(s) must be followed

**Table 3-6 Action and Limit Levels for Water Quality**

Parameter	Performance Criteria	Impact Station		
		W1	W2	W4
DO Concentration (mg/L)	Action Level	7.27	7.26	9.27
	Limit Level	7.05	6.44	7.98
pH	Action Level	NA	NA	NA
	Limit Level	6 - 9	6 - 9	6 - 9
Turbidity (NTU)	Action Level	4.77	2.46	3.32
	Limit Level	5.26	3.42	4.52
Suspended Solids (mg/L)	Action Level	9.73	8.89	6.98
	Limit Level	10.77	9.75	7.66

Notes:

- The proposed Action/Limit Levels of DO are established to be used 5%-ile/1%-ile of all the baseline data;
- The proposed Action/Limit Levels of Turbidity and SS are established to be used 95%-ile/99%-ile of all the baseline data;
- For DO, non-compliance of the water quality limits occur is when monitoring result lower than the action/limit levels;
- For turbidity and SS, non-compliance of the water quality limits occurs is when monitoring result higher than the limits; and
- For pH, non-compliance of the quality limit occur is when monitoring result lower than 6 and higher than 9; and
- All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered necessary

**Table 3-7 Action and Limit Levels for Hydrological Characteristics**

Parameter	Acceptance Criteria	Monitoring Station			
		H1	H2	H3	H4
Water Depth (m)	Action Level	0.08 (80% of baseline water depth)	0.40 (80% of baseline water depth)	0.40 (80% of baseline water depth)	0.24 (80% of baseline water depth)
	Limit Level	0.06 (60% of baseline water depth)	0.30 (60% of baseline water depth)	0.30 (60% of baseline water depth)	0.18 (60% of baseline water depth)
Water Flow Rate (m3/s)	Action Level	120% of control station's water flow rate on the same day of measurement	120% of control station's water flow rate on the same day of measurement	120% of control station's water flow rate on the same day of measurement	120% of control station's water flow rate on the same day of measurement

	Limit Level	140% of control station's water flow rate on the same day of measurement	140% of control station's water flow rate on the same day of measurement	140% of control station's water flow rate on the same day of measurement	140% of control station's water flow rate on the same day of measurement
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- 3.39 The locations H3 and H4 are a reference measurement point in order to monitor any changes in the hydrological characteristics of Wai Ha River arising from the work Contract 2 to affect the Shuen Wan Marsh.
- 3.40 Should non-compliance of the environmental quality criteria occurs, remedial actions will be triggered according to the Event and Action Plan enclosed in **Appendix F**.

**EQUIPMENT CALIBRATION**

- 3.41 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme in yearly basis.
- 3.42 All the water quality monitoring equipment such as the DO, pH and Turbidity meters are calibrated by HOKLAS accredited laboratory of three month intervals.
- 3.43 A portable, water flow meter, brand named “*GLOBAL WATER model FP211*” is calibrated in yearly basis.
- 3.44 All updated calibration certificates of the monitoring equipment used for the impact monitoring programme in this Reporting Quarter are attached in the relevant Monthly EM&A Reports.

**METEOROLOGICAL INFORMATION**

- 3.45 The meteorological information during the construction phase is obtained from Tai Po and Shatin Stations of the Hong Kong Observatory (HKO). The meteorological data during the impact monitoring days are summarized in the relevant Monthly EM&A Reports.



#### 4.0 IMPACT MONITORING RESULTS

##### RESULTS OF CONSTRUCTION NOISE MONITORING

4.01 Summary of construction noise monitoring at the identified locations during the Reporting Quarter are summarized in *Table 4-1* and the summary of breaches of A/L Level are presented in *Table 4-2*. In this Reporting Quarter, a total of **65** events of construction noise measurement were conducted and the graphic plots in are presented in *Appendix E*.

**Table 4-1 Summary of Construction Noise Monitoring Results, dB(A)**

Station	Leq30min (dB(A))				
	M1 <sup>(#)</sup>	AL1 <sup>(#)</sup>	M2 <sup>(*)</sup>	M3 <sup>(*)</sup>	M4 <sup>(*)</sup>
Minimum	47.5	53.0	59.1	52.4	48.8
Min. recorded date	15-Dec-11	10-Nov-11	22-Nov-11	22-Nov-11	17-Nov-11
Maximum	60.6	58.5	74.5	72.4	74.4
Max. recorded date	20-Oct-11	6-Oct-11	20-Oct-11	20-Oct-11	25-Oct-11

Remarks:

(#) The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.

(\*) The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines

**Table 4-2 Summaries of Breaches of Construction Noise A/L Levels**

Station	Exceedance of Environmental Quality Criteria	
	Action Level	Limit Level
M1	0	0
AL1	0	0
M2	0	0
M3	0	0
M4	0	0

4.02 No noise complaint (which is an Action Level exceedance) was received in this Reporting Quarter. All the noise monitoring result are well below 75dB(A) and no Action or Limit Level exceedance was triggered.

##### RESULTS OF LOCAL STREAM WATER QUALITY MONITORING

4.03 In this Reporting Quarter, **38** sampling days have been carried out at four designated locations W1 to W4 for local steam water quality monitoring. Breaches of water quality A/L Levels and statistics of the compliance status during the Reporting Quarter are summarized in *Tables 4-3* and *4-4* and graphical plots are shown in *Appendix E*.

4.04 During the Reporting Quarter, field measurements showed that stream water temperatures were within 15.5°C to 29.4°C and pH values within 6.80 to 8.70. Furthermore, salinity measured at Locations W1 and W2 were detected between 0.7 – 22.7 ppt and 0.7 – 25.4 ppt.

**Table 4-3 Summaries of Breaches of the Existing Water Quality A/L Levels**

Location	Dissolve Oxygen		Turbidity		Suspended Solids		Total Exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit
<b>October 2011</b>								
W1	2	3	0	3	0	1	2	7
W2	3	4	2	4	0	1	5	9
W4	0	12	2	6	0	1	2	19
<b>November 2011</b>								
W1	5	1	0	1	0	0	5	2
W2	10	0	1	1	0	1	11	2
W4	0	13	1	0	0	0	1	13
<b>December 2011</b>								
W1	4	1	1	3	1	2	6	6

Location	Dissolve Oxygen		Turbidity		Suspended Solids		Total Exceedance	
	Action	Limit	Action	Limit	Action	Limit	Action	Limit
W2	8	0	2	6	0	2	10	8
W4	0	13	1	7	0	4	1	24
Total	32	47	10	31	1	12	43	90

**Table 4-4 Statistics Water Quality Exceedance in the Reporting Quarter**

Parameter	Statistics		
	Number of Monitoring Event (W1, W2 & W4)	No. of Exceedances	Compliance %
Dissolve Oxygen	114	79	30.7%
Turbidity	114	41	64.0%
Suspended Solids	114	13	88.6%

**Exceedances in October 2011**

4.05 In October 2011, 24, 17 and 3 Action/Limit levels exceedances are recorded for DO, Turbidity and SS respectively. According to site activity and precautionary measures provided by KLKJVJ, investigation report concluded that all the exceedances were not related to the works under the Project.

**Exceedances in November 2011**

4.06 In November 2011, 29, 4 and 1 Action/Limit levels exceedances are recorded for DO, Turbidity and SS respectively. According to site activity and precautionary measures provided by KLKJVJ, investigation report concluded that all the exceedances were not related to the works under the Project.

**Exceedances in December 2011**

4.07 In December 2011, 26, 20 and 9 Action/Limit levels exceedances are recorded for DO, Turbidity and SS respectively. According to site activity and precautionary measures provided by KLKJVJ, investigation report concluded that all the exceedances were not related to the works under the Project.

**RESULTS OF HYDROLOGICAL CHARACTERISTICS MONITORING**

4.08 In this Reporting Quarter, 13 sampling days of hydrological characteristics monitoring were carried out at designated measurement points H1 to H4. Hydrological characteristics results of the all measurement points are summarized in *Tables 4-5* and *4-6*.

**Table 4-5 Summarized Hydrological Characteristics of Water Depth, m**

Date	Mid-Flood				Mid-Ebb			
	H1	H2	H3	H4	H1	H2	H3	H4
8 Oct 2011	0.1	0.1	0.14	0.22	0.09	0.1	0.14	0.21
15 Oct 2011	0.08	0.09	0.10	0.23	0.1	0.24	0.12	0.24
22 Oct 2011	0.12	0.12	0.15	0.30	0.09	0.12	0.14	0.33
29 Oct 2011	0.11	0.18	0.15	0.40	0.08	0.18	0.13	0.39
5-Nov-11	0.49	0.42	0.30	0.40	0.24	0.16	0.30	0.40
12-Nov-11	0.18	0.12	0.30	0.40	0.18	0.12	0.30	0.40
19-Nov-11	0.18	0.37	0.30	0.40	-	-	0.30	0.40
26-Nov-11	-	-	0.30	0.40	0.12	0.17	0.30	0.40
3 Dec 11	0.12	0.14	0.30	0.20	-	-	0.30	0.20
10 Dec 11	0.24	0.14	0.30	0.40	0.18	0.12	0.30	0.40
17 Dec 11	0.37	0.37	0.30	0.50	0.24	0.37	0.30	0.40
24 Dec 11	0.06	0.43	0.30	0.40	0.18	0.43	0.30	0.40
31 Dec 11	0.18	0.61	0.30	0.40	0.67	0.61	0.30	0.40

**Table 4-6 Summarized Hydrological Characteristics of Average Volumetric flow rate (Q), m<sup>3</sup>/s**

Date	Mid-Flood				Mid-Ebb			
	H1	H2	H3	H4	H1	H2	H3	H4
8 Oct 2011	0.075	0.754	0.417	0.060	0.075	0.377	0.417	0.115
15 Oct 2011	0.075	0.377	0.373	0.126	0.150	0.754	0.536	0.132
22 Oct 2011	0.075	0.754	0.671	0.247	0.075	0.377	0.626	0.181
29 Oct 2011	0.150	0.377	0.671	0.329	0.075	0.377	0.581	0.214
5-Nov-11	0.075	0.377	1.56	0.33	0.075	0.377	1.34	0.33
12-Nov-11	0.075	0.754	2.01	0.33	0.15	0.7536	1.79	0.33
19-Nov-11	0.15	0.377	1.56	0.33	-	-	1.34	0.22
26-Nov-11	-	-	1.79	0.33	0.1	0.502	1.56	0.33
3 Dec 11	0.075	0.754	1.56	0.11	-	-	1.79	0.11
10 Dec 11	0.075	0.377	1.12	0.33	0.075	0.377	0.89	0.22
17 Dec 11	0.15	0.377	1.12	0.41	0.15	0.377	1.34	0.33
24 Dec 11	0.075	0.377	1.12	0.22	0.075	0.377	1.12	0.33
31 Dec 11	0.075	0.754	0.89	0.22	0.15	0.754	1.12	0.33

4.09 To compare the monitoring data between the Reporting Quarter and baseline monitoring period, the current water depth and volumetric flow rate has insignificant changed. Furthermore, water depth and water flow rate were found no exceedance in this Reporting Quarter.

## 5.0 WASTE MANAGEMENT

5.01 Waste management was carried out by an on-site Environmental Officer or an Environmental Supervisor from time to time.

### RECORDS OF WASTE QUANTITIES

5.02 All types of waste arising from the construction work are classified into the following:

- Construction & Demolition (C&D) Material;
- Chemical Waste;
- General Refuse; and
- Excavated Soil

5.03 The quantities of waste for disposal in this Reporting Quarter are summarized in *Table 5-1* and *5-2* and the Monthly Summary Waste Flow Table is shown in *Appendix G*. Whenever possible, materials were reused on-site as far as practicable.

**Table 5-1 Summary of Quantities of Inert C&D Materials**

Type of Waste	Quantity			Disposal Location
	Oct 11	Nov 11	Dec 11	
C&D Materials (Inert) (m <sup>3</sup> )	0	0	0	-
Reused in this Contract (Inert) (m <sup>3</sup> )	0	0	0	-
Reused in other Projects (Inert) (m <sup>3</sup> )	0	0	0	-
Disposal as Public Fill (Inert) (m <sup>3</sup> )	0	0	80	Tuen Mum Area 38

**Table 5-2 Summary of Quantities of C&D Wastes**

Type of Waste	Quantity			Disposal Location
	Oct 11	Nov 11	Dec 11	
Recycled Metal (kg)	0	0	0	-
Recycled Paper / Cardboard Packing (kg)	0	0	0	-
Recycled Plastic (kg)	0	0	0	-
Chemical Wastes (kg)	0	0	0	-
General Refuses (m <sup>3</sup> )	20	45	0	-

5.04 To control over the site performance on waste management, the Contractor shall ensure that all solid and liquid waste management works are in full compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. The Contractor is also reminded to implement the recommended environmental mitigation measures according to the EM&A Manual based on actual site conditions.

## 6.0 SITE INSPECTION

- 6.01 According to the Updated Environmental Monitoring and Audit Manual, regular site inspection to evaluate the project environmental performance should be carried out during construction phase. Weekly environmental site inspections had been carried out by the Contractor and the RE on **8, 14, 21, 28 October, 3, 10, 17, 24 November 2011 and 1, 7 15, 21 and 29 December 2011**. Furthermore, the RE, IEC, the Contractor and ET of joint site inspection were carried out on **14 October, 10 November and 7 December 2011**. In this Reporting Quarter, no non-compliance were recorded but **14** observations and 3 reminders were note.
- 6.02 Observations for the site inspection and monthly audit within this Reporting Quarter are summarized in *Table 6-1*.

**Table 6-1 Site Observations during this Reporting Quarter**

Date	Findings / Deficiencies	Follow-Up Status
8 Oct 11	1) Mud tail was observed at the site exit/ access road, the Contractor should apply water spray on those areas more frequently to minimize dust impact.	The Observation has been rectified before the site inspection on 14 October 2011
14 Oct 11	1) The Contractor was reminded to Improve the Sediment Treatment facilities ensure it effective remove mud water discharge. 2) A chemical container was observed as located at working area. The Contractor was reminded to store it in a suitable area. 3) General housekeeping should be enhanced.	The improvement has been undertaken before site inspection 20 October 2011. The observation was rectified immediately at time.
20 Oct 11	No adverse environmental impact was observed during site inspection.	N.A.
27 Oct 11	1) Stagnant water cumulated in the site area should be drained away to prevent mosquito breeding.	The Observation has been rectified before the site inspection on 3 Nov 2011
3 Nov 11	1) The Contractor is reminded to keep the site entrance/exit clean.	The Observation has been rectified before the site inspection on 10 Nov 2011
10 Nov 11	No adverse environmental impact was observed during site inspection. General reminder is advised to the Contractor such as: - Waste disposal should be in accordance with the Project WMP. - Housekeeping should be maintained. - Waste bin should be provided on site.	Not follow up for reminder.
17 Nov 11	1) Open stockpile was observed within the site, the Contractor is reminded to cover any dusty material with tarpaulin sheet under dry and windy conditions.	The Observation has been rectified before the site inspection on 24 Nov 2011
24 Nov 11	No adverse environmental impact was observed during site inspection.	N.A.
1 Dec 11	1) Water spraying on haul road as a dust suppressive measure was carried out by the Contractor. However, excessive water was found direct discharge to the local drainage	The observation has been rectified before the site inspection on 7 Dec 2011.

	system. The Contractor is advised to control the amount of water for those works in the future.	
7 Dec 11	<ol style="list-style-type: none"> <li>1) Open sand stockpiles were observed on site, the Contractor should cover it with tarpaulin sheet or other means to prevent fugitive dust.</li> <li>2) Dust suppressive measures such as air spraying should be applied on the dry haul road.</li> </ol>	The observations have been rectified before the site inspection on 21 Dec 2011.
15 Dec 11	<ol style="list-style-type: none"> <li>1) Open sand stockpiles were observed on site, the Contractor should cover it with tarpaulin sheet or other means to prevent fugitive dust.</li> </ol>	The observation has been rectified before the site inspection on 21 Dec 2011.
21 Dec 11	<ol style="list-style-type: none"> <li>1) Free standing chemical container was observed on site, the Contractor should provide proper mitigation measures such as drip tray underneath and place it in the chemical storage area after use.</li> <li>2) Stagnant water was observed on site, drying or filling off the ponding with gravels is advised.</li> </ol>	The observations have been rectified before the site inspection on 29 Dec 2011
29 Dec 11	<ol style="list-style-type: none"> <li>1) Stagnant water was observed on site, the Contractor is advised to improve the drainage system of the ponding.</li> </ol>	The observation has been rectified before the site inspection on 5 Jan 2012.

#### LANDSCAPE AND VISUAL INSPECTION

- 6.03 In this Reporting Quarter, **7** events of landscape and visual inspection were carried out by the landscape sub-contractor. The detailed reports are presented in the Monthly EM&A Report (**October 2011, November 2011 and December 2011**).

**7.0 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**

**ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION**

7.01 No environmental complaint, summons and prosecution was received in this Reporting Quarter. The statistical summary table of environmental complaint is presented in *Tables 7-1, 7-2 and 7-3.*

**Table 7-1 Statistical Summary of Environmental Complaints**

Reporting Period	Environmental Complaint Statistics		
	Frequency	Cumulative	Complaint Nature
July– September 2011	0	0	NA
October 2011	0	0	NA
November 2011	0	0	NA
December 2011	0	0	NA

**Table 7-2 Statistical Summary of Environmental Summons**

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
July– September 2011	0	0	NA
October 2011	0	0	NA
November 2011	0	0	NA
December 2011	0	0	NA

**Table 7-3 Statistical Summary of Environmental Prosecution**

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
July– September 2011	0	0	NA
October 2011	0	0	NA
November 2011	0	0	NA
December 2011	0	0	NA

## 8.0 IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Updated Environmental Monitoring and Audit Manual covered the issues of dust, noise and waste and they are summarized as follows:

### Noise Mitigation Measure

- (a) Only well-maintained plant should be operated on-site and plant shall be serviced regularly during the construction programme;
- (b) Silencers or mufflers on construction equipment should be utilized and shall be properly maintained during the construction programme;
- (c) Mobile plant, if any, should be sited as far from NSRs as possible;
- (d) Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;
- (e) Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs;
- (f) Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities;
- (g) Use of quieter plants to carry out the construction tasks proposed for the Project;
- (h) Use about 3.5m high of temporary noise barriers as screened the noisy PMEs to carry out construction of box culvert and site clearance.
- (i) Low Impact Method, such as using PMEs smaller in size and to be enclosed by noise enclosure, should be adopted for the construction of box culvert and pipe laying in Wai Ha; and
- (j) Use of noise enclosure during the works area for pipe laying in Wai Ha.

