Maeda - CRGL - SELI Joint Venture

Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel

Monthly EM&A Report (June 2013)

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Report No	EB000364R0971	
Certified By	**F.C. Tsang** ET Leader	
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Report No	EB000364R0971	
Date	15 July 2013	

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EXECUTIVE SUMMARY

- Drainage Services Department (DSD) has awarded the contract for the Design and Construction of Tsuen Wan Drainage Tunnel (hereafter referred to as the "Project") to Maeda-CRGL-SELI Joint Venture (MCSJV). MCSJV has appointed Hyder Consulting Limited (HCL) as the Environmental Team (ET) to undertake the Environmental Monitoring and Audit (EM&A) works in accordance with the EM&A Manual and Environmental Permit (EP). Commencement of the construction work had been notified to the Environmental Protection Department (EPD) in January 2008. This Monthly EM&A Report summarises the EM&A works undertaken in June 2013.
- According to the EM&A Manual, there are four designated air quality monitoring locations, five designated noise monitoring locations and five water quality monitoring locations during the construction phase: (i) Sik Sik Yuen Ho Fung College (ASR 1, NSR 1 and Intake I-1); (ii) Hong Hoi Chee Hong Temple (ASR 3, NSR 3 and Intake I-2); (iii) Squatters (NSR 6 and Intake I-3); (iv) Beach Tower (Long Beach Gardens) (ASR 8, NSR 8 and Outfall O-1); and (v) Greenview Terrace (Block 1) (ASR 9, NSR 9 and Outfall O-1).
- During the non-restricted hours, major construction activities undertaken by the Contractor at Tsuen Wan Drainage Tunnel included site cleaning and tidying at Outfall, I-1, I-2 and I-3; construction of reinforced concrete (RC) structure of Outfall "W" at Outfall; construction of surface drainage at Outfall; backfilling on top of box culvert at Outfall; slope reinstatement works at Outfall; landscape works at Outfall; installation of miscellaneous steel works at trellis beam and tapered channel at Outfall; installation of additional irrigation system at Outfall; excavation and construction of permanent access road and surface drainage at I-3; landscape works at I-3; excavation and construction of associated drainage of access platform next to man access shaft at I-2; water proofing works for vortex shaft and approach channel at I-2; tiling works at equipment room and man access shaft at I-2; landscape works at I-2; installation of security fencing at I-1; landscape works at I-1; and reinstatement of site entrance at I-1.
- No exceedance was recorded for air quality monitoring during the reporting month.
- No exceedance was recorded for noise monitoring during the reporting month.
- Exceedances for river water quality monitoring are summarised in the following table:

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Two records at I-1 on 15 June 2013 and 24 June 2013 Two records at I-2 on 15 June 2013 and 24 June 2013 Three records at I-3 on 15 June 2013, 24 June 2013 and 26 June 2013
SS	Two record at I-1 on 7 June 2013 and 28 June 2013	Two records at I-1 on 15 June 2013 and 24 June 2013 Three records at I-2 on 15 June 2013, 19 June 2013 and 24 June 2013 Two records at I-3 on 15 June 2013 and 24 June 2013

- Marine water quality monitoring for dredging and marine works has been terminated since 1 May 2012. As such, there was no marine water quality monitoring in this reporting month.

- The status of waste generation in the reporting month is:
    - A total of 718.0 m^3 C&D material was disposed to public fill at Tuen Mun. No inert C&D material was reused in this Contract and no inert C&D material was reused in other Contracts. Detail information could be referred to Section 5.1.1 of this report;
    - About 35.1 m^3 general waste was disposed of to NENT Landfill;
    - No paper/cardboard was recycled in the reporting month;
    - No metal was generated in the reporting month;
    - No plastic waste was disposed of in the reporting month; and
    - No chemical waste was disposed of in the reporting month.
- In this reporting month, two site inspections and one monthly site audit were carried out by the ET and Independent Environmental Checker (IEC) respectively, to ensure proper implementation of environmental mitigation measures specified in the EM&A Manual and compliance with environmental legislation. All observations, which were recorded on the site inspection checklists, were passed to the Contractor together with the ET's recommendations.
- As advised by the Contractor and verified by ET:
    - No non-compliance regarding the site inspection was received in the reporting month;
    - No environmental complaint was received in the reporting month; and
    - No summons and prosecution was received in the reporting month.
- The major construction works for the upcoming three months will be:
    - Site cleaning and tidying at Outfall, I-1, I-2 and I-3;
    - Construction of RC structures of pump room at Outfall;
    - Slope reinstatement works at Outfall;
    - Finishing works for spiral ramp at Outfall;
    - Construction of surface drainage at Outfall;
    - Installation of GRP panels of spiral ramp at Outfall;
    - Landscape works at Outfall;
    - Footpath reinstatement work at Outfall;
    - Installation of additional irrigation system at Outfall;
    - Construction of permanent access road and associated drainage at I-3;
    - Installation of stone facing for vortex shaft at I-3;
    - Landscape works at I-3;
    - Construction of access platform and associated drainage next to man access shaft at I-2; and
    - Installation of vortex shaft opening steel cover and security fencing at I-2.

1 INTRODUCTION

1.1.1 The Drainage Services Department (DSD) proposed to construct a tunnel with an internal diameter of 6.5 m and a length of 5.13 km, with the purpose to alleviate the flooding risk in Tsuen Wan and Kwai Chung.

1.1.2 This project is a Designated Project under Schedule 2 Part I Category Q, of the Environmental Impact Assessment Ordinance (EIAO) as part of the proposed Tsuen Wan Drainage Tunnel (TWDT) passes underneath the existing Tai Mo Shan Country Park. An Environmental Impact Assessment (EIA) Study has therefore been undertaken to provide information on the nature and extent of environmental impacts arising from the construction and operation of the proposed designated project and related activities taking place concurrently. From the EIA, the recommendations for monitoring contained herein are made.

1.1.3 The Maeda-CRGL-SELI Joint Venture (MCSJV) was awarded by DSD with the Contract – Design and Construction of Tsuen Wan Drainage Tunnel.

1.1.4 Hyder was commissioned by the MCSJV as the Environmental Team (ET) to implement an EM&A programme in accordance with the EM&A Manual. The proposed tunnel section flows from the junction of Shing Mun Road and Wo Yi Hop Road and discharges to south of Yau Kom Tau underneath Castle Peak Road as shown in Appendix A.

1.1.5 The construction works of the Project was commenced in January 2008. This is the sixty-third monthly EM&A report summarising the impact monitoring results and audit findings of the EM&A programme in June 2013.

2 PROJECT INFORMATION

2.1 Project Organization and Management Structure

2.1.1 The organization chart and lines of communication with respect to the on-site environmental management are shown in Appendix B.

2.2 Construction Progress

2.2.1 The overall project programme from the detail design to completion of all civil works shall take approximately 70 months. The construction programme is presented in Appendix C.

2.2.2 The major construction activities undertaken in the reporting month were:

- Site cleaning and tidying at Outfall, I-1, I-2 and I-3;
- Construction of reinforced concrete (RC) structure of Outfall "W" at Outfall;
- Construction of surface drainage at Outfall;
- Backfilling on top of box culvert at Outfall;
- Slope reinstatement works at Outfall;
- Landscape works at Outfall;
- Installation of miscellaneous steel works at trellis beam and tapered channel at Outfall;
- Installation of additional irrigation system at Outfall;
- Excavation and construction of permanent access road and surface drainage at I-3;
- Landscape works at I-3;
- Excavation and construction of associated drainage of access platform next to man access shaft at I-2;
- Water proofing works for vortex shaft and approach channel at I-2;
- Tiling works at equipment room and man access shaft at I-2;
- Landscape works at I-2;
- Installation of security fencing at I-1;
- Landscape works at I-1; and
- Reinstatement of site entrance at I-1.

2.2.3 No marine mud dredging works for basin scheme at portion E was conducted in the reporting month, as all marine works were completed on 30 March 2012.

2.2.4 Planting trees at intake I-3 was undertaken during the restricted hours in the reporting period.

2.3 Mitigation Measures

2.3.1 The implemented environmental mitigation measures and their statuses are given in Appendix D.

2.4 Statuses of Licences and Permits

2.4.1 A summary of relevant permits and licences for the Project is given in Appendix E.

3 SUMMARY OF EM&A REQUIREMENT

3.1 Air Quality

Air Quality Parameters

3.1.1 One-hour total suspended particulates (TSP) levels were measured at the designated air quality monitoring locations in accordance with the EM&A Manual. Information such as date of monitoring, duration, weather condition, equipment used and monitoring results were recorded on the field data sheet developed for the Project. The monitoring results are presented in Section 4.

Monitoring Methodology

3.1.2 One-hour TSP monitoring was carried out under typical weather conditions (with no adverse weather such as typhoon signal or rain storm warning) three times every six days using High Volume Air Samplers (HVASs). Monitoring was conducted in accordance with the standard sampling method as set out in High Volume Method for Total Suspended Particulates, Part 50 Chapter 1 Appendix B, Title 40 of the Code of Federal Regulations of the USEPA.

3.1.3 After each sampling, the filter paper loaded with dust was kept in a clean and tightly sealed plastic bag. The filter paper was then re-conditioned in desiccators for 24 hours before obtaining the weight under laboratory conditions.

3.1.4 The average concentrations of the TSP were calculated based on the following information obtained from monitoring:

- Flow rate;
- Weight of the filter paper before and after sampling; and
- Sampling period indicated by the elapsed-time meter.

3.1.5 All samples were kept in good condition (i.e. stored in sealed plastic bags, with brief description of the monitoring dates and locations) for a period of 6 months before disposal. Sample analysis was carried out by ALS Technichem (HK) Pty Limited (HOKLAS Registration Number 066).

Monitoring Equipment and Calibration

3.1.6 High Volume Air Samplers (HVASs) were used for 1-hour TSP monitoring to comply with the USEPA specifications in Appendix B Part 5 - Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-Volume Method) of the Code of Federal Regulation dated June 1, 1991.

3.1.7 All HVASs were calibrated before commencement of monitoring using standard orifice 5-points calibration method with orifice calibrator to determine the actual flow rate of each HVAS. This was used for the calculation of the TSP level. Calibration Kit Model - TE5025A was used for calibration of the HVAS. Recalibration of the HVAS was carried out after motor maintenance, at least once every six months, which was about the expected life of carbon brush. The air quality monitoring equipment used during the

reporting month is shown in Table 3-1 below. The calibration certificates are included in Appendix F.

Equipment Type	Model	Serial Number	Calibration Orifice Number	Location
HVAS	BM2000HX	4994	1785	ASR 1
HVAS	BM2000HX	5875	1785	ASR 3
HVAS	TE5005X	1059	1785	ASR 8
HVAS	TE5005X	1713	1785	ASR 9

Table 3-1 Air Quality Monitoring Equipment

Monitoring Location

3.1.8 Four designated air quality monitoring locations were identified in the contract specific EM&A Manual. They are listed in Table 3-2 below and shown in Appendix G.

Monitoring Station ID	Name of Premises	Floor Level
ASR1	Sik Sik Yuen Ho Fung College	G/F
ASR3	Hong Hoi Chee Hong Temple	Podium
ASR8	Beach Tower (Long Beach Garden)	G/F
ASR9	Greenview Terrace (Block 1)	G/F

Table 3-2 Air Quality Monitoring Locations

Action and Limit Levels

3.1.9 The Action and Limit Levels for the 1-hour TSP monitoring are shown in Table 3-3. In case exceedances of Action and/or Limit levels for air quality occur, Event Contingency Plans (ECPs) would be implemented. The ECPs for Action and Limit levels exceedances are shown in Table 3-4.

Station	1-hour TSP Level in µg/m^3	
	Action Level	**Limit Level**
ASR 1	307	500
ASR 3	327	500
ASR 8	337	500
ASR 9	329	500

Table 3-3 Action & Limit Levels for Air Quality

EVENT	ACTION			
	ET	IEC	SOR	CONTRACTOR
ACTION LEVEL				
Exceedance for one sample	• Identify source, investigate the causes of exceedance and propose remedial measures; • Inform IEC and SOR; • Repeat measurement to confirm finding; • Increase monitoring frequency to daily.	• Check monitoring data submitted by ET; • Check Contractor's working method.	• Notify Contractor.	• Rectify any unacceptable practice; • Amend working methods if appropriate.
Exceedance for two or more consecutive samples	• Identify source; • Inform IEC and SOR; • Advise SOR on the effectiveness of the proposed remedial measures; • Repeat measurements to confirm findings; • Increase monitoring frequency to daily; • Discuss with IEC and Contractor on remedial actions required; • If exceedance continues, arrange meeting with IEC and SOR; • If exceedance stops, cease additional monitoring.	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss with ET and Contractor on possible remedial measures; • Advise the ET on the effectiveness of the proposed remedial measures; • Supervise Implementation of remedial measures.	• Confirm receipt of notification of exceedance in writing; • Notify Contractor; • Ensure remedial measures properly implemented.	• Submit proposals for remedial actions to SOR within 3 working days of notification; • Implement the agreed proposals; • Amend proposal if appropriate.
LIMIT LEVEL				
Exceedance for one sample	• Identify source, investigate the causes of exceedance and propose remedial measures;	• Check monitoring data submitted by ET; • Check Contractor's working method; • Discuss with ET and	• Confirm receipt of notification of exceedance in writing; • Notify Contractor; • Ensure remedial	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working

EVENT	ACTION			
	ET	IEC	SOR	CONTRACTOR
	• Inform IEC, SOR, Contractor and EPD; • Repeat measurement to confirm finding; • Increase monitoring frequency to daily; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SOR informed of the results.	Contractor on possible remedial measures; • Advise SOR on the effectiveness of the proposed remedial measures; • Supervise implementation of remedial measures.	measures properly implemented.	days of notification; • Implement the agreed proposals; • Amend proposal if appropriate.
Exceedance for two or more consecutive samples	• Notify IEC, SOR, Contractor and EPD; • Identify source; • Repeat measurement to confirm findings; • Increase monitoring frequency to daily; • Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented; • Arrange meeting with IEC and SOR to discuss the remedial actions to be taken; • Assess effectiveness of Contractor's remedial actions and keep IEC, EPD and SOR informed of the results; • If exceedance stops, cease additional monitoring.	• Discuss amongst SOR, ET, and Contractor on the potential remedial actions; • Review Contractor's remedial actions whenever necessary to assure their effectiveness and advise SOR accordingly; • Supervise the implementation of remedial measures.	• Confirm receipt of notification of exceedance in writing; • Notify Contractor; • In consultation with the IEC, agree with the Contractor on the remedial measures to be implemented; • Ensure remedial measures properly implemented; • If exceedance continues, consider what portion of the work is responsible and instruct the Contractor to stop that portion of work until the exceedance is abated.	• Take immediate action to avoid further exceedance; • Submit proposals for remedial actions to IEC within 3 working days of notification; • Implement the agreed proposals; • Resubmit proposals if problem still not under control; • Stop the relevant portion of works as determined by SOR until the exceedance is abated.

Table 3-4 Event/Action Plan for Air Quality

3.2 Noise

Noise Parameters

3.2.1 The construction noise level was measured in terms of equivalent A-weighted sound pressure level (L_{eq}) measured in decibels (dB(A)). Monitoring of $L_{eq(30\ min)}$ was carried out at the noise monitoring locations on a weekly basis during normal construction working hours (0700-1900 hours from Monday to Saturday except public holidays). For all other time periods (i.e. restricted hours), $L_{eq(5\ min)}$ would be employed for comparison with the Noise Control Ordinance (NCO) criteria if necessary.

3.2.2 The two statistical sound levels L_{10} and $L_{90,}$ the level exceeded for 10 and 90 percent of the time respectively, were also recorded during monitoring. Major noise sources observed, both on-site and off-site, were recorded on the field data sheet. All measurements were recorded and presented to the nearest 0.1 dB(A) in this report. Results are presented in Section 4.

Monitoring Methodology

3.2.3 Sound level meters, which comply with the International Electrotechnical Commission Publication 651:1979 (Type 1) and 804:1985 (Type 1) specifications as referred to the Technical Memorandum (TM) issued under the Noise Control Ordinance, were used. Noise levels for the A-weighted levels $L_{eq(30\ min)}$, L_{10} and L_{90} were measured throughout the impact monitoring. An average, by sound power, of six consecutive 5-minute readings was used to provide $L_{eq(30\ min)}$ for non-restricted hours (0700-1900 hours from Monday to Saturday except public holidays). A facade correction of 3 dB(A) was applied to the measurements that were carried out under free field conditions.

3.2.4 During the impact monitoring, parameters such as dates, weather condition, equipment used, measurement results and major noise sources were recorded on the field data record sheet. Monitoring would not be carried out in the presence of fog, rain or strong wind with a steady speed exceeding 5 m/s. In relation to the monitored noise levels, other noise sources such as road traffic might make a significant contribution to the overall noise environment. Therefore, noise monitoring activities would take into account such influencing factors, which were not present during the baseline monitoring period.

Monitoring Equipment and Calibration

3.2.5 Rion Precision Sound Level Meters of Type NL-31 and B&K Integrating Sound Level Meter of Type 2238 in compliance with the International Electrotechnical Commission Publication specifications (Paragraph 3.2.3) were used for noise monitoring in this reporting month.

3.2.6 Prior to and following each noise measurement, the accuracy of the sound level meters was checked using an acoustic calibrator generating a known sound pressure level at a known frequency. Measurements were considered as valid only if the calibration levels from before and after the noise measurement agreed to within 1.0 dB(A). Sound level meters and calibrators were calibrated annually to ensure they performed to the same level of accuracy as stated in the manufacturer's specifications. The noise monitoring

equipment used during the reporting month are shown in Table 3-5 below. The calibration certificates are included in Appendix F.

Equipment Type	Manufacturer	Type Number	Serial Number	Location
Sound Level Meter	Rion	NL-31	00410224	NSR1, NSR3, NSR6, NSR8 and NSR9
Sound Level Meter	B&K	2238	2448529	
Sound Level Calibrator	Rion	NC-73	10486660	
Sound Level Calibrator	B&K	4231	2699361	

Table 3-5 Noise Monitoring Equipment

Monitoring Location

3.2.7 Five designated noise monitoring locations were identified in the contract specific EM&A Manual. They are listed in Table 3-6 below and shown in Appendix G. All the locations below are in facade measurement.

Monitoring Station ID	Name of Premises	Floor Level
NSR1	Sik Sik Yuen Ho Fung College	G/F
NSR3	Hong Hoi Chee Hong Temple	Podium
NSR6	Squatters	G/F
NSR8	Beach Tower (Long Beach Garden)	G/F
NSR9	Greenview Terrace (Block 1)	Podium (up to 6 July 2009) Roof* (since 16 July 2009)

* The noise monitoring location of NSR9 had been adjusted to rooftop since 16 July 2009.

Table 3-6 Noise Monitoring Locations

Action and Limit Levels

3.2.8 The Action and Limit levels for construction noise are defined in Table 3-7. If non-compliance of the criteria occurs, actions in accordance with the Action Plan in Table 3-8 would be carried out.

Time Period	Action	Limit
0700 – 1900 hours on normal weekdays	When one documented complaint is received	75 dB(A)*

* For educational establishments the limit level shall be 70 dB(A) and reduced to 65 dB(A) during examination periods between 0700 and 1900 hours on normal weekdays.

Table 3-7 Action & Limit Levels for Air Borne Noise

Event	Action			
	ET Leader	IEC	SOR	Contractor
Action Level	• Notify IEC and the Contractor. • Carry out investigation. • Report the results of investigation to IEC and the Contractor. • Discuss with the Contractor and formulate remedial measures. • Increase monitoring frequency to check mitigation measures.	• Review with analysed results submitted by ET. • Review the proposed remedial measures by the Contractor and advise SOR accordingly. • Supervise the implementation of remedial measures.	• Confirm receipt of notification of exceedance in writing. • Notify the Contractor. • Require the Contractor to propose remedial measures for the analysed noise problem. • Ensure remedial measures are properly implemented.	• Submit noise mitigation proposals to IEC. • Implement noise mitigation proposals.
Limit Level	• Identify the source. • Notify IEC, SOR, EPD and the Contractor. • Repeat measurement to confirm findings. • Increase monitoring frequency. • Carry out analysis of Contractor's working procedures to determine possible mitigation to be implemented. • Inform IEC, SOR, and EPD the causes and actions taken for the exceedances. • Assess effectiveness of the Contractor's remedial actions and keep IEC, EPD and SOR informed of the results. • If exceedance stops, cease additional monitoring.	• Discuss amongst SOR, ET Leader and the Contractor on the potential remedial actions. • Review the Contractor's remedial actions whenever necessary to assure their effectiveness and advise SOR accordingly. • Supervise the implementation of remedial measures.	• Confirm receipt of notification of exceedance in writing. • Notify the Contractor. • Require the Contractor to propose remedial measures for the analysed noise problem. • Ensure remedial measures are properly implemented. • If exceedance continues, consider what activity of the work is responsible and instruct the Contractor to stop that activity of work until the exceedance is abated.	• Take immediate action to avoid further exceedance. • Submit proposals for remedial actions to IEC within 3 working days of notification. • Implement the agreed proposals. • Resubmit proposals if problem still not under control. • Stop the relevant activity of works as determined by the SOR until the exceedance is abated.

Table 3-8 Event/Action Plan for Airborne Noise

3.3 Water Quality

3.3.1 The water quality impact would be insignificant with the protection measures recommended in Section 5.6 of the EIA report. However, in view of the sensitive nature of the rivers / streams and bathing beaches near the Project site, it is suggested that a programme of monitoring should be established to confirm the effectiveness of these mitigation measures in protecting these water bodies.

Water Quality Parameters

3.3.2 Monitoring for dissolved oxygen (DO), temperature, turbidity, pH and suspended solids (SS) should be undertaken at designated monitoring locations. It should be noted that DO, temperature, turbidity and pH should be measured in-situ whereas SS is assayed in a laboratory.

3.3.3 In association with the water quality parameters, other relevant data should also be measured, such as monitoring location/position, time, weather conditions, and any special phenomena and description of work underway at the construction site etc.

Monitoring Methodology

3.3.4 In accordance with the EM&A Manual, the water quality monitoring for all specified parameters were measured at all designated monitoring locations including control points at an interval of 3 days per week. DO, temperature, turbidity, pH and SS measurements were undertaken at designated monitoring locations.

3.3.5 It should be noted that water samples for all monitoring parameters were collected, stored, preserved and analysed according to Standard Methods, APHA 17 ed. and/or methods agreed by the Director of Environmental Protection.

3.3.6 Each sample was analysed in accordance with the APHA Standard Methods for the Examination of Water and Wastewater, 18th edition, or an equivalent method approved by the EPD. In any circumstance, the sample testing should comply with a comprehensive quality assurance and quality control programme. The laboratory should be prepared to demonstrate the quality programmes to the EPD when requested.

Monitoring Equipment and Calibration

3.3.7 All the water samples collected were transferred to clearly labelled and pre-cleaned sample containers with necessary preservatives immediately after collection. The sample containers were provided by a HOKLAS accredited laboratory. About 1 L of samples was collected for all laboratory analysis. Following sampling, samples should be stored in a cool box at temperature between 0 and 4 ^{o}C, and transported to the laboratory within the sample retention time as advised by the laboratory under proper chain-of-custody system. The water quality monitoring equipment used during the reporting month is shown in Table 3-9 below.

Equipment Type	Manufacturer	Model	Quantity
DO / Temperature Meter / pH	YSI	Professional Plus	1
pH Meter	Hanna	HI-8014	1
Turbidimeter	Hanna	HI 98703-02	1

Table 3-9 Water Quality Monitoring Equipment

3.3.8 All in-situ monitoring equipment were checked and calibrated prior to use. They were calibrated by a laboratory accredited under HOKLAS or any other international accreditation scheme, and subsequently re-calibrated at 3 monthly intervals throughout all stages of the water quality monitoring. Responses of sensors and electrodes were checked with certified standard solutions before each use. Wet bulb calibrations for all DO meters were carried out before measurement at each monitoring location. For the on-site calibration of field equipment, BS 127:1993, "Guide to field and on-site test methods for the analysis of waters" was observed. The calibration certificates are included in Appendix F.

Monitoring Location

3.3.9 Five designated impact monitoring locations (three river stations and two marine stations) and five control locations (three river control stations and two marine control stations) were identified in the contract specific EM&A Manual for river and marine water quality monitoring. These monitoring stations are listed in Table 3-10 below and shown in Appendix G.

Monitoring Station ID	Name of Premises
River	
I-1	Intake I-1
I-1-C	Control of Intake I-1
I-2	Intake I-2
I-2-C	Control of Intake I-2
I-3	Intake I-3
I-3-C*	Control of Intake I-3
Marine	
O-1 (FT) and (ET)	Outfall O-1 during Flood Tide and Ebb Tide
O-1-C (FT)	Control of Outfall O-1 during Flood Tide
O-1-C (ET)	Control of Outfall O-1 during Ebb Tide

The upper stream location (I-3-C) had been relocated from end of February 2009 due to coarse stone blockage.

Table 3-10 Water Quality Monitoring Locations

3.3.10 Note that there were two control stations for Outfall O-1, one for sampling during flood tide and one for sampling during ebb tide. Only one of these control stations for Outfall

O-1 was sampled during each sampling. Control station to be sampled was determined based on the tidal information provided by the Hong Kong Observatory.

3.3.11 Referring to Section 4.4 of the approved Contract Specific EM&A Manual (Report No. EB000364R0273, dated 6 January 2010), while the construction of the Outfall requires minor dredging, water quality monitoring at the Outfall shall be undertaken during the period of the dredging works. As advised by the Contractor, all relevant marine works at Portion E of the site were completed in April 2012. As such, the ET submitted a proposal to EPD on 30 April 2012 to terminate the marine water quality monitoring effective from 1 May 2012. EPD had no objection to the proposal in their reply on 7 May 2012.

Action and Limit Levels

3.3.12 The Action and Limit levels for water quality monitoring parameters are defined in Table 3-11. In case of any exceedance, appropriate actions would be undertaken in accordance with the Event and Action Plan as described in Table 3-12.

Parameters	Action	Limit
DO in mg/L (Surface, Middle and Bottom)	Surface and Middle 5%-ile of baseline data for surface and middle layer. Bottom 5%-ile of baseline data for bottom layer.	Surface and Middle 4 mg/L except 5 mg/L for Fish Culture Zone or 1%-ile of baseline data for surface and middle layer Bottom 2 mg/L or 1%-ile of baseline data for bottom layer
SS in mg/L (depth-averaged)	95%-ile of baseline data or 120% of upstream control station's SS at the same tide of the same day	99%-ile of baseline or 130% of upstream control station's SS at the same tide of the same day and specific sensitive receiver water quality requirements (e.g. required suspended solids levels for concerned sea water intakes)
Turbidity (Tby) in NTU (depth-averaged)	95%-ile of baseline data or 120% of upstream control station's Tby at the same tide of the same day	99%-ile of baseline or 130% of upstream control station's Tby at the same tide of the same day

Notes:

- For DO, non-compliance of the water quality limits occurs when monitoring result is lower than the limit.
- For SS and Tby, non-compliance of the water quality limits occurs when monitoring result is higher than the limits.
- All the figures given in the table are used for reference only and the EPD may amend the figures whenever it is considered necessary.

Table 3-11 Action/Limit Levels for Water Quality

Event	ET Leader	IEC	SOR	Contractor
Action Level being exceeded by one sampling day	• Repeat in-situ measurement to confirm findings; • Identify source(s) of impact; • Inform IEC and Contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC and Contractor; and • Repeat measurement on next day of exceedance.	• Discuss with ET and Contractor on the mitigation measures; • Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; and • Assess the effectiveness of the implemented mitigation measures.	• Discuss with IEC on the proposed mitigation measures; and • Make agreement on the mitigation measures to be implemented.	• Inform the SOR and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; • Consider changes of working methods; • Discuss with ET and IEC and propose mitigation measures to IEC and SOR; and • Implement the agreed mitigation measures.
Action Level being exceeded by more than one consecutive sampling day	• Repeat in-situ measurement to confirm findings; • Identify source(s) of impact; • Inform IEC and Contractor; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC and Contractor; • Ensure mitigation measures are implemented; • Prepare to increase the monitoring frequency to daily; and • Repeat	• Discuss with ET and Contractor on the mitigation measures; • Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; and • Assess the effectiveness of the implemented mitigation measures.	• Discuss with IEC on the proposed mitigation measures; • Make agreement on the mitigation measures to be implemented; and • Assess the effectiveness of the implemented mitigation measures.	• Inform the Engineer and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; • Consider changes of working methods; • Discuss with ET and IEC and propose mitigation measures to IEC and SOR within 3 working days; and • Implement the agreed mitigation measures.

Event	ET Leader	IEC	SOR	Contractor
	measurement on next day of exceedance.			
Limit Level being exceeded by one sampling day	• Repeat in-situ measurement to confirm findings; • Identify source(s) of impact; • Inform IEC, Contractor and EPD; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with IEC, SOR and Contractor; • Ensure mitigation measures are implemented; and • Increase the monitoring frequency to daily until no exceedance of Limit level.	• Discuss with ET and Contractor on the mitigation measures; • Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; and • Assess the effectiveness of the implemented mitigation measures.	• Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods; • Make agreement on the mitigation measures to be implemented; and • Assess the effectiveness of the implemented mitigation measures.	• Inform the SOR and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; • Consider changes of working methods; • Discuss with ET, IEC and SOR and propose mitigation measures to IEC and SOR within 3 working days; and • Implement the agreed mitigation measures.
Limit Level being exceeded by more than one consecutive sampling day	• Repeat in-situ measurement to confirm findings; • Identify source(s) of impact; • Inform IEC, Contractor and EPD; • Check monitoring data, all plant, equipment and Contractor's working methods; • Discuss mitigation measures with	• Discuss with ET and Contractor on the mitigation measures; • Review proposals on mitigation measures submitted by Contractor and advise the SOR accordingly; and • Assess the effectiveness of the implemented mitigation	• Discuss with IEC, ET and Contractor on the proposed mitigation measures; • Request Contractor to critically review the working methods; • Make agreement on the mitigation measures to be implemented; • Assess the effectiveness of	• Inform the SOR and confirm notification of the non-compliance in writing; • Rectify unacceptable practice; • Check all plant and equipment; • Consider changes of working methods; • Discuss with ET, IEC and SOR and

Event	ET Leader	IEC	SOR	Contractor
	IEC, SOR and Contractor; • Ensure mitigation measures are implemented; and • Increase the monitoring frequency to daily until no exceedance of Limit level for two consecutive days.	measures.	the implemented mitigation measures; and • Consider and instruct, if necessary, the Contractor to slow down or to stop all or part of the marine work until no exceedance of Limit Level.	propose mitigation measures to IEC and SOR within 3 working days; • Implement the agreed mitigation measures; and • As directed by the SOR, to slow down or to stop all or part of the marine work or construction activities.

Table 3-12 Event/Action Plan for Water Quality

4 MONITORING RESULT

4.1 Air Quality

4.1.1 The air quality monitoring schedule of the reporting period is given in Appendix H.

1-hour TSP Monitoring

4.1.2 Results of 1-hour TSP level are shown in Table 4-1. All measurements were recorded and presented to the nearest 0.1 µg/m^3 in this report. Detailed results including weather conditions and graphical presentations are presented in Appendix I.

Station	Monitoring Date	Monitoring Result (µg/m^3)	Action/Limit Levels (µg/m^3)
ASR 1	5-Jun-13	93.4	307/500
		103.9	
		94.7	
	11-Jun-13	89.4	
		97.3	
		93.4	
	17-Jun-13	78.9	
		55.2	
		76.3	
	21-Jun-13	47.3	
		82.8	
		48.6	
	27-Jun-13	68.4	
		84.2	
		81.5	
ASR 3	5-Jun-13	37.7	327/500
		101.9	
		131.2	
	11-Jun-13	122.8	
		125.6	
		164.7	
	17-Jun-13	93.5	
		74.0	
		74.0	

Station	Monitoring Date	Monitoring Result ($\mu g/m^3$)	Action/Limit Levels ($\mu g/m^3$)
	21-Jun-13	55.8	
		131.2	
		62.8	
	27-Jun-13	108.9	
		67.0	
		48.9	
ASR 8	5-Jun-13	70.3	337/500
		103.3	
		107.5	
	11-Jun-13	125.4	
		113.0	
		53.7	
	17-Jun-13	66.1	
		70.3	
		95.1	
	21-Jun-13	106.1	
		86.8	
		106.1	
	27-Jun-13	40.0	
		122.6	
		150.2	
ASR 9	5-Jun-13	48.4	329/500
		106.5	
		112.0	
	11-Jun-13	114.8	
		134.1	
		78.8	
	17-Jun-13	77.4	
		80.2	
		84.4	
	21-Jun-13	125.8	
		63.6	
		77.4	
	27-Jun-13	135.5	

Station	Monitoring Date	Monitoring Result ($\mu g/m^3$)	Action/Limit Levels ($\mu g/m^3$)
		81.6	
		102.3	

Note: *Italic* indicates the occurrence of exceedance of *Action level*
Bold indicates the occurrence of exceedance of **Limit Level**

Table 4-1 Air Quality Monitoring Results

4.1.3 No project related air quality exceedance was recorded in the reporting month.

4.2 Noise

Air Borne Noise Monitoring

4.2.2 The air borne noise monitoring schedule of the reporting period is given in Appendix H. Results of measured noise level, in terms of $L_{eq\ (30min)}$, during the construction are shown in Table 4-2. All measurements including L_{10} and L_{90} are recorded and presented to the nearest 0.1 dB(A) in this report. Detailed results including weather conditions and graphical presentation are presented in Appendix I.

Station	Monitoring Date	$L_{eq\ (30\ min)}$ dB(A)	Limit Levels dB(A)
NSR 1	5-Jun-13	64.2	65*
	11-Jun-13	62.4	
	17-Jun-13	64.0	
	27-Jun-13	63.3	70
NSR 3	5-Jun-13	62.9	75
	11-Jun-13	64.1	
	17-Jun-13	59.3	
	27-Jun-13	62.7	
NSR 6	5-Jun-13	56.7	
	11-Jun-13	55.7	
	17-Jun-13	54.4	
	27-Jun-13	56.3	
NSR 8	5-Jun-13	64.4	
	11-Jun-13	63.5	
	17-Jun-13	64.1	
	27-Jun-13	64.0	
NSR 9	5-Jun-13	63.7	
	11-Jun-13	64.0	
	17-Jun-13	64.5	
	27-Jun-13	67.7	

Note : * The limit level of NSR 1 is 65 dB(A) during school examination period.

Table 4-2 Air Borne Noise Monitoring Results

4.2.3 No project related noise exceedance was recorded in the reporting month.

4.3 Water Quality Monitoring

4.3.1 The water quality monitoring schedule of the reporting period is given in Appendix H. Summaries of exceedances for water quality monitoring are provided in Table 4-3 to Table 4-5.

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Two records at I-1 on 15 June 2013 and 24 June 2013
SS	Two records at I-1 on 7 June 2013 and 28 June 2013	Two records at I-1 on 15 June 2013 and 24 June 2013
Total	2	4

Table 4-3 Summary of Exceedances for I-1

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Two records at I-2 on 15 June 2013 and 24 June 2013
SS	Nil	Three records at I-2 on 15 June 2013, 19 June 2013 and 24 June 2013
Total	0	5

Table 4-4 Summary of Exceedances for I-2

Parameter	Action Level Exceedance	Limit Level Exceedance
DO	Nil	Nil
Turbidity	Nil	Three records at I-3 on 15 June 2013, 24 June 2013 and 26 June 2013
SS	Nil	Two records at I-3 on 15 June 2013 and 24 June 2013
Total	0	5

Table 4-5 Summary of Exceedances for I-3

4.3.2 Results of measured water quality parameters during the reporting month are shown in Table 4-6. Detailed results including weather conditions and graphical presentations are enclosed in Appendix I.

4.3.3 Sixteen exceedances were recorded for the river water quality monitoring within the reporting month.

Exceedances of Turbidity Level

Limit Level at I-1 on 15 June 2013

4.3.4 One exceedance of turbidity limit level was recorded at I-1 on 15 June 2013. The measured turbidity level (21.05 NTU) was higher than the baseline limit level, but lower than the turbidity level (21.25 NTU) of the upstream control station (I-1-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 69 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 9:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-1 on 24 June 2013

4.3.5 One exceedance of turbidity limit level was recorded at I-1 on 24 June 2013. The measured turbidity level (27.45 NTU) was higher than the baseline limit level, but lower than 120% of the turbidity level (27.05 NTU) of the upstream control station (I-1-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-2 on 15 June 2013

4.3.6 One exceedance of turbidity limit level was recorded at I-2 on 15 June 2013. The measured turbidity level (22.55 NTU) was higher than the baseline limit level, but lower than 120% of the turbidity level (22.45 NTU) of the upstream control station (I-2-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 69 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 9:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-2 on 24 June 2013

4.3.7 One exceedance of turbidity limit level was recorded at I-2 on 24 June 2013. The measured turbidity level (22.15 NTU) was higher than the baseline limit level, but lower

than 120% of the turbidity level (22.05 NTU) of the upstream control station (I-2-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-3 on 15 June 2013

4.3.8 One exceedance of turbidity limit level was recorded at I-3 on 15 June 2013. The measured turbidity level (20.65 NTU) was higher than the baseline limit level, but lower than the turbidity level (20.85 NTU) of the upstream control station (I-3-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 58 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 8:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-3 on 24 June 2013

4.3.9 One exceedance of turbidity limit level was recorded at I-3 on 24 June 2013. The measured turbidity level (27.55 NTU) was higher than the baseline limit level, but lower than the turbidity level (27.95 NTU) of the upstream control station (I-3-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-3 on 26 June 2013

4.3.10 One exceedance of turbidity limit level was recorded at I-3 on 26 June 2013. The measured turbidity level (4.25 NTU) was higher than the baseline limit level, but lower than 120% of the turbidity level (4.14 NTU) of the upstream control station (I-3-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Therefore, the exceedance was considered to be contributed by natural variation. Since the exceedance was non-project related, no further action was required.

