PROJECT NO.: TCS/00512/09

DSD CONTRACT NO. DC/2009/13
CONSTRUCTION OF SEWAGE TREATMENT WORKS AT YUNG SHUE WAN AND SOK KWU WAN

YUNG SHUE WAN PORTION AREA
QUARTERLY ENVIRONMENTAL MONITORING AND AUDIT (EM&A) SUMMARY REPORT NO.Q17
(SEPTEMBER TO NOVEMBER 2014)

PREPARED FOR
LEADER CIVIL ENGINEERING CORPORATION LIMITED

Quality Index Date	Reference No.	Prepared By	Certified By
26 January 2015	TCS00512/09/600/R0847v1	 Martin Li Assistant Environmental Consultant	 T.W. Tam Environmental Team Leader

Version	Date	Description
1	26 January 2015	First submission

URS CDM Joint Venture

Chief Engineer/Harbour Area Treatment Scheme
Drainage Services Department
5/F, Western Magistracy
2A, Pok Fu Lam Road
Hong Kong

Attention: Mr P.F. Ma

Your reference:

Our reference: 05117/6/16/440176

Date: 26 March 2015

BY FAX

Dear Sir,

Contract No. DC/2009/13
Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan
Yung Shue Wan Portion Area
Quarterly EM&A Summary Report No. Q17 (September to November 2014)

We refer to the Environmental Permit (EP-282/2007/A) and the email from the Environmental Team, Action-United Environmental Services and Consulting (AUES), with the revised report for the captioned project, dated 11 March 2015. We have no comment and have verified the captioned report.

Yours faithfully
URS CDM JOINT VENTURE

Rodney Ip
Independent Environmental Checker

ICWR/DCYO/wwsc

Encl

cc Leader Civil Engineering (Attn: Mr Ron Hung)
AUES (Attn: Mr T.W. Tam)
ER/LAMMA (Attn: Mr Kenneth Kwong)
CDM (Attn: Mr Sylvester Hsu)

EXECUTIVE SUMMARY

ES.01 This is the **17th** Quarterly Environmental Monitoring and Audit (EM&A) Summary Report for Yung Shue Wan Portion Area under the Project, covering the construction period from **26 August 2014 to 25 November 2014** (the Reporting Period).

ENVIRONMENTAL MONITORING AND AUDIT ACTIVITIES

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

Issues	Environmental Monitoring Parameters / Inspection	Occasions
Air Quality	1-hour TSP	96
	24-hour TSP	24
Construction Noise	$L_{eq(30min)}$ Daytime	13
Water Quality	Marine Water Sampling	0
Ecology	Coral Monitoring	0
Inspection / Audit	ET Regular Environmental Site Inspection	14

ES.03 Four (4) events of power failure of the high volume sampler occurred during 24-hour TSP monitoring at AC02b on 7 and 30 October 2014, and at AC04c on 13 and 19 September 2014. The incidents were reported to relevant parties on the next day and the provision of power supply was rectified the before the next monitoring event.

ES.04 According to the construction information provided by the Contractor, the marine works in Yung Shue Wan has been completed on 22 April 2013. As agreed by the Contractor, the ecology monitoring was ceased in May 2013 due to no ecological impact and concern after the completion of marine work, whereas impact marine water quality monitoring was terminated in July 2013. In this regards, an associated letter ref. TCS00512/10/300/L0656 dated 28 June 2013 has been issued to EPD for approval and no comment was received.

BREACH OF ACTION AND LIMIT (A/L) LEVELS

ES.05 No exceedances in air quality and construction noise monitoring were recorded in this Reporting Period. 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
Air Quality	1-hour TSP	0	0	0	--	--
	24-hour TSP	0	0	0	--	--
Construction Noise	$L_{eq(30min)}$ Daytime	0	0	0	--	--
Water Quality	DO	0	0	0	--	--
	Turbidity	0	0	0	--	--
	SS	0	0	0	--	--
Ecology (Coral)	Sediment Cover (%)	0	0	0	--	--
	Bleaching (%)	0	0	0	--	--
	Mortality (%)	0	0	0	--	--

Note: NOE – Notification of Exceedance

ES.06 **14** events of site inspection were carried out by ET in this Reporting Period and no non-compliance was observed during the inspection. In general, all the observation has been rectified during the next week site inspection. The environmental performance of the Project was therefore considered as satisfactory.

ENVIRONMENTAL COMPLAINT, NOTIFICATION OF SUMMONS AND SUCCESSFUL PROSECUTIONS

ES.07 No written or verbal complaint, environmental summons or successful prosecutions were recorded in this Reporting Period.

REPORTING CHANGE

ES.08 No reporting changes were made in this Reporting Period.

FUTURE KEY ISSUES

ES.09 During dry and windy season, the Contractor shall pay attention on the construction dust that may cause environmental issues in the upcoming months. Mitigation measures on construction dust identified at the EM&A manual such as watering at haul road and covering of dusty material should be fully implemented.

ES.10 Nevertheless, the Contractor shall keep paying attention on the potential water impact as the construction site is adjacent to the coastline. Muddy water and other water quality pollutants via site surface water runoff into the sea body within Fish culture zone at Picnic Bay and the Secondary recreation contact subzone at Mo Tat Wan should be avoided. Therefore, mitigation measures for water quality should be fully implemented.

TABLE OF CONTENTS

LIST OF APPENDIXES

LIST OF TABLES

1 INTRODUCTION

1.1 PROJECT BACKGROUND

1.01 The Leader Civil Engineering Corporation Limited (Leader) has been awarded the *Contract DC/2009/13 - Construction of Sewage Treatment Works at Yung Shue Wan and Sok Kwu Wan* (the Project) by the Drainage Services Department (DSD) on 4 May 2010. The Project is part of an overall plan approved under a statutory EIA for Outlying Islands Sewerage Stage 1 Phase 2 Package J – Sok Kwu Wan Sewage Collection and Treatment (Register No. AEIAR-075/2003) and Disposal Facilities and Outlying Islands Sewerage Stage 1 Phase 1 Package C – Yung Shue Wan Sewage Treatment Works and Outfall (Register No. EIA-124/BC). The Environmental Permit No. EP-281/2007 and EP-282/2007 for the Project have been obtained by the DSD on 29 June 2007 for the relevant works. After July 2009, EP-281/2007/A stead EP-281/2007 is EP for Sok Kwu Wan relevant Works.

1.02 The Project involves construction of sewage treatment works at Sok Kwu Wan and Yung She Wan with a capacity of 1,430m^3/day and 2,850m^3/day to provide secondary treatment. The majority of works include construction of pumping stations, construction of submarine outfall from the coastline and lying of underground sewerage pipeline. The site layout plan for the captioned work under the Project is showing in ***Appendix A*****.**

1.03 According to the Particular Specification (PS) and ***Appendix 25*** of the Project, Leader should establish an Environmental Team to implement the environmental monitoring and auditing works to fulfill the requirements as stipulated in the Environmental Monitoring and Audit (EM&A) Manuals.

1.04 Action-United Environmental Services and Consulting (AUES) has been commissioned by Leader as the ET to implement the relevant EM&A program. Organization chart of the Environmental Team for the Project is shown in ***Appendix B***. For ease of reporting, the proposed EM&A programme for baseline and impact monitoring is spilt to two copies:

(a) Proposed EM&A Programme for Baseline and Impact Monitoring – Sok Kwu Wan (under EP No. 281/2007/A, varied on 23 September 2009)

(b) Proposed EM&A Programme for Baseline and Impact Monitoring – Yung Shue Wan (under EP No. 282/2007)

1.05 According to the EM&A Manuals of Sok Kwu Wan and Yung Shue Wan, baseline water quality monitoring should be carried out for consecutive six months before commencement of the marine work. Therefore, the baseline reports of Sok Kwu Wan and Yung Shue Wan are divided to two volumes, i.e. the Volume 1 for air quality and noise monitoring; and the Volume II for water quality monitoring for separate submission.

1.06 This is the **17th** Quarterly EM&A Summary report for Yung Shue Wan Portion Area presenting the monitoring results and inspection findings for the Reporting Period from **26 August 2014** to **25 November 2014**.

1.2 REPORT STRUCTURE

The Quarterly Environmental Monitoring and Audit (EM&A) Summary Report is structured by following sections:-

SECTION 1	**INTRODUCTION**
SECTION 2	**PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS**
SECTION 3	**SUMMARY OF MONITORING REQUIREMENTS**
SECTION 4	**IMPACT MONITORING RESULTS**
SECTION 5	**WASTE MANAGEMENT**
SECTION 6	**SITE INSPECTION**
SECTION 7	**ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE**
SECTION 8	**IMPLEMENTATION STATUS OF MITIGATION MEASURES**
SECTION 9	**CONCLUSIONS AND RECOMMENTATIONS**

2 PROJECT ORGANIZATION AND CONSTRUCTION PROGRESS

2.1 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***.

2.2 CONSTRUCTION PROGRESS

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

September 2014

- Excavation,
- Pipe laying,
- Concreting,
- Installation of equipment and finishing works

October 2014

- Excavation,
- Pipe laying,
- Concreting,
- Installation of equipment and finishing works

November 2014

- Concreting work,
- Pipe installation,
- Finishing works,
- Site clearance work,
- Operation of E&M equipment

2.3 SUMMARY OF ENVIRONMENTAL SUBMISSIONS

2.03 Summary of the relevant permits, licences, and/or notifications on environmental protection for this Project in this Reporting Period 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) Regulation	Notified 19/5/2010 Case No: 317486
2	Chemical Waste Producer Registration	Issued on 8/6/2010 WPN 5213-912-L2720-01
3	Water Pollution Control Ordinance	Issued on 22/9/2010 WT00007566-2010
4	Billing Account for Disposal of Construction Waste	Issued on 26 May 2010 A/C No: 7010815

3 SUMMARY OF MONITORING REQUIREMENTS

3.1 ENVIRONMENTAL ASPECT

3.01 The EM&A baseline monitoring programme cover the following environmental issues:

- Air quality;
- Construction noise;
- Marine water quality; and
- Ecology

3.02 The ET implements the EM&A programme in accordance with the aforementioned requirements. Detailed air quality, construction noise, water quality and ecology monitoring of the EM&A program are presented in the following sub-sections.

3.03 A summary of the air, noise, marine water and ecology monitoring parameters is presented in ***Table 3-1***:

Table 3-1 Summary of EM&A Requirements

Environmental Issue	Parameters
Air Quality	• 1-hour TSP Monitoring by Real-Time Portable Dust Meter; and • 24-hour TSP Monitoring by High Volume Air Sampler.
Noise	• $L_{eq(30min)}$ during normal working hours; and • $L_{eq(15min)}$ during Restricted Hours.
Marine Water Quality	***In-situ Measurements*** • Dissolved Oxygen Concentration (mg/L); • Dissolved Oxygen Saturation (%); • Turbidity (NTU); • pH unit; • Salinity (ppt); • Water depth (m); and • Temperature (℃). ***Laboratory Analysis*** • Suspended Solids (mg/L)
Ecology	• Coral Monitoring

3.2 MONITORING LOCATIONS

Air Quality

3.04 Two designated monitoring stations, AC02a, located at Yung Shue Wan Refuse Transfer Station, and AC04, located at residential area nearby Yung Shue Wan football pitch, were recommended in the *EM&A Manual Section 2.5*. In order to identify and seek for the access of the air monitoring locations designated in the EM&A Manual, site visit was conducted by the Contractor and ET.

3.05 At the site visit, all designated monitoring locations were identified, however the premises for high volume sampler installation were objected by the owner or the residents of nearby. Therefore, an alternative air monitoring locations were proposed in accordance with the criteria set out in *EM&A manual Section 2.5.2 and 2.5.3*. The proposed alternative air monitoring stations was accepted by the ER and IEC, and EPD endorsed. Details of renewal air monitoring stations are described in ***Table 3-2***. The graphical of air monitoring stations is shown in ***Appendix D***.

Table 3-2 Locations of Air Quality Monitoring Station

Sensitive Receiver	Location
AC02b	The entrance of RE's site office
AC04c	Next to a power transformer station TP208 Yung Shue Wan and adjacent to the road direct to the construction site

Construction Noise

3.06 According to *EM&A Manual Section 3.4*, one noise sensitive receivers (NC05) designated for the construction noise monitoring was recommended at Yung Shue Wan Portion Area of the Project. The designated monitoring station is identified and successfully granted the premises. The detailed construction noise monitoring station is described in ***Table 3-3*** and graphical is shown in ***Appendix D.***

Table 3-3 Location of Construction Noise Monitoring Station

Sensitive Receiver	Location
NC05	North Lamma Clinic

Marine Water Quality

3.07 Two control stations (CY1 and CY2) and three impact stations (WY1-WY3) were recommended in the *EM&A Manual Section 4.5*. Impact stations WY1-WY3 were identified close to the sensitive receivers (the coral colonies in the vicinity of Yung Shue Wan, and secondary contact recreation subzone). It is proposed to monitor the impacts from the construction of the submarine outfall as well as the effluent discharge from the proposed STW on water quality. Two control stations: CY1 and CY2 were recommended at locations representative of the project site in its undisturbed condition and located at upstream and downstream of the works area. The marine water quality monitoring stations to be performed under the Project is described in ***Table 3-4*** and shown in ***Appendix D.***

Table 3-4 Locations of Marine Water Quality Monitoring Station

Station	Description	Coordinates	
		Easting	Northing
WY1	Coral colonies on seawall at STW site	829 170	809 550
WY2	Coral colonies at Shek kok Tsui	829 000	810 400
WY3	Coral colonies at O Tsai (headland N at SW ferry pier)	829 200	809 850
CY1 (flood)	Control Station	828 400	810 800
CY2 (ebb)	Control Station	828 000	808 800

Coral Monitoring

3.08 The coral monitoring station to be performed under the Project is show in ***Appendix D***. The ecology monitoring was ceased since the completion of marine work on 22 April 2013.

3.09 It is concluded that Sham Wan is more suitable as a control site than Beaufort Island. The proposal for relocation of control station was submitted to IEC and AFCD and both parties have no comment on the proposal. The coral monitoring stations to be performed under the Project is described in ***Table 3-5*** and shown in ***Appendix D.***

Table 3-5 Location of Coral Monitoring

Dive Site	Number	Coordinates	
		Easting	Northing
Yung Shu Wan, Lamma Island	1	829180.06E	809555.76N
Sham Wan, Lamma Island	2	832160.86E	805738.31N

3.3 MONITORING FREQUENCY AND PERIOD

3.10 The Impact monitoring carried out in the EM&A programme is basically in accordance with the requirements in *EM&A Manual Sections 2.7, 3.6, 4.7, 4.8, 7.3 and 7.4*. The monitoring requirements are listed as follows:

Air Quality Monitoring

Parameters: 1-hour TSP and 24-hour TSP.

Frequency: Once in every six days for 24-hour TSP and three times in every six days for 1-hour TSP.

Duration: Throughout the construction period.

Noise Monitoring

Parameters: $L_{eq(30min)}$ & $L_{eq(5min)}$, L10 and L90.

$L_{eq(15min)}$ & $L_{eq(5min)}$, L10 and L90 during the construction undertaken during Restricted Hours (19:00 to 07:00 hours next of normal working day and full day of public holiday and Sunday).

Frequency: Once per week during 0700-1900 hours on normal weekdays. Restricted Hour monitoring should depend on conditions stipulated in Construction Noise Permit.

Duration: Throughout the construction period.

Marine Water Quality Monitoring

Parameters: Duplicate in-situ measurements: water depth, temperature, Dissolved Oxygen, pH, turbidity and salinity;

HOKLAS-accredited laboratory analysis: Suspended Solids

Frequency: Three days a week, at mid ebb and mid flood tides. The interval between 2 sets of monitoring will be more than 36 hours.

Sampling Depth:
(i.) Three depths: 1m below water surface, 1m above sea bottom and at mid-depth when the water depth exceeds 6m.
(ii.) If the water depth is between 3m and 6m, two depths: 1m below water surface and 1m above sea bottom.
(iii.) If the water depth is less than 3m, 1 sample at mid-depth is taken

Duration: During the course of marine works

Coral Monitoring

Parameters: Presence and coverage of hard and soft corals such as diversity, abundance and health status of the corals in the general area, plus other physical and biological condition at the underwater environment. The monitoring parameters are categorized in (1) percentage sediment cover; (2) percentage bleached tissue; and (3) percentage dead of each tagged coral

Frequency: One per week for the first three months of the marine works;

If no exceedances are reported during the first three months, the frequency may be reduced to twice every month. Monitoring frequency shall be increase if there is indication/trend of increase in the monitoring parameters, upon the decision of Inspecting Officer

Duration: During the course of marine works

Post-Construction Monitoring – Marine Water

3.11 Upon the marine works (dredging and HDD pipe installation) completion, 4 weeks of post-construction monitoring would be undertaken in accordance with the *Section 4.8 of EM&A Manual*. The requirements of post-construction monitoring such as the parameter, frequency, location and sampling depth is same as the impact monitoring.

3.4 MONITORING EQUIPMENT

Air Quality Monitoring

3.12 The 24-hour and 1-hour TSP levels shall be measured by following the standard high volume sampling method as set out in the *Title 40 of the Code of Federal Regulations, Chapter 1 (Part 50), Appendix B.* If the ET proposes to use a direct reading dust meter to measure 1-hour TSP levels, it shall submit sufficient information to the IEC to approve. The filter paper of 24-hour TSP measurement shall be determined by HOKLAS accredited laboratory.

1-hour TSP

3.13 The 1-hour TSP monitor, a TSI Dust Track Aerosol Monitor Model 8520 or Sibata LD-3 Laser Dust Meter is a portable, battery-operated laser photometer. The 1-hour TSP meter provides a real time 1-hour TSP measurement based on 90^0 light scattering. The 1-hour TSP monitor consisted of the following:

a. A pump to draw sample aerosol through the optic chamber where TSP is measured;
b. A sheath air system to isolate the aerosol in the chamber to keep the optics clean for maximum reliability; and
c. A built-in data logger compatible with Windows based program to facilitate data collection, analysis and reporting.

24-hour TSP

3.14 The equipment used for 24-hour TSP measurement will be a TISCH High Volume Air Sampler, HVS Model TE-5170, which complied with EPA Code of Federal Regulation, Appendix B to Part 50. The HVS consists of the following:

a. An anodized aluminum shelter;
b. A 8"x10" stainless steel filter holder;
c. A blower motor assembly;
d. A continuous flow/pressure recorder;
e. A motor speed-voltage control/elapsed time indicator;
f. A 7-day mechanical timer, and
g. A power supply of 220v/50 hz

3.15 For HVS for 24-hour TSP monitoring, the HVS is mounted in a metallic cage with a top for protection and also it is sat on the existing ground. The flow rate of the HVS between

0.63m3/min and 1.7m3/min will be properly set in accordance with the manufacturer's instruction to within the range recommended in USEPA Standard Title 40, CFR Part 50. Glass Fiber Filter 8" x 10" of TE-653 will be used for 24-hour TSP monitoring and would be supplied by laboratory. The general procedures of sampling are described as below:-

- A horizontal platform with appropriate support to secure the samples against gusty wind should be provided;
- No two samplers should be placed less than 2 meters apart;
- The distance between the sampler and an obstacle, such as building, must be at least twice the height that the obstacle protrudes above the sample;
- A minimum of 2 meters of separation from any supporting structure, measured horizontally is required;
- Before placing any filter media at the HVS, the power supply will be checked to ensure the sampler work properly;
- The filter paper will be set to align on the screen of HVS to ensure that the gasket formed an air tight seal on the outer edges of the filter. Then filter holder frame will be tightened to the filter hold with swing bolts. The holding pressure should be sufficient to avoid air leakage at the edge.
- The mechanical timer will be set for a sampling period of 24 hours (00:00 mid-night to 00:00 mid-night next day). Information will be recorded on the field data sheet, which would be included the sampling data, starting time, the weather condition at current and the filter paper ID with the initial weight;
- After sampling, the filter paper will be collected to transfer from the filter holder of the HVS to a sealed in the envelope and sent to a local HOKLAS accredited laboratory for quantifying.

3.16 All the sampled 24-hour TSP filters will be kept in normal air conditioned room conditions, i.e. 70% HR (Relative Humidity) and 25^{o}C, for six months prior to disposal.

3.17 The HVS used for 24-hour TSP monitoring will be calibrated before the commencement for sampling, and after in two months interval for 1 point checking of maintenance and six months interval for five points calibrate in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5028A) to establish a relationship between the follow recorder meter reading in cfm (cubic feet per minute) and the standard flow rate, Qstd, in m^3/min.

Noise Monitoring

3.18 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 carrying out the noise monitoring. The sound level meter shall be checked using an acoustic calibrator. The wind speed shall be checked with a portable wind speed meter capable of measuring the wind speed in m s^{-1}.

3.19 All noise measurements will be performed with the meter set to FAST response and on the A-weighted equivalent continuous sound pressure level (Leq). Leq(30 min) in six consecutive Leq(5 min) measurements will be used as the monitoring parameter for the time period between 0700-1900 hours on weekdays throughout the construction period. Leq(15 min) in three consecutive Leq(5 min) measurements for other time periods (e.g. during restricted hours) will only be conducted for monitoring the construction noise during restricted hours as necessary.

3.20 The sound level meter will be mounted on a tripod at a height of 1.2 m 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 will be fitted for all measurements. Where a measurement is to be carried out at a building, the assessment point would normally be

at a position 1 m from the exterior of the building façade. Where a measurement is to be made for noise being received at a place other than a building, the assessment point would be at a position 1.2 m above the ground in a free-field situation, i.e. at least 3.5 m away from reflective surfaces such as adjacent buildings or walls.

3.21 Immediately prior to and following each noise measurement the accuracy of the sound level meter will be checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements will be accepted as valid only if the calibration level from before and after the noise measurement agrees to within 1.0dB.

3.22 Noise measurements will not be made in fog, rain, wind with a steady speed exceeding 5m/s or wind with gusts exceeding 10m/s. The wind speed will be checked with a portable wind speed meter capable of measuring the wind speed in m/s. An acoustic calibrator and sound level meter will be calibrated yearly. A valid of Calibration certificates will be shown in the Environmental Monitoring Report accordingly.

Water Quality Monitoring

3.23 Marine water quality monitoring will be conducted at the designated locations in accordance with EM&A Manual. The operating and analytical of sampling procedures are described as below:

- A Global Positioning System (GPS) will be used to ensure that the correct location was selected prior to sample collection. A portable, battery-operated echo sounder will be used for the determination of water depth at each designated monitoring station.
- The marine water sampler will be 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.
- During the sampling, the sampling container will be rinsed to use a portion of the marine water sample before the water sample is transferred to the container. Upon sampling completion, the container is sealed with a screw cap.
- Before the sampling process, general information such as the date and time of sampling, weather condition and tidal condition as well as the personnel responsible for the monitoring will be recorded on the monitoring field data sheet.
- In-situ measurement including water temperature, turbidity, dissolved oxygen, salinity, pH and water depth undertake at the identified monitoring point. At each station, marine water samples are collected at three depths: 1m below water surface, 1m above sea bottom and at mid-depth when the water depth exceeds 6m. Samples at 1m below water surface and 1m above sea bottom are collected when the water depth is between 3m and 6m. Only 1 sample at mid-depth is taken when the water depth is below 3m.
- For the in-situ measurement, two consecutive measurements of sampling depth, temperature, dissolved oxygen, salinity, turbidity and pH concentration will be measured at the sea. The YSI Model 6820 Multi-parameter Water Quality Sonde is retrieved out of the water after the first measurement and then re-deployed for the second measurement. Where the difference in the value between the first and second readings of each set is more than 25% of the value of the first reading, the reading is discarded and further readings is taken.
- Water sample collection would be used the water sampler. During the water sample collected from the sea, it is fill in high-density polythene bottles. Before the water sample storage, the sampling bottles will be pre-rinsed with the same water sample. The sample bottles then is packed in cool-boxes (cooled at $4^{O}C$ without being frozen), and delivered to HOKLAS accredited laboratory for the chemical analysis as followed APHA *Standard Methods for the Examination of Water and Wastewater* 19ed 2540D, unless otherwise specified.
- The laboratory has be comprehensive quality assurance and quality control programmes. For QA/QC procedures, one duplicate samples of every batch of 20 samples is analyzed as

followed the HOKLAS accredited requirement.

3.24 All water samples will be analyzed with various chemical tests as specified in the EM&A Manual by a local HOKLAS-accredited testing laboratory (ALS Technichem (HK) Pty Ltd HOKLAS registration no. 66). Duplicate samples from each independent sampling event are required for all parameters and the samples will be mixed and analyzed in one set of laboratory analysis. The mixed process would be carried by the laboratory. The determination works should start within 24 hours after collection of the water samples or within the holding time as advised by the laboratory. The laboratory analysis result will be input in our computer database upon received from the laboratory

Coral Monitoring

3.25 The monitoring equipments used for the coral monitoring could be referred to ***Impact Coral Monitoring report.***

3.5 EQUIPMENT CALIBRATION

3.26 Calibration of the HVS is performed upon installation in accordance with the manufacturer's instruction using the NIST-certified standard calibrator (Tisch Calibration Kit Model TE-5025A). The calibration data are properly documented and the records are maintained by ET for future reference.

3.27 The 1-hour TSP meter was calibrated by the supplier prior to purchase. Zero response of the equipment was checked before and after each monitoring event. In-house calibration with the High Volume Sampler (HVS) in same condition was undertaken in yearly basis.

3.28 The sound level meter and calibrator are calibrated and certified by a laboratory accredited under HOKLAS or any other international accreditation scheme at yearly basis.

3.29 For the marine water sampling period, the Multi-parameter Water Quality Monitoring System will be calibrated by three month interval accordingly. The available calibration certificate will be issued to ensure the performance of Multi-parameter Water Quality Monitoring System to use for in-situ measurement.

3.30 All updated calibration certificates of the monitoring equipment used for the impact monitoring program in the relevant Monthly EM&A Report.

3.6 METEOROLOGICAL INFORMATION

3.31 The meteorological information during the construction phase is obtained from the Wong Chuk Hang Station of the Hong Kong Observatory (HKO) which near the Project site. The meteorological information in this Reporting Period is presented in ***Appendix F.***

3.7 DATA MANAGEMENT AND DATA QA/QC CONTROL

3.32 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 program.

3.33 The monitoring data recorded in the equipment e.g. 1-hour TSP meter, noise meter and Multi-parameter Water Quality Monitoring System, are downloaded directly from the equipments 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.

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

3.34 According to the Yung Shue Wan Environmental Monitoring and Audit Manual, the air quality, construction noise, marine water quality and coral monitoring were established, namely Action and Limit levels are listed in ***Tables 3-6, 3-7, 3-8 and 3-9*** as below.