### Dust Mitigation Measure

8.02 Implementation of mitigation measures stipulated in the Air Pollution Control (Construction Dust) Regulation and good site practices including but not limited to the following:

- (a) Use of regular watering to reduce dust emissions from exposed site surfaces and unpaved road, with complete coverage, particularly during dry weather;
- (b) Use of frequent watering for particularly dusty static construction areas and areas close to ASRs;
- (c) Tarpaulin covering of all dusty vehicle loads transported to, from and between site location;
- (d) Establishment and use of vehicle wheel and body washing facilities at the exit points of the site;
- (e) Routing of vehicles and positioning of construction plant should be at the maximum possible distance from ASRs;
- (f) Stockpiled excavated materials should be covered with tarpaulin and should be removed offsite within 24 hours to avoid any odour nuisance arising.

### Local Stream Water Quality Mitigation Measure

- (a) Before commencing any site formation work, all sewer and drainage connections shall be sealed to prevent debris, soil, sand etc. from entering public sewers/drains;
- (b) Temporary ditches shall be provided to facilitate run-off discharge into appropriate watercourses, via a silt retention pond. No site run-off shall enter the fishponds at Shuen Wan;
- (c) Sand/silt removal facilities such as sand traps, silt traps and sediment basins shall be provided to remove sand/silt particles from runoff to meet the requirements of the Technical Memorandum standard under the Water Pollution Control Ordinance. The design of silt removal facilities shall be based on the guidelines provided in ProPECC PN 1/94. All drainage facilities and erosion and sediment control structures shall be inspected monthly and maintained to ensure proper and efficient operation at all times and particularly during rainstorms
- (d) Water pumped out from excavated pits shall be discharged into silt removal facilities;



- (e) During rainstorms, exposed slope/soil surfaces shall be covered by a tarpaulin or other means. Other measures that need to be implemented before, during, and after rainstorms as summarized in ProPECC PN 1/94 shall be followed
- (f) Exposed soil areas shall be minimized to reduce potential for increased siltation and contamination of runoff
- (g) Earthwork final surfaces shall be well compacted and subsequent permanent work or surface protection shall be immediately performed to reduce the potential of soil erosion;
- (h) Open stockpiles of construction materials or construction wastes on-site shall be covered with tarpaulin or similar fabric during rainstorms;
- (i) For the construction of the box culvert next to the existing channel of the Wai Ha River, sand bags should be deployed around the boundary of the works trench to prevent muddy water ingress into the adjacent CA or Wai Ha River. Sand bags should also be used to surround the excavated trench. Generally, the sand bags will be placed up to a height 01 300mm to provide adequate allowance for the built-up water level during rainstorm event. With sand bags in place surface runoff will be intercepted and flow to Wai Ha River or collected by the existing drainage system as usual;
- (j) For the construction of the box culvert in the extreme northeast corner of Shuen Wan Marsh Conservation Area sand bags should be deployed along the limit of the works area to prevent muddy water ingress into the CA. Sand bags should be placed to a height 0.1 at least 300mm from ground level and +2.5 mPD (whichever is greater) to provide adequate allowance for the built-up water level during rainstorm events Unpolluted surface runoff within the works area should then be collected and directed into the existing drainage system;
- (k) Sheet-piles, which would be installed around the works trench near the Conservation Area, would be extended above ground level for about 2m to serve as hoardings to isolate the works site;
- (l) Tarpaulin sheets would be used to cover the excavation areas during heavy rainstorms. This would prevent the ingress of rainwater into the trench minimizing the risk of muddy water getting into Wai Ha River and the adjacent Conservation Area;
- (m) Any concrete washing water would be contained inside the works site surrounded by the extended sheet piles. A pump sump at the bottom of the trench would be provided to pump any excess water during concrete washing;
- (n) Stockpiling the excavated materials adjacent to the Conservation Area would not be allowed. The excavated materials would be either removed off site immediately after excavation, or stockpile at location(s) away from the Conservation Area. The stockpile locations shall be approved by the site engineer;
- (o) Debris and refuse generated on-site should be collected, handled and disposed of properly to avoid entering the Wai Ha River and fish ponds at Shuen Wan. Stockpiles of cement and other construction materials should be kept covered when not being used.
- (p) Oils and fuels should only be used and stored in designated areas which have pollution prevention facilities to prevent spillage of fuels and solvents to nearby water bodies, all fuel tanks and storage areas should be provided with locks and be sited on sealed areas, within bunds of a capacity equal to 110% of the storage capacity of the largest tank The bund should be drained of rainwater after a rain event
- (q) Temporary sanitary facilities, such as portable chemical toilets, should be employed on-site. A licensed contractor would be responsible for appropriate disposal and maintenance of these facilities;
- (r) The excavation works within the upstream end of the existing river channel of the Wai Ha River for the construction of the proposed box culvert should be carried out in dry condition. Containment measures such as bunds and barriers shall be used within the affected length of the river channel and the excavation works restricted to within an enclosed dry section of the channel. The excavation works within Wai Ha River shall be restricted to the period from October to April

**Waste Mitigation Measures**

- (a) The Contractor shall observe and comply with the Waste Disposal Ordinance (WDO) and its subsidiary regulations.
- (b) The Contractor shall submit to the Engineer for approval a Waste Management Plan with appropriate mitigation measures including the allocation of an area for waste segregation and shall ensure that the day-to-day site operations comply with the approved waste management plan.
- (c) The Contractor shall minimise the generation of waste from his work. Avoidance and minimisation of waste generation can be achieved through changing or improving design and practices, careful planning and good site management.
- (d) The reuse and recycling of waste shall be practised as far as possible. The recycled materials shall include paper/cardboard, timber and metal etc.
- (e) The Contractor shall ensure that Construction and Demolition (C&D) materials are sorted into public fill (inert portion) and C&D waste (non-inert portion). The public fill which comprises soil, rock, concrete, brick, cement plaster/mortar, inert building debris, aggregates and asphalt shall be reused in earth filling, reclamation or site formation works. The C&D waste which comprises metal, timber, paper, glass, junk and general garbage shall be reused or recycled where possible and, as the last resort, disposal of at landfills.
- (f) The Contractor shall record the amount of wastes generated, recycled and disposed of (including the disposal sites). The Contractor shall use a trip ticket system for the disposal of C&D materials to any designated public filling facility and/or landfill.
- (g) In order to avoid dust or odour impacts, any vehicles leaving a works area carrying construction waste or public fill shall have their load covered.
- (h) To avoid the excessive use of wood, reusable steel shutters shall be used as a preferred alternative to formwork and falsework where possible.
- (i) The Contractor shall observe and comply with the Waste Disposal (Chemical Waste) (General) Regulation. The Contractor shall apply for registration as chemical waste producer under the Waste Disposal (Chemical Waste) (General) Regulation when chemical waste is produced. All chemical waste shall be properly stored, labeled, packaged and collected in accordance with the Regulation.

8.03 KLKJV had been implementing the required environmental mitigation measures according to the Updated Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by KLKJV in this Reporting Quarter are summarized in **Table 8-1**.

**Table 8-1 Environmental Mitigation Measures**

Issues	Environmental Mitigation Measures
Water Quality	<ul style="list-style-type: none"> <li>• Wastewater were appropriately treated by treatment facilities;</li> <li>• Drainage channels were provided to convey run-off into the treatment facilities; and</li> <li>• Drainage systems were regularly and adequately maintained.</li> </ul>
Air Quality	<ul style="list-style-type: none"> <li>• Regular watering to reduce dust emissions from all exposed site surface, particularly during dry weather;</li> <li>• Frequent watering for particularly dusty construction areas and areas close to air sensitive receivers;</li> <li>• Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet;</li> <li>• Public roads around the site entrance/exit had been kept clean and free from dust; and</li> <li>• Tarpaulin covering of any dusty materials on a vehicle leaving the site.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Good site practices to limit noise emissions at the sources;</li> <li>• Use of quiet plant and working methods;</li> <li>• Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs;</li> <li>• Use of shrouds/temporary noise barriers to screen noise from relatively static PMEs;</li> <li>• Scheduling of construction works nearly Tung Tsz Road; and</li> <li>• Alternative use of plant items within one worksite, where practicable.</li> </ul>

Issues	Environmental Mitigation Measures
Waste and Chemical Management	<ul style="list-style-type: none"><li>• Excavated material should be reused on site as far as possible to minimize off-site disposal. Scrap metals or abandoned equipment should be recycled if possible;</li><li>• Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner;</li><li>• The Contractor should adopt a trip ticket system for the disposal of C&amp;D materials to any designed public filling facility and/or landfill; and</li><li>• Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.</li></ul>
General	<ul style="list-style-type: none"><li>• The site was generally kept tidy and clean.</li></ul>

## 9.0 CONCLUSIONS AND RECOMMENTATIONS

### CONCLUSIONS

- 9.01 This is the 2<sup>nd</sup> Quarterly EM&A Summary Report under Environmental Permit No.EP-303/2008 for the Contract No. DC/2010/02 - Drainage Improvement in Shuen Wan and Shek Wu Wai, covering the period from **1 October to 31 December 2011**.
- 9.02 No noise complaint (which is an Action Level exceedance) was received and no construction noise measurement results and hydrological characteristics results that exceeded the Limit Level were recorded in this Reporting Quarter.
- 9.03 133 Action/Limit Levels exceedances, namely 79 dissolved oxygen, 41 turbidity and 13 suspended solids were recorded in water quality monitoring in this Reporting Quarter. Investigation reports concluded that all registered exceedances were not related to the work under the Project.
- 9.04 No documented complaint, notification of summons or successful prosecution was received.
- 9.05 Weekly environmental site inspections had been carried out by the Contractor and the RE on **8, 14, 21, 28 October, 3, 10, 17, 24 November 2011 and 1, 7 15, 21 and 29 December 2011**. Furthermore, the RE, IEC, the Contractor and ET of joint site inspection was carried out on **14 October, 10 November and 7 December 2011**. In this Reporting Quarter, no non-compliance were recorded but **14** observations and 3 reminders were note. The environmental performance of the Project was therefore considered satisfactory.
- 9.06 During this Reporting Quarter, **7** events of landscape and visual inspection were carried out by a landscape sub-contractor.
- 9.07 No site visit was undertaken by any external party in this Reporting Quarter.

### RECOMMENDATIONS

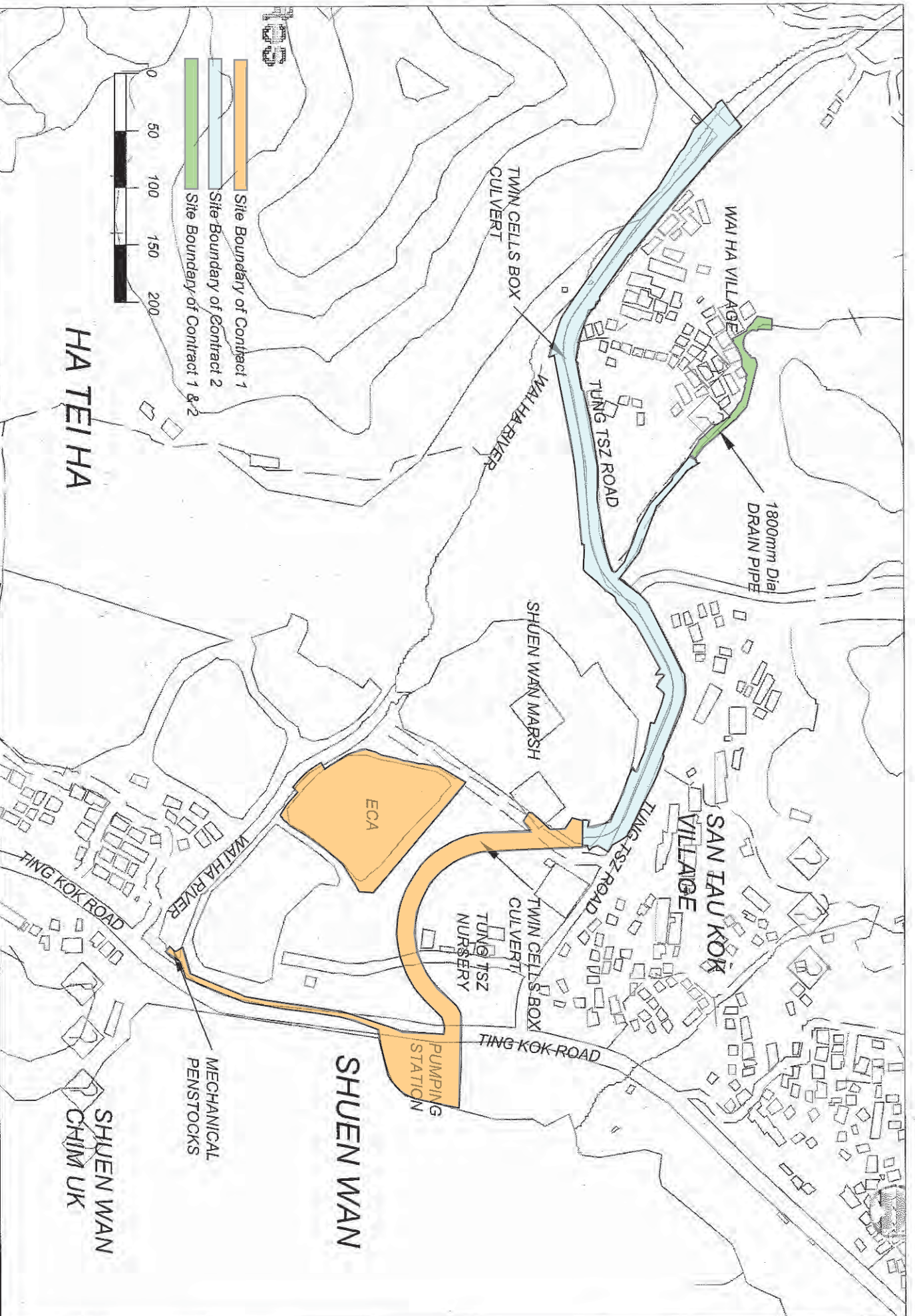
- 9.08 The mitigation measures recommended in the EM&A Manual were implemented properly during the Reporting Quarter. Although breaches of water quality criteria were frequently recorded in this Reporting Quarter, all the exceedances were concluded that not related to works under the Project and a revision of A/L Limit is under reviewed by IEC. Therefore, the implemented mitigation measures recommended in the EM&A Manual effectively minimize the environmental impact arise from the works on the Project.
- 9.09 During dry season, special attention should be paid to the dust mitigation measures to avoid fugitive dust emissions from loose soil surface or haul road. On the other hand, construction noise should be other key environmental issue during sheet-piling process. The noise mitigation measures should be necessary to implement in accordance with EM&A Manual stipulation.
- 9.10 To control the site performance on waste management, the KLKJV shall ensure that all solid and liquid waste management works are fully in compliance with the relevant license/permit requirements, such as the effluent discharge licence and the chemical waste producer registration. KLKJV is also reminded to implement the recommended environmental mitigation measures according to the Updated Environmental Monitoring and Audit Manual.
- 9.11 Baseline monitoring of water quality was conducted during typical Hong Kong dry season. It is important that influence of the seasonal changes is taken into account when interpreting monitoring data of water quality obtained in the coming wet season. Review of the baseline conditions may need to be conducted regularly in particular during times of seasonal changes. If the baseline changes are evident, the environmental performance criteria should be re-established under agreement of the ER and IEC and submitted to the EPD for endorsement.

**END OF TEXT**

## **Appendix A**

### **Site Location Plan (DSD Contract 1 and Contract 2 at Shuen Wan)**

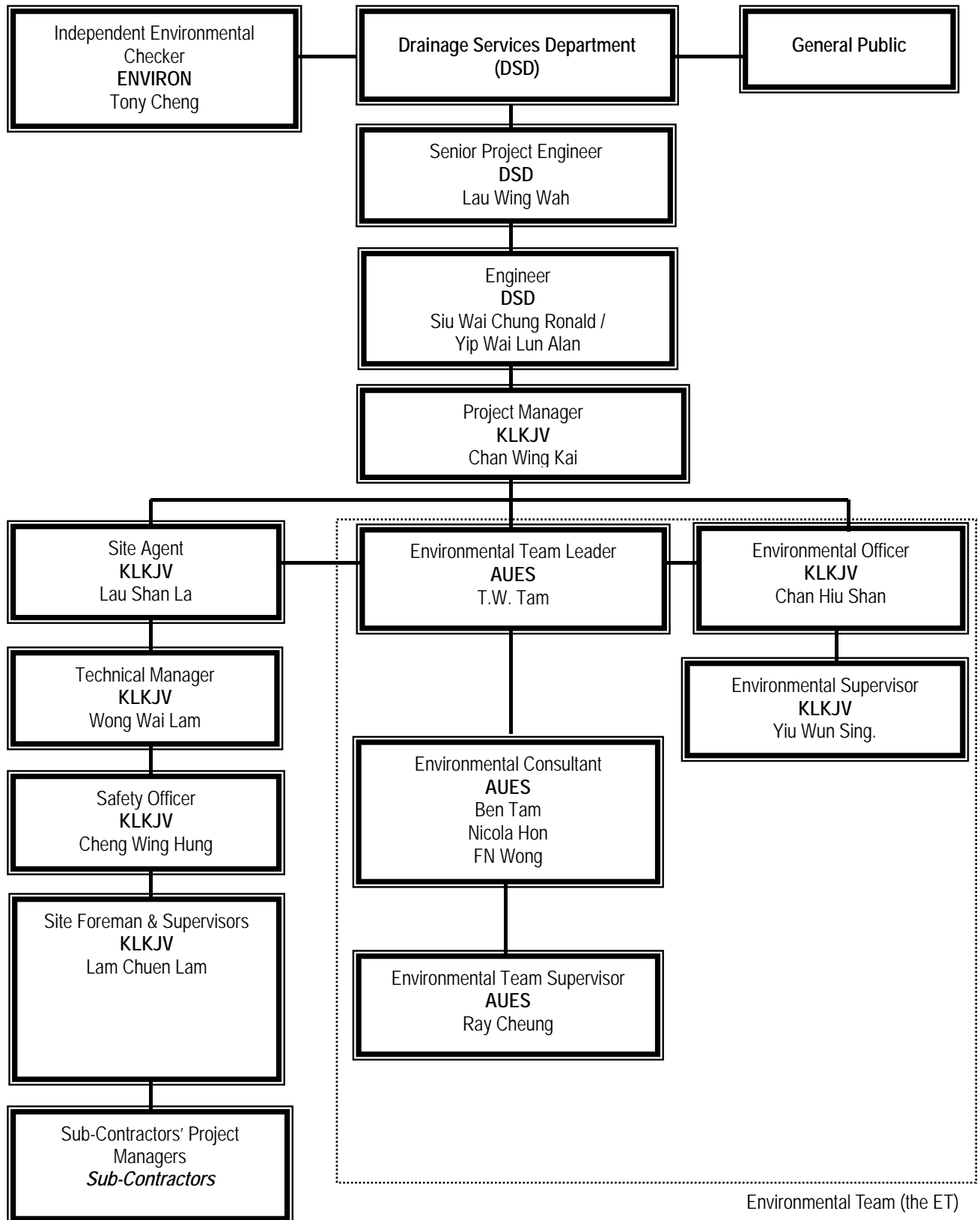




Site Location Plan of DSD Contract 1 and Contract 2 at Shuen Wan

## **Appendix B**

### **Organization Chart and the Key Contact Person**



Environmental Team (the ET)