Exceedances of Suspended Solids Level

Action Level at I-1 on 7 June 2013

4.3.11 One exceedance of SS action level was recorded at I-1 on 7 June 2013. The measured SS level (9.85 mg/L) was higher than the baseline action level, but lower than the SS level (10.55 mg/L) of the upstream control station (I-1-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Therefore, the exceedance was considered to be contributed by natural variation. Since the exceedance was non-project related, no further action was required.

Limit Level at I-1 on 15 June 2013

4.3.12 One exceedance of SS limit level was recorded at I-1 on 15 June 2013. The measured SS level (10.40 mg/L) was higher than the baseline limit level, and lower than the SS level (14.05 mg/L) of the upstream control station (I-1-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 69 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 9:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high SS level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-1 on 24 June 2013

4.3.13 One exceedance of SS limit level was recorded at I-1 on 24 June 2013. The measured SS level (36.20 mg/L) was higher than the baseline limit level, but lower than 120% of the SS level (35.35 mg/L) of the upstream control station (I-1-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high SS level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-2 on 15 June 2013

4.3.14 One exceedance of SS limit level was recorded at I-2 on 15 June 2013. The measured SS level (19.20 mg/L) was higher than the baseline limit level, but lower than the SS level (21.95 mg/L) of the upstream control station (I-2-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 69 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 9:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high SS level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-2 on 19 June 2013

4.3.15 One exceedance of SS limit level was recorded at I-2 on 19 June 2013. The measured SS level (2.60 mg/L) was lower than the baseline limit level, but higher than 130% of the SS level (<2.00 mg/L) of the upstream control station (I-2-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Therefore, the exceedance was considered to be contributed by natural variation. Since the exceedance was non-project related, no further action was required.

Limit Level at I-2 on 24 June 2013

4.3.16 One exceedance of SS limit level was recorded at I-2 on 24 June 2013. The measured SS level (18.25 mg/L) was higher than the baseline limit level, but lower than 120% of the SS level (17.40 mg/L) of the upstream control station (I-2-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high SS level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-3 on 15 June 2013

4.3.17 One exceedance of SS limit level was recorded at I-3 on 15 June 2013. The measured SS level (13.50 mg/L) was higher than the baseline limit level, but lower than 120% of the SS level (9.85 mg/L) of the upstream control station (I-3-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 58 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 8:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.

Limit Level at I-3 on 24 June 2013

4.3.18 One exceedance of SS limit level was recorded at I-3 on 24 June 2013. The measured SS level (32.75 mg/L) was higher than the baseline limit level, but lower than the SS level (34.55 mg/L) of the upstream control station (I-3-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high SS level at upstream location. Since the exceedance was non-project related, no further action was required.

Action Level at I-1 on 28 June 2013

4.3.19 One exceedance of SS action level was recorded at I-1 on 28 June 2013. The measured SS level (2.75 mg/L) was lower than the baseline action level, but higher than 120% of the SS level (2.15 mg/L) of the upstream control station (I-1-C). Details of the construction activities conducted on the monitoring day are given in Appendix J. No direct disturbance was observed from the site. Therefore, the exceedance was considered to be contributed by natural variation. Since the exceedance was non-project related, no further action was required.

Station	Date	Temperature (°C)	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-1	3-Jun-13	27.70	8.71	3.42 / 3.34	7.80	4.89	9.75 / 12.47	4.80	8.85 / 10.17
	5-Jun-13	24.90	7.95		7.95	3.81		2.80	
	7-Jun-13	27.50	8.44		7.96	7.83		*9.85*	
	10-Jun-13	26.50	8.01		7.96	9.66		5.55	
	13-Jun-13	26.60	7.94		7.85	2.64		<2.00	
	15-Jun-13	25.50	7.97		7.95	**21.05**		**10.40**	
	17-Jun-13	26.80	8.68		7.91	2.96		<2.00	
	19-Jun-13	28.00	9.05		7.95	2.71		2.25	
	21-Jun-13	27.70	9.07		7.96	3.08		2.30	
	24-Jun-13	25.40	9.22		7.82	**27.45**		**36.20**	
	26-Jun-13	27.20	9.02		7.98	6.56		7.30	
	28-Jun-13	27.90	9.16		7.85	3.04		*2.75*	

Note: *Italic* indicates the occurrence of exceedance of *Action level*.
Bold indicates the occurrence of exceedance of **Limit level**.

Station	Date	Temperature (°C)	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-1-C	3-Jun-13	27.70	8.64	- / -	7.80	4.77	- / -	5.10	- / -
	5-Jun-13	24.90	7.88		7.95	3.82		2.65	
	7-Jun-13	27.50	8.52		7.96	7.69		10.55	
	10-Jun-13	26.50	7.92		7.96	9.89		5.20	
	13-Jun-13	26.60	7.86		7.85	2.68		<2.00	
	15-Jun-13	25.50	7.89		7.95	21.25		14.05	
	17-Jun-13	26.80	8.61		7.91	2.92		<2.00	
	19-Jun-13	28.00	9.14		7.95	2.80		2.15	
	21-Jun-13	27.70	9.17		7.96	3.14		2.30	
	24-Jun-13	25.40	9.17		7.82	27.05		35.35	
	26-Jun-13	27.20	8.92		7.98	6.85		6.55	
	28-Jun-13	27.90	9.08		7.85	3.07		2.15	

Note: *Italic* indicates the occurrence of exceedance of *Action level*.
Bold indicates the occurrence of exceedance of **Limit level**.

Station	Date	Temperature (°C)	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-2	3-Jun-13	27.80	8.56	3.66 / 3.63	7.82	1.33	6.63 / 6.99	<2.00	7.68 / 8.34
	5-Jun-13	24.90	7.77		7.91	2.17		2.25	
	7-Jun-13	27.60	8.31		7.95	1.38		<2.00	
	10-Jun-13	26.60	8.14		7.95	1.32		<2.00	
	13-Jun-13	26.60	7.92		7.86	1.20		2.00	
	15-Jun-13	25.40	7.79		7.96	**22.55**		**19.20**	
	17-Jun-13	26.60	8.54		7.90	1.63		<2.00	
	19-Jun-13	28.10	8.95		7.96	1.39		2.60	
	21-Jun-13	27.80	9.09		7.95	1.44		<2.00	
	24-Jun-13	25.50	9.17		7.80	**22.15**		**18.25**	
	26-Jun-13	27.30	9.08		7.96	2.36		2.15	
	28-Jun-13	27.70	8.95		7.80	1.43		<2.00	

Note: *Italic* indicates the occurrence of exceedance of *Action level*.
Bold indicates the occurrence of exceedance of **Limit level**.

Station	Date	Temperature (°C)	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-2-C	3-Jun-13	27.80	8.59	- / -	7.82	1.32	- / -	2.00	- / -
	5-Jun-13	24.90	7.83		7.91	2.29		<2.00	
	7-Jun-13	27.60	8.37		7.95	1.44		<2.00	
	10-Jun-13	26.60	8.11		7.95	1.28		<2.00	
	13-Jun-13	26.60	7.98		7.86	1.24		<2.00	
	15-Jun-13	25.40	7.85		7.96	22.45		21.95	
	17-Jun-13	26.60	8.51		7.90	1.70		<2.00	
	19-Jun-13	28.10	9.01		7.96	1.45		<2.00	
	21-Jun-13	27.80	8.99		7.95	1.52		<2.00	
	24-Jun-13	25.40	9.28		7.80	22.05		17.40	
	26-Jun-13	27.20	9.10		7.96	2.27		2.40	
	28-Jun-13	27.70	9.04		7.80	1.51		<2.00	

Note: *Italic* indicates the occurrence of exceedance of *Action level*.
Bold indicates the occurrence of exceedance of **Limit level**.

Station	Date	Temperature (°C)	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-3	3-Jun-13	27.90	8.46	3.65 / 3.51	7.82	2.06	3.99 / 4.18	<2.00	6.13 / 7.23
	5-Jun-13	24.80	7.98		7.89	3.38		<2.00	
	7-Jun-13	27.70	8.50		7.95	2.06		<2.00	
	10-Jun-13	26.70	8.00		7.90	3.60		2.40	
	13-Jun-13	26.50	8.04		7.80	1.83		<2.00	
	15-Jun-13	25.40	7.80		7.97	**20.65**		**13.50**	
	17-Jun-13	26.50	8.49		7.88	2.23		<2.00	
	19-Jun-13	28.10	8.90		7.90	1.73		<2.00	
	21-Jun-13	27.80	9.19		7.91	1.74		<2.00	
	24-Jun-13	25.50	9.02		7.86	**27.55**		**32.75**	
	26-Jun-13	27.40	8.94		7.90	**4.25**		2.50	
	28-Jun-13	27.70	8.85		7.81	2.42		<2.00	

Note: *Italic* indicates the occurrence of exceedance of *Action level*.
Bold indicates the occurrence of exceedance of **Limit level**.

Station	Date	Temperature (°C)	DO (mg/L)	Action/Limit Level for DO (mg/L)	pH	Turbidity (NTU)	Action/Limit Level for Turbidity (NTU)	SS (mg/L)	Action/Limit Level for SS (mg/L)
I-3-C	3-Jun-13	27.90	8.51	- / -	7.82	2.12	- / -	<2.00	- / -
	5-Jun-13	24.80	7.91		7.89	3.45		2.05	
	7-Jun-13	27.70	8.39		7.95	2.15		<2.00	
	10-Jun-13	26.70	8.05		7.90	3.66		2.90	
	13-Jun-13	26.50	7.98		7.80	1.88		<2.00	
	15-Jun-13	25.40	7.74		7.97	20.85		9.85	
	17-Jun-13	26.50	8.43		7.88	2.17		<2.00	
	19-Jun-13	28.10	8.99		7.90	1.78		<2.00	
	21-Jun-13	27.80	9.22		7.91	1.78		<2.00	
	24-Jun-13	25.50	9.08		7.86	27.95		34.55	
	26-Jun-13	27.40	8.85		7.91	4.14		2.35	
	28-Jun-13	27.70	8.92		7.81	2.57		<2.00	

Note: *Italic* indicates the occurrence of exceedance of *Action level*. **Bold** indicates the occurrence of exceedance of **Limit level**

Table 4-6 Water Quality Monitoring Result

4.4 Summary of Project-Related Exceedances

4.4.1 Table 4-7 summarises the project-related exceedance results recorded in June 2013. Note that exceedances that are considered not related to the construction activities are not included in this table.

Environmental Monitoring	Total No. of Measurement	Action Level Exceedance	% of Action Level Exceedance	Limit Level Exceedance	% of Limit Level Exceedance
Air Quality	60	0	0	0	0
Air Borne Noise	20	0	0	0	0
Water	72	0	0	0	0

Note: Exceedances that are considered not related to the construction activities are not included in this table.

Table 4-7 Summary of Project-Related Exceedances

5 WASTE MANAGEMENT

5.1.1 The status of waste management is summarised in Table 5-1.

Status of waste management	Quantity
Inert C&D Material Disposed to Public Fill at Tuen Mun (m^3)	718.0
Inert C&D Material Reused in this Contract (m^3)	0
Inert C&D Material Reused in other Contract(s) (m^3)	0
Metals Generated (kg)	0
Paper / Cardboard Packaging (kg)	0
Plastics (kg)	0
Chemical Waste (kg)	0
General Waste Disposed of to NENT Landfill (m^3)	35.1

Table 5-1 Waste Generated in June 2013

6 NON-COMPLIANCE AND DEFICIENCY

6.1 Site Audit by ET

6.1.1 ET has carried out two site inspections in the reporting month. All observations together with the appropriate recommended mitigation measures where necessary were recorded in the audit checklists that were passed to the Contractor. Major environmental deficiencies observed during site inspections / audits and recommendation, which were made by the ET, are summarised in Table 6-1 below. No non-compliance was observed.

Inspection Date	Observation	Recommendation	Status
6 June 2013	1) Discharge water of wastewater treatment plant was not in good condition at Intake-3. 2) Chemical should be placed on drip tray to prevent leakage at I-2. 3) Stagnant water was found at the pit for fencing footing at intake I-1.	1) The contractor was reminded to improve the condition of wastewater discharged from the treatment plant at I-3. 2) Chemical drums or containers should be placed on drip tray(s). 3) The contractor was reminded to clean up the stagnant water regularly.	1) The wastewater from the treatment plant at Intake-3 was improved to good condition on 7 June 2013. 2) Chemical drums or containers at Intake-2 were placed on a drip tray on 7 June 2013. 3) The stagnant water at Intake-1 was cleaned up on 8 June 2013.
20 June 2013	Breaker tip was not wrapped with acoustic material at Outfall.	Breaker tip should be properly wrapped with acoustic material.	Breaker tip was wrapped with acoustic material properly on 20 June 2013.

Table 6-1 Site Inspections by ET

7 COMPLAINT

7.1.1 A complaint hotline at **9850 3241** of the Contractor has been established for the Project.

7.1.2 No environmental complaint was received during the reporting month.

7.1.3 Details of the past complaint investigation and observations can also be referred to Appendix K.

7.1.4 Cumulative statistics of environmental complaints are shown in Table 7-1.

Complaints Received in the Reporting Month	Cumulative Number of Complaints
0	27

Table 7-1 Cumulative Statistics of Environmental Complaints

8 SUMMARY OF NOTIFICATION OF SUMMONS, SUCCESSFUL PROSECUTIONS AND CORRECTIVE ACTIONS

8.1.1 No summons and successful prosecution was received during the reporting month.

8.1.2 Cumulative statistics of notification of summons, successful prosecutions and convictions are shown in Table 8-1.

Notification of Summons		Successful Prosecution and Conviction	
June 2013	Cumulative	June 2013	Cumulative
0	0	0	0

Table 8-1 Cumulative Statistics of Notification of Summons and Successful Prosecutions and Convictions

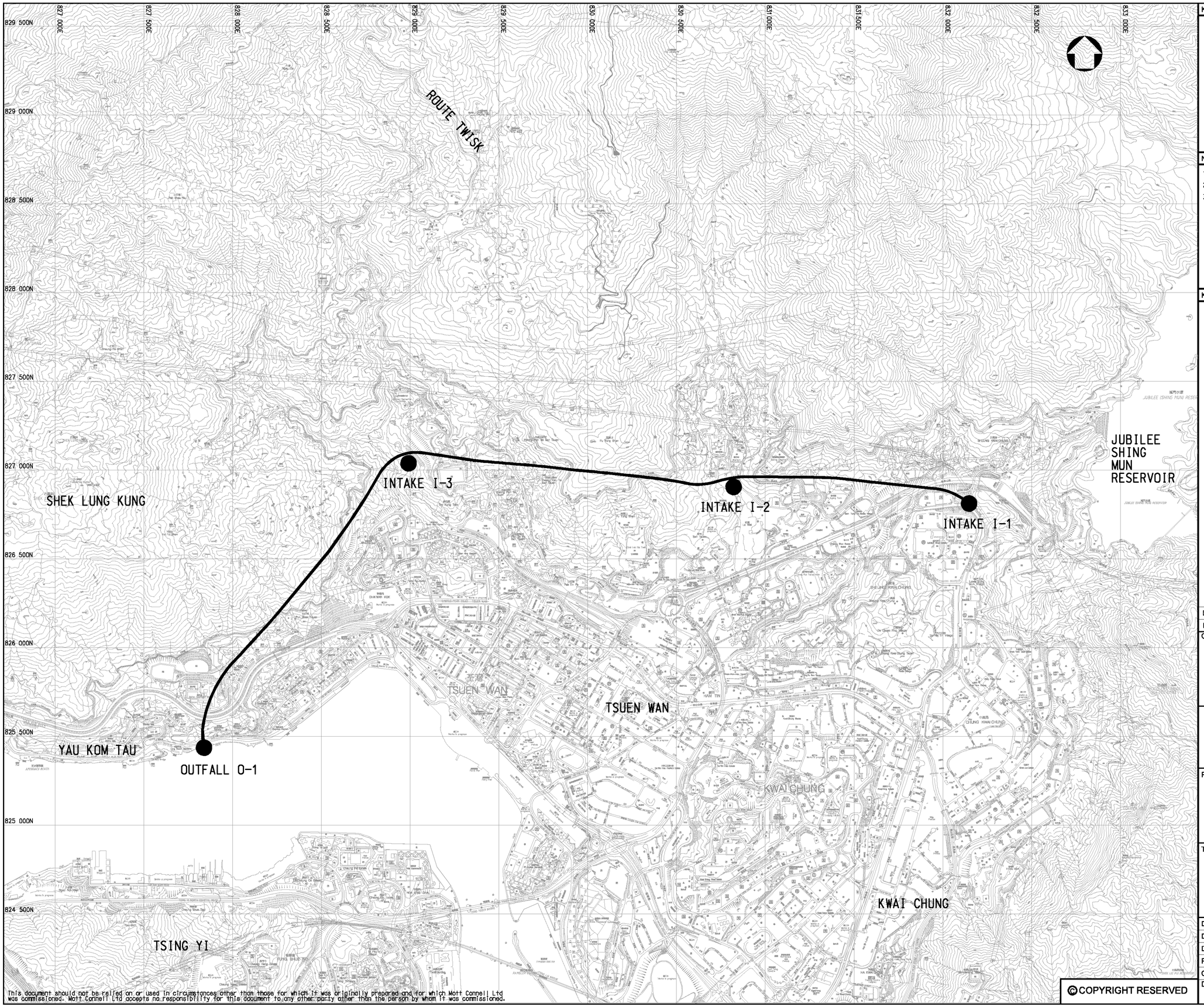
9 FUTURE KEY ISSUE

9.1.1 The forecast of construction works for the upcoming three months are:

- Site cleaning and tidying at Outfall, I-1, I-2 and I-3;
- Construction of RC structures of pump room at Outfall;
- Slope reinstatement works at Outfall;
- Finishing works for spiral ramp at Outfall;
- Construction of surface drainage at Outfall;
- Installation of GRP panels of spiral ramp at Outfall;
- Landscape works at Outfall;
- Footpath reinstatement work at Outfall;
- Installation of additional irrigation system at Outfall;
- Construction of permanent access road and associated drainage at I-3;
- Installation of stone facing for vortex shaft at I-3;
- Landscape works at I-3;
- Construction of access platform and associated drainage next to man access shaft at I-2; and
- Installation of vortex shaft opening steel cover and security fencing at I-2.

Appendix A

Site Map and Works Area



Key Plan:

Notes:

1. CO-ORDINATES REFER TO HONG KONG METRIC GRID (1980).
2. ALL LEVELS ARE IN METRES ABOVE PRINCIPAL DATUM (P.D.).
3. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS OTHERWISE STATED.

Key to symbols

LEGENDS :

TUNNEL ALIGNMENT

INTAKE/OUTFALL STRUCTURES

Rev	Date	Drawn	Description	Ch'k'd	App'd
B1	MAR 05	EL	FOR EM&A MANUAL	MT	

Client

The Government of the Hong Kong Special Administrative Region
Drainage Services Department

Consulting Engineers

Mott Connell Ltd.

in Association with

MVA Hong Kong Ltd
WL/Delft Hydraulics Ltd
EDAW Earth Asia Ltd
Chesterton Petty Ltd
Environmental Resources Management

Project

Drainage Improvement in Tsuen Wan and Kwai Chung - Tsuen Wan Drainage Tunnel - Investigation

Title

TUNNEL ALIGNMENT AND SURROUNDING AREA

Designed	CF		Eng.Chk.	MT	
Drawn	HL	HL	Approved	TMC	
Dwg.Chk.	KN		Scale		
Project	204417				Status
CAD file	J:\204417\DRAWING\FIGURE EM&A MANUAL\FIGURE1.1.dgn				
Drawing No.	FIGURE 1.1				Rev 01

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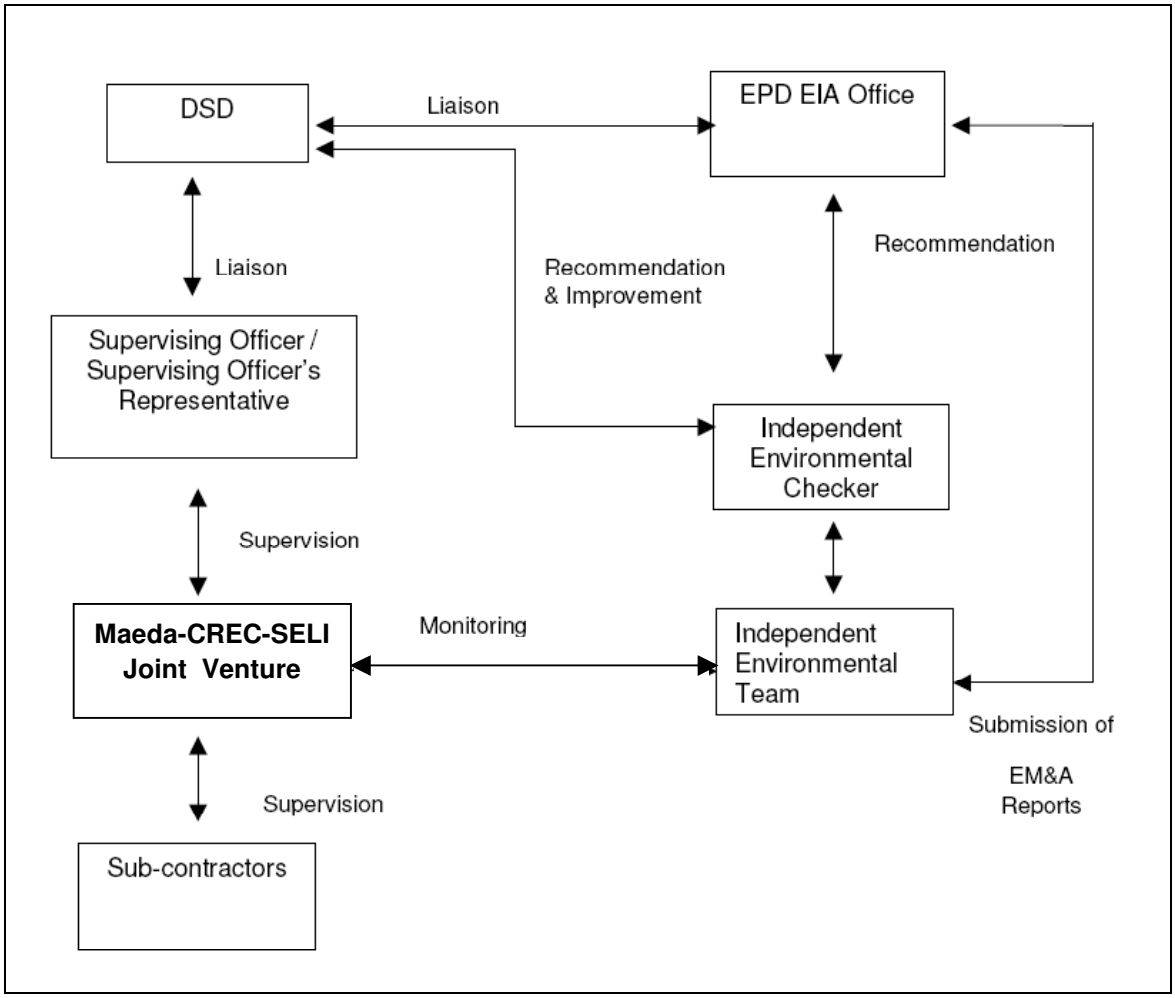
Appendix B

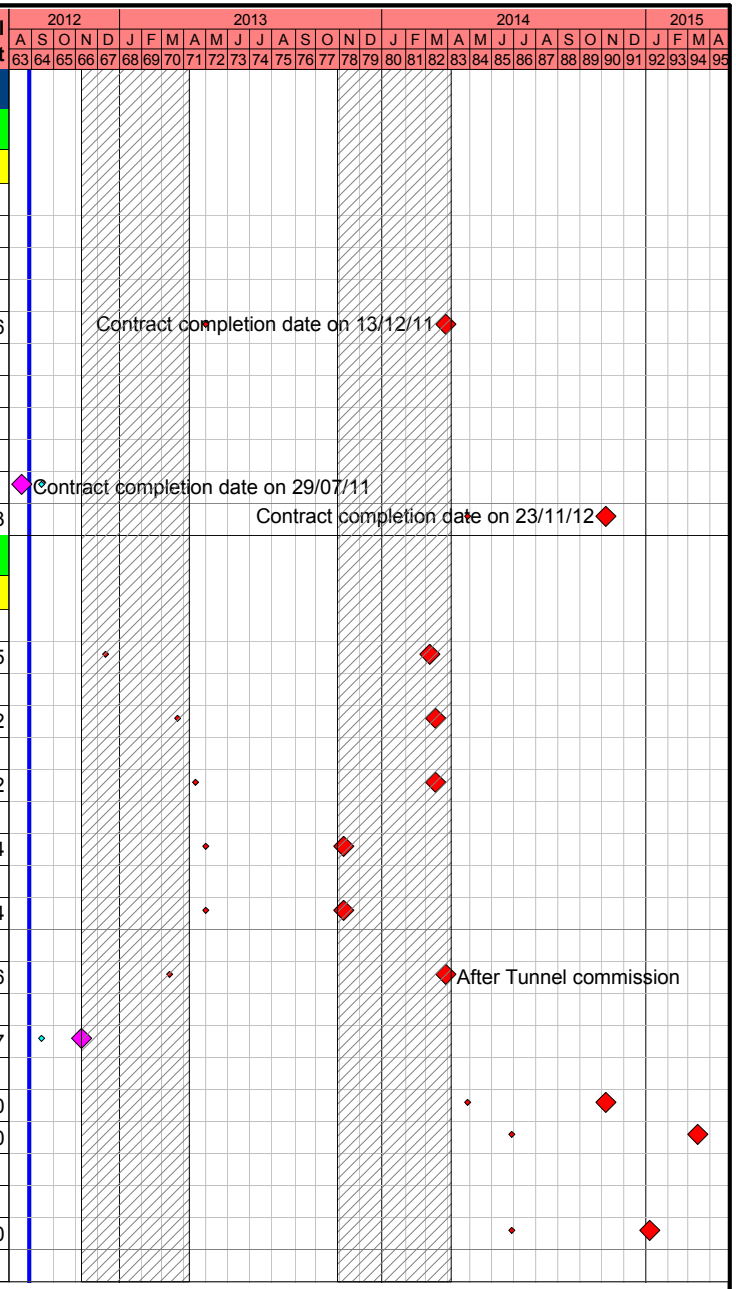
Organization Chart


DSD
Liaison
EPD EIA Office
Liaison
Recommendation
& Improvement
Recommendation
Supervising Officer /
Supervising Officer's
Representative
Independent
Environmental
Checker
Supervision
Maeda-CREC-SELI
Joint Venture
Monitoring
Independent
Environmental
Team
Submission of
EM&A
Reports
Supervision
Sub-contractors

Appendix C

Construction Programme

ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Preliminaries									
Project Dates									
01R0000002	Tender Issue Date	0	0	26JUN07A		100	26JUN07A		
01R0000004	Tender Closing Date	0	0	05OCT07A		100	05OCT07A		
01R0000006	Letter of Acceptance Issued Date	0	0	14DEC07A		100	14DEC07A		
01R0000008	Contract Commencement Date	0	0	28DEC07A		100	28DEC07A		
01R0000010	Completion of Section 1 of the Works	0	0		28MAR14	0		29APR13	-836
01R0000012	Completion of Section 2 of the Works	0	0		06SEP11A	100		06SEP11A	
01R0000014	Completion of Section 3 of the Works	0	0		03AUG11A	100		03AUG11A	
01R0000016	Completion of Section 4 of the Works	0	0		11AUG11A	100		11AUG11A	
01R0000018	Completion of Section 5 of the Works	0	0		19SEP11A	100		19SEP11A	
01R0000020	Completion of Section 6 of the Works	0	0		16AUG12A	100		14SEP12	
01R0000022	Completion of Section 7 of the Works	0	0		06NOV14	0		29APR14	-713
Possession of Area									
01R00A0102	Possession Portion A - 90d of DOC	0	0	27FEB08A		100	27FEB08A		
01R00A0104	Handover of Portion A	0	0		07MAR14	0		12DEC12	-815
01R00B0102	Possession of Portion B - 90d of DOC	0	0	07MAR08A		100	07MAR08A		
01R00B0104	Handover of Portion B	0	0		14MAR14	0		22MAR13	-822
01R00C0102	Possession of Portion C - 90d of DOC	0	0	26MAR08A		100	26MAR08A		
01R00C0104	Handover of Portion C	0	0		14MAR14	0		16APR13	-822
01R00D0102	Possession of Portion D on DOC	0	0	28DEC07A		100	28DEC07A		
01R00D0104	Handover of Portion D	0	0		06NOV13	0		29APR13	-694
01R00E0102	Possession of Portion E - 650d of DOC	0	0	09JUL09A		100	09JUL09A		
01R00E0104	Handover of Portion E	0	0		06NOV13	0		29APR13	-694
01R00F0102	Possession of Portion F on DOC	0	0	28DEC07A		100	28DEC07A		
01R00F0104	Handover of Portion F	0	0		28MAR14	0		09MAR13	-836
01R00G0102	Possession of Portion G - 700d of DOC	0	0	26NOV09A		100	26NOV09A		
01R00G0104	Handover of Portion G	0	0		07NOV12	0		14SEP12	857
01R00I0102	Possession of Portion I on DOC	0	0	28DEC07A		100	28DEC07A		
01R00I0104	Handover of Portion I	0	0		06NOV14	0		29APR14	0
01R00J0102	Possession of Portion J	0	0	15MAR15		0	29JUN14		0
01R00J0104	Handover of Portion J	0	0		23NOV11A	100		23NOV11A	
01R0H10102	Possession of Portion H1 on DOC	0	0	28DEC07A		100	28DEC07A		
01R0H10104	Handover of Portion H1	0	0		05JAN15	0		28JUN14	0
01R0H20102	Possession of Portion H2 - 300d of DOC	0	0	04NOV08A		100	04NOV08A		



Start Date 29JUN07
Finish Date 14MAR15
Data Date 28AUG12
Run Date 19SEP12 11:47

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Early Bar
Target Bar
Progress Bar
Critical Activity

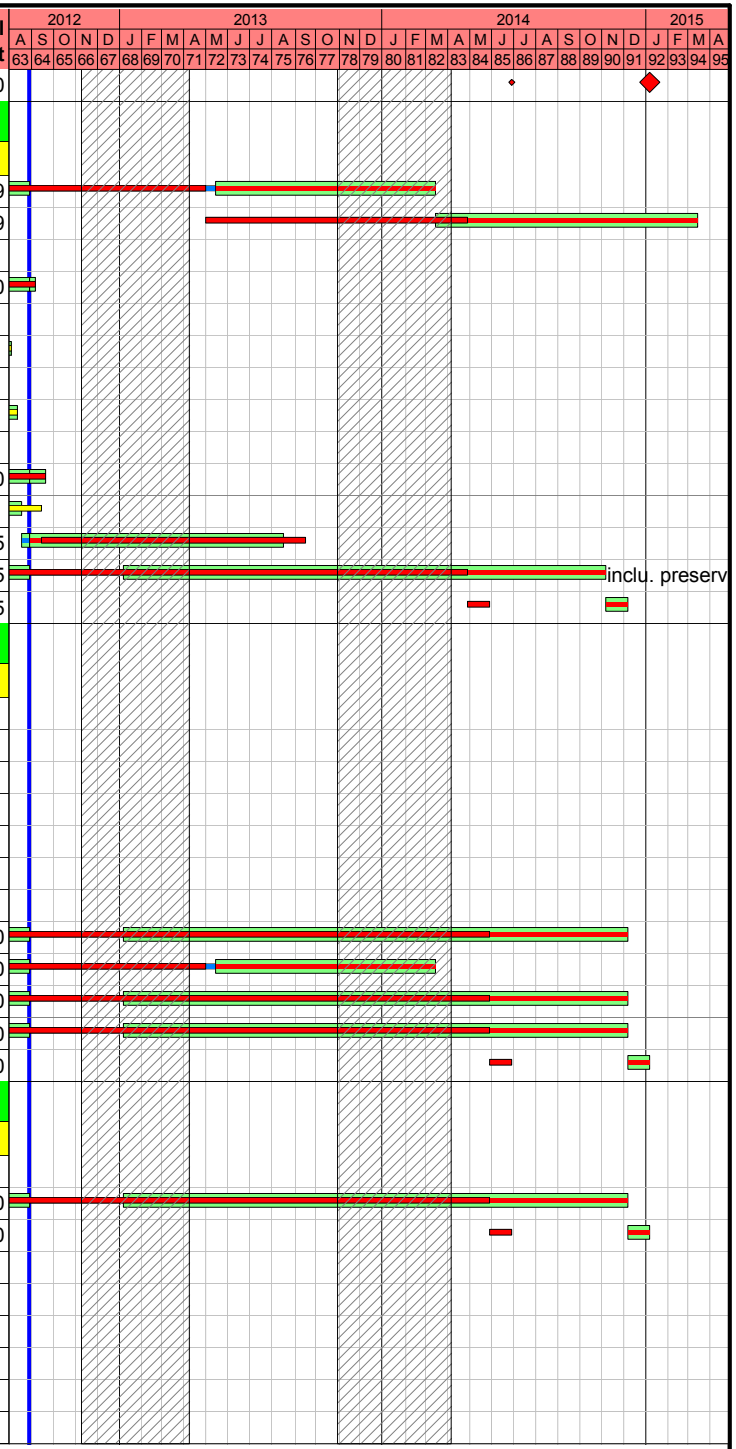
WP10

Maeda-CREC-SELI JV
CONTRACT NO. DC/2007/12
Design and Construction of Tsuen Wan Drainage Tunnel Works Programme

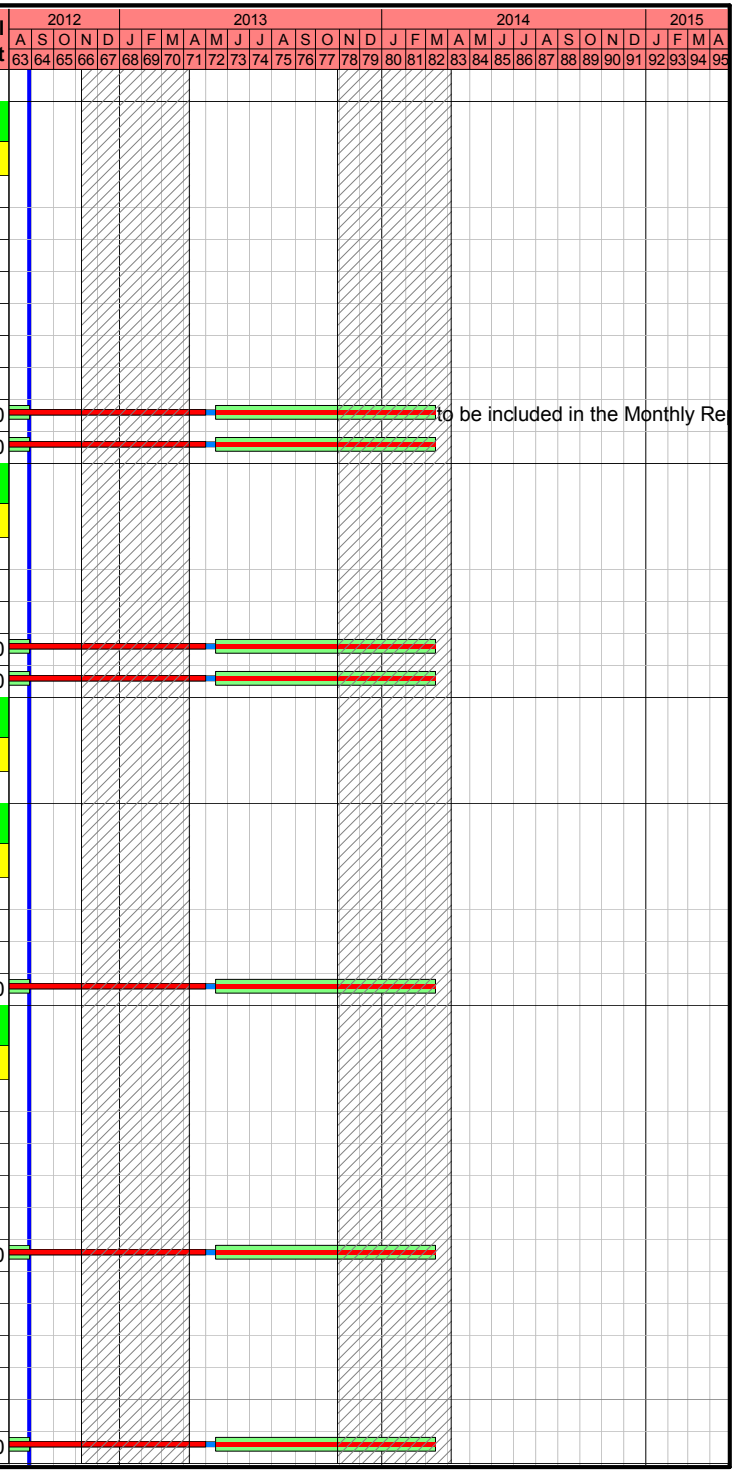
WP10

Date	Revision	Checked	Approved
05SEP11	WP8A		
09MAR12	WP09		
13SEP12	WP10		

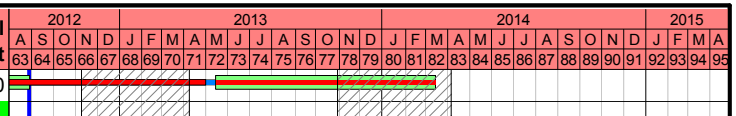
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
01R0H20104	Handover of Portion H2	0	0		05JAN15	0		28JUN14	0
Section of Works - DOP to Completion									
01R1000202	S1-Works in Portions A to F except works in S2-7	1,950	1,950	28DEC07A	14MAR14	84	28DEC07A	29APR13	-839
01R1000204	S1-Maintenance Period (365 days)	365	365	15MAR14	14MAR15	0	30APR13	29APR14	-839
01R20A0206	S2-Slope Stabilization works within Portion A	1,288	1,288	27FEB08A	06SEP11A	100	27FEB08A	06SEP11A	
01R20A0208	S2-Maintenance Period (365 days)	365	365	07SEP11A	05SEP12	98	07SEP11A	05SEP12	0
01R30B0210	S3-Slope Stabilization works within Portion B	1,245	1,245	07MAR08A	03AUG11A	100	07MAR08A	03AUG11A	
01R30B0212	S3-Maintenance Period (365 days)	365	365	04AUG11A	02AUG12A	100	04AUG11A	02AUG12	
01R40C0214	S4-Slope Stabilization works within Portion C	1,234	1,234	26MAR08A	11AUG11A	100	26MAR08A	11AUG11A	
01R40C0216	S4-Maintenance Period (365 days)	365	365	12AUG11A	10AUG12A	100	12AUG11A	10AUG12	
01R50D0218	S5-Slope Stabilization works within Portion D	1,308	1,308	28DEC07A	19SEP11A	100	28DEC07A	19SEP11A	
01R50D0220	S5-Maintenance Period (365 days)	365	365	20SEP11A	18SEP12	94	20SEP11A	18SEP12	0
01R60G0222	S6-Works within Portion G	1,023	1,023	27NOV09A	16AUG12A	100	27NOV09A	14SEP12	
01R60G0224	S6-Maintenance Period (365 days)	365	365	17AUG12A	16AUG13	3	15SEP12	14SEP13	-385
01R7000226	S7-Ladscape softworks & establishment works	2,315	2,315	28DEC07A	06NOV14	71	28DEC07A	29APR14	-745
01R7000228	S7-Maintenance Period (30 days)	30	30	07NOV14	06DEC14	0	30APR14	29MAY14	-745
Facilities for the SO as per ER 12									
01R0000302	Provide temporary accommodation	7	7	28DEC07A	15JAN08A	100	28DEC07A	15JAN08A	
01R0000304	Design the SO's principle office	95	95	28DEC07A	28AUG08A	100	28DEC07A	28AUG08A	
01R0000305	Erect Hoarding/Signboard/Gate/Fencing	35	35	28MAR08A	16MAR09A	100	28MAR08A	16MAR09A	
01R0000306	Erect SO's principle office in Portion H1/H2	100	100	19MAY08A	13SEP08A	100	19MAY08A	13SEP08A	
01R0000308	Provide secondary offices, directed by SO	64	64	14SEP08A	13JUN09A	100	14SEP08A	13JUN09A	
01R0000310	Provide transport for the SO as per App. ER,M	90	90	28DEC07A	02MAY08A	100	28DEC07A	02MAY08A	
01R0000311	Provide survey equipments as per App. ER,M	30	30	28DEC07A	19AUG08A	100	28DEC07A	19AUG08A	
01R0000314	Maintain & Service the Principle Office	2,084	2,084	14SEP08A	06DEC14	66	14SEP08A	29MAY14	0
01R0000316	Maintain & service the Secondary Office	1,645	1,645	28OCT08A	14MAR14	81	28OCT08A	29APR13	0
01R0000318	Maintain & Service the transportation	2,330	2,330	12JAN08A	06DEC14	70	12JAN08A	29MAY14	0
01R0000319	Maintain & Service the survey equipments	2,293	2,293	18FEB08A	06DEC14	69	18FEB08A	29MAY14	0
01R0000372	Demolish & removal of Principle Office	30	30	07DEC14	05JAN15	0	30MAY14	28JUN14	0
Contractor's Accommodation as per ER.B									
01R0001402	Design Contractor's main office	30	30	01FEB08A	19MAY08A	100	01FEB08A	19MAY08A	
01R0001406	Maintain & service Contractor's office	2,142	2,142	18JUL08A	06DEC14	67	18JUL08A	29MAY14	0
01R0001408	Demolish & removal of Contractor's main office	30	30	07DEC14	05JAN15	0	30MAY14	28JUN14	0
01R000141	Erect Contractor's main office in Portion H1	50*	50*	19MAY08A	17JUL08A	100	19MAY08A	17JUL08A	
01R0001412	Construct base slab	10	10	19MAY08A	30MAY08A	100	19MAY08A	30MAY08A	
01R0001413	Install steel frames	12	12	31MAY08A	21JUN08A	100	31MAY08A	21JUN08A	
01R0001414	Install wall/roof panels, windows etc	6	6	23JUN08A	30JUN08A	100	23JUN08A	30JUN08A	
01R0001415	Install & E& M/ceiling/floor panels	8	8	02JUL08A	12JUL08A	100	02JUL08A	12JUL08A	
01R0001416	Site clearance	1	1	14JUL08A	17JUL08A	100	14JUL08A	17JUL08A	