Table 3-6 Action and Limit Levels for Air Quality Monitoring

Monitoring Station	Action Level (μg /m^3)		Limit Level (μg/m^3)	
	1-hour TSP	24-hour TSP	1-hour TSP	24-hour TSP
AC02b	288	161	500	260
AC04c	290	176	500	260

Table 3-7 Action and Limit Levels for Construction Noise Monitoring

Recommended Action & Limit Levels of Construction Noise		
Monitoring Location	Action Level	Limit Level
	0700-1900 hours on normal weekdays	
NC05	When one or more documented complaints are received	75 dB(A)*

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

Table 3-8 Action and Limit Levels for Marine Water Quality Monitoring

Parameter	Performance Criteria	Impact Station		
		WY1	WY2	WY3
DO Concentration (Surface and Middle) (mg/L)	Action Level	3.63	3.53	3.61
	Limit Level	3.32	3.47	3.42
DO Concentration (Bottom) (mg/L)	Action Level	3.33	2.92	3.36
	Limit Level	3.23	2.63	3.14
Turbidity (Depth-Average) (NTU)	Action Level	10.94	14.16	14.99
	Limit Level	17.35	15.20	16.21
Suspended Solids (Depth-Average) (mg/L)	Action Level	17.52	14.04	14.52
	Limit Level	25.62	16.51	16.88

Table 3-9 Action and Limit Levels for Coral Monitoring

Step	Action
1	Commence tagged coral monitoring at the impact site. If no increase in sedimentation cover/bleaching/partial mortality is observed on the hard corals or partial mortality no the soft/black corals, no action is required. The coral survey specialist should present this information to the IC(E) at the end of each survey day for verification. If an increase in sedimentation cover/bleaching/partial mortality is observed on the hard corals or partial mortality on the soft/black corals at one or more impact monitoring stations Step 3 should be enacted, if not, Step 2.
2	If non actions are triggered a formal report should be issued along with evidentiary photographs following completion of the survey. Meanwhile monitoring work and construction works should continue uninterrupted.
3	If during the impact monitoring a 15% increase in the percentage of sedimentation on the hard corals occurs at more than 20% of the tagged coral colonies at the Impact Monitoring Station that is not reported at the Control Monitoring Station, then the Action Level is exceeded (Step 4).
4	If the Action Level is exceeded the IC(E) should inform all parties. The data from the water quality monitoring should also be reviewed. If the water quality monitoring shows no attributable effects of the installation works, then the Action Level is not triggered. If the water quality data indicate exceedances (for SS and/or turbidity) the IC(E) should discus with the Contractor the most appropriate method of reducing suspended solids during construction (e.g. reduce rate of dredging). The water quality data reviewed should then be enacted on the next working day.
5	Monitoring should proceed the following day as per Step 1. If during the Impact Monitoring a 25% increase in the percentage of sedimentation on the hard corals at more than 20% of the tagged coral colonies at the Impact Monitoring Station that is not reported at the Control Monitoring Station, then the Limit Level is exceeded (Step 6). If the Limit Level is not exceeded Step 2 is enacted and work continues according to the mitigated method.
6	If the Limit Level is exceeded the Inspector Officer should inform all parties immediately. Should the Limit Level be exceeded, the Contractor should stop works immediately and work out a solution to the satisfaction of the IC(E), EPD and AFCD. The IC(E) should inform the Contractor to suspend marine construction works until an effective solution is identified. Once the solution has identified and agreed with all parties, backfilling works may re-commence.

4 IMPACT MONITORING RESULTS

4.01 The environmental monitoring results will be compared against the Action and Limit Levels established based on the baseline monitoring results and statutory criteria. In case the measured data exceed the environmental quality criteria, remedial actions will be triggered according to the Event and Action Plan. In the Reporting Period, the graphical plots of the trends of monitored parameter over the past four months are presented in ***Appendix E***.

4.1 RESULTS OF AIR QUALITY MONITORING

4.02 The monitoring results of air quality monitoring at the identified locations during the Reporting Period are summarized in ***Tables 4-1***. In this Reporting Period, a total of **96** events of 1-hour TSP and **24** events of 24-hour TSP measurements were therefore performed.

4.03 Power failure of HVS occurred during 24-hour TSP monitoring at AC02b on 7 and 30 October 2014, and at AC04c on 13 and 19 September 2014. The incidents have been reported to relevant parties on the next day and the provisions of power supply were rectified by the Contractor before the next monitoring event. To avoid the recurrence of power failure, the Contractor was reminded to pay more attention to the power issue and ensure a stable power source for the HVS.

Table 4-1 Summary of 1-hour and 24-hour TSP Monitoring Results

Monitoring Location	1-hour TSP (μg/m³)			24-hour TSP (μg/m³)		
	Max	Min	Mean	Max	Min	Mean
AC02b	208	15	81	94	9	51
Record Date	4-Nov-14	26-Aug-14	48 events	13-Oct-14	17-Nov-14	12 events
AC04c	235	13	86	102	24	56
Record Date	4-Nov-14	12-Sep-14	48 events	24-Oct-14	8-Sep-14	12 events

4.04 The 1-hour TSP and 24-hour TSP monitoring values fluctuated below the Action and Limit Levels during the Reporting Period. No Notification of Exceedance (NOE) of air quality criteria or corrective action was therefore required.

4.2 RESULTS OF CONSTRUCTION NOISE MONITORING

4.05 Summary of construction noise monitoring at the identified locations during the Reporting Period are summarized in ***Table 4-2***. In this Reporting Period, a total of **13** events of construction noise measurement were conducted while no documented construction complaint was received and all the construction noise results were below the Limit level. No NOE or corrective action was recommended for this parameter.

Table 4-2 Summary of Construction Noise Monitoring Results

Station	Leq, 30min (dB((A))	
	Max	Min
NC05	63.8	53.7
Record Date	21-Nov-14	23-Oct-14

4.3 RESULTS OF MARINE WATER QUALITY MONITORING

6.01 According to the EM&A Manual of Yung Shue Wan, water quality monitoring should be carried out during the course of marine work. As informed by the Contractor in June 2013, the marine works in Yung Shue Wan has been completed on 22 April 2013. Marine water quality monitoring was therefore terminated in July 2013 after consent was obtained with IEC. In this regards, an associated letter ref. TCS00512/10/300/L0656 dated 28 June 2013 has been issued to EPD for approval and no comment was received.

4.4 RESULTS OF ECOLOGY MONITORING

7.01 According to the EM&A Manual of Yung Shue Wan, ecology monitoring should be carried out during the course of marine work. As informed by the Contractor in June 2013, the marine works in Yung Shue Wan has been completed on 22 April 2013. Ecology monitoring was therefore terminated in June 2013 after consent was obtained with IEC. In this regards, an associated letter ref. TCS00512/10/300/L0656 dated 28 June 2013 has been issued to EPD for approval and no comment was received.

5 WASTE MANAGEMENT

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

5.1 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 Period 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
	Sep 14	Oct 14	Nov 14	
C&D Materials (Inert) ('000m^3)	0	0	0	-
Reused in this Contract (Inert) ('000m^3)	0	0	0	-
Reused in other Projects (Inert) ('000m^3)	0	0	0	-
Disposal as Public Fill (Inert) ('000m^3)	0	0	0	Tuen Mun Area 38

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

Type of Waste	Quantity			Disposal Location
	Sep 14	Oct 14	Nov 14	
Metal (kg)	0	0	0	-
Paper / Cardboard Packing (kg)	0	0	0	-
Plastic (kg)	0	0	0	-
Chemical Wastes (kg)	0	0	0	
General Refuses (tonne)	19.610	28.860	10.880	Yung Shue Wan RTS

5.04 There was no site effluent discharged but the estimated volume of surface runoff was less than 50m^3 in this reporting quarter.

6 SITE INSPECTION

6.01 According to the Final Report Environmental Monitoring and Audit Manual, the environmental site inspection should been formulation by ET Leader. Regular environmental site inspections had been carried out by the ET to confirm the environmental performance. In this reporting period, weekly joint-site visit by RE, the Contractor and ET was carried out on **27 August 2014; 2, 12, 17, 25, 30 September 2014; 7, 14, 21, 28 October 2014; 4, 11, 18 and 25 November 2014.**

6.02 Observations for the site inspections and monthly audit within this Reporting Period are summarized in ***Table 6-1***.

Table 6-1 Site Observations

Date	Findings / Deficiencies	Follow-Up Status
27 August 2014	• No environmental issue was observed during the site inspection	NA.
2 September 2014	• No environmental issue was observed during the site inspection	NA.
12 September 2014	• The Contractor was reminded to improve the housekeeping of the construction site. • • The Contractor was reminded to cover the stockpile with tarpaulin sheet to reduce dust generation.	Housekeeping condition has been improved. The stockpile has been backfilled.
17 September 2014	• The Contractor was reminded to keep the public access road clean at the front of the construction entrance.	The public access road has been cleaned.
25 September 2014	• No environmental issue was observed during the site inspection	NA
30 September 2014	• No environmental issue was observed during the site inspection	NA.
7 October 2014	• The Contractor was reminded to spray larvicidal oil regularly at U-channel for mosquito breeding prevention.	Spraying of larvicidal oil was performed regularly.
14 October 2014	• No environmental issue was observed during the site inspection	NA
21 October 2014	• The Contractor was reminded to dispose empty cement bags properly to reduce dust generation.	The empty cement bags were removed.
28 October 2014	• The Contractor was reminded to clean the stagnant water at drip tray of chemical cans for mosquito breeding prevention.	Stagnant water has been removed.
4 November 2014	• The Contractor was reminded to ensure no leaking of water from the junction of pipe at rooftop of YSW sewage treatment plant to avoid mosquito breeding. • The Contractor was reminded to better cover the opening of water tank to prevent stagnant water being stored.	No leaking of water was observed. The opening of the water tank has been better covered.
11 November 2014	• The Contractor was reminded to better cover the dusty stockpile with tarpaulin sheet to reduce dust generation.	The stockpile has been better covered.

	•	
18 November 2014	• The Contractor was reminded to ensure no leaking of water from the water hose at rooftop of YSW sewage treatment plant to avoid mosquito breeding.	No leaking of water from the water hose was observed.
25 November 2014	• No environmental issue was observed during the site inspection	NA

7 ENVIRONMENTAL COMPLAINT AND NON-COMPLIANCE

7.1 ENVIRONMENTAL COMPLAINT, SUMMONS AND PROSECUTION

7.01 No environmental complaint, summons and prosecution was received in this Reporting Period. 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
September 2014	0	0	NA
October 2014	0	0	NA
November 2014	0	0	NA

Table 7-2 Statistical Summary of Environmental Summons

Reporting Period	Environmental Summons Statistics		
	Frequency	Cumulative	Complaint Nature
September 2014	0	0	NA
October 2014	0	0	NA
November 2014	0	0	NA

Table 7-3 Statistical Summary of Environmental Prosecution

Reporting Period	Environmental Prosecution Statistics		
	Frequency	Cumulative	Complaint Nature
September 2014	0	0	NA
October 2014	0	0	NA
November 2014	0	0	NA

8 IMPLEMENTATION STATUS OF MITIGATION MEASURES

8.01 The environmental mitigation measures that recommended in the Yung Shue Wan Environmental Monitoring and Audit Manual covered the issues of dust, noise, water and waste and they are summarized as following:

Dust Mitigation Measure

8.02 Installation of 2m high solid fences around the construction site of Pumping Station P2 is recommended. Implementation of the requirements stipulated in the Air Pollution Control (Construction Dust) Regulation and the following good site practices are recommended to control dust emission from the site:

(a) Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather;

(b) Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses;

(c) Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like.

(d) Any vehicle used for moving sands, aggregates and construction waste shall have properly fitting side and tail boards. Materials should not be loaded to a level higher than the side and tail boards, and should be covered by a clean tarpaulin.

Noise Mitigation Measure

8.03 As detailed in the EIA report, concreting work of the Pumping Station P1a and sewer alignment construction activities would likely cause adverse noise impacts on some of the noise sensitive receivers. Appropriate mitigation measures have therefore been recommended. The mitigation measures recommended in the EIA report are summarised below:

(a) Use of quiet equipment for the construction activities of the Pumping Stations and sewer alignment;

(b) Use of temporary noise barrier around the site boundary of Pumping Station P1a;

(c) Use of kick ripper (saw and lift) method to replace the breaker for pavement removal during sewer alignment construction;

(d) Restriction on the number of plant during sewer alignment construction;

(e) Use of noise screening structures in the form of acoustic shed or movable barrier wherever practicable and feasible in areas with sufficient clearance and headroom during the construction of sewer alignment;

(f) Adoption of manual working method wherever practicable and feasible in areas where the worksites of the proposed sewer alignment are located less than 20m from the residential noise sensitive receivers and less than 30m from the temple and the public library; and

(g) Implementation of the following good site practices**:**

- Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction program.
- Mobile plant, if any, should be sited as far away from NSRs as possible.
- Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum.
- Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs.
- Material stockpiles and other structures should be effectively utilised, wherever practicable, in screening noise from on-site construction activities.

Water Quality Mitigation Measure

8.04 No-dig method using Horizontal Directional Drilling (HDD) would be used for the installation of outfall pipe of about 480 m from shore to minimize the potential water quality impacts arising from the dredging works required for the submarine outfall construction. For the remaining outfall pipe of about 240m and the diffuser section, open trench dredging would still be required.

8.05 During the dredging works, the Contractor should be responsible for the design and implementation of the following mitigation measures.

- Dredging should be undertaken using closed grab dredgers with a total production rate of 55m^3/hr;
- Deployment of 2-layer silt curtains with first layer enclosing the grab and the second layer at around 50, from the dredging area while dredging works are in progress;
- all vessels should be sized such that adequate clearance (i.e. minimum clearance of 0.6m) is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash;
- all pipe leakages should be repaired promptly and plant shall not be operated with leaking pipes;
- excess material should be cleaned from the decks and exposed fittings of barges before the vessel is moved;
- adequate freeboard (i.e. minimum of 200m) should be maintained on barges to ensure that decks are not washed by wave action;
- all barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; and
- loading of barges and hoppers should be controlled to prevent splashing of dredged material to the surrounding water, and barges and hoppers should not be filled to a level which would cause the overflow of materials or sediment laden water during loading or transportation; and
- the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard.

Construction Run-off and Drainage

8.06 The Contractor should observe and comply with the Water Pollution Control Ordinance and the subsidiary regulations. The Contractor should follow the practices, and be responsible for the design, construction, operation and maintenance of all the mitigation measures as specified in ProPECC PN 1/94 "Construction Site Drainage". The design of the mitigation measures should be submitted by the Contractor to the Engineer for approval. These mitigation measures should include the following practices to minimise site surface runoff and the chance of erosion, and also to retain and reduce any suspended solids prior to discharge:

- Provision of perimeter channels to intercept storm-runoff from outside the site. These should be constructed in advance of site formation works and earthworks.
- Works programmes should be designed to minimize works areas at any one time, thus minimising exposed soil areas and reducing the potential for increased siltation and runoff.
- Sand/silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove the sand/silt particles from run-off. These facilities should be properly and regularly maintained. These facilities shall be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site.
- Careful programming of the works to minimise soil excavation works during rainy seasons.
- Exposed soil surface should be protected by paving or hydroseeding as soon as possible to reduce the potential of soil erosion.
- Trench excavation should be avoided in the wet season, and if necessary, these should be excavated and backfilled in short sections.
- Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric.

General Construction Activities

8.07 Debris and rubbish generated on-site should be collected, handled and disposed of properly to avoid entering the nearby coastal waters and stormwater drains. 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. Open drainage channels and culverts near the works areas should be covered to block the entrance of large debris and refuse.

Wastewater Arising from Workforce

8.08 Portable toilets shall be provided by the Contractors, where necessary, to handle sewage from the workforce. The Contractor shall also be responsible for waste disposal and maintenance practices

Sediment Contamination Mitigation Measure

8.09 The basic requirements and procedures for dredged mud disposal are specified under the WBTC No. 34/2002. The management of the dredging, use and disposal of marine mud is monitored by the MFC, while the licensing of marine dumping is the responsibility of the Director of Environmental Protection (DEP).

8.10 The uncontaminated dredged sediment will be loaded onto barges and transported to the designated marine disposal site. Appropriate dredging methods have been incorporated into the recommended water quality mitigation measures including the use of closed-grab dredgers and silt curtains. Category L sediment would be suitable for disposal at a gazetted open sea disposal ground.

8.11 During transportation and disposal of the dredged marine sediments, the following measures should be taken to minimize potential impacts on water quality:

- Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved.
- Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self-monitoring devices as specified by the DEP.

Construction Waste Mitigation Measure

Good Site Practices and Waste Reduction Measures

8.12 It is not anticipated that adverse waste management related impacts would arise, provided that good site practices are strictly followed. Recommendations for good site practices for the construction waste arising include:

- Nomination of an approved person, such as a site manager, to be responsible for the implementation of good site practices, arranging for collection and effective disposal to an appropriate facility, of all wastes generated at the site.
- Training of site personnel in proper waste management and chemical handling procedures.
- Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers.
- Provision of sufficient waste disposal points and regular collection for disposal.
- Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility.
- Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.
- Maintain records of the quantities of wastes generated, recycled and disposed.

8.13 In order to monitor the disposal of C&D waste at landfills and to control fly tipping, a trip-ticket system should be included as one of the contractual requirements and implemented by an Environmental Team undertaking the Environmental Monitoring and Audit work. An Independent Environmental Checker should be responsible for auditing the results of the system.

8.14 Good management and control can prevent the generation of significant amount of waste. Waste reduction is best achieved at the planning and design stage, as well as by ensuring the implementation of good site practices. Recommendations to achieve waste reduction include:

- segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal;
- to encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to segregate this waste from other general refuse generated by the work force;
- any unused chemicals or those with remaining functional capacity should be recycled;
- use of reusable non-timber formwork to reduce the amount of C&D material;
- prior to disposal of C&D waste, it is recommended that wood, steel and other metals should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill;
- proper storage and site practices to minimise the potential for damage or contamination of construction materials; and
- plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.

General Site Wastes

8.15 A collection area should be provided where waste can be stored prior to removal from site. An enclosed and covered area is preferred for the collection of the waste to reduce 'wind blow' of light material.

Chemical Wastes

8.16 After use, chemical waste (e.g. cleaning fluids, solvents, lubrication oil and fuel) should be handled according to the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes. Any unused chemicals or those with remaining functional capacity should be recycled. Spent chemicals should be properly stored on site within suitably designed containers, and should be collected by an approved operator for disposal at the Chemical Waste Treatment Facility or other licenced facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordinance.

8.17 Any service shop and minor maintenance facilities should be located on hard standings within a bunded area, and sumps and oil interceptors should be provided. Maintenance of vehicles and equipment involving activities with potential for leakages and spillage should only be undertaken with the areas appropriately equipped to control these discharges.

Construction and Demolition Material

8.18 The C&D material should be separated on-site into three categories: (i) public fill, the inert portion of the C&D material (e.g. concrete and rubble), which should be re-used on-site or disposed of at a public filling area; (ii) C&D waste for re-use and/or recycling, the non-inert portion of the C&D material, (e.g. steel and other metals, wood, glass and plastic); (iii) C&D waste which cannot be re-used and/or recycled. The waste producers are responsible for its disposal at strategic landfills.

8.19 In order to minimise the impact resulting from collection and transportation of material for off-site disposal, it was recommended that inert material should be re-used on-site where possible. Prior to disposal of C&D material, it was also recommended that steel and other metals should be separated for re-use and/or recycling where practicable to minimise the quantity of waste to be disposed of to landfill.

Ecology Mitigation Measure

8.20 The following general good practice measures should be adopted to mitigate ecological impacts during marine works (including dredging and HOD);

- Excess material from vessel loading should be cleaned from the decks and exposed fittings before vessels are moved to the backfilling location;
- Dredging should cause no foam, oil, grease, scum, litter or other objectionable matter to be present on the water;
- Adequate freeboard should be maintained to ensure that decks are not washed by wave action;
- All pie leakages should be repaired promptly and plant Should not be operated with leaking pipes; and
- All banges and other vessels should maintain adequate clearance between vessels and the seabed at all stats of the tide and reduce operational speeds to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash.

8.21 In the event of exceedances of ecological action or limit level, the Contractor will be required to revise his operations as a further mitigation measure. Revisions to the operation method may include (but not be limited to):

- Reduction in dredging rate'
- Restriction of dredging in particular areas to specific periods in the tidal cycle

8.22 Should repeated non-compliances with limit level(s) occur the Contractor shall modify his working method until he is able to achieve the required compliances with the limit levels to the satisfaction of the IC(E)

Fisheries Mitigation Measure

8.23 Closed grab dredger, deployment of silt curtains around the immediate dredging area and low dredging rate have been recommended in Water Quality of the EIA report in order to minimise sediment release into the water column.

Landscape & Visual Mitigation Measure

8.24 Mitigation measures recommended in the EIA Report for landscape and visual impacts during the construction stage are summarised below.

- Screening of site construction works by use of hoarding that is appropriate to its site context;
- Retaining existing trees and minimising damage to vegetation where possible by close co-ordination and on site alignment adjusted of rising main and gravity sewer pipelines. Tree protective measures should be implemented to ensure trees identified as to be retained are satisfactorily protected during the construction phase;
- Careful and efficient transplanting of affected trees (1 no.) to temporary or final transplant location (the proposed tree to be transported is a semi-mature *Macaranga tanarius* and is located at the proposed Pumping Station P2 location);
- Short excavation and immediate backfilling of sections upon completion of works to reduce active site area;
- Conservation of top-soil for reuse.
- Night-time light source from marine fleets should be directed away from the residential units

8.25 The implementation schedule of mitigation measures is presented in ***Appendix H***.

8.26 Leader had been implementing the required environmental mitigation measures according to the Yung Shue Wan Environmental Monitoring and Audit Manual subject to the site condition. Environmental mitigation measures generally implemented by Leader in this Reporting Month are summarized in ***Table 8-1***.

Table 8-1 Environmental Mitigation Measures

Issues	Environmental Mitigation Measures
Water Quality	• Drainage channels were provided to convey run-off into the treatment facilities; and • Drainage systems were regularly and adequately maintained.
Air Quality	• Cover all excavated or stockpile of dusty material by impervious sheeting or sprayed with water to maintain the entire surface wet; • Public roads around the site entrance/exit had been kept clean and free from dust; and • Tarpaulin covering of any dusty materials on a vehicle leaving the site.
Noise	• Good site practices to limit noise emissions at the sources; • Use of quite plant and working methods; • Use of site hoarding or other mass materials as noise barrier to screen noise at ground level of NSRs; and • To minimize plant number use at the worksite.
Waste and Chemical Management	• 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; • Waste arising should be kept to a minimum and be handled, transported and disposed of in a suitable manner; • The Contractor should adopt a trip ticket system for the disposal of C&D materials to any designed public filling facility and/or landfill; and • Chemical waste shall be handled in accordance with the Code of Practice on the Packaging, Handling and Storage of Chemical Wastes.
General	• The site was generally kept tidy and clean.

9 CONCLUSIONS AND RECOMMENTATIONS

9.1 CONCLUSIONS

9.01 This is the **17th** Quarterly EM&A Summary Report for Yung Shue Wan Portion Area under the Project covering the construction period from **26 August 2014 to 25 November 2014.**

9.02 No 1-hour and 24-hour TSP monitoring results were found to trigger the Action or Limit Level in this Reporting Period. No Notification of Exceedance (NOE) of air quality criteria or corrective action was therefore required.

9.03 No exceedance in construction noise monitoring was recorded in this Reporting Period.

9.03.1 As informed by the Contractor in June 2013, the marine works in Yung Shue Wan has been completed on 22 April 2013. Marine water quality monitoring was therefore terminated in July 2013 after consent was obtained with IEC. In this regards, an associated letter ref. TCS00512/10/300/L0656 dated 28 June 2013 has been issued to EPD for approval and no comment was received.

9.04 According to the construction information provided by the Contractor, the marine works in Yung Shue Wan has been completed on 22 April 2013. As agreed by the Contractor, the ecology monitoring was ceased in May 2013 due to no ecological impact and concern after the completion of marine work, whereas impact marine water quality monitoring was terminated in July 2013. In this regards, an associated letter ref. TCS00512/10/300/L0656 dated 28 June 2013 has been issued to EPD for approval and no comment was received.

9.05 No documented complaint, notification of summons or successful prosecution was received.

9.06 **14** events of site inspection were carried out by ET in this Reporting Period and no non-compliance was observed during the inspection. In general, all the observation has been rectified during the next week site inspection. The environmental performance of the Project was therefore considered as satisfactory.

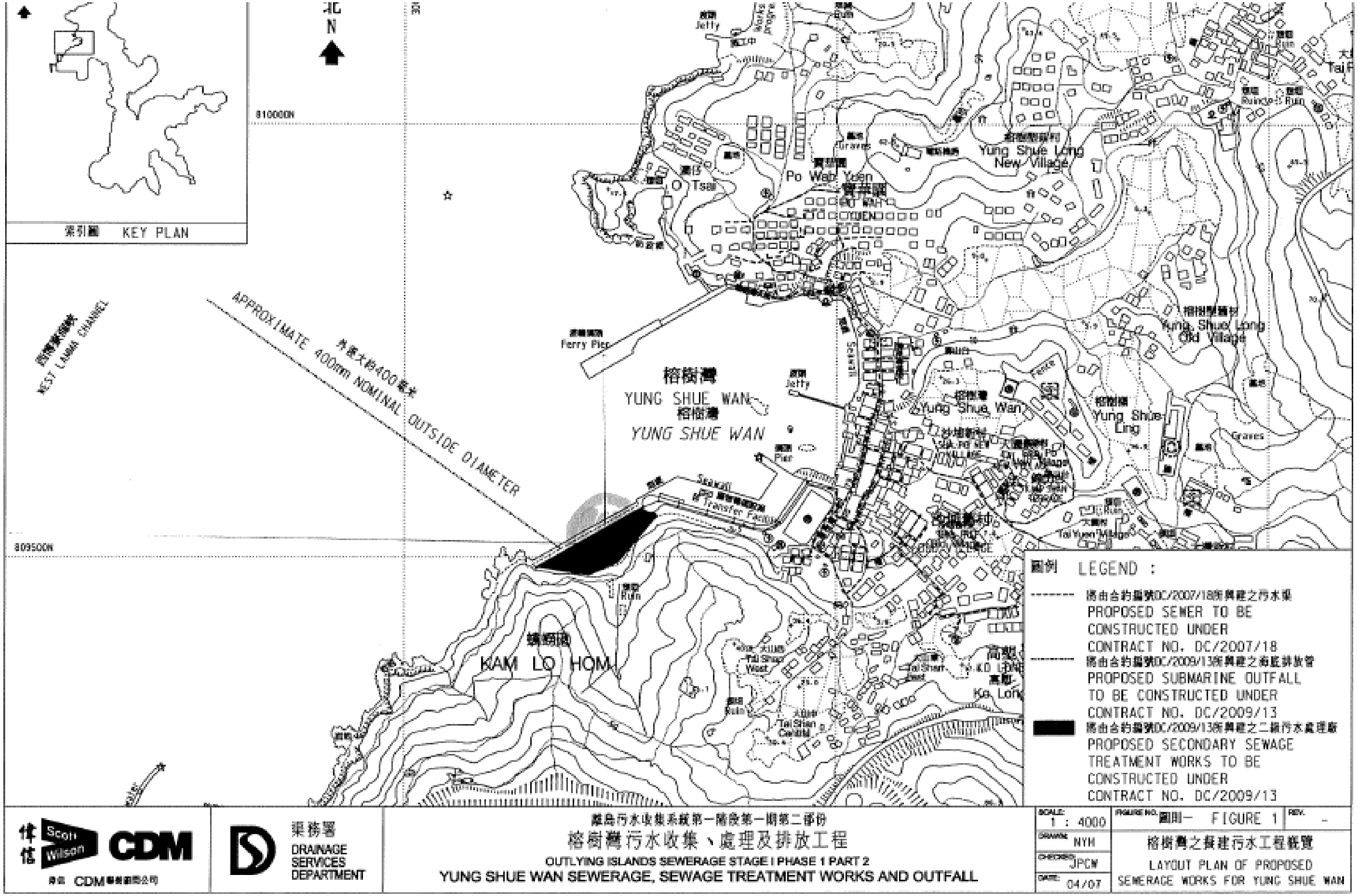
9.2 RECOMMENDATIONS

9.07 During dry and windy season, the Contractor shall pay attention on the construction dust that may cause environmental issues in the upcoming months. Mitigation measures on construction dust identified at the EM&A manual such as watering at haul road and covering of dusty material should be fully implemented.