Environmental Management Organization



**Contact Details of Key Personnel**

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. Luk Wai Hung	2594 7400	2827 8700
DSD	Senior Engineer	Mr. Lau Wing Wah	2594 7402	2827 8700
DSD	Engineer	Mr. Siu Wai Chung, Ronald	2594 7595	2827 8700
DSD	Engineer	Mr. Yip Wai Lun	2594 7359	2827 8700
DSD	Senior Inspector	Mr. Tso Si On	6778 2708	2827 8700
ENVIRON	Independent Environmental Checker	Mr. Tong Cheng	3743-0788	3548-6988
KLKJV	Project Director	Mr. Poon Chi Yeung Francis	2674 3888	2674 9988
KLKJV	Project Manager	Mr. Chan Wing Kai	2674 3888	2674 9988
KLKJV	Site Agent	Mr. Lau Shan La	2674 3888	2674 9988
KLKJV	Sub- Agent	Mr. Wong Wai Lam,	2674 3888	2674 9988
KLKJV	Technical Manager	Mr. Yeung Tai Yung	9674 9712	2674 9988
KLKJV	Site Forman	Mr. Lam Chuen Lam	2674 3888	2674 9988
KLKJV	Environmental Officer	Miss. Chan Hiu Shan	2674 3888	2674 9988
KLKJV	Environmental Supervisor	Mr. Yiu Wun Sing	2674 3888	2674 9988
AUES	Environmental Team Leader	Mr. T.W. Tam	2959-6059	2959-6079
AUES	Senior Environmental Consultant	Mr. Wong Fu Nam	2959-6059	2959-6079
AUES	Environmental Consultant	Miss. Nicola Hon	2959-6059	2959-6079
AUES	Environmental Consultant	Mr. Ben Tam	2959-6059	2959-6079
AUES	Environmental Team Supervisor	Mr. Ray Cheung	2959-6059	2959-6079

Legends:

DSD (Employer) – Drainage Services Department

DSD (Engineer) – Drainage Services Department

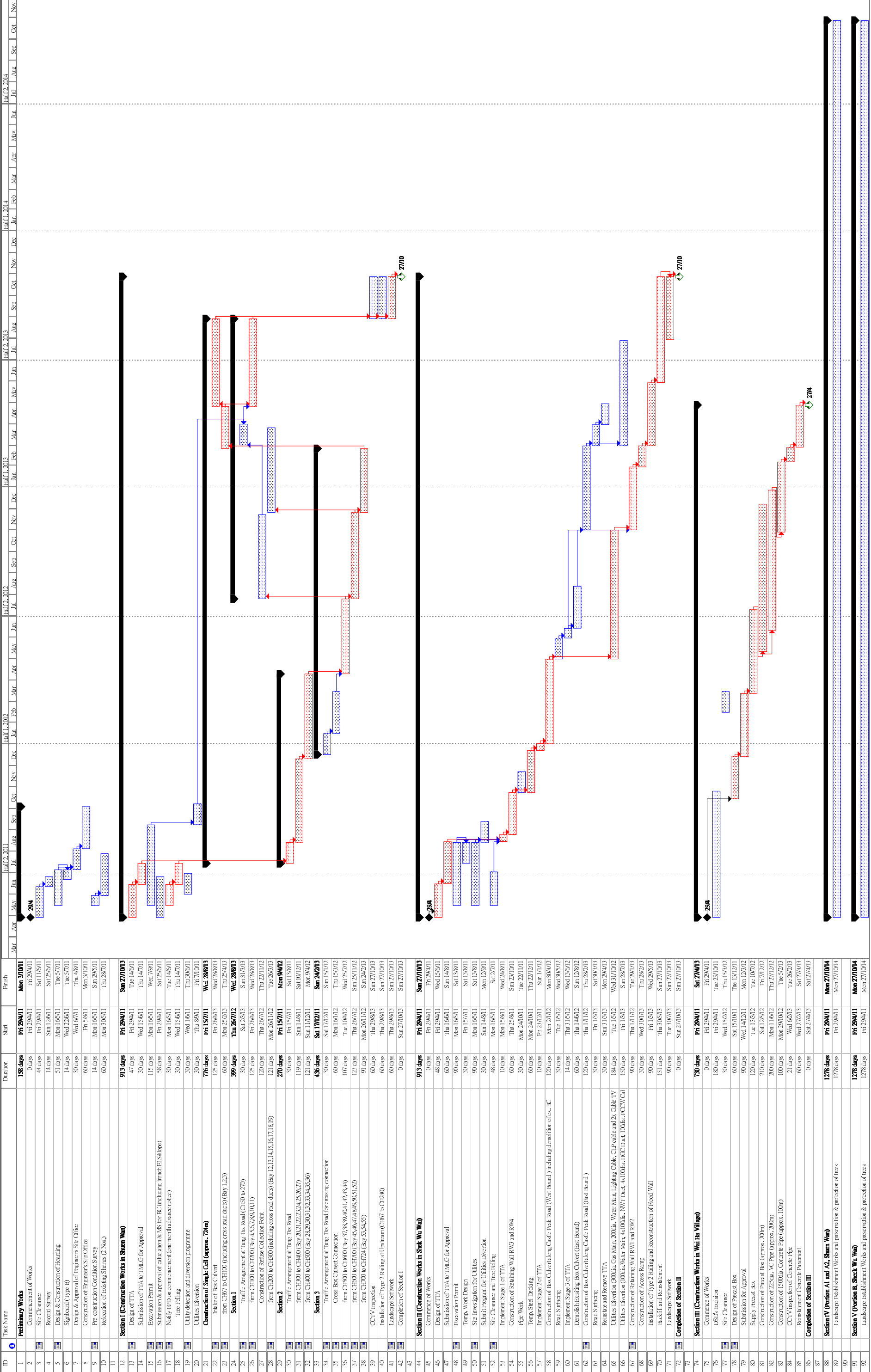
KLKJV (Main Contractor) – Kwan Lee-Kuly Joint Venture

ENVIRON (IEC) – ENVIRON Hong Kong Limited

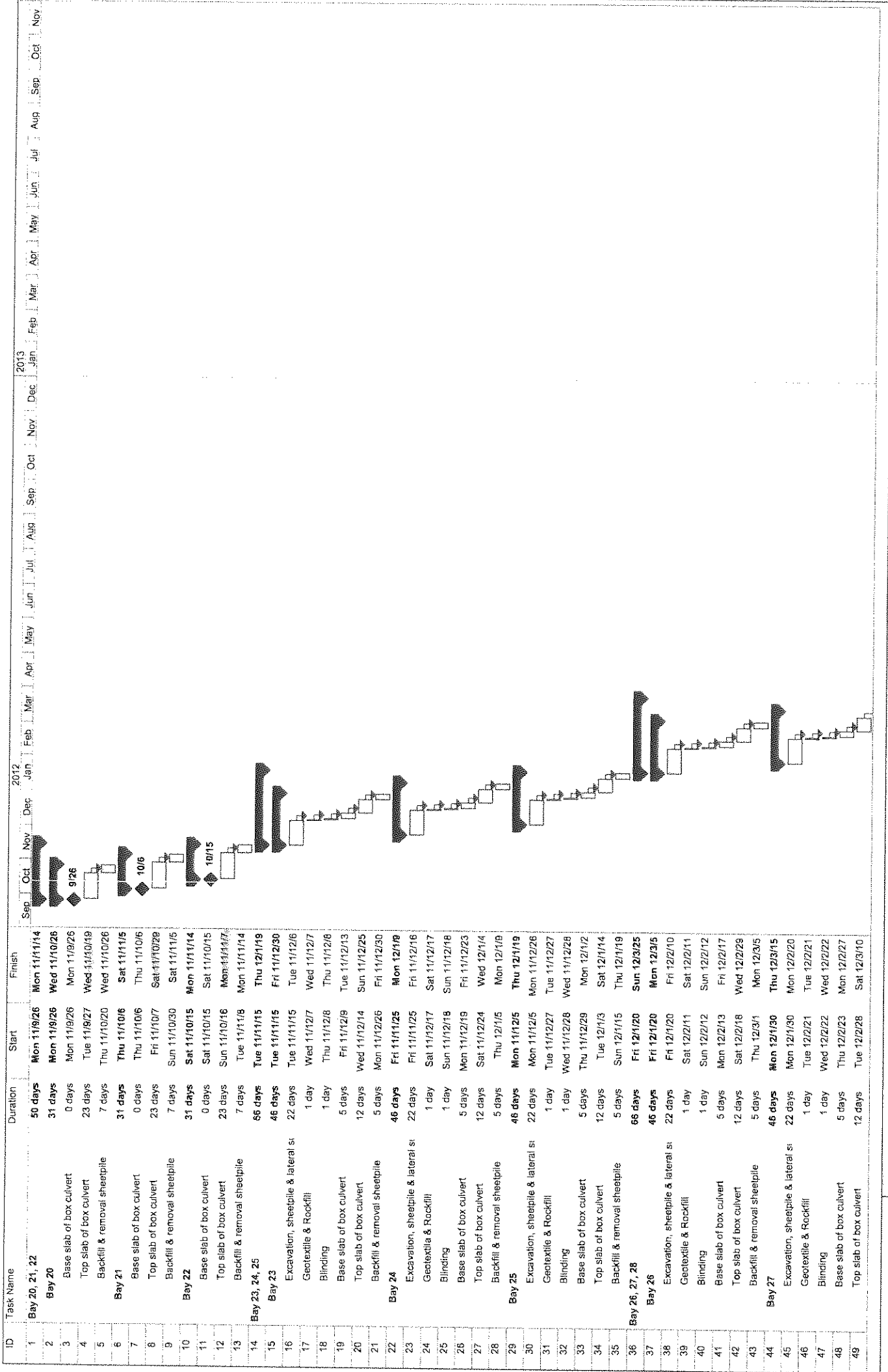
AUES (ET) – Action-United Environmental Services & Consulting