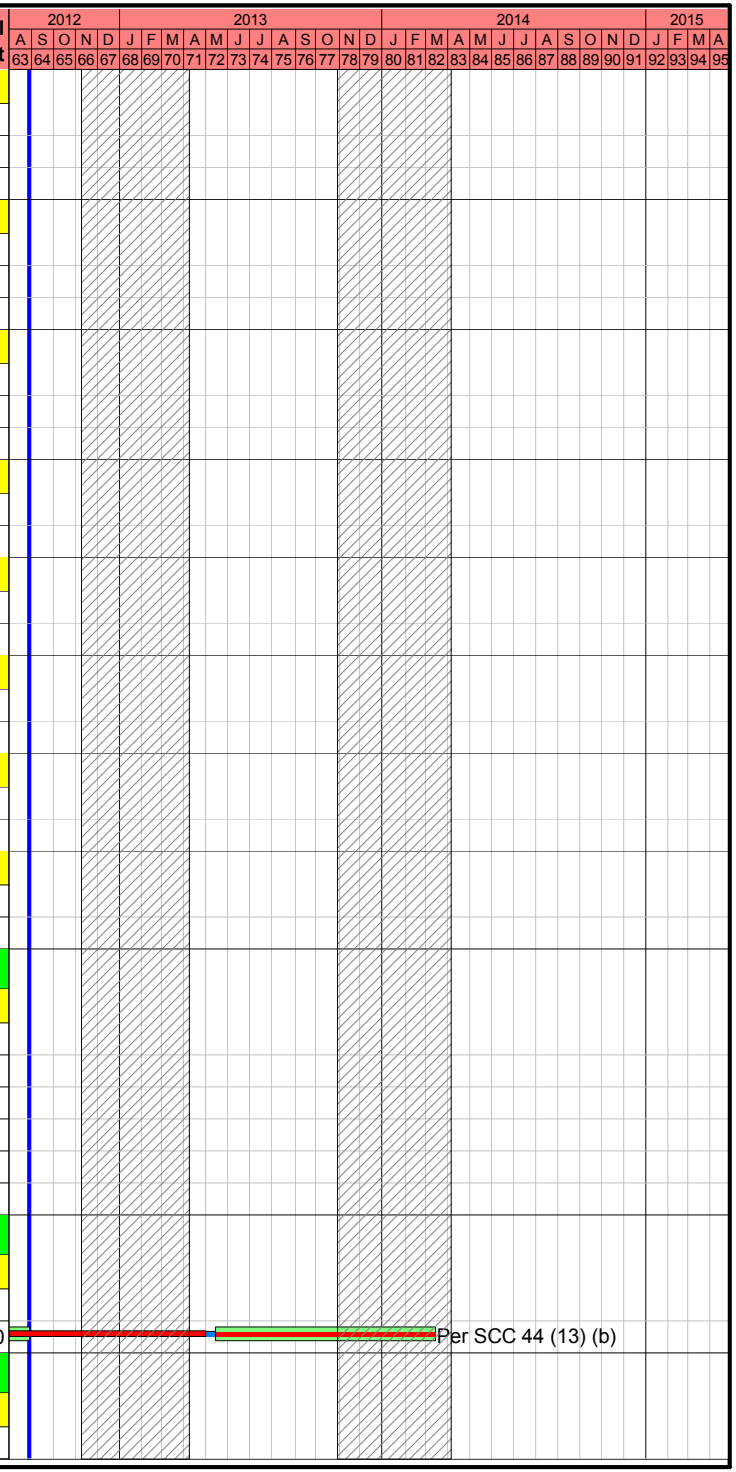
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
01R0001417	Install furnitures/internet & move in	2	2	14JUL08A	17JUL08A	100	14JUL08A	17JUL08A	
Works Programme & Monthly Report as per SCC 27									
01R0000502	Prepare/Submit draft Works Programme	7	7	14DEC07A	21DEC07A	100	14DEC07A	21DEC07A	
01R0000504	SO's review/comment on draft Works Programme	14	14	22DEC07A	23JAN08A	100	22DEC07A	23JAN08A	
01R0000505	Prepare/Submit draft Works Programme Rev. 1	28	28	24JAN08A	15FEB08A	100	24JAN08A	15FEB08A	
01R0000506	Prepare/Submit 1st 3-Month Rolling Programme	14	14	14DEC07A	03JAN08A	100	14DEC07A	03JAN08A	
01R0000507	SO's approval on draft Works Programme	14	14	16FEB08A	28MAR08A	100	16FEB08A	28MAR08A	
01R0000508	Submit Revised Works Programme	14	14	28AUG08A	30SEP08A	100	28AUG08A	30SEP08A	
01R0000510	SO's Approval of Revised Works Programme	14	14	02OCT08A	28FEB09A	100	02OCT08A	28FEB09A	
01R0000512	Monthly update program	1,929	1,929	18JAN08A	14MAR14	84	18JAN08A	29APR13	0
01R0000514	Contractor's Monthly Progress Report	1,925	1,925	22JAN08A	14MAR14	84	22JAN08A	29APR13	0
Safety Plan as per SCC 35									
01R0000602	Submit draft Safety Plan	14	14	14DEC07A	29DEC07A	100	14DEC07A	29DEC07A	
01R0000604	Hold an ad hoc meeting with RE on Safety Plan	7	7	31DEC07A	09JAN08A	100	31DEC07A	09JAN08A	
01R0000606	Submit 6 copies of the Safety Plan	35	35	14DEC07A	26FEB08A	100	14DEC07A	26FEB08A	
01R0000608	Submit updated safety orgainiza. chart monthly	1,867	1,867	20MAR08A	14MAR14	84	20MAR08A	29APR13	0
17R0000602	Fulfill all relevant safety obligation	1,950	1,950	28DEC07A	14MAR14	84	28DEC07A	29APR13	0
Contractor's All Insurances									
01R0000704	Submit documents for all insurances are effected	21	21	14DEC07A	02SEP08A	100	14DEC07A	02SEP08A	
Quality System as per ER 9.3									
01R0000802	Appoint a Quality Manager	14	14	28DEC07A	02JAN08A	100	28DEC07A	02JAN08A	
01R0000804	Submit proposed Quality System for SO's consent	28	28	14DEC07A	22JAN08A	100	14DEC07A	22JAN08A	
01R0000806	Submit QSSP for approval of the SO	28	28	28DEC07A	14MAR08A	100	28DEC07A	14MAR08A	
01R0000808	Maintain & update Quality System	1,922	1,922	25JAN08A	14MAR14	84	25JAN08A	29APR13	0
Environment									
01R0000902	Nominate Environmental Officer	14	14	14DEC07A	21DEC07A	100	14DEC07A	21DEC07A	
01R0000903	Establish a billing account for disposal	21	21	14DEC07A	02JAN08A	100	14DEC07A	02JAN08A	
01R0000904	Submit draft EMP	21	21	14DEC07A	02JAN08A	100	14DEC07A	02JAN08A	
01R0000906	Revise draft EMP within 7 days of SO's notice	14	14	04JAN08A	21FEB08A	100	04JAN08A	21FEB08A	
01R0000908	Submit final version of EMP	45	45	14DEC07A	21FEB08A	100	14DEC07A	21FEB08A	
01R0000910	Review/update/submit EMP monthly	1,919	1,919	28JAN08A	14MAR14	84	28JAN08A	29APR13	0
01R0000912	Employ IET	21	21	14DEC07A	02JAN08A	100	14DEC07A	02JAN08A	
01R0000914	Submit Baseline Monitoring Plan	21	21	28DEC07A	18JAN08A	100	28DEC07A	18JAN08A	
01R0000915	Seek for EPD's Agreement on WQML & schedule	21	21	18JAN08A	31JAN08A	100	18JAN08A	31JAN08A	
01R0000916	Carry out baseline monitoring	37	37	11FEB08A	20MAR08A	100	11FEB08A	20MAR08A	
01R0000918	Prepare/submit reports for baseline monitoring	20	20	21MAR08A	28MAR08A	100	21MAR08A	28MAR08A	
01R0000920	Impact monitoring & reporting	1,855	1,855	01APR08A	14MAR14	84	01APR08A	29APR13	0



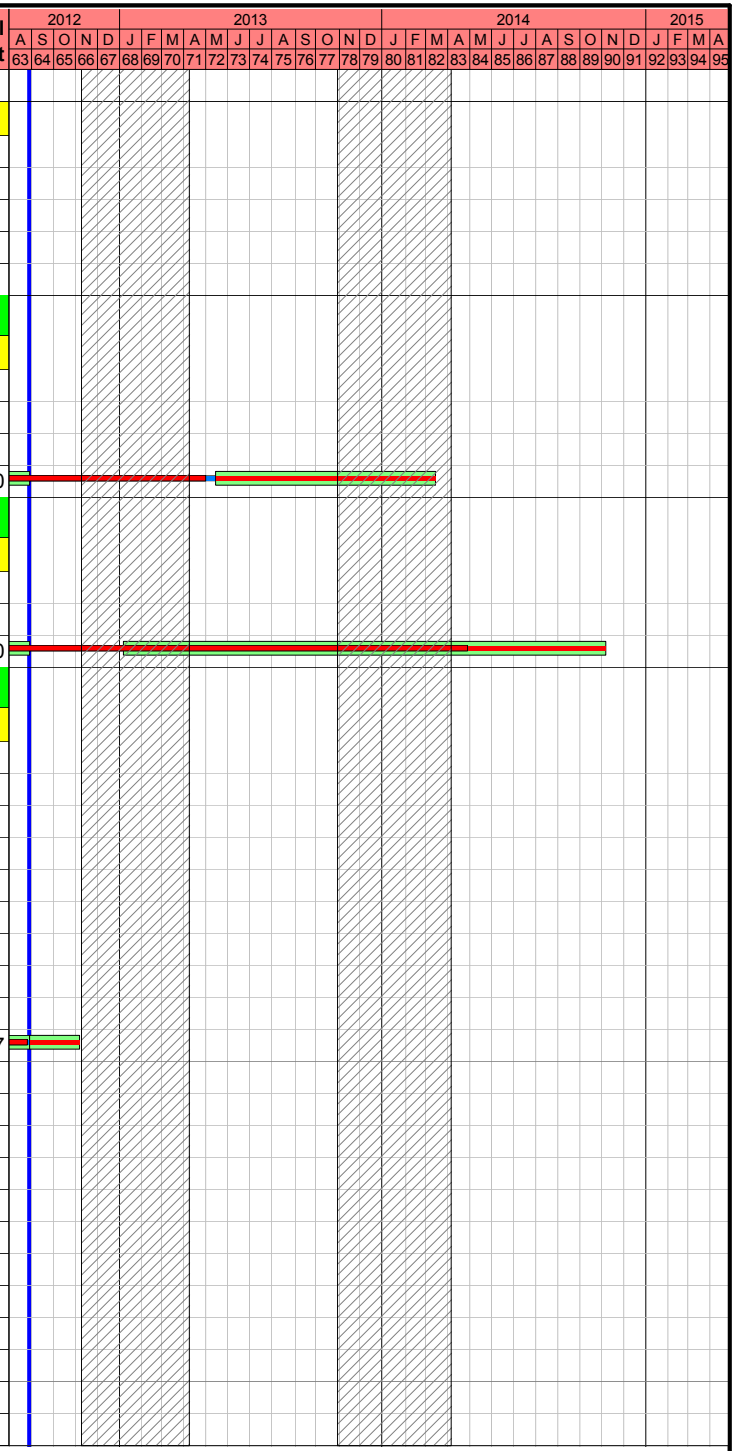
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
17R0000902	Fulfill all relevant environmental obligation	1,950	1,950	28DEC07A	14MAR14	84	28DEC07A	29APR13	0
Excavation Permit/Utilities per SCC 54 & SCC 83									
01R0001002	Nominate IIUMS co-ordinator	7	7	14DEC07A	15JAN08A	100	14DEC07A	15JAN08A	
01R0001004	SO approve IIUMS co-ordinator	14	14	16JAN08A	29FEB08A	100	16JAN08A	29FEB08A	
01R0001006	Submit brand name of UGS detection equipment	7	7	28DEC07A	18FEB08A	100	28DEC07A	18FEB08A	
01R0001008	Utilities detection & report to the SO	21	21	29FEB08A	05APR08A	100	29FEB08A	05APR08A	
01R0001010	Liaison with UUs	21	21	04JAN08A	29FEB08A	100	04JAN08A	29FEB08A	
01R0001012	Apply XP for site entrance construction	7	7	21JAN08A	08MAR08A	100	21JAN08A	08MAR08A	
01R0001014	HyD process XP for site entrance construction	20	20	10MAR08A	28MAY08A	100	10MAR08A	28MAY08A	
01R0001016	HyD issue XP for site entrance construction	0	0		28MAY08A	100		28MAY08A	
01R0001018	Apply XP for GI works at I-1 & I-2	1	1	22APR08A	20MAY08A	100	22APR08A	20MAY08A	
01R0001020	HyD process XP for GI works at I-1 & I-2	30	30	23APR08A	26SEP08A	100	23APR08A	26SEP08A	
01R0001022	HyD issue XP for GI works at I-1 & I-2	0	0		26SEP08A	100		26SEP08A	
01R0001024	Apply XP for trial grout at Fault F1	1	1	22APR08A	20MAY08A	100	22APR08A	20MAY08A	
01R0001026	HyD process XP for trial grout at Fault F1	30	30	23APR08A	22JUL08A	100	23APR08A	22JUL08A	
01R0001028	HyD issue XP for trial grout at Fault F1	0	0		22JUL08A	100		22JUL08A	
Pre-construction Condition Survey									
Preliminaries									
01R0001102	Appoint a Qualified Structural Engineer	30	30	28DEC07A	19MAR08A	100	28DEC07A	19MAR08A	
01R0001104	Submit nos. & extent of the affected EBS	30	30	28DEC07A	19MAR08A	100	28DEC07A	19MAR08A	
PCS Stage 1 between I-1 & I-2									
01R0001118	Carry out stg 1 PCS between I-1 & I-2	6	6	22APR08A	23APR08A	100	22APR08A	23APR08A	
01R0001120	Prepare/submit reports for stg 1 PCS bet I-1&I-2	60	60	24APR08A	22SEP08A	100	24APR08A	22SEP08A	
01R0001122	Review/accept reports for stg 1 PCS bet I-1&I-2	60	60	31MAY08A	20JAN09A	100	31MAY08A	20JAN09A	
PCS Stage 1 between I-2 & I-3									
01R0001130	Carry out stg 1 PCS between I-2 & I-3	5	5	25MAR08A	30APR08A	100	25MAR08A	30APR08A	
01R0001132	Prepare/submit reports for stg 1 PCS bet I-2&I-3	60	60	24APR08A	22SEP08A	100	24APR08A	22SEP08A	
01R0001134	Review/accept reports for stg 1 PCS bet I-2&I-3	60	60	24MAY08A	04FEB09A	100	24MAY08A	04FEB09A	
PCS Stage 1 between I-3 & O-1									
01R0001142	Carry out stg 1 PCS between I-3 & O-1	5	5	25MAR08A	26MAR08A	100	25MAR08A	26MAR08A	
01R0001144	Prepare/submit reports for stg 1 PCS bet I-3&O-1	60	60	26MAR08A	11SEP08A	100	26MAR08A	11SEP08A	
01R0001146	Review/accept reports for stg 1 PCS bet I-3&O-1	60	60	31MAY08A	04FEB09A	100	31MAY08A	04FEB09A	
PCS Stage 1 at vicinity of O-1									
01R0001106	Carry out stg 1 PCS at vicinity of O-1	5	5	25MAR08A	29MAR08A	100	25MAR08A	29MAR08A	
01R0001108	Prepare/submit reports for stg 1 PCS at O-1	60	60	31MAR08A	10SEP08A	100	31MAR08A	10SEP08A	
01R0001110	Review/accept reports for stg 1 PCS at O-1	60	60	27MAY08A	09FEB09A	100	27MAY08A	09FEB09A	
PCS Stage 2 between I-1 & I-2									
01R0001124	Carry out stg 2 PCS between I-1 & I-2	5	5	22APR08A	02JUN08A	100	22APR08A	02JUN08A	
01R0001126	Prepare/submit reports for stg 2 PCS bet I-1&I-2	60	60	24APR08A	10JUN08A	100	24APR08A	10JUN08A	
01R0001128	Review/accept reports for stg 2 PCS bet I-1&I-2	60	60	11JUN08A	09FEB09A	100	11JUN08A	09FEB09A	



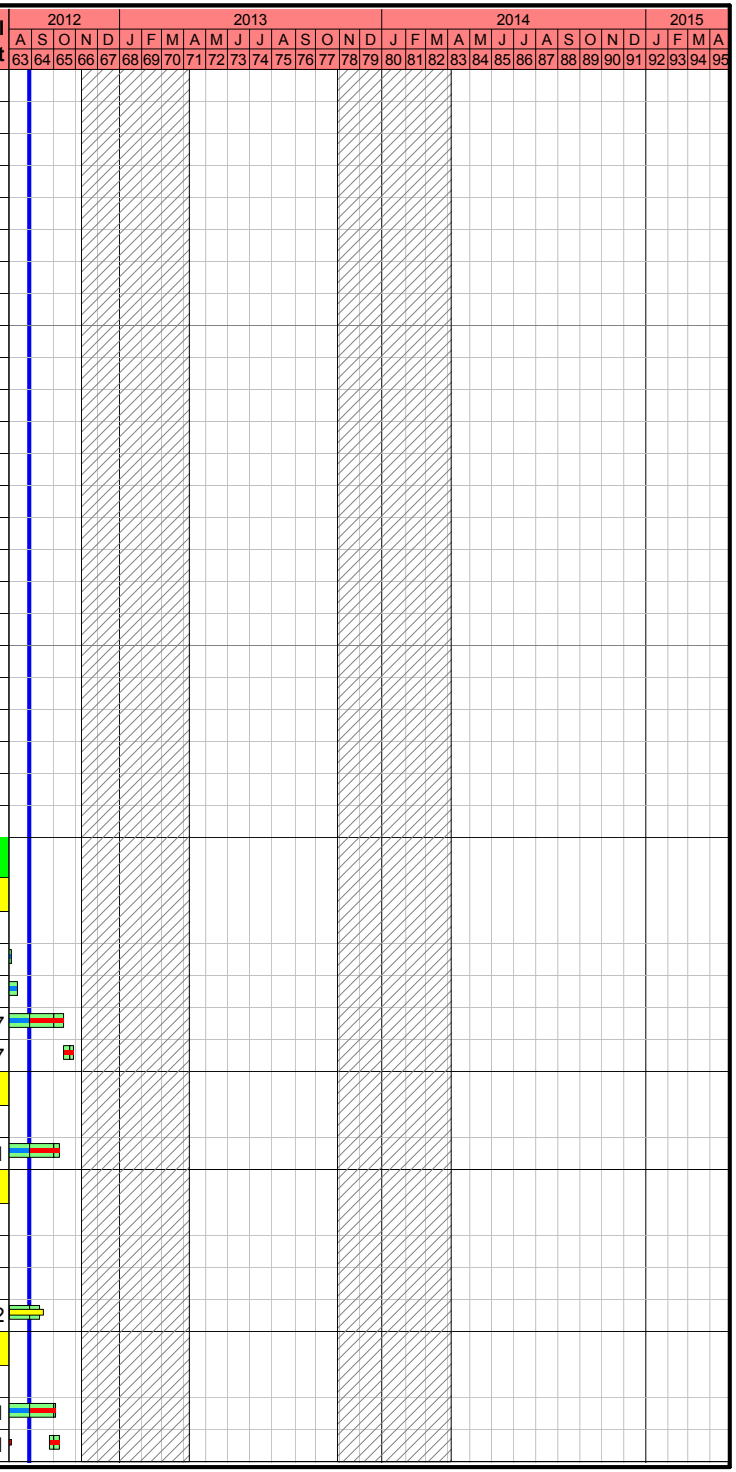
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
PCS Stage 2 between I-2 & I-3									
01R0001136	Carry out stg 2 PCS between I-2 & I-3	5	5	30APR08A	07JUN08A	100	30APR08A	07JUN08A	
01R0001138	Prepare/submit reports for stg 2 PCS bet I-2&I-3	60	60	02MAY08A	12JUN08A	100	02MAY08A	12JUN08A	
01R0001140	Review/accept reports for stg 2 PCS bet I-2&I-3	60	60	13JUN08A	09FEB09A	100	13JUN08A	09FEB09A	
PCS Stage 2 between I-3 & O-1									
01R0001148	Carry out stg 2 PCS between I-3 & O-1	5	5	09MAY08A	13JUN08A	100	09MAY08A	13JUN08A	
01R0001150	Prepare/submit reports for stg 2 PCS bet I-3&O-1	60	60	04JUN08A	18JUN08A	100	04JUN08A	18JUN08A	
01R0001152	Review/accept reports for stg 2 PCS bet I-3&O-1	60	60	19JUN08A	09FEB09A	100	19JUN08A	09FEB09A	
PCS Stage 2 at Vicinity of O-1									
01R0001112	Carry out stg 2 PCS at vicinity of O-1	12	12	01APR08A	06JUN08A	100	01APR08A	06JUN08A	
01R0001114	Prepare/submit reports for stg 2 PCS at O-1	60	60	02JUN08A	16JUN08A	100	02JUN08A	16JUN08A	
01R0001116	Review/accept reports for stg 2 PCS at O-1	60	60	17JUN08A	09FEB09A	100	17JUN08A	09FEB09A	
Pre-const. condition structural survey; I-1									
01R0001154	Prepare/submit reports for EBS at I-1	28	28	28AUG08A	10JAN09A	100	28AUG08A	10JAN09A	
01R0001156	Review/accept reports for EBS at I-1	28	28	12JAN09A	24MAR09A	100	12JAN09A	24MAR09A	
Pre-const. condition structural survey; I-2									
01R0001158	Prepare/submit reports for EBS at I-2	28	28	28AUG08A	10JAN09A	100	28AUG08A	10JAN09A	
01R0001160	Review/accept reports for EBS at I-2	28	28	12JAN09A	24MAR09A	100	12JAN09A	24MAR09A	
Pre-const. condition structural survey; I-3									
01R0001162	Prepare/submit reports for EBS at I-3	28	28	28AUG08A	10JAN09A	100	28AUG08A	10JAN09A	
01R0001164	Review/accept reports for EBS at I-3	28	28	12JAN09A	24MAR09A	100	12JAN09A	24MAR09A	
Pre-const. condition structural survey; O-1									
01R0001166	Prepare/submit reports for EBS at O-1	28	28	28AUG08A	10JAN09A	100	28AUG08A	10JAN09A	
01R0001168	Review/accept reports for EBS at O-1	28	28	12JAN09A	24MAR09A	100	12JAN09A	24MAR09A	
Pre-const. condition structural survey; Tunnel									
01R0001170	Prepare/submit reports for EBS along Tunnel alig	346	346	28AUG08A	22SEP09A	100	28AUG08A	22SEP09A	
01R0001172	Review/accept reports for EBS along Tunnel align	207	207	16JAN09A	22APR10A	100	16JAN09A	22APR10A	
Traffic									
01R0001202	Appoint Traffic Consultant/Traffic Engineer	14	14	14DEC07A	03JAN08A	100	14DEC07A	03JAN08A	
01R0001204	Eng's Approval of Traffic Consultant	7	7	28DEC07A	28FEB08A	100	28DEC07A	28FEB08A	
01R0001206	Prepare/submit TTA Schemes (ingress & egress)	14	14	04JAN08A	31JAN08A	100	04JAN08A	31JAN08A	
01R0001216	Obtain endorsement of TTA schemes from TMLG	21	21	01FEB08A	01APR08A	100	01FEB08A	01APR08A	
01R0001234	Approval of TTA schemes by the Authorities	14	14	02APR08A	19APR08A	100	02APR08A	19APR08A	
01R0001236	Approval of TTA schemes by the Authorities	14	14	02APR08A	19APR08A	100	02APR08A	19APR08A	
Management of Sub-contractors as per SCC 44									
01R0001302	Submit a Sub-contractor Management Plan	30	30	14DEC07A	12JAN08A	100	14DEC07A	12JAN08A	
01R0001304	Submit Quarterly the Updated SMP	1,762	1,762	03JUL08A	14MAR14	83	03JUL08A	29APR13	0
Trees									
Siu Ho Wan as a New Tree Transplanting Area									
VO028-02	Receive VO28 for new tree transplanting area	0	0		16AUG08A	100		16AUG08A	



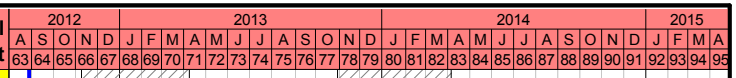
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
VO028-04	Preparation works for new T.T. area	20	20	18AUG08A	07SEP08A	100	18AUG08A	07SEP08A	
01R0001502	Appoint Landscape Specialist Contractor	14	14	14DEC07A	14JAN08A	100	14DEC07A	14JAN08A	
01R0001504	SO's Approval of Landscape Contractor	7	7	15JAN08A	28FEB08A	100	15JAN08A	28FEB08A	
01R0001506	Nominate competent person to oversee tree works	45	45	14DEC07A	29JAN08A	100	14DEC07A	29JAN08A	
01R0001510	Obtain Tree Removal Permit by Others	90	90	28DEC07A	06MAR08A	100	28DEC07A	06MAR08A	
01R0001512	Remove / Transplant Trees start	0	0	08SEP08A		100	08SEP08A		
Survey									
01R0001602	Appoint Surveyors	14	14	28DEC07A	10JAN08A	100	28DEC07A	10JAN08A	
01R0001604	SO's Approval of Surveyor	7	7	11JAN08A	16APR08A	100	11JAN08A	16APR08A	
01R0001608	Initial Survey	28	28	18JAN08A	10MAR08A	100	18JAN08A	10MAR08A	
01R0001610	Maintain & carry out survey works	1,893	1,893	23FEB08A	14MAR14	84	23FEB08A	29APR13	0
Smart Card System as per ER B.30									
01R0001802	Submit Smart Card Sys for SO's Approval	7	7	28DEC07A	15JAN08A	100	28DEC07A	15JAN08A	
01R0001804	Install & start Operating Smart-Card System	60	60	28DEC07A	23FEB08A	100	28DEC07A	23FEB08A	
01R0001806	Operate & Maintain Smart-Card System	2,256	2,256	25FEB08A	06NOV14	70	25FEB08A	29APR14	0
Procurement of Sub-contractor									
01R0001904	Spoil Disposal	60	60	28AUG08A	27MAR09A	100	28AUG08A	27MAR09A	
01R0001906	Earthwork for Outfall O-1	60	60	14DEC07A	05JUN08A	100	14DEC07A	05JUN08A	
01R0001910	Re-bar Supply	90	90	14DEC07A	30MAY08A	100	14DEC07A	30MAY08A	
01R0001912	Soil Nailing	60	60	28DEC07A	02APR08A	100	28DEC07A	02APR08A	
01R0001914	H-piling Works	90	90	14DEC07A	09MAY08A	100	14DEC07A	09MAY08A	
01R0001916	Fabrication of Pre-cast Lining	80	80	02JUN08A	05JAN09A	100	02JUN08A	05JAN09A	
01R0001920	Drainage/Road Works for Access Road at I-3	60	60	08AUG08A	03NOV08A	100	08AUG08A	03NOV08A	
01R0001922	Temp. steel decking over Shing Mun Nullah at I-1	90	90	14DEC07A	25APR08A	100	14DEC07A	25APR08A	
01R0001924	Design/Install Communication System	414	414	28JUN08A	31JUL09A	100	28JUN08A	31JUL09A	
01R0001936	Procurement & delivery of Communication System	120	120	09JUL12A	05NOV12	42	06MAY12A	25AUG12	-377
01R0018A02	Supply TBM/Main Tunnel Construction	7	7	14DEC07A	21DEC07A	100	14DEC07A	21DEC07A	
01R0018A04	Security	17	17	17DEC07A	02JAN08A	100	17DEC07A	02JAN08A	
01R0018A06	Progress Photo/Vedio	25	25	29DEC07A	22JAN08A	100	29DEC07A	22JAN08A	
01R0018A08	Webpage/Physical Model/3D Animation	48	48	14DEC07A	14FEB08A	100	14DEC07A	14FEB08A	
01R0018A10	Hoarding/Fencing Erection	60	60	04JAN08A	03MAR08A	100	04JAN08A	03MAR08A	
01R0018A12	Erection of Contractor's Office	67	67	28DEC07A	03MAR08A	100	28DEC07A	03MAR08A	
01R0018A14	Remote Control CCTV	60	60	04JAN08A	03MAR08A	100	04JAN08A	03MAR08A	
01R0018A16	Concrete Supply	45	45	14DEC07A	11MAR08A	100	14DEC07A	11MAR08A	
01R0018A18	Geotechnical Instrumentation	60	60	15JAN08A	14MAR08A	100	15JAN08A	14MAR08A	
01R0018A20	Drilling/Grouting for Geotchnical Instrumentat.	60	60	16JAN08A	15MAR08A	100	16JAN08A	15MAR08A	
01R0018A22	Site Clearance	60	60	26JAN08A	25MAR08A	100	26JAN08A	25MAR08A	
01R0018A24	Erection of SOR's Office	95	95	02JAN08A	05APR08A	100	02JAN08A	05APR08A	

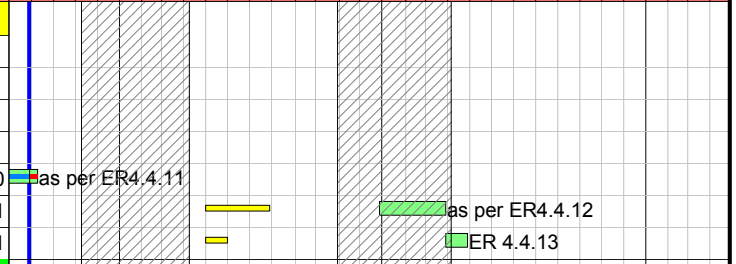


ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
01R0018A26	Carry out Grout Trial at Fault F1	90	90	02APR08A	30JUN08A	100	02APR08A	30JUN08A	
01R0018A28	Design/Fabricate Segmental Lining Mould	90	90	23APR08A	21JUL08A	100	23APR08A	21JUL08A	
01R0018A30	Construction of Skin Walls	90	90	21JUL08A	03JAN09A	100	21JUL08A	03JAN09A	
01R0018A32	Design/Fabricate/Supply/Install Conveyor Belt	90	90	14JUL08A	05JAN09A	100	14JUL08A	05JAN09A	
01R0018A34	Supply of Locomotive	90	90	14JUL08A	10OCT08A	100	14JUL08A	10OCT08A	
01R0018A36	Excavation Works at I-1	60	60	28AUG08A	21JAN09A	100	28AUG08A	21JAN09A	
01R0018A38	Construction of Steel Platform at O-1	50	50	28AUG08A	14MAR09A	100	28AUG08A	14MAR09A	
01R0018A40	Construction of Steel Platform at I-2	50	50	28AUG08A	27DEC08A	100	28AUG08A	27DEC08A	
01R0018A42	Pre-excavation Grouting for Shaft Excavation	60	60	28AUG08A	11MAR09A	100	28AUG08A	11MAR09A	
01R0018A46	Excavation/Construction of TBM Launching Chamber	70	70	28AUG08A	18DEC08A	100	28AUG08A	18DEC08A	
01R0018A48	Construction of Subgrade Structure at I-1	364	364	28AUG08A	26DEC09A	100	28AUG08A	26DEC09A	
01R0018A50	Shaft Excavation by RCD at I-2	90	90	28AUG08A	26NOV08A	100	28AUG08A	26NOV08A	
01R0018A52	Excavation/Construction of Shafts/Adits/Chambers	90	90	28AUG08A	26MAR09A	100	28AUG08A	26MAR09A	
01R0018A54	Construction of Hopper at O-1	90	90	28AUG08A	31JAN09A	100	28AUG08A	31JAN09A	
01R0018A56	Suttering of Spiral Ramp	364	364	28AUG08A	23JAN10A	100	28AUG08A	23JAN10A	
01R0018A58	Open Cut Excavation & Construction at I-3	90	90	28AUG08A	02MAY09A	100	28AUG08A	02MAY09A	
01R0018A60	Lining Formworks for Underground Structures	1,016	1,016	28AUG08A	27OCT11A	100	28AUG08A	27OCT11A	
01R0018A61	Tunnel Data Management System (TDMS)	90	90	28AUG08A	03APR09A	100	28AUG08A	03APR09A	
01R0018A62	Supply of Rail Track	90	90	28AUG08A	26MAR09A	100	28AUG08A	26MAR09A	
01R0018A64	Supply of Aggregate	169	169	28FEB09A	02NOV09A	100	28FEB09A	02NOV09A	
01R0018A68	Construct Box Culvert/Cascade/Spiral Ramp at O-1	200	200	28FEB09A	27JUL10A	100	28FEB09A	27JUL10A	
01R0018A70	Stainless steel Works	200	200	28FEB09A	14MAR11A	100	28FEB09A	14MAR11A	
01R0018A72	Pipe Jacking Works at Lo Wai	250	250	28FEB09A	20NOV09A	100	28FEB09A	20NOV09A	
01R0018A74	Finishing Works	980	980	28FEB09A	27JAN12A	100	28FEB09A	27JAN12A	
Others									
Off-site Fabrication of Trash Grill for Intakes									
01R1BI2T02	Procure sub- contract	0	0		14MAR11A	100		14MAR11A	
01R1BI2T12	Prepare shop drawing	157	157	15MAR11A	04AUG12A	100	15MAR11A	05MAR12	
01R1BI2T22	Procure stainless steel material	48	48	01AUG11A	11AUG12A	100	01AUG11A	14MAR12	
01R1BI2T32	Fabrication	60	60	16APR12A	13OCT12	33	15MAR12	30MAY12	-357
01R1BI2T42	Delivery	12	12	15OCT12	29OCT12	0	31MAY12	13JUN12	-357
Fabrication of Pre-cast Staircase at MAS/MAA									
01RSC05	Prepare & material procurement	60	60	28FEB12A	09MAY12A	100	28FEB12	14MAY12	
01RSC15	Fabrication	60	60	17MAR12A	09OCT12	40	15MAY12	25JUL12	-281
Off-site Fabricatio of Steel Gate for Outfall									
01RSG02	Recieve VO#137 for Penstock	0	0		10SEP11A	100		10SEP11A	
01RSG05	Obtain approval for shop drawing/technical subm	122	122	12SEP11A	11FEB12A	100	12SEP11A	11FEB12A	
01RSG15	Fabrication & approval of inspection report	136	136	13FEB12A	27JUL12A	100	13FEB12A	28JUL12	
01RSG25	Packup & Delivery	42	42	28JUL12A	12SEP12	67	30JUL12	15SEP12	742
Fabrication of Steel Handrailing for MAS									
01RSH05	Prepare shop drawing & material procurement	60	60	28JAN12A	21MAR12A	100	28JAN12A	21MAR12	
01RSH15	Fabrication	96	96	22MAR12A	02OCT12	69	22MAR12	20JUL12	-311
01RSH25	Delivery	12	12	25SEP12	09OCT12	0	21JUL12	03AUG12	-311