9.08 Moreover, the construction dust mitigation measures identified at the EM&A Manuel such as watering at haul road and covering of dusty material should also be implemented and properly maintained during wet season.

Appendix A

Site Layout Plan – Yung Shue Wan Portion Area


KEY PLAN
N
WEST LAMMA CHANNEL
APPROXIMATE 400mm NOMINAL OUTSIDE DIAMETER
Ferry Pier
YUNG SHUE WAN
Po Wah Yuen
Yung Shue Long New Village
Yung Shue Long Old Village
Yung Shue Wan
Yung Shue Ling
Tai Yuen Village
KAM LO HOM
Seawall
LEGEND :
PROPOSED SEWER TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2007/18
PROPOSED SUBMARINE OUTFALL TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2009/13
PROPOSED SECONDARY SEWAGE TREATMENT WORKS TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2009/13
Scott Wilson
CDM
渠務署
DRAINAGE SERVICES DEPARTMENT
榕樹灣污水收集、處理及排放工程
OUTLYING ISLANDS SEWERAGE STAGE I PHASE 1 PART 2
YUNG SHUE WAN SEWERAGE, SEWAGE TREATMENT WORKS AND OUTFALL
SCALE 1 : 4000
FIGURE 1
DRAWN NYH
CHECKED JPCW
DATE 04/07
LAYOUT PLAN OF PROPOSED SEWERAGE WORKS FOR YUNG SHUE WAN

Appendix B

Organization Structure and Contact Details of Relevant Parties

Contact Details of Key Personnel

Organization	Project Role	Name of Key Staff	Tel No.	Fax No.
DSD	Employer	Mr. F K Pong	2159-3550	2833-9162
UCJV	Engineer's Representative	Mr. Kenneth W K Kwong	2982 0240	2982 4129
URS	Independent Environmental Checker	Mr. Rodney Ip	2410 3750	2428 9922
Leader	Director	Mr. Wilfred So	2982 1750	2982 1163
Leader	Contracts Manager	Mr. Vincent Chan	2982 1750	2982 1163
Leader	Site Agent	Mr. Ron Hung	2982 1750	2982 1163
Leader	Environmental Officer	Mr. Leung Man Kin	2982 8652	2982 8650
Leader	Sub-Agent	Mr. Leung Man Kin	2982 1750	2982 1163
Leader	Safety Officer	Ms. Vanessa Chan	2982 1750	2982 1163
AUES	Environmental Team Leader	Mr. T. W. Tam	2959 6059	2959 6079
AUES	Environmental Consultant	Ms. Nicola Hon	2959 6059	2959 6079
AUES	Team Supervisor	Mr. Ben Tam	2959 6059	2959 6079
AUES	Coral Specialist	Mr. Keith Kei	2959 6059	2959 6079

Legend:

DSD (Employer) – Drainage Services Department

UCJV (Engineer) – URS CDM Joint Venture

Leader (Main Contractor) – Leader Civil Engineering Corporation Limited

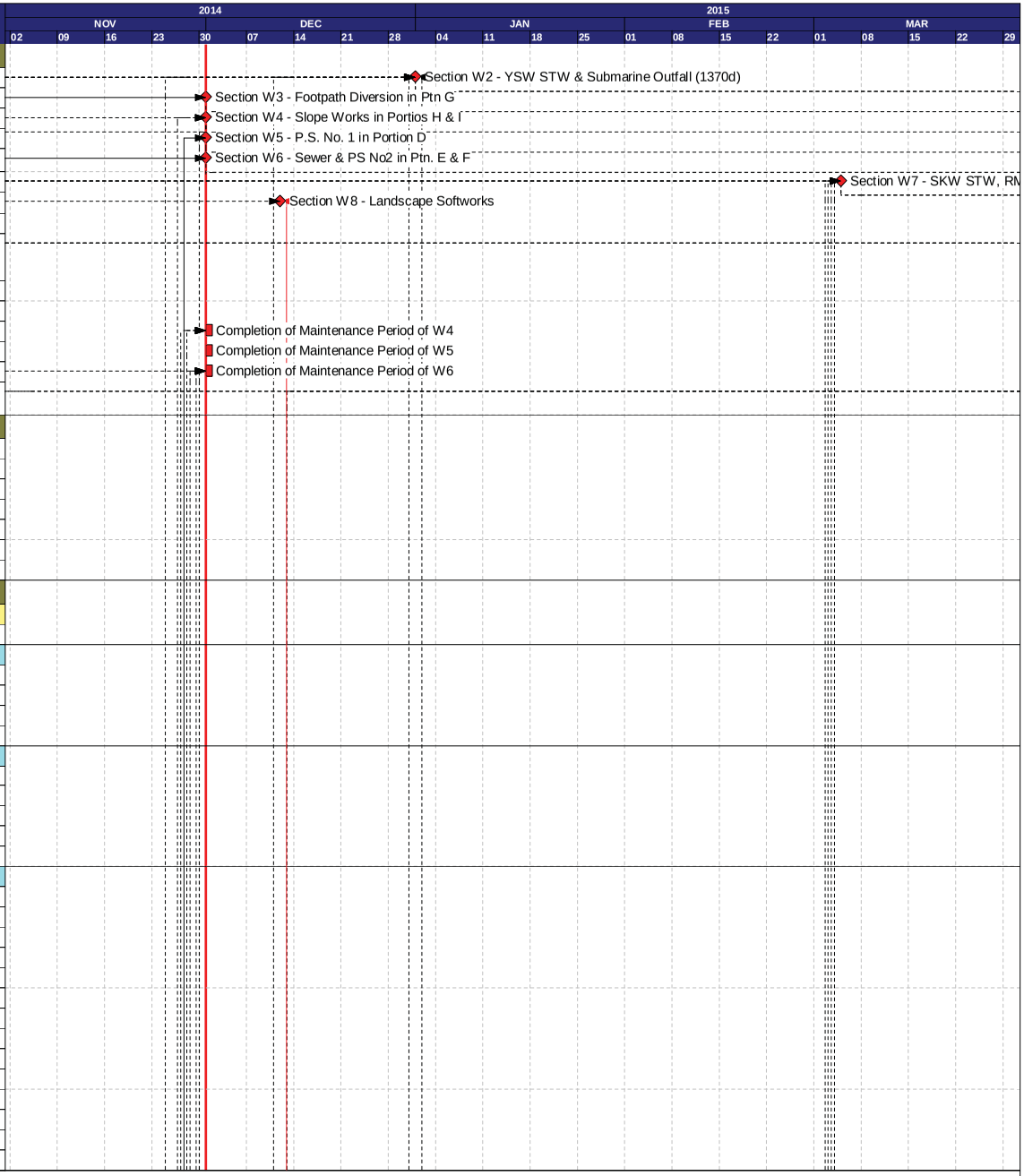
URS (IEC) – URS Hong Kong Limited

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

Appendix C

Master and Three Months Rolling Construction Programs

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish
Project Key Date							
KD0040	Section W2 - YSW STW & Submarine Outfall (1370d)	0	0		31/12/14 *		31/12/14 *
KD0050	Section W3 - Footpath Diversion in Ptn G	0	0		30/11/14		30/11/14
KD0060	Section W4 - Slope Works in Portios H & I	0	0		30/11/14 *		30/11/14 *
KD0070	Section W5 - P.S. No. 1 in Portion D	0	0		30/11/14 *		30/11/14
KD0080	Section W6 - Sewer & PS No2 in Ptn. E & F	0	0		30/11/14 *		30/11/14
KD0090	Section W7 - SKW STW, RM & Sm. Outfall	0	0		04/03/15 *		04/03/15 *
KD0100	Section W8 - Landscape Softworks	0	0		11/12/14 *		11/12/14
KD0110	Section W9 - Establishment Works	0	0		23/06/15 *		23/06/15
KD0125	Project Completion	0	0		23/06/15		23/06/15
KD0130	Completion of Maintenance Period of W1	1	100	13/10/12 A	13/10/12 A	13/10/12 A	13/10/12 A
KD0132	Completion of Maintenance Period of W2	1	0	15/06/15	15/06/15 *	15/06/15	15/06/15 *
KD0135	Completion of Maintenance Period of W4	1	0	01/12/14	01/12/14 *	01/11/14	01/11/14 *
KD0145	Completion of Maintenance Period of W5	1	0	01/12/14	01/12/14 *	01/11/14	01/11/14 *
KD0155	Completion of Maintenance Period of W6	1	0	01/12/14	01/12/14 *	01/11/14	01/11/14 *
KD0165	Completion of Maintenance period of W7	1	0	06/10/15	06/10/15 *	06/10/15	06/10/15 *
Preliminary (Civil)							
PRE0020	Pre-condition Survey	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A
PRE0040	Erection of Engineer's Site Accommodation at YSW	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A
PRE0050	Taking over the Secondary Engineer's Site Accomm	75	100	17/05/10 A	30/07/10 A	17/05/10 A	30/07/10 A
PRE0060	Application of Consent from Marine Department	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A
PRE0090	Working Group Meeting for Outfall Construction	120	100	17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A
PRE0100	Application & Consent of XP from HyD (Mo Tat Rd)	120	100	17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A
PRE0130	Setup Web-site for EM&A Reporting	90	100	17/05/10 A	14/08/10 A	17/05/10 A	14/08/10 A
Preliminary (E&M)							
Technical Submission							
YSW0820	ABWF installation	90	100	15/01/13 A	05/09/14 A	15/01/13 A	05/09/14 A
Process Design of SKWSTW & YSWSTW							
E&M0010	Submission	38	100	17/05/10 A	23/06/10 A	17/05/10 A	23/06/10 A
E&M0020	Vetting and Comment by ER	21	100	24/06/10 A	14/07/10 A	24/06/10 A	14/07/10 A
E&M0030	Revision and Resubmission	125	100	15/07/10 A	16/11/10 A	15/07/10 A	16/11/10 A
E&M0080	Approval from the Engineer	14	100	17/11/10 A	30/11/10 A	17/11/10 A	30/11/10 A
Hydraulic Design							
E&M0040	Submission	21	100	15/07/10 A	04/08/10 A	15/07/10 A	04/08/10 A
E&M0050	Vetting and Comment by ER	14	100	05/08/10 A	18/08/10 A	05/08/10 A	18/08/10 A
E&M0060	Revision and Resubmission	97	100	19/08/10 A	10/10/10 A	19/08/10 A	10/10/10 A
E&M0430	Approval from the Engineer	7	100	24/11/10 A	30/11/10 A	24/11/10 A	30/11/10 A
YSW1536	Water tightness test	40	100	12/08/13 A	26/08/13 A	12/08/13 A	26/08/13 A
Equipment Submission & Approval							
E&M0070	Submission of Membrane Module	50	100	17/05/10 A	05/07/10 A	17/05/10 A	05/07/10 A
E&M0090	Vetting and Comment by ER	14	100	06/07/10 A	19/07/10 A	06/07/10 A	19/07/10 A
E&M0100	Revision and Resubmission	14	100	20/07/10 A	24/02/11 A	20/07/10 A	24/02/11 A
E&M0101	Submission of Equipment	90	100	05/08/10 A	30/11/11 A	05/08/10 A	30/11/11 A
E&M0102	Vetting and Comment by ER	60	100	03/11/10 A	30/11/11 A	03/11/10 A	30/11/11 A
E&M0103	Revision and Resubmission	60	100	01/02/11 A	30/11/11 A	01/02/11 A	30/11/11 A
E&M0110	Approval on Coarse Screens	30	100	25/05/11 A	25/05/11 A	25/05/11 A	25/05/11 A
E&M0120	Approval on Fine Screens	30	100	12/09/11 A	12/09/11 A	12/09/11 A	12/09/11 A
E&M0130	Approval on Pumps	30	100	23/06/11 A	23/06/11 A	23/06/11 A	23/06/11 A
E&M0140	Approval on Submersible Mixers	30	100	23/03/11 A	23/03/11 A	23/03/11 A	23/03/11 A
E&M0150	Approval on Grit Removal Equipment	30	100	10/10/11 A	10/10/11 A	10/10/11 A	10/10/11 A
E&M0160	Approval on MBR Membrane Modules (M.M.)	105	100	03/08/10 A	24/02/11 A	03/08/10 A	24/02/11 A
E&M0170	Approval on Sludge Dewatering Equipment	30	100	01/09/11 A	01/09/11 A	01/09/11 A	01/09/11 A
E&M0180	Approval on Valves, Pipes & Fittings	30	100	19/11/11 A	04/08/13 A	19/11/11 A	04/08/13 A



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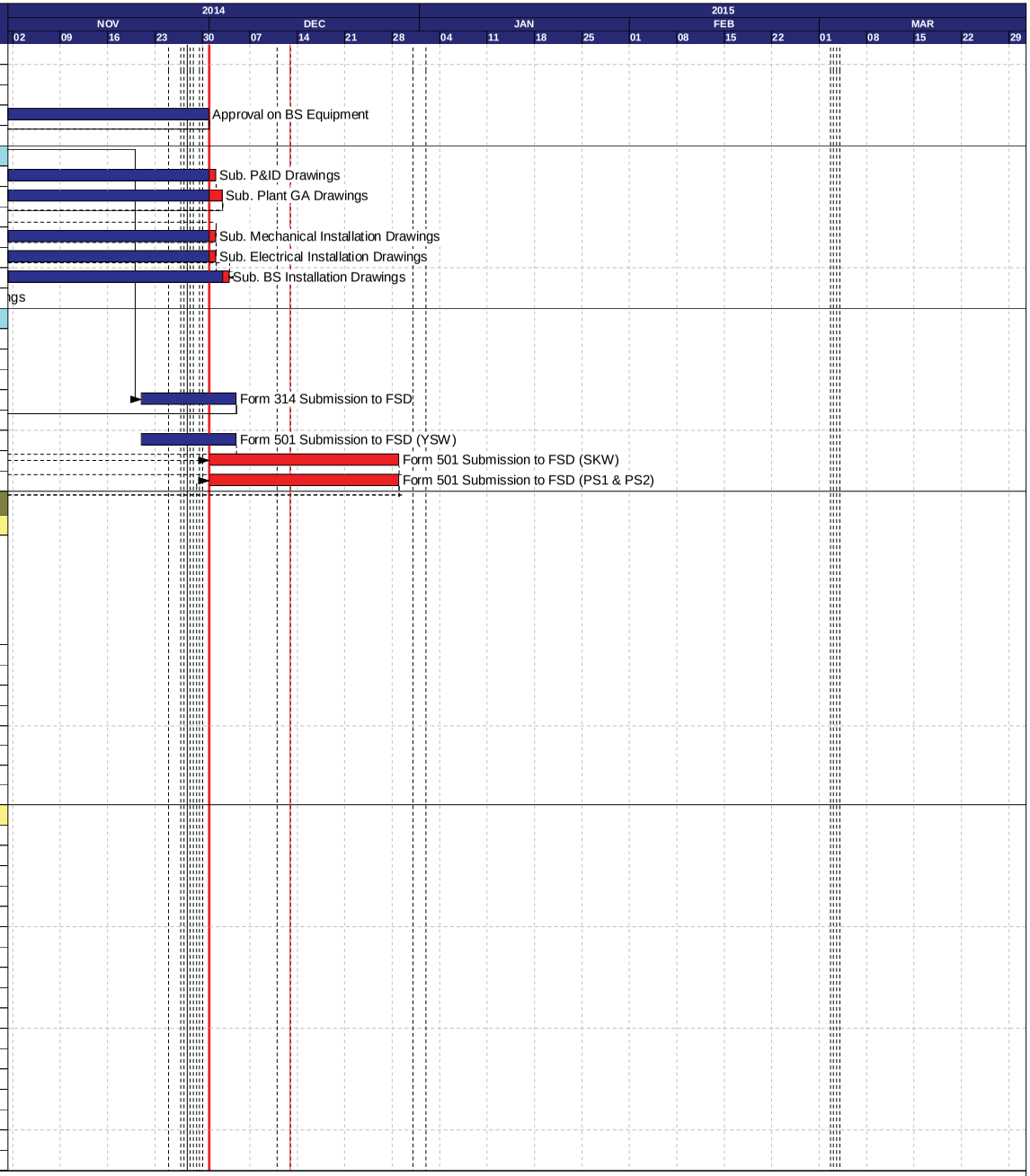
Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Dec 2014 - Feb 2015

Date	Revision	Checked	Approved
30/11/14	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish
E&M0190	Approval on Penstocks	30	100	15/11/11 A	15/11/11 A	15/11/11 A	15/11/11 A
E&M0200	Approval on Instrumentation	30	100	21/06/11 A	08/03/12 A	21/06/11 A	08/03/12 A
E&M0210	Approval on MCC & LVSB	30	100	19/11/11 A	01/01/14 A	19/11/11 A	01/01/14 A
E&M0220	Approval on BS Equipment	30	99	30/11/11 A	30/11/14 *	30/11/11 A	13/09/14 *
E&M0230	Approval on FS Equipment	30	100	30/11/11 A	02/10/14 A	30/11/11 A	02/10/14 A
Drawings Submission & Approval							
E&M0235	Sub. P&ID Drawings	100	99	24/06/10 A	01/12/14	24/06/10 A	12/09/14
E&M0240	Sub. Plant GA Drawings	45	96	04/08/10 A	02/12/14	04/08/10 A	12/09/14
E&M0250	Sub. Builder's Works Requirements Drawings	15	100	04/08/10 A	31/01/13 A	04/08/10 A	31/01/13 A
E&M0260	Sub. Mechanical Installation Drawings	60	99	27/09/10 A	01/12/14	27/09/10 A	12/09/14
E&M0270	Sub. Electrical Installation Drawings	60	99	27/09/10 A	01/12/14	27/09/10 A	12/09/14
E&M0280	Sub. BS Installation Drawings	120	99	27/09/10 A	03/12/14	27/09/10 A	13/09/14
E&M0290	Sub. FS Installation Drawings	120	100	13/11/11 A	08/10/14 A	13/11/11 A	08/10/14 A
Statutory Submission							
E&M0295	Preparation of Submission to HEC	39	100	01/11/11 A	30/11/11 A	01/11/11 A	30/11/11 A
E&M0300	Application & Approval from HEC	150	100	01/11/11 A	03/03/14 A	01/11/11 A	03/03/14 A
E&M0305	Provision of Cables to the STWs	180	100	03/03/14 A	30/08/14 A	03/03/14 A	30/08/14 A
E&M0320	Form 314 Submission to FSD	14	100	21/11/14 A	04/12/14 A	21/11/14 A	04/12/14 A
E&M0325	Submission to WSD	14	100	01/11/11 A	29/02/12 A	01/11/11 A	29/02/12 A
E&M0330	Form 501 Submission to FSD (YSW)	28	100	21/11/14 A	04/12/14 A	21/11/14 A	04/12/14 A
E&M0340	Form 501 Submission to FSD (SKW)	28	0	01/12/14	28/12/14 *	01/11/14	28/11/14 *
E&M0350	Form 501 Submission to FSD (PS1 & PS2)	28	0	01/12/14	28/12/14 *	01/11/14	28/11/14 *
Yung Shue Wan							
Preliminary							
KD0020	Project Commencement Date	0	100		17/05/10 A		17/05/10 A
KD0030	Section W1 - Slope Works in Portion A & C	0	100		14/10/11 A		14/10/11 A
YSW0020	Approval of Environmental Team	16	100	17/05/10 A	01/06/10 A	17/05/10 A	01/06/10 A
YSW00201	Change Baseline Monitoring Location (Air&Noise)	59	100	02/06/10 A	30/07/10 A	02/06/10 A	30/07/10 A
YSW0030	Baseline monitoring (Air & Noise)	23	100	31/07/10 A	22/08/10 A	31/07/10 A	22/08/10 A
YSW0035	Baseline Monitoring Report Submission (A & N)	16	100	23/08/10 A	07/09/10 A	23/08/10 A	07/09/10 A
YSW00351	Submission & Approval for Monitoring Method (W)	58	100	02/06/10 A	29/07/10 A	02/06/10 A	29/07/10 A
YSW0040	Baseline monitoring (Water)	155	100	30/07/10 A	31/12/10 A	30/07/10 A	31/12/10 A
YSW0050	Erect Hoarding and Fencing	60	100	19/05/10 A	17/07/10 A	19/05/10 A	17/07/10 A
Section W1 - Slope Works in Portion A & C							
YSW0075	Mobilization	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A
YSW0080	Site Clearance	30	100	16/06/10 A	15/07/10 A	16/06/10 A	15/07/10 A
YSW0085	Initial Survey	14	100	02/07/10 A	15/07/10 A	02/07/10 A	15/07/10 A
YSW0090	Verify the Rock Boulder required Stablization Wk	249	100	16/07/10 A	21/03/11 A	16/07/10 A	21/03/11 A
YSW0100	Removal of Rock Boulder	257	100	20/09/10 A	03/06/11 A	20/09/10 A	03/06/11 A
YSW0110	Stablizing work for rock boulder	35	100	16/07/11 A	19/08/11 A	16/07/11 A	19/08/11 A
YSW0120	Cut the slope to design profile	2	100	24/09/10 A	25/09/10 A	24/09/10 A	25/09/10 A
YSW0131	Mobilization of Plant and Material of Soil Nails	14	100	12/09/10 A	25/09/10 A	12/09/10 A	25/09/10 A
YSW0132	Erect Scaffold and Working Platform	2	100	26/09/10 A	27/09/10 A	26/09/10 A	27/09/10 A
YSW0133	Setting out and Verify Locations of Soil Nails	45	100	28/09/10 A	11/11/10 A	28/09/10 A	11/11/10 A
YSW0134	Drilling and Soil Nails Installation	43	100	19/10/10 A	30/11/10 A	19/10/10 A	30/11/10 A
YSW0135	Construction of Nail Heads	12	100	01/12/10 A	12/12/10 A	01/12/10 A	12/12/10 A
YSW0136	Mesh Installation on Cut Slope	3	100	13/12/10 A	15/12/10 A	13/12/10 A	15/12/10 A
YSW01361	Verify alignment of access & channels on slope	118	100	16/12/10 A	12/04/11 A	16/12/10 A	12/04/11 A
YSW0140	Construct U-channels & Step Channel on Cut Slope	182	100	13/04/11 A	11/10/11 A	13/04/11 A	11/10/11 A
YSW0153	Removal of Ex U-Channel where clash with B. Wall	151	100	10/05/11 A	07/10/11 A	10/05/11 A	07/10/11 A
YSW01545	Temporary Diversion of Drainage	244	100	08/09/10 A	09/05/11 A	08/09/10 A	09/05/11 A



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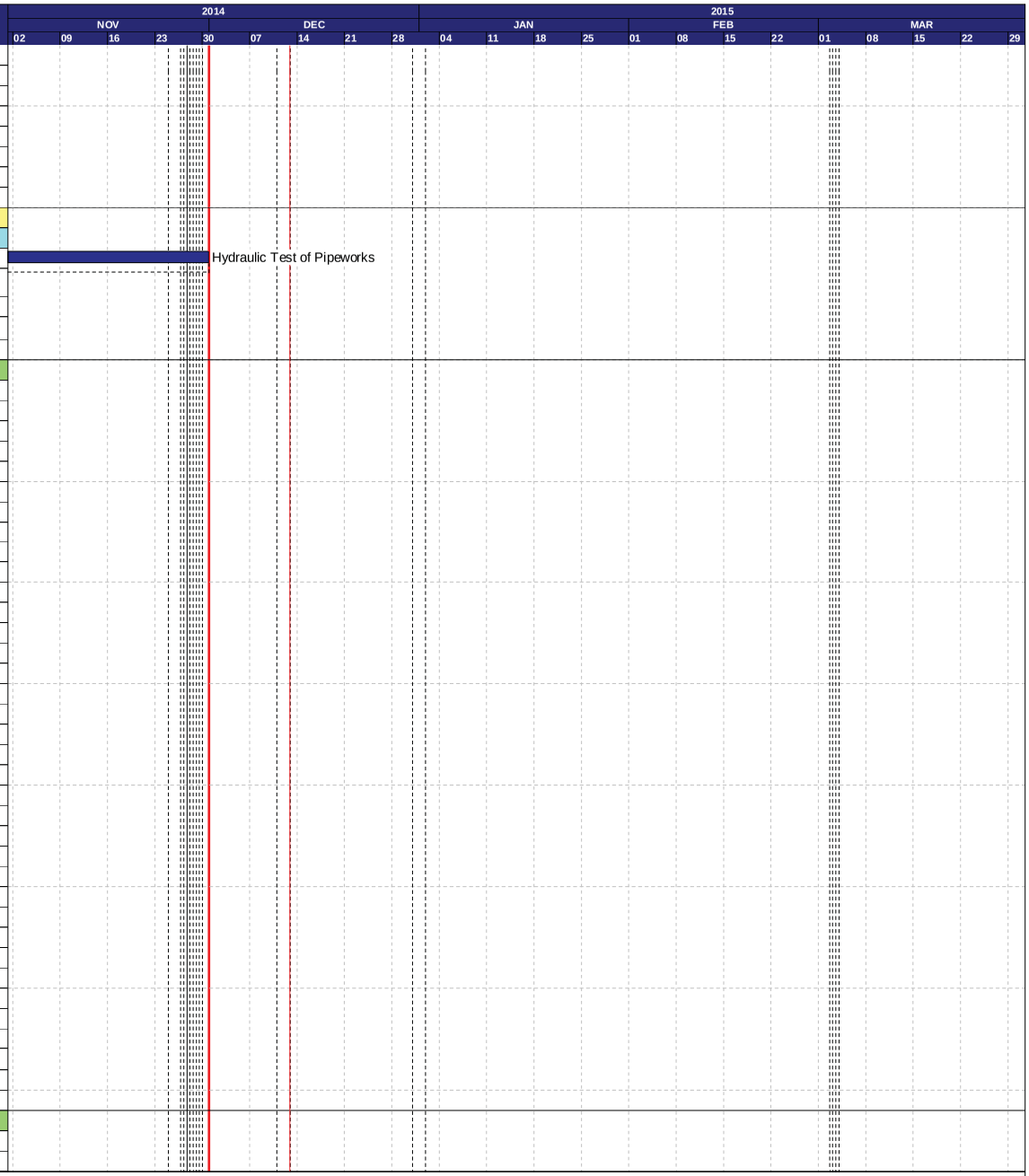
Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Dec 2014 - Feb 2015