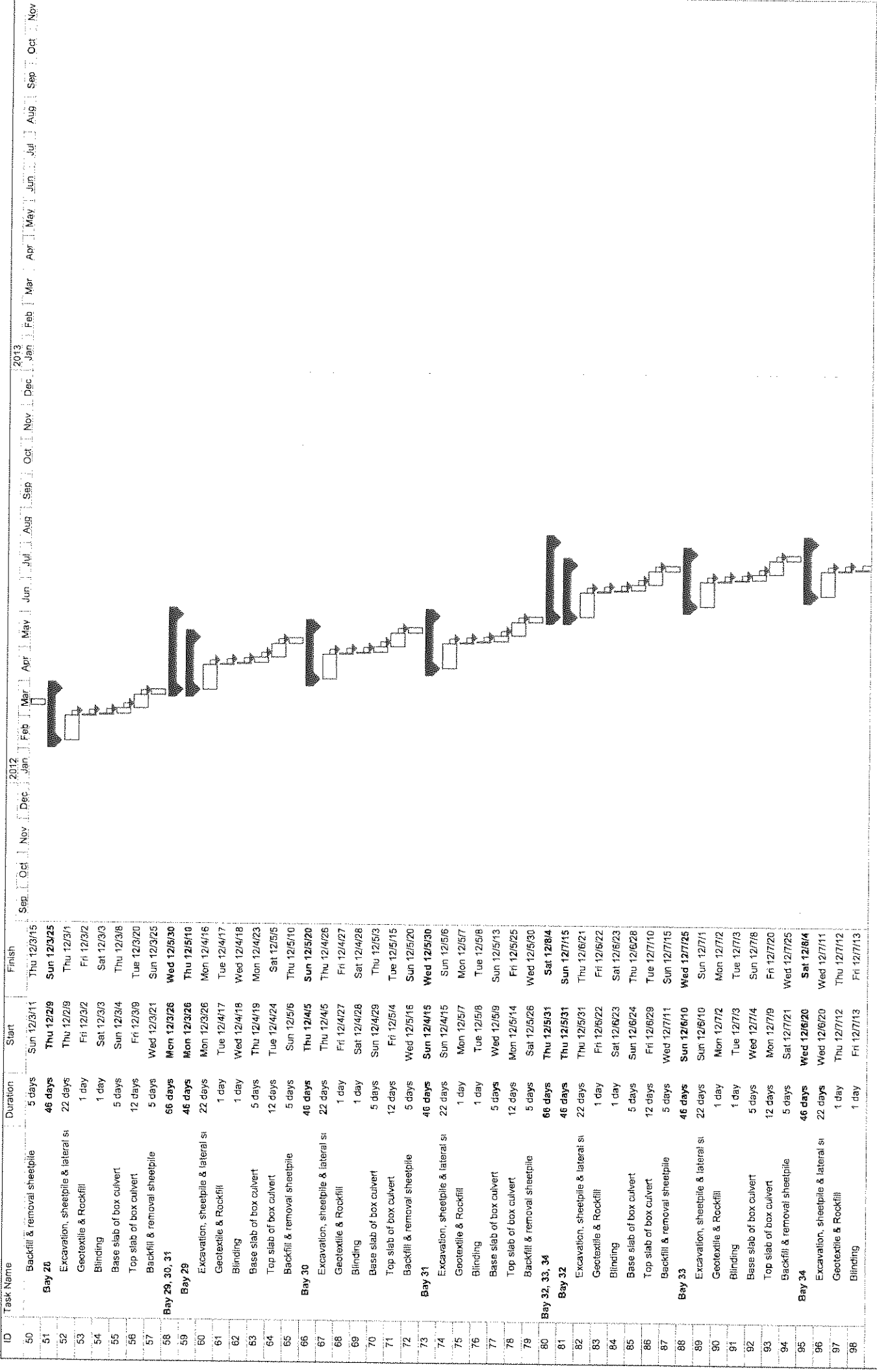
## **Appendix C**

### **Master and Three Months Rolling Construction Programme**

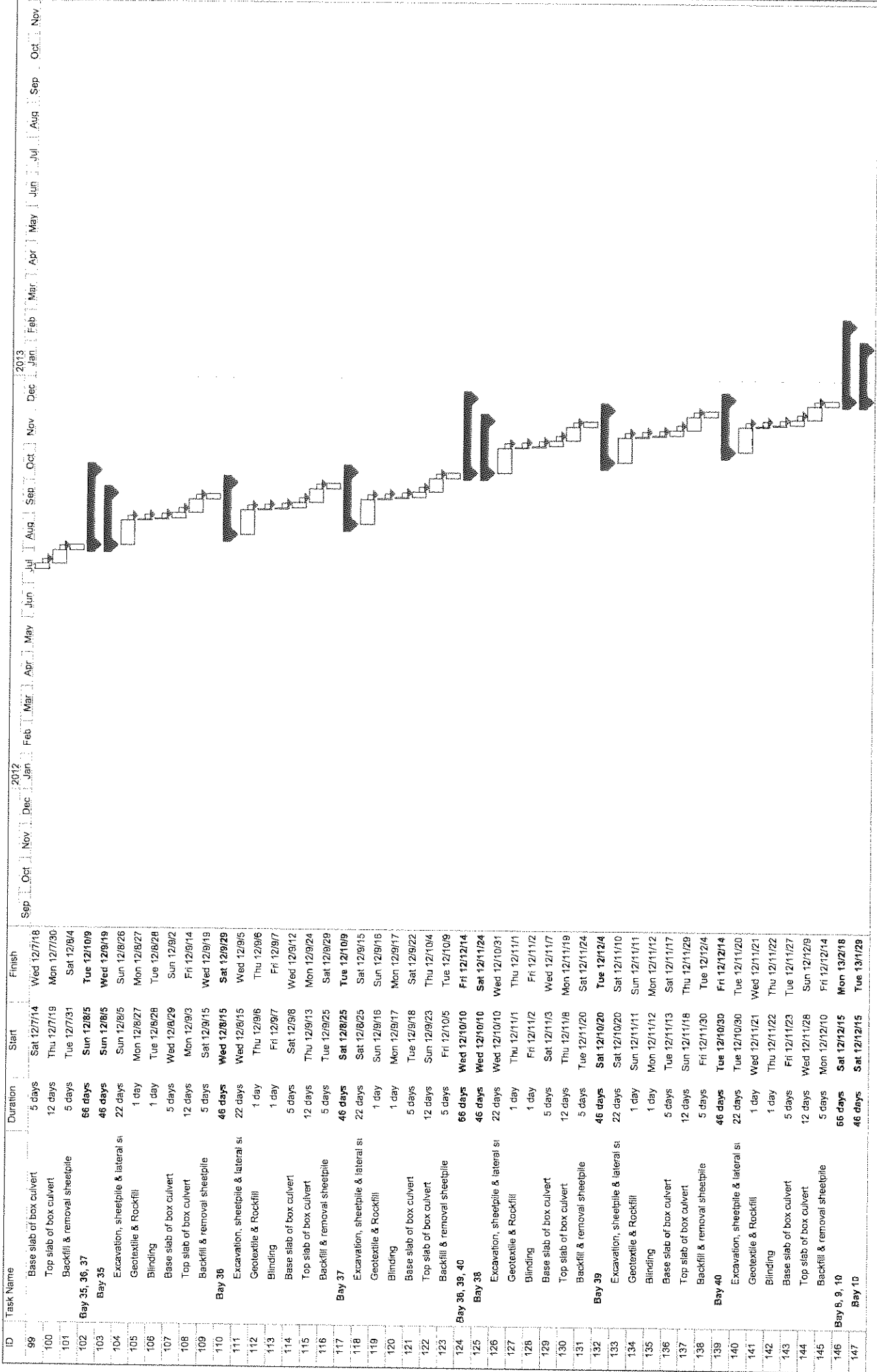


ID	Task Name	Duration	Start	Finish
1	<b>Preliminary Works</b>	158 days	Fri 29/04/11	Mon 30/06/11
2	Commencement of Works	0 days	Fri 29/04/11	Fri 29/04/11
3	Site Clearance	44 days	Fri 29/04/11	Sat 11/06/11
4	Recruit Survey	14 days	Fri 29/04/11	Sat 25/05/11
5	Design & Construction of Hearding	51 days	Mon 16/05/11	Tue 5/7/11
6	Signboard (Type B)	14 days	Wed 22/05/11	Tue 5/7/11
7	Design & Approval of Engineer's Site Office	30 days	Wed 22/05/11	Thu 4/8/11
8	Construction of Engineer's Site Office	60 days	Fri 5/8/11	Mon 31/08/11
9	Pre-construction Condition Survey	14 days	Mon 15/05/11	Mon 29/05/11
10	Relocation of Existing Strains (2 Nos.)	60 days	Mon 30/05/11	Thu 28/7/11
11				
12	<b>Section I (Construction Works in Shuen Wan)</b>	913 days	Fri 29/04/11	Sun 27/10/13
13	Design of TTA	47 days	Thu 14/06/11	Thu 14/7/11
14	Submission of TTA to TM.G for Approval	30 days	Wed 15/06/11	Thu 14/7/11
15	Excavation Permit	115 days	Mon 16/05/11	Wed 7/9/11
16	Submission & approval of calculation & MS for BC (including trench H/S slope)	58 days	Fri 29/04/11	Sat 25/05/11
17	Notify EPD on commencement (one month advance notice)	30 days	Mon 16/05/11	Thu 14/6/11
18	Trench Felling	30 days	Wed 15/06/11	Thu 14/7/11
19	Utility detection and diversion programme	30 days	Thu 14/7/11	Thu 14/7/11
20	Utilities Diversion	776 days	Fri 7/10/11	Wed 28/09/13
21	<b>Construction of Single Cell (approx. 74m)</b>	125 days	Fri 26/04/13	Wed 28/09/13
22	Inlet of Box Culvert	60 days	Mon 25/02/13	Thu 25/04/13
23	from CH67 to CH100 (including cross road ducts) (Rv 1,2,3)	30 days	Mon 25/02/13	Thu 25/04/13
24	<b>Section 1</b>	399 days	Thu 26/7/12	Wed 28/09/13
25	Traffic Arrangement of Tung Tsz Road (C150 to 270)	125 days	Fri 26/04/13	Wed 28/09/13
26	from CH100 to CH100 (Rv 4,5,6,7,8,9,10,11)	120 days	Thu 26/7/12	Thu 26/7/12
27	Construction of Refuse Collection Point	121 days	Mon 26/01/12	Thu 26/04/13
28	from CH200 to CH100 (including cross road ducts) (Rv 12,13,14,15,16,17,18,19)	270 days	Fri 15/7/11	Mon 9/4/12
29	Traffic Arrangement of Tung Tsz Road for crossing connection	30 days	Fri 15/7/11	Sat 13/8/11
30	from CH300 to CH400 (Rv 20,21,22,23,24,25,26,27)	119 days	Sun 14/8/11	Sat 10/7/11
31	from CH400 to CH150 (Rv 28,29,30,31,32,33,34,35,36)	121 days	Sun 11/7/11	Mon 9/4/12
32	<b>Section 2</b>	436 days	Sat 17/12/11	Sun 24/12/13
33	Traffic Arrangement of Tung Tsz Road for crossing connection	60 days	Mon 16/01/12	Thu 15/02/12
34	Cross Box Culvert Connection	107 days	Thu 04/02/12	Wed 25/07/12
35	from CH500 to CH100 (Rv 37,38,39,40,41,42,43,44)	123 days	Mon 26/01/12	Sun 24/02/12
36	from CH100 to CH170 (Rv 45,46,47,48,49,50,51,52)	91 days	Mon 26/01/12	Sun 24/02/12
37	from CH170 to CH1724 (Rv 53,54,55)	60 days	Thu 29/08/13	Sun 27/10/13
38	CCTV Inspection	60 days	Thu 29/08/13	Sun 27/10/13
39	Installation of Type 2 Rolling at Upstream (CH67 to CH140)	60 days	Thu 29/08/13	Sun 27/10/13
40	Landscape Softwork	0 days	Sun 27/10/13	Sun 27/10/13
41	Completion of Section I			
42				
43	<b>Section II (Construction Works in Shek Wu Wai)</b>	913 days	Fri 29/04/11	Sun 27/10/13
44	Commencement of Works	0 days	Fri 29/04/11	Fri 29/04/11
45	Design of TTA	48 days	Fri 29/04/11	Wed 15/06/11
46	Submission of TTA to TM.G for Approval	30 days	Thu 14/6/11	Sun 14/8/11
47	Excavation Permit	60 days	Mon 16/05/11	Sat 13/8/11
48	Temp. Work Design	30 days	Fri 15/7/11	Sat 13/8/11
49	Site Investigation for Utilities	30 days	Mon 16/05/11	Sat 13/8/11
50	Submit Program for Utilities Diversion	30 days	Mon 14/8/11	Mon 12/9/11
51	Site Clearance and Tree Felling	48 days	Mon 16/05/11	Sat 27/11/11
52	Implement Stage 1 of TTA	10 days	Mon 15/8/11	Wed 24/8/11
53	Construction of Retaining Wall RW3 and RW4	60 days	Thu 5/8/11	Mon 25/10/11
54	Pipe Work	30 days	Mon 24/10/11	Thu 21/11/11
55	Temp. Silted Decking	60 days	Mon 24/10/11	Thu 21/11/11
56	Implement Stage 2 of TTA	10 days	Fri 25/12/11	Sun 17/1/12
57	Construction of Box Culvert along Castle Peak Road (West Bound) including demolition of ex. BC	120 days	Mon 21/12/11	Mon 30/4/12
58	Road Surfacing	30 days	Thu 16/2/12	Wed 30/5/12
59	Implement Stage 3 of TTA	14 days	Thu 31/8/12	Wed 13/9/12
60	Demolish Existing Box Culvert (East Bound)	60 days	Thu 14/6/12	Sun 12/9/12
61	Construction of Box Culvert along Castle Peak Road (East Bound)	120 days	Thu 17/1/12	Thu 28/2/13
62	Road Surfacing	30 days	Fri 1/6/13	Sat 30/5/13
63	Reinstate and Remove TTA	30 days	Sun 31/6/13	Mon 29/4/13
64	Utilities Diversion (300kva Gas Main, 200kva Water Main, Lifting Cable, CLP cable and 2x Cable TV)	184 days	Thu 15/12/11	Wed 31/10/12
65	Utilities Diversion (100kva Water Main, 4x 100kva, NWT Duct, 4x 100kva, RCC Duct, 100kva, RCCW Cal)	150 days	Fri 1/6/13	Sun 28/7/13
66	Construction of Retaining Wall RW1 and RW2	90 days	Thu 17/1/12	Thu 28/1/13
67	Construction of Access Ramp	30 days	Wed 30/1/13	Thu 28/2/13
68	Installation of Type 2 Rolling and Reconstruction of Flood Wall	90 days	Fri 1/6/13	Wed 29/8/13
69	Backfill and Reinstatement	151 days	Thu 30/5/13	Sun 27/10/13
70	Landscape Softwork	90 days	Tue 3/10/13	Sun 27/10/13
71	<b>Completion of Section II</b>			
72				
73	<b>Section III (Construction Works in Wai Tia Village)</b>	776 days	Fri 29/04/11	Sat 27/10/13
74	Commencement of Works	0 days	Fri 29/04/11	Fri 29/04/11
75	DSE's Excision	180 days	Fri 29/04/11	Thu 25/10/11
76	Site Clearance	30 days	Wed 15/02/12	Thu 15/02/12
77	Design of Precast Box	60 days	Sat 15/10/11	Thu 13/1/12
78	Submission for Approval	90 days	Wed 14/7/12	Mon 12/9/12
79	Supply Precast Box	120 days	Thu 13/6/12	Thu 10/7/12
80	Construction of Precast Box (approx. 200m)	210 days	Sat 12/5/12	Fri 7/7/12
81	Construction of 225kva, VC Pipe (approx. 200m)	200 days	Mon 11/6/12	Thu 7/1/12
82	Construction of 150kva, Concrete Pipe (approx. 100m)	100 days	Mon 29/10/12	Tue 5/7/13
83	CCTV Inspection of Concrete Pipe	21 days	Wed 6/2/13	Thu 28/2/13
84	Reinstate Concrete Pavement	60 days	Wed 27/10/13	Sat 27/10/13
85	<b>Completion of Section III</b>			
86				
87	<b>Section IV (Portion A1 and A2, Shuen Wan)</b>	1278 days	Fri 29/04/11	Mon 27/10/14
88	Landscape Establishment Works and preservation & protection of trees	1278 days	Fri 29/04/11	Mon 27/10/14
89				
90	<b>Section V (Portion B, Shek Wu Wai)</b>	1278 days	Fri 29/04/11	Mon 27/10/14
91	Landscape Establishment Works and preservation & protection of trees	1278 days	Fri 29/04/11	Mon 27/10/14
92				





Progress  
 Milestone  
 Summary  
 Project Summary  
 External Tasks  
 External Milestone  
 Deadline



ID	Task Name	Duration	Start	Finish
99	Base slab of box culvert	5 days	Sat 12/7/14	Wed 12/7/18
100	Top slab of box culvert	12 days	Thu 12/7/19	Mon 12/7/30
101	Backfill & removal sheepile	5 days	Tue 12/7/31	Sat 12/8/4
102	Bay 35, 36, 37	66 days	Sun 12/8/5	Tue 12/10/9
103	Excavation, sheepile & lateral sl	22 days	Sun 12/8/5	Sun 12/8/26
104	Geotextile & Rockfill	1 day	Mon 12/8/27	Mon 12/8/28
105	Blinding	1 day	Tue 12/8/28	Tue 12/8/28
106	Base slab of box culvert	5 days	Wed 12/8/29	Sun 12/9/2
107	Top slab of box culvert	12 days	Mon 12/9/3	Fri 12/9/14
108	Backfill & removal sheepile	5 days	Sat 12/9/15	Wed 12/9/19
109	Bay 38	46 days	Wed 12/8/15	Sat 12/9/29
110	Excavation, sheepile & lateral sl	22 days	Wed 12/8/15	Wed 12/9/5
111	Geotextile & Rockfill	1 day	Thu 12/9/6	Thu 12/9/6
112	Blinding	1 day	Fri 12/9/7	Fri 12/9/7
113	Base slab of box culvert	5 days	Sat 12/9/8	Wed 12/9/12
114	Top slab of box culvert	12 days	Thu 12/9/13	Mon 12/9/24
115	Backfill & removal sheepile	5 days	Tue 12/9/25	Sat 12/9/29
116	Bay 37	46 days	Sat 12/8/25	Tue 12/10/9
117	Excavation, sheepile & lateral sl	22 days	Sat 12/8/25	Sat 12/9/15
118	Geotextile & Rockfill	1 day	Sun 12/9/16	Sun 12/9/16
119	Blinding	1 day	Mon 12/9/17	Mon 12/9/17
120	Base slab of box culvert	5 days	Tue 12/9/18	Sat 12/9/22
121	Top slab of box culvert	12 days	Sun 12/9/23	Thu 12/10/4
122	Backfill & removal sheepile	5 days	Fri 12/10/5	Tue 12/10/9
123	Bay 36, 39, 40	66 days	Wed 12/10/10	Fri 12/12/14
124	Excavation, sheepile & lateral sl	22 days	Wed 12/10/10	Sat 12/11/24
125	Geotextile & Rockfill	1 day	Thu 12/11/1	Wed 12/10/31
126	Blinding	1 day	Thu 12/11/1	Thu 12/11/1
127	Base slab of box culvert	5 days	Fr 12/11/2	Fr 12/11/2
128	Top slab of box culvert	12 days	Sat 12/11/3	Wed 12/11/7
129	Backfill & removal sheepile	5 days	Thu 12/11/8	Mon 12/11/19
130	Bay 39	46 days	Tue 12/11/20	Sat 12/11/24
131	Excavation, sheepile & lateral sl	22 days	Sat 12/10/20	Tue 12/12/4
132	Geotextile & Rockfill	1 day	Sat 12/10/20	Sat 12/11/10
133	Blinding	1 day	Sun 12/11/11	Sun 12/11/11
134	Base slab of box culvert	5 days	Mon 12/11/12	Mon 12/11/12
135	Top slab of box culvert	12 days	Tue 12/11/13	Sat 12/11/17
136	Backfill & removal sheepile	5 days	Sun 12/11/18	Thu 12/11/29
137	Bay 40	46 days	Fri 12/11/30	Tue 12/12/4
138	Excavation, sheepile & lateral sl	22 days	Tue 12/10/30	Fri 12/12/14
139	Geotextile & Rockfill	1 day	Tue 12/10/30	Tue 12/11/20
140	Blinding	1 day	Wed 12/11/21	Wed 12/11/21
141	Base slab of box culvert	5 days	Thu 12/11/22	Thu 12/11/22
142	Top slab of box culvert	12 days	Fri 12/11/23	Tue 12/11/27
143	Backfill & removal sheepile	5 days	Mon 12/12/10	Fri 12/12/14
144	Bay 8, 9, 10	66 days	Sat 12/12/15	Mon 13/2/18
145	Excavation, sheepile & lateral sl	22 days	Sat 12/12/15	Tue 13/1/29
146	Geotextile & Rockfill	1 day	Sat 12/12/15	Tue 13/1/29
147	Blinding	1 day	Sat 12/12/15	Tue 13/1/29