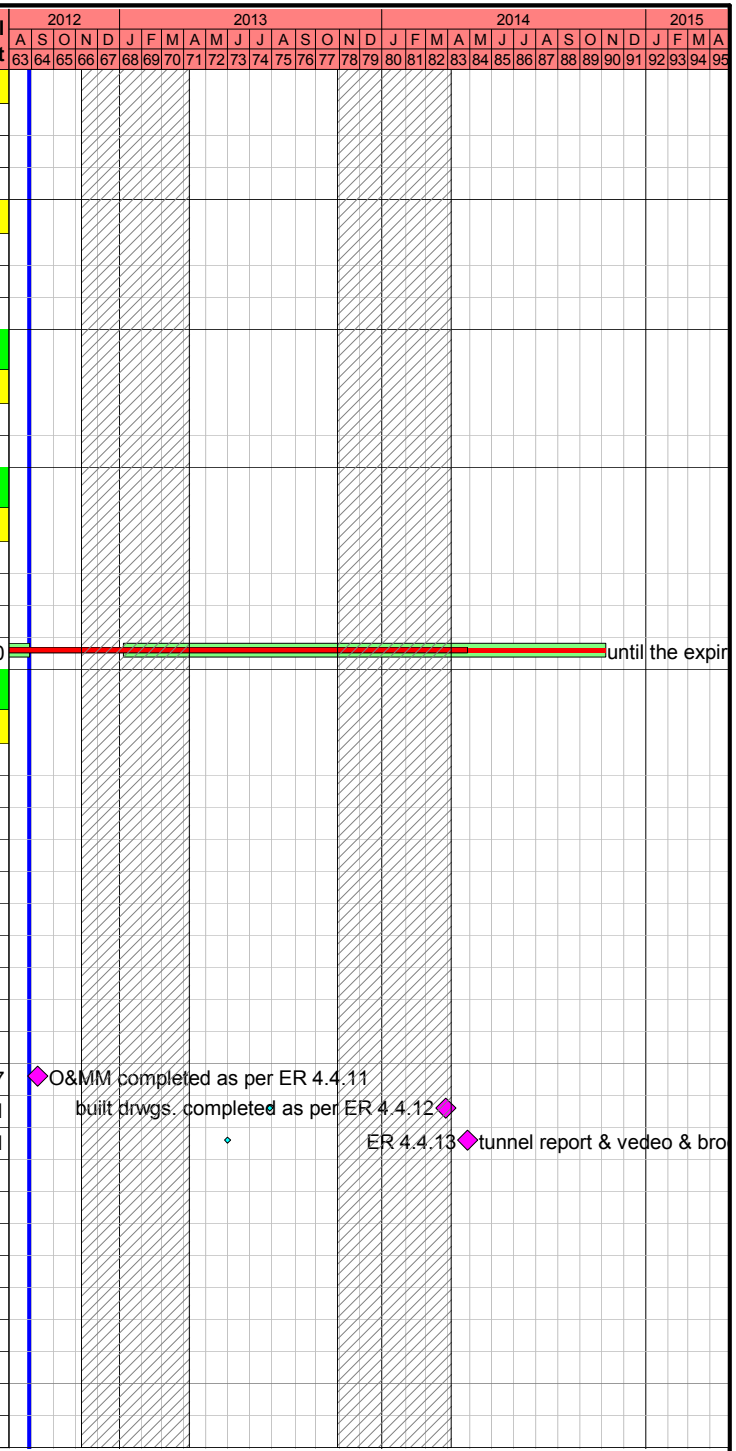


ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
01R0001928	Submit Contractor's Management Team	0	0		10JAN08A	100		10JAN08A	
01R0001930	Submit Photographer for Monthly Progress Photo	0	0	28JAN08A		100	28JAN08A		
01R0001932	Install Project Signboards at Potions A,B,C & D	30	30	28FEB09A	29MAY09A	100	28FEB09A	29MAY09A	
01R0001934	Presentation of TDMS to SOR/ Employer; ER 4.4.6	6	6	27MAR09A	06MAY09A	100	27MAR09A	06MAY09A	
01R0001940	Prepare/submit Operation & Maintenance Manual	90	90	28FEB12A	08SEP12	87	28FEB12	27MAY12	-500
01R0001942	Prepare/submit As-built Drawings	90	90	29DEC13	28MAR14	0	30APR13	28JUL13	351
01R0001944	Produce 2 documentary video for tunnel	30	30	29MAR14	27APR14	0	30APR13	29MAY13	321
Construction Risk Assessment (CRA) as per ER 7									
PCRA for Works at Portion A (I-1)									
01R00PCRA2	Prepare/submit PCRA for works at I-1	21	21	07APR08A	20AUG08A	100	07APR08A	20AUG08A	
01R00PCRA4	DC review & certify PCRA for works at I-1	60	60	22MAY08A	13OCT08A	100	22MAY08A	13OCT08A	
01R00PCRA6	SOR review & accept PCRA at works at I-1	60	60	12MAY08A	25SEP08A	100	12MAY08A	25SEP08A	
PCRA for Works at Portion B (I-2)									
01R00PCRB2	Prepare/submit PCRA for works at I-2	21	21	14APR08A	20AUG08A	100	14APR08A	20AUG08A	
01R00PCRB4	DC review & certify PCRA for works at I-2	60	60	22MAY08A	13OCT08A	100	22MAY08A	13OCT08A	
01R00PCRB6	SOR review & accept PCRA at works at I-2	60	60	22MAY08A	25SEP08A	100	22MAY08A	25SEP08A	
PCRA for Works at Portion C (I-3)									
01R00PCRC2	Prepare/submit PCRA for works at I-3	21	21	01APR08A	20AUG08A	100	01APR08A	20AUG08A	
01R00PCRC4	DC review & certify PCRA for works at I-3	60	60	21MAY08A	13OCT08A	100	21MAY08A	13OCT08A	
01R00PCRC6	SOR review & accept PCRA at works at I-3	60	60	21MAY08A	25SEP08A	100	21MAY08A	25SEP08A	
PCRA for Works at Portion D/E (O-1)									
01R00PCRD2	Prepare/submit PCRA for works at O-1	21	21	01APR08A	20AUG08A	100	01APR08A	20AUG08A	
01R00PCRD4	DC review & certify PCRA for works at O-1	60	60	21MAY08A	13OCT08A	100	21MAY08A	13OCT08A	
01R00PCRD6	SOR review & accept PCRA at works at O-1	60	60	12MAY08A	25SEP08A	100	12MAY08A	25SEP08A	
PCRA for Works at Portion F/J (Main Tunnel)									
01R00PCRF2	Prepare/submit PCRA for main tunnel works	21	21	09JUN08A	23APR09A	100	09JUN08A	23APR09A	
01R00PCRF4	DC review & certify PCRA for main tunnel works	60	60	14JUL08A	08JUN09A	100	14JUL08A	08JUN09A	
01R00PCRF6	SOR review & accept PCRA for main tunnel works	60	60	16JUL08A	24JUL09A	100	16JUL08A	24JUL09A	
DCRA for Works at Portion A (I-1)									
01R00DCRA2	Prepare/submit DCRA for works at I-1	14	14	02OCT08A	27OCT08A	100	02OCT08A	27OCT08A	
01R00DCRA4	DC review & certify DCRA for works at I-1	21	21	28OCT08A	17FEB09A	100	28OCT08A	17FEB09A	
01R00DCRA6	SOR review & accept DCRA at works at I-1	49	49	05NOV08A	26MAR09A	100	05NOV08A	26MAR09A	
DCRA for Works at Portion B (I-2)									
01R00DCRB2	Prepare/submit DCRA for works at I-2	14	14	14OCT08A	02JUN09A	100	14OCT08A	02JUN09A	
01R00DCRB4	DC review & certify DCRA for works at I-2	21	21	05DEC08A	09JUN09A	100	05DEC08A	09JUN09A	
01R00DCRB6	SOR review & accept DCRA at works at I-2	49	49	10DEC08A	28AUG09A	100	10DEC08A	28AUG09A	
DCRA for Works at Portion C (I-3)									
01R00DCRC2	Prepare/submit DCRA for works at I-3	14	14	14OCT08A	03JUN09A	100	14OCT08A	03JUN09A	
01R00DCRC4	DC review & certify DCRA for works at I-3	21	21	31OCT08A	10JUN09A	100	31OCT08A	10JUN09A	
01R00DCRC6	SOR review & accept DCRA at works at I-3	49	49	07NOV08A	24JUN09A	100	07NOV08A	24JUN09A	

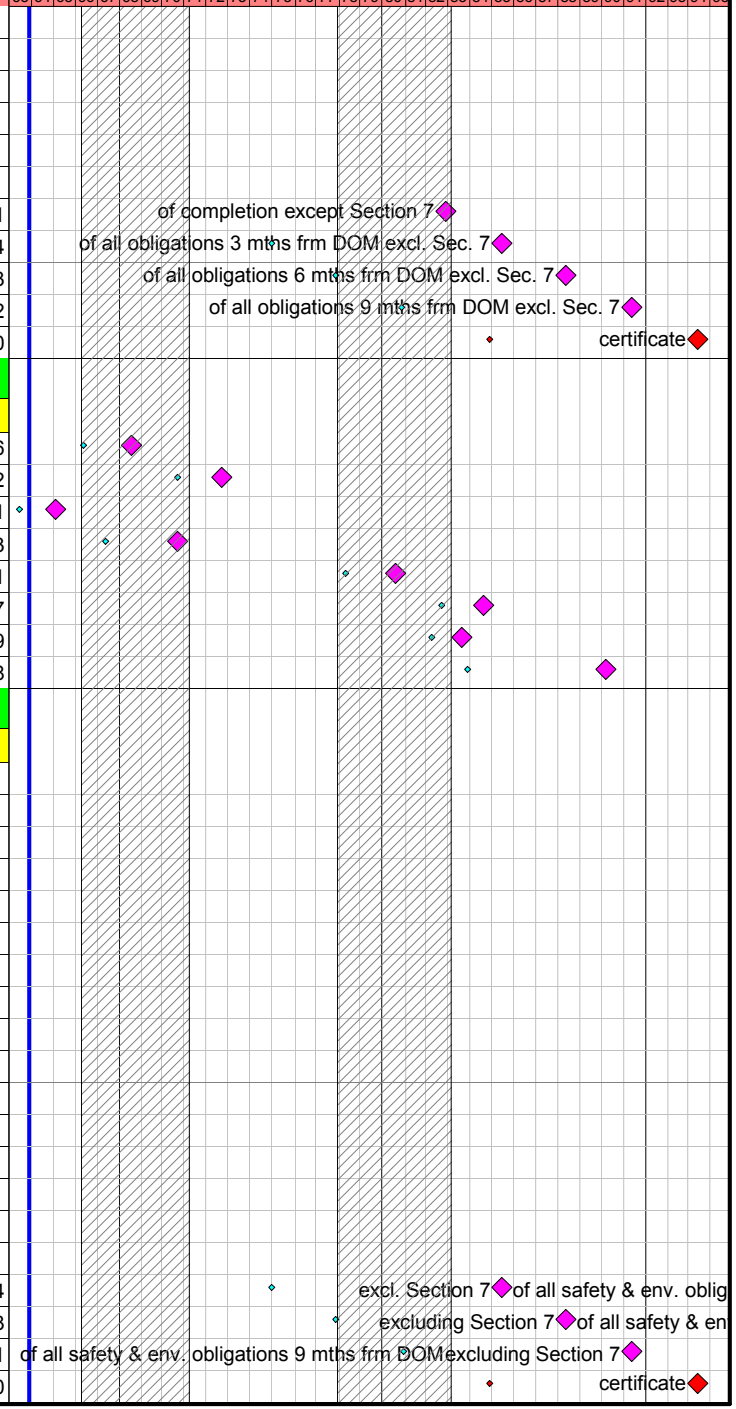




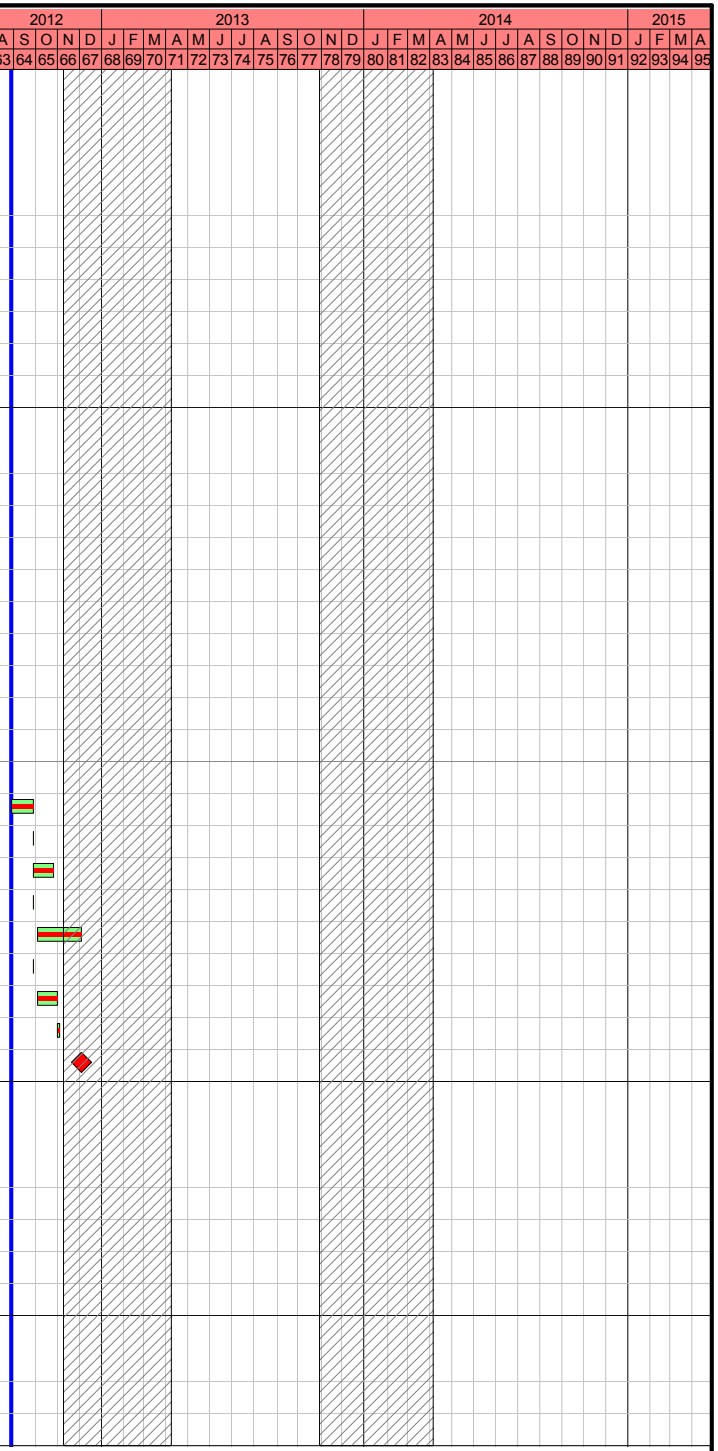
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
DCRA for Works at Portion D/E (O-1)									
01R00DCRD2	Prepare/submit DCRA for works at O-1	14	14	03NOV08A	03JUN09A	100	03NOV08A	03JUN09A	
01R00DCRD4	DC review & certify DCRA for works at O-1	21	21	15NOV08A	10JUN09A	100	15NOV08A	10JUN09A	
01R00DCRD6	SOR review & accept DCRA at works at O-1	285	285	15NOV08A	10NOV09A	100	15NOV08A	10NOV09A	
DCRA for Works at Portion F/J (Main Tunnel)									
01R00DCRF2	Prepare/submit DCRA for main tunnel works	142	142	14MAR09A	11AUG09A	100	14MAR09A	11AUG09A	
01R00DCRF4	DC review & certify DCRA for main tunnel works	21	21	11AUG09A	13AUG09A	100	11AUG09A	13AUG09A	
01R00DCRF6	SOR review & accept DCRA for main tunnel works	49	49	12AUG09A	22APR10A	100	12AUG09A	22APR10A	
Physical Models & Other Material Display									
01R0002302	Prepare/submit a physical models	255	255	15FEB08A	27NOV08A	100	15FEB08A	27NOV08A	
01R0002304	Prepare/submit a 3-D animation model	308	308	15FEB08A	27FEB09A	100	15FEB08A	27FEB09A	
Internet Website as per ER 4.4.7									
01R0002402	Propose the design of web page	30	30	28DEC07A	09FEB08A	100	28DEC07A	09FEB08A	
01R0002404	Produce the web page for approval of SO	211	211	10MAR08A	19FEB09A	100	10MAR08A	19FEB09A	
01R0002406	SO's approval of web page	30	30	02JUN08A	24FEB09A	100	02JUN08A	24FEB09A	
01R0002408	Submit updated web pages monthly	1,890	1,890	25FEB09A	06NOV14	65	25FEB09A	29APR14	0
Schedule of Milestones for Cost Centre No. 1R									
01R0002501	1R 1; On provision of SO's Accommodation	0	0		13SEP08A	100		13SEP08A	
01R0002502	1R 2; On providing documents of effected CWI	0	0		03JAN08A	100		03JAN08A	
01R0002503	1R 3; On providing documents of effected TPI	0	0		03JAN08A	100		03JAN08A	
01R0002504	1R 4; On Pproviding documents of effected PII	0	0		03JAN08A	100		03JAN08A	
01R0002505	1R 5; On delivery of all Land Transport for SO	0	0		02MAY08A	100		02MAY08A	
01R0002506	1R 6; On install. of computer facilities for SO	0	0		13SEP08A	100		13SEP08A	
01R0002507	1R 7; On accept. of detailed CRA incl. PCS	0	0		22APR10A	100		22APR10A	
01R0002508	1R 8; On acceptance of Physical Model by the SO	0	0		27NOV08A	100		27NOV08A	
01R0002509	1R 9; On acceptance of 3-D Animation Model	0	0		27FEB09A	100		27FEB09A	
01R0002510	1R 10; On satisf. operation of CCTV for 3 mth	0	0		17JUN09A	100		17JUN09A	
01R0002511	1R 11; On acceptance of O&MM	0	0		08SEP12	0		27MAY12	917
01R0002512	1R 12; On acceptance of as-built drwgs.	0	0		28MAR14	0		28JUL13	351
01R0002513	1R 13; On acceptance of T.R/Video/Brouchure	0	0		27APR14	0		29MAY13	321
01R0002514	1R 14; On complete all wks for 3 mth frm DOC	0	0		27MAR08A	100		27MAR08A	
01R0002515	1R 15; On complete all wks for 6 mth frm DOC	0	0		27JUN08A	100		27JUN08A	
01R0002516	1R 16; On complete all wks for 9 mth frm DOC	0	0		25SEP08A	100		25SEP08A	
01R0002517	1R 17; On complete all wks for 12 mth frm DOC	0	0		27DEC08A	100		27DEC08A	
01R0002518	1R 18; On complete all wks for 15 mth frm DOC	0	0		27MAR09A	100		27MAR09A	
01R0002519	1R 19; On complete all wks for 18 mth frm DOC	0	0		26JUN09A	100		26JUN09A	
01R0002520	1R 20; On complete all wks for 21 mth frm DOC	0	0		27SEP09A	100		27SEP09A	
01R0002521	1R 21; On complete all wks for 24 mth frm DOC	0	0		26DEC09A	100		26DEC09A	
01R0002522	1R 22; On complete all wks for 27 mth frm DOC	0	0		27MAR10A	100		27MAR10A	



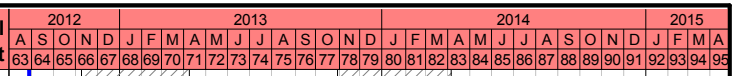
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
01R0002523	1R 23; On complete all wks for 30 mth frm DOC	0	0		26JUN10A	100		26JUN10A	
01R0002524	1R 24; On complete all wks for 33 mth frm DOC	0	0		25SEP10A	100		25SEP10A	
01R0002525	1R 25; On complete all wks for 36 mth frm DOC	0	0		27DEC10A	100		27DEC10A	
01R0002526	1R 26; On complete all wks for 39 mth frm DOC	0	0		27MAR11A	100		27MAR11A	
01R0002527	1R 27; On complete all wks for 42 mth frm DOC	0	0		26JUN11A	100		26JUN11A	
01R0002528	1R 28; On complete all wks for 45 mth frm DOC	0	0		25SEP11A	100		25SEP11A	
01R0002529	1R 29; On issuance of completion certificates	0	0		28MAR14	0		27FEB12	351
01R0002530	1R 30; On complete all wks for 3 mth frm CMP	0	0		13JUN14	0		29JUL13	274
01R0002531	1R 31; On complete all wks for 6 mth frm CMP	0	0		12SEP14	0		28OCT13	183
01R0002532	1R 32; On complete all wks for 9 mth frm CMP	0	0		12DEC14	0		27JAN14	92
01R0002533	1R 33; On issuance of maintenance certificate	0	0		14MAR15	0		29MAY14	0
Schedule of Milestones for Cost Centre No. 16R									
16R7003001	16R 1; On completion of landscape wks; Portion A	0	0		17JAN13	0		10NOV12	786
16R7003002	16R 2; On completion of landscape wks; Portion B	0	0		21MAY13	0		22MAR13	662
16R7003003	16R 3; On completion of landscape wks; Portion C	0	0		04OCT12	0		14AUG12	891
16R7003004	16R 4; On completion of landscape wks; Portion D	0	0		21MAR13	0		11DEC12	723
16R7003005	16R 5; On completion of establish wks; Portion A	0	0		17JAN14	0		10NOV13	421
16R7003006	16R 6; On completion of establish wks; Portion B	0	0		21MAY14	0		22MAR14	297
16R7003007	16R 7; On completion of establish wks; Portion C	0	0		19APR14	0		08MAR14	329
16R7003008	16R 8; On completion of establish wks; Portion D	0	0		06NOV14	0		29APR14	128
Schedule of Milestones for Cost Centre No. 17R									
17R0003101	17R 1; On complet of all wks for 3 mth frm DOC	0	0		27MAR08A	100		27MAR08A	
17R0003102	17R 2; On complet of all wks for 6 mth frm DOC	0	0		27JUN08A	100		27JUN08A	
17R0003103	17R 3; On complet of all wks for 9 mth frm DOC	0	0		26SEP08A	100		26SEP08A	
17R0003104	17R 4; On complet of all wks for 12 mth frm DOC	0	0		27DEC08A	100		27DEC08A	
17R0003105	17R 5; On complet of all wks for 15 mth frm DOC	0	0		27MAR09A	100		27MAR09A	
17R0003106	17R 6; On complet of all wks for 18 mth frm DOC	0	0		15JUL09A	100		15JUL09A	
17R0003107	17R 7; On complet of all wks for 21 mth frm DOC	0	0		27SEP09A	100		27SEP09A	
17R0003108	17R 8; On complet of all wks for 24 mth frm DOC	0	0		26DEC09A	100		26DEC09A	
17R0003109	17R 9; On complet of all wks for 27 mth frm DOC	0	0		13MAY10A	100		13MAY10A	
17R0003110	17R 10; On complet all wks for 30 mth frm DOC	0	0		12AUG10A	100		12AUG10A	
17R0003111	17R 11; On complet all wks for 33 mth frm DOC	0	0		02OCT10A	100		02OCT10A	
17R0003112	17R 12; On complet all wks for 36 mth frm DOC	0	0		27DEC10A	100		27DEC10A	
17R0003113	17R 13; On complet all wks for 39 mth frm DOC	0	0		02APR11A	100		02APR11A	
17R0003114	17R 14; On complet all wks for 42 mth frm DOC	0	0		02JUL11A	100		02JUL11A	
17R0003115	17R 15; On complet all wks for 45 mth frm DOC	0	0		30SEP11A	100		30SEP11A	
17R0003116	17R 16; On complet all wks for 48 mth frm DOC	0	0		28FEB12A	100		27FEB12	
17R0003117	17R 17; On complet of all wks for 3 mth frm CMP	0	0		13JUN14	0		29JUL13	274
17R0003118	17R 18; On complet of all wks for 6 mth frm CMP	0	0		12SEP14	0		28OCT13	183
17R0003119	17R 19; On complet of all wks for 9 mth frm CMP	0	0		13DEC14	0		28JAN14	91
17R0003120	17R 20; On issuance of maintenance certificate	0	0		14MAR15	0		29MAY14	0



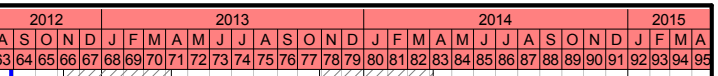
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Design/Design Check for Permanent Works									
Project -wide Packages									
Project Design Plan (PDP)									
02L10D0102	Employ Independent Designer	7	7	14DEC07A	20DEC07A	100	14DEC07A	20DEC07A	
02L10D0104	Prepare & submit Project Design Plan (PDP)	28	28	14DEC07A	26FEB08A	100	14DEC07A	26FEB08A	
02L10D0106	SO's review & comment on PDP	28	28	27FEB08A	18MAR08A	100	27FEB08A	18MAR08A	
02L10D0108	Provide further information of (PDP)	28	28	19MAR08A	21AUG08A	100	19MAR08A	21AUG08A	
02L10D0110	SO approves PDP	14	14	14MAY08A	04SEP08A	100	14MAY08A	04SEP08A	
02L10D0112	Employ Independent Design Checker	14	14	28DEC07A	01FEB08A	100	28DEC07A	01FEB08A	
02L10D0114	Approval of Design Checker by the SO	28	28	02FEB08A	28FEB08A	100	02FEB08A	28FEB08A	
Design for Communication System									
02L1FE0002	Receive VO# 180 for Digital Comm. Sys	0	0	15NOV11A		100	15NOV11A		
02L1FE0012	AIP (Digital); Submit/approve from ICE & SOR	121	121	31OCT11A	11JUN12A	100	31OCT11A	27APR12	
02L1FE0102	Design preparation for the AIP submission	15	15	23NOV09A	10DEC09A	100	23NOV09A	10DEC09A	
02L1FE0103	Design (AIP) submission for the DC's approval	1	1	11DEC09A	11DEC09A	100	11DEC09A	11DEC09A	
02L1FE0104	Design (AIP) certification by the Design Checker	28	28	12DEC09A	26JAN10A	100	12DEC09A	26JAN10A	
02L1FE0106	Design (AIP) submission for the SO's approval	1	1	27JAN10A	27JAN10A	100	27JAN10A	27JAN10A	
02L1FE0108	Design (AIP) review by the SO	60	60	28JAN10A	24JUN10A	100	28JAN10A	24JUN10A	
02L1FE0110	AIP submission for rel. authorities' approval	1	1	05APR12A	17APR12A	100	30APR12	30APR12	
02L1FE0112	Design (AIP) review by the rel. authorities	28	28	06APR12A	11JUN12A	100	01MAY12	28MAY12	
02L1FE0114	Obtain rel. authorities's approval for AIP	0	1		11JUN12A	100	29MAY12	29MAY12	
02L1FE0116	Obtain SO's consent for design (AIP)	0	0		11JUN12A	100		24JUN10A	
02L1FE0118	Design preparation for the DDA submission	30	30	28AUG12	26SEP12	0	28APR12	27MAY12	-406
02L1FE0119	Design (DDA) submission for the DC's approval	1	1	27SEP12	27SEP12	0	28MAY12	28MAY12	-331
02L1FE0120	Design (DDA) certification by the Design Checker	28	28	28SEP12	25OCT12	0	29MAY12	25JUN12	-406
02L1FE0122	Design (DDA) submission for the SO's approval	1	1	27SEP12	27SEP12	0	28MAY12	28MAY12	-325
02L1FE0124	Design (DDA) review by the SO	60	60	05OCT12	03DEC12	0	05JUN12	03AUG12	-406
02L1FE0126	DDA submission for rel. authorities' approval	1	1	27SEP12	27SEP12	0	28MAY12	28MAY12	-299
02L1FE0128	Design (DDA) review by the rel. authorities	28	28	05OCT12	01NOV12	0	05JUN12	02JUL12	-374
02L1FE0130	Obtain rel. authorities's approval for DDA	1	1	02NOV12	02NOV12	0	03JUL12	03JUL12	-305
02L1FE0132	Obtain SO's consent for design (DDA)	0	0		04DEC12	0		04AUG12	-406
Design Packages for Works in Portion A									
Temp. Steel Decking Design Over Shing Mun Nullah									
02L1AA0102	Design preparation by the Designer	14	14	22FEB08A	15MAY08A	100	22FEB08A	15MAY08A	
02L1AA0104	Design certification by the Design Checker	14	14	16MAY08A	26MAY08A	100	16MAY08A	26MAY08A	
02L1AA0106	Design submission for the SO's approval	1	1	26MAY08A	26MAY08A	100	26MAY08A	26MAY08A	
02L1AA0108	Design review by the SO	21	21	27MAY08A	30JUN08A	100	27MAY08A	30JUN08A	
02L1AA0110	Obtain design approval from the SO	0	0		30JUN08A	100		30JUN08A	
ELS Design for Spiral Ramp/Cascade/Box Culvert									
02L1AA0202	Design preparation for the DDA submission	158	158	02MAY08A	16FEB09A	100	02MAY08A	16FEB09A	
02L1AA0203	Design submission for the DC's approval	2	2	10JUL08A	17FEB09A	100	10JUL08A	17FEB09A	
02L1AA0204	Design (DDA) certification by the Design Checker	30	30	11JUL08A	17FEB09A	100	11JUL08A	17FEB09A	



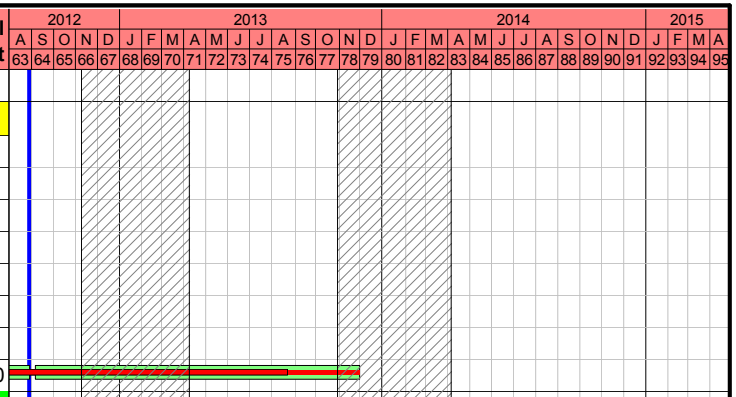
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1AA0206	Design (DDA) submission for the SO's approval	2	2	12AUG08A	17FEB09A	100	12AUG08A	17FEB09A	
02L1AA0208	Design (DDA) review by the SO	68	68	13AUG08A	14MAR09A	100	13AUG08A	14MAR09A	
02L1AA0216	SO submit design (DDA) for review of GEO	1	1	03FEB09A	03MAR09A	100	03FEB09A	03MAR09A	
02L1AA0218	Design (DDA) review by the GEO	28	28	04MAR09A	28OCT09A	100	04MAR09A	28OCT09A	
02L1AA0238	Obtain SO's consent for design (DDA)	0	0		24MAR09A	100		24MAR09A	
Temp. Platform Design for H-Piling									
02L1AA0302	Design preparation by the Designer	15	15	01FEB11A	19FEB11A	100	01FEB11A	19FEB11A	
02L1AA0303	Design submission for the DC's approval	1	1	21FEB11A	21FEB11A	100	21FEB11A	21FEB11A	
02L1AA0304	Design certification by the Design Checker	28	28	21FEB11A	24MAR11A	100	21FEB11A	24MAR11A	
02L1AA0306	Design submission for the SO's approval	1	1	21FEB11A	25MAR11A	100	21FEB11A	25MAR11A	
02L1AA0308	Design review by the SO	42	42	21FEB11A	01APR11A	100	21FEB11A	01APR11A	
02L1AA0310	Obtain design approval from the SO	0	0		06APR11A	100		06APR11A	
Cascade & Box Culver Design for Portion A									
02L1AA0402	Design preparation for the AIP submission	30	30	02JUN08A	28FEB09A	100	02JUN08A	28FEB09A	
02L1AA0403	Design (AIP) submission for the DC's approval	3	3	12JUL08A	02MAR09A	100	12JUL08A	02MAR09A	
02L1AA0404	Design (AIP) certification by the Design Checker	243	243	14JUL08A	18MAR09A	100	14JUL08A	18MAR09A	
02L1AA0406	Design (AIP) submission for the SO's approval	2	2	15JUL08A	19MAR09A	100	15JUL08A	19MAR09A	
02L1AA0408	Design (AIP) review by the SO	66	66	16JUL08A	20MAR09A	100	16JUL08A	20MAR09A	
02L1AA0410	AIP submission for rel. authorities' approval	1	1	14JUL08A	19AUG08A	100	14JUL08A	19AUG08A	
02L1AA0412	Design (AIP) review by the rel. authorities	28	28	15JUL08A	18NOV08A	100	15JUL08A	18NOV08A	
02L1AA0414	Obtain rel. authorities's approval for AIP	1	1	03NOV08A	18NOV08A	100	03NOV08A	18NOV08A	
02L1AA0420	Obtain SO's consent for design (AIP)	0	0		20MAR09A	100		20MAR09A	
02L1AA0422	Design preparation for the DDA submission	141	141	21MAR09A	30SEP10A	100	21MAR09A	30SEP10A	
02L1AA0423	Design (DDA) submission for the DC's approval	2	2	02SEP09A	01SEP10A	100	02SEP09A	01SEP10A	
02L1AA0424	Design (DDA) certification by the Design Checker	28	28	03SEP09A	18NOV10A	100	03SEP09A	18NOV10A	
02L1AA0426	Design (DDA) submission for the SO's approval	2	2	07SEP09A	19NOV10A	100	07SEP09A	19NOV10A	
02L1AA0428	Design (DDA) review by the SO	66	66	08SEP09A	24NOV10A	100	08SEP09A	24NOV10A	
02L1AA0430	DDA submission for rel. authorities' approval	1	1	06DEC10A	06DEC10A	100	06DEC10A	06DEC10A	
02L1AA0432	Design (DDA) review by the rel. authorities	28	28	06DEC10A	03JAN11A	100	06DEC10A	03JAN11A	
02L1AA0434	Obtain rel. authorities's approval for DDA	1	1	03JAN11A	03JAN11A	100	03JAN11A	03JAN11A	
02L1AA0440	Obtain SO's consent for design (DDA)	0	0		24NOV10A	100		24NOV10A	
Impact Assessment on WSD Wo Yip Hop V. S. P. H.									
02L1AA0502	Design preparation for the DDA submission	30	30	02MAY08A	26FEB09A	100	02MAY08A	26FEB09A	
02L1AA0503	Design (DDA) submission for the DC's approval	1	1	26JUN08A	27FEB09A	100	26JUN08A	27FEB09A	
02L1AA0504	Design (DDA) certification by the Design Checker	60	60	27JUN08A	11MAR09A	100	27JUN08A	11MAR09A	
02L1AA0506	Design (DDA) submission for the SO's approval	2	2	14JUL08A	24MAR09A	100	14JUL08A	24MAR09A	
02L1AA0508	Design (DDA) review by the SO	66	66	15JUL08A	31MAR09A	100	15JUL08A	31MAR09A	
02L1AA0510	DDA submission for rel. authorities' approval	2	2	10JUL08A	14MAR09A	100	10JUL08A	14MAR09A	
02L1AA0512	Design (DDA) review by the rel. authorities	385	385	14JUL08A	02NOV09A	100	14JUL08A	02NOV09A	
02L1AA0514	Obtain rel. authorities's approval for DDA	1	1	03NOV09A	03NOV09A	100	03NOV09A	03NOV09A	
02L1AA0520	Obtain SO's consent for design (DDA)	0	0		31MAR09A	100		31MAR09A	
Temporary Platform for Pipe Piling									
02L1AA0602	Design preparation by the Designer	11	11	21JUL08A	23AUG08A	100	21JUL08A	23AUG08A	