Date	Revision	Checked	Approved
30/11/14	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish
YSW0155	RC Barrier Wall Bay 1-13 (below Ground Level)	256	100	26/09/10 A	08/06/11 A	26/09/10 A	08/06/11 A
YSW0170	RC Barrier Wall Bay 1-13 (above Ground Level)	125	100	09/06/11 A	11/10/11 A	09/06/11 A	11/10/11 A
YSW0175	Construct U-channels and Catchpits (Phase 1)	76	100	09/06/11 A	23/08/11 A	09/06/11 A	23/08/11 A
YSW01750	Construction of subsoil drain (phase 1)	7	100	12/10/11 A	08/02/12 A	12/10/11 A	08/02/12 A
YSW01755	Construct subsoil drain (phase 2)	14	100	06/12/12 A	31/12/12 A	06/12/12 A	31/12/12 A
YSW01800	RC Barrier Wall Bay 14 (below & above Ground)	87	100	03/09/12 A	28/11/12 A	03/09/12 A	28/11/12 A
YSW01805	Hydroseeding	14	100	02/03/13 A	02/03/13 A	02/03/13 A	02/03/13 A
YSW01810	Construct U-channels and Catchpits (Phase 2)	30	100	29/11/12 A	22/12/12 A	29/11/12 A	22/12/12 A
Section W2 - YSW STW & Submarine Outfall							
Civil & Structural Work							
E&M1120	Hydraulic Test of Pipeworks	7	100	09/05/13 A	30/11/14 A	09/05/13 A	30/11/14 A
KD0010	Receive Letter of Acceptance	0	100		05/05/10 A		05/05/10 A
YSW0412	Mobilization	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A
YSW0422	Site Clearance	30	100	17/05/10 A	15/06/10 A	17/05/10 A	15/06/10 A
YSW0432	Initial Survey	14	100	02/06/10 A	15/06/10 A	02/06/10 A	15/06/10 A
YSW STW - GL H - T							
YSW0500	ELS & Excavation for Inlet Pumping Station	105	100	08/09/10 A	21/12/10 A	08/09/10 A	21/12/10 A
YSW0510	Sub-structure construction (Inlet Pumping Stn)	129	100	22/12/10 A	29/04/11 A	22/12/10 A	29/04/11 A
YSW0520	Backfill & Remove ELS (Inlet Pumping Stn)	40	100	30/04/11 A	08/06/11 A	30/04/11 A	08/06/11 A
YSW0530	ELS & Excavation for Equalization Tank	159	100	01/01/11 A	08/06/11 A	01/01/11 A	08/06/11 A
YSW0540	Sub-structure construction (Equalization Tank)	112	100	09/06/11 A	28/09/11 A	09/06/11 A	28/09/11 A
YSW0550	Backfilling & Remove ELS (Equalization Tank)	20	100	29/09/11 A	18/10/11 A	29/09/11 A	18/10/11 A
YSW05701	ELS & Excavation for Grit Chambers	28	100	09/06/11 A	06/07/11 A	09/06/11 A	06/07/11 A
YSW05711	Construct sub-structure for Grit Chambers	106	100	07/07/11 A	20/10/11 A	07/07/11 A	20/10/11 A
YSW05721	Backfill & Remove ELS for Grit Chambers	12	100	21/10/11 A	01/11/11 A	21/10/11 A	01/11/11 A
YSW05731	ELS & Excavation for Grease Separators (GS)	34	100	07/07/11 A	09/08/11 A	07/07/11 A	09/08/11 A
YSW05741	Construct sub-structure for Grease Separators	52	100	10/08/11 A	30/09/11 A	10/08/11 A	30/09/11 A
YSW05751	Install Dia.400 Puddles in Grease Separators	27	100	01/10/11 A	27/10/11 A	01/10/11 A	27/10/11 A
YSW05752	Construct sub-structure for GS (above puddles)	48	100	28/10/11 A	14/12/11 A	28/10/11 A	14/12/11 A
YSW05761	Backfill & remove ELS for Grease Separators	10	100	15/12/11 A	24/12/11 A	15/12/11 A	24/12/11 A
YSW0580	Excavate to Formation for Deodorizer Room	10	100	25/12/11 A	03/01/12 A	25/12/11 A	03/01/12 A
YSW05801	Excavate to formation - Grid J-N/5-7	40	100	04/01/12 A	12/02/12 A	04/01/12 A	12/02/12 A
YSW05802	Excavate to formation - Grid GA-H/5-7	10	100	13/02/12 A	22/02/12 A	13/02/12 A	22/02/12 A
YSW05901	G/F to 1/F Construction Grid GA-K/1-5	90	100	29/09/11 A	27/12/11 A	29/09/11 A	27/12/11 A
YSW05911	G/F to 1/F Construction Grid N-S/1-5	80	100	21/10/11 A	08/01/12 A	21/10/11 A	08/01/12 A
YSW05921	G/F to 1/F Construction Grid K-N/1-5	45	100	25/12/11 A	07/02/12 A	25/12/11 A	07/02/12 A
YSW05922	G/F to 1/F Construction for Deodorizer Room	80	100	04/01/12 A	23/03/12 A	04/01/12 A	23/03/12 A
YSW05923	G/F to 1/F Construction for Grid J-N/5-7	60	100	13/02/12 A	12/04/12 A	13/02/12 A	12/04/12 A
YSW05924	G/F to 1/F Construction for Grid GA-H/5-7	50	100	28/05/12 A	16/07/12 A	28/05/12 A	16/07/12 A
YSW06001	1/F to Roof Constuction for Grid GA-K/1-5	87	100	28/12/11 A	23/03/12 A	28/12/11 A	23/03/12 A
YSW06011	1/F to Roof Constuction for Grid N-S/1-5	75	100	09/01/12 A	23/03/12 A	09/01/12 A	23/03/12 A
YSW06021	1/F to Roof Constuction for Grid K-N/1-5	44	100	08/02/12 A	22/03/12 A	08/02/12 A	22/03/12 A
YSW06022	1/F to Roof Constuction for Deodorizer Room	60	100	24/03/12 A	22/05/12 A	24/03/12 A	22/05/12 A
YSW06023	1/F to Roof Constuction for Grid J-N/5-7	45	100	13/04/12 A	27/05/12 A	13/04/12 A	27/05/12 A
YSW06034	1/F to Roof Constuction for Grid GA-H/5-7	28	100	27/07/12 A	13/08/12 A	27/07/12 A	13/08/12 A
YSW06035	Construct buffle walls in Grease Separators	90	100	18/04/12 A	16/07/12 A	18/04/12 A	16/07/12 A
YSW07201	Water tightness test for Inlet Pumping Station	60	100	23/03/12 A	21/05/12 A	23/03/12 A	21/05/12 A
YSW07202	Water tightness test for Equalization Tanks	42	100	22/05/12 A	02/07/12 A	22/05/12 A	02/07/12 A
YSW07203	Water tightness test for Grit Chambers	42	100	17/09/12 A	29/09/12 A	17/09/12 A	29/09/12 A
YSW07204	Water tightness test for Grease Separators	32	100	03/10/12 A	31/10/12 A	03/10/12 A	31/10/12 A
YSW07205	Water tightness test for water channels	21	100	31/08/13 A	23/09/13 A	31/08/13 A	23/09/13 A
YSW0800	ABWF installation	271	100	03/07/12 A	03/07/14 A	03/07/12 A	03/07/14 A
YSW STW - GL T - X							
YSW0610	Excavate to formation	10	100	08/09/10 A	17/09/10 A	08/09/10 A	17/09/10 A
YSW0620	Base slab construction	248	100	18/09/10 A	23/05/11 A	18/09/10 A	23/05/11 A



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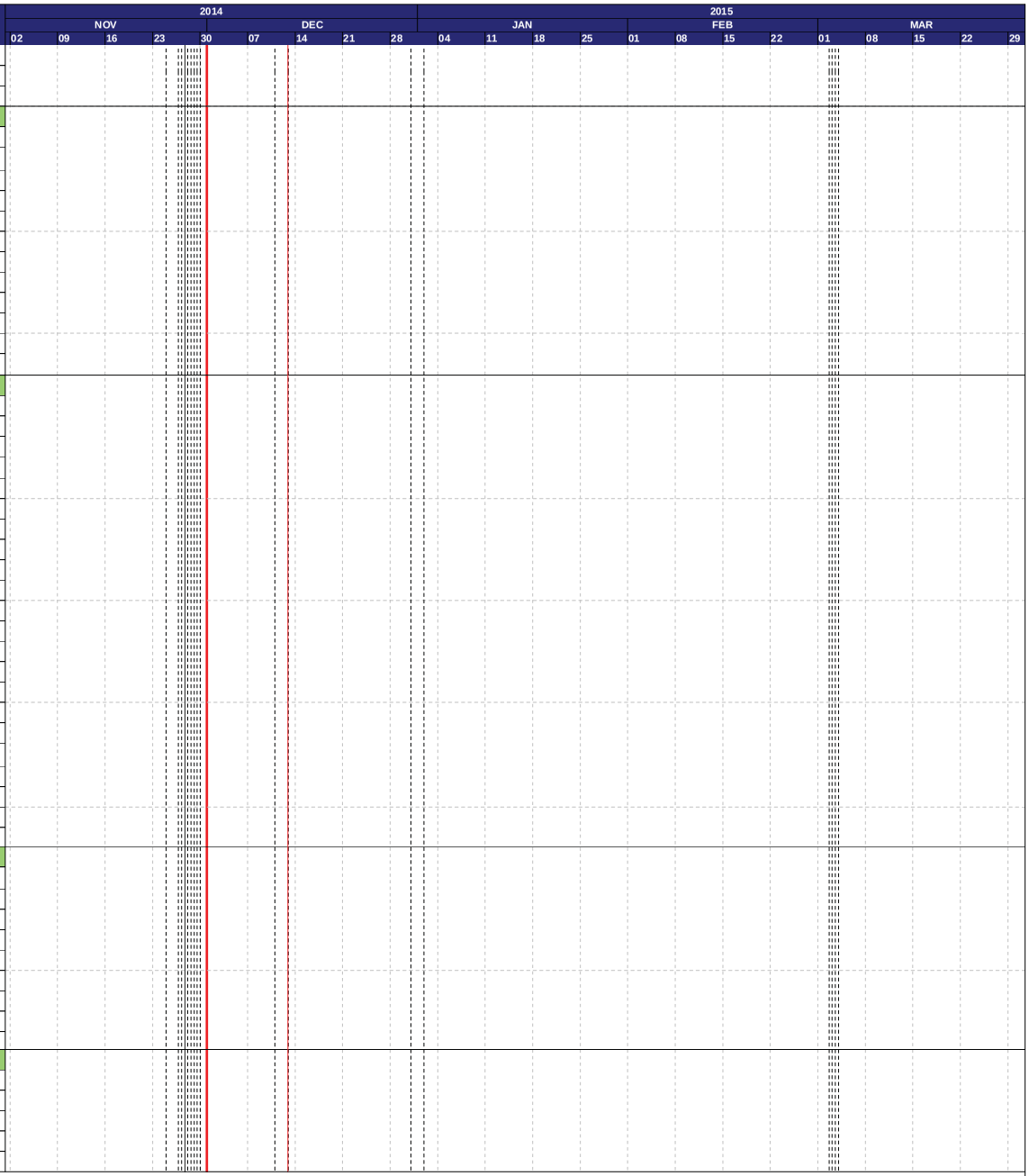
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Dec 2014 - Feb 2015

Date	Revision	Checked	Approved
30/11/14	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish
YSW0630	G/F to 1/F construction	205	100	24/05/11 A	14/12/11 A	24/05/11 A	14/12/11 A
YSW0640	1/F to Roof Construction	64	100	15/12/11 A	16/02/12 A	15/12/11 A	16/02/12 A
YSW0810	ABWF installation	80	100	28/12/11 A	16/03/12 A	28/12/11 A	16/03/12 A
YSW STW - GL F - H & DN Tanks							
YSW0650	ELS & Excavation for DN Tanks	37	100	08/09/10 A	14/10/10 A	08/09/10 A	14/10/10 A
YSW0660	Sub-struction construction (DN Tanks)	78	100	15/10/10 A	31/12/10 A	15/10/10 A	31/12/10 A
YSW0670	Backfill & Remove ELS (DN Tanks)	70	100	01/01/11 A	11/03/11 A	01/01/11 A	11/03/11 A
YSW0680	Base slab construction (SD1, SD2 & MBR4)	17	100	12/03/11 A	28/03/11 A	12/03/11 A	28/03/11 A
YSW0690	Construct Superstructure SD1, SD2 & MBR4	82	100	29/03/11 A	18/06/11 A	29/03/11 A	18/06/11 A
YSW06901	Construct Superstructure of DN Tanks	28	100	15/05/12 A	11/06/12 A	15/05/12 A	11/06/12 A
YSW0705	Water test for MBR 4	47	100	01/10/12 A	16/11/12 A	01/10/12 A	16/11/12 A
YSW07055	Water test for SD1 & SD2	54	100	17/11/12 A	10/01/13 A	17/11/12 A	10/01/13 A
YSW0710	Apply protective paint for MBR 4	7	100	24/09/12 A	30/09/12 A	24/09/12 A	30/09/12 A
YSW07105	Apply protective paint for SD1 & SD2	7	100	01/10/12 A	07/10/12 A	01/10/12 A	07/10/12 A
YSW0830	Water test for DN Tanks	28	100	14/07/13 A	13/09/13 A	14/07/13 A	13/09/13 A
YSW0850	Apply protecitve paint for DN Tanks	6	100	27/04/13 A	11/07/13 A	27/04/13 A	11/07/13 A
YSW STW - GL A - F							
YSW0730	Completion of HDD	0	100	21/01/12 A		21/01/12 A	
YSW0732	Excavate for MBR 2 & 3	20	100	21/01/12 A	09/02/12 A	21/01/12 A	09/02/12 A
YSW0733	Construct basement of MBR 2 & 3	20	100	10/02/12 A	29/02/12 A	10/02/12 A	29/02/12 A
YSW0735	Construct superstructure of MBR 2	75	100	01/03/12 A	14/05/12 A	01/03/12 A	14/05/12 A
YSW0736	Construct superstructure of MBR 3	100	100	15/05/12 A	14/05/12 A	15/05/12 A	14/05/12 A
YSW0740	ELS & excavate for Outfall Shaft	75	100	01/03/12 A	14/05/12 A	01/03/12 A	14/05/12 A
YSW0750	Construct basement of Outfall Shaft	19	100	15/05/12 A	02/06/12 A	15/05/12 A	02/06/12 A
YSW07501	Connect additional flange to HDPE pipe (VO 042)	5	100	03/06/12 A	07/06/12 A	03/06/12 A	07/06/12 A
YSW07502	Construct sub-structure of Outfall Shaft	16	100	08/06/12 A	23/06/12 A	08/06/12 A	23/06/12 A
YSW0760	Backfill & remove ELS (outfall shaft)	8	100	24/06/12 A	01/07/12 A	24/06/12 A	01/07/12 A
YSW07601	Construct superstructure for Outfall Shaft	30	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A
YSW07603	ELS & excavate for FSH Water Supply Tank	25	100	01/06/12 A	25/06/12 A	01/06/12 A	25/06/12 A
YSW07604	Construct substructure for FSH Water Supply Tank	24	100	26/06/12 A	19/07/12 A	26/06/12 A	19/07/12 A
YSW07605	Backfill & remove ELS for FSH Water Supply Tank	12	100	20/07/12 A	31/07/12 A	20/07/12 A	31/07/12 A
YSW07607	Construct basement of MBR 1 & Workshop	24	100	01/08/12 A	24/08/12 A	01/08/12 A	24/08/12 A
YSW07608	Construct superstructure for FSH Water Supply Tk	37	100	25/08/12 A	30/09/12 A	25/08/12 A	30/09/12 A
YSW07609	Construct superstructure for MBR 1	37	100	25/08/12 A	30/09/12 A	25/08/12 A	30/09/12 A
YSW07610	Construct Workshop, FSSH Pump Rm, PW Pump Rm	31	100	03/10/12 A	31/10/12 A	03/10/12 A	31/10/12 A
YSW08301	Water tightness test for Outfall Shaft	42	100	03/04/13 A	18/04/13 A	03/04/13 A	18/04/13 A
YSW08302	Water tightness test for MBR 2 & 3	95	100	10/08/13 A	24/08/13 A	10/08/13 A	24/08/13 A
YSW08303	Water tightness test for MBR 1	19	100	30/11/12 A	18/12/12 A	30/11/12 A	18/12/12 A
YSW08304	Water tightness test for FSH Water Supply Tank	32	100	31/08/13 A	01/10/13 A	31/08/13 A	01/10/13 A
Fire Hose Reel / Sprinkler Pump Rm							
YSW08305	Apply protective paint	120	100	02/10/12 A	15/08/13 A	02/10/12 A	15/08/13 A
YSW0840	ELS & excavate to formation (+0 mPD approx.)	40	100	25/02/13 A	18/04/13 A	25/02/13 A	18/04/13 A
YSW0860	Sub-structure construction	40	100	19/04/13 A	12/06/13 A	19/04/13 A	12/06/13 A
YSW0880	Backfill & remove ELS	35	100	21/06/13 A	26/08/13 A	21/06/13 A	26/08/13 A
YSW0890	Construction Ground Slab at +5.2mPD	40	100	04/06/13 A	14/07/13 A	04/06/13 A	14/07/13 A
YSW0900	Superstructure construction upto +9.2mPD	35	100	04/06/13 A	01/08/13 A	04/06/13 A	01/08/13 A
YSW0910	Water test	28	100	31/12/13 A	27/01/14 A	31/12/13 A	27/01/14 A
YSW0915	Apply protective paint	14	100	31/12/13 A	13/01/14 A	31/12/13 A	13/01/14 A
YSW0925	ABWF installation	30	100	16/07/13 A	19/01/14 A	16/07/13 A	19/01/14 A
Emergency Storage Tank							
YSW1470	ELS & excavate to formation (-1.5mPD Approx.)	16	100	17/09/12 A	02/10/12 A	17/09/12 A	02/10/12 A
YSW1480	Sub-structure construction	14	100	03/10/12 A	16/10/12 A	03/10/12 A	16/10/12 A
YSW1490	Backfill & extract sheetpile	3	100	17/10/12 A	19/10/12 A	17/10/12 A	19/10/12 A
YSW1500	Superstructure construction upto +10.5mPD	41	100	20/10/12 A	29/11/12 A	20/10/12 A	29/11/12 A
YSW1530	Underground pipeline works	40	100	20/07/13 A	01/10/13 A	20/07/13 A	01/10/13 A



Start date	05/05/10
Finish date	22/11/16
Data date	01/12/14
Run date	12/12/14
Page number	4A
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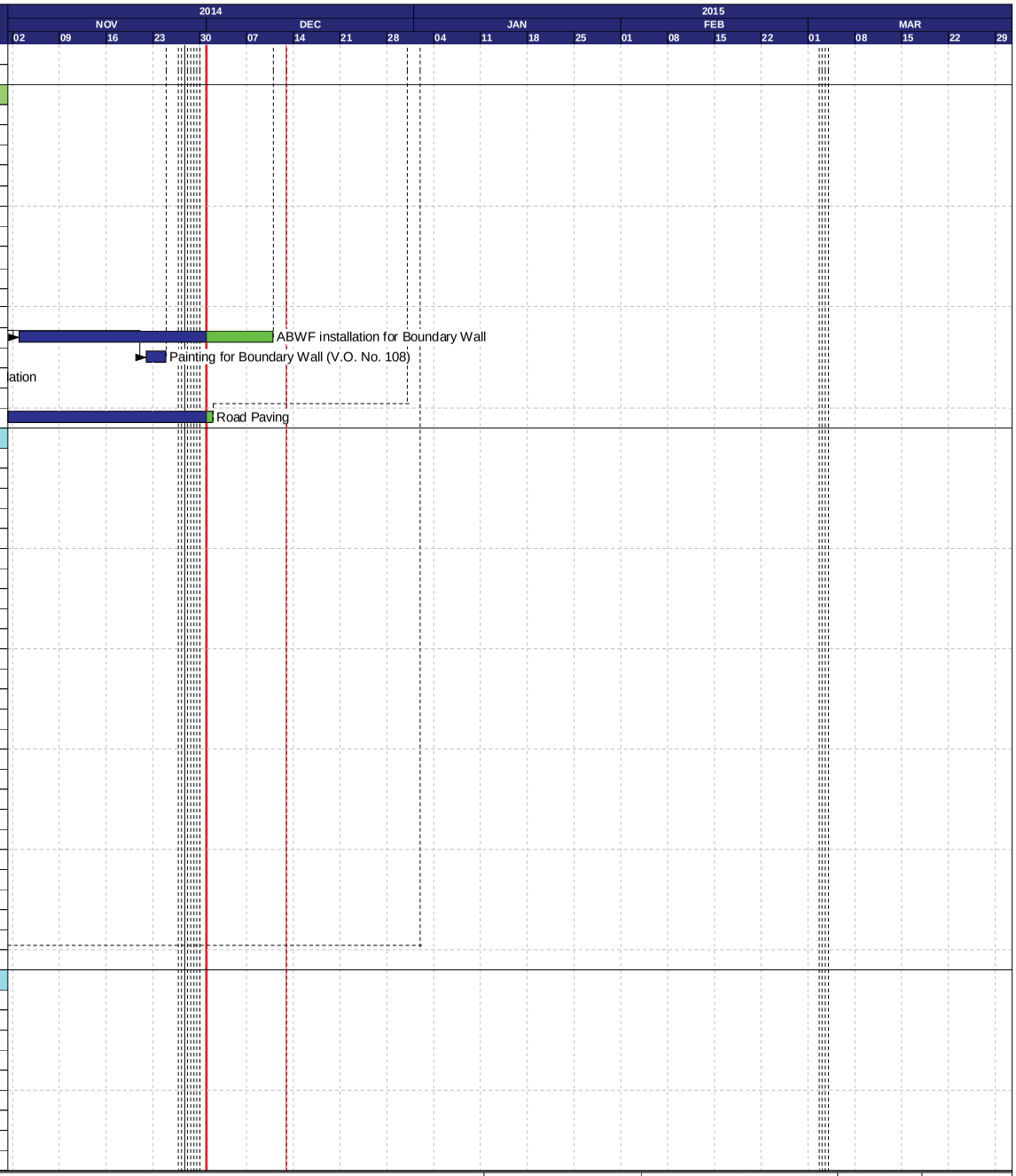
Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Dec 2014 - Feb 2015

Date	Revision	Checked	Approved
30/11/14	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish
YSW1538	Apply protective paint	30	100	04/03/13 A	05/03/13 A	04/03/13 A	05/03/13 A
YSW1540	ABWF installation	40	100	03/04/13 A	01/10/13 A	03/04/13 A	01/10/13 A
Road, Drain, Cable Draw Pits & Ducting							
YSW16601	ELS & excavate 6m deep sewer (FM1 - YFMH13)	90	100	04/08/13 A	15/01/14 A	04/08/13 A	15/01/14 A
YSW16602	Lay pipe & backfill 6m deep sewer (FM1 - YFMH13)	45	100	20/01/14 A	10/02/14 A	20/01/14 A	10/02/14 A
YSW16603	Construct UU & pipes along sea side (Grid Q-X)	60	100	04/03/14 A	29/01/14 A	04/03/14 A	29/01/14 A
YSW16604	Construct UU & pipes along sea side (Grid XA-D)	60	100	22/07/13 A	06/02/14 A	22/07/13 A	06/02/14 A
YSW16605	Construct UU & pipes along sea side (Grid D-Q)	60	100	20/11/13 A	11/01/14 A	20/11/13 A	11/01/14 A
YSW16606	Construct UU & pipes along hill side (Grid D-Q)	90	100	10/10/12 A	01/09/13 A	10/10/12 A	01/09/13 A
YSW16607	Construct UU & pipes along hill side (Grid Q-X)	72	100	20/08/12 A	01/09/13 A	20/08/12 A	01/09/13 A
YSW16608	Construct UU & pipes along hill side (Grid XA-D)	72	100	30/11/12 A	01/09/13 A	30/11/12 A	01/09/13 A
YSW16701	Construct Boundary Wall (Grid XA-D)	80	100	10/01/13 A	15/12/13 A	10/01/13 A	15/12/13 A
YSW16702	Construct Boundary Wall (Grid D-Q)	80	100	01/01/14 A	31/01/14 A	01/01/14 A	31/01/14 A
YSW16703	Construct Boundary Wall (Grid Q-X)	80	100	21/02/14 A	26/03/14 A	21/02/14 A	26/03/14 A
YSW16704	ABWF installation for Boundary Wall	20	50	03/11/14 A	10/12/14	03/11/14 A	31/12/14 *
YSW16705	Painting for Boundary Wall (V.O. No. 108)	5	100	22/11/14 A	24/11/14 A	22/11/14 A	24/11/14 A
YSW1680	Fire Hydrant & pipeline installation	120	100	26/01/13 A	06/10/14 A	26/01/13 A	06/10/14 A
YSW1690	Construction of Road Kerbs, Downpipes, U-channel	180	100	02/01/13 A	11/08/14 A	02/01/13 A	11/08/14 A
YSW1700	Road Paving	110	99	23/05/14 A	01/12/14	23/05/14 A	31/12/14
Submarine Outfall							
YSW0180	Coordination of HEC	53	100	17/05/10 A	08/07/10 A	17/05/10 A	08/07/10 A
YSW0200	Submission and Approval of Ecologist	60	100	17/05/10 A	15/07/10 A	17/05/10 A	15/07/10 A
YSW0210	Ecology Survey	211	100	16/07/10 A	11/02/11 A	16/07/10 A	11/02/11 A
YSW0220	Submission and Approval of In. Hydro Survey	103	100	17/05/10 A	27/08/10 A	17/05/10 A	27/08/10 A
YSW0230	Hydrogrophical Survey (YSW)	157	100	28/08/10 A	31/01/11 A	28/08/10 A	31/01/11 A
YSW0240	Material Submission, Approval of HDPE pipe	319	100	17/05/10 A	31/03/11 A	17/05/10 A	31/03/11 A
YSW02401	Clarify Coordinate of Point Y (Reply of RFI 010)	83	100	28/06/10 A	18/09/10 A	28/06/10 A	18/09/10 A
YSW0250	Submit and Approval of Method Statement for HDD	188	100	19/09/10 A	25/03/11 A	19/09/10 A	25/03/11 A
YSW0260	Submission of HDD Method Statement to HEC	14	100	26/03/11 A	08/04/11 A	26/03/11 A	08/04/11 A
YSW0270	Additional G.I. Boreholes (YSW)	123	100	19/09/10 A	19/01/11 A	19/09/10 A	19/01/11 A
YSW0280	Submission of propose alignment	44	100	20/01/11 A	04/03/11 A	20/01/11 A	04/03/11 A
YSW0290	Submission of Marine Notice	69	100	20/01/11 A	29/03/11 A	20/01/11 A	29/03/11 A
YSW0310	Construction of Entry Pit and Preparation Work	27	100	05/03/11 A	31/03/11 A	05/03/11 A	31/03/11 A
YSW0320	Prepare of HDD Drill Rig Set-up (YSW)	28	100	01/04/11 A	28/04/11 A	01/04/11 A	28/04/11 A
YSW0330	Establishment of HDD plant & equipment	6	100	09/04/11 A	14/04/11 A	09/04/11 A	14/04/11 A
YSW0340	Setting up at drillhole location	14	100	15/04/11 A	28/04/11 A	15/04/11 A	28/04/11 A
YSW0350	Drill pilot hole and reaming hole - NS400 - 530m	229	100	29/04/11 A	13/12/11 A	29/04/11 A	13/12/11 A
YSW0360	Installation of NS400 HDPE 530m	17	100	14/12/11 A	30/12/11 A	14/12/11 A	30/12/11 A
YSW03601	Demobilization of HDD plant & equipment	7	100	31/12/11 A	06/01/12 A	31/12/11 A	06/01/12 A
YSW03605	Remove Entry pit of HDD	14	100	07/01/12 A	20/01/12 A	07/01/12 A	20/01/12 A
YSW03620	Removal of Receiving Pit	14	100	31/12/11 A	13/01/12 A	31/12/11 A	13/01/12 A
YSW03641	Prepare backfilling material under VO 046A	120	100	07/01/12 A	05/05/12 A	07/01/12 A	05/05/12 A
YSW0365	Set up of Silt Curtain as per EP	2	100	23/11/12 A	24/11/12 A	23/11/12 A	24/11/12 A
YSW0370	Dredging of Marine Deposit for Diffuser (YSW)	5	100	24/11/12 A	29/11/12 A	24/11/12 A	29/11/12 A
YSW0380	Diffuser Construction (YSW)	60	100	30/11/12 A	20/06/13 A	30/11/12 A	20/06/13 A
YSW0400	Removal of silt curtain	30	100	30/04/13 A	31/05/13 A	30/04/13 A	31/05/13 A
E&M Works - YSW STW							
E&M0360	Delivery of MBR Memb. Mod. (MBR Tk 4)	118	100	24/02/11 A	21/06/11 A	24/02/11 A	21/06/11 A
E&M0370	Delivery of MBR Membrane Modules - 2nd Shipment	236	100	24/02/11 A	17/10/11 A	24/02/11 A	17/10/11 A
E&M0380	Delivery of Grit Removal Equipment	81	100	10/10/11 A	29/12/11 A	10/10/11 A	29/12/11 A
E&M0390	Delivery of Coarse Screens	129	100	06/09/11 A	12/01/12 A	06/09/11 A	12/01/12 A
E&M0400	Delivery of Fine Screens	80	100	12/09/11 A	30/11/11 A	12/09/11 A	30/11/11 A
E&M0410	Delivery of Pumps	75	100	23/06/11 A	05/09/11 A	23/06/11 A	05/09/11 A
E&M0420	Delivery of Submersible Mixers	230	100	26/02/11 A	26/02/11 A	26/02/11 A	26/02/11 A
E&M0440	Delivery of Sludge Dewatering Equipment	558	100	31/08/11 A	16/06/14 A	31/08/11 A	16/06/14 A
E&M0450	Delivery of Valves, Pipes & Fittings	560	100	30/08/11 A	26/02/14 A	30/08/11 A	26/02/14 A