Project: Tung Tsz Road  
Date: Wed 11/10/12

Task Split

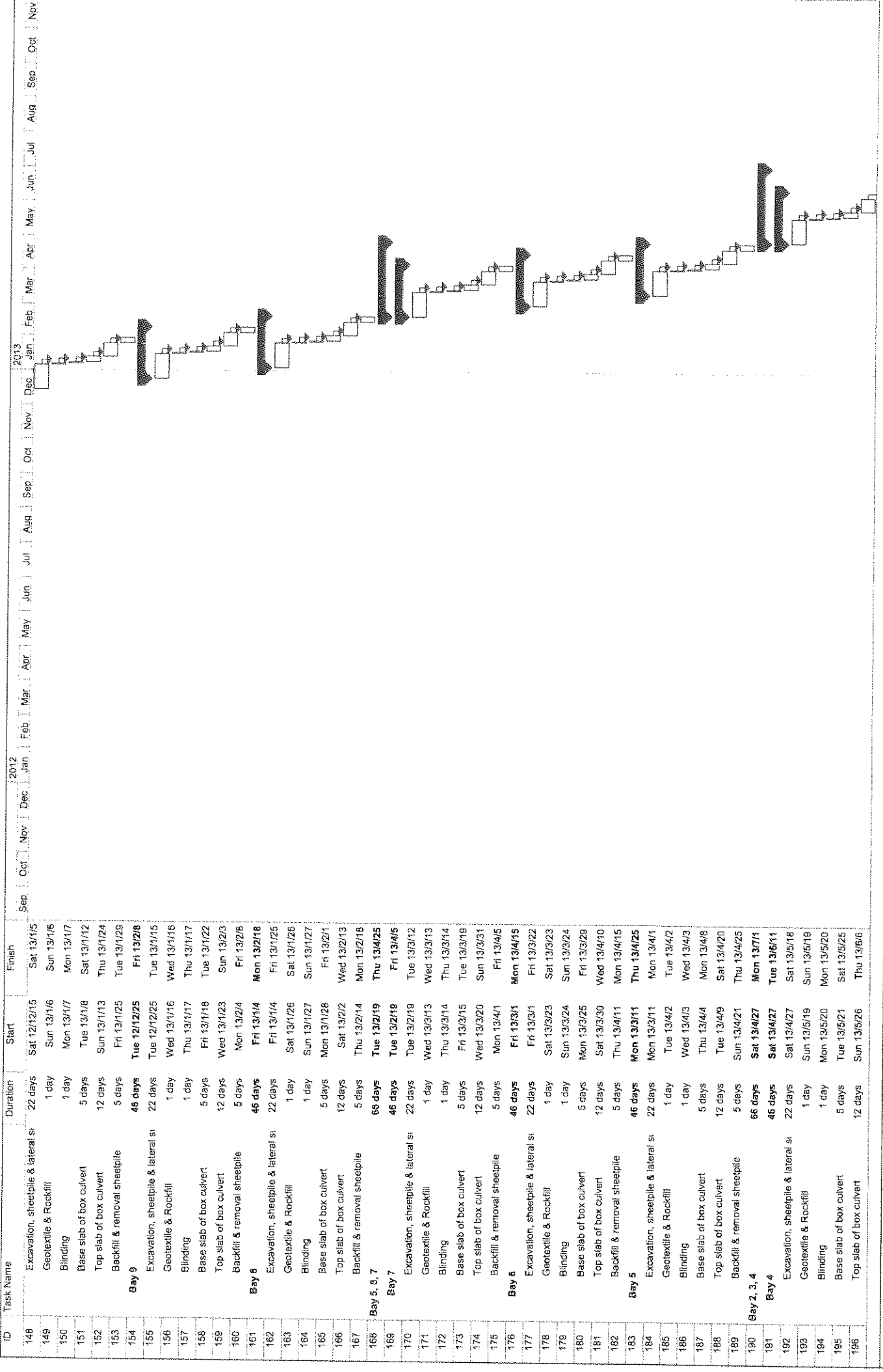
Progress Milestone

Summary Project Summary

External Tasks External Milestone

Deadline

Page 3

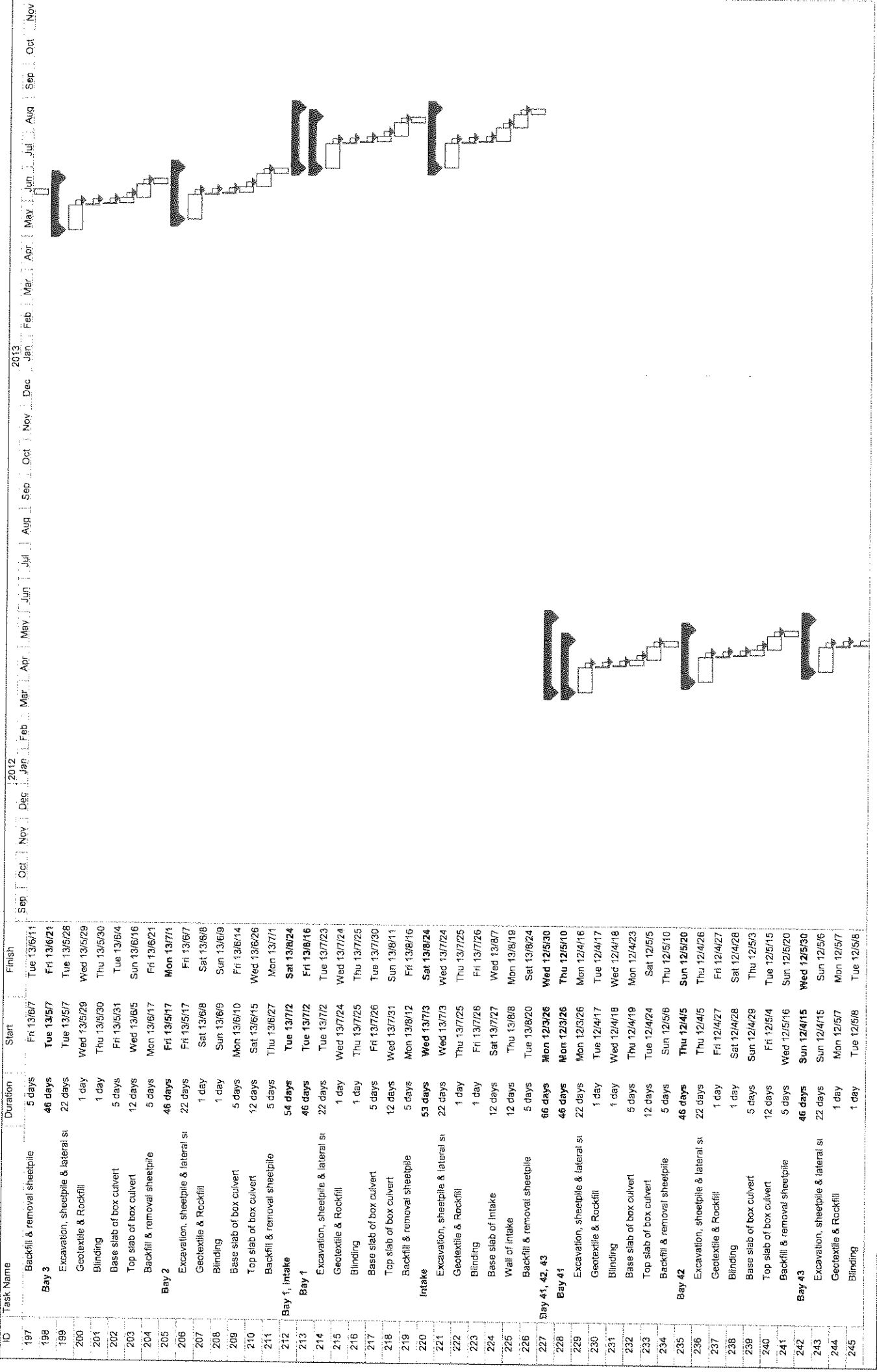


Project: Tung Tsz Road  
 Date: Wed 11/10/12

Legend:  
 Progress: [Solid Bar]  
 Milestone: [Diamond]  
 Summary: [Dotted Bar]  
 Project Summary: [Horizontal Line]  
 External Tasks: [Dotted Bar]  
 External Milestone: [Diamond]

Navigation: [Left Arrow] [Right Arrow]

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Project: Tung Tsz Road  
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Summary  
 Project Summary

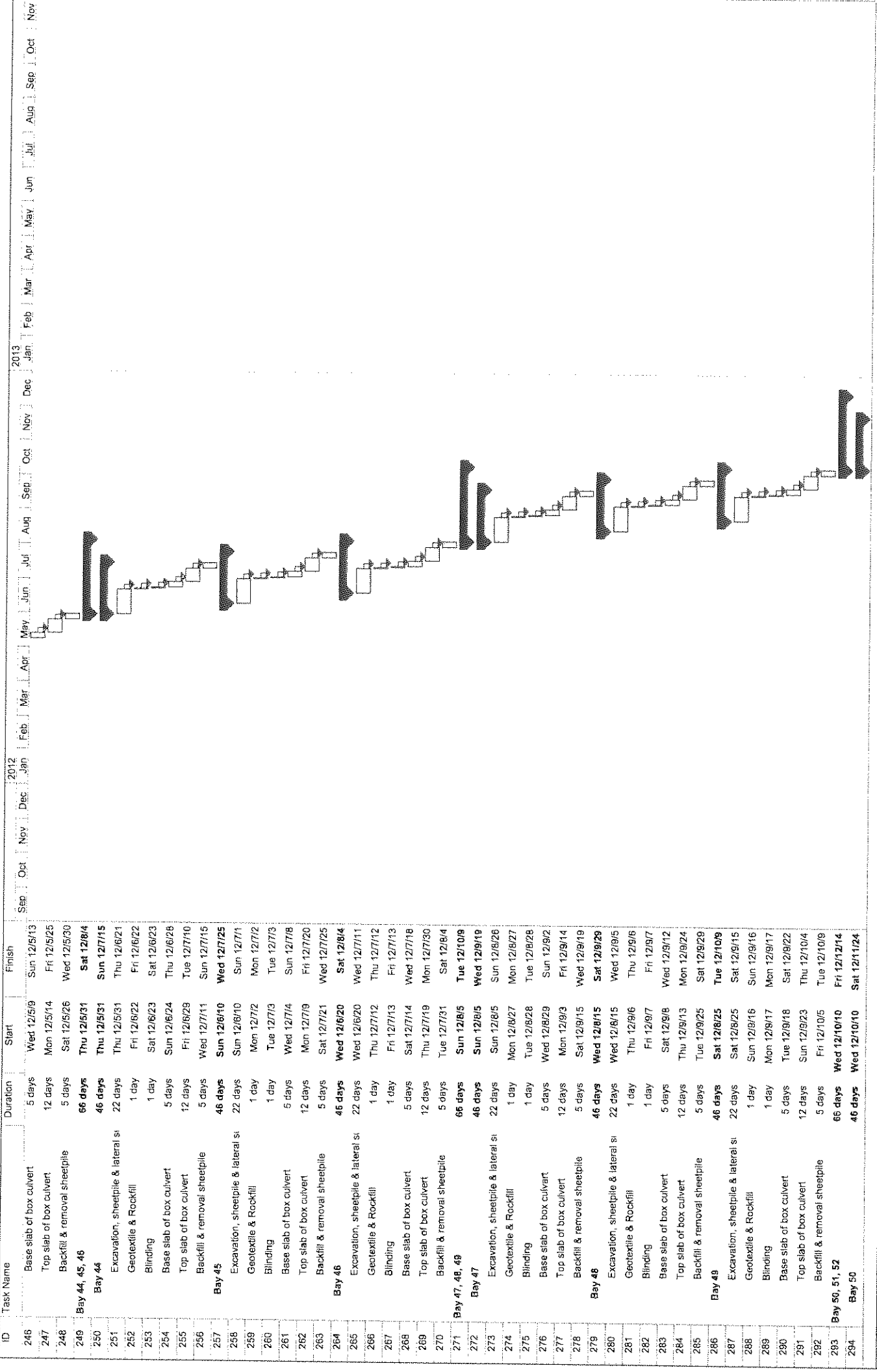
Progress  
 Milestone

External Tasks  
 External Milestone

Deadline

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ID	Task Name	Duration	Start	Finish	Progress	Milestone
246	Base slab of box culvert	5 days	Wed 12/5/13	Sun 12/5/13		
247	Top slab of box culvert	12 days	Mon 12/5/14	Fri 12/5/25		
248	Backfill & removal sheetpile	5 days	Sat 12/5/26	Wed 12/5/30		
249	Bay 44, 45, 46	66 days	Thu 12/6/31	Sat 12/8/4		
250	Bay 44	46 days	Thu 12/6/31	Sun 12/7/15		
251	Excavation, sheetpile & lateral sheetpile	22 days	Thu 12/6/31	Thu 12/6/21		
252	Geotextile & Rockfill	1 day	Fri 12/6/22	Fri 12/6/22		
253	Blinding	1 day	Sat 12/6/23	Sat 12/6/23		
254	Base slab of box culvert	5 days	Sun 12/6/24	Thu 12/6/28		
255	Top slab of box culvert	12 days	Fri 12/6/29	Tue 12/7/10		
256	Backfill & removal sheetpile	5 days	Wed 12/7/11	Sun 12/7/15		
257	Bay 45	46 days	Sun 12/6/10	Wed 12/7/25		
258	Excavation, sheetpile & lateral sheetpile	22 days	Sun 12/6/10	Sun 12/7/1		
259	Geotextile & Rockfill	1 day	Mon 12/7/2	Mon 12/7/2		
260	Blinding	1 day	Tue 12/7/3	Tue 12/7/3		
261	Base slab of box culvert	5 days	Wed 12/7/4	Sun 12/7/8		
262	Top slab of box culvert	12 days	Mon 12/7/9	Fri 12/7/20		
263	Backfill & removal sheetpile	5 days	Sat 12/7/21	Wed 12/7/25		
264	Bay 46	46 days	Wed 12/6/20	Sat 12/8/4		
265	Excavation, sheetpile & lateral sheetpile	22 days	Wed 12/6/20	Wed 12/7/11		
266	Geotextile & Rockfill	1 day	Thu 12/7/12	Thu 12/7/12		
267	Blinding	1 day	Fri 12/7/13	Fri 12/7/13		
268	Base slab of box culvert	5 days	Sat 12/7/14	Wed 12/7/18		
269	Top slab of box culvert	12 days	Thu 12/7/19	Mon 12/7/30		
270	Backfill & removal sheetpile	5 days	Tue 12/7/31	Sat 12/8/4		
271	Bay 47, 48, 49	66 days	Sun 12/8/5	Tue 12/10/9		
272	Bay 47	46 days	Sun 12/8/5	Wed 12/9/19		
273	Excavation, sheetpile & lateral sheetpile	22 days	Sun 12/8/5	Sun 12/8/26		
274	Geotextile & Rockfill	1 day	Mon 12/8/27	Mon 12/8/27		
275	Blinding	1 day	Tue 12/8/28	Tue 12/8/28		
276	Base slab of box culvert	5 days	Wed 12/8/29	Sun 12/9/2		
277	Top slab of box culvert	12 days	Mon 12/9/3	Fri 12/9/14		
278	Backfill & removal sheetpile	5 days	Sat 12/9/15	Wed 12/9/19		
279	Bay 48	46 days	Wed 12/8/15	Sat 12/9/29		
280	Excavation, sheetpile & lateral sheetpile	22 days	Wed 12/8/15	Wed 12/9/5		
281	Geotextile & Rockfill	1 day	Thu 12/9/6	Thu 12/9/6		
282	Blinding	1 day	Fri 12/9/7	Fri 12/9/7		
283	Base slab of box culvert	5 days	Sat 12/9/8	Wed 12/9/12		
284	Top slab of box culvert	12 days	Thu 12/9/13	Mon 12/9/24		
285	Backfill & removal sheetpile	5 days	Tue 12/9/25	Sat 12/9/29		
286	Bay 49	46 days	Sat 12/8/25	Tue 12/10/9		
287	Excavation, sheetpile & lateral sheetpile	22 days	Sat 12/8/25	Sat 12/9/15		
288	Geotextile & Rockfill	1 day	Sun 12/9/16	Sun 12/9/16		
289	Blinding	1 day	Mon 12/9/17	Mon 12/9/17		
290	Base slab of box culvert	5 days	Tue 12/9/18	Sat 12/9/22		
291	Top slab of box culvert	12 days	Sun 12/9/23	Thu 12/10/4		
292	Backfill & removal sheetpile	5 days	Fri 12/10/5	Tue 12/10/9		
293	Bay 50, 51, 52	66 days	Wed 12/10/10	Fri 12/12/14		
294	Bay 50	46 days	Wed 12/10/10	Sat 12/11/24		

Project: Tung Tsz Road  
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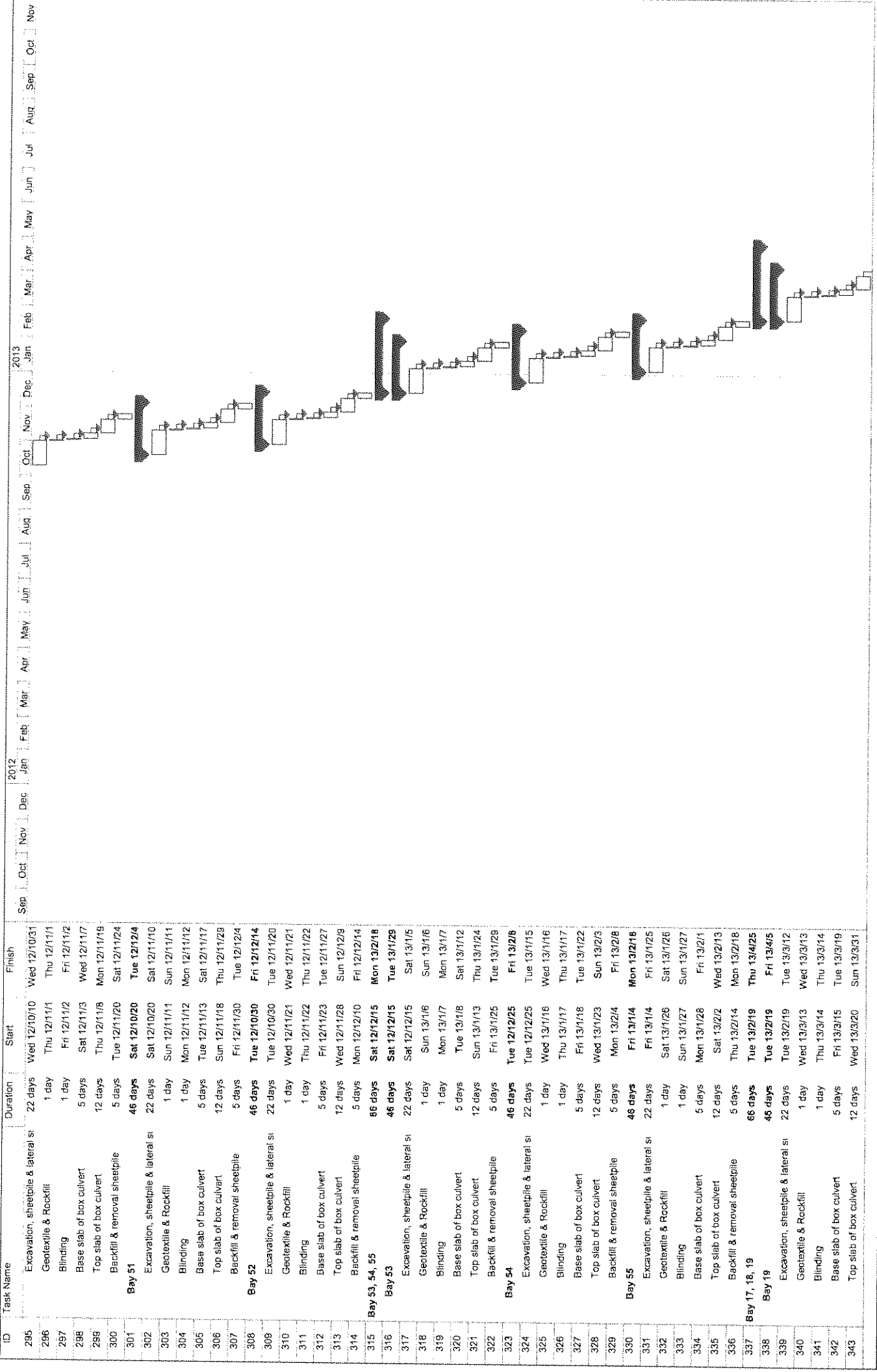
Summary Project Summary

External Tasks External Milestone

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ID	Task Name	Duration	Start	Finish
295	Excavation, sheeppile & lateral s	22 days	Wed 12/10/10	Wed 12/10/31
296	Geotextile & Rockfill	1 day	Thu 12/11/11	Thu 12/11/11
297	Blinding	1 day	Fri 12/11/12	Fri 12/11/12
298	Base slab of box culvert	5 days	Sat 12/11/13	Wed 12/11/17
299	Top slab of box culvert	12 days	Thu 12/11/18	Mon 12/11/19
300	Backfill & removal sheeppile	5 days	Tue 12/11/20	Sat 12/11/24
301	<b>Bay 51</b>	<b>46 days</b>	<b>Sat 12/10/20</b>	<b>Tue 12/12/14</b>
302	Excavation, sheeppile & lateral s	22 days	Sat 12/10/20	Sat 12/11/10
303	Geotextile & Rockfill	1 day	Sun 12/11/11	Sun 12/11/11
304	Blinding	1 day	Mon 12/11/12	Mon 12/11/12
305	Base slab of box culvert	5 days	Tue 12/11/13	Sat 12/11/17
306	Top slab of box culvert	12 days	Sun 12/11/18	Thu 12/11/29
307	Backfill & removal sheeppile	5 days	Fri 12/11/30	Tue 12/12/4
308	<b>Bay 52</b>	<b>46 days</b>	<b>Tue 12/10/30</b>	<b>Fri 12/12/14</b>
309	Excavation, sheeppile & lateral s	22 days	Tue 12/10/30	Tue 12/11/20
310	Geotextile & Rockfill	1 day	Wed 12/11/21	Wed 12/11/21
311	Blinding	1 day	Thu 12/11/22	Thu 12/11/22
312	Base slab of box culvert	5 days	Fri 12/11/23	Tue 12/11/27
313	Top slab of box culvert	12 days	Wed 12/11/28	Sun 12/12/9
314	Backfill & removal sheeppile	5 days	Mon 12/12/10	Fri 12/12/14
315	<b>Bay 53, 54, 55</b>	<b>66 days</b>	<b>Sat 12/12/15</b>	<b>Mon 13/2/18</b>
316	<b>Bay 53</b>	<b>46 days</b>	<b>Sat 12/12/15</b>	<b>Tue 13/1/29</b>
317	Excavation, sheeppile & lateral s	22 days	Sat 12/12/15	Sat 13/1/5
318	Geotextile & Rockfill	1 day	Sun 13/1/6	Sun 13/1/6
319	Blinding	1 day	Mon 13/1/7	Mon 13/1/7
320	Base slab of box culvert	5 days	Tue 13/1/8	Sat 13/1/12
321	Top slab of box culvert	12 days	Sun 13/1/13	Thu 13/1/24
322	Backfill & removal sheeppile	5 days	Fri 13/1/25	Tue 13/1/29
323	<b>Bay 54</b>	<b>46 days</b>	<b>Tue 12/12/25</b>	<b>Fri 13/2/6</b>
324	Excavation, sheeppile & lateral s	22 days	Tue 12/12/25	Tue 13/1/15
325	Geotextile & Rockfill	1 day	Wed 13/1/16	Wed 13/1/16
326	Blinding	1 day	Thu 13/1/17	Thu 13/1/17
327	Base slab of box culvert	5 days	Fri 13/1/18	Tue 13/1/22
328	Top slab of box culvert	12 days	Wed 13/1/23	Sun 13/2/3
329	Backfill & removal sheeppile	5 days	Mon 13/2/4	Fri 13/2/6
330	<b>Bay 55</b>	<b>46 days</b>	<b>Fri 13/1/4</b>	<b>Mon 13/2/18</b>
331	Excavation, sheeppile & lateral s	22 days	Fri 13/1/4	Fri 13/1/25
332	Geotextile & Rockfill	1 day	Sat 13/1/26	Sat 13/1/26
333	Blinding	1 day	Sun 13/1/27	Sun 13/1/27
334	Base slab of box culvert	5 days	Mon 13/1/28	Fri 13/2/1
335	Top slab of box culvert	12 days	Sat 13/2/2	Wed 13/2/15
336	Backfill & removal sheeppile	5 days	Thu 13/2/14	Mon 13/2/18
337	<b>Bay 17, 18, 19</b>	<b>66 days</b>	<b>Tue 13/2/19</b>	<b>Thu 13/4/25</b>
338	<b>Bay 19</b>	<b>46 days</b>	<b>Tue 13/2/19</b>	<b>Fri 13/4/5</b>
339	Excavation, sheeppile & lateral s	22 days	Tue 13/2/19	Tue 13/3/12
340	Geotextile & Rockfill	1 day	Wed 13/3/13	Wed 13/3/13
341	Blinding	1 day	Thu 13/3/14	Thu 13/3/14
342	Base slab of box culvert	5 days	Fri 13/3/15	Tue 13/3/19
343	Top slab of box culvert	12 days	Wed 13/3/20	Sun 13/3/31