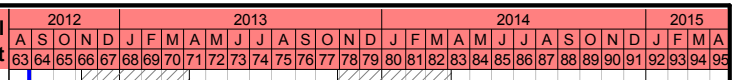
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1AA0603	Design submission for the DC's approval	1	1	01AUG08A	25AUG08A	100	01AUG08A	25AUG08A	
02L1AA0604	Design certification by the Design Checker	21	21	02AUG08A	26SEP08A	100	02AUG08A	26SEP08A	
02L1AA0606	Design submission for the SO's approval	1	1	08AUG08A	27SEP08A	100	08AUG08A	27SEP08A	
02L1AA0608	Design review by the SO	28	28	09AUG08A	17OCT08A	100	09AUG08A	17OCT08A	
02L1AA0610	Obtain design approval from the SO	0	0		17OCT08A	100		17OCT08A	
Temporary Works Design for Retrieval of TBM									
02L1AA0702	Design preparation by the Designer	162	162	28FEB09A	12JAN11A	100	28FEB09A	12JAN11A	
02L1AA0703	Design submission for the DC's approval	1	1	13JAN11A	13JAN11A	100	13JAN11A	13JAN11A	
02L1AA0704	Design certification by the Design Checker	28	28	18AUG09A	22MAR11A	100	18AUG09A	22MAR11A	
02L1AA0706	Design submission for the SO's approval	1	1	13JAN11A	23MAR11A	100	13JAN11A	23MAR11A	
02L1AA0708	Design review by the SO	42	42	14JAN11A	20JUN11A	100	14JAN11A	20JUN11A	
02L1AA0710	Obtain design approval from the SO	0	0		20JUN11A	100		20JUN11A	
Temporary Drainage Management Plan for Portion A									
02L1AA0802	TDMP preparation by the Designer	208	208	18AUG08A	23MAY09A	100	18AUG08A	23MAY09A	
02L1AA0804	TDMP submission for the DC's approval	2	2	24SEP08A	25MAY09A	100	24SEP08A	25MAY09A	
02L1AA0806	TDMP certification by the Design Checker	80	80	24OCT08A	02DEC09A	100	24OCT08A	02DEC09A	
02L1AA0808	TDMP submission for the SO's approval	5	5	05NOV08A	03DEC09A	100	05NOV08A	03DEC09A	
02L1AA0810	TDMP review by the SO	284	284	05NOV08A	05DEC09A	100	05NOV08A	05DEC09A	
02L1AA0812	TDMP submission for DSD's approval	1	1	03DEC09A	03DEC09A	100	03DEC09A	03DEC09A	
02L1AA0814	TDMP review by the DSD	60	60	23SEP09A	05DEC09A	100	23SEP09A	05DEC09A	
02L1AA0816	Obtain DSD's approval for DDA	1	1	07DEC09A	07DEC09A	100	07DEC09A	07DEC09A	
02L1AA0818	Obtain SO's consent for TDMP	0	0		07DEC09A	100		07DEC09A	
Temp. Design For Exit. Channel Modification									
02L1AA0902	Design preparation	25	25	25SEP09A	27OCT09A	100	25SEP09A	27OCT09A	
02L1AA0912	Design submission to Design Checker	1	1	28OCT09A	28OCT09A	100	28OCT09A	28OCT09A	
02L1AA0922	Design certification by Design Checker	18	18	29OCT09A	15NOV09A	100	29OCT09A	15NOV09A	
02L1AA0932	Design submission to SO	1	1	16NOV09A	16NOV09A	100	16NOV09A	16NOV09A	
02L1AA0942	Design revew by SO	21	21	17NOV09A	07DEC09A	100	17NOV09A	07DEC09A	
02L1AA0952	Obtain design approval from SO	0	0		07DEC09A	100		07DEC09A	
Temp. Design for TBM Portal Strengtheing at I-1									
02L1AA1002	Design preparation	18	18	02DEC09A	10JAN11A	100	02DEC09A	10JAN11A	
02L1AA1012	Design submission to Design Checker	1	1	11JAN11A	11JAN11A	100	11JAN11A	11JAN11A	
02L1AA1022	Design certification by Design Checker	7	7	12JAN11A	22MAR11A	100	12JAN11A	22MAR11A	
02L1AA1032	Design submission to SO	1	1	11JAN11A	23MAR11A	100	11JAN11A	23MAR11A	
02L1AA1042	Design review by SO	21	21	12JAN11A	01APR11A	100	12JAN11A	01APR11A	
02L1AA1052	Obtain design approval from SO	0	0		01APR11A	100		01APR11A	
Geotechnical Instrumentation Stg 1 for GL Works									
3DL1AAG102	Design preparation by the Designer	14	14	22FEB08A	28APR08A	100	22FEB08A	28APR08A	
3DL1AAG104	Design certification by the Design Checker	7	7	29APR08A	16JUN08A	100	29APR08A	16JUN08A	
3DL1AAG106	Design submission for the SO's approval	1	1	10MAY08A	10MAY08A	100	10MAY08A	10MAY08A	
3DL1AAG108	Design review by the SO	14	14	12MAY08A	28AUG08A	100	12MAY08A	28AUG08A	
3DL1AAG110	Obtain design approval from the SO	0	0		28AUG08A	100		28AUG08A	
3DL1AAG112	Install Geotechnical Instruments	6	6	26MAY08A	26MAY08A	100	26MAY08A	26MAY08A	



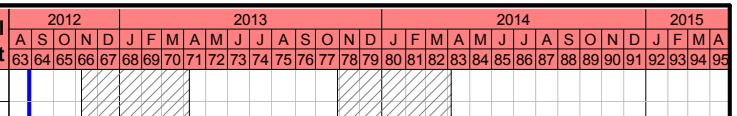
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
3DL1AAG114	Baseline Monitoring	14	14	27MAY08A	31MAY08A	100	27MAY08A	31MAY08A	
Geotechnical Instrumentation Stg 2 for Deep Exc.									
3DL1AAG202	Design preparation by the Designer	14	14	01DEC08A	24FEB09A	100	01DEC08A	24FEB09A	
3DL1AAG204	Design certification by the Design Checker	7	7	15DEC08A	25FEB09A	100	15DEC08A	25FEB09A	
3DL1AAG206	Design submission for the SO's approval	1	1	07JAN09A	25FEB09A	100	07JAN09A	25FEB09A	
3DL1AAG208	Design review by the SO	28	28	08JAN09A	24MAR09A	100	08JAN09A	24MAR09A	
3DL1AAG210	Obtain design approval from the SO	0	0		24MAR09A	100		24MAR09A	
3DL1AAG212	Install Geotechnical Instruments	28	28	09FEB09A	03NOV09A	100	09FEB09A	03NOV09A	
3DL1AAG214	Baseline Monitoring	6	6	18FEB09A	25MAR09A	100	18FEB09A	25MAR09A	
3DL1AAG216	Monitor/report Geotechnical Instrumentation	1,908	1,908	02JUN08A	30NOV13	76	02JUN08A	22AUG13	0
Design Packages for Works in Portion B									
Piling Platform to Construct H-pile Wall									
02L1BB0202	Design preparation by the Designer	15	15	24MAR08A	09MAY08A	100	24MAR08A	09MAY08A	
02L1BB0204	Design certification by the Design Checker	14	14	10MAY08A	08AUG08A	100	10MAY08A	08AUG08A	
02L1BB0206	Design submission for the SO's approval	1	1	21MAY08A	08AUG08A	100	21MAY08A	08AUG08A	
02L1BB0208	Design review by the SO	21	21	22MAY08A	25SEP08A	100	22MAY08A	25SEP08A	
02L1BB0210	Obtain design approval from the SO	0	0		25SEP08A	100		25SEP08A	
Temp. Platform to Construct Drop Shafts									
02L1BB0302	Design preparation by the Designer	22	22	04AUG08A	11DEC08A	100	04AUG08A	11DEC08A	
02L1BB0303	Design submission for the DC's approval	2	2	11DEC08A	12FEB09A	100	11DEC08A	12FEB09A	
02L1BB0304	Design certification by the Design Checker	14	14	12DEC08A	25FEB09A	100	12DEC08A	25FEB09A	
02L1BB0306	Design submission for the SO's approval	2	2	12DEC08A	25FEB09A	100	12DEC08A	25FEB09A	
02L1BB0308	Design review by the SO	21	21	13DEC08A	11MAR09A	100	13DEC08A	11MAR09A	
02L1BB0310	Obtain design approval from the SO	0	0		11MAR09A	100		11MAR09A	
Temporary Drainage Management Plan									
02L1BB0402	TDMP preparation by the Designer	313	313	05MAY08A	21MAR09A	100	05MAY08A	21MAR09A	
02L1BB0403	TDMP submission for the DC's approval	2	2	05AUG08A	23MAR09A	100	05AUG08A	23MAR09A	
02L1BB0404	TDMP certification by the Design Checker	213	213	06AUG08A	13APR09A	100	06AUG08A	13APR09A	
02L1BB0406	TDMP submission for the SO's approval	2	2	24SEP08A	14APR09A	100	24SEP08A	14APR09A	
02L1BB0408	TDMP review by the SO	90	90	25SEP08A	28OCT09A	100	25SEP08A	28OCT09A	
02L1BB0410	TDMP submission for DSD's approval	1	1	23SEP08A	23SEP08A	100	23SEP08A	23SEP08A	
02L1BB0412	TDMP review by the DSD	90	90	24SEP08A	02NOV09A	100	24SEP08A	02NOV09A	
02L1BB0414	Obtain DSD's approval for DDA	1	1	03NOV09A	03NOV09A	100	03NOV09A	03NOV09A	
02L1BB0416	Obtain SO's consent for TDMP	0	0		03NOV09A	100		03NOV09A	
Temp. Support Design for MAA/MAS/VDS/DC									
02L1BB0502	Design preparation for the AIP submission	272	272	02JUN08A	19MAR09A	100	02JUN08A	19MAR09A	
02L1BB0503	Design (AIP) submission for the DC's approval	2	2	11JUL08A	20MAR09A	100	11JUL08A	20MAR09A	
02L1BB0504	Design (AIP) certification by the Design Checker	60	60	12JUL08A	04APR09A	100	12JUL08A	04APR09A	
02L1BB0506	Design (AIP) submission for the SO's approval	2	2	24JUL08A	06APR09A	100	24JUL08A	06APR09A	
02L1BB0508	Design (AIP) review by the SO	66	66	25JUL08A	06JUN09A	100	25JUL08A	06JUN09A	
02L1BB0510	AIP submission for rel. authorities' approval	1	1	12JUL08A	12JUL08A	100	12JUL08A	12JUL08A	
02L1BB0512	Design (AIP) review by the rel. authorities	28	28	14JUL08A	10NOV08A	100	14JUL08A	10NOV08A	
02L1BB0514	Obtain rel. authorities's approval for AIP	1	1	11NOV08A	11NOV08A	100	11NOV08A	11NOV08A	



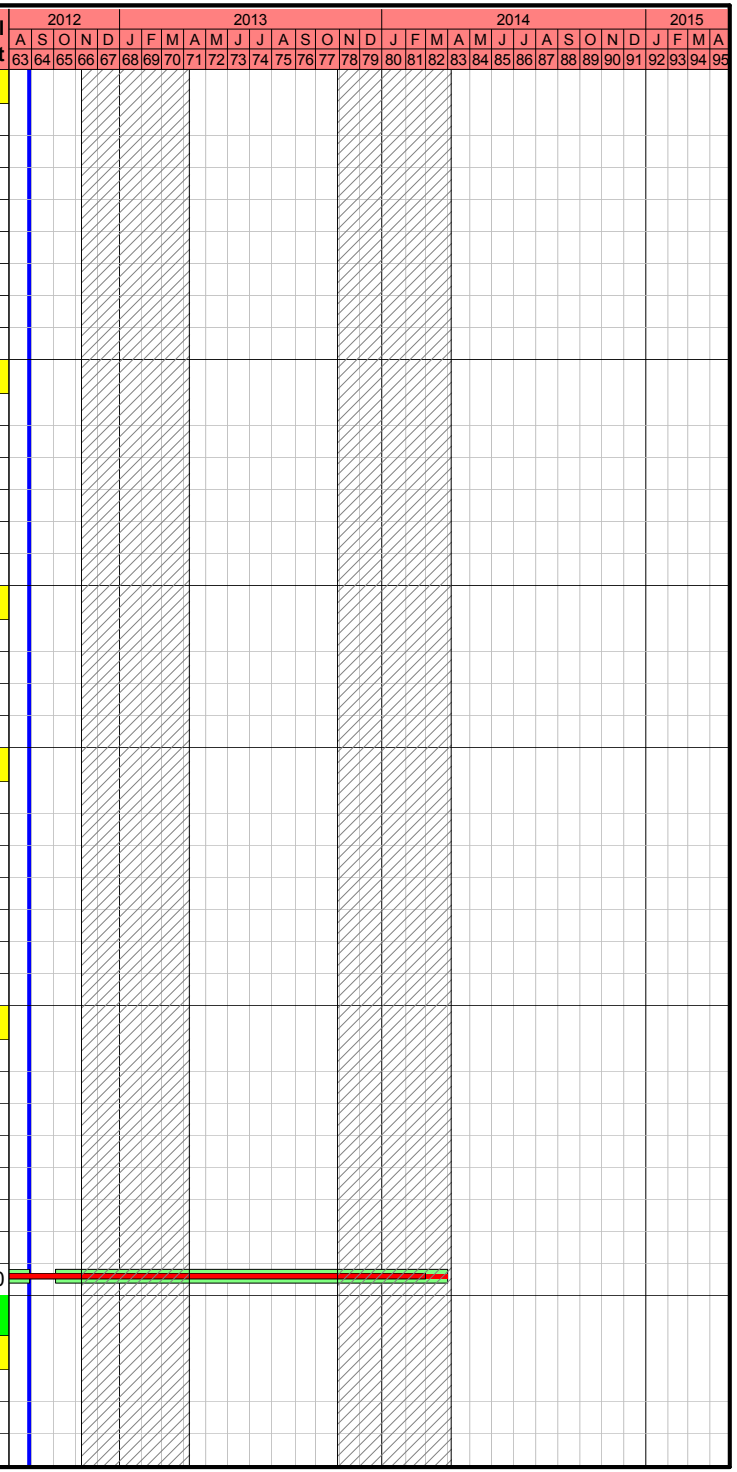
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1BB0516	SO submit design (AIP) for review of GEO	1	1	29MAY09A	29MAY09A	100	29MAY09A	29MAY09A	
02L1BB0518	Design (AIP) review by the GEO	28	28	30MAY09A	26AUG09A	100	30MAY09A	26AUG09A	
02L1BB0520	Obtain SO's consent for design (AIP)	0	0		06JUN09A	100		06JUN09A	
02L1BB0522	Design preparation for the DDA submission	30	30	04MAY09A	28MAY09A	100	04MAY09A	28MAY09A	
02L1BB0523	Design (DDA) submission for the DC's approval	1	1	01JUN09A	16JUL09A	100	01JUN09A	16JUL09A	
02L1BB0524	Design (DDA) certification by the Design Checker	80	80	02JUN09A	28DEC09A	100	02JUN09A	28DEC09A	
02L1BB0526	Design (DDA) submission for the SO's approval	2	2	07JUL09A	28DEC09A	100	07JUL09A	28DEC09A	
02L1BB0528	Design (DDA) review by the SO	66	66	08JUL09A	16DEC09A	100	08JUL09A	16DEC09A	
02L1BB0530	DDA submission for rel. authorities' approval	1	1	07NOV09A	07NOV09A	100	07NOV09A	07NOV09A	
02L1BB0532	Design (DDA) review by the rel. authorities	28	28	09NOV09A	06DEC09A	100	09NOV09A	06DEC09A	
02L1BB0534	Obtain rel. authorities's approval for DDA	1	1	07DEC09A	07DEC09A	100	07DEC09A	07DEC09A	
02L1BB0536	SO submit design (DDA) for review of GEO	1	1	05DEC09A	05DEC09A	100	05DEC09A	05DEC09A	
02L1BB0538	Design (DDA) review by the GEO	28	28	06DEC09A	09JAN10A	100	06DEC09A	09JAN10A	
02L1BB0540	Obtain SO's consent for design (DDA)	0	0		16DEC09A	100		16DEC09A	
Temp. Support Design for MA and MA/MT Connection									
02L1BB0602	Design preparation for the AIP submission	110	110	09JUN08A	08NOV09A	100	09JUN08A	08NOV09A	
02L1BB0603	Design (AIP) submission for the DC's approval	2	2	18MAY09A	09NOV09A	100	18MAY09A	09NOV09A	
02L1BB0604	Design (AIP) certification by the Design Checker	28	28	19MAY09A	25NOV09A	100	19MAY09A	25NOV09A	
02L1BB0606	Design (AIP) submission for the SO's approval	1	1	09NOV09A	09NOV09A	100	09NOV09A	09NOV09A	
02L1BB0608	Design (AIP) review by the SO	66	66	10NOV09A	10MAY10A	100	10NOV09A	10MAY10A	
02L1BB0616	SO submit design (AIP) for review of GEO	1	1	11MAY10A	11MAY10A	100	11MAY10A	11MAY10A	
02L1BB0618	Design (AIP) review by the GEO	28	28	12MAY10A	28JUN10A	100	12MAY10A	28JUN10A	
02L1BB0620	Obtain SO's consent for design (AIP)	0	0		10JUN10A	100		10JUN10A	
02L1BB0622	Design preparation for the DDA submission	30	30	28JUN10A	24AUG10A	100	28JUN10A	24AUG10A	
02L1BB0623	Design (DDA) submission for the DC's approval	1	1	25AUG10A	06DEC10A	100	25AUG10A	06DEC10A	
02L1BB0624	Design (DDA) certification by the Design Checker	28	28	26AUG10A	20DEC10A	100	26AUG10A	20DEC10A	
02L1BB0626	Design (DDA) submission for the SO's approval	1	1	25AUG10A	20DEC10A	100	25AUG10A	20DEC10A	
02L1BB0628	Design (DDA) review by the SO	66	66	26AUG10A	05JAN11A	100	26AUG10A	05JAN11A	
Permanent Design for MAA/MAS/VDS/DC									
02L1BB0702	Design preparation for the AIP submission	285	285	02JUN08A	02JUN09A	100	02JUN08A	02JUN09A	
02L1BB0703	Design submission for the DC's approval	2	2	03JUL08A	06JUL09A	100	03JUL08A	06JUL09A	
02L1BB0704	Design (AIP) certification by the Design Checker	60	60	24JUL08A	21JUL09A	100	24JUL08A	21JUL09A	
02L1BB0706	Design (AIP) submission for the SO's approval	2	2	04JUL08A	22JUL09A	100	04JUL08A	22JUL09A	
02L1BB0708	Design (AIP) review by the SO	66	66	05JUL08A	09DEC09A	100	05JUL08A	09DEC09A	
02L1BB0710	AIP submission for rel. authorities' approval	1	1	03JUL08A	03JUL08A	100	03JUL08A	03JUL08A	
02L1BB0712	Design (AIP) review by the rel. authorities	28	28	04JUL08A	28OCT09A	100	04JUL08A	28OCT09A	
02L1BB0714	Obtain rel. authorities's approval for AIP	1	1		10DEC09A	100		10DEC09A	
02L1BB0720	Obtain SO's consent for design (AIP)	0	0		10DEC09A	100		10DEC09A	
02L1BB0722	Design preparation for the DDA submission	30	30	04JAN10A	11AUG11A	100	04JAN10A	11AUG11A	
02L1BB0723	Design submission for the DC's approval	1	1	14MAY10A	24MAR11A	100	14MAY10A	24MAR11A	
02L1BB0724	Design (DDA) certification by the Design Checker	28	28	15MAY10A	11AUG11A	100	15MAY10A	11AUG11A	
02L1BB0726	Design (DDA) submission for the SO's approval	1	1	24MAY10A	11AUG11A	100	24MAY10A	11AUG11A	
02L1BB0728	Design (DDA) review by the SO	66	66	25MAY10A	02JAN12A	100	25MAY10A	02JAN12A	



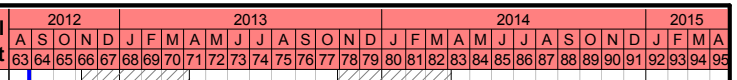
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1BB0730	DDA submission for rel. authorities' approval	1	1	19JAN12A	19JAN12A	100	19JAN12A	19JAN12A	
02L1BB0732	Design (DDA) review by the rel. authorities	28	28	20JAN12A	29FEB12A	100	20JAN12A	18MAR12	
02L1BB0734	Obtain rel. authorities's approval for DDA	0	1		29FEB12A	100	19MAR12	19MAR12	
02L1BB0740	Obtain SO's consent for design (DDA)	0	0		29FEB12A	100		19MAR12	
Permanent Design for MA and MA/MT Connection									
02L1BB0802	Design preparation for AIP submission	90	90	09JUN08A	14NOV09A	100	09JUN08A	14NOV09A	
02L1BB0803	Design (AIP) submission for the DC's approval	2	2	30JUN08A	16NOV09A	100	30JUN08A	16NOV09A	
02L1BB0804	Design (AIP) certification by the Design Checker	28	28	24JUL08A	02DEC09A	100	24JUL08A	02DEC09A	
02L1BB0806	Design (AIP) submission for the SO's approval	2	2	25JUL08A	03DEC09A	100	25JUL08A	03DEC09A	
02L1BB0808	Design (AIP) review by the SO	66	66	26JUL08A	28JUN10A	100	26JUL08A	28JUN10A	
02L1BB0810	AIP submission for rel. authorities' approval	1	1	20OCT08A	17JUN10A	100	20OCT08A	17JUN10A	
02L1BB0820	Obtain SO's consent for design (AIP)	0	0		28JUN10A	100		28JUN10A	
02L1BB0822	Design preparation for the DDA submission	30	30	28JUN10A	12APR12A	100	28JUN10A	01MAR12	
02L1BB0823	Design (DDA) submission for the DC's approval	1	1	31MAY11A	13APR12A	100	31MAY11A	02MAR12	
02L1BB0824	Design (DDA) certification by the Design Checker	28	28	01JUN11A	20APR12A	100	01JUN11A	12MAR12	
02L1BB0826	Design (DDA) submission for the SO's approval	1	1	31MAY11A	13APR12A	100	31MAY11A	13MAR12	
02L1BB0828	Design (DDA) review by the SO	66	66	01JUN11A	21APR12A	100	01JUN11A	11APR12	
02L1BB0830	DDA submission for rel. authorities' approval	1	1	05MAY12A	05MAY12A	100	12APR12	12APR12	
02L1BB0832	Design (DDA) review by the rel. authorities	28	28	07MAY12A	07JUN12A	100	13APR12	10MAY12	
02L1BB0834	Obtain rel. authorities's approval for DDA	0	1		08JUN12A	100	11MAY12	11MAY12	
02L1BB0840	Obtain SO's consent for design (DDA)	0	0		08JUN12A	100		11MAY12	
ELS for L-shapped Retaining Wall									
02L1BB0902	Design preparation by the Designer	14	14	05JUL10A	31AUG10A	100	05JUL10A	31AUG10A	
02L1BB0903	Design submission for the DC's approval	1	1	01SEP10A	01SEP10A	100	01SEP10A	01SEP10A	
02L1BB0904	Design certification by the Design Checker	28	28	02SEP10A	04NOV10A	100	02SEP10A	04NOV10A	
02L1BB0906	Design submission for the SO's approval	1	1	05OCT10A	05OCT10A	100	05OCT10A	05OCT10A	
02L1BB0908	Design review by the SO	42	42	06OCT10A	17NOV10A	100	06OCT10A	17NOV10A	
02L1BB0910	Obtain design approval from the SO	0	0		17NOV10A	100		17NOV10A	
Platform for RCD Operation (Air Vent Shaft)									
02L1BB1602	Prepare design/method statement	6	6	22NOV08A	01DEC08A	100	22NOV08A	01DEC08A	
02L1BB1604	Submit design/method statement to Design Checker	1	1	02DEC08A	23DEC08A	100	02DEC08A	23DEC08A	
02L1BB1606	Certify design/m.s. by Design Checker	7	7	03DEC08A	24DEC08A	100	03DEC08A	24DEC08A	
02L1BB1608	Submit design/m.s. to SO	1	1	24DEC08A	24DEC08A	100	24DEC08A	24DEC08A	
02L1BB1610	Design/m.s. review by SO	14	14	25DEC08A	11MAR09A	100	25DEC08A	11MAR09A	
02L1BB1612	Obtain design/m.s. approval from the SO	0	0		11MAR09A	100		11MAR09A	
Temporary Works for Air Vent Shaft Construction									
02L1BB1702	Prepare design/method statement	21	21	03NOV08A	16DEC08A	100	03NOV08A	16DEC08A	
02L1BB1704	Submit design/method statement to Design Checker	1	1	17DEC08A	17DEC08A	100	17DEC08A	17DEC08A	
02L1BB1706	Certify design/m.s. by Design Checker	14	14	18DEC08A	23JAN09A	100	18DEC08A	23JAN09A	
02L1BB1708	Submit design/m.s. to SO	1	1	23JAN09A	23JAN09A	100	23JAN09A	23JAN09A	
02L1BB1710	Design/m.s. review by SO	7	7	24JAN09A	23MAR09A	100	24JAN09A	23MAR09A	
02L1BB1712	Obtain design/m.s. approval from the SO	0	0		23MAR09A	100		23MAR09A	



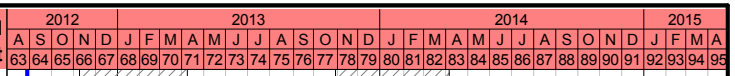
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Permanet Design for Air Vent Shaft									
02L1BB1802	Prepare design/method statement	60	60	05NOV08A	24NOV09A	100	05NOV08A	24NOV09A	
02L1BB1804	Submit design/method statement to Design Checker	2	2	12DEC08A	25NOV09A	100	12DEC08A	25NOV09A	
02L1BB1806	Certify design/m.s. by Design Checker	28	28	13DEC08A	02DEC09A	100	13DEC08A	02DEC09A	
02L1BB1808	Submit design/m.s. to SO	2	2	17DEC08A	03DEC09A	100	17DEC08A	03DEC09A	
02L1BB1810	Design/m.s. review by SO	42	42	18DEC08A	04FEB10A	100	18DEC08A	04FEB10A	
02L1BB1812	Submit design to rel. authorities	1	1	25MAR09A	25MAR09A	100	25MAR09A	25MAR09A	
02L1BB1814	Obtain design approval from rel. authorities	28	28	01MAR09A	08DEC09A	100	01MAR09A	08DEC09A	
02L1BB1816	Obtain design/m.s. approval from the SO	0	0		04FEB10A	100		04FEB10A	
ELS Design for Construction of Vortex Shaft									
02L1BB1902	Design preparation by the Designer	25	25	23FEB09A	02JUN09A	100	23FEB09A	02JUN09A	
02L1BB1904	Design submission for the DC's approval	1	1	03JUN09A	03JUN09A	100	03JUN09A	03JUN09A	
02L1BB1906	Design certification by the Design Checker	28	28	04JUN09A	10NOV09A	100	04JUN09A	10NOV09A	
02L1BB1908	Design submission for the SO's approval	1	1	12JUN09A	12JUN09A	100	12JUN09A	12JUN09A	
02L1BB1910	Design review by the SO	42	42	13JUN09A	09DEC09A	100	13JUN09A	09DEC09A	
02L1BB1912	Obtain design approval from the SO	0	0		09DEC09A	100		09DEC09A	
Blasting Assessment Report (BAR)									
02L1BBAR02	Prepare submit BAR Feasibiliti Study Report	31	31	03MAY10A	08JUN10A	100	03MAY10A	08JUN10A	
02L1BBAR12	Prepare/submit BAR to SOR	83	83	09JUN10A	15SEP10A	100	09JUN10A	15SEP10A	
02L1BBAR22	Prepare/submit BAR to CEDD	94	94	09JUN10A	29SEP10A	100	09JUN10A	29SEP10A	
02L1BBAR32	Obtain Blasting Permit From Rel. Authorities	183	183	30SEP10A	22JUL11A	100	30SEP10A	22JUL11A	
Geotechnical Instrumentation Stg 1 for GL Works									
3DL1BBG102	Design preparation by the Designer	14	14	22FEB08A	05MAY08A	100	22FEB08A	05MAY08A	
3DL1BBG104	Design certification by the Design Checker	7	7	06MAY08A	29AUG08A	100	06MAY08A	29AUG08A	
3DL1BBG106	Design submission for the SO's approval	1	1	10MAY08A	10MAY08A	100	10MAY08A	10MAY08A	
3DL1BBG108	Design review by the SO	14	14	12MAY08A	14JUL08A	100	12MAY08A	14JUL08A	
3DL1BBG110	Obtain design approval from the SO	0	0		14JUL08A	100		14JUL08A	
3DL1BBG112	Install Geotechnical Instruments	6	6	11JUN08A	19JUL08A	100	11JUN08A	19JUL08A	
3DL1BBG114	Baseline Monitoring	14	14	21JUL08A	26JUL08A	100	21JUL08A	26JUL08A	
Geotechnical Instrumentation Stg 2 for Deep Exc.									
3DL1BBG202	Design preparation by the Designer	40	40	31AUG08A	24OCT08A	100	31AUG08A	24OCT08A	
3DL1BBG204	Design certification by the Design Checker	14	14	24OCT08A	22JUL09A	100	24OCT08A	22JUL09A	
3DL1BBG206	Design submission for the SO's approval	1	1	05NOV08A	23JUL09A	100	05NOV08A	23JUL09A	
3DL1BBG208	Design review by the SO	28	28	06NOV08A	04AUG09A	100	06NOV08A	04AUG09A	
3DL1BBG210	Obtain design approval from the SO	0	0		04AUG09A	100		04AUG09A	
3DL1BBG212	Install Geotechnical Instruments	12	12	14MAR09A	27MAR09A	100	14MAR09A	27MAR09A	
3DL1BBG214	Baseline Monitoring	14	14	11JUN09A	24JUN09A	100	11JUN09A	24JUN09A	
3DL1BBG216	Monitor/report Geotechnical Instrumentation	2,040	2,040	28JUL08A	01APR14	73	28JUL08A	28FEB14	0
Design Packages for Works in Portion C									
Piling Platform for H-pile Wall A									
02L1CC0002	Design preparation by the Designer	15	15	12MAY08A	27JUN08A	100	12MAY08A	27JUN08A	
02L1CC0004	Design certification by the Design Checker	14	14	22MAY08A	03JUL08A	100	22MAY08A	03JUL08A	
02L1CC0006	Design submission for the SO's approval	1	1	04JUL08A	04JUL08A	100	04JUL08A	04JUL08A	



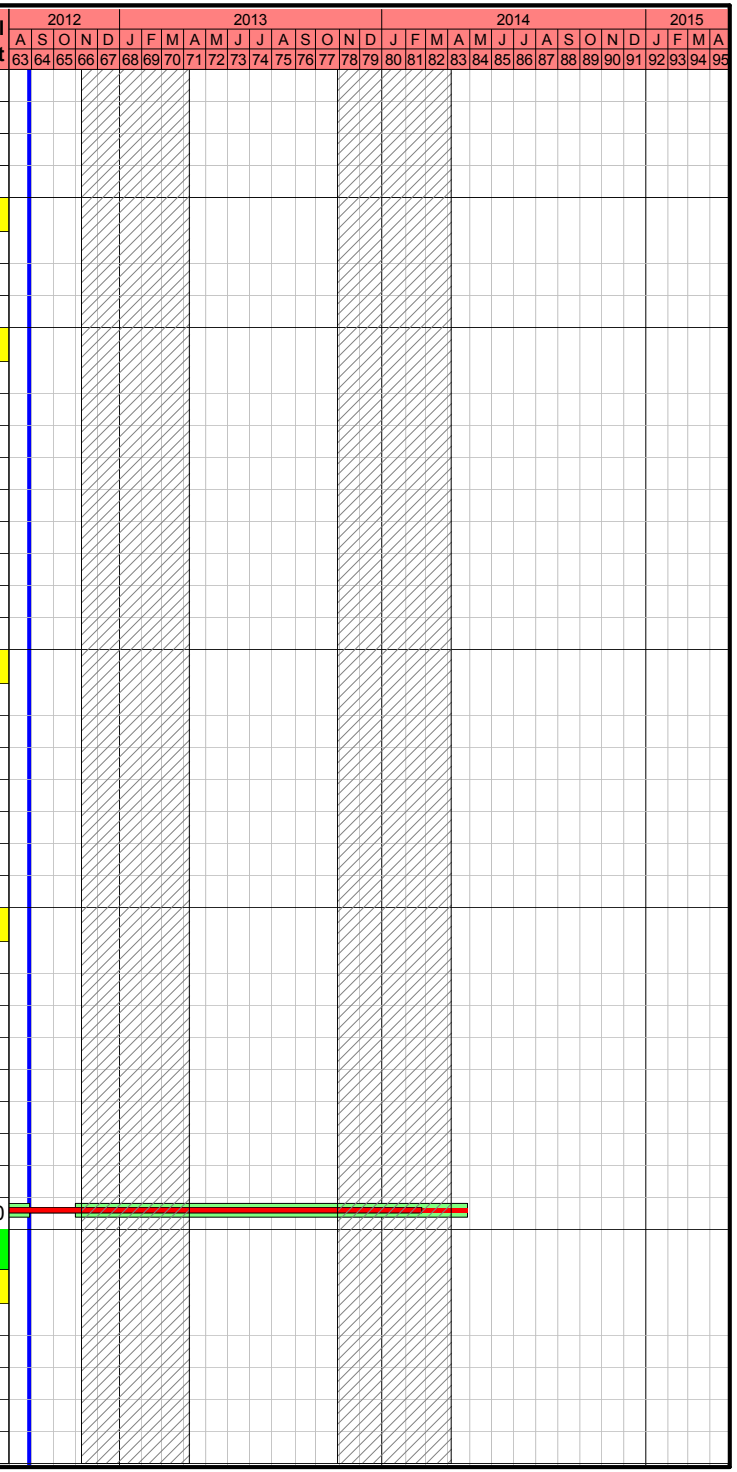
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1CC0008	Design review by the SO	14	14	05JUL08A	29JUL08A	100	05JUL08A	29JUL08A	
02L1CC0010	Obtain design approval from the SO	0	0		29JUL08A	100		29JUL08A	
Temporary Works for Formation of Access Road									
02L1CC0102	Design preparation by the Designer	40	40	29SEP08A	01DEC08A	100	29SEP08A	01DEC08A	
02L1CC0103	Design submission for the DC's approval	1	1	02DEC08A	02DEC08A	100	02DEC08A	02DEC08A	
02L1CC0104	Design certification by the Design Checker	14	14	03DEC08A	08DEC08A	100	03DEC08A	08DEC08A	
02L1CC0106	Design submission for the SO's approval	1	1	09DEC08A	09DEC08A	100	09DEC08A	09DEC08A	
02L1CC0108	Design review by the SO	28	28	10DEC08A	23MAR09A	100	10DEC08A	23MAR09A	
02L1CC0110	Obtain design approval from the SO	0	0		23MAR09A	100		23MAR09A	
Piling Platform for H-pile Wall B									
02L1CC0202	Design preparation by the Designer	30	30	01SEP09A	02NOV09A	100	01SEP09A	02NOV09A	
02L1CC0203	Design submission for the DC's approval	1	1	03NOV09A	03NOV09A	100	03NOV09A	03NOV09A	
02L1CC0204	Design certification by the Design Checker	28	28	04NOV09A	01DEC09A	100	04NOV09A	01DEC09A	
02L1CC0206	Design submission for the SO's approval	2	2	03NOV09A	03NOV09A	100	03NOV09A	03NOV09A	
02L1CC0208	Design review by the SO	42	42	04NOV09A	06MAR10A	100	04NOV09A	06MAR10A	
02L1CC0210	Obtain design approval from the SO	0	0		06MAR10A	100		06MAR10A	
Temp. Support Design for MAA/MAS/VDS/DC/AVS									
02L1CC0302	Design preparation for the AIP submission	103	103	26JUN08A	09MAY09A	100	26JUN08A	09MAY09A	
02L1CC0303	Design (AIP) submission for the DC's approval	2	2	23DEC08A	15MAY09A	100	23DEC08A	15MAY09A	
02L1CC0304	Design (AIP) certification by the Design Checker	28	28	24DEC08A	19MAY09A	100	24DEC08A	19MAY09A	
02L1CC0306	Design (AIP) submission for the SO's approval	2	2	23DEC08A	19MAY09A	100	23DEC08A	19MAY09A	
02L1CC0308	Design (AIP) review by the SO	66	66	24DEC08A	05JUN09A	100	24DEC08A	05JUN09A	
02L1CC0310	AIP submission for rel. authorities' approval	1	1	16JUN09A	16JUN09A	100	16JUN09A	16JUN09A	
02L1CC0312	Design (AIP) review by the rel. authorities	28	28	17JUN09A	14NOV09A	100	17JUN09A	14NOV09A	
02L1CC0314	Obtain rel. authorities's approval for AIP	1	1	16NOV09A	16NOV09A	100	16NOV09A	16NOV09A	
02L1CC0316	SO submit design (AIP) for review of GEO	1	1	28OCT09A	28OCT09A	100	28OCT09A	28OCT09A	
02L1CC0318	Design (AIP) review by the GEO	28	28	29OCT09A	25NOV09A	100	29OCT09A	25NOV09A	
02L1CC0320	Obtain SO's consent for design (AIP)	0	0		05JUN09A	100		05JUN09A	
02L1CC0322	Design preparation for the DDA submission	30	30	07JUN09A	24NOV09A	100	07JUN09A	24NOV09A	
02L1CC0323	Design (DDA) submission for the DC's approval	2	2	07JUL09A	25NOV09A	100	07JUL09A	25NOV09A	
02L1CC0324	Design (DDA) certification by the Design Checker	28	28	08JUL09A	02DEC09A	100	08JUL09A	02DEC09A	
02L1CC0326	Design (DDA) submission for the SO's approval	1	1	07JUL09A	03DEC09A	100	07JUL09A	03DEC09A	
02L1CC0328	Design (DDA) review by the SO	66	66	08JUL09A	22FEB10A	100	08JUL09A	22FEB10A	
02L1CC0330	DDA submission for rel. authorities' approval	1	1		07JUL09A	100		07JUL09A	
02L1CC0332	Design (DDA) review by the rel. authorities	28	28	25NOV09A	22FEB10A	100	25NOV09A	22FEB10A	
02L1CC0334	Obtain rel. authorities's approval for DDA	1	1	22FEB10A	22FEB10A	100	22FEB10A	22FEB10A	
02L1CC0336	SO submit design (DDA) for review of GEO	1	1	10DEC09A	10DEC09A	100	10DEC09A	10DEC09A	
02L1CC0338	Design (DDA) review by the GEO	28	28	11DEC09A	22FEB10A	100	11DEC09A	22FEB10A	
02L1CC0340	Obtain SO's consent for design (DDA)	0	0		22FEB10A	100		22FEB10A	
Temp. Support Design for MA and MA/MT Connection									
02L1CC0402	Design preparation for the AIP submission	110	110	18AUG08A	20OCT09A	100	18AUG08A	20OCT09A	
02L1CC0403	Design (AIP) submission for the DC's approval	2	2	05MAY09A	21OCT09A	100	05MAY09A	21OCT09A	
02L1CC0404	Design (AIP) certification by the Design Checker	28	28	06MAY09A	27OCT09A	100	06MAY09A	27OCT09A	