Start date	05/05/10
Finish date	22/11/16
Data date	01/12/14
Run date	12/12/14
Page number	5A
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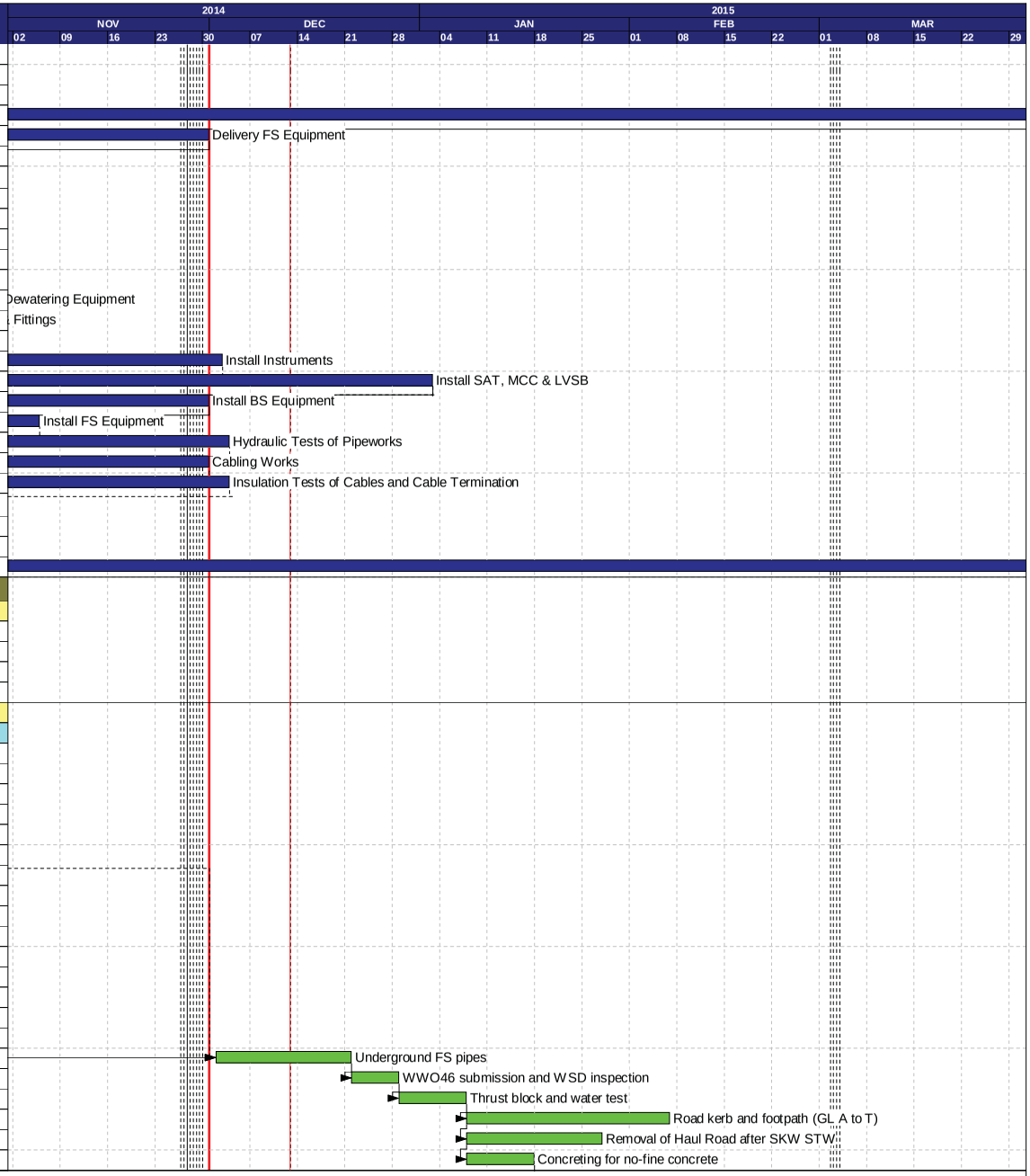
Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Dec 2014 - Feb 2015

Date	Revision	Checked	Approved
30/11/14	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish
E&M0460	Delivery of Penstocks	135	100	12/08/11 A	24/12/11 A	12/08/11 A	24/12/11 A
E&M0470	Delivery of Instruments	232	100	03/11/11 A	21/06/11 A	03/11/11 A	21/06/11 A
E&M0480	Delivery of MCC LVSB	90	100	03/12/12 A	04/03/13 A	03/12/12 A	04/03/13 A
E&M0490	Delivery of BS Equipment	180	100	10/12/11 A	15/04/15 A	10/12/11 A	15/04/15 A
E&M0500	Delivery FS Equipment	995	100	11/12/11 A	01/12/14	11/12/11 A	01/12/14
E&M0510	Install Membrane Modules in MBR Tank no. 4	89	100	03/11/12 A	28/02/13 A	03/11/12 A	28/02/13 A
E&M0520	Install Membrane Modules in MBR Tank No. 1 to 3	57	100	03/12/12 A	28/02/13 A	03/12/12 A	28/02/13 A
E&M0530	Install Grit Removal Equipment	122	100	01/06/12 A	30/09/12 A	01/06/12 A	30/09/12 A
E&M0540	Install Coarse Screens	240	100	23/04/12 A	23/08/13 A	23/04/12 A	23/08/13 A
E&M0550	Install Fine Screens	122	100	01/06/12 A	12/08/13 A	01/06/12 A	12/08/13 A
E&M0560	Install Pumps	355	100	23/04/12 A	04/02/14 A	23/04/12 A	04/02/14 A
E&M0570	Install Submersible Mixers	163	100	15/01/13 A	16/01/14 A	15/01/13 A	16/01/14 A
E&M0580	Install Sludge Dewatering Equipment	361	100	29/05/12 A	18/10/14 A	29/05/12 A	18/10/14 A
E&M0590	Install Valves, Pipes & Fittings	232	100	15/01/13 A	12/10/14 A	15/01/13 A	12/10/14 A
E&M0600	Install Penstocks (Batch 1, GL H - T)	213	100	23/04/12 A	21/05/13 A	23/04/12 A	21/05/13 A
E&M0610	Install Instruments	74	100	02/01/13 A	02/12/14 A	02/01/13 A	02/12/14 A
E&M0620	Install SAT, MCC & LVSB	8	100	02/01/13 A	02/01/15 A	02/01/13 A	02/01/15 A
E&M0630	Install BS Equipment	637	100	02/01/13 A	01/12/14	02/01/13 A	01/12/14
E&M0640	Install FS Equipment	180	100	02/01/13 A	05/11/14 A	02/01/13 A	05/11/14 A
E&M0650	Hydraulic Tests of Pipeworks	153	100	02/01/13 A	03/12/14 A	02/01/13 A	03/12/14 A
E&M0660	Cabling Works	15	100	04/02/13 A	30/11/14 A	04/02/13 A	30/11/14 A
E&M0670	Insulation Tests of Cables and Cable Termination	26	100	11/04/13 A	03/12/14 A	11/04/13 A	03/12/14 A
E&M0680	Energization	1	100	02/04/13 A	03/04/13 A	02/04/13 A	03/04/13 A
E&M0690	Functional and Performance Tests of Equipment	35	100	25/03/13 A	11/04/13 A	25/03/13 A	11/04/13 A
E&M0700	T&C Period	137	100	09/12/13 A	01/07/13 A	09/12/13 A	01/07/13 A
E&M0730	Trial Operation Period	413	100	02/07/13 A	04/03/16 A	02/07/13 A	04/03/16 A
Sok Kwu Wan							
Preliminary							
E&M0605	Install Penstocks (Batch 2, GL A - F)	131	100	02/01/13 A	19/01/14 A	02/01/13 A	19/01/14 A
SKW0250	Approval of Environmental Team	16	100	17/05/10 A	01/06/10 A	17/05/10 A	01/06/10 A
SKW0260	Baseline monitoring (Air & Noise)	14	100	02/06/10 A	15/06/10 A	02/06/10 A	15/06/10 A
SKW0265	Baseline Monitoring Submission (A & N)	14	100	16/06/10 A	08/07/10 A	16/06/10 A	08/07/10 A
Section W3 - Footpath Diversion in Portion G							
Civil & Geotechnical Works							
SKW0240	Site Clearance	21	100	17/05/10 A	06/06/10 A	17/05/10 A	06/06/10 A
SKW0241	Initial Survey	9	100	07/06/10 A	15/06/10 A	07/06/10 A	15/06/10 A
SKW0242	Retaining Wall Bay 0-10 (Incl. VO. 001A)	177	100	30/06/10 A	23/12/10 A	30/06/10 A	23/12/10 A
SKW0461	Utilities Laying and Diversion	70	100	24/12/10 A	03/03/11 A	24/12/10 A	03/03/11 A
SKW0471	Concreting for Pavement	7	100	04/03/11 A	10/03/11 A	04/03/11 A	10/03/11 A
SKW0481	Footpath Diversion - Stage 1	14	100	11/03/11 A	24/03/11 A	11/03/11 A	24/03/11 A
SKW04811	Excavate for FP transition at CH0-35 &CH130-141	37	100	25/03/11 A	30/04/11 A	25/03/11 A	30/04/11 A
SKW04821	Construction of Drainage outfall near bay 10	3	100	01/05/11 A	03/05/11 A	01/05/11 A	03/05/11 A
SKW04831	Cable diversion by HEC	26	100	04/05/11 A	29/05/11 A	04/05/11 A	29/05/11 A
SKW04841	Diversion of Ducting and Drawpit by PCCW	12	100	20/05/11 A	31/05/11 A	20/05/11 A	31/05/11 A
SKW04851	Soil backfilling behind FP retaining wall	14	100	01/06/11 A	14/06/11 A	01/06/11 A	14/06/11 A
SKW04861	Concreting for footpath pavement	7	100	15/06/11 A	21/06/11 A	15/06/11 A	21/06/11 A
SKW04871	Relocation of Temp Safety Fence at SKW STW A-G	57	100	22/06/11 A	17/08/11 A	22/06/11 A	17/08/11 A
SKW04881	Disposal of excavation material at A-G SKW STW	138	100	18/08/11 A	02/01/12 A	18/08/11 A	02/01/12 A
SKW04885	Footpath Diversion - Stage 2	7	100	03/01/12 A	09/01/12 A	03/01/12 A	09/01/12 A
SKW04891	Underground FS pipes	20	0	02/12/14 *	21/12/14	08/02/15	27/02/15
SKW04892	WWO46 submission and WSD inspection	7	0	22/12/14	28/12/14	28/02/15	06/03/15
SKW04893	Thrust block and water test	10	0	29/12/14	07/01/15	07/03/15	16/03/15
SKW04894	Road kerb and footpath (GL A to T)	30	0	08/01/15	06/02/15	17/03/15	15/04/15
SKW0491	Removal of Haul Road after SKW STW	20	0	08/01/15 *	27/01/15	17/03/15	05/04/15
SKW0501	Concreting for no-fine concrete	10	0	08/01/15	17/01/15	17/03/15	26/03/15



Start date	05/05/10
Finish date	22/11/16
Data date	01/12/14
Run date	12/12/14
Page number	6A
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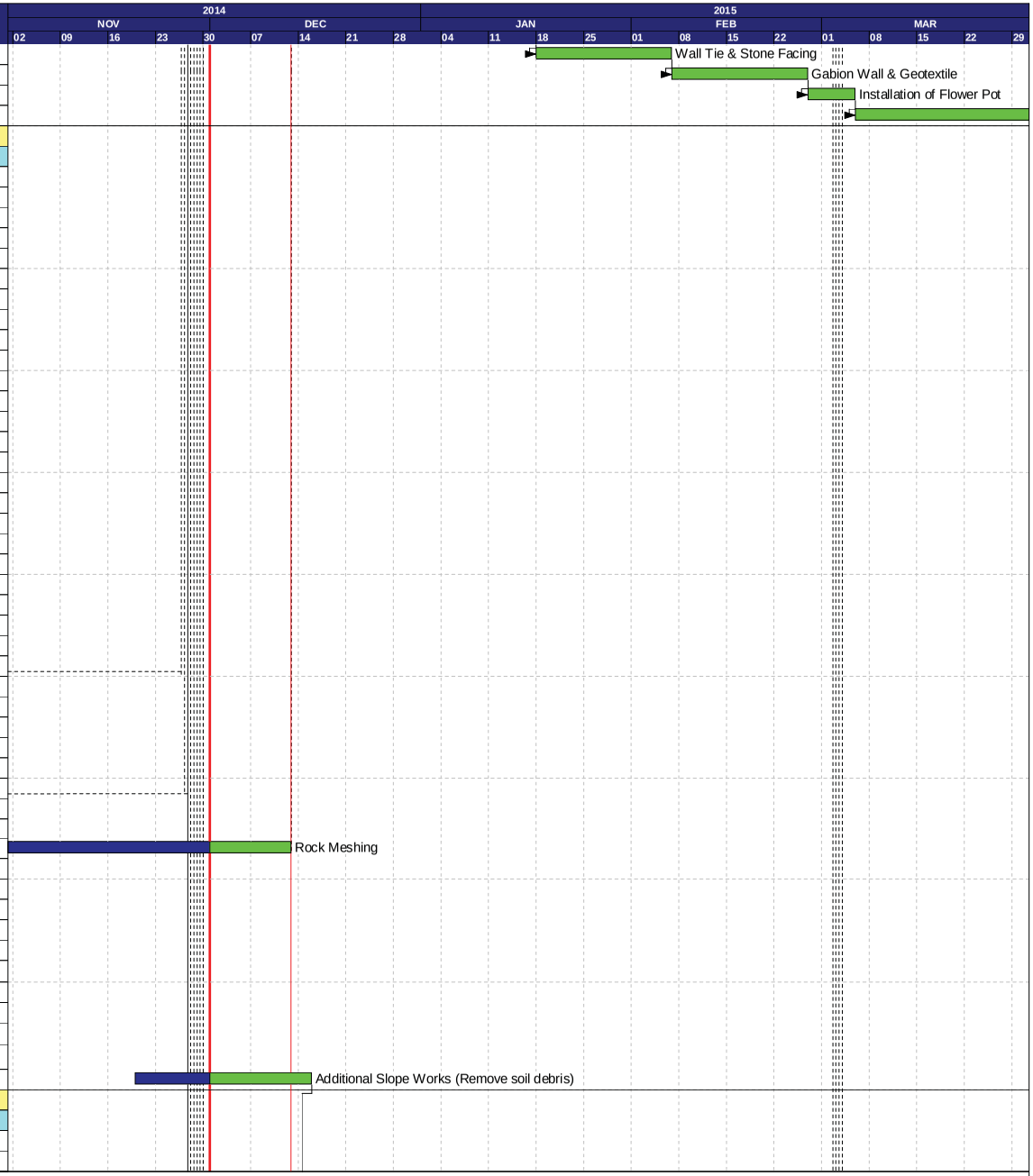
Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Dec 2014 - Feb 2015

Date	Revision	Checked	Approved
30/11/14	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish
SKW0511	Wall Tie & Stone Facing	20	0	18/01/15	06/02/15	27/03/15	15/04/15
SKW0521	Gabion Wall & Geotextile	20	0	07/02/15	26/02/15	16/04/15	05/05/15
SKW0531	Installation of Flower Pot	7	0	27/02/15	05/03/15	06/05/15	12/05/15
SKW0541	Completion of Outstanding Works	42	0	06/03/15	16/04/15	13/05/15	23/06/15
Section W4 - Slope Works in Portions H & I							
Geotechnical Works							
SKW0588	Construct scaffolding access	30	100	15/06/10 A	14/07/10 A	15/06/10 A	14/07/10 A
SKW0590	Site Clearance for Slope	100	100	15/07/10 A	22/10/10 A	15/07/10 A	22/10/10 A
SKW0591	Initial Survey for Slope	28	100	21/09/10 A	18/10/10 A	21/09/10 A	18/10/10 A
SKW0592	Temporary Rockfall fence at ex. Footpath	43	100	31/08/10 A	12/10/10 A	31/08/10 A	12/10/10 A
SKW05931	Construction of Haul Road (To +30mPD)	50	100	03/09/10 A	22/10/10 A	03/09/10 A	22/10/10 A
SKW05932	Construction of Haul Road (To +42.5mPD)	68	100	23/10/10 A	29/12/10 A	23/10/10 A	29/12/10 A
SKW059321	Removal of Boulders (IBG 1 - 119, SI No. 11B)	121	100	03/11/10 A	03/03/11 A	03/11/10 A	03/03/11 A
SKW059322	Add. Site Invest. Works (VO. No. 9,12 &16)	174	100	11/01/11 A	03/07/11 A	11/01/11 A	03/07/11 A
SKW059323	Revised Profile at West Slope (+56 to +42.5mPD)	1	100	17/03/11 A	17/03/11 A	17/03/11 A	17/03/11 A
SKW059324	Construction of Haul Road (+42.5 to +56mPD)	12	100	18/03/11 A	29/03/11 A	18/03/11 A	29/03/11 A
SKW059325	Removal of Boulders (IBG 120-139, SI No. 11C)	17	100	30/03/11 A	15/04/11 A	30/03/11 A	15/04/11 A
SKW05933	West Slope Cutting (+56mPD to +42.5mPD)	2	100	16/04/11 A	17/04/11 A	16/04/11 A	17/04/11 A
SKW059331	Removal of Boulders (IBG 140-189, SI No. 11D)	45	100	18/04/11 A	01/06/11 A	18/04/11 A	01/06/11 A
SKW05934	West Slope Cutting (+42.5mPD to +35mPD)	32	100	02/06/11 A	03/07/11 A	02/06/11 A	03/07/11 A
SKW059341	Revised Profile at West Slope (+20 to +4.8mPD)	1	100	04/07/11 A	04/07/11 A	04/07/11 A	04/07/11 A
SKW05935	West Slope Cutting (+35mPD to +27.5mPD)	83	100	08/07/11 A	28/09/11 A	08/07/11 A	28/09/11 A
SKW05936	West Slope Cutting (+27.5mPD to +20mPD)	61	100	29/09/11 A	28/11/11 A	29/09/11 A	28/11/11 A
SKW05937	West Slope Cutting (+20mPD to +12.5mPD)	39	100	29/11/11 A	06/01/12 A	29/11/11 A	06/01/12 A
SKW05938	West Slope Cutting (+12.5mPD to +4.8mPD)	90	100	07/01/12 A	27/03/12 A	07/01/12 A	27/03/12 A
SKW05941	Slope Stormwater Drainage	300	100	28/03/12 A	25/05/12 A	28/03/12 A	25/05/12 A
SKW059411	East Slope Cutting (+50mPD to +42.5mPD)	72	100	04/03/11 A	14/05/11 A	04/03/11 A	14/05/11 A
SKW059412	East Slope Cutting (+42.5mPD to +35mPD)	82	100	15/05/11 A	04/08/11 A	15/05/11 A	04/08/11 A
SKW059413	East Slope Cutting (+35mPD to +27.5mPD)	55	100	05/08/11 A	28/09/11 A	05/08/11 A	28/09/11 A
SKW059414	East Slope Cutting (+27.5mPD to +20mPD)	61	100	29/09/11 A	28/11/11 A	29/09/11 A	28/11/11 A
SKW059415	East Slope Cutting (+20mPD to +12.5mPD)	39	100	29/11/11 A	06/01/12 A	29/11/11 A	06/01/12 A
SKW059416	East Slope Cutting (+12.5mPD to +4.8mPD)	81	100	07/01/12 A	27/03/12 A	07/01/12 A	27/03/12 A
SKW05942	Slope Miscellaneous Works	61	100	26/05/12 A	31/07/12 A	26/05/12 A	31/07/12 A
SKW05943	Buttress & surface Protection (SI No. 31)	60	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A
SKW05944	Slope Treatment (SI. No. 36)	60	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A
SKW05945	Rock Slope Treatment (SI. No. 68)	60	100	01/08/12 A	30/09/12 A	01/08/12 A	30/09/12 A
SKW05946	Rock Slope Treatment (SI. No. 98)	60	100	10/09/12 A	28/02/13 A	10/09/12 A	28/02/13 A
SKW05947	Rock Slope Treatment (SI. No. 115)	60	100	01/11/12 A	28/02/13 A	01/11/12 A	28/02/13 A
SKW05948	Soil Nailing Works (VO. No. 52)	300	100	10/02/12 A	28/02/13 A	10/02/12 A	28/02/13 A
SKW0595	Rock Meshing	60	80	01/07/14 A	12/12/14	01/07/14 A	05/10/15
SKW05963	Determine Alignment & Foundation Design of RFB	120	100	10/02/12 A	08/06/12 A	10/02/12 A	08/06/12 A
SKW059631	GEO Approval of Foundation Design	70	100	09/06/12 A	31/07/12 A	09/06/12 A	31/07/12 A
SKW05964	Fabrication & Shipping of RFB Material	180	100	09/06/12 A	30/11/12 A	09/06/12 A	30/11/12 A
SKW05965	Site clearance & Formation of access	62	100	09/06/12 A	31/07/12 A	09/06/12 A	31/07/12 A
SKW05967	Plant mobilization	14	100	02/01/13 A	15/01/13 A	02/01/13 A	15/01/13 A
SKW05968	Construction of anchors & pull out test	180	100	16/01/13 A	17/08/13 A	16/01/13 A	17/08/13 A
SKW05969	Construction of Foundation	120	100	11/07/13 A	23/08/13 A	11/07/13 A	23/08/13 A
SKW05970	Proof Load Test	60	100	31/07/13 A	28/09/13 A	31/07/13 A	28/09/13 A
SKW05971	Transportation of Material (To the slope crest)	30	100	31/07/13 A	29/08/13 A	31/07/13 A	29/08/13 A
SKW05972	Installation of Flexible barrier	90	100	31/07/13 A	28/10/13 A	31/07/13 A	28/10/13 A
SKW05981	Additional Slope Works (Remove soil debris)	25	40	20/11/14 A	15/12/14	20/11/14 A	30/08/16
Section W5 - P.S. No. 1 in Portion D							
Civil & Geotechnical Works							
SKW0651	Site Clearance	7	100	17/05/10 A	23/05/10 A	17/05/10 A	23/05/10 A
SKW0652	Initial Survey	7	100	24/05/10 A	30/05/10 A	24/05/10 A	30/05/10 A