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Task Split

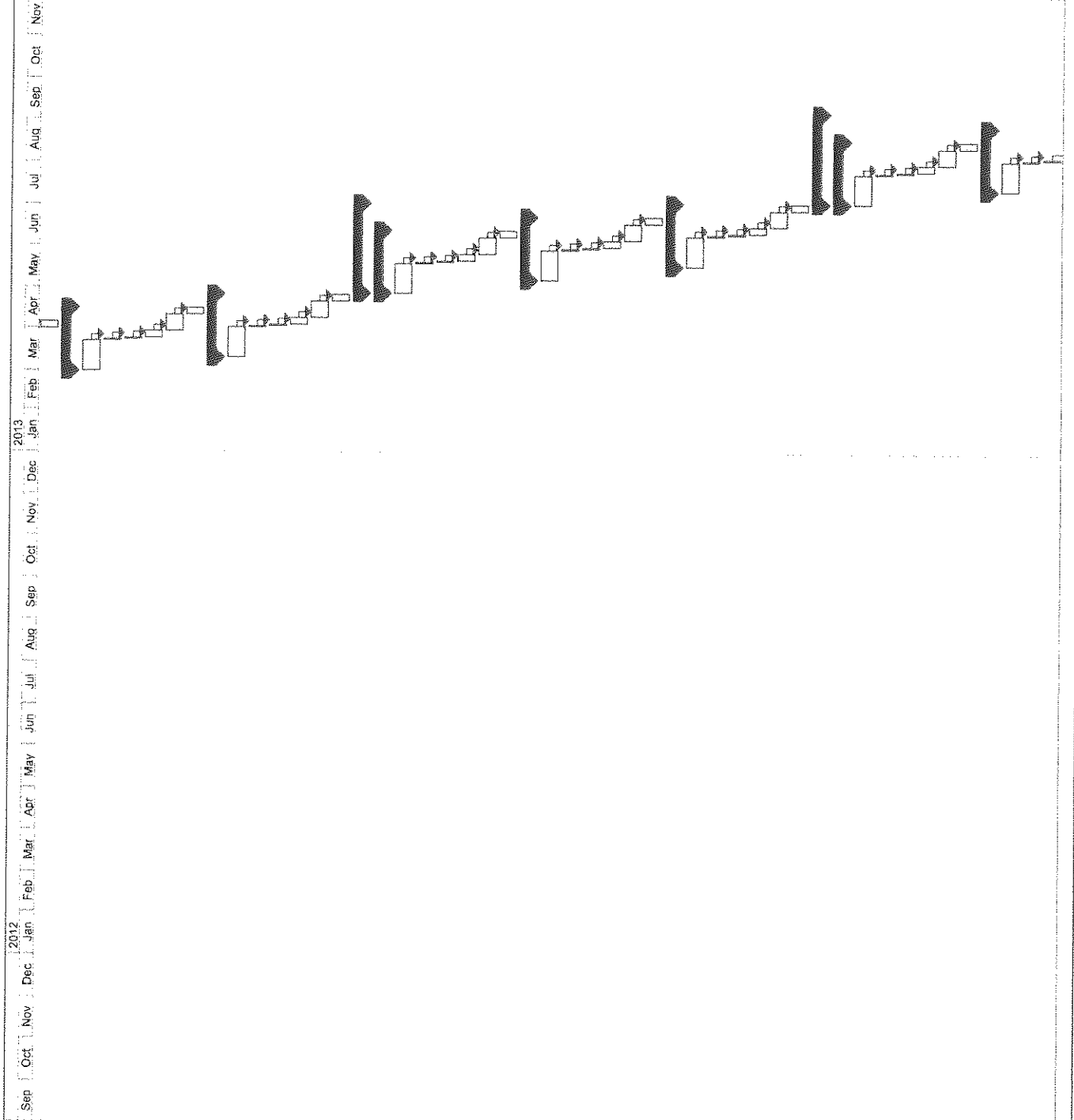
Progress Milestone

Summary Project Summary

External Tasks External Milestone

Deadline

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ID	Task Name	Duration	Start	Finish
344	Backfill & removal sheetpile	5 days	Mon 13/4/1	Fri 13/4/5
345	Bay 18	46 days	Fri 13/3/1	Mon 13/4/15
346	Excavation, sheetpile & lateral si	22 days	Fri 13/3/1	Fri 13/3/22
347	Geotextile & Rockfill	1 day	Sat 13/3/23	Sat 13/3/23
348	Blinding	1 day	Sun 13/3/24	Sun 13/3/24
349	Base slab of box culvert	5 days	Mon 13/3/25	Fri 13/3/29
350	Top slab of box culvert	12 days	Sat 13/3/30	Wed 13/4/10
351	Backfill & removal sheetpile	5 days	Thu 13/4/11	Mon 13/4/15
352	Bay 17	46 days	Mon 13/3/11	Thu 13/4/25
353	Excavation, sheetpile & lateral si	22 days	Mon 13/3/11	Mon 13/4/1
354	Geotextile & Rockfill	1 day	Tue 13/4/2	Tue 13/4/2
355	Blinding	1 day	Wed 13/4/3	Wed 13/4/3
356	Base slab of box culvert	5 days	Thu 13/4/4	Mon 13/4/8
357	Top slab of box culvert	12 days	Tue 13/4/9	Sat 13/4/20
358	Backfill & removal sheetpile	5 days	Sun 13/4/21	Thu 13/4/25
359	Bay 14, 15, 16	66 days	Sat 13/4/27	Mon 13/7/1
360	Bay 16	46 days	Sat 13/4/27	Tue 13/6/11
361	Excavation, sheetpile & lateral si	1 day	Sun 13/5/19	Sat 13/5/18
362	Geotextile & Rockfill	1 day	Mon 13/5/20	Sun 13/5/19
363	Blinding	5 days	Tue 13/5/21	Mon 13/5/25
364	Base slab of box culvert	12 days	Sun 13/5/26	Thu 13/6/6
365	Top slab of box culvert	5 days	Fri 13/6/7	Tue 13/6/11
366	Backfill & removal sheetpile	48 days	Tue 13/5/7	Fri 13/6/21
367	Bay 15	22 days	Tue 13/5/7	Fri 13/6/21
368	Excavation, sheetpile & lateral si	1 day	Wed 13/5/29	Tue 13/5/28
369	Geotextile & Rockfill	1 day	Thu 13/5/30	Wed 13/5/29
370	Blinding	5 days	Fri 13/5/31	Thu 13/6/4
371	Base slab of box culvert	12 days	Wed 13/6/5	Tue 13/6/16
372	Top slab of box culvert	5 days	Mon 13/6/17	Sun 13/6/16
373	Backfill & removal sheetpile	48 days	Fri 13/5/17	Fri 13/6/21
374	Bay 14	22 days	Fri 13/5/17	Mon 13/7/1
375	Excavation, sheetpile & lateral si	1 day	Sat 13/6/8	Fri 13/6/7
376	Geotextile & Rockfill	1 day	Sun 13/6/9	Sat 13/6/8
377	Blinding	5 days	Mon 13/6/10	Sun 13/6/9
378	Base slab of box culvert	12 days	Sat 13/6/15	Fri 13/6/14
379	Top slab of box culvert	5 days	Thu 13/6/27	Wed 13/6/26
380	Backfill & removal sheetpile	56 days	Tue 13/7/2	Mon 13/7/1
381	Bay 11, 12, 13	46 days	Tue 13/7/2	Thu 13/9/5
382	Bay 13	22 days	Tue 13/7/2	Thu 13/8/16
383	Excavation, sheetpile & lateral si	1 day	Wed 13/7/24	Tue 13/7/23
384	Geotextile & Rockfill	1 day	Thu 13/7/25	Wed 13/7/24
385	Blinding	5 days	Fri 13/7/26	Thu 13/7/25
386	Base slab of box culvert	12 days	Wed 13/7/31	Tue 13/7/30
387	Top slab of box culvert	5 days	Mon 13/8/12	Sun 13/8/11
388	Backfill & removal sheetpile	46 days	Fri 13/7/12	Fri 13/8/16
389	Bay 12	22 days	Fri 13/7/12	Mon 13/8/26
390	Excavation, sheetpile & lateral si	1 day	Sat 13/8/3	Fri 13/8/2
391	Geotextile & Rockfill	1 day	Sun 13/8/4	Sat 13/8/3
392	Blinding	1 day	Sun 13/8/4	Sun 13/8/4

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Summary  
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ID	Task Name	Duration	Start	Finish
393	Base slab of box culvert	5 days	Mon 13/8/15	Fri 13/8/19
394	Top slab of box culvert	12 days	Sat 13/8/10	Wed 13/8/21
395	Backfill & removal sheetpile	5 days	Thu 13/8/22	Mon 13/8/26
396	Day 11	46 days	Mon 13/7/22	Thu 13/9/5
397	Excavation, sheetpile & lateral si	22 days	Mon 13/7/22	Mon 13/8/12
398	Geotextile & Rockfill	1 day	Tue 13/8/13	Tue 13/8/13
399	Blinding	1 day	Wed 13/8/14	Wed 13/8/14
400	Base slab of box culvert	5 days	Thu 13/8/15	Mon 13/8/19
401	Top slab of box culvert	12 days	Tue 13/8/20	Sat 13/8/31
402	Backfill & removal sheetpile	5 days	Sun 13/9/1	Thu 13/9/5



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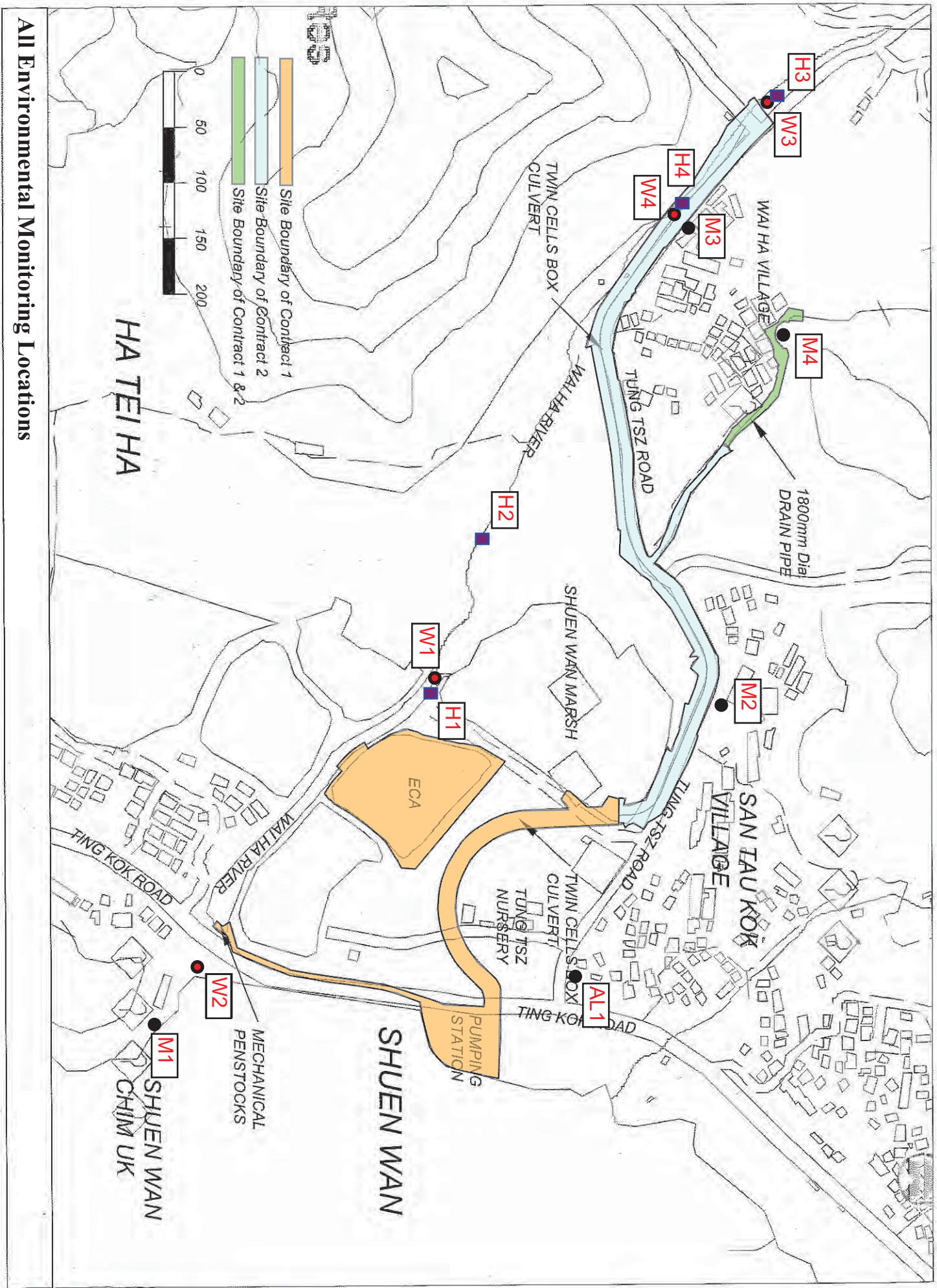
Task Split

Progress Milestone Summary Project Summary External Tasks External Milestone

Deadline

## **Appendix D**

### **Environmental Monitoring Locations**



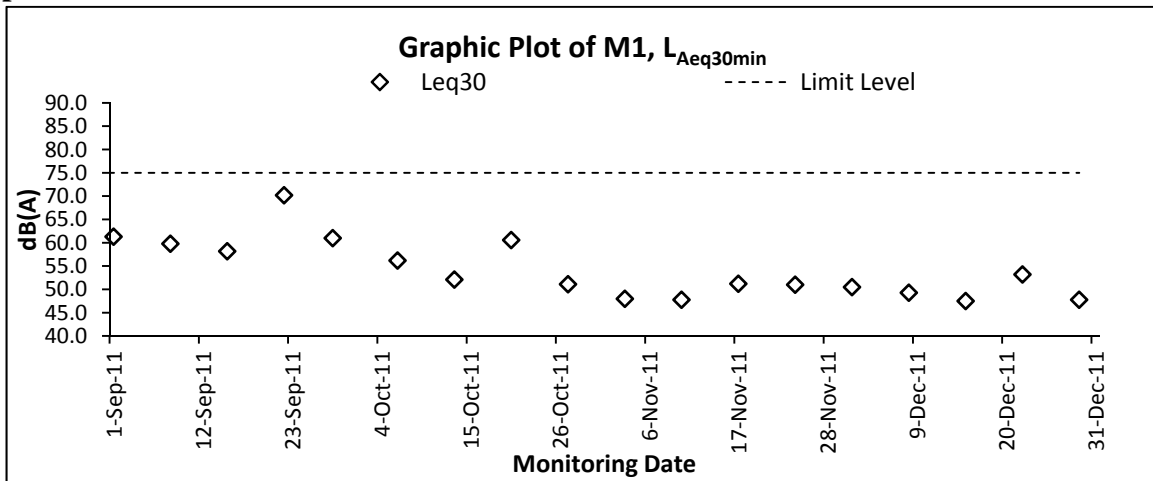
All Environmental Monitoring Locations

**Appendix E**

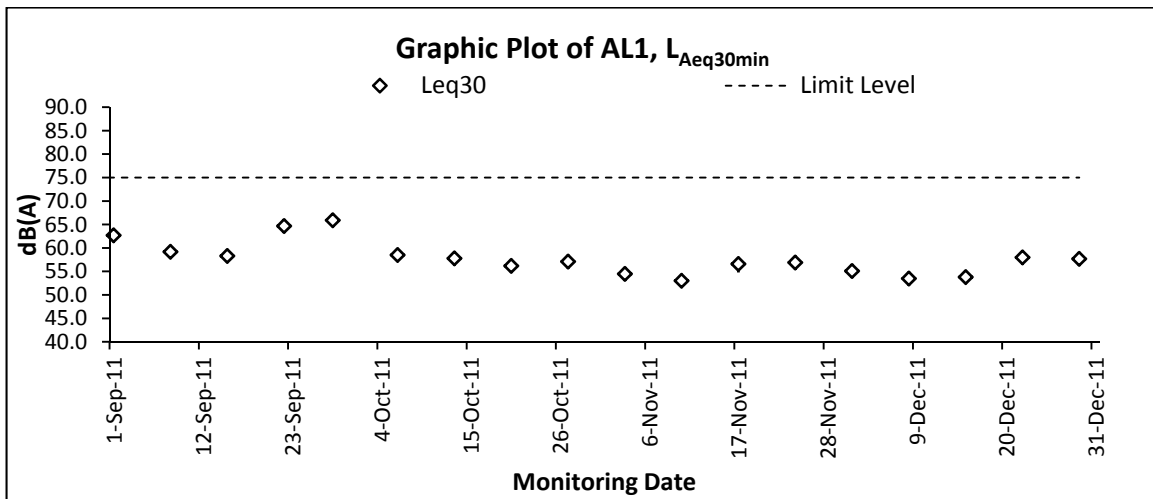
**Graphical Plots of Impact Monitoring –  
Noise,  
Water Quality  
and  
Hydrological Characteristics**