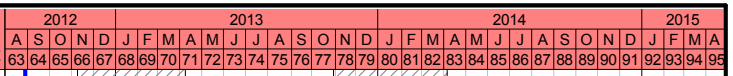
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1CC0406	Design (AIP) submission for the SO's approval	1	1	27OCT09A	27OCT09A	100	27OCT09A	27OCT09A	
02L1CC0408	Design (AIP) review by the SO	66	66	28OCT09A	10MAY10A	100	28OCT09A	10MAY10A	
02L1CC0416	SO submit design (AIP) for review of GEO	1	1	11MAY10A	11MAY10A	100	11MAY10A	11MAY10A	
02L1CC0418	Design (AIP) review by the GEO	28	28	12MAY10A	28JUN10A	100	12MAY10A	28JUN10A	
02L1CC0420	Obtain SO's consent for design (AIP)	0	0		28JUN10A	100		28JUN10A	
02L1CC0422	Design preparation for the DDA submission	30	30	29JUN10A	30NOV10A	100	29JUN10A	30NOV10A	
02L1CC0423	Design submission for the DC's approval	1	1	01DEC10A	01DEC10A	100	01DEC10A	01DEC10A	
02L1CC0424	Design (DDA) certification by the Design Checker	28	28	02DEC10A	21DEC10A	100	02DEC10A	21DEC10A	
02L1CC0426	Design (DDA) submission for the SO's approval	1	1	22DEC10A	22DEC10A	100	22DEC10A	22DEC10A	
02L1CC0428	Design (DDA) review by the SO	66	66	23DEC10A	05JAN11A	100	23DEC10A	05JAN11A	
Permanent Design for MAA/MAS/VDS/DC/AVS									
02L1CC0502	Design preparation for the AIP submission	103	103	26JUN08A	04MAY09A	100	26JUN08A	04MAY09A	
02L1CC0503	Design submission for the DC's approval	2	2	11OCT08A	05MAY09A	100	11OCT08A	05MAY09A	
02L1CC0504	Design (AIP) certification by the Design Checker	28	28	13OCT08A	19MAY09A	100	13OCT08A	19MAY09A	
02L1CC0506	Design (AIP) submission for the SO's approval	4	4	05NOV08A	20JUL09A	100	05NOV08A	20JUL09A	
02L1CC0508	Design (AIP) review by the SO	66	66	06NOV08A	23DEC09A	100	06NOV08A	23DEC09A	
02L1CC0510	AIP submission for rel. authorities' approval	1	1	28FEB09A	28FEB09A	100	28FEB09A	28FEB09A	
02L1CC0512	Design (AIP) review by the rel. authorities	28	28	01MAR09A	28MAY09A	100	01MAR09A	28MAY09A	
02L1CC0514	Obtain rel. authorities's approval for AIP	1	1	29MAY09A	29MAY09A	100	29MAY09A	29MAY09A	
02L1CC0516	SO submit design (AIP) for review of GEO	1	1	28FEB09A	28FEB09A	100	28FEB09A	28FEB09A	
02L1CC0518	Design (AIP) review by the GEO	28	28	01MAR09A	28MAY09A	100	01MAR09A	28MAY09A	
02L1CC0520	Obtain SO's consent for design (AIP)	0	0		23DEC09A	100		23DEC09A	
02L1CC0522	Design preparation for the DDA submission	60	60	09MAR09A	11AUG11A	100	09MAR09A	11AUG11A	
02L1CC0523	Design submission for the DC's approval	1	1	08JUN11A	11AUG11A	100	08JUN11A	11AUG11A	
02L1CC0524	Design (DDA) certification by the Design Checker	28	28	19JUN10A	11AUG11A	100	19JUN10A	11AUG11A	
02L1CC0526	Design (DDA) submission for the SO's approval	1	1	18JUN10A	11AUG11A	100	18JUN10A	11AUG11A	
02L1CC0528	Design (DDA) review by the SO	66	66	19JUN10A	28DEC11A	100	19JUN10A	28DEC11A	
02L1CC0530	DDA submission for rel. authorities' approval	1	1	14JAN12A	14JAN12A	100	14JAN12A	14JAN12A	
02L1CC0532	Design (DDA) review by the rel. authorities	28	28	15JAN12A	29FEB12A	100	15JAN12A	13MAR12	
02L1CC0534	Obtain rel. authorities's approval for DDA	0	1		29FEB12A	100	14MAR12	14MAR12	
02L1CC0540	Obtain SO's consent for design (DDA)	0	0		29FEB12A	100		14MAR12	
Permanent Design for MA and MA/MT Connection									
02L1CC0602	Design preparation for the AIP submission	84	84	01JUL08A	20OCT09A	100	01JUL08A	20OCT09A	
02L1CC0603	Design (AIP) submission for the DC's approval	2	2	25JUL08A	21OCT09A	100	25JUL08A	21OCT09A	
02L1CC0604	Design (AIP) certification by the Design Checker	28	28	26JUL08A	27OCT09A	100	26JUL08A	27OCT09A	
02L1CC0606	Design (AIP) submission for the SO's approval	2	2	26JUL08A	28OCT09A	100	26JUL08A	28OCT09A	
02L1CC0608	Design (AIP) review by the SO	66	66	28JUL08A	14JUL10A	100	28JUL08A	14JUL10A	
02L1CC0620	Obtain SO's consent for design (AIP)	0	0		14JUL10A	100		14JUL10A	
02L1CC0622	Design preparation for the DDA submission	30	30	15JUL10A	06AUG11A	100	15JUL10A	06AUG11A	
02L1CC0623	Design (DDA) submission for the DC's approval	1	1	08AUG11A	12APR12A	100	08AUG11A	28FEB12	
02L1CC0624	Design (DDA) certification by the Design Checker	28	28	09AUG11A	13APR12A	100	09AUG11A	04MAR12	
02L1CC0626	Design (DDA) submission for the SO's approval	1	1	09AUG11A	13APR12A	100	05MAR12	05MAR12	
02L1CC0628	Design (DDA) review by the SO	66	66	09AUG11A	21APR12A	100	09AUG11A	11APR12	



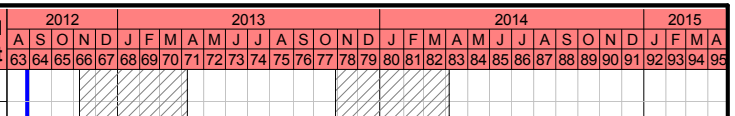
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1CC0630	DDA submission for rel. authorities' approval	1	1	05MAY12A	05MAY12A	100	12APR12	12APR12	
02L1CC0632	Design (DDA) review by the rel. authorities	28	28	07MAY12A	07JUN12A	100	13APR12	10MAY12	
02L1CC0634	Obtain rel. authorities's approval for DDA	0	1		08JUN12A	100	11MAY12	11MAY12	
02L1CC0640	Obtain SO's consent for design (DDA)	0	0		08JUN12A	100		11MAY12	
Boulder Assessment & Design for Stabili. Measure									
02L1CC0702	Boulder Surevey	30	30	02JUN08A	15AUG08A	100	02JUN08A	15AUG08A	
02L1CC0704	Prepare/submit boulder surevey report	25	25	14JUL08A	05SEP08A	100	14JUL08A	05SEP08A	
02L1CC0706	SO review boulder survey report	14	14	06SEP08A	19SEP08A	100	06SEP08A	19SEP08A	
Temporary Drainage Management Plan									
02L1CC0802	TDMP preparation by the Designer	14	14	04AUG08A	03SEP08A	100	04AUG08A	03SEP08A	
02L1CC0803	TDMP submission for the DC's approval	1	1	08SEP08A	08SEP08A	100	08SEP08A	08SEP08A	
02L1CC0804	TDMP certification by the Design Checker	28	28	09SEP08A	10DEC08A	100	09SEP08A	10DEC08A	
02L1CC0806	TDMP submission for the SO's approval	2	2	20OCT08A	11DEC08A	100	20OCT08A	11DEC08A	
02L1CC0808	TDMP review by the SO	90	90	21OCT08A	08JAN09A	100	21OCT08A	08JAN09A	
02L1CC0810	TDMP submission for DSD's approval	1	1	21OCT08A	21OCT08A	100	21OCT08A	21OCT08A	
02L1CC0812	TDMP review by the DSD	90	90	22OCT08A	08JAN09A	100	22OCT08A	08JAN09A	
02L1CC0814	Obtain DSD's approval for DDA	1	1	08JAN09A	08JAN09A	100	08JAN09A	08JAN09A	
02L1CC0816	Obtain SO's consent for TDMP	0	0		08JAN09A	100		08JAN09A	
Geotechnical Instrumentation Stg 1 for GL Works									
3DL1CCG102	Design preparation by the Designer	14	14	22FEB08A	29APR08A	100	22FEB08A	29APR08A	
3DL1CCG104	Design certification by the Design Checker	7	7	30APR08A	26MAY08A	100	30APR08A	26MAY08A	
3DL1CCG106	Design submission for the SO's approval	1	1	10MAY08A	26MAY08A	100	10MAY08A	26MAY08A	
3DL1CCG108	Design review by the SO	14	14	12MAY08A	14JUL08A	100	12MAY08A	14JUL08A	
3DL1CCG110	Obtain design approval from the SO	0	0		14JUL08A	100		14JUL08A	
3DL1CCG112	Install Geotechnical Instruments	19	19	24JUN08A	09AUG08A	100	24JUN08A	09AUG08A	
3DL1CCG114	Baseline Monitoring	14	14	26JUL08A	16AUG08A	100	26JUL08A	16AUG08A	
Geotechnical Instrumentation Stg 2 for Deep Exc.									
3DL1CCG202	Design preparation by the Designer	60	60	28AUG08A	04NOV08A	100	28AUG08A	04NOV08A	
3DL1CCG204	Design certification by the Design Checker	14	14	11NOV08A	01DEC08A	100	11NOV08A	01DEC08A	
3DL1CCG206	Design submission for the SO's approval	2	2	04NOV08A	02DEC08A	100	04NOV08A	02DEC08A	
3DL1CCG210	Design review by the SO	28	28	05NOV08A	24NOV09A	100	05NOV08A	24NOV09A	
3DL1CCG212	Obtain design approval from the SO	0	0		24NOV09A	100		24NOV09A	
3DL1CCG214	Install Geotechnical Instruments	18	18	14MAR09A	18JUN09A	100	14MAR09A	18JUN09A	
3DL1CCG215	Install additional Geotechnical instruments	30	30	06OCT09A	10NOV09A	100	06OCT09A	10NOV09A	
3DL1CCG216	Baseline Monitoring	14	14	19JUN09A	13NOV09A	100	19JUN09A	13NOV09A	
3DL1CCG218	Monitor/report Geotechnical Instrumentation	2,014	2,014	18AUG08A	28APR14	73	18AUG08A	22FEB14	0
Design Packages for Works in Portion D									
Temp. Access Rd Design at P. D; +14mPD to +69mPD									
02L1DD0102	Design preparation by the Designer	14	14	17JAN08A	16APR08A	100	17JAN08A	16APR08A	
02L1DD0104	Design certification by the Design Checker	150	150	17APR08A	13SEP08A	100	17APR08A	13SEP08A	
02L1DD0106	Design submission for the SO's approval	2	2	25APR08A	24SEP08A	100	25APR08A	24SEP08A	
02L1DD0108	Design review by the SO	90	90	26APR08A	04FEB09A	100	26APR08A	04FEB09A	
02L1DD0110	Design review by GEO	28	28	23JUN08A	29NOV08A	100	23JUN08A	29NOV08A	



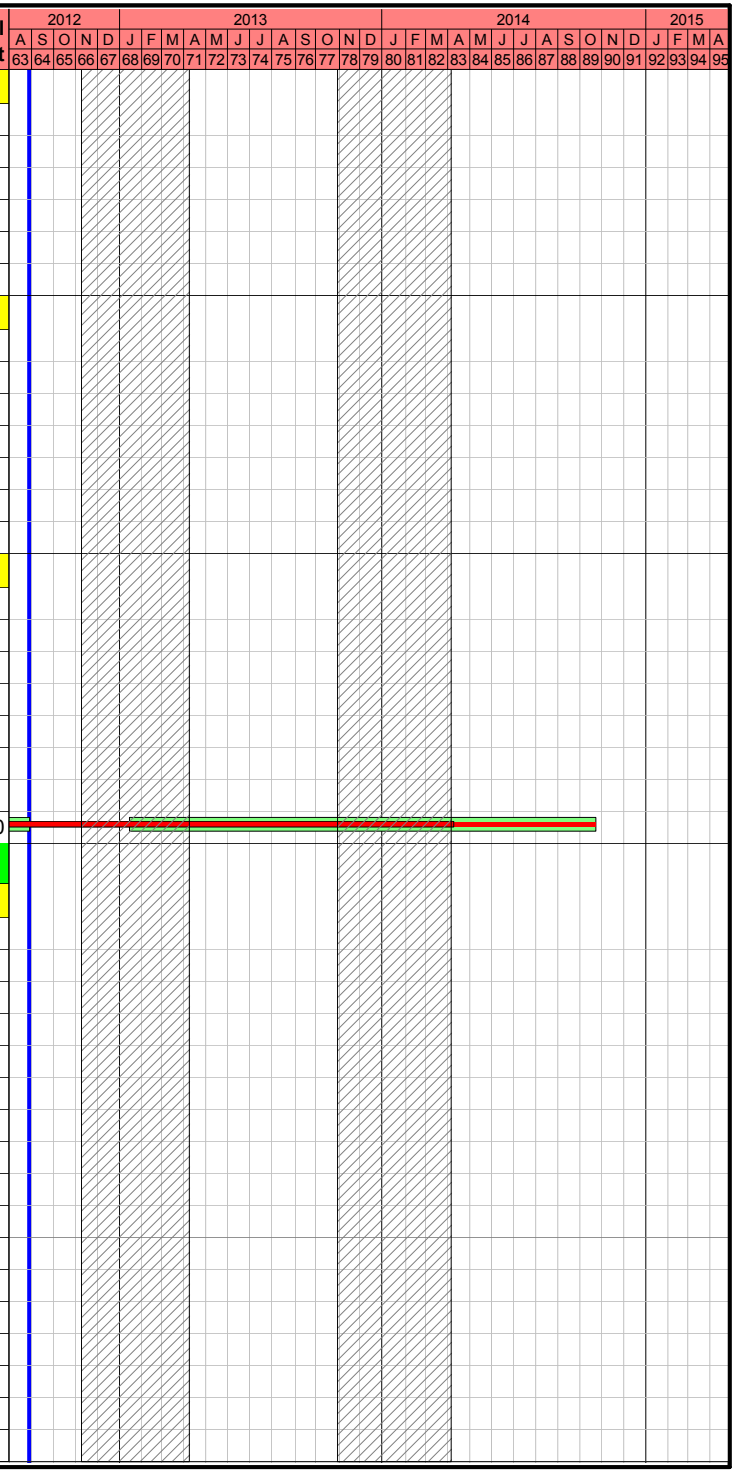
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1DD0112	Obtain design approval from the SO	0	0		04FEB09A	100		04FEB09A	
Boulder Assessment & Design for Stabili. Measure									
02L1DD0302	Boulder Surevey	14	14	03APR08A	11APR08A	100	03APR08A	11APR08A	
02L1DD0304	Prepare/submit boulder surevey report	25	25	12APR08A	26MAY08A	100	12APR08A	26MAY08A	
02L1DD0306	SO review boulder survey report	14	14	27MAY08A	16JUN08A	100	27MAY08A	16JUN08A	
Site Formation Design; +69mPD to +40mPD									
02L1DD0402	Design preparation by the Designer	14	14	17JAN08A	16APR08A	100	17JAN08A	16APR08A	
02L1DD0404	Design certification by the Design Checker	150	150	17APR08A	14NOV08A	100	17APR08A	14NOV08A	
02L1DD0406	Design submission for the SO's approval	2	2	25APR08A	14NOV08A	100	25APR08A	14NOV08A	
02L1DD0408	Design review by the SO	90	90	26APR08A	04DEC08A	100	26APR08A	04DEC08A	
02L1DD0412	Obtain design approval from the SO	0	0		04DEC08A	100		04DEC08A	
Site Formation Design; +40mPD to +24mPD									
02L1DD0502	Design preparation by the Designer	120	120	14APR08A	09MAY09A	100	14APR08A	09MAY09A	
02L1DD0504	Design certification by the Design Checker	145	145	05MAY08A	15MAY09A	100	05MAY08A	15MAY09A	
02L1DD0506	Design submission for the SO's approval	2	2	10MAY08A	29MAY09A	100	10MAY08A	29MAY09A	
02L1DD0508	Design review by the SO	90	90	12MAY08A	14AUG09A	100	12MAY08A	14AUG09A	
02L1DD0512	Obtain design approval from the SO	0	0		14AUG09A	100		14AUG09A	
Site Formation Design; +24mPD to 14mPD									
02L1DD0602	Design preparation by the Designer	60	60	28AUG08A	23APR09A	100	28AUG08A	23APR09A	
02L1DD0603	Design submission for the DC's approval	2	2	16JAN09A	24APR09A	100	16JAN09A	24APR09A	
02L1DD0604	Design certification by the Design Checker	28	28	19JAN09A	03AUG09A	100	19JAN09A	03AUG09A	
02L1DD0606	Design submission for the SO's approval	2	2	02FEB09A	04AUG09A	100	02FEB09A	04AUG09A	
02L1DD0608	Design review by the SO	63	63	03FEB09A	24JUN09A	100	03FEB09A	24JUN09A	
02L1DD0612	Obtain design approval from the SO	0	0		24JUN09A	100		24JUN09A	
TBM Launching Chamber Design									
02L1DD0702	Design (AIP) preparation by the Designer	381	381	21APR08A	11MAY09A	100	21APR08A	11MAY09A	
02L1DD0703	Design (AIP) submission for the DC's approval	3	3	28JUL08A	12MAY09A	100	28JUL08A	12MAY09A	
02L1DD0704	Design (AIP) certification by the Design Checker	37	37	21AUG08A	13MAY09A	100	21AUG08A	13MAY09A	
02L1DD0706	Design (AIP) submission for the SO's approval	3	3	28JUL08A	13MAY09A	100	28JUL08A	13MAY09A	
02L1DD0708	Design (AIP) review by the SO	280	280	29JUL08A	19MAY09A	100	29JUL08A	19MAY09A	
02L1DD0710	AIP submission for rel. authorities' approval	1	1	28AUG08A	28AUG08A	100	28AUG08A	28AUG08A	
02L1DD0712	Design (AIP) review by the rel. authorities	28	28	28FEB09A	27MAR09A	100	28FEB09A	27MAR09A	
02L1DD0714	Obtain rel. authorities's approval for AIP	0	0		19MAY09A	100		19MAY09A	
02L1DD0716	SO submit Design (AIP) for review of GEO	1	1	28FEB09A	28FEB09A	100	28FEB09A	28FEB09A	
02L1DD0718	Design (AIP) review by the GEO	28	28	01MAR09A	28MAY09A	100	01MAR09A	28MAY09A	
02L1DD0720	Obtain SO's consent for design (AIP)	0	0		19MAY09A	100		19MAY09A	
02L1DD0722	Design preparation for the DDA submission	30	30	07MAR09A	05JUN09A	100	07MAR09A	05JUN09A	
02L1DD0723	Design (DDA) submission for the DC's approval	1	1	06JUN09A	06JUN09A	100	06JUN09A	06JUN09A	
02L1DD0724	Design (DDA) certification by the Design Checker	28	28	07JUN09A	04AUG09A	100	07JUN09A	04AUG09A	
02L1DD0726	Design (DDA) submission for the SO's approval	2	2	06JUN09A	28OCT09A	100	06JUN09A	28OCT09A	
02L1DD0728	Design (DDA) review by the SO	66	66	07JUN09A	03NOV09A	100	07JUN09A	03NOV09A	
02L1DD0730	DDA submission for rel. authorities' approval	1	1	28OCT09A	28OCT09A	100	28OCT09A	28OCT09A	
02L1DD0732	Design (DDA) review by the rel. authorities	28	28	29OCT09A	25NOV09A	100	29OCT09A	25NOV09A	



ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1DD0734	Obtain rel. authorities's approval for DDA	1	1	26NOV09A	26NOV09A	100	26NOV09A	26NOV09A	
02L1DD0736	SO submit design (DDA) for review of GEO	0	0	27OCT09A	27OCT09A	100	27OCT09A	27OCT09A	
02L1DD0738	Design (DDA) review by the GEO	28	28	28OCT09A	24NOV09A	100	28OCT09A	24NOV09A	
02L1DD0740	Obtain SO's consent for design (DDA)	0	0		04NOV09A	100		04NOV09A	
Hopper Design									
02L1DD0802	Design preparation by the Designer	119	119	28FEB09A	13AUG09A	100	28FEB09A	13AUG09A	
02L1DD0803	Design submission for the DC's approval	1	1	14AUG09A	14AUG09A	100	14AUG09A	14AUG09A	
02L1DD0804	Design certification by the Design Checker	28	28	17AUG09A	13NOV09A	100	17AUG09A	13NOV09A	
02L1DD0806	Design submission for the SO's approval	1	1	14AUG09A	14NOV09A	100	14AUG09A	14NOV09A	
02L1DD0808	Design review by the SO	42	42	15AUG09A	01DEC09A	100	15AUG09A	01DEC09A	
02L1DD0810	Obtain design approval from the SO	0	0		01DEC09A	100		01DEC09A	
Steel Platform Design									
02L1DD0902	Design preparation by the Designer	82	82	02JAN09A	24MAR09A	100	02JAN09A	24MAR09A	
02L1DD0903	Design submission for the DC's approval	1	1	25MAR09A	25MAR09A	100	25MAR09A	25MAR09A	
02L1DD0904	Design certification by the Design Checker	28	28	26MAR09A	18JUL09A	100	26MAR09A	18JUL09A	
02L1DD0906	Design submission for the SO's approval	1	1	23JUN09A	18JUL09A	100	23JUN09A	18JUL09A	
02L1DD0908	Design review by the SO	42	42	24JUN09A	24JUL09A	100	24JUN09A	24JUL09A	
02L1DD0910	Obtain design approval from the SO	0	0		24JUL09A	100		24JUL09A	
Overhead Gantry Support & Noise Enclosure Design									
02L1DD1002	Design preparation by the Designer	82	82	02JAN09A	02NOV09A	100	02JAN09A	02NOV09A	
02L1DD1003	Design submission for the DC's approval	2	2	15JUN09A	03NOV09A	100	15JUN09A	03NOV09A	
02L1DD1004	Design certification by the Design Checker	28	28	16JUN09A	13OCT09A	100	16JUN09A	13OCT09A	
02L1DD1006	Design submission for the SO's approval	2	2	15JUN09A	13OCT09A	100	15JUN09A	13OCT09A	
02L1DD1008	Design review by the SO	42	42	16JUN09A	17NOV09A	100	16JUN09A	17NOV09A	
02L1DD1010	Obtain design approval from the SO	0	0		17NOV09A	100		17NOV09A	
ELS Design for Spiral Ramp									
02L1DD1102	Design preparation for the AIP submission	30	30	28MAY09A	16SEP09A	100	28MAY09A	16SEP09A	
02L1DD1103	Design (DDA) submission for the DC's approval	1	1	22JUN09A	16SEP09A	100	22JUN09A	16SEP09A	
02L1DD1104	Design (DDA) certification by the Design Checker	28	28	23JUN09A	07OCT09A	100	23JUN09A	07OCT09A	
02L1DD1106	Design (DDA) submission for the SO's approval	1	1	08OCT09A	08OCT09A	100	08OCT09A	08OCT09A	
02L1DD1108	Design (DDA) review by the SO	66	66	09OCT09A	07JUN10A	100	09OCT09A	07JUN10A	
02L1DD1114	Obtain rel. authorities's approval for DDA	1	1	26NOV09A	26NOV09A	100	26NOV09A	26NOV09A	
02L1DD1116	SO submit design (DDA) for review of GEO	0	0		12MAY10A	100		12MAY10A	
02L1DD1118	Design (DDA) review by the GEO	28	28	13MAY10A	04JUN10A	100	13MAY10A	04JUN10A	
02L1DD1120	Obtain SO's consent for design (DDA)	0	0		07JUN10A	100		07JUN10A	
Temp. Design for Box Culvert Opon Cut									
02L1DD1202	Design preparation for the DDA submission	80	80	27JUN09A	28FEB10A	100	27JUN09A	28FEB10A	
02L1DD1203	Design (DDA) submission for the DC's approval	1	1	01MAR10A	27JUL10A	100	01MAR10A	27JUL10A	
02L1DD1204	Design (DDA) certification by the Design Checker	28	28	02MAR10A	06DEC10A	100	02MAR10A	06DEC10A	
02L1DD1206	Design (DDA) submission for the SO's approval	1	1	19MAR10A	07DEC10A	100	19MAR10A	07DEC10A	
02L1DD1208	Design (DDA) review by the SO	66	66	20MAR10A	16DEC10A	100	20MAR10A	16DEC10A	
02L1DD1220	Obtain SO's consent for design (DDA)	0	0		16DEC10A	100		16DEC10A	

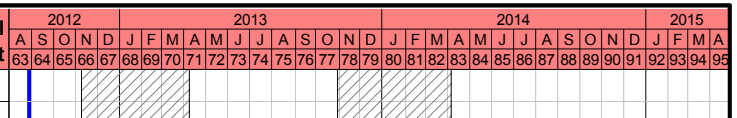


ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Temporary Drainage Management Plan									
02L1DD1302	TDMP preparation by the Designer	225	225	05MAY08A	27MAR09A	100	05MAY08A	27MAR09A	
02L1DD1303	TDMP submission for the DC's approval	2	2	08AUG08A	29MAY09A	100	08AUG08A	29MAY09A	
02L1DD1304	TDMP certification by the Design Checker	28	28	09AUG08A	06JUN09A	100	09AUG08A	06JUN09A	
02L1DD1306	TDMP submission for the SO's approval	2	2	08AUG08A	08JUN09A	100	08AUG08A	08JUN09A	
02L1DD1308	TDMP review by the SO	90	90	08AUG08A	16AUG11A	100	08AUG08A	16AUG11A	
02L1DD1316	Obtain SO's consent for TDMP	0	0		16AUG11A	100		16AUG11A	
Geotechnical Instrumentation Stg 1 for GL Works									
3DL1DDG102	Design preparation by the Designer	14	14	22FEB08A	24APR08A	100	22FEB08A	24APR08A	
3DL1DDG104	Design certification by the Design Checker	7	7	25APR08A	16JUN08A	100	25APR08A	16JUN08A	
3DL1DDG106	Design submission for the SO's approval	1	1	25APR08A	16JUN08A	100	25APR08A	16JUN08A	
3DL1DDG108	Design review by the SO	14	14	26APR08A	14JUL08A	100	26APR08A	14JUL08A	
3DL1DDG110	Obtain design approval from the SO	0	0		14JUL08A	100		14JUL08A	
3DL1DDG112	Install Geotechnical Instruments	10	10	04JUN08A	05JUL08A	100	04JUN08A	05JUL08A	
3DL1DDG114	Initial reading	14	14	18JUN08A	09JUL08A	100	18JUN08A	09JUL08A	
Geotechnical Instrumentation Stg 2 for Deep Exc.									
3DL1DDG202	Design preparation by the Designer	14	14	28MAY09A	31OCT09A	100	28MAY09A	31OCT09A	
3DL1DDG204	Design certification by the Design Checker	14	14	11JUN09A	04DEC09A	100	11JUN09A	04DEC09A	
3DL1DDG206	Design submission for the SO's approval	2	2	11JUN09A	04DEC09A	100	11JUN09A	04DEC09A	
3DL1DDG208	Design review by the SO	28	28	12JUN09A	16DEC10A	100	12JUN09A	16DEC10A	
3DL1DDG210	Obtain design approval from the SO	0	0		16DEC10A	100		16DEC10A	
3DL1DDG212	Install Geotechnical Instruments	18	18	09MAR10A	25MAR11A	100	09MAR10A	25MAR11A	
3DL1DDG214	Baseline Monitoring	14	14	24MAR10A	26MAR11A	100	24MAR10A	26MAR11A	
3DL1DDG216	Monitor/report Geotechnical Insturmentatation	2,098	2,098	10JUL08A	22OCT14	69	10JUL08A	10APR14	0
Design Packages for Works in Portion F									
Main Tunnel Design									
02L1FF0102	Design preparation for the AIP submission	414	414	08FEB08A	27MAR09A	100	08FEB08A	27MAR09A	
02L1FF0103	Design (AIP) submission for the DC's approval	2	2	02MAY08A	27MAR09A	100	02MAY08A	27MAR09A	
02L1FF0104	Design (AIP) certification by the Design Checker	28	28	03MAY08A	27MAR09A	100	03MAY08A	27MAR09A	
02L1FF0106	Design (AIP) submission for the SO's approval	1	1	10JUL08A	27MAR09A	100	10JUL08A	27MAR09A	
02L1FF0108	Design (AIP) review by the SO	66	66	11JUL08A	16JUN09A	100	11JUL08A	16JUN09A	
02L1FF0110	AIP submission for rel. authorities' approval	1	1	08JUL08A	08JUL08A	100	08JUL08A	08JUL08A	
02L1FF0112	Design (AIP) review by the rel. authorities	28	28	09JUL08A	05MAR09A	100	09JUL08A	05MAR09A	
02L1FF0114	Obtain rel. authorities's approval for AIP	1	1	06MAR09A	06MAR09A	100	06MAR09A	06MAR09A	
02L1FF0116	SO submit design (AIP) for review of GEO	1	1	16MAY09A	16JUN09A	100	16MAY09A	16JUN09A	
02L1FF0118	Design (AIP) review by the GEO	28	28	30MAY09A	03NOV09A	100	30MAY09A	03NOV09A	
02L1FF0120	Obtain SO's consent for design (AIP)	0	0		16JUN09A	100		16JUN09A	
02L1FF0122	Design preparation for the DDA submission	30	30	04NOV08A	10SEP09A	100	04NOV08A	10SEP09A	
02L1FF0123	Design (DDA) submission for the DC's approval	2	2	08JUN09A	11SEP09A	100	08JUN09A	11SEP09A	
02L1FF0124	Design (DDA) certification by the Design Checker	28	28	09JUN09A	17SEP09A	100	09JUN09A	17SEP09A	
02L1FF0126	Design (DDA) submission for the SO's approval	2	2	30JUN09A	18SEP09A	100	30JUN09A	18SEP09A	
02L1FF0128	Design (DDA) review by the SO	56	56	02JUL09A	10NOV09A	100	02JUL09A	10NOV09A	
02L1FF0130	DDA submission for rel. authorities' approval	1	1	25SEP09A	25SEP09A	100	25SEP09A	25SEP09A	

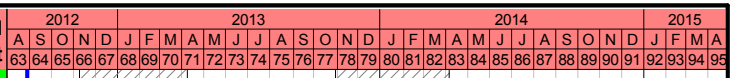


ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1FF0132	Design (DDA) review by the rel. authorities	28	28	26SEP09A	22NOV09A	100	26SEP09A	22NOV09A	
02L1FF0134	Obtain rel. authorities's approval for DDA	1	1	23NOV09A	23NOV09A	100	23NOV09A	23NOV09A	
02L1FF0136	SO submit design (DDA) for review of GEO	1	1	28OCT09A	28OCT09A	100	28OCT09A	28OCT09A	
02L1FF0138	Design (DDA) review by the GEO	28	28	29OCT09A	25NOV09A	100	29OCT09A	25NOV09A	
02L1FF0140	Obtain SO's consent for design (DDA)	0	0		27NOV09A	100		27NOV09A	
Impact Assessment on WSD Yau Kam Tau WTW									
02L1FF0202	Design preparation for the DDA submission	60	60	29APR08A	30JUN08A	100	29APR08A	30JUN08A	
02L1FF0203	Design (DDA) submission for the DC's approval	1	1	03JUL08A	03JUL08A	100	03JUL08A	03JUL08A	
02L1FF0204	Design (DDA) certification by the Design Checker	260	260	04JUL08A	18MAR09A	100	04JUL08A	18MAR09A	
02L1FF0206	Design (DDA) submission for the SO's approval	1	1	15JUL08A	18MAR09A	100	15JUL08A	18MAR09A	
02L1FF0208	Design (DDA) review by the SO	66	66	16JUL08A	31MAR09A	100	16JUL08A	31MAR09A	
02L1FF0210	DDA submission for rel. authorities' approval	1	1	10JUL08A	02APR09A	100	10JUL08A	02APR09A	
02L1FF0212	Design (DDA) review by the rel. authorities	28	28	11JUL08A	30OCT09A	100	11JUL08A	30OCT09A	
02L1FF0214	Obtain rel. authorities's approval for DDA	1	1	31OCT09A	31OCT09A	100	31OCT09A	31OCT09A	
02L1FF0220	Obtain SO's consent for design (DDA)	0	0		31MAR09A	100		31MAR09A	
Impact Assessment on WSD Tai Lam Chung WT No. 3									
02L1FF0302	Design preparation for the DDA submission	32	32	14APR08A	27JUN08A	100	14APR08A	27JUN08A	
02L1FF0303	Design submission for the DC's approval	1	1	27JUN08A	27JUN08A	100	27JUN08A	27JUN08A	
02L1FF0304	Design (DDA) certification by the Design Checker	285	285	28JUN08A	30MAY09A	100	28JUN08A	30MAY09A	
02L1FF0306	Design (DDA) submission for the SO's approval	1	1	15JUL08A	01JUN09A	100	15JUL08A	01JUN09A	
02L1FF0308	Design (DDA) review by the SO	66	66	16JUL08A	04DEC10A	100	16JUL08A	04DEC10A	
02L1FF0310	DDA submission for rel. authorities' approval	1	1	28OCT09A	28OCT09A	100	28OCT09A	28OCT09A	
02L1FF0312	Design (DDA) review by the rel. authorities	28	28	29OCT09A	11DEC10A	100	29OCT09A	11DEC10A	
02L1FF0314	Obtain rel. authorities's approval for DDA	0	0		11DEC10A	100		11DEC10A	
02L1FF0320	Obtain SO's consent for design (DDA)	0	0		11DEC10A	100		11DEC10A	
Impact Assessment on KCRC West Rail Tunnel									
02L1FF0402	Design preparation for the DDA submission	30	30	28APR08A	26JUN08A	100	28APR08A	26JUN08A	
02L1FF0403	Design submission for the DC's approval	1	1	26JUN08A	26JUN08A	100	26JUN08A	26JUN08A	
02L1FF0404	Design (DDA) certification by the Design Checker	90	90	27JUN08A	02APR09A	100	27JUN08A	02APR09A	
02L1FF0406	Design (DDA) submission for the SO's approval	2	2	15JUL08A	03APR09A	100	15JUL08A	03APR09A	
02L1FF0408	Design (DDA) review by the SO	267	267	16JUL08A	04JAN10A	100	16JUL08A	04JAN10A	
02L1FF0410	DDA submission for rel. authorities' approval	1	1	14JUL08A	14JUL08A	100	14JUL08A	14JUL08A	
02L1FF0412	Design (DDA) review by the rel. authorities	28	28	15JUL08A	23DEC09A	100	15JUL08A	23DEC09A	
02L1FF0414	Obtain rel. authorities's approval for DDA	1	1	23DEC09A	23DEC09A	100	23DEC09A	23DEC09A	
02L1FF0420	Obtain SO's consent for design (DDA)	0	0		05JAN10A	100		05JAN10A	
Impact Assessment on WSD Tsuen Wan Reservoir G.									
02L1FF0502	Design preparation for the DDA submission	30	30	05MAY08A	02JUL08A	100	05MAY08A	02JUL08A	
02L1FF0503	Design submission for the DC's approval	1	1	03JUL08A	03JUL08A	100	03JUL08A	03JUL08A	
02L1FF0504	Design (DDA) certification by the Design Checker	260	260	04JUL08A	24AUG09A	100	04JUL08A	24AUG09A	
02L1FF0506	Design (DDA) submission for the SO's approval	2	2	15JUL08A	15SEP09A	100	15JUL08A	15SEP09A	
02L1FF0508	Design (DDA) review by the SO	60	60	16JUL08A	02OCT09A	100	16JUL08A	02OCT09A	
02L1FF0510	DDA submission for rel. authorities' approval	1	1	10JUL08A	10JUL08A	100	10JUL08A	10JUL08A	
02L1FF0512	Design (DDA) review by the rel. authorities	28	28	11JUL08A	11NOV09A	100	11JUL08A	11NOV09A	