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Page number	7A
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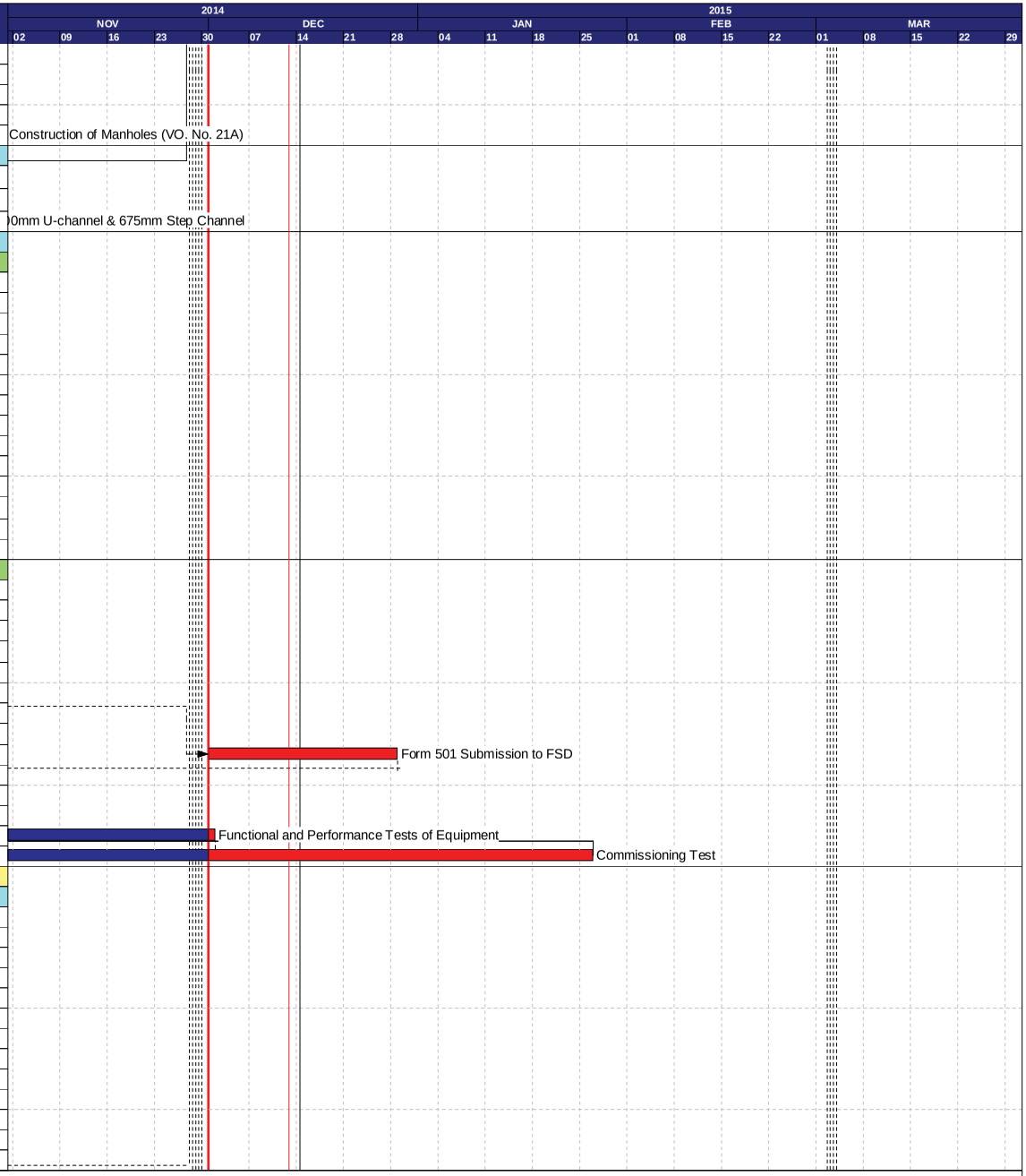
SKW0661	Transplantation for uncommon vegatation	30	100	31/05/10 A	29/06/10 A	31/05/10 A	29/06/10 A
SKW0681	Excavate to lower the working platform to +3mPD	49	100	30/06/10 A	17/08/10 A	30/06/10 A	17/08/10 A
SKW0691	ELS to +2.2mPD	40	100	18/08/10 A	26/09/10 A	18/08/10 A	26/09/10 A
SKW0721	Excavate to formation	270	100	17/09/10 A	13/06/11 A	17/09/10 A	13/06/11 A
SKW0722	Construction of Manholes (VO. No. 21A)	107	100	28/10/13 A	31/10/14 A	28/10/13 A	31/10/14 A
Structural Works							
SKW0741	RC Works for Structure	240	100	14/06/11 A	08/02/12 A	14/06/11 A	08/02/12 A
SKW0841	ABWF works	60	100	09/02/12 A	08/04/12 A	09/02/12 A	08/04/12 A
SKW0861	300mm U-channel & 675mm Step Channel	30	100	26/01/14 A	29/10/14 A	26/01/14 A	29/10/14 A
E&M Works (PS1)							
Submission & Delivery							
E&M1001	Submission of Pumps	198	100	17/05/10 A	24/02/11 A	17/05/10 A	24/02/11 A
E&M1002	Submission of Gen-Set	198	100	17/05/10 A	24/02/11 A	17/05/10 A	24/02/11 A
E&M1003	Submission of DeO System	198	100	17/05/10 A	16/07/13 A	17/05/10 A	16/07/13 A
E&M1004	Submission of LV SB & MCC	180	100	17/05/10 A	09/01/12 A	17/05/10 A	09/01/12 A
E&M1005	Submission of Instrumentation	243	100	17/05/10 A	12/03/12 A	17/05/10 A	12/03/12 A
E&M1006	Submission of FS System	243	100	17/05/10 A	30/09/12 A	17/05/10 A	30/09/12 A
E&M1007	Submission of BS System	243	100	17/05/10 A	07/01/14 A	17/05/10 A	07/01/14 A
E&M1011	Delivery of Pumps	150	100	24/02/11 A	21/07/11 A	24/02/11 A	21/07/11 A
E&M1012	Delivery of Gen-Set	150	100	24/02/11 A	23/09/11 A	24/02/11 A	23/09/11 A
E&M1013	Delivery of DeO System	150	100	11/07/11 A	28/10/11 A	11/07/11 A	28/10/11 A
E&M1014	Delivery of LV SB & MCC	150	100	01/06/12 A	31/07/12 A	01/06/12 A	31/07/12 A
E&M1015	Delivery of Instrumentation	90	100	01/11/11 A	03/11/11 A	01/11/11 A	03/11/11 A
E&M1016	Delivery of FS Equipment	107	100	01/12/11 A	21/01/14 A	01/12/11 A	21/01/14 A
E&M1017	Delivery of BS Equipment	107	100	15/11/11 A	28/01/14 A	15/11/11 A	28/01/14 A
Installation, T&C							
E&M1101	Install Pumps	55	100	02/10/12 A	05/01/14 A	02/10/12 A	05/01/14 A
E&M1102	Install Gen Set	55	100	02/10/12 A	05/05/13 A	02/10/12 A	05/05/13 A
E&M1103	Install DeO System	55	100	03/12/12 A	02/01/14 A	03/12/12 A	02/01/14 A
E&M1104	Install LV SB & MCC	55	100	02/01/13 A	26/03/13 A	02/01/13 A	26/03/13 A
E&M1105	Install Instrumentation	55	100	01/11/12 A	28/01/14 A	01/11/12 A	28/01/14 A
E&M1106	Install FS Equipment	55	100	02/10/12 A	30/01/14 A	02/10/12 A	30/01/14 A
E&M1107	Install BS Equipment	55	100	02/10/12 A	08/01/14 A	02/10/12 A	08/01/14 A
E&M1110	Install Valves, Pipes & Fittings	46	100	02/01/13 A	27/03/13 A	02/01/13 A	27/03/13 A
E&M1130	Form 501 Submission to FSD	28	0	01/12/14	28/12/14 *	01/11/14	28/11/14 *
E&M1140	Cabling Works	43	100	21/05/13 A	07/02/14 A	21/05/13 A	07/02/14 A
E&M1150	Insulation Tests of Cables and Cable Termination	7	100	25/06/13 A	09/02/14 A	25/06/13 A	09/02/14 A
E&M1160	Engergization	3	100	01/07/13 A	02/08/13 A	01/07/13 A	02/08/13 A
E&M1170	Functional and Performance Tests of Equipment	30	98	02/01/13 A	01/12/14 *	02/01/13 A	02/11/14 *
E&M1800	Commissioning Test	60	5	01/10/14 A	26/01/15 *	01/10/14 A	27/12/14 *
Section W6 - Sewer and PS No.2 in Portions E&H							
Civil & Geotechnical Works							
SKW0881	Site Clearance	7	100	17/05/10 A	23/05/10 A	17/05/10 A	23/05/10 A
SKW0891	Plant mobilization	7	100	17/05/10 A	23/05/10 A	17/05/10 A	23/05/10 A
SKW0892	Initial Survey	30	100	24/05/10 A	22/06/10 A	24/05/10 A	22/06/10 A
SKW0901	Tree Transplantation	90	100	23/06/10 A	20/09/10 A	23/06/10 A	20/09/10 A
SKW0921	Cut Slope & U-Channel	14	100	21/09/10 A	04/10/10 A	21/09/10 A	04/10/10 A
SKW0931	Hoarding & Fencing	14	100	05/10/10 A	18/10/10 A	05/10/10 A	18/10/10 A
SKW0950	Removal of Rock Boulders before ELS	66	100	19/10/10 A	23/12/10 A	19/10/10 A	23/12/10 A
SKW0951	ELS & Excavate to formation	169	100	24/12/10 A	10/06/11 A	24/12/10 A	10/06/11 A
SKW0961	Mass Conc. Retaining Wall	90	100	16/01/13 A	06/01/14 A	16/01/13 A	06/01/14 A
SKW1491	LCS (ChA0+45 to 1+75) VO.7	90	100	24/03/12 A	21/06/12 A	24/03/12 A	21/06/12 A
SKW15111	Twin DN150 DI Rising Main (ChA1+75 - ChA5+79)	180	100	22/06/12 A	30/11/12 A	22/06/12 A	30/11/12 A
SKW15112	Twin DN150 DI Rising Main (ChA0+00 - ChA0+45)	30	100	01/02/13 A	03/01/14 A	01/02/13 A	03/01/14 A
SKW1531	Extent village sewers S163.1 & S164.1	34	100	30/11/12 A	10/01/13 A	30/11/12 A	10/01/13 A



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Finish date	22/11/16
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Run date	12/12/14
Page number	8A
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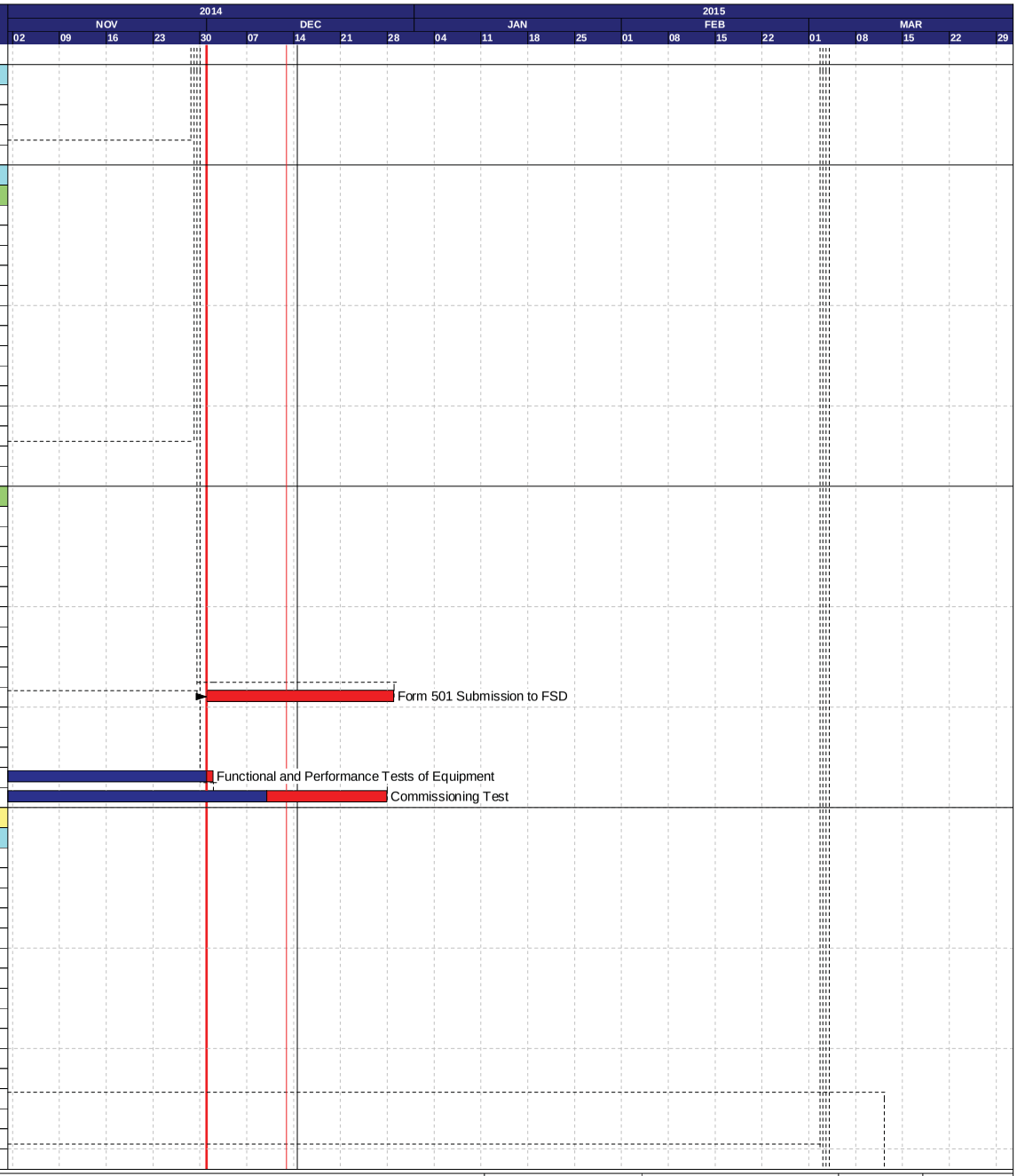
SKW1581	Construct Manhole no. S163 & S164	34	100	11/01/13 A	28/02/13 A	11/01/13 A	28/02/13 A
Structural Works							
SKW0971	Structural Works (Phase 1)	245	100	11/06/11 A	10/02/12 A	11/06/11 A	10/02/12 A
SKW1021	Structural Works (Phase 2)	42	100	11/02/12 A	23/03/12 A	11/02/12 A	23/03/12 A
SKW1061	ABWF Works	90	100	24/03/12 A	21/06/12 A	24/03/12 A	21/06/12 A
SKW1081	375mm U-channel/catchpits/outfall	30	100	22/06/12 A	31/01/13 A	22/06/12 A	31/01/13 A
E&M Works (PS2)							
Submission & Delivery							
E&M2001	Submission of Pumps	198	100	17/05/10 A	24/02/11 A	17/05/10 A	24/02/11 A
E&M2002	Submission of Gen-Set	198	100	17/05/10 A	24/02/11 A	17/05/10 A	24/02/11 A
E&M2003	Submission of DeO System	198	100	17/05/10 A	11/07/11 A	17/05/10 A	11/07/11 A
E&M2004	Submission of LV SB & MCC	271	100	17/05/10 A	30/06/12 A	17/05/10 A	30/06/12 A
E&M2005	Submission of Instrumentation	243	100	17/05/10 A	30/06/12 A	17/05/10 A	30/06/12 A
E&M2006	Submission of FS System	243	100	17/05/10 A	07/01/14 A	17/05/10 A	07/01/14 A
E&M2007	Submission of BS System	243	100	17/05/10 A	07/01/14 A	17/05/10 A	07/01/14 A
E&M2011	Delivery of Pumps	150	100	24/02/11 A	21/07/11 A	24/02/11 A	21/07/11 A
E&M2012	Delivery of Gen-Set	150	100	24/02/11 A	23/09/11 A	24/02/11 A	23/09/11 A
E&M2013	Delivery of DeO System	150	100	11/07/11 A	28/10/11 A	11/07/11 A	28/10/11 A
E&M2014	Delivery of LV SB & MCC	150	100	29/02/12 A	31/07/12 A	29/02/12 A	31/07/12 A
E&M2015	Delivery of Instrumentation	90	100	21/06/11 A	03/11/11 A	21/06/11 A	03/11/11 A
E&M2016	Delivery of FS Equipment	107	100	01/12/11 A	28/01/14 A	01/12/11 A	28/01/14 A
E&M2017	Delivery of BS Equipment	107	100	15/01/11 A	28/01/14 A	15/01/11 A	28/01/14 A
Installation, T&C							
E&M2101	Install Pumps	55	100	02/10/12 A	10/01/14 A	02/10/12 A	10/01/14 A
E&M2102	Install Gen Set	55	100	01/09/12 A	05/05/13 A	01/09/12 A	05/05/13 A
E&M2103	Install DeO System	55	100	03/12/12 A	05/01/14 A	03/12/12 A	05/01/14 A
E&M2104	Install LV SB & MCC	55	100	02/01/13 A	31/01/13 A	02/01/13 A	31/01/13 A
E&M2105	Install Instrumentation	55	100	31/05/13 A	01/02/14 A	31/05/13 A	01/02/14 A
E&M2106	Install FS Equipment	55	100	02/10/12 A	27/02/14 A	02/10/12 A	27/02/14 A
E&M2107	Install BS Equipment	55	100	01/09/12 A	05/02/14 A	01/09/12 A	05/02/14 A
E&M2110	Install Valves, Pipes & Fittings	46	100	02/01/13 A	31/01/13 A	02/01/13 A	31/01/13 A
E&M2120	Hydraulic Test of Pipeworks	7	100	02/01/13 A	31/01/13 A	02/01/13 A	31/01/13 A
E&M2130	Form 501 Submission to FSD	28	0	01/12/14	28/12/14 *	01/11/14	28/11/14 *
E&M2140	Cabling Works	43	100	01/02/13 A	08/03/14 A	01/02/13 A	08/03/14 A
E&M2150	Insulation Tests of Cables and Cable Termination	7	100	01/02/13 A	11/03/14 A	01/02/13 A	11/03/14 A
E&M2160	Engergization	3	100	01/02/13 A	25/03/13 A	01/02/13 A	25/03/13 A
E&M2170	Functional and Performance Tests of Equipment	30	98	15/01/13 A	01/12/14 *	15/01/13 A	03/11/14 *
E&M2180	Commissioning Test	60	70	01/10/14 A	27/12/14 *	01/10/14 A	27/12/14 *
Section W7 - SKW STW,Sewer and Submarine Outfall							
Submarine Outfall							
SKW1130	Approval of IHS Consultant	180	100	17/05/10 A	27/08/10 A	17/05/10 A	27/08/10 A
SKW1131	Hydrographical Survey (SKW)	300	100	01/02/11 A	28/02/11 A	01/02/11 A	28/02/11 A
SKW1141	Baseline Monitoring (Water)	213	100	27/07/10 A	31/12/10 A	27/07/10 A	31/12/10 A
SKW1151	Set up Temporary Working Platform	90	100	15/06/11 A	30/09/11 A	15/06/11 A	30/09/11 A
SKW1171	ELS for HDD Set-up (SKW)	90	100	01/09/11 A	30/09/11 A	01/09/11 A	30/09/11 A
SKW1181	Mobilization of HDD plant & equipment to SKW	8	100	06/01/12 A	07/01/12 A	06/01/12 A	07/01/12 A
SKW1191	Setting up at drillhole location	7	100	09/01/12 A	14/01/12 A	09/01/12 A	14/01/12 A
SKW1201	Drill pilot hole and reaming hole - NS280 - 750m	33	100	16/01/12 A	16/02/12 A	16/01/12 A	16/02/12 A
SKW1211	Receiving Pit for HDD (SKW)	13	100	16/01/12 A	29/02/12 A	16/01/12 A	29/02/12 A
SKW1221	Installaiton of NS280 HDPE 450mm dia. pipe	61	100	31/03/12 A	30/04/12 A	31/03/12 A	30/04/12 A
SKW1231	Removal of Receiving Platform	50	100	01/05/12 A	19/06/12 A	01/05/12 A	19/06/12 A
SKW1241	Dredging of MD for Diffuser (PS CL 1.122(3))	16	100	20/06/12 A	05/07/12 A	20/06/12 A	05/07/12 A
SKW1251	Diffuser Construction	77	100	01/09/12 A	16/11/12 A	01/09/12 A	16/11/12 A
SKW1431	Removal of silt curtain	1	100	17/11/12 A	17/11/12 A	17/11/12 A	17/11/12 A
SKW1440	Sewer of Outfall Chamber to connection pit VO37A	90	100	31/12/12 A	04/01/14 A	31/12/12 A	04/01/14 A
SKW1441	Sewer of Connection Pit to Outfall VO45	177	100	05/06/13 A	30/01/14 A	05/06/13 A	30/01/14 A



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Finish date	22/11/16
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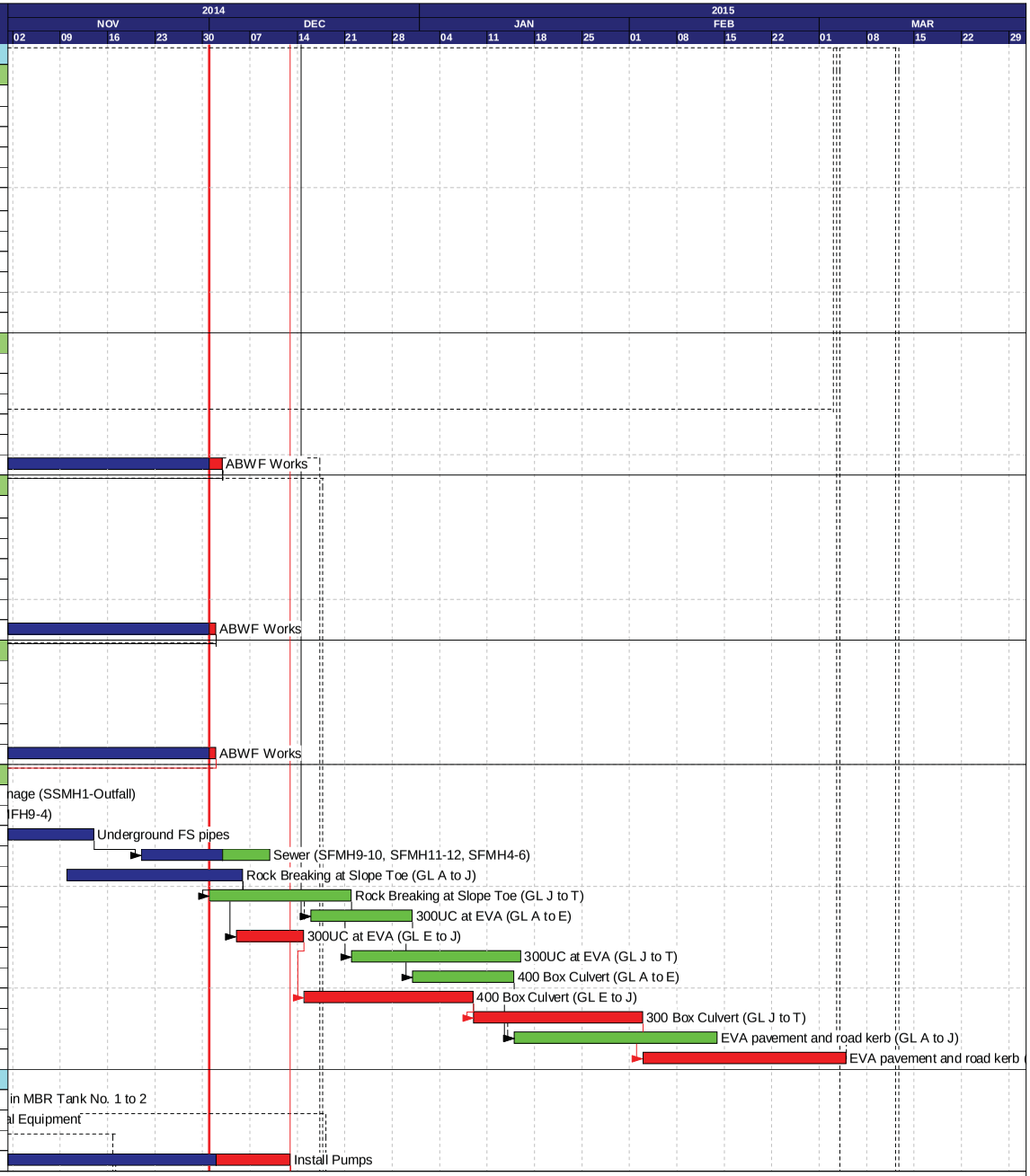
Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Dec 2014 - Feb 2015

Date	Revision	Checked	Approved
30/11/14	Revision 0	RH	VC

Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish
SKW STW							
Submission & Delivery (E&M)							
E&M3010	Delivery of MBR M.M. - 1st shipment for Temp STP	150	100	24/02/11 A	17/10/11 A	24/02/11 A	17/10/11 A
E&M3030	Delivery of Grit Removal Equipment	180	100	10/10/11 A	29/12/11 A	10/10/11 A	29/12/11 A
E&M3060	Delivery of Fine Screens	136	100	12/09/11 A	30/11/11 A	12/09/11 A	30/11/11 A
E&M3070	Delivery of Pumps	136	100	23/06/11 A	05/09/11 A	23/06/11 A	05/09/11 A
E&M3080	Delivery of Submersible Mixers	180	100	26/07/11 A	17/11/11 A	26/07/11 A	17/11/11 A
E&M3090	Delivery of Sludge Dewatering Equipment	210	100	01/09/11 A	03/03/14 A	01/09/11 A	03/03/14 A
E&M3100	Delivery of Valves, Pipes & Fittings	180	100	30/08/11 A	06/07/14 A	30/08/11 A	06/07/14 A
E&M3110	Delivery of Penstocks	180	100	12/08/11 A	24/12/11 A	12/08/11 A	24/12/11 A
E&M3130	Delivery of instruments	180	100	21/06/11 A	03/11/11 A	21/06/11 A	03/11/11 A
E&M3140	Delivery of MCC LVSB	180	100	01/01/14 A	30/06/14 A	01/01/14 A	30/06/14 A
E&M3150	Delivery of BS Equipment	180	100	03/07/12 A	20/07/14 A	03/07/12 A	20/07/14 A
E&M3160	Delivery of FS Equipment	180	100	30/06/12 A	06/08/14 A	30/06/12 A	06/08/14 A
Construction of Grid A-G							
SKW1261	Excavate for SKW STW Structure (Grid A -G)	164	100	28/03/12 A	31/08/12 A	28/03/12 A	31/08/12 A
SKW1271	55 M3 Fire Sprinkle Water Tank (FL +0.9 mPD)	36	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A
SKW1281	Ground Floor Slab (Grid A-G)	46	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A
SKW1291	Columns & Walls to 1/F & 1/F Slab (Grid A-G)	50	100	03/07/12 A	31/07/12 A	03/07/12 A	31/07/12 A
SKW1301	Columns & Walls to R/F & R/F Slab (Grid A-G)	50	100	01/09/12 A	31/01/13 A	01/09/12 A	31/01/13 A
SKW1411	ABWF Works	105	98	01/02/13 A	02/12/14 *	01/02/13 A	05/11/14 *
Construction of Grid G-N							
SKW1311	Excavate for SKW STW Structure (Grid G-N)	90	100	28/03/12 A	25/06/12 A	28/03/12 A	25/06/12 A
SKW1321	Equalization Tank no.1 & 2 with base slabs (-2.1	42	100	26/06/12 A	30/09/12 A	26/06/12 A	30/09/12 A
SKW1331	Columns & Walls from B/S to G/F Slab (Grid G-N)	35	100	01/09/12 A	30/09/12 A	01/09/12 A	30/09/12 A
SKW1341	Ground Floor Slab (Grid G-N)	35	100	01/09/12 A	17/12/12 A	01/09/12 A	17/12/12 A
SKW1351	Columns & Walls to 1/F & 1/F Slab (Grid G-N)	28	100	01/11/12 A	15/01/13 A	01/11/12 A	15/01/13 A
SKW1361	Columns & Walls to R/F & R/F Slab (Grid G-N)	35	100	01/11/12 A	03/08/13 A	01/11/12 A	03/08/13 A
SKW1451	ABWF Works	54	98	05/06/13 A	01/12/14 *	05/06/13 A	03/11/14 *
Construction of Grid N-T							
SKW1371	Excavate for SKW STW Structure (Grid N-T)	97	100	03/07/12 A	25/01/13 A	03/07/12 A	25/01/13 A
SKW1381	Ground Floor Slabs include MBR Tank (Grid N-T)	58	100	02/10/12 A	31/01/13 A	02/10/12 A	31/01/13 A
SKW1391	Columns & Walls to 1/F & 1/F Slab (Grid N-T)	35	100	31/05/13 A	05/07/13 A	31/05/13 A	05/07/13 A
SKW1401	Columns & Walls to R/F & R/F Slab (Grid N-T)	35	100	03/07/13 A	15/09/13 A	03/07/13 A	15/09/13 A
SKW1421	ABWF Works	60	98	06/08/13 A	01/12/14 *	06/08/13 A	10/11/14 *
Road and Drainage at Internal EVA							
SKW1551	Drainage (SSMH1-Outfall)	35	100	15/07/14 A	27/10/14 A	15/07/14 A	27/10/14 A
SKW15611	Sewer (SMFH10-11, SMFH9-4)	22	100	27/03/14 A	10/10/14 A	27/03/14 A	10/10/14 A
SKW156111	Underground FS pipes	20	100	23/10/14 A	13/11/14 A	23/10/14 A	13/11/14 A
SKW15612	Sewer (SFMH9-10, SFMH11-12, SFMH4-6)	17	60	21/11/14 A	09/12/14	21/11/14 A	22/11/16
SKW156121	Rock Breaking at Slope Toe (GL A to J)	25	100	10/11/14 A	05/12/14 A	10/11/14 A	05/12/14 A
SKW156122	Rock Breaking at Slope Toe (GL J to T)	25	10	01/12/14 A	21/12/14	01/12/14 A	18/10/16
SKW15613	300UC at EVA (GL A to E)	15	0	16/12/14 *	30/12/14	30/08/16	20/09/16
SKW15614	300UC at EVA (GL E to J)	25	30	05/12/14 A	14/12/14	05/12/14 A	14/12/14
SKW15615	300UC at EVA (GL J to T)	25	0	22/12/14	15/01/15	18/10/16	22/11/16
SKW15616	400 Box Culvert (GL A to E)	15	0	31/12/14	14/01/15	20/09/16	11/10/16
SKW15617	400 Box Culvert (GL E to J)	25	0	15/12/14	08/01/15	15/12/14	08/01/15
SKW15618	300 Box Culvert (GL J to T)	25	0	09/01/15	02/02/15	09/01/15	02/02/15
SKW15619	EVA pavement and road kerb (GL A to J)	30	0	15/01/15	13/02/15	11/10/16	22/11/16
SKW15620	EVA pavement and road kerb (GL J to T)	30	0	03/02/15	04/03/15	03/02/15	04/03/15
SKW STW - E&M Works							
E&M3170	Install Membrane Modules in MBR Tank No. 1 to 2	100	100	14/01/14 A	08/10/14 A	14/01/14 A	08/10/14 A
E&M3190	Install Grit Removal Equipment	60	100	15/03/14 A	15/10/14 A	15/03/14 A	15/10/14 A
E&M3210	Install Fine Screens	60	100	14/01/14 A	09/10/14 A	14/01/14 A	09/10/14 A
E&M3220	Install Pumps	75	85	15/03/14 A	12/12/14	15/03/14 A	30/08/14