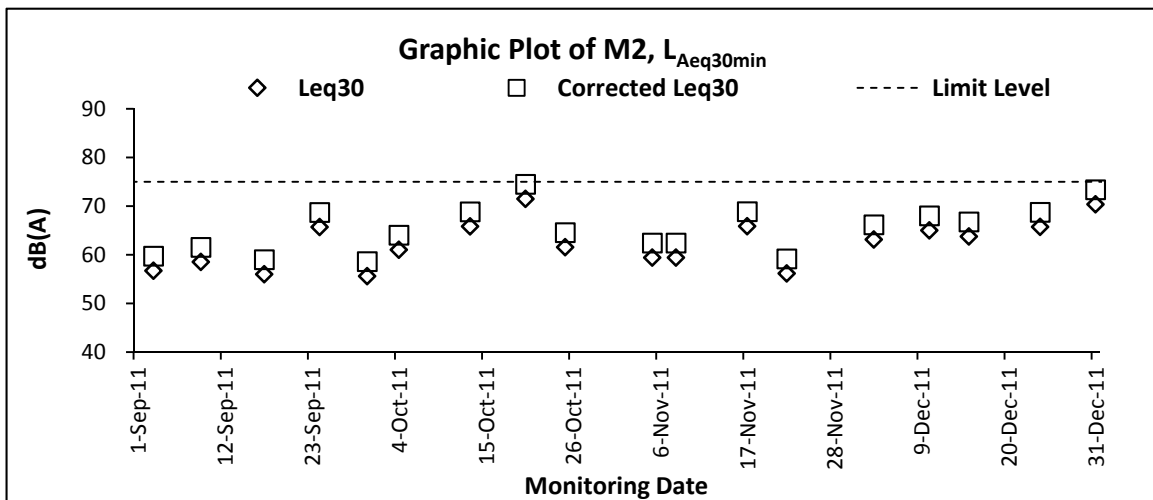
**Graphic Plot – Construction Noise**



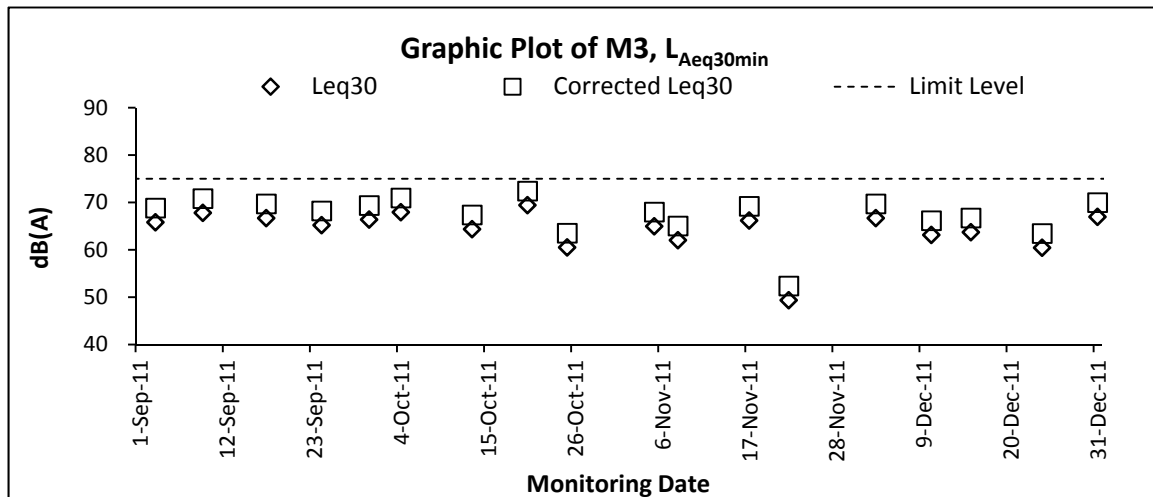
Remark: The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.



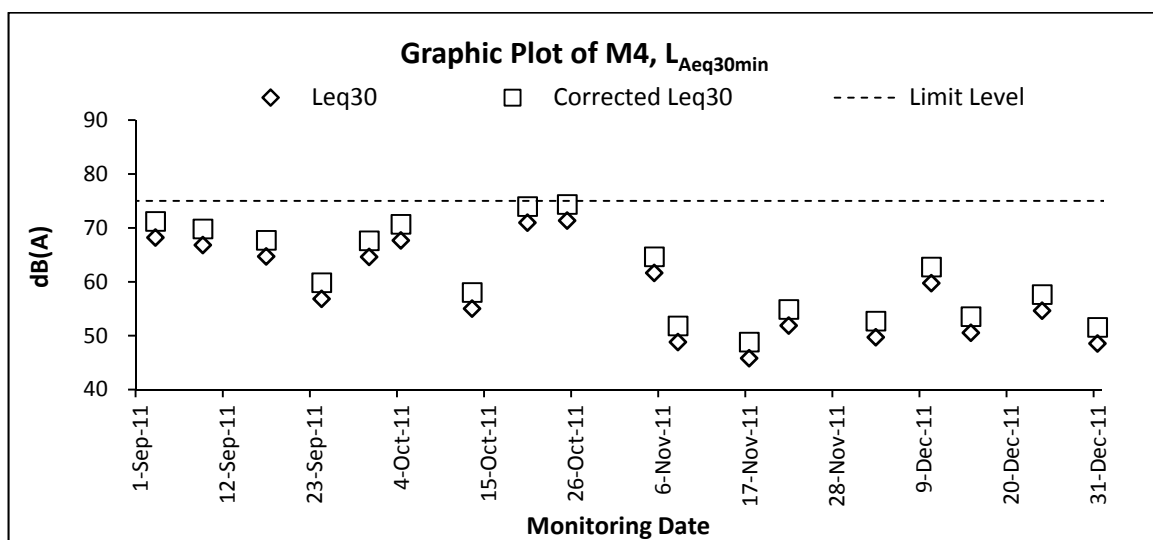
Remark: The monitoring is undertaken under façade situation. No façade correction is added according to acoustical principles and EPD guidelines.



Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines

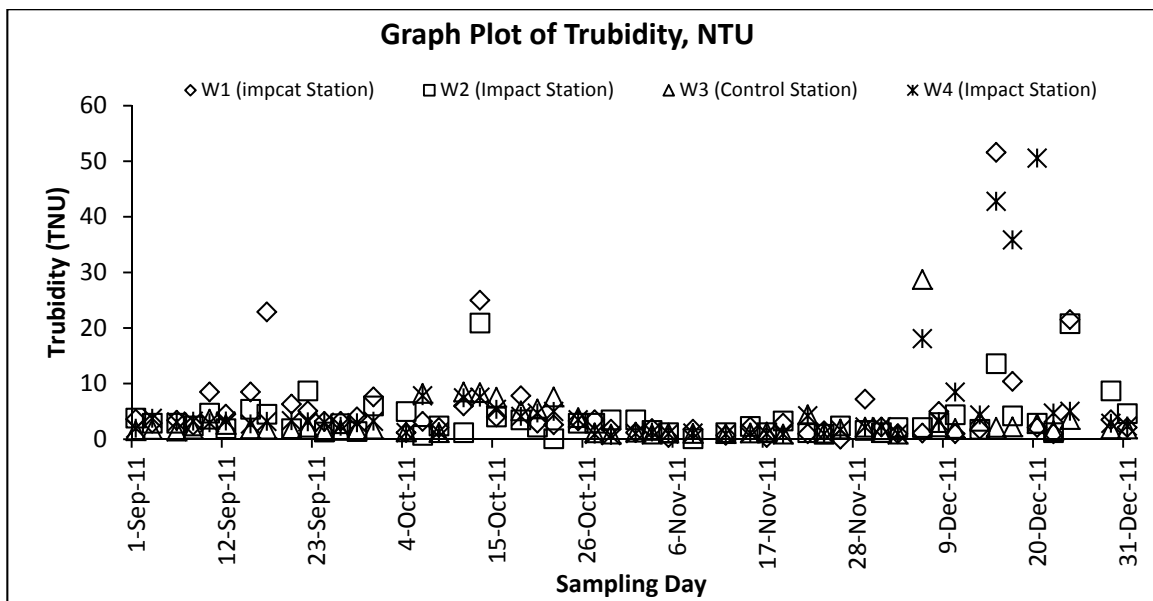
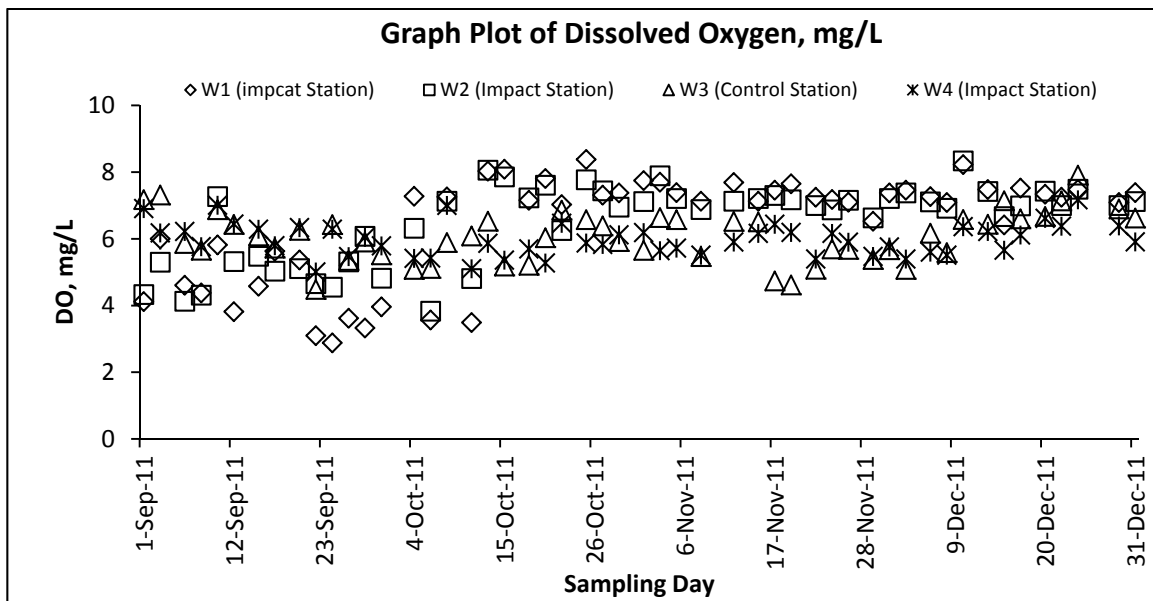


Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines

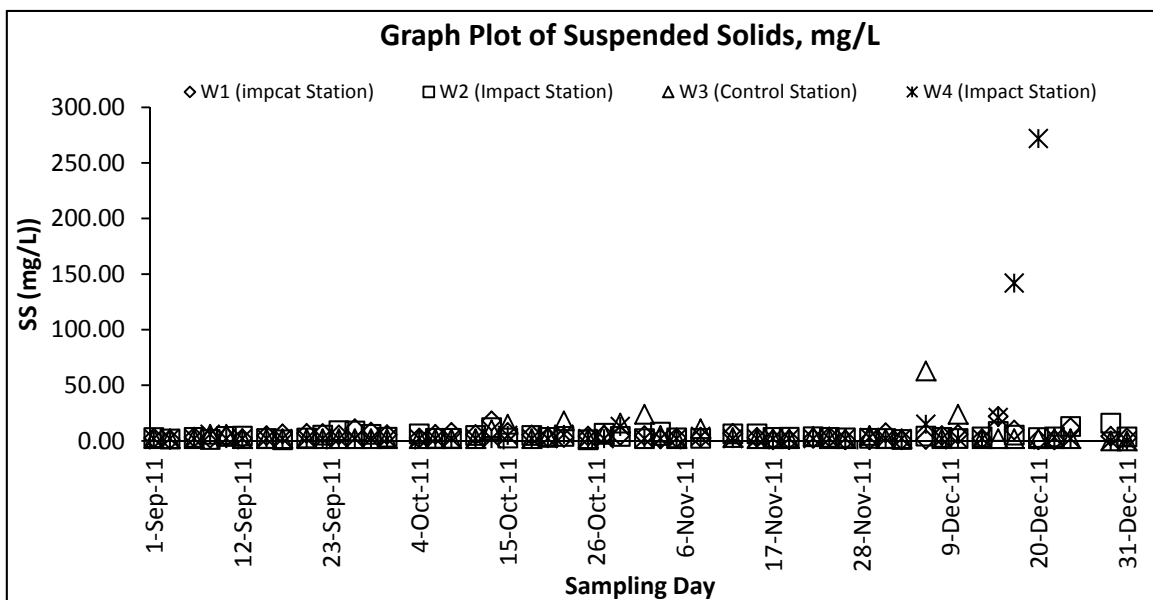
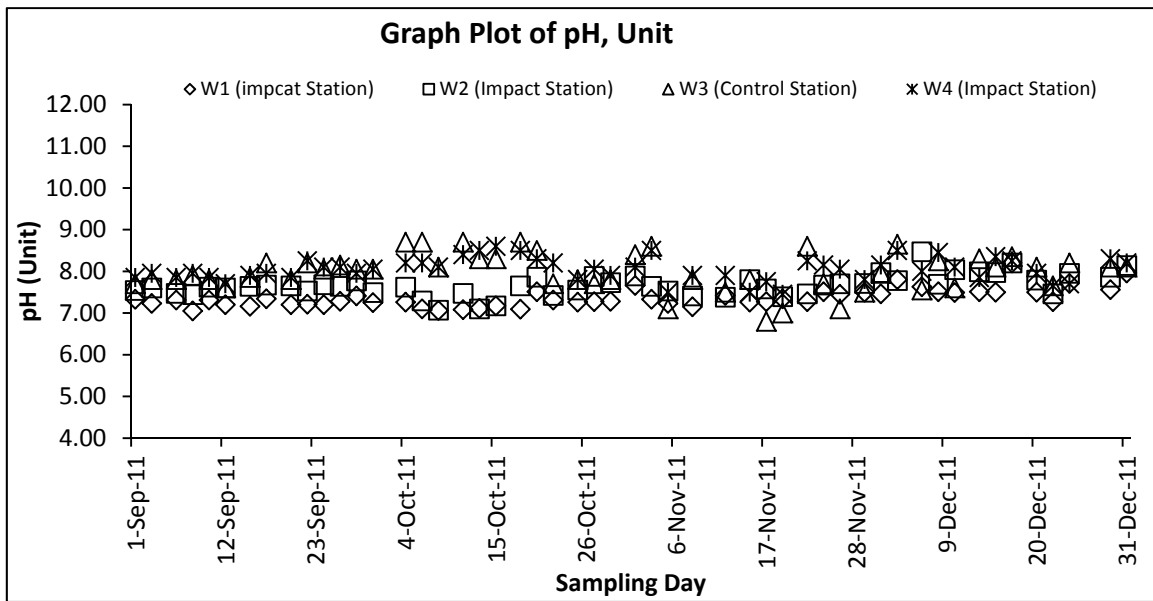


Remark: The monitoring is undertaken under free field situation. A façade correction of +3 dB(A) has been added according to acoustical principles and EPD guidelines

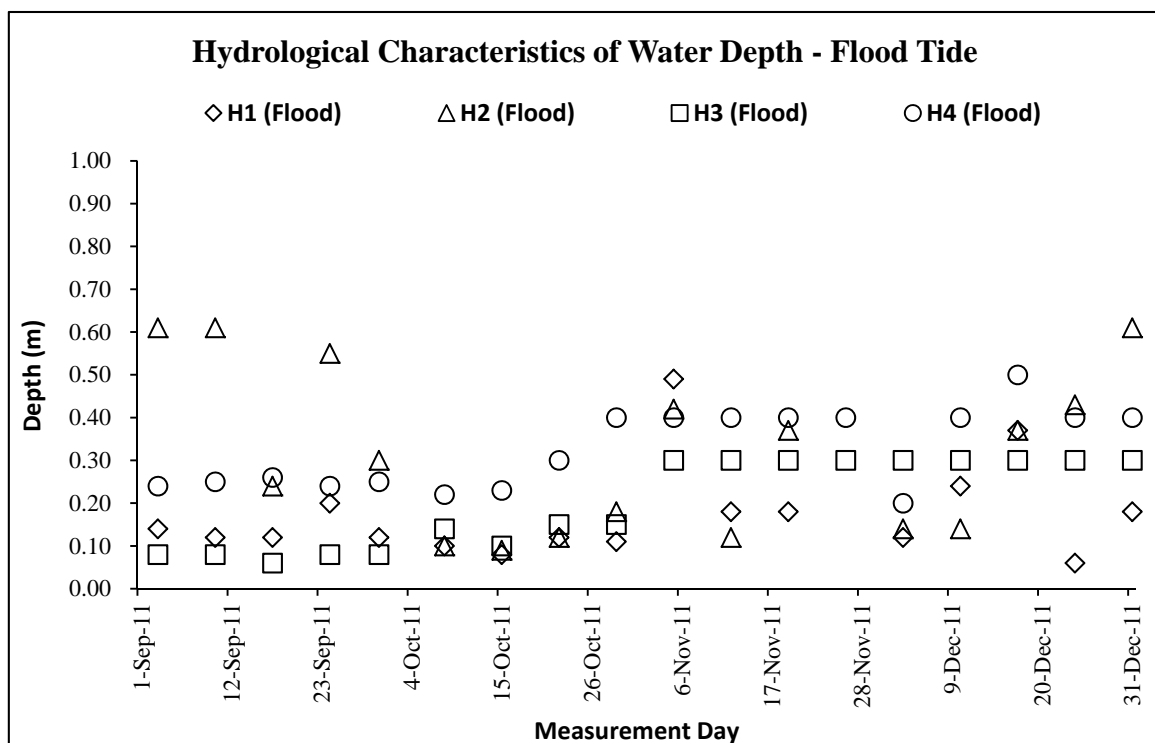
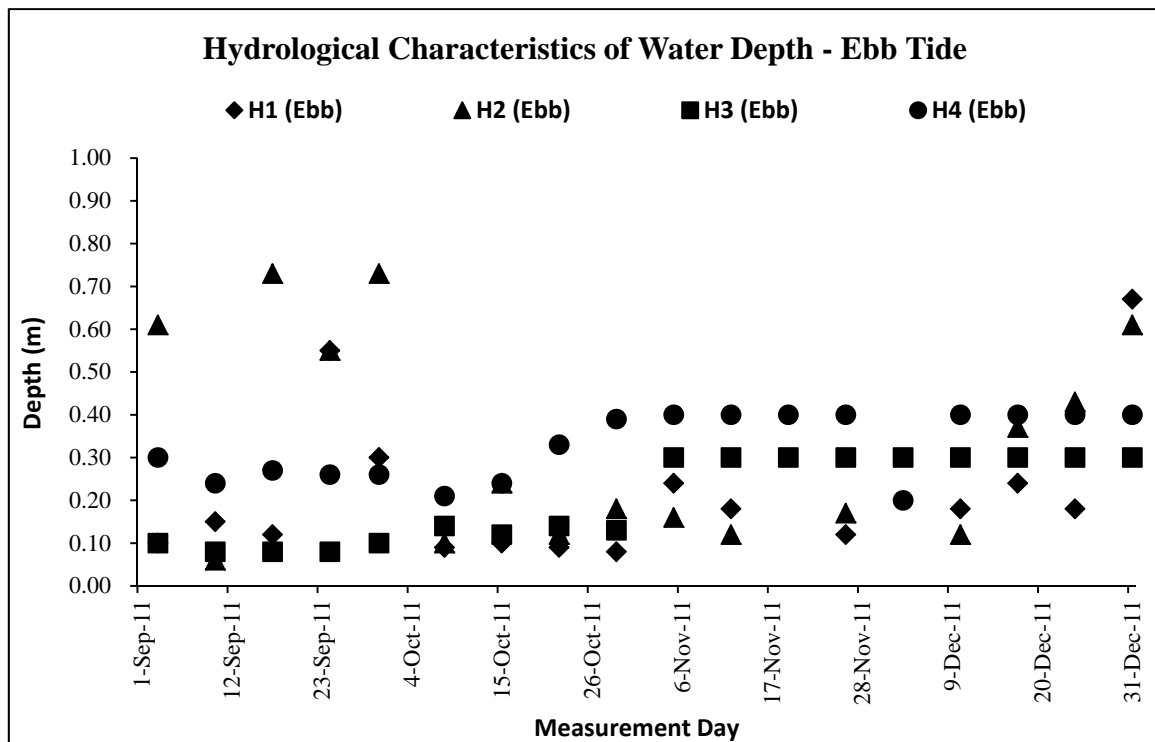
**Graphic Plot – Water Quality**