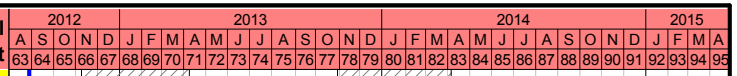
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
02L1FF0514	Obtain rel. authorities's approval for DDA	1	1	12NOV09A	12NOV09A	100	12NOV09A	12NOV09A	
02L1FF0520	Obtain SO's consent for design (DDA)	0	0		02OCT09A	100		02OCT09A	
Grout Trial at Foult Zone F1									
02L1FF0602	MS preparation for the DDA submission	12	12	02MAY08A	20MAY08A	100	02MAY08A	20MAY08A	
02L1FF0606	Ms (DDA) submission for the SO's approval	1	1	21MAY08A	21MAY08A	100	21MAY08A	21MAY08A	
02L1FF0608	MS (DDA) review by the SO	24	24	22MAY08A	17JUL08A	100	22MAY08A	17JUL08A	
02L1FF0620	Obtain SO's consent for MS (DDA)	0	0		17JUL08A	100		17JUL08A	
Geotechniucal Instrumentation									
3DL1FFGI02	Design preparation by the Designer	60	60	28AUG08A	23JAN09A	100	28AUG08A	23JAN09A	
3DL1FFGI04	Design certification by the Design Checker	14	14	24JAN09A	31OCT09A	100	24JAN09A	31OCT09A	
3DL1FFGI06	Design submission for the SO's approval	2	2	24JAN09A	28NOV09A	100	24JAN09A	28NOV09A	
3DL1FFGI08	Design review by the SO	56	56	24JAN09A	08APR10A	100	24JAN09A	08APR10A	
3DL1FFGI10	DDA submission for rel. authorities' approval	1	1	14MAR09A	14MAR09A	100	14MAR09A	14MAR09A	
3DL1FFGI12	Design (DDA) review by the rel. authorities	56	56	15MAR09A	11DEC09A	100	15MAR09A	11DEC09A	
3DL1FFGI14	Obtain rel. authorities's approval for DDA	1	1	12DEC09A	12DEC09A	100	12DEC09A	12DEC09A	
3DL1FFGI16	Obtain design approval from the SO	0	0		08APR10A	100		08APR10A	
3DL1FFGI18	Install geotechnical instrumentsation	90	90	03MAR10A	31JAN11A	100	03MAR10A	31JAN11A	
3DL1FFGI20	Baseline Monitoring	14	14	06MAR10A	05FEB11A	100	06MAR10A	05FEB11A	
3DL1FT0208	Maintain/monitor geotechnical instrumentation	1,196	1,196	28APR10A	17OCT13	66	28APR10A	06AUG13	-328
Design Packages for Works in Portion G									
Drainage Impact Assessment									
02L1GG0115	Information for catchment area by SOR	21	21	09OCT09A	03NOV09A	100	09OCT09A	03NOV09A	
02L1GG0125	Prepare DIA report	32	32	09OCT09A	24NOV09A	100	09OCT09A	24NOV09A	
02L1GG0135	Submission of DIA report to SOR/DSD	1	1	25NOV09A	25NOV09A	100	25NOV09A	25NOV09A	
02L1GG0145	SOR/DSD review/comment DIA report	28	28	25NOV09A	24DEC09A	100	25NOV09A	24DEC09A	
02L1GG0155	Revise DIA incorporating comments	12	12	28DEC09A	29JAN10A	100	28DEC09A	29JAN10A	
02L1GG0165	SOR/DSD review/approve DIA report	28	28	30JAN10A	16SEP11A	100	30JAN10A	16SEP11A	
02L1GG0175	Obtain consent from SOR and DSD	0	0		16SEP11A	100		16SEP11A	
Temp. Platform Design for H-Piling at Portion G									
02L1GG0202	Design preparation for the DDA submission	53	53	05OCT09A	03DEC09A	100	05OCT09A	03DEC09A	
02L1GG0203	Design (DDA) submission for the DC's approval	1	1	15DEC09A	15DEC09A	100	15DEC09A	15DEC09A	
02L1GG0204	Design (DDA) certification by the Design Checker	14	14	16DEC09A	14JAN10A	100	16DEC09A	14JAN10A	
02L1GG0206	Design (DDA) submission for the SO's approval	1	1	15JAN10A	15JAN10A	100	15JAN10A	15JAN10A	
02L1GG0208	Design (DDA) review by the SO	40	40	16JAN10A	23JUN10A	100	16JAN10A	23JUN10A	
02L1GG0228	Obtain design (DDA) approval from the SO	0	0		23JUN10A	100		23JUN10A	
ELS Design for Pipe Jacking at Portion G									
02L1GG0302	Design preparation for the DDA submission	15	15	21NOV09A	23JAN10A	100	21NOV09A	23JAN10A	
02L1GG0303	Design (DDA) submission for the DC's approval	1	1	25JAN10A	25JAN10A	100	25JAN10A	25JAN10A	
02L1GG0304	Design (DDA) certification by the Design Checker	14	14	26JAN10A	28APR10A	100	26JAN10A	28APR10A	
02L1GG0306	Design (DDA) submission for the SO's approval	1	1	29APR10A	29APR10A	100	29APR10A	29APR10A	
02L1GG0308	Design (DDA) review by the SO	28	28	30APR10A	04JUN10A	100	30APR10A	04JUN10A	
02L1GG0318	Obtain design (DDA) approval from the SO	0	0		04JUN10A	100		04JUN10A	



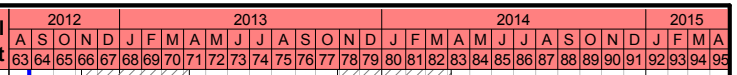
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Schedule of Milestones for Cost Centre No. 2L									
02L10D1002	2L 1; On submission of PDP to the SO	0	0		10JAN08A	100		10JAN08A	
02L10D1004	2L 2; On acception of PDP by the SO	0	0		04SEP08A	100		04SEP08A	
02L10D1006	2L 3; On submission of AIP to the SO; Portion A	0	0		12MAY09A	100		12MAY09A	
02L10D1008	2L 4; On acceptance of AIP by the SO; Portion A	0	0		25JUL09A	100		25JUL09A	
02L10D1010	2L 5; On subumission of DDA to the SO; Portion A	0	0		19NOV10A	100		28MAY12	
02L10D1012	2L 6; On acceptance of DDA by the SO; Portion A	0	0		24NOV10A	100		04AUG12	
02L10D1014	2L 7; On submission of AIP to the SO; Portion B	0	0		07JUL09A	100		07JUL09A	
02L10D1016	2L 8; On acceptance of AIP by the SO; Portion B	0	0		06OCT10A	100		06OCT10A	
02L10D1018	2L 9; On submission of DDA to the SO; Portion B	0	0		13APR12A	100		28MAY12	
02L10D1020	2L 10; On acceptance of DDA by the SO; Portion B	0	0		08JUN12A	100		11MAY12	
02L10D1022	2L 11; On submission of AIP to the SO; Portion C	0	0		25JUL09A	100		25JUL09A	
02L10D1024	2L 12; On acceptance of AIP by the SO; Portion C	0	0		06OCT10A	100		06OCT10A	
02L10D1026	2L 13; On submission of DDA to the SO; Portion C	0	0		13APR12A	100		28MAY12	
02L10D1028	2L 14; On acceptance of DDA by the SO; Portion C	0	0		08JUN12A	100		11MAY12	
02L10D1030	2L 15; On acceptance of AIP by the SO; Portion D	0	0		25JUL09A	100		25JUL09A	
02L10D1032	2L 16; On acceptance of DDA by the SO; Portion D	0	0		30JUL11A	100		30JUL11A	
02L10D1034	2L 17; On submission of AIP to the SO; Portion F	0	0		13JUL09A	100		13JUL09A	
02L10D1036	2L 18; On acceptance of AIP by the SO; Portion F	0	0		24JUN10A	100		24JUN10A	
02L10D1038	2L 19; On submission of DDA to the SO; Portion F	0	0		31JUL09A	100		28MAY12	
02L10D1040	2L 20; On acceptance of DDA by the SO; Portion F	0	0		28OCT09A	100		04AUG12	
02L10D1042	2L 21; On acceptance of AIP by the SO; Portion G	0	0		11JAN10A	100		11JAN10A	
02L10D1044	2L 22; On acceptance of DDA by the SO; Portion G	0	0		16SEP11A	100		27FEB12	
02L10D1046	2L 23; On completion of all works under this CC	0	0		08JUN12A	100		27FEB12	
Construction of Main Tunnel									
Trial Grout at Fault Zone F1									
3AL1FT0002	HyD issue XP	0	0		23JUL08A	100		23JUL08A	
3AL1FT0004	Adavance notice to HyD/Road advice	6	6	24JUL08A	30JUL08A	100	24JUL08A	30JUL08A	
3AL1FT0006	Trial pit excavation	4	4	31JUL08A	04AUG08A	100	31JUL08A	04AUG08A	
3AL1FT0010	Scaffolding, mobilize & set up	7	7	05AUG08A	13AUG08A	100	05AUG08A	13AUG08A	
3AL1FT0012	Drill & test for 2m Arrangement Test	45	45	14AUG08A	15NOV08A	100	14AUG08A	15NOV08A	
3AL1FT0014	Backfill drilled holes, demobilization & Tidy up	6	6	17NOV08A	22NOV08A	100	17NOV08A	22NOV08A	
3AL1FT0016	Drill & test for single hole arrangement test	17	17	11AUG08A	04SEP08A	100	11AUG08A	04SEP08A	
3AL1FT0018	Backfill drilled hole, demobilization & tidy up	1	1	05SEP08A	05SEP08A	100	05SEP08A	05SEP08A	
TBM Manufacture/Testing/Delivery									
Manufacture of TBM & Back-ups									
3AL1FT0302	TBM & Excavation Sys Procurement	30	30	14DEC07A	12JAN08A	100	14DEC07A	12JAN08A	
3AL1FT0304	TBM design & manufacturing	252	252	21DEC07A	28SEP08A	100	21DEC07A	28SEP08A	
3AL1FT0306	TBM workshop tests	7	7	04OCT08A	08OCT08A	100	04OCT08A	08OCT08A	
3AL1FT0308	TBM dismounting & packing	21	21	09OCT08A	24DEC08A	100	09OCT08A	24DEC08A	



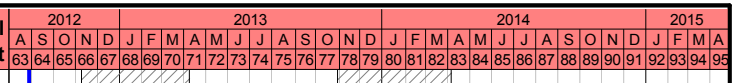
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Delivery of TBM									
3AL1FT0105	TBM shipment to Hong Kong	30	30	06JUL09A	10AUG09A	100	06JUL09A	10AUG09A	
3AL1FT0110	TBM arriving Portion I	3	3	10AUG09A	12AUG09A	100	10AUG09A	12AUG09A	
3AL1FT0115	Destuffing Containers/Cleaning & lubrication	24	24	08SEP09A	10OCT09A	100	08SEP09A	10OCT09A	
TBM Pre-assembly/Test & Commis. at Portion I									
3AL1FT0215	Backup # 1	12	12	09SEP09A	22SEP09A	100	09SEP09A	22SEP09A	
3AL1FT0220	Backup # 2	8	8	15SEP09A	23SEP09A	100	15SEP09A	23SEP09A	
3AL1FT0225	Backup # 3	4	4	21SEP09A	24SEP09A	100	21SEP09A	24SEP09A	
3AL1FT0230	Backup # 4	3	3	24SEP09A	26SEP09A	100	24SEP09A	26SEP09A	
3AL1FT0240	Baackup # 5	2	2	28SEP09A	29SEP09A	100	28SEP09A	29SEP09A	
3AL1FT0245	Backup # 6	3	3	29SEP09A	02OCT09A	100	29SEP09A	02OCT09A	
3AL1FT0250	Backup # 7	3	3	30SEP09A	05OCT09A	100	30SEP09A	05OCT09A	
3AL1FT0255	Backup # 8	4	4	05OCT09A	08OCT09A	100	05OCT09A	08OCT09A	
3AL1FT0260	Backup # 9	5	5	07OCT09A	15OCT09A	100	07OCT09A	15OCT09A	
3AL1FT0365	Backup # 10	6	6	09OCT09A	15OCT09A	100	09OCT09A	15OCT09A	
3AL1FT0370	Backup # 11	6	6	10OCT09A	15OCT09A	100	10OCT09A	15OCT09A	
3AL1FT0375	Backup # 12	6	6	13OCT09A	15OCT09A	100	13OCT09A	15OCT09A	
3AL1FT0377	Backup conveyor	5	5	17OCT09A	16JAN10A	100	17OCT09A	16JAN10A	
3AL1FT0379	Ventilation duct into cassette and scaffolding	3	3	04NOV09A	26JAN10A	100	04NOV09A	26JAN10A	
3AL1FT0381	Wheels	5	5	16OCT09A	11JAN10A	100	16OCT09A	11JAN10A	
3AL1FT0383	Testing for compressor	3	3	16OCT09A	19JAN10A	100	16OCT09A	19JAN10A	
3AL1FT0385	Testing for hosereels	3	3	28OCT09A	19JAN10A	100	28OCT09A	19JAN10A	
3AL1FT0387	Testing for peagravel system	3	3	12NOV09A	19JAN10A	100	12NOV09A	19JAN10A	
3AL1FT0389	Erector	4	4	22OCT09A	20JAN10A	100	22OCT09A	20JAN10A	
3AL1FT0391	Segment hoisting crane	3	3	22OCT09A	27NOV09A	100	22OCT09A	27NOV09A	
3AL1FT0393	Shields	7	7	29OCT09A	07JAN10A	100	29OCT09A	07JAN10A	
3AL1FT0395	Pre-testing for hydraulic & electric system	4	4	22SEP09A	23JAN10A	100	22SEP09A	23JAN10A	
3AL1FT0397	Holding cylinder heads	8	8	16NOV09A	23NOV09A	100	16NOV09A	23NOV09A	
3AL1FT0399	Walkways	12	12	22SEP09A	23JAN10A	100	22SEP09A	23JAN10A	
3AL1FT0401	Ventilation pipes supports	16	16	05NOV09A	02JAN10A	100	05NOV09A	02JAN10A	
3AL1FT0403	Cutterhead, welding & testing	37	37	30OCT09A	22JAN10A	100	30OCT09A	22JAN10A	
TBM Transport from Portion I to Outfall									
3AL1FT0405	Bottm shield 1 piece	1	1	19FEB10A	19FEB10A	100	19FEB10A	19FEB10A	
3AL1FT0415	Outer telescopic shield bottom	0	0		22FEB10A	100		22FEB10A	
3AL1FT0425	Main bearing	0	0		19FEB10A	100		19FEB10A	
3AL1FT0435	Side shield balance 2 pieces	1	1	22FEB10A	23FEB10A	100	22FEB10A	23FEB10A	
3AL1FT0455	Bottom inner telescopic shield	1	1	22FEB10A	22FEB10A	100	22FEB10A	22FEB10A	
3AL1FT0465	Main thrust rams	1	1	23FEB10A	23FEB10A	100	23FEB10A	23FEB10A	
3AL1FT0475	Side gripper shield balance 2 pieces	1	1	22FEB10A	22FEB10A	100	22FEB10A	22FEB10A	
3AL1FT0495	Electric motors for maindrive	1	1	25FEB10A	25FEB10A	100	25FEB10A	25FEB10A	
3AL1FT0505	Cutterhead centre	1	1	02MAR10A	02MAR10A	100	02MAR10A	02MAR10A	
3AL1FT0515	Cutterhead balance 4 pieces	1	1	02MAR10A	02MAR10A	100	02MAR10A	02MAR10A	
3AL1FT0525	Gripper cylinders	1	1	22FEB10A	22FEB10A	100	22FEB10A	22FEB10A	



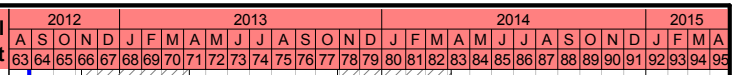
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
3AL1FT0535	Tail shield	1	1	20MAR10A	20MAR10A	100	20MAR10A	20MAR10A	
3AL1FT0545	Erector	1	1	22FEB10A	22FEB10A	100	22FEB10A	22FEB10A	
3AL1FT0555	TBM conveyor	1	1	25FEB10A	25FEB10A	100	25FEB10A	25FEB10A	
3AL1FT0565	Probe drill	1	1	25FEB10A	25FEB10A	100	25FEB10A	25FEB10A	
3AL1FT0604	Backup # 1	1	1	09MAR10A	09MAR10A	100	09MAR10A	09MAR10A	
3AL1FT0606	Backup # 2	1	1	09MAR10A	09MAR10A	100	09MAR10A	09MAR10A	
3AL1FT0608	Backup # 3	1	1	22MAR10A	22MAR10A	100	22MAR10A	22MAR10A	
3AL1FT0610	Backup # 4	1	1	16MAR10A	16MAR10A	100	16MAR10A	16MAR10A	
3AL1FT0612	Backup # 5	1	1	16MAR10A	16MAR10A	100	16MAR10A	16MAR10A	
3AL1FT0614	Backup # 6	1	1	22MAR10A	22MAR10A	100	22MAR10A	22MAR10A	
3AL1FT0616	Backup # 7	1	1	19MAY10A		100	19MAY10A		
3AL1FT0618	Backup # 8	1	1	19MAY10A	19MAY10A	100	19MAY10A	19MAY10A	
3AL1FT0620	Backup # 9	1	1	08JUN10A	08JUN10A	100	08JUN10A	08JUN10A	
3AL1FT0622	Backup # 10	1	1	08JUN10A	08JUN10A	100	08JUN10A	08JUN10A	
3AL1FT0624	Backup # 11	1	1	24JUN10A	24JUN10A	100	24JUN10A	24JUN10A	
3AL1FT0628	Backup # 12	1	1	24JUN10A	24JUN10A	100	24JUN10A	24JUN10A	
Manufacture Pre-cast Lining/Delivery									
Segmental Lining Mould									
3AL1FTSM02	Procure sub-contract for segmental mould	0	0		21JUL08A	100		21JUL08A	
3AL1FTSM04	Prepare shop drwgs for segmental mould	60	60	02FEB09A	05MAR09A	100	02FEB09A	05MAR09A	
3AL1FTSM06	Fabrication of segmental mould	90	90	06MAR09A	16MAY09A	100	06MAR09A	16MAY09A	
3AL1FTSM08	Inspection in Korea	7	7	18MAY09A	20MAY09A	100	18MAY09A	20MAY09A	
3AL1FTSM10	Painting & packing	7	7	21MAY09A	27MAY09A	100	21MAY09A	27MAY09A	
3AL1FTSM12	Delivery of segmental moulds to HKG	7	7	28MAY09A	03JUN09A	100	28MAY09A	03JUN09A	
Pre-cast Segmental Lining									
3AL1FT0404	Prepare/submit QA/QC System	30	30	12JAN09A	04MAR09A	100	12JAN09A	04MAR09A	
3AL1FT0410	SO approve QA/QC system	28	28	05MAR09A	06JUN09A	100	05MAR09A	06JUN09A	
3AL1FT0412	Approval of Tunnel Linig Design	0	0		25NOV09A	100		25NOV09A	
3AL1FT0416	Manufactur of segments	330	330	30NOV09A	04MAY11A	100	30NOV09A	04MAY11A	
3AL1FT0418	Delivery of Segments	813	813	05MAR10A	26NOV11A	100	05MAR10A	26NOV11A	
3AL1FTSL02	Procure sub-contract for segment lining	0	0		05JAN09A	100		05JAN09A	
Geotechnical Instrumetation at WSD Tunnel									
Method Statement to Install G.I. Works									
3AL1FTMS02	Prepare method statement	69	69	12MAR09A	26MAR09A	100	12MAR09A	26MAR09A	
3AL1FTMS04	Method statement endorsement by ICE & APRE	30	30	29MAY09A	29JUN09A	100	29MAY09A	29JUN09A	
3AL1FTMS06	Method statement endorsement by SOR	60	60	30JUN09A	24NOV09A	100	30JUN09A	24NOV09A	
3AL1FTMS14	Method statement endorsement by WSD	24	24	16JUL10A	11AUG10A	100	16JUL10A	11AUG10A	
Air Sampling & Pre-construction Condition Survey									
3AL1WT3A02	Prepare method statement for air sampling	12	12	02NOV09A	14NOV09A	100	02NOV09A	14NOV09A	
3AL1WT3A04	Submit method statement for air sampling	1	1	16NOV09A	16NOV09A	100	16NOV09A	16NOV09A	
3AL1WT3A06	Approval of method statement for air sampling	29	29	17NOV09A	19DEC09A	100	17NOV09A	19DEC09A	
3AL1WT3A08	WSD Tunnel Shutdown for Air Sample/Cond'n Survey	2	2	15DEC09A	22DEC09A	100	15DEC09A	22DEC09A	



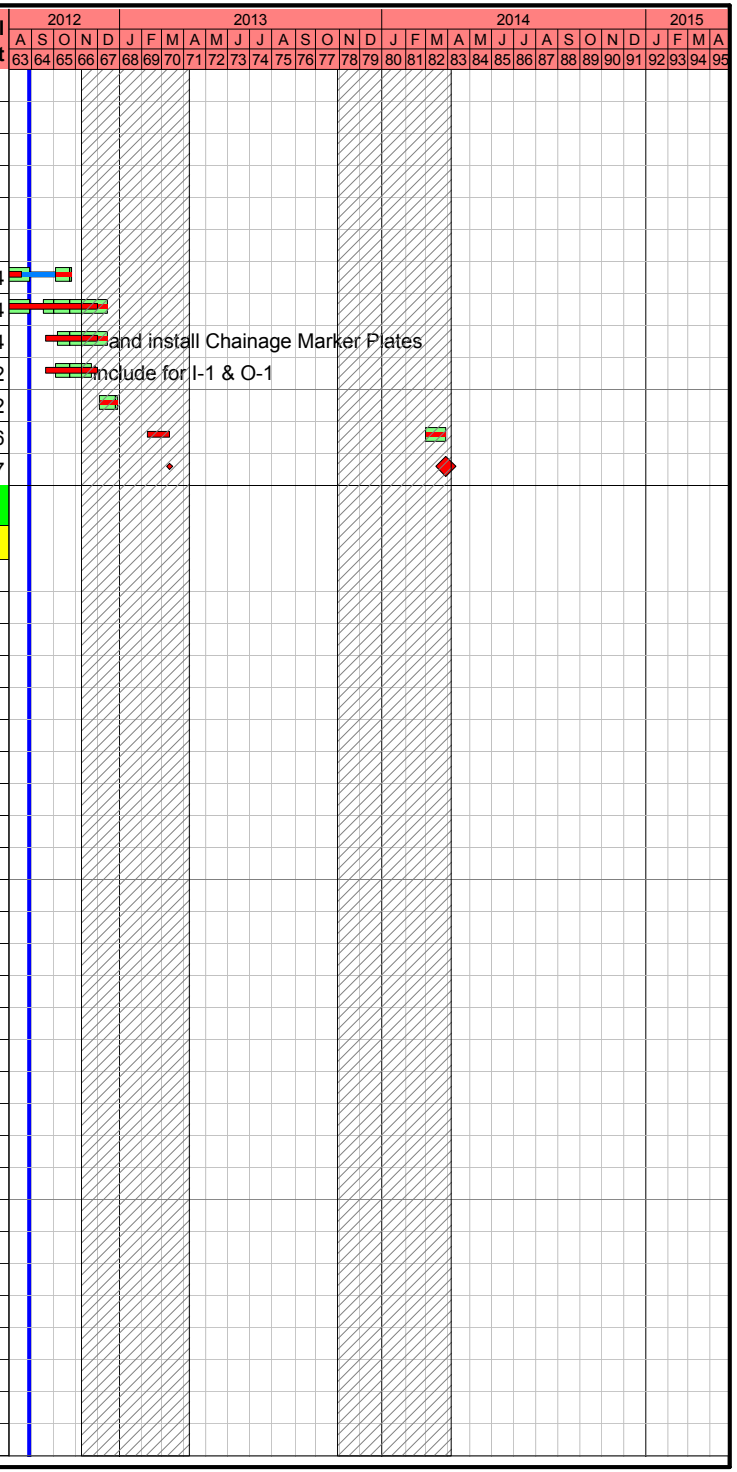
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
3AL1WT3A10	Carry out air sampling & condition survey	9	9	21DEC09A	22DEC09A	100	21DEC09A	22DEC09A	
3AL1WT3A20	Commence for 2nd intervantion of WSD Tunnel	1	1	25FEB10A	25FEB10A	100	25FEB10A	25FEB10A	
3AL1WT3A30	Carry out air sampling & condition survey	8	8	27FEB10A	02MAR10A	100	27FEB10A	02MAR10A	
Preparation Works at Ting Kau Air Valve House									
3AL1WT3B02	Arrange WSD to open the valve house	1	1	30JUL10A	30JUL10A	100	30JUL10A	30JUL10A	
3AL1WT3B12	Set up exhaust fans & arrange temp. electricity	3	3	03AUG10A	03AUG10A	100	03AUG10A	03AUG10A	
3AL1WT3B32	Remove the air vent pipe (DN250)	2	2	14AUG10A	14AUG10A	100	14AUG10A	14AUG10A	
3AL1WT3B42	Remove connection flange (DN900)	1	1	14AUG10A	14AUG10A	100	14AUG10A	14AUG10A	
3AL1WT3B52	Connect exhaust fan to valve shaft	5	5	17AUG10A	17AUG10A	100	17AUG10A	17AUG10A	
Preparation Works at Chai Wan Kok Shaft									
3AL1FTCT02	Install electricity take off, switch board &	5	5	12AUG10A	12AUG10A	100	12AUG10A	12AUG10A	
3AL1FTCT22	Install toilet and shower	3	3	12AUG10A	12AUG10A	100	12AUG10A	12AUG10A	
3AL1FTCT32	Set up generatior and two water pumps	2	2	12AUG10A	12AUG10A	100	12AUG10A	12AUG10A	
3AL1FTCW16	WSD Tunnel Shut Down Period	112*	112*	12AUG10A	23DEC10A	100	12AUG10A	23DEC10A	
3AL1FTCW18	WSD Tunnel #3 commences shut down	1	1	12AUG10A	12AUG10A	100	12AUG10A	12AUG10A	
3AL1FTCW22	Plug DN1200 pipe at the face near valve house	1	1	23AUG10A	23AUG10A	100	23AUG10A	23AUG10A	
Works in Aqueduct									
3AL1FTAD04	Install instruments	26	26	26AUG10A	03SEP10A	100	26AUG10A	03SEP10A	
3AL1FTAD06	Inspection	2	2	27SEP10A	27SEP10A	100	27SEP10A	27SEP10A	
3AL1FTAD08	TBM crossing affected 210m section	16	16	30NOV10A	16DEC10A	100	30NOV10A	16DEC10A	
3AL1FTAD10	De-install instruments	3	3	17DEC10A	19DEC10A	100	17DEC10A	19DEC10A	
Demobilisation									
3AL1FTAE04	Remove dewatering system	1	1	20DEC10A	22DEC10A	100	20DEC10A	22DEC10A	
3AL1FTAE14	Remove the plug at Chai Wan Kok	1	1	20DEC10A	20DEC10A	100	20DEC10A	20DEC10A	
3AL1FTAE24	Reinstate vent pipe Y falange at T.K.	1	1	21DEC10A	21DEC10A	100	21DEC10A	21DEC10A	
3AL1FTAE34	Remove ventilation fan	1	1	23DEC10A	23DEC10A	100	23DEC10A	23DEC10A	
Reinstatement Works									
3AL1FTRS02	Reinstate opening at Chai Wan Kok	1	1	22DEC10A	22DEC10A	100	22DEC10A	22DEC10A	
3AL1FTRS04	WSD Tunnel #3 re-operates	1	1	23DEC10A	23DEC10A	100	23DEC10A	23DEC10A	
TBM Assembly & Initial Driving; Day Time Work									
TBM Assembly/Test & Commiss. at Outfall									
3AL1FT0605	Mobilization & setup 300 ton crane	1	1	22FEB10A	22FEB10A	100	22FEB10A	22FEB10A	
3AL1FT0607	Bottom fornt shield	1	1	22FEB10A	22FEB10A	100	22FEB10A	22FEB10A	
3AL1FT0609	Outer telescopic shield bottom	1	1	22FEB10A	13MAR10A	100	22FEB10A	13MAR10A	
3AL1FT0611	Main bearing	2	2	23FEB10A	23FEB10A	100	23FEB10A	23FEB10A	
3AL1FT0613	Side shield balance (2 pieces)	2	2	23FEB10A	24FEB10A	100	23FEB10A	24FEB10A	
3AL1FT0615	Bottom gripper shield	1	1	22FEB10A	22FEB10A	100	22FEB10A	22FEB10A	
3AL1FT0617	Inner telescopic shield	1	1	22FEB10A	09MAR10A	100	22FEB10A	09MAR10A	
3AL1FT0619	Main thrust rams	2	2	24FEB10A	02MAR10A	100	24FEB10A	02MAR10A	
3AL1FT0621	Side gripper shield balance (2 pieces)	2	2	23FEB10A	25FEB10A	100	23FEB10A	25FEB10A	
3AL1FT0625	Cutterhead centre	2	2	02MAR10A	04MAR10A	100	02MAR10A	04MAR10A	
3AL1FT0626	Electric motors for maindrive	3	3	25FEB10A	02MAR10A	100	25FEB10A	02MAR10A	
3AL1FT0627	Cutterhead balance (4 pieces)	3	3	03MAR10A	12MAR10A	100	03MAR10A	12MAR10A	



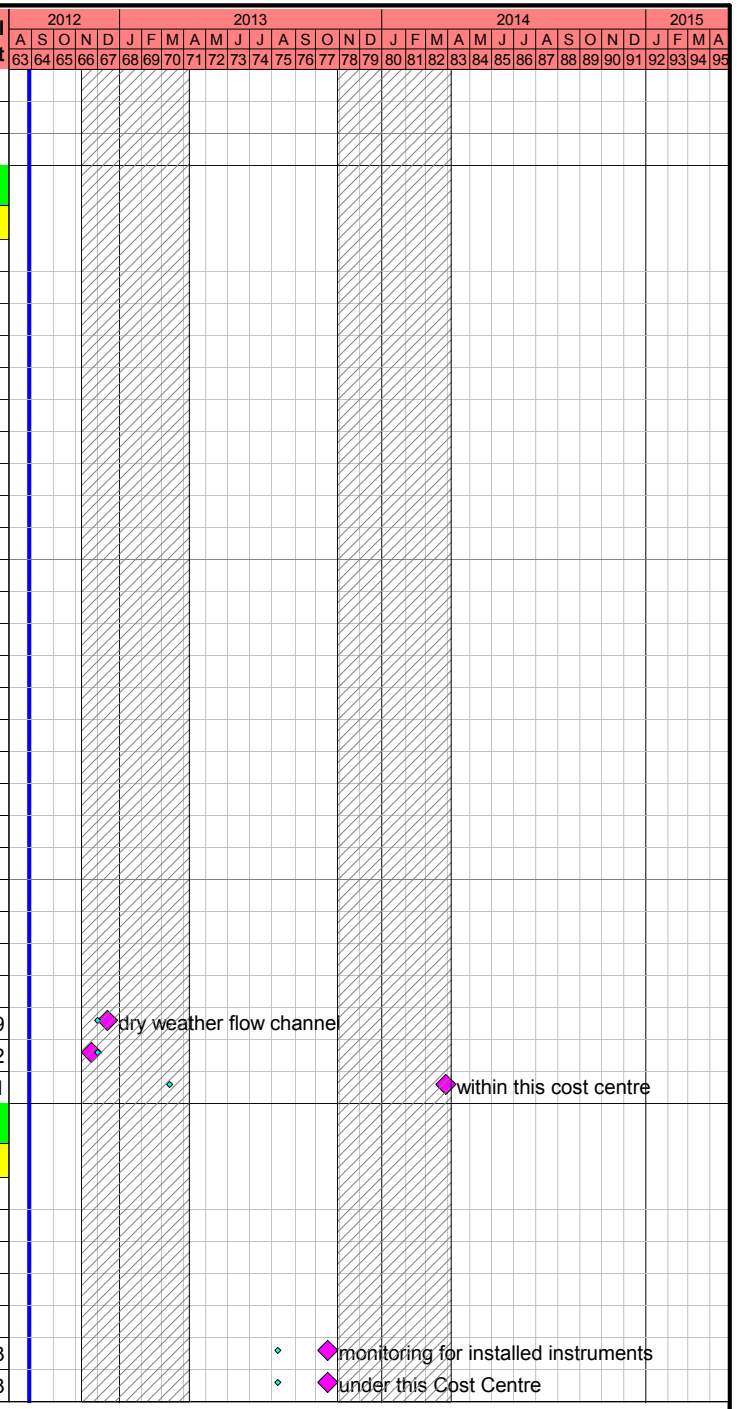
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
3AL1FT0629	Gripper cylinders	2	2	23FEB10A	27FEB10A	100	23FEB10A	27FEB10A	
3AL1FT0631	Tail shield	2	2	22FEB10A	23FEB10A	100	22FEB10A	23FEB10A	
3AL1FT0633	Erector	1	1	22FEB10A	02MAR10A	100	22FEB10A	02MAR10A	
3AL1FT0635	TBM conveyor	2	2	25FEB10A	15MAR10A	100	25FEB10A	15MAR10A	
3AL1FT0637	Probe drill	1	1	26FEB10A	08MAR10A	100	26FEB10A	08MAR10A	
3AL1FT0649	Connect hydraulic & electric for main shield	6	6	27FEB10A	10APR10A	100	27FEB10A	10APR10A	
3AL1FT0651	Back-up #1	2	2	10MAR10A	27MAR10A	100	10MAR10A	27MAR10A	
3AL1FT0653	TBM launch to excavation face (30m)	3	3	06MAR10A	12APR10A	100	06MAR10A	12APR10A	
3AL1FT0655	Backup # 2	2	2	12MAR10A	08APR10A	100	12MAR10A	08APR10A	
3AL1FT0657	Backup # 4; put aside & connect	2	2	20MAR10A	13APR10A	100	20MAR10A	13APR10A	
3AL1FT0659	Backup # 5; put aside & connect	3	3	20MAR10A	14APR10A	100	20MAR10A	14APR10A	
3AL1FT0661	Backup # 6; put aside & connect	3	3	23MAR10A	15APR10A	100	23MAR10A	15APR10A	
3AL1FT0663	Backup # 3	2	2	23MAR10A	10APR10A	100	23MAR10A	10APR10A	
3AL1FT0665	Complete balance electric & hydraulic/test 1	6	6	07APR10A	24APR10A	100	07APR10A	24APR10A	
3AL1FT0669	TBM advances 36m into tunnel (Ch. 5084 to 5048)	12	12	27APR10A	02JUN10A	100	27APR10A	02JUN10A	
3AL1FT0671	Install Backup # 4	2	2	19MAY10A	22MAY10A	100	19MAY10A	22MAY10A	
3AL1FT0673	Install Bakcup # 5	2	2	24MAY10A	25MAY10A	100	24MAY10A	25MAY10A	
3AL1FT0675	Install Backup # 6	3	3	26MAY10A	28MAY10A	100	26MAY10A	28MAY10A	
3AL1FT0677	Backup #7	2	2	08JUN10A	08JUN10A	100	08JUN10A	08JUN10A	
3AL1FT0679	Backup #8	2	2	08JUN10A	08JUN10A	100	08JUN10A	08JUN10A	
3AL1FT0681	Backup #9	2	2	14JUN10A	17JUN10A	100	14JUN10A	17JUN10A	
3AL1FT0683	Backup #10	2	2	14JUN10A	17JUN10A	100	14JUN10A	17JUN10A	
3AL1FT0685	Backup #11	2	2	25JUN10A	26JUN10A	100	25JUN10A	26JUN10A	
3AL1FT0687	Backup #12	2	2	26JUN10A	28JUN10A	100	26JUN10A	28JUN10A	
3AL1FT0689	Complete balance electric & hydraulic/ test 2	3	3	27AUG10A	27AUG10A	100	27AUG10A	27AUG10A	
TBM Initial Advacing; Day Time Work									
3AL1FT0708	TBM advances; CH5048-4957	42	42	03JUN10A	23JUL10A	100	03JUN10A	23JUL10A	
3AL1FT0720	TBM stop to install rem. items	35	35	24JUL10A	02SEP10A	100	24JUL10A	02SEP10A	
Main Tunnel Works; Day & Night Work									
TBM Advancing upto Crossing WSD Tunnel # 3									
3AL1FT0816	TBM advances; CH4957-4460 (to WSD Tunnel # 3)	72	72	03SEP10A	29NOV10A	100	03SEP10A	29NOV10A	
3AL1FT0818	TBM crossing WSD Tunnel # 3; CH4460- 4250	15	15	30NOV10A	16DEC10A	100	30NOV10A	16DEC10A	
TBM Advancing upto Breakthrough									
3AL1FT0819	TBM advances; P6 CH4250-4220	3	3	20DEC10A	22DEC10A	100	20DEC10A	22DEC10A	
3AL1FT0820	TBM advances; CH4220-3940	23	23	22DEC10A	20JAN11A	100	22DEC10A	20JAN11A	
3AL1FT0821	TBM advances; CH3940-3560	25	25	20JAN11A	21FEB11A	100	20JAN11A	21FEB11A	
3AL1FT0822	TBM advances CH3560-2970	48	48	21FEB11A	18APR11A	100	21FEB11A	18APR11A	
3AL1FT0823	TBM advances; WSD T.W.S. R. G. CH2970-2860	8	8	18APR11A	29APR11A	100	18APR11A	29APR11A	
3AL1FT0824	TBM advances; CH2860-1827	64	64	29APR11A	15JUL11A	100	29APR11A	15JUL11A	
3AL1FT0825	TBM advances; CH1827-1564	16	16	15JUL11A	02AUG11A	100	15JUL11A	02AUG11A	
3AL1FT0826	TBM advances; CH1564-1449	7	7	02AUG11A	11AUG11A	100	02AUG11A	11AUG11A	
3AL1FT0827	TBM advances; CH1449-1295 (Intake I-2)	13	13	11AUG11A	24AUG11A	100	11AUG11A	24AUG11A	
3AL1FT0828	TBM advances; CH1295-955	19	19	24AUG11A	20SEP11A	100	24AUG11A	20SEP11A	