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Leader Civil Engineering Corp. Ltd.
Contract No. DC/2009/13
Construction of Sewage Treatment Works at YSW & SKW
3-month Rolling Programme (Dec 2014 - Feb 2015

Date	Revision	Checked	Approved
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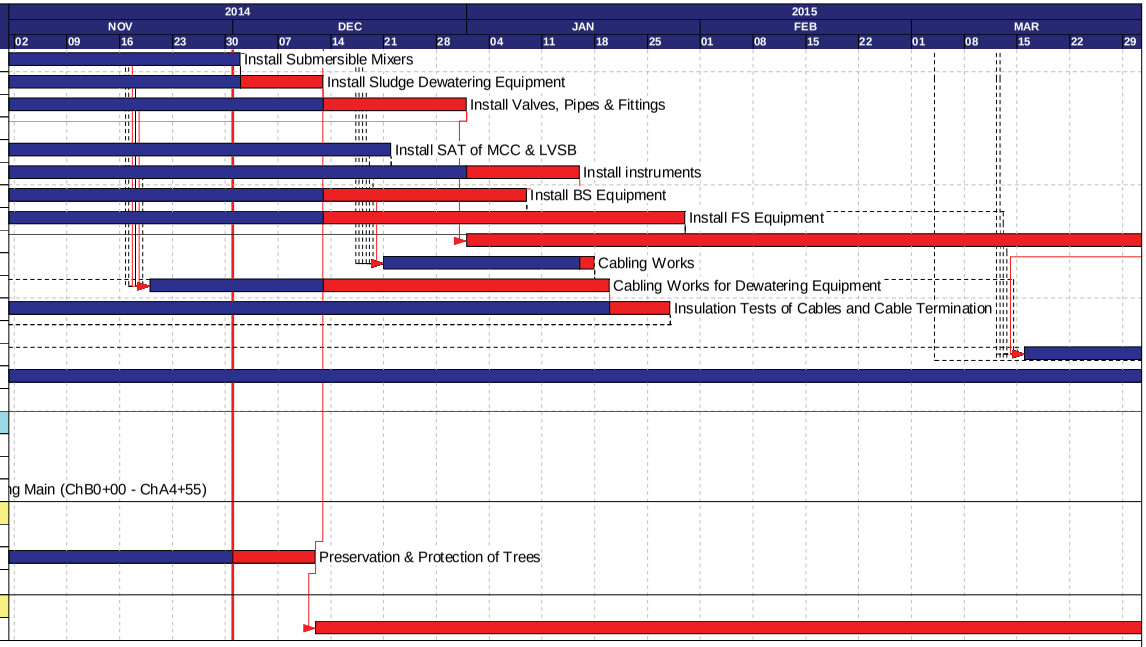
Activity ID	Description	Original Duration	Percent Complete	Early Start	Early Finish	Late Start	Late Finish
E&M3230	Install Submersible Mixers	45	100	29/05/14 A	01/12/14 A	29/05/14 A	01/12/14 A
E&M3240	Install Sludge Dewatering Equipment	74	85	04/03/14 A	12/12/14	04/03/14 A	01/11/14
E&M3250	Install Valves, Pipes & Fittings	75	75	13/07/14 A	31/12/14	13/07/14 A	18/09/14
E&M3260	Install Penstocks	135	100	05/03/14 A	15/10/14 A	05/03/14 A	15/10/14 A
E&M3261	Install SAT of MCC & LVSB	174	100	30/06/14 A	21/12/14 A	30/06/14 A	21/12/14 A
E&M3270	Install instruments	60	75	26/09/14 A	15/01/15	26/09/14 A	15/12/14
E&M3291	Install BS Equipment	180	85	28/07/14 A	08/01/15	28/07/14 A	17/12/14
E&M3300	Install FS Equipment	161	70	06/08/14 A	29/01/15	06/08/14 A	17/12/14
E&M3310	Hydraulic Tests of Pipeworks	90	0	01/01/15	31/03/15	18/09/14	17/12/14
E&M3311	Cabling Works	47	95	21/12/14 A	17/01/15	21/12/14 A	17/12/14
E&M3320	Cabling Works for Dewatering Equipment	47	20	20/11/14 A	19/01/15	20/11/14 A	09/12/14
E&M3321	Insulation Tests of Cables and Cable Termination	21	60	06/02/14 A	27/01/15	06/02/14 A	17/12/14
E&M3331	Energization	1	100	03/02/14 A	04/02/14 A	03/02/14 A	04/02/14 A
E&M3359	Functional and Performance Tests of Equipment	35	50	16/03/15 A	18/04/15	16/03/15 A	04/01/15
E&M3360	T&C Period	91	35	16/10/14 A	17/06/15	16/10/14 A	04/03/15
E&M3370	Trial Operation Period	456	0	17/06/15	22/11/16	17/06/15	22/11/16
Rising Main							
SKW1481	Subm, Approval & Delivery of DI pipes	120	100	17/05/10 A	13/09/10 A	17/05/10 A	13/09/10 A
SKW1501	LCS (ChB0+00 - ChB1+20)	300	100	14/09/10 A	10/07/11 A	14/09/10 A	10/07/11 A
SKW1521	Twin DN150 DI Rising Main (ChB0+00 - ChA4+55)	250	100	11/07/11 A	13/10/14 A	11/07/11 A	13/10/14 A
Section W8 - Landscape Softworks in All Portions							
SKW1591	Tree Survey	21	100	17/05/10 A	06/06/10 A	17/05/10 A	06/06/10 A
SKW1611	Preservation & Protection of Trees	1053	99	17/05/10 A	11/12/14	17/05/10 A	11/12/14
SKW1621	Transplantation at SKW	90	100	07/06/10 A	04/09/10 A	07/06/10 A	04/09/10 A
Section W9 - Establishment Works in All Portions							
SKW1631	Section W9 - Establishment Works	194	0	12/12/14	23/06/15	12/12/14	23/06/15



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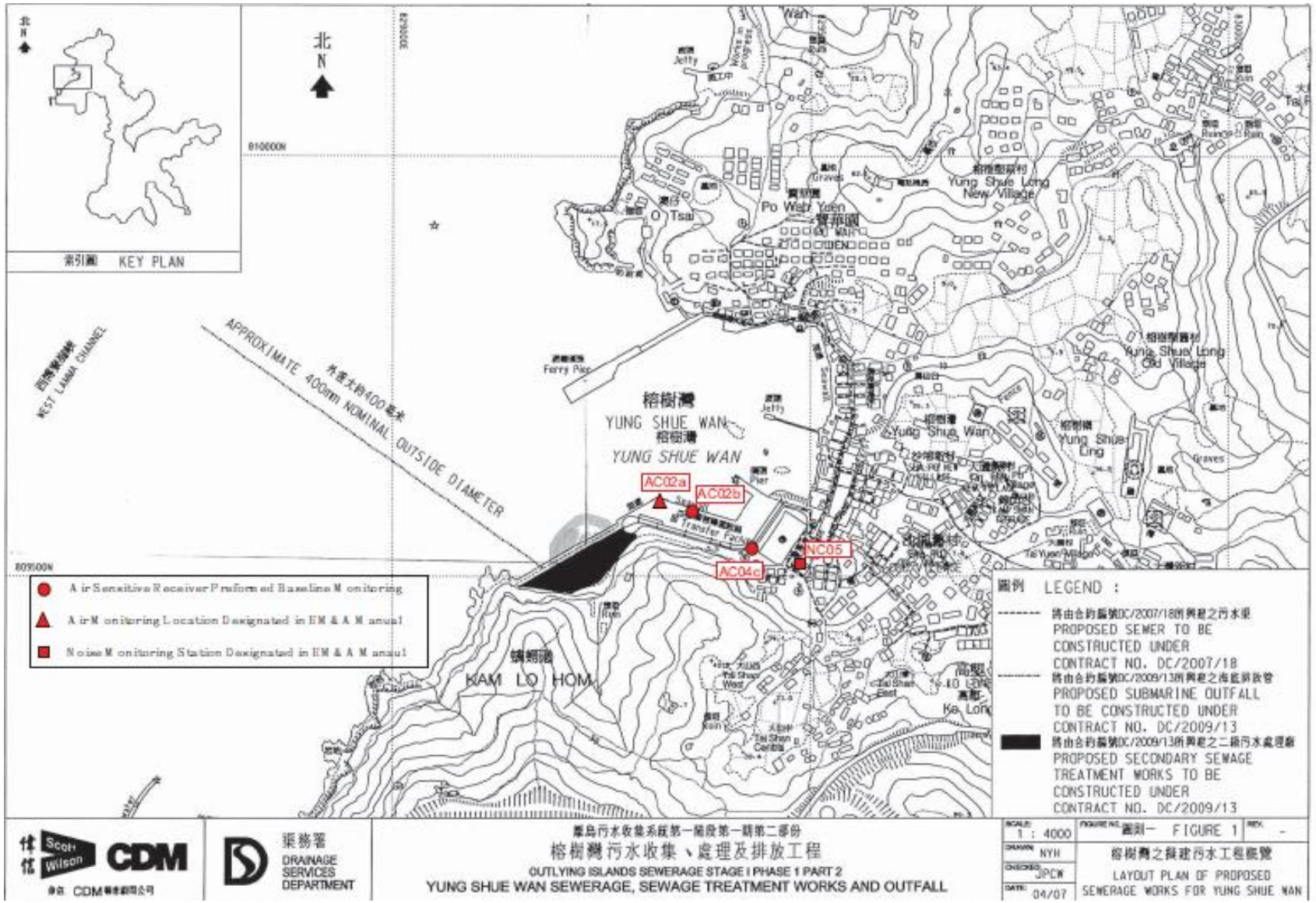
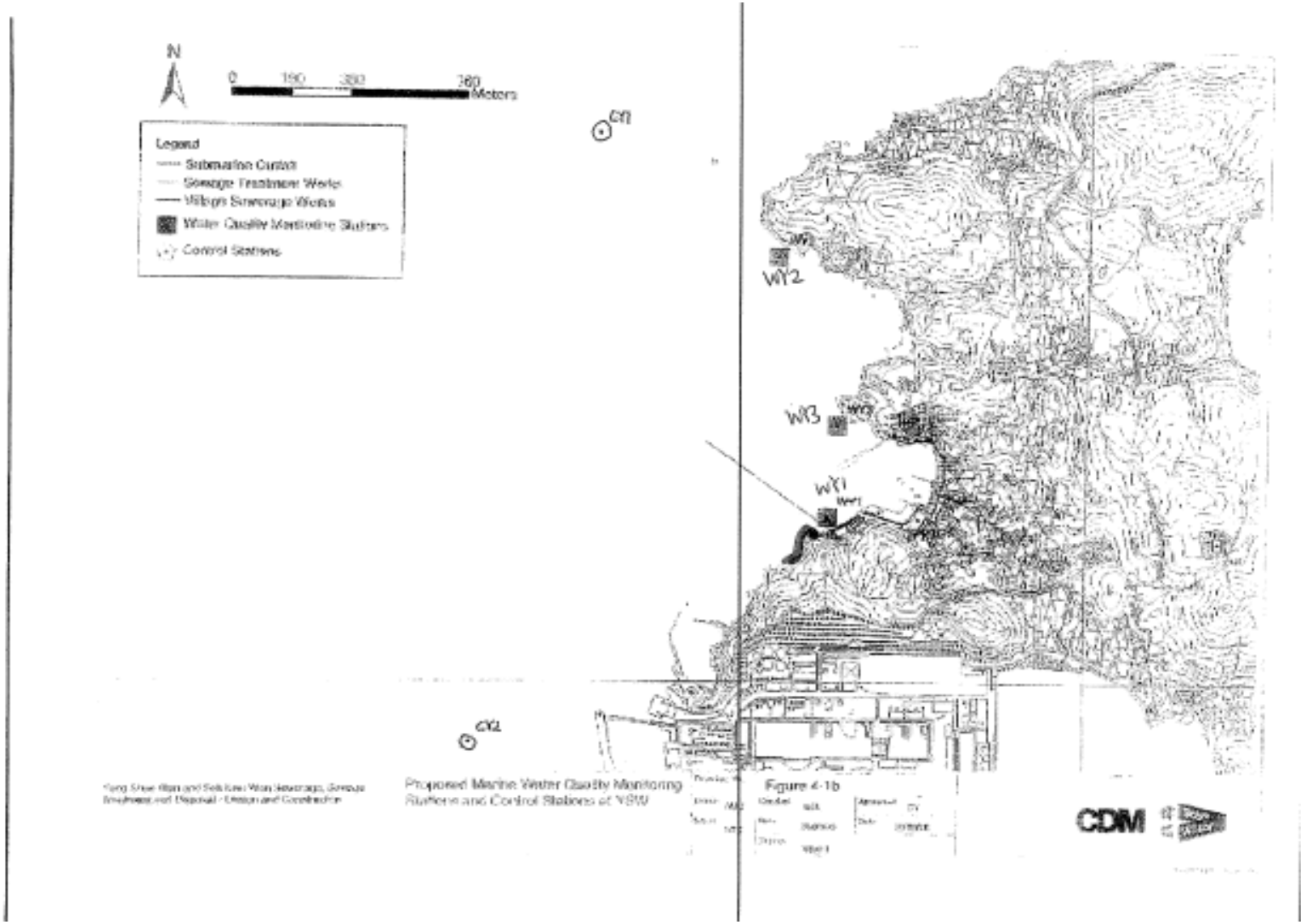
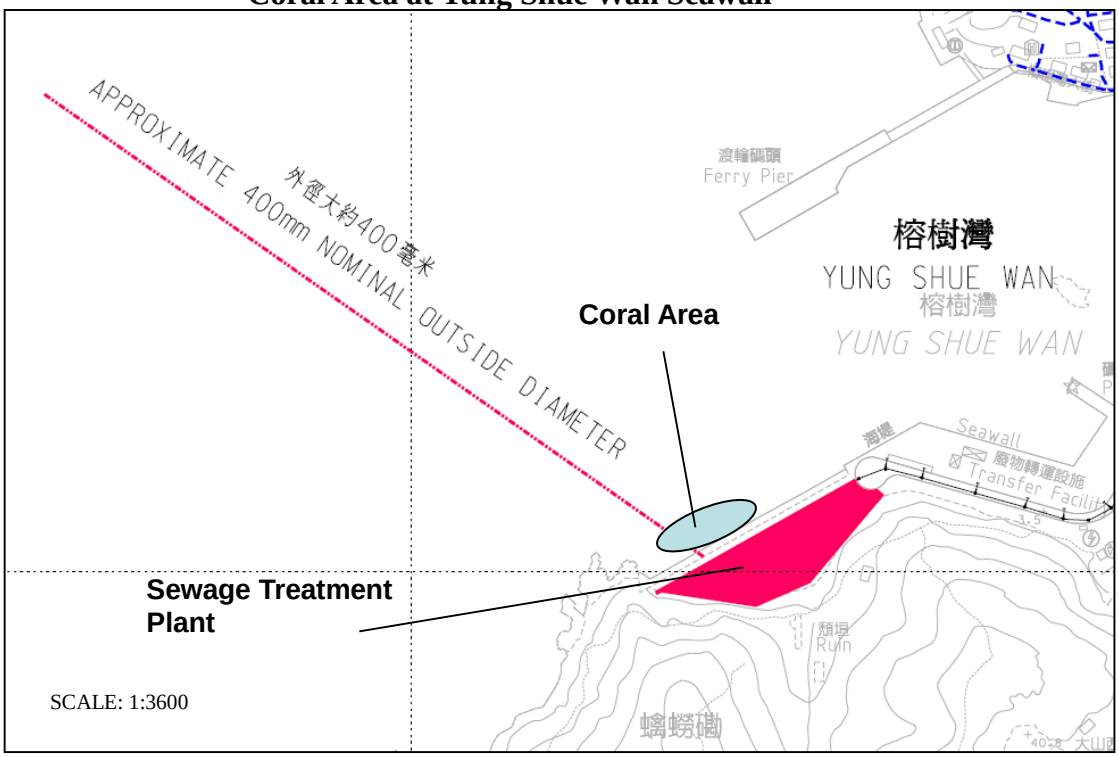
Appendix D

Location of Monitoring Stations (Air Quality / Construction Noise / Marine Water Quality / Ecology)

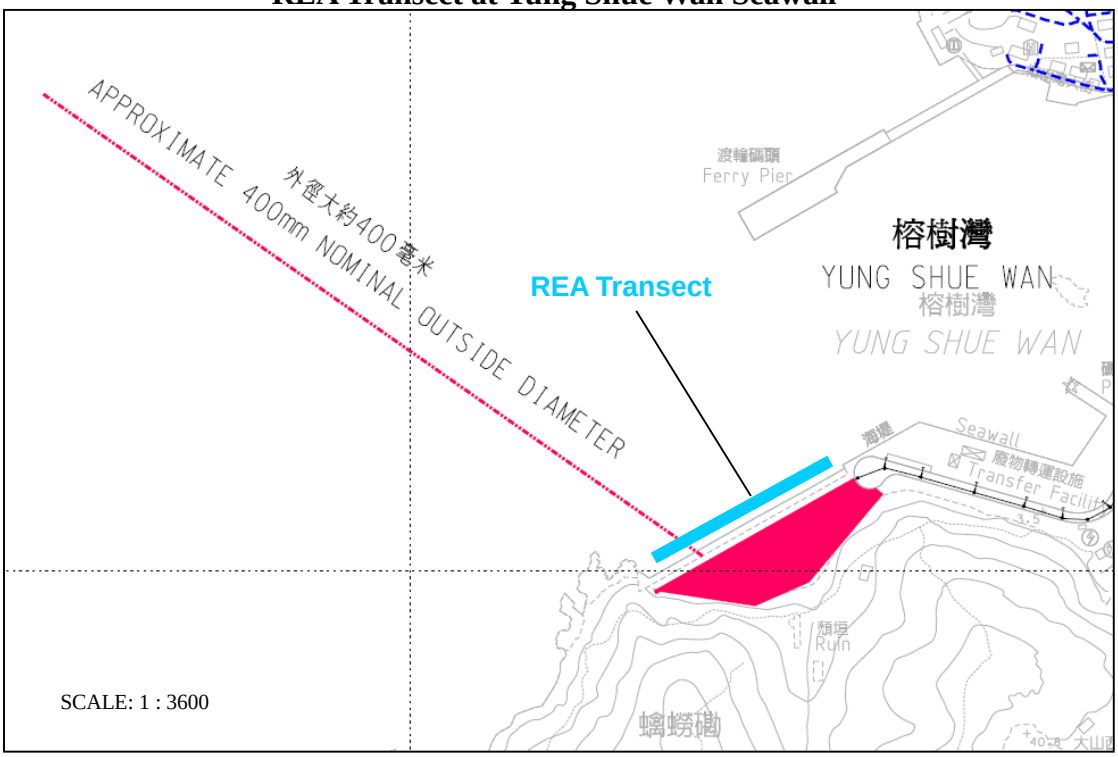

索引圖 KEY PLAN
北 N
810000N
809500N
APPROXIMATE 400mm NOMINAL OUTSIDE DIAMETER
榕樹灣 YUNG SHUE WAN
YUNG SHUE WAN
AC02a
AC02b
NC05
AC04c
KAM LO HOM
Air Sensitive Receiver Preformed Baseline Monitoring
Air Monitoring Location Designated in EM & A Manual
Noise Monitoring Station Designated in EM & A Manual
圖例 LEGEND :
PROPOSED SEWER TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2007/18
PROPOSED SUBMARINE OUTFALL TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2009/13
PROPOSED SECONDARY SEWAGE TREATMENT WORKS TO BE CONSTRUCTED UNDER CONTRACT NO. DC/2009/13
DRAINAGE SERVICES DEPARTMENT
榕樹灣污水收集、處理及排放工程
OUTLYING ISLANDS SEWERAGE STAGE I PHASE 1 PART 2
YUNG SHUE WAN SEWERAGE, SEWAGE TREATMENT WORKS AND OUTFALL
1 : 4000
圖則一 FIGURE 1
榕樹灣之擬建污水工程總覽
LAYOUT PLAN OF PROPOSED SEWERAGE WORKS FOR YUNG SHUE WAN


N
0
190
380
760
Meters
Legend
Submarine Outfall
Sewage Treatment Works
Village Sewerage Works
Water Quality Monitoring Stations
Control Stations
CR1
CR2
WY2
WY3
WY1
Proposed Marine Water Quality Monitoring Stations and Control Stations at YSW
Figure 4-1b
CDM