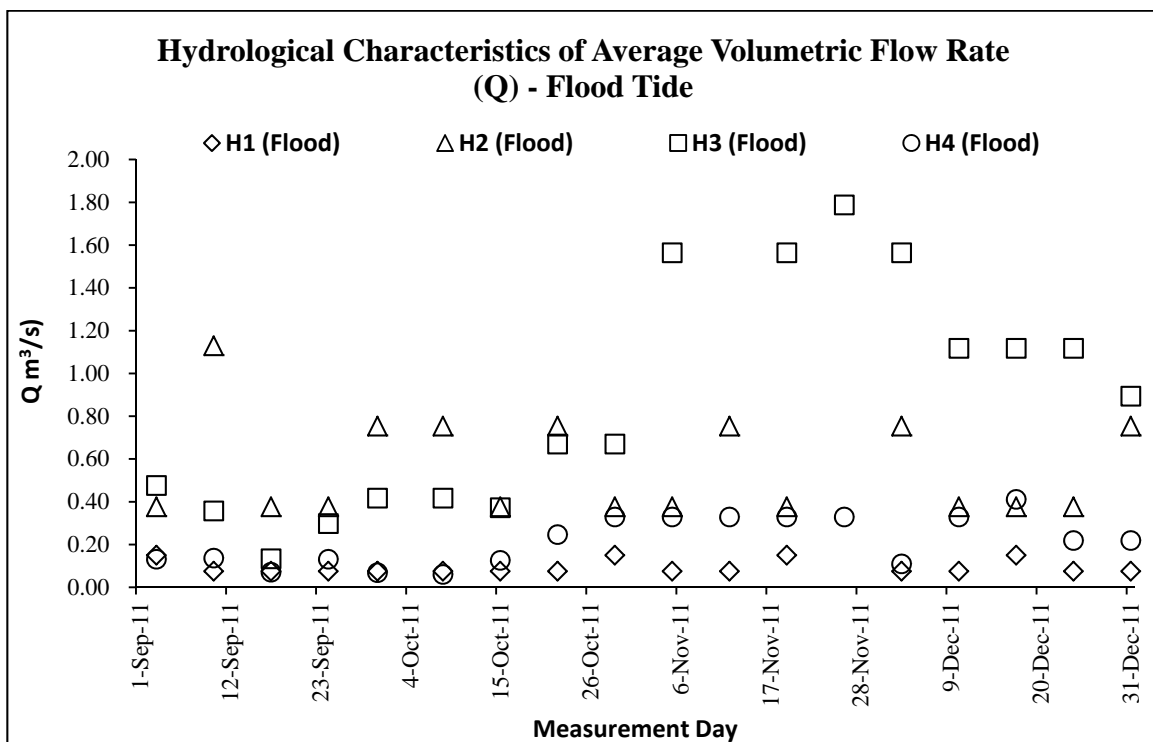
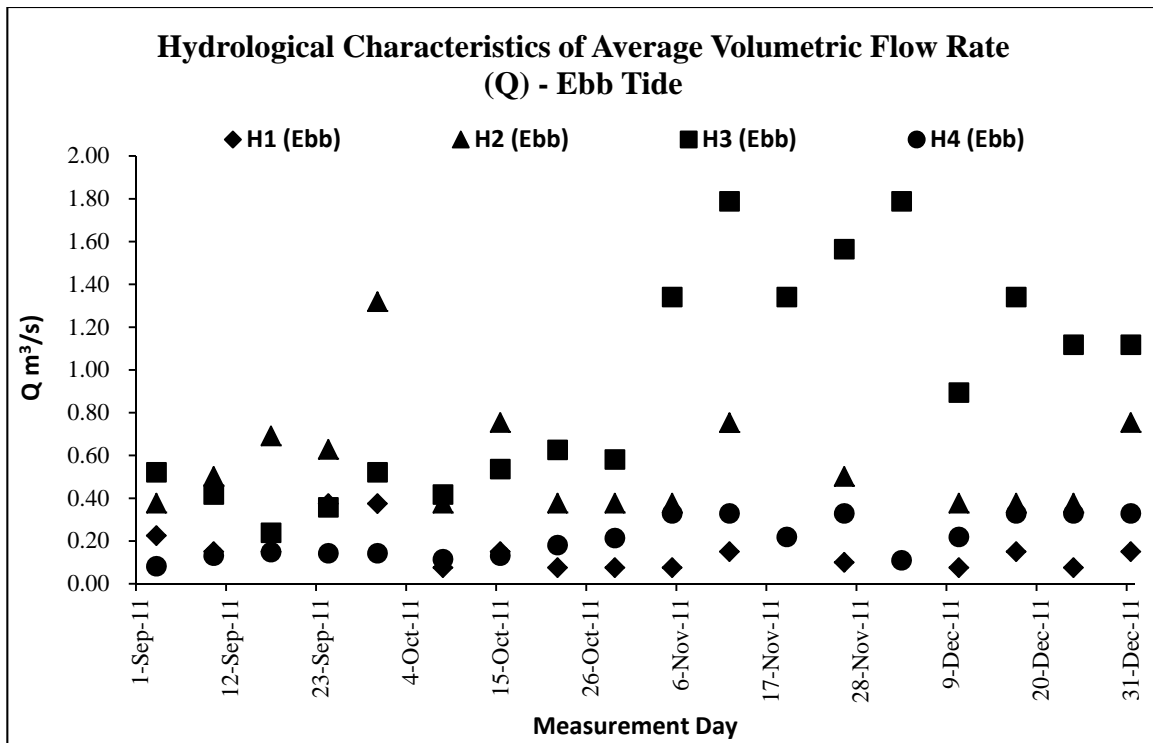
### Graphic Plot – Water Quality



Graphic Plot – Hydrological Characteristics (Water Depth)



Graphic Plot – Hydrological Characteristics (Water Flow Rate)



## **Appendix F**

### **Event and Action Plan**



**Event Action Plan for Construction Noise**

EVENT	ACTION			
	ET Leader	IEC	ER	Contractor
Action Level	<ol style="list-style-type: none"> <li>1. Notify IEC and Contractor</li> <li>2. Carry out investigation.</li> <li>3. Report the results of investigation to the IEC, ER and Contractor.</li> <li>4. Discuss with the Contractor and formulate remedial measures</li> <li>5. Increase monitoring frequency to check mitigation effectiveness.</li> </ol>	<ol style="list-style-type: none"> <li>1. Review the analyzed results submitted by the ET.</li> <li>2. Review the proposed remedial measures by the Contractor and advise the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analyzed noise problem</li> <li>4. Check remedial measures are properly implemented.</li> </ol>	<ol style="list-style-type: none"> <li>1. Submit noise mitigation proposals to IEC</li> <li>2. Implement noise mitigation proposals</li> </ol>
Limit Level	<ol style="list-style-type: none"> <li>1. Notify IEC, ER, EPD and Contractor</li> <li>2. Identify source.</li> <li>3. Repeat measurements to confirm findings</li> <li>4. Increase monitoring frequency.</li> <li>5. Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented</li> <li>6. Inform IEC, ER and EPD the causes and actions taken for the exceedances</li> <li>7. Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and ER informed of the results</li> <li>8. If exceedance stops, cease additional monitoring.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss amongst ER, ET, and Contractor on the potential remedial actions</li> <li>2. Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise the ER accordingly</li> <li>3. Supervise the implementation of remedial measures</li> </ol>	<ol style="list-style-type: none"> <li>1. Confirm receipt of notification of failure in writing</li> <li>2. Notify Contractor</li> <li>3. Require Contractor to propose remedial measures for the analyzed noise problem</li> <li>4. Check remedial measures properly implemented.</li> <li>5. If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated</li> </ol>	<ol style="list-style-type: none"> <li>1. Take immediate action to avoid further exceedance</li> <li>2. Submit proposals for remedial actions to IEC within 3 working days of notification</li> <li>3. Implement the agreed proposals</li> <li>4. Resubmit proposals if problem still not under control</li> <li>5. Stop the relevant portion of works as determined by the ER until the exceedance is abated</li> </ol>

### Event and action Plan for Water Quality

Event	ET Leader	IEC	ER	Contractor
<b>ACTION LEVEL</b>				
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>Repeat in-situ measurements to confirm findings;</li> <li>Identify reasons for non-compliance and source(s) of impact;</li> <li>Inform IEC, Contractor and Engineer;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>Ensure mitigation measures are implemented.</li> <li>Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>Make agreement on mitigation measures to be implemented;</li> <li>Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment;</li> <li>Consider changes in working methods;</li> <li>Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>Implement agreed mitigation measures.</li> </ol>
Action level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> <li>Repeat in-situ measurements to confirm findings;</li> <li>Identify reasons for non-compliance and source(s) of impact;</li> <li>Inform IEC, Contractor and Engineer;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>Ensure mitigation measures are implemented.</li> <li>Prepare to increase the monitoring frequency to daily;</li> <li>Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>Make agreement on mitigation measures to be implemented;</li> <li>Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment;</li> <li>Consider changes in working methods;</li> <li>Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>Implement agreed mitigation measures</li> </ol>
<b>LIMIT LEVEL</b>				
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>Repeat in-situ measurements to confirm findings;</li> <li>Identify reasons for non-compliance and source(s) of impact;</li> <li>Inform EPD, IEC, Contractor and Engineer;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>Ensure mitigation measures are implemented;</li> <li>Increase the monitoring frequency to daily until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>Request Contractor to critically review the working methods;</li> <li>Make agreement on mitigation measures to be implemented;</li> <li>Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment;</li> <li>Consider changes in working methods;</li> <li>Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>Implement agreed mitigation measures.</li> </ol>
Limit level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> <li>Repeat in-situ measurements to confirm findings;</li> <li>Identify reasons for non-compliance and source(s) of impact;</li> <li>Inform EPD, IEC, Contractor and Engineer;</li> <li>Check monitoring data, all plant, equipment and Contractor's working methods;</li> <li>Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>Ensure mitigation measures are implemented.</li> <li>Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>Request Contractor to critically review the working methods;</li> <li>Make agreement on mitigation measures to be implemented;</li> <li>Assess effectiveness of implemented mitigation measures;</li> <li>Consider and if necessary instruct Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>Rectify unacceptable practice;</li> <li>Check all plant and equipment;</li> <li>Consider changes in working methods;</li> <li>Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>Implement agreed mitigation measures;</li> <li>As directed by the Engineer, slow down or stop all or part of the construction activities until no exceedance of Limit level.</li> </ol>

**Event and action Plan for Hydrological Characteristics**

Event	ET Leader	IEC	ER	Contractor
<b>ACTION LEVEL</b>				
Action level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Make agreement on mitigation measures to be implemented;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures.</li> </ol>
Action level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Prepare to increase the monitoring frequency to daily;</li> <li>8. Repeat measurement on next day of exceedance.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Make agreement on mitigation measures to be implemented;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures</li> </ol>
<b>LIMIT LEVEL</b>				
Limit level being exceeded by one sampling day	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform AFCD, IEC, Contractor and Engineer;</li> <li>4. Check monitoring data, and Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented;</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Request Contractor to critically review the working methods;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures.</li> </ol>
Limit level being exceeded by more than two consecutive sampling days	<ol style="list-style-type: none"> <li>1. Repeat in-situ measurements to confirm findings;</li> <li>2. Identify reasons for non-compliance and source(s) of impact;</li> <li>3. Inform AFCD, IEC, Contractor and Engineer;</li> <li>4. Check monitoring data and Contractor's working methods and any excavation works or dewatering processes;</li> <li>5. Discuss mitigation measures with IEC, Engineer and Contractor;</li> <li>6. Ensure mitigation measures are implemented.</li> <li>7. Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss mitigation measures with ET, Engineer and Contractor;</li> <li>2. Review proposals on mitigation measures submitted by Contractor and advise the Engineer accordingly;</li> <li>3. Assess effectiveness of implemented mitigation measures.</li> </ol>	<ol style="list-style-type: none"> <li>1. Discuss proposed mitigation measures with IEC, ET and Contractor;</li> <li>2. Request Contractor to critically review the working methods;</li> <li>3. Make agreement on mitigation measures to be implemented;</li> <li>4. Assess effectiveness of implemented mitigation measures;</li> <li>5. Consider and if necessary instruct Contractor to slow down or to stop all or part of the construction activities until no exceedance of Limit Level.</li> </ol>	<ol style="list-style-type: none"> <li>1. Inform Engineer and confirm in writing notification of the non-compliance;</li> <li>2. Rectify unacceptable practice;</li> <li>3. Check working methods and any excavation works or dewatering processes;</li> <li>4. Consider changes in working methods and plans;</li> <li>5. Discuss with ET, IEC and Engineer and propose mitigation measures to IEC and Engineer within three working days;</li> <li>6. Implement agreed mitigation measures;</li> <li>7. As directed by the Engineer, slow down or stop all or part of the construction activities until no exceedance of Limit level.</li> </ol>

## **Appendix G**

### **Monthly Summary Waste Flow Table**

Name of Department: DSD

Contract No.: DC/2010/02

**Monthly Summary Waste Flow Table for 2011 (Year)**

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse
	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )
Apr	Nil	-	-	-	-	-	-	-	-	-	-
May	Nil	-	-	-	-	-	-	-	-	-	-
June	Nil	-	-	-	-	-	-	-	-	-	-
<b>Sub-Total</b>	<b>Nil</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
July	Nil	-	-	-	-	-	-	-	-	-	-
Aug	0.7855	0	0	0.7855	0	0	0	0	0	0	0
Sept	Nil	0	0	0	0	0	0	0	0	0	0
Oct	Nil	0	0	0	0	0	0	0	0	0	0.02
Nov	Nil	0	0	0	0	0	0	0	0	0	0.045
Dec	0.08	0	0	0	0.08	0	0	0	0	0	0
<b>Total</b>	<b>0.8655</b>	<b>0</b>	<b>0</b>	<b>0.7855</b>	<b>0.08</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.065</b>
Forecast of Total Quantities of C&D Materials to be Generated from the Contract*											
Total Quantity Generated	Hard Rock and Large Broken Concrete	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 3)	Chemical Waste	Others, e.g. general refuse	
(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000m <sup>3</sup> )	(in '000 kg)	(in '000kg)	(in '000kg)	(in '000kg)	(in '000m <sup>3</sup> )	
23	1	10	0	10	2	5	2	1	1	3	

Notes:

- (1) The performance targets are given in ETWB Technical Circular PS Clause 6(14).
- (2) The waste flow table shall also include C&D materials that are specified in the Contract to be imported for use at the Site.
- (3) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material
- (4) The Contractor shall also submit the latest forecast of the total amount of C&D materials expected to be generated from the Works, together with a breakdown of the nature where the total amount of C&D materials expected to be generated from the Works is equal to or exceeding 50,000 m<sup>3</sup>. (ETWB Technical Circular PS Clause 5(4)(b) refers). [Delete Note (4) and the table above on the forecast, where inapplicable].

**Summary Table for Work Processes or Activities Requiring Timber for Temporary Works**

Contract No. : DC/2010/02

Contract Title : Drainage Improvement Works in Shuen Wan and Shek Wu Wai

Item No.	Description of Works Process or Activity [see note (a) below]	Justifications for Using Timber in Temporary Construction Works	Est. Quantities of Timber Used (m3)	Actual Quantities used (m3)	Remarks
1.	Formwork for concreting	Easy handle by manpower	2.2	1.7	
2.					
3.					
4.					
5.					
6.					
7.					
8.					
<b>Total Estimated Quantity of Timber Used</b>			2.2		

Notes:

- a. The Contractor shall list out all the work items requiring timber for use in temporary construction works. Several minor work items may be grouped into one for ease of updating.
- b. The summary table shall be submitted to the \*Architect/Engineer's Representative monthly together with the Waste Flow Table for review and monitoring in accordance with the ETWB Technical Circular 19/2005 PS sub-clause 5(5) in Appendix C.