Coral Area at Yung Shue Wan Seawall



REA Transect at Yung Shue Wan Seawall



Coral Area at Sham Wan

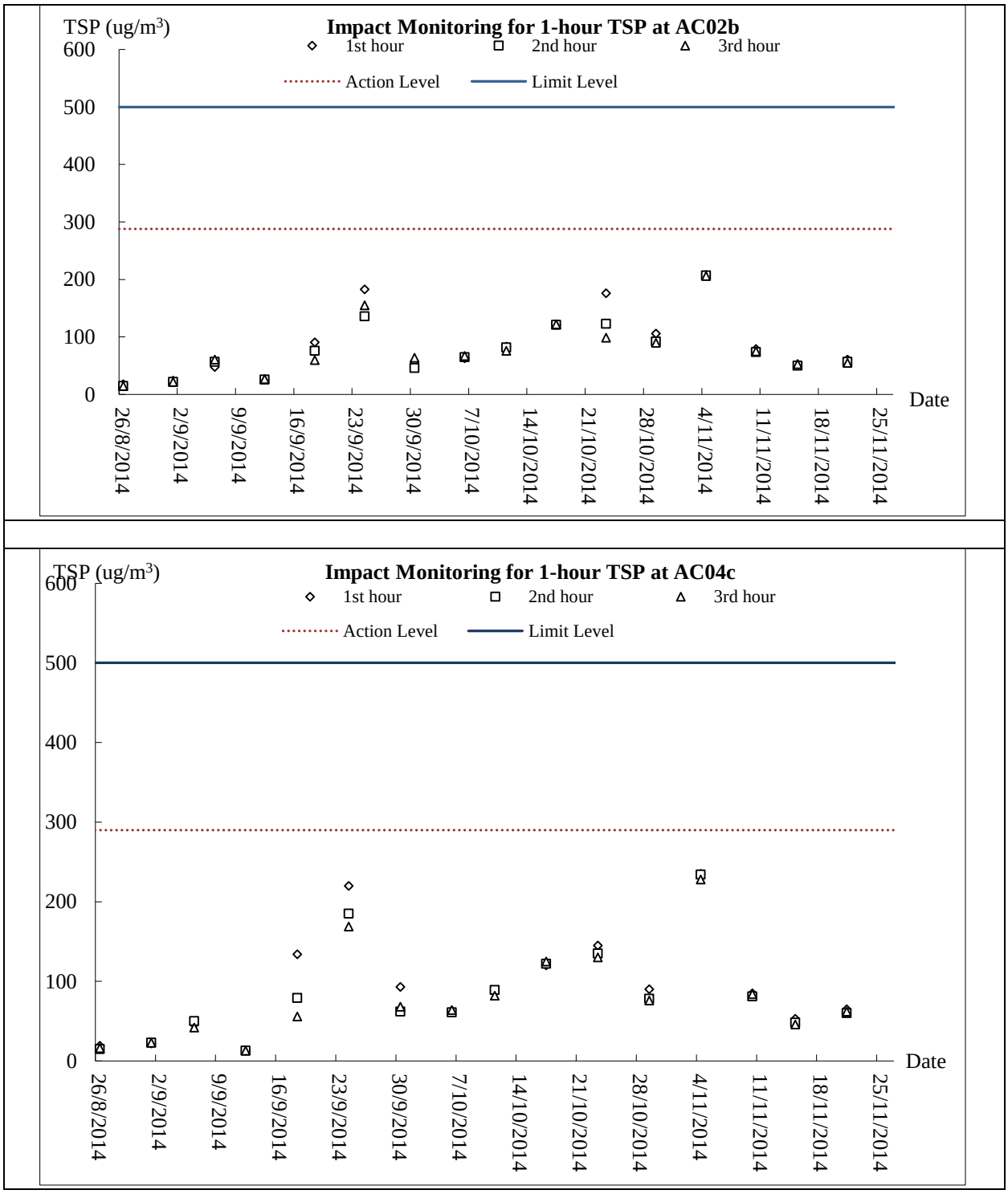
REA Transect at Sham Wan

Appendix E

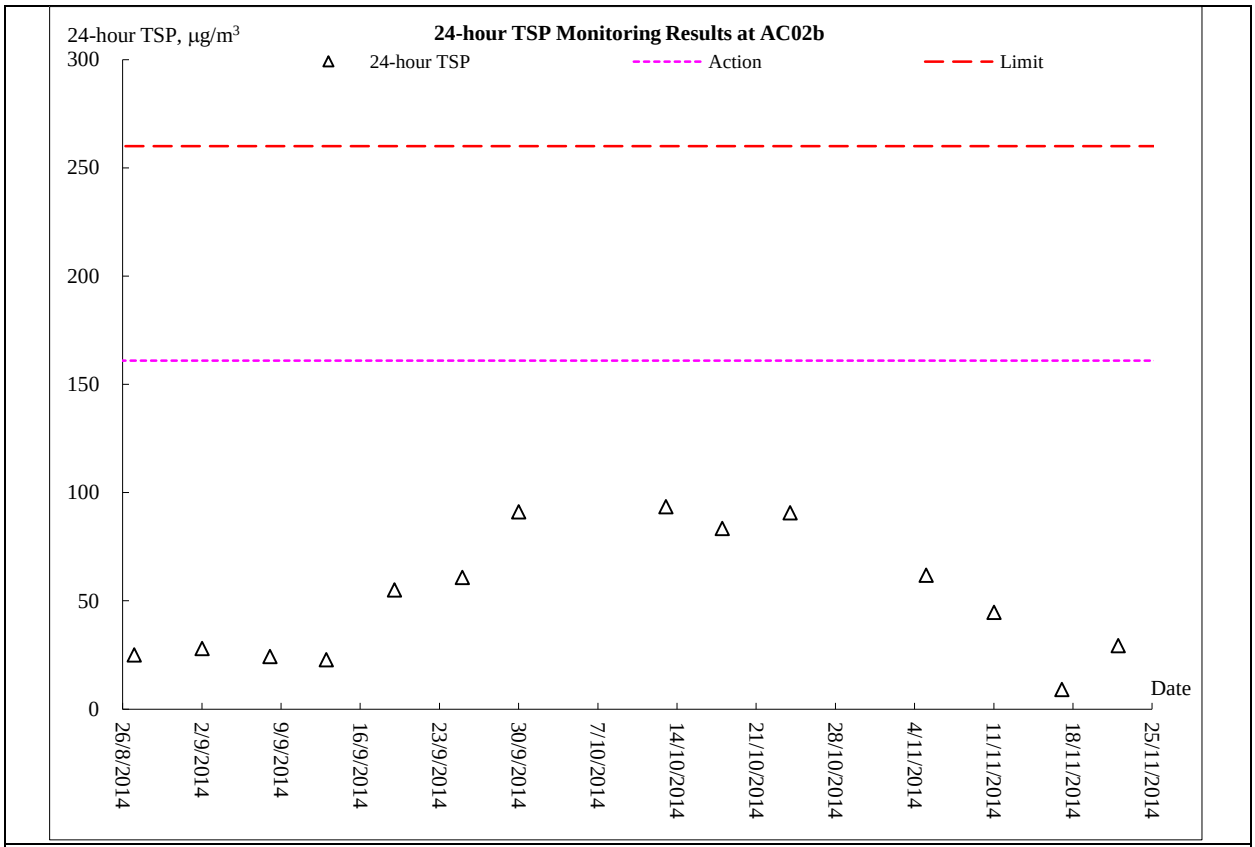
Graphical Plots of Impact Monitoring

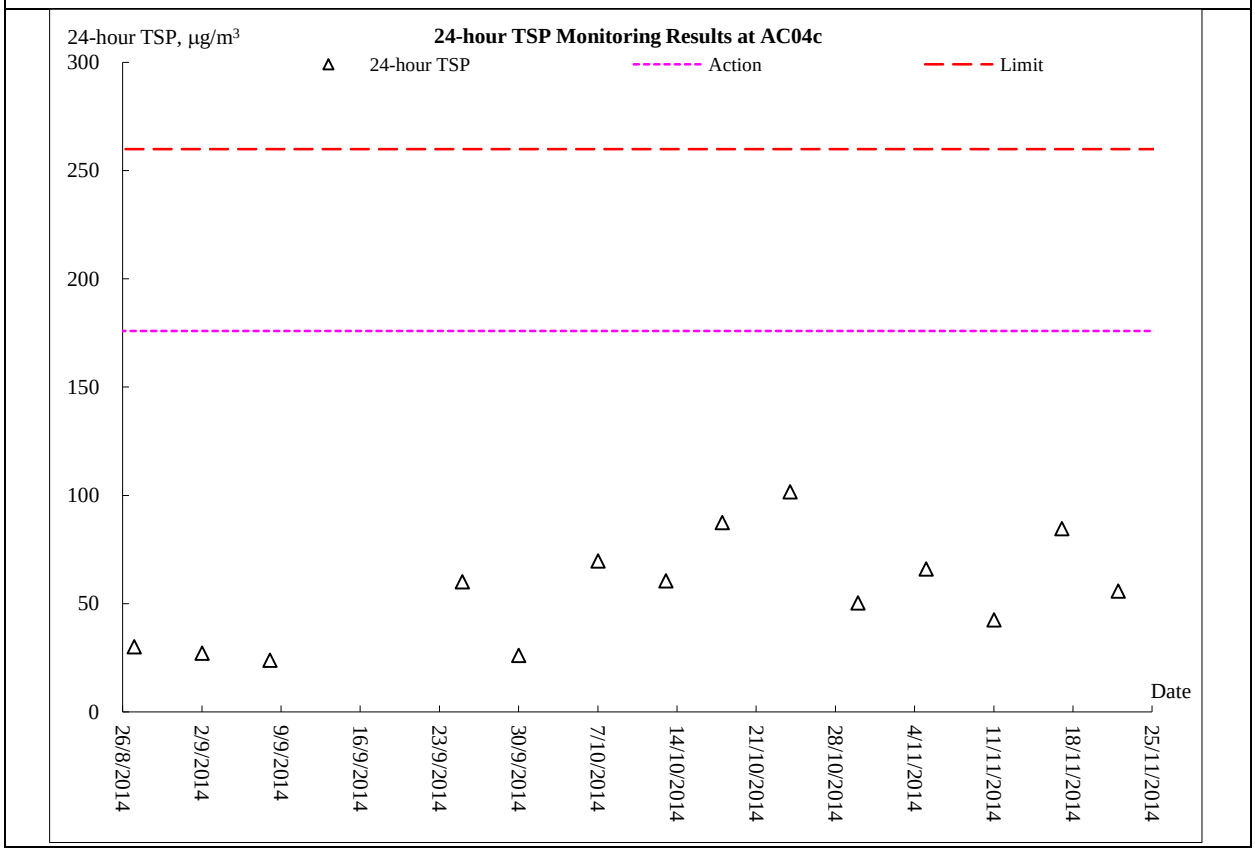
1. **Air Quality**
2. **Construction Noise**
3. **Marine Water Quality**

Air Quality – 1-hour TSP Monitoring

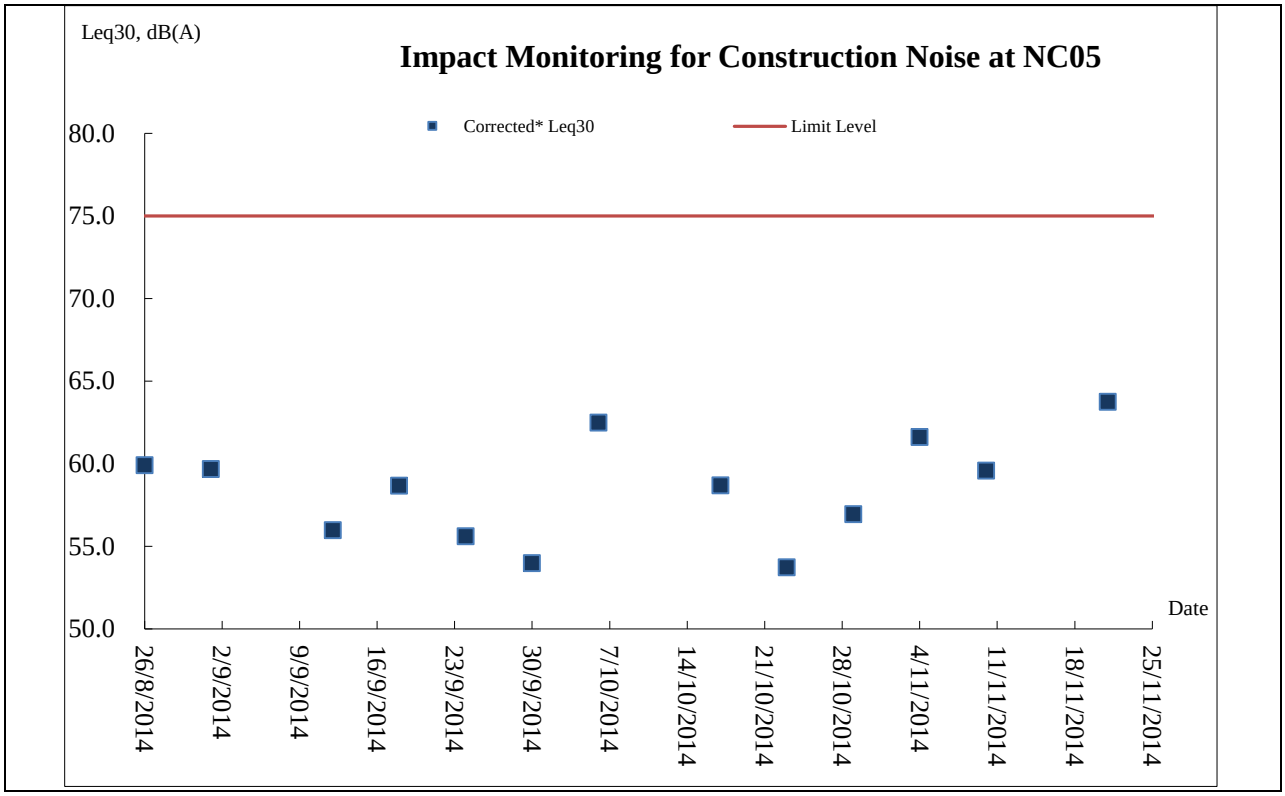


Air Quality – 24-hour TSP Monitoring





Construction Noise



Appendix F

Meteorological Information

Meteorological condition –September 2014

Under the dominance of the subtropical ridge over southern China, September 2014 was the hottest September on record. The monthly mean minimum temperature of 27.0 degrees and mean temperature of 29.0 degrees were respectively the highest and one of the highest for September since record began in 1884. The month was also drier than usual with a monthly total rainfall amount of 140.6 millimetres, only about 43 percent of the September normal of 327.6 millimetres. The accumulated rainfall since 1 January was 2452.7 millimetres, about 10 percent above the normal of 2233.1 millimetres for the same period.

Meteorological condition– October 2014

Under the dominance of a relatively dry northeast monsoon, October 2014 was much warmer and sunnier than usual. The mean temperature for the month was 26.2 degrees, 0.7 degrees above the normal figure of 25.5 degrees and also the one of the fifth highest for October since record began in 1884. The monthly total duration of sunshine was 222.9 hours, about 15 percent above the normal figure of 193.9 hours.

Meteorological condition– November 2014

The weather of November 2014 was overall cloudier yet warmer than usual. The mean temperature for the month was 22.6 degrees, 0.8 degrees above the normal figure of 21.8 degrees. Despite more clouds and less sunshine, the total rainfall of 31.1 millimetres recorded in the month was about 17 percent below the normal figure of 37.6 millimetres. The accumulated rainfall since 1 January was 2593.6 millimetres, about 9 percent above the normal of 2371.7 millimetres for the same period.

Note: please refer to the monthly EM&A report (September – November 2014) for the weather details on each successive day.

Appendix G

Monthly Summary Waste Flow Table

Name of Department: ~~ArchSD/CEDD/DSD/EMSD/HyD/WSD~~ **Contract No.:** **DC/2009/13**

Monthly Summary Waste Flow Table for November 2014

Month	Actual Quantities of Inert C&D Materials Generated Monthly												Actual Quantities of C&D Wastes Generated Monthly									
	Total Quantity Generated (a) = (c)+(d)+(e)		Hard Rock and Large Broken Concrete (b)		Reused in the Contract (c)		Reused in other Projects (d)		Disposed as Public Fill (e)		Imported Fill (f)		Metals		Paper/ cardboard packaging		Plastics		Chemical Waste		Others, e.g. rubbish	
	(in '000m^3)		(in '000m^3)		(in '000m^3)		(in '000m^3)		(in '000m^3)		(in '000m^3)		(in '000kg)		(in '000kg)		(in '000kg)		(in '000kg)		(in tonne)	
	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW	YSW	SKW
2014	15.933	50.762	0.160	0.432	0.740	2.802	0.000	0.000	15.194	47.960	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	487.580	290.030
Jan	0.342	0.325	0.000	0.005	0.000	0.000	0.000	0.000	0.342	0.325	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.480	4.820
Feb	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	18.110	4.300
Mar	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.305	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	5.150	4.340
Apr	0.000	0.000	0.000	0.005	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	4.030	3.900
May	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	35.810	4.180
Jun	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	33.060	5.880
Sub-total	16.581	51.087	0.160	0.442	0.740	2.802	0.000	0.000	15.841	48.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	588.220	317.450
Jul	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	21.980	11.520
Aug	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	22.250	3.540
Sep	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	19.610	3.270
Oct	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	28.860	5.490
Nov	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	10.880	3.890
Dec																						
Total	16.581	51.087	0.160	0.442	0.740	2.802	0.000	0.000	15.841	48.285	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	691.800	345.160
	67.668		0.602		3.542		0.000		64.126		0.000		0.000		0.000		0.000		0.000		1036.960	

Remark: Assume 1.0 m^3 vehicle dump load = 1.6 tonnes C&D materials

YSW: Yung Shue Wan

SKW: Sok Kwu Wan

Appendix H

Implementation Schedule of Mitigation Measures

Implementation Schedule of Air Quality Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.3.18	2.10.2	Adopting the following good site practices and follow the dust control requirements of the Air Pollution Control (Construction Dust) Regulation: • Stockpiles of imported material kept on site should be contained within hoardings, dampened and / or covered during dry and windy weather; • Material stockpiled alongside trenches should be covered with tarpaulins whenever works are close to village houses; • Water sprays should be used during the delivery and handling of cement, sands, aggregates and the like. • Any vehicle used for moving sands, aggregates and construction waste should have properly fitting side and tail boards. Materials should not be loaded to a level higher than the side and tail boards, and should be covered by a clean tarpaulin.	Work site / during construction	All contractors		√		TM- EIAO, APCO, Air Pollution Control (Construction Dust) Regulation
2.10.3	Section 2	1 hour and 24 hour dust monitoring and site audit	Designated air monitoring locations / throughout construction period	Contractor/ Environmental Team		√		EM&A Manual

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Implementation Schedule of Noise Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location/Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
\2.4.16	3.8.2	Implementation of following measures during the sewer construction: • Use of quiet PME or method; • Restriction on the number plant (1 item for each type of plant); and • Good Site Practices ➢ Only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction programme. ➢ Mobile plant, if any, should be sited as far away from NSRs as possible. ➢ Machines and plant (such as trucks) that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum. ➢ Plant known to emit noise strongly in one direction should, wherever possible, be orientated so that the noise is directed away from the nearby NSRs. ➢ Material stockpiles and other structures should be effectively utilized, wherever practicable, in screening noise from on-site construction activities.	Work site /during the construction of Sewer.	Contractor		√		EIAO-TM, NCO
2.10.5 to 2.10.9	Section 35	Noise monitoring	Designated noise monitoring locations / throughout construction period	Contractor/ Environmental Team		√		EM&A Manual

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Implementation Schedule of Water Quality Control Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location (duration /completion of measures)	Implementation Agent	Implementation Stages**			Relevant Legislation and Guidelines
					D	C	O	
Construction Phase								
2.5.23	4.12.1	No-dig method using Horizontal Directional Drilling (HDD) would be used for the installation of main portion of outfall pipes	Marine works site / During construction of submarine outfall	Contractor		√		
4.5.38	4.12.3	Dredging Works Implementation of following measures during the dredging works: • dredging should be undertaken using closed grab dredgers with a maximum total production rate of 55m^3/hr; • deployment of 2-layer silt curtains with the first layer enclosing the grab and the second layer at around 50m from the dredging area while dredging works are in progress; • dredging operation should be undertaken during ebb tide only; • all vessels should be sized such that adequate clearance (i.e. minimum clearance of 0.6m) is maintained between vessels and the sea bed at all states of the tide to ensure that undue turbidity is not generated by turbulence from vessel movement or propeller wash; • all pipe leakages should be repaired promptly and plant should not be operated with leaking pipes; • excess material should be cleaned from the decks and exposed fittings of barges before the vessel is moved; • adequate freeboard (i.e. minimum of 200mm) should be maintained on barges to ensure that decks are not washed by wave action; • all barges should be fitted with tight fitting seals to their bottom openings to prevent leakage of material; • loading of barges should be controlled to prevent splashing of dredged material to the surrounding water, and barges should not be filled to a level which will cause the overflow of materials or polluted water during loading or transportation; and	Marine works site and at the identified water sensitive receivers/ During construction	Contractor		√		

		• the decks of all vessels should be kept tidy and free of oil or other substances that might be accidentally or otherwise washed overboard.						
2.5.39	4.12.4	<u>Construction Run-off and Drainage</u> Implementation of the following site practices outlined in ProPECC PN 1/94 for "Construction Site Drainage" • Provision of perimeter channels to intercept storm-runoff from outside the site. These should be constructed in advance of site formation works and earthworks. • Works programmes should be designed to minimize works areas at any one time, thus minimizing exposed soil areas and reducing the potential for increased siltation and runoff. • Sand / silt removal facilities such as sand traps, silt traps and sediment basins should be provided to remove the sand / silt particles from run-off. These facilities should be properly and regularly maintained. These facilities should be carefully planned to ensure that they would be installed at appropriate locations to capture all surface water generated on site. • Careful programming of the works to minimise soil excavation works during rainy seasons. • Exposed soil surface should be protected by paving or hydroseeding as soon as possible to reduce the potential of soil erosion. • Trench excavation should be avoided in the wet season, and if necessary, these should be excavated and backfilled in short sections. • Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric	Construction works sites	Contractor		√		ProPECC PN 1/94
2.5.39	4.12.5	<u>General Construction Activities</u> • Debris and rubbish generated on-site should be collected, handled and disposed of properly to avoid entering the nearby coastal waters and stormwater drains. • 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.	Construction works sites	Contractor		√		

		• Open drainage channels and culverts near the works areas should be covered to block the entrance of large debris and refuse.						
2.5.39	4.12.6	Wastewater Arising from Workforce Portable toilets should be provided by the Contractors, where necessary, to handle sewage from the workforce. The Contractor should also be responsible for waste disposal and maintenance practices.	Construction works sites	Contractor		√		
2.10.10	Section 4	Water quality monitoring	Designated water monitoring locations/ throughout construction period	Contractor		√		EM&A Manual

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Implementation Schedule of Sediment Contamination Mitigation Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
2.9.24	5.2.1	Carrying out Sediment Quality Investigation	Marine works site / prior to construction	DSD	√			WBTC No. 34/2002
2.9.23	5.2.1	Follow the requirement and procedures for dredged mud disposal specified under the WBTC No. 34/2002.	Marine works site / during dredging works	Contractor		√		WBTC No. 34/2002
2.9.23	5.2.2	Implement appropriate dredging methods which have been incorporated into the recommended water quality mitigation measures.	Marine works site, during dredging works	Contractor		√		
2.9.23	5.2.3	During the transportation and disposal of the dredged sediment, the following measures should be taken: • Bottom opening of barges should be fitted with tight fitting seals to prevent leakage of material. Excess material should be cleaned from the decks and exposed fittings of barges and hopper dredgers before the vessel is moved. • Monitoring of the barge loading should be conducted to ensure that loss of material does not take place during transportation. Transport barges or vessels should be equipped with automatic self monitoring devices as specified by the DEP.	Marine works site and at the identified sensitive receivers	Contractor		√		

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Implementation Schedule of Solid Waste Management Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.9.14	6.6.2	Good site practices • Nomination of an approved person, such as a site manager, to be responsible for implementation of good site practices, arranging for collection and effective disposal to an appropriate facility, of all wastes generated at the site • Training (proper waste management and chemical handling procedure) should be provided for site staffs • Appropriate measures to minimize windblown litter and dust during transportation of waste by either covering trucks or by transporting wastes in enclosed containers. • Provision of sufficient waste disposal points and regular collection for disposal. • Separation of chemical wastes for special handling and appropriate treatment at the Chemical Waste Treatment Facility. • Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors. • Maintain records of the quantities of wastes generated, recycled and disposed.	Work sites/During construction	Contractor		√		Waste Disposal Ordinance (Cap.54)
2.9.15	6.2.3	The Contractor will be required to open a billing account under the Construction Waste Disposal Charging Scheme, and to pay for disposal of all construction waste. The construction waste will be sent to a designated reception facility, which in this case will be YSW RTS, where drivers must present a valid chit for disposal of each load.	Work sites/During construction	Contractor		√		Waste disposal (Amendment) Ordinance 2004
2.9.16	6.2.4	Recommendations to achieve waste reduction include: • segregation and storage of different types of waste in different containers, skips or stockpiles to enhance reuse or recycling of materials and their proper disposal; • to encourage collection of aluminium cans by individual collectors, separate labelled bins should be provided to	Work sites/During construction	Contractor		√		WBTC No. 4/98, 5/98

		segregate this waste from other general refuse generated by the work force; • any unused chemicals or those with remaining functional capacity should be recycled; • use of reusable non-timber formwork to reduce the amount of C&D material; • prior to disposal of C&D waste, it is recommended that wood, steel and other metals should be separated for re-use and / or recycling to minimise the quantity of waste to be disposed of to landfill; • proper storage and site practices to minimise the potential for damage or contamination of construction materials; and • plan and stock construction materials carefully to minimise amount of waste generated and avoid unnecessary generation of waste.						
2.9.18	6.2.5	<u>General Site Wastes</u> • A collection area for construction site waste should be provided where waste can be stored prior to removal from site • An enclosed and covered area for the collection of the waste is recommended to reduce 'wind blow' of light material	Work sites/During construction	Contractor		√		Public Health and Municipal Services Ordinance (Cap. 132)
2.9.19	6.2.6 and 6.2.7	<u>Chemical Wastes</u> • After use, chemical waste should be handled according to the Code of Practice on the Package, Labelling and Storage of Chemical Wastes • Any unused chemicals or those with remaining functional capacity should be recycled • Waste should be properly stored on site within suitably designed containers and should be collected by an approved licensed waste collectors for disposal at the Chemical Waste Treatment Facility or other licenced facility in accordance with the Waste Disposal (Chemical Waste) (General) Regulation under the Waste Disposal Ordance. • Any service shop and minor maintenance facilities should be located on hard standing within a bunded area, and sumps and oil interceptors should be provided. • Maintenance of vehicles and equipment involving activities with potential for leakage and spillage should be undertaken	Work sites/During construction	Contractor		√		Waste Disposal (Chemical Waste) (General) Regulation, Code of Practice on the Packaging Labelling and Storage of Chemical Wastes

		within the designated areas equipped control these discharges						
2.9.21 and 2.9.22	6.2.8 and 6.2.9	<u>Construction and Demolition Material</u> • The C&D waste should be separated on-site into three categories: ➢ public fill, the inert portion of the C&D material (e.g. concrete and rubble), which should be re-used on-site or disposed of at a public filling area; ➢ C&D waste for re-use and / or recycling, the non-inert portion of the C&D material, (e.g. steel and other metals, woods, glass and plastic); ➢ C&D waste which cannot be re-used and / or recycled (e.g. wood, glass and plastic) • Where possible, inert material should be re-used on-site • Where practicable, steel and other metals should be separated for re-use and/or recycling prior to disposal of C&D material	During all construction phases	Contractors		√		WBTC No. 4/98, 5/98, 21/2002, 25/99, 12/2000

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Implementation Schedule of Ecological Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.10.11 and 2.10.12	7.2 and 7.3	Carry out monitoring of corals before, during and after marine works.	Work sites / during construction phase	Contractor		√		
2.6.45 to 2.6.48	7.6.1	Use horizontal directional drilling to avoid direct disturbance to corals	Marine works site / during dredging works	Contractor		√		
2.6.57 to 2.6.58	4.12.3	Deploying of 2-layer silt curtains with the first layer enclosing the grab an the second layer at around 50m from the dredging area while dredging works are in progress	All work sites / during construction phase	Contractor		√		
2.6.51	7.6.1	Fence off the slope stabilisation works area from surrounding shrubland and/ woodland, to prevent access to or disturbance of adjacent habitats. The works area should be as small as is possible, consistent with the requirements of the works.	STW/ During construction	Contractor		√		

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Implementation Schedule of Fisheries Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages**			Relevant Legislation & Guidelines
					D	C	O	
2.5.37	4.12.4	Use of closed grab dredging and silt curtains around the immediate dredging area and low dredging rates as recommended in Water Quality of the EIA report	Marine works site, during dredging works	Contractor		√		TM on EIA Process

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** D=Design, C=Construction, O=Operation
N/A Not applicable

Implementation Schedule of Landscape and Visual Impact Measures

EIA Ref	EM&A Ref	Environmental Protection Measures*	Location / Timing	Implementation Agent	Implementation Stages **			Relevant Legislation & Guidelines
					D	C	O	
Construction Phase								
2.8.37	9.2.2	Careful and efficient transplanting of affected trees to temporary or final transplant location (the proposed tree to be transplanted is a semi-mature *Macaranga tanarius* and is located at the proposed Pumping Station P2 location).	All sites	Contractor		√		WBTC No. 14/2002
2.8.37	9.2.2	Short excavation and immediate backfilling sections upon completion of works to reduce active site area.	All sites	Contractor		√		
2.8.37	9.2.2	Screening of site construction works by use of hoarding that is appropriate to its site.	All sites	Contractor		√		WBTC No. 19/2001
2.8.37	9.2.2	Conservation of topsoil for reuse.	All sites	Contractor		√		
2.8.30	9.2.2	Night-time light source from marine fleets should be directed away from the residential units.	Outfall area	Contractor		√		

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** D=Design, C=Construction, O=Operation
N/A Not applicable