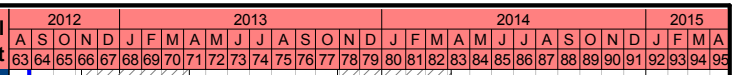
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
3AL1FT0829	TBM advances; CH955-250	36	36	20SEP11A	16NOV11A	100	20SEP11A	16NOV11A	
3AL1FT0831	TBM advances; Faoult F1 CH250-150	10	10	16NOV11A	21NOV11A	100	16NOV11A	21NOV11A	
3AL1FT0832	TBM advances; Fault F1 CH150-0	82	82	21NOV11A	28FEB12A	100	21NOV11A	28FEB12	
3AL1FT0890	Remov framework/demobilization of TBM& BU	47*	48*	29FEB12A	27APR12A	100	29FEB12	30APR12	
3AL1FT0891	Removal of TBM services from tunnel	24	24	02MAR12A	30APR12A	100	02MAR12	29MAR12	
3AL1FT0892	Back grouting; CH5100-00	562	562	20APR10A	30APR12A	100	20APR10A	29MAY12	
3AL1FT0893	Secondary grouting	231	231	26AUG11A	26OCT12	91	26AUG11A	16AUG12	-324
3AL1FT0894	Segment bolt pocket filling/repair segment crack	200	200	16APR12A	15DEC12	62	02APR12	01DEC12	-324
3AL1FT0895	Install kerb for dry weathe channel	60	60	06OCT12	15DEC12	0	21SEP12	01DEC12	-324
3AL1FT0896	Install anchorages for radio comm. system	42	60	04OCT12	22NOV12	0	21SEP12	01DEC12	-322
3AL1FT0897	Lay cable for radio comm. system	18	0	05DEC12	27DEC12	0			-332
3AL1FT0898	Testing & Commissioning	28	28	01MAR14	28MAR14	0	10FEB13	09MAR13	-836
3AL1FT0904	Handover of Portion F	0	0		28MAR14	0		09MAR13	-677
Schedule of Milestones for Cost Centre No. 6aR									
6AR1FT0902	6aR 1; On completion of grouting at P7	0	0		20JUL10A	100		20JUL10A	
6AR1FT0904	6aR 2; On completion of grouting at F6c	0	0		30SEP10A	100		30SEP10A	
6AR1FT0906	6aR 3; On completion of grouting at F6b	0	0		09OCT10A	100		09OCT10A	
6AR1FT0908	6aR 4; On completion of grouting at F6a	0	0		24NOV10A	100		24NOV10A	
6AR1FT0910	6aR 5; On completion of grouting at WSD T. 3	0	0		14DEC10A	100		14DEC10A	
6AR1FT0912	6aR 6; On completion of 20% grout by Ith at P6	0	0		20DEC10A	100		20DEC10A	
6AR1FT0914	6aR 7; On completion of 40% grout by Ith at P6	0	0		20DEC10A	100		20DEC10A	
6AR1FT0916	6aR 8; On completion of 60% grout by Ith at P6	0	0		21DEC10A	100		21DEC10A	
6AR1FT0918	6aR 9; On completion of 80% grout by Ith at P6	0	0		21DEC10A	100		21DEC10A	
6AR1FT0920	6aR 10; On completion of grouting works at P6	0	0		22DEC10A	100		22DEC10A	
6AR1FT0922	6aR 11; On completion of grouting wks at P5	0	0		29JAN11A	100		29JAN11A	
6AR1FT0924	6aR 12; On completion of grouting wks at P4	0	0		21FEB11A	100		21FEB11A	
6AR1FT0926	6aR 13; On completion of grouting wks at P3	0	0		04APR11A	100		04APR11A	
6AR1FT0928	6aR 14; On completion of grouting wks at WSD's	0	0		29APR11A	100		29APR11A	
6AR1FT0930	6aR 15; On completion of grouting wks at F5	0	0		11MAY11A	100		11MAY11A	
6AR1FT0932	6aR 16; On completion of grouting wks at F4	0	0		20MAY11A	100		20MAY11A	
6AR1FT0934	6aR 17; On completion of grouting wks at F3	0	0		13JUN11A	100		13JUN11A	
6AR1FT0936	6aR 18; On completion of grouting wks at F2	0	0		29AUG11A	100		29AUG11A	
6AR1FT0938	6aR 19; On completion of grouting wks at P2	0	0		04OCT11A	100		04OCT11A	
6AR1FT0940	6aR 20; On completion of grouting wks at P1	0	0		24OCT11A	100		24OCT11A	
6AR1FT0942	6aR 21; On completion of 10% grout by Ith at F1	0	0		21NOV11A	100		21NOV11A	
6AR1FT0944	6aR 22; On completion of 20% grout by Ith at F1	0	0		22NOV11A	100		22NOV11A	
6AR1FT0946	6aR 23; On completion of 30% grout by Ith at F1	0	0		22NOV11A	100		22NOV11A	
6AR1FT0948	6aR 24; On completion of 40% grout by Ith at F1	0	0		23NOV11A	100		23NOV11A	
6AR1FT0950	6aR 25; On completion of 50% grout by Ith at F1	0	0		24NOV11A	100		24NOV11A	
6AR1FT0952	6aR 26; On completion of 60% grout by Ith at F1	0	0		10JAN12A	100		10JAN12A	
6AR1FT0954	6aR 27; On completion of 70% grout by Ith at F1	0	0		30JAN12A	100		30JAN12A	
6AR1FT0956	6aR 28; On completion of 80% grout by Ith at F1	0	0		14FEB12A	100		14FEB12A	



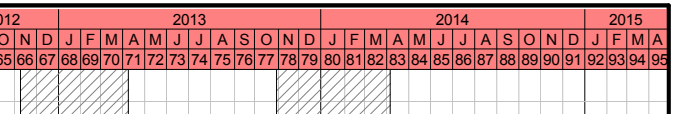
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
6AR1FT0958	6aR 29; On completion of 90% grout by lth at F1	0	0		16FEB12A	100		16FEB12A	
6AR1FT0960	6aR 30; On completion of grouting works at F1	0	0		20FEB12A	100		20FEB12A	
6AR1FT0970	6aR 31; On completion of all works under this CC	0	0		28FEB12A	100		06MAR12	
Schedule of Milestones for Cost Centre No. 3aL									
3AL1FT1002	3aL 1; On providing evidence of procuring TBM	0	0		19JAN08A	100		19JAN08A	
3AL1FT1004	3aL 2; On providing evidence of TBM Factory Test	0	0		08OCT08A	100		08OCT08A	
3AL1FT1006	3aL 3; On delivery of all parts of TBM to the Si	0	0		12AUG09A	100		12AUG09A	
3AL1FT1008	3aL 4; On completion of site comm. & test. of TB	0	0		27SEP10A	100		27SEP10A	
3AL1FT1010	3aL 5; On completion of 5% perm. tunnel lining	0	0		02OCT10A	100		02OCT10A	
3AL1FT1012	3aL 6; On completion of 10% perm. tunnel lining	0	0		03NOV10A	100		03NOV10A	
3AL1FT1014	3aL 7; On completion of 15% perm. tunnel lining	0	0		26NOV10A	100		26NOV10A	
3AL1FT1016	3aL 8; On completion of 20% perm. tunnel lining	0	0		08JAN11A	100		08JAN11A	
3AL1FT1018	3aL 9; On completion of 25% perm. tunnel lining	0	0		27JAN11A	100		27JAN11A	
3AL1FT1020	3aL 10; On completion of 30% perm. tunnel lining	0	0		21FEB11A	100		21FEB11A	
3AL1FT1022	3aL 11; On completion of 35% perm. tunnel lining	0	0		12MAR11A	100		12MAR11A	
3AL1FT1024	3aL 12; On completion of 40% perm. tunnel lining	0	0		11APR11A	100		11APR11A	
3AL1FT1026	3aL 13; On completion of 45% perm. tunnel lining	0	0		05MAY11A	100		05MAY11A	
3AL1FT1028	3aL 14; On completion of 50% perm. tunnel lining	0	0		23MAY11A	100		23MAY11A	
3AL1FT1030	3aL 15; On completion of 55% perm. tunnel lining	0	0		08JUN11A	100		08JUN11A	
3AL1FT1032	3aL 16; On completion of 60% perm. tunnel lining	0	0		27JUN11A	100		27JUN11A	
3AL1FT1034	3aL 17; On completion of 65% perm. tunnel lining	0	0		11JUL11A	100		11JUL11A	
3AL1FT1036	3aL 18; On completion of 70% perm. tunnel lining	0	0		08AUG11A	100		08AUG11A	
3AL1FT1038	3aL 19; On completion of 75% perm. tunnel lining	0	0		25AUG11A	100		25AUG11A	
3AL1FT1040	3aL 20; On completion of 80% perm. tunnel lining	0	0		16SEP11A	100		16SEP11A	
3AL1FT1042	3aL 21; On completion of 85% perm. tunnel lining	0	0		05OCT11A	100		05OCT11A	
3AL1FT1044	3aL 22; On completion of 90% perm. tunnel lining	0	0		27OCT11A	100		27OCT11A	
3AL1FT1046	3aL 23; On completion of 95% perm. tunnel lining	0	0		16NOV11A	100		16NOV11A	
3AL1FT1048	3aL 24; On completion of perm. tunnel lining	0	0		08MAR12A	100		06MAR12	
3AL1FT1050	3aL 25; On completion of maint. access/flow chan	0	0		15DEC12	0		01DEC12	819
3AL1FT1052	3aL 26; On completion of provision of communic.	0	0		22NOV12	0		01DEC12	842
3AL1FT1054	3aL 27; On completion of all works under this CC	0	0		28MAR14	0		09MAR13	351
Schedule of Milestones for Cost Centre No. 3dL									
3DL10T1202	3dL 1; On complet. of install geo instrrument.	0	0		27MAY11A	100		27MAY11A	
3DL10T1204	3dL 2; Maint./monit. geo. inst. for 12 mth	0	0		27DEC08A	100		27DEC08A	
3DL10T1206	3dL 3; Maint./monitor geo. inst. for 24	0	0		26DEC09A	100		26DEC09A	
3DL10T1208	3dL 4; Maint./monitor geo. inst. for 36	0	0		27DEC10A	100		27DEC10A	
3DL10T1210	3dL 5; Maint./monitor geo. inst. for 48	0	0		26DEC11A	100		26DEC11A	
3DL10T1212	3dL 6; On completion of maint. & monit. of geo.	0	0		17OCT13	0		06AUG13	513
3DL10T1224	3dL 12; On completion of all works under this CC	0	0		17OCT13	0		06AUG13	513



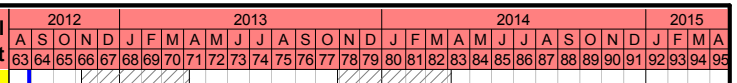
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Construction of Intake I-1									
Preliminary Works									
VO#07; Transperant Hoarding at I-1									
VO007-02	Receive VO7 for transparent hoarding	0	0		19MAY08A	100		19MAY08A	
VO007-04	Procure/prepare/install transparent hoarding	70	70	20MAY08A	11AUG08A	100	20MAY08A	11AUG08A	
01R1AI1102	Possession of site	0	0	19MAR08A		100	19MAR08A		
01R1AI1104	Obtain TTA (ingress & egress) approval	0	0	19APR08A		100	19APR08A		
01R1AI1106	Site clearance	30	30	21APR08A	26MAY08A	100	21APR08A	26MAY08A	
01R1AI1108	Obtain tree	6	6	13MAY08A	31JUL08A	100	13MAY08A	31JUL08A	
01R1AI1110	Hoarding erection enclosing the Site	18	18	23MAY08A	11AUG08A	100	23MAY08A	11AUG08A	
01R1AI1112	Site entrance construction	6	6	23JUN08A	25JUL08A	100	23JUN08A	25JUL08A	
01R1AI1114	Install wheel wahing facilities	7	7	03JUN08A	07JUN08A	100	03JUN08A	07JUN08A	
01R1AI1116	Erect SOR's secondary site office	6	6	28AUG08A	03SEP08A	100	28AUG08A	03SEP08A	
01R1AI1118	Footing for temp. bridge span over Shing M. Nul.	26	26	10JUN08A	16JUL08A	100	10JUN08A	16JUL08A	
01R1AI1120	Decking for temp. bridge span over Shing M. Nul.	13	13	17JUL08A	01AUG08A	100	17JUL08A	01AUG08A	
01R1AI1122	Install remote control CCTV as per ER 4.4.10	12	12	04SEP08A	18SEP08A	100	04SEP08A	18SEP08A	
16R1AI1101	Tree Identification & Report	14	14	14MAR08A	01APR08A	100	14MAR08A	01APR08A	
16R7AI1102	1st tree pruning for small 3 nos. trees	1	1	03JUN08A	03JUN08A	100	03JUN08A	03JUN08A	
16R7AI1104	2nd tree pruning for small 3 nos. trees	1	1	04JUL08A	04JUL08A	100	04JUL08A	04JUL08A	
16R7AI1106	Final pruning & uplifting of 3 nos. small trees	2	2	08SEP08A	09SEP08A	100	08SEP08A	09SEP08A	
16R7AI1108	Confirm location for trees to be transplanted	51	51	02APR08A	27AUG08A	100	02APR08A	27AUG08A	
16R7AI1114	One stg transplant for big 4 nos. big trees	9	9	11FEB09A	19FEB09A	100	11FEB09A	19FEB09A	
Permanent Soil Nailing Works									
11R2AI1302	Erect working platform & mobilization	8	8	17MAY08A	24MAY08A	100	17MAY08A	24MAY08A	
11R2AI1304	Install test nails & proof loading test; 2 nos.	8	8	24JUN08A	08JUL08A	100	24JUN08A	08JUL08A	
11R2AI1306	Soil nailing for A to C rows; 69 nos.	16	16	02JUL08A	14JUL08A	100	02JUL08A	14JUL08A	
11R2AI1308	Soil nailing for D to F rows; 71 nos.	29	29	15JUL08A	05SEP08A	100	15JUL08A	05SEP08A	
11R2AI1310	Constrcut soil nail heads; 140 nos.	22	22	19JUL08A	06SEP08A	100	19JUL08A	06SEP08A	
11R2AI1312	Demobilization	3	3	08SEP08A	10SEP08A	100	08SEP08A	10SEP08A	
Construction of Spiral Ramp & Cascade									
Additional GI Woks to Fnalize Design									
AGIA-02	Drill for 5 nos. additional GI works	21	21	09SEP08A	04OCT08A	100	09SEP08A	04OCT08A	
Temp. Pipe-pile cofferdam									
04L1AI1202	Erect piling platform	43	43	22OCT08A	24DEC08A	100	22OCT08A	24DEC08A	
04L1AI1203	Mobilization & set up piling rig	3	3	30OCT08A	01NOV08A	100	30OCT08A	01NOV08A	
04L1AI1204	Install 273 mm dia. temp. pipe piles; 144 nos.	43	43	08NOV08A	05JAN09A	100	08NOV08A	05JAN09A	
04L1AI1226	Demobilize all plant and materials	6	6	06JAN09A	13JAN09A	100	06JAN09A	13JAN09A	
Excavate +104.0 to +100.5mPD; Row 7									
04L1AI1402	Mobilization	1	1	23FEB09A	23FEB09A	100	23FEB09A	23FEB09A	
04L1AI1404	Bulk excavation; soil (155m3)	4	4	24FEB09A	27FEB09A	100	24FEB09A	27FEB09A	



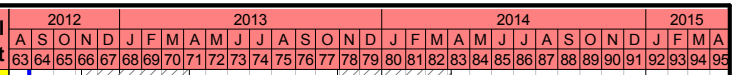
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
04L1AI1406	Install test tie-back & proof load test	4	4	28FEB09A	04MAR09A	100	28FEB09A	04MAR09A	
04L1AI1408	Install tie backs/wailing & shortcrete	4	4	03MAR09A	06MAR09A	100	03MAR09A	06MAR09A	
Excavate +100.5 to +99.0mPD; Rows 1 & 8									
04L1AI1410	Bulk excavation; soil (219m3)	2	2	07MAR09A	09MAR09A	100	07MAR09A	09MAR09A	
04L1AI1412	Install tie backs/wailing & shorcrete	6	6	10MAR09A	16MAR09A	100	10MAR09A	16MAR09A	
Excavate +99.0 to +96.5mPD; Rows 2, 9 & 18									
04L1AI1414	Bulk excavation; soil (710m3)	3	3	17MAR09A	19MAR09A	100	17MAR09A	19MAR09A	
04L1AI1416	Install test tie-back & proof load test	4	4	26MAR09A	01APR09A	100	26MAR09A	01APR09A	
04L1AI1418	Install tie backs/wailing & shortcrete	6	6	23MAR09A	28MAR09A	100	23MAR09A	28MAR09A	
Excavate +96.5 to +95.0mPD; Rows3, 10 & 19									
04L1AI1420	Bulk excavation; soil (721m3)	3	3	30MAR09A	04APR09A	100	30MAR09A	04APR09A	
04L1AI1422	Install tie backs/wailing & shortcrete	4	4	02APR09A	20APR09A	100	02APR09A	20APR09A	
Excavate +95.0 to +94.0 mPD; Rows 4, 11 & 20									
04L1AI1424	Bulk excavation; soil (701m3)	3	3	06APR09A	18APR09A	100	06APR09A	18APR09A	
04L1AI1426	Install tie backs/wailing & shorcrete	5	5	03APR09A	30APR09A	100	03APR09A	30APR09A	
Excavate +94.0 to + 93.0mPD; Rows 5,12,16,21&24									
04L1AI1428	Bulk excavation; soil (818m3)	4	4	20APR09A	27APR09A	100	20APR09A	27APR09A	
04L1AI1430	Install test tie-back & proof load test	4	4	21APR09A	16MAY09A	100	21APR09A	16MAY09A	
04L1AI1432	Install tie backs/wailing & shorcrete	5	5	21APR09A	16MAY09A	100	21APR09A	16MAY09A	
Excavate +93.0 to +92.5mPD; Row 22									
04L1AI1434	Bulk excavation; soil (423m3) & rock (52m3)	3	3	04MAY09A	18MAY09A	100	04MAY09A	18MAY09A	
04L1AI1436	Install tie backs/wailing & shorcrete	2	2	19MAY09A	27MAY09A	100	19MAY09A	27MAY09A	
Excavate +92.5 to 91.1mPD; Rows 6,13,16,17&23									
04L1AI1438	Bulk excavation; soil (1002m3) & rock (342m3)	8	8	06MAY09A	23MAY09A	100	06MAY09A	23MAY09A	
04L1AI1440	Install test tie-back & proof load test	4	4	08MAY09A	25MAY09A	100	08MAY09A	25MAY09A	
04L1AI1442	Install tie backs/wailing & shorcrete	4	4	18MAY09A	27MAY09A	100	18MAY09A	27MAY09A	
Excavate +91.1 to 89.5mPD; Rows 14, 17 & 25									
04L1AI1444	Bulk excavation; soil (724m3) & rock (811m3)	12	12	18MAY09A	01JUN09A	100	18MAY09A	01JUN09A	
04L1AI1446	Install tie backs/wailing & shorcrete	4	4	02JUN09A	05JUN09A	100	02JUN09A	05JUN09A	
Excavate +89.5 to 88.5mPD; Rows 15 & 26									
04L1AI1448	Bulk excavation; soil (269m3) & rock (690m3)	9	9	06JUN09A	16JUN09A	100	06JUN09A	16JUN09A	
04L1AI1450	Install tie backs/wailing & shorcrete	3	3	17JUN09A	19JUN09A	100	17JUN09A	19JUN09A	
Excavate +88.5 to 71.5mPD; Rows 27 to 31									
07R1AI1442	Set up for dewatering	8	8	20JUN09A	29JUN09A	100	20JUN09A	29JUN09A	
07R1AI1444	Rock excavation/mucking out/temp. support	168	168	30JUN09A	30JAN10A	100	30JUN09A	30JAN10A	
Ground Treatment for Fault F1									
07R1AI1G02	Erection of scaffolding platform	8	8	24JUN10A	03JUL10A	100	24JUN10A	03JUL10A	
07R1AI1G04	Mobilization & setup of horizontal drilling rig	11	11	05JUL10A	16JUL10A	100	05JUL10A	16JUL10A	
07R1AI1G06	Drill & grout hoizontally	87	87	17JUL10A	01FEB11A	100	17JUL10A	01FEB11A	
07R1AI1G08	Dewater,dismantle & re-erection of platform	46	46	23JUL10A	02OCT10A	100	23JUL10A	02OCT10A	
07R1AI1G10	Repair of drilling rig & re-setting up	45	45	23AUG10A	15OCT10A	100	23AUG10A	15OCT10A	



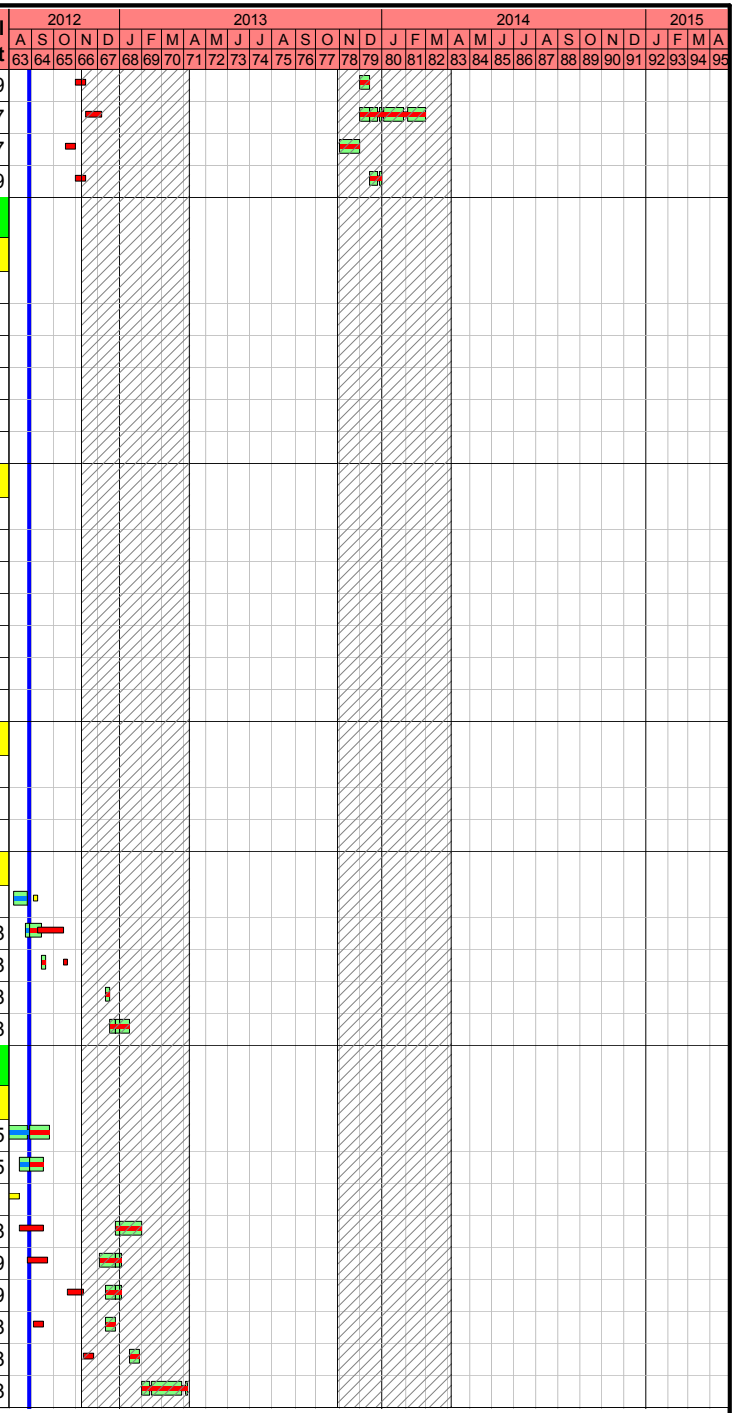
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Strengthening of Portal for TBM Breakthrough									
07R1AI1452	Form working platform	5	5	25FEB11A	05MAR11A	100	25FEB11A	05MAR11A	
07R1AI1462	Mobilization & setup plants	1	1	07MAR11A	09MAR11A	100	07MAR11A	09MAR11A	
07R1AI1472	strengthening of portal	25	25	10MAR11A	24MAY11A	100	10MAR11A	24MAY11A	
07R1AI1492	Demobilization/remove working platform	2	2	25MAY11A	27MAY11A	100	25MAY11A	27MAY11A	
Construcion of Vehiucular Access									
04L1AI1452	Cast base slab	6	6	05MAR11A	16MAR11A	100	05MAR11A	16MAR11A	
04L1AI1456	Cast wall & roof slab	24	24	17MAR11A	04APR11A	100	17MAR11A	04APR11A	
Base for Spiral Ramp									
07R1AI1402	Cast base slab	14	14	24FEB10A	11MAR10A	100	24FEB10A	11MAR10A	
Spiral Ramp from +73.56mPD to 76.65mPD									
07R1AI1S02	Cast spiral ramp; pour 1	12	12	12MAR10A	08APR10A	100	12MAR10A	08APR10A	
Spiral Ramp from 76.65mPD to 80.95mPD									
07R1AI1S04	Cast spiral ramp; pour 2	20	20	09APR10A	03MAY10A	100	09APR10A	03MAY10A	
07R1AI1S06	Cast spiral ramp; pour 3	13	13	26APR10A	11MAY10A	100	26APR10A	11MAY10A	
07R1AI1S08	Cast spiral ramp; pour 4	10	10	08MAY10A	19MAY10A	100	08MAY10A	19MAY10A	
Spiral Ramp from +80.95 to +85.25mPD									
07R1AI1S10	Cast spiral ramp; pour 5	12	12	13MAY10A	27MAY10A	100	13MAY10A	27MAY10A	
07R1AI1S12	Cast spiral ramp; pour 6	12	12	20MAY10A	03JUN10A	100	20MAY10A	03JUN10A	
07R1AI1S14	Cast spiral ramp; pour 7	15	15	24MAY10A	09JUN10A	100	24MAY10A	09JUN10A	
Spiral Ramp from 85.25mPD to 89.55mPD									
07R1AI1S16	Cast spiral ramp; pour 8	16	16	28MAY10A	15JUN10A	100	28MAY10A	15JUN10A	
07R1AI1S18	Cast spiral ramp; pour 9	16	16	04JUN10A	23JUN10A	100	04JUN10A	23JUN10A	
07R1AI1S20	Cast spiral ramp; pour 10	14	14	14JUN10A	30JUN10A	100	14JUN10A	30JUN10A	
Spiral Ramp from 89.55 to 93.85mPD									
07R1AI1S24	Cast spiral ramp; pour 11	18	18	17JUN10A	08JUL10A	100	17JUN10A	08JUL10A	
07R1AI1S26	Cast spiral ramp; pour 12	16	16	25JUN10A	14JUL10A	100	25JUN10A	14JUL10A	
07R1AI1S28	Cast spiral ramp; pour 13	16	16	02JUL10A	20JUL10A	100	02JUL10A	20JUL10A	
Spiral Ramp from +93.85mPD to 98.15mPD									
07R1AI1S30	Cast spiral ramp; pour 14	19	19	09JUL10A	06SEP10A	100	09JUL10A	06SEP10A	
07R1AI1S32	Cast spiral ramp; pour 15	14	14	02SEP10A	17SEP10A	100	02SEP10A	17SEP10A	
07R1AI1S34	Cast spiral ramp; pour 16	8	8	20SEP10A	29SEP10A	100	20SEP10A	29SEP10A	
Spiral Ramp from 98.15mPD to 102.45mPD									
07R1AI1S36	Cast spiral ramp; pour 17	11	11	22SEP10A	06OCT10A	100	22SEP10A	06OCT10A	
07R1AI1S38	Cast spiral ramp; pour 18	11	11	02OCT10A	14OCT10A	100	02OCT10A	14OCT10A	
07R1AI1S40	Cast spiral ramp; pour 19	11	11	12OCT10A	25OCT10A	100	12OCT10A	25OCT10A	
Spiral Ramp from 102.45mPD to 108.50mPD									
07R1AI1S42	Cast spiral ramp; pour 20	10	10	22OCT10A	02NOV10A	100	22OCT10A	02NOV10A	
07R1AI1S44	Cast spiral ramp; pour 21	11	11	29OCT10A	10NOV10A	100	29OCT10A	10NOV10A	
07R1AI1S46	Cast spiral ramp; pour 22	14	14	08NOV10A	23NOV10A	100	08NOV10A	23NOV10A	
07R1AI1S48	Cast spiral ramp; pour 23	14	14	20NOV10A	06DEC10A	100	20NOV10A	06DEC10A	
07R1AI1S50	Preparation & fill for central void; 2700m3	18	18	07DEC10A	19FEB11A	100	07DEC10A	19FEB11A	
07R1AI1S52	Cast spiral ramp roof	8	8	26FEB11A	07MAR11A	100	26FEB11A	07MAR11A	



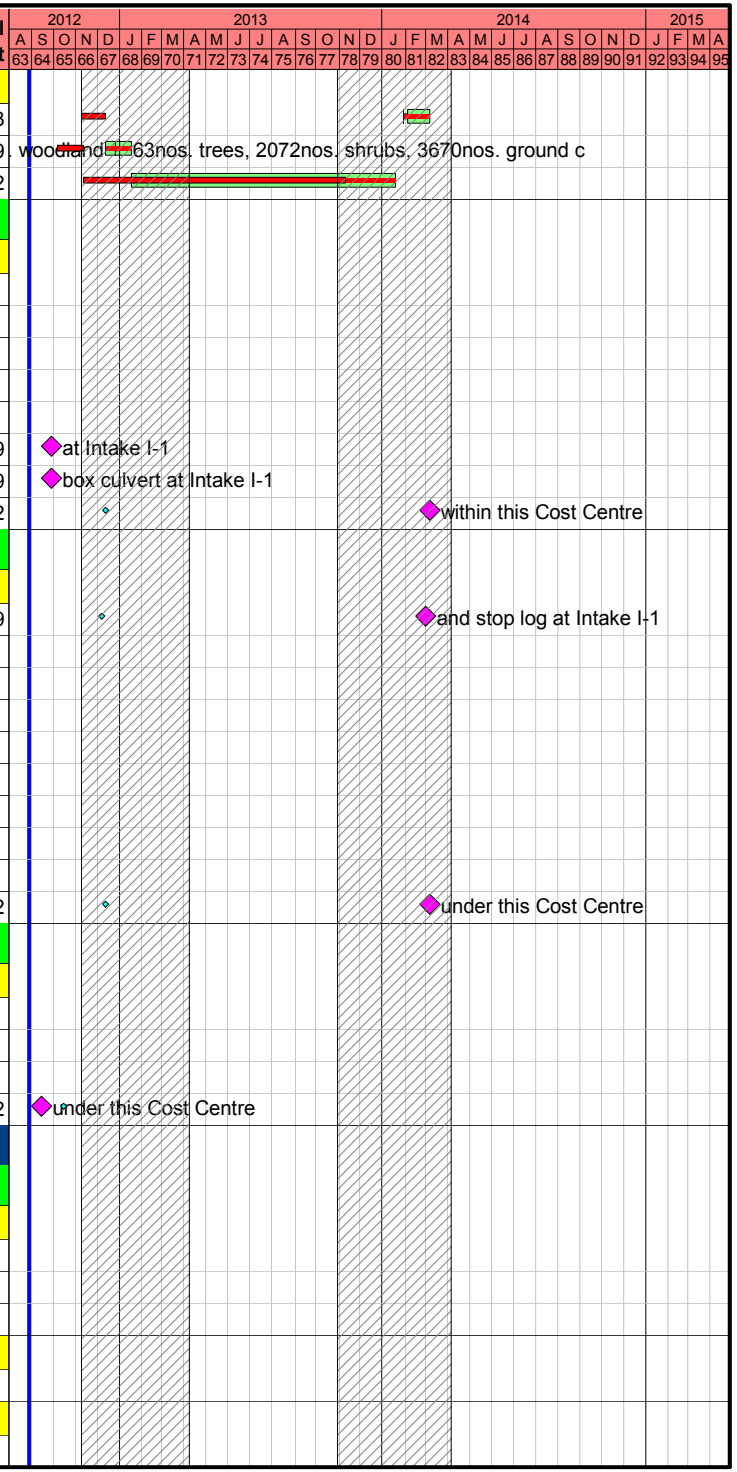
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Construction of Cascade Structure									
04L1AI1472	Cast base slabs	12	12	21JAN11A	21MAR11A	100	21JAN11A	21MAR11A	
04L1AI1474	Cast walls 1st lift	18	18	22MAR11A	20APR11A	100	22MAR11A	20APR11A	
04L1AI1476	Cast walls 2nd lift, 200mm down from soffit	18	18	21APR11A	27MAY11A	100	21APR11A	27MAY11A	
04L1AI1478	Cast roof slabs	18	18	28MAY11A	11JUN11A	100	28MAY11A	11JUN11A	
04L1AI1488	Cast side walls	18	18	13JUN11A	08JUL11A	100	13JUN11A	08JUL11A	
Dismantle & Removal of TBM									
04L1AI1D02	Form cranage platform	52	52	27JUN11A	24AUG11A	100	27JUN11A	24AUG11A	
04L1AI1D03	Mobilization & setup- piling rig	6	6	24AUG11A	27AUG11A	100	24AUG11A	27AUG11A	
04L1AI1D04	Construct 2# temporary H-piles	6	6	29AUG11A	05SEP11A	100	29AUG11A	05SEP11A	
04L1AI1D05	Demobilze piling rig	6	6	06SEP11A	08SEP11A	100	06SEP11A	08SEP11A	
04L1AI1D06	Install H-beam frameworks	24	24	09SEP11A	07OCT11A	100	09SEP11A	07OCT11A	
04L1AI1D08	Construct cradle	12	12	08OCT11A	15OCT11A	100	08OCT11A	15OCT11A	
04L1AI1D09	Obtain CNP for TBM dismantle	0	0		16NOV11A	100		16NOV11A	
04L1AI1D12	Remove debris/steel frame & TBM push to cradle	5	5	29FEB12A	05MAR12A	100	29FEB12	05MAR12	
04L1AI1D13	Mobilization & setup 400t crane	4	4	07MAR12A	10MAR12A	100	07MAR12	10MAR12	
04L1AI1D14	Dissembly & demobiliseTBM/BU	38	38	12MAR12A	27APR12A	100	12MAR12	30APR12	
04L1AI1D16	Remove H-beam frame & cradle	12	12	18APR12A	21JUL12A	100	02MAY12	15MAY12	
Construction of Box Culvert Structure									
04L1AI1463	Cast base	6	6	23JUL12A	04AUG12A	100	16MAY12	22MAY12	
04L1AI1464	Cast walls	24	18	06AUG12A	05SEP12	67	23MAY12	12JUN12	-428
04L1AI1468	Cast roof slabs	18	18	06SEP12	26SEP12	0	13JUN12	05JUL12	-428
04L1AI1470	Backfill & compation, 1st 13m; 4000m3	26	26	12OCT12	12NOV12	0	06JUL12	04AUG12	-428
Slope Reinstatement									
04L1AI1S10	Prepare slope reinstatement report	42	42	28JUL11A	19AUG11A	100	28JUL11A	19AUG11A	
04L1AI1S20	Obtain consent from SOR & GEO	170	170	20DEC11A	26MAY12A	100	20DEC11A	17APR12	
04L1AI1S30	Backfill & compaction, remain. 8m; 900m3	24	24	13NOV12	10DEC12	0	06AUG12	01SEP12	-428
Modification of Existing Channel in Dry Season									
Channel Modification (Varied)Works (Civil Works)									
07R1AI1502	Demolish WYHN wall, weir and SMN weir	10	10	08DEC09A	28DEC09A	100	08DEC09A	28DEC09A	
07R1AI1504	Demolish WYHN slab	4	4	29DEC09A	28JAN10A	100	29DEC09A	28JAN10A	
07R1AI1506	Excavation for WYH channel wall under slab	18	18	30DEC09A	12FEB10A	100	30DEC09A	12FEB10A	
07R1AI1508	Construct WYHN wall under slab;1st layer wall	5	5	29MAR10A	08APR10A	100	29MAR10A	08APR10A	
07R1AI1510	Construct WYHN wall under slab; 2nd layer wall	5	5	09APR10A	22APR10A	100	09APR10A	22APR10A	
07R1AI1512	Install 26# 11m pipe piles	7	7	22DEC09A	13JAN10A	100	22DEC09A	13JAN10A	
07R1AI1514	Demolish WYHN interface wall and SMN	23	23	14JAN10A	12FEB10A	100	14JAN10A	12FEB10A	
07R1AI1518	Construct WYHN and SMN slab	4	4	01MAR10A	13MAR10A	100	01MAR10A	13MAR10A	
07R1AI1520	Construct SMN wall (1st)	9	9	15MAR10A	30MAR10A	100	15MAR10A	30MAR10A	
07R1AI1522	Construct SMN wall (2nd) and weir	8	8	01APR10A	20APR10A	100	01APR10A	20APR10A	
07R1AI1524	Construct WYHN wall	8	8	21APR10A	28APR10A	100	21APR10A	28APR10A	
Channel Modification Works (Steel Works)									
07R1AI1628	Construct WYH clolumn	9	9	04NOV11A	09DEC11A	100	04NOV11A	09DEC11A	
07R1AI1638	Construct R.C. frame for stop log	18	18	04NOV11A	09DEC11A	100	04NOV11A	09DEC11A	



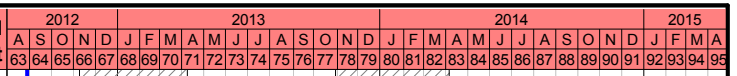
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
07R1AI1648	Install stop log A	12	12	29NOV13*	12DEC13	0	01NOV12*	14NOV12	-629
07R1AI1658	Install trash grill	72	18	29NOV13	28FEB14	0	15NOV12	05DEC12	-677
07R1AI1668	Remove TDMP	24	12	01NOV13*	28NOV13	0	17OCT12	31OCT12	-677
07R1AI1678	Install stop log B	12	12	14DEC13*	30DEC13	0	01NOV12*	14NOV12	-629
Piling Works									
Piing Works Along Crest Plarform									
11R2AI1000	Implement TTA at Shing Mun Road	0	0		01APR11A	100		01APR11A	
11R2AI1010	Implement XP	0	0		01APR11A	100		01APR11A	
11R2AI1200	Erect piling platform for upper piles	24	24	02APR11A	05MAY11A	100	02APR11A	05MAY11A	
11R2AI1204	Mobilize piling rig & set up	6	6	11MAY11A	16MAY11A	100	11MAY11A	16MAY11A	
11R2AI1206	350mm dia. pre-bored H-piles (upper); 36 nos.	54	54	17MAY11A	01JUN11A	100	17MAY11A	01JUN11A	
11R2AI1208	Demobilize piling rig	3	3	02JUN11A	04JUN11A	100	02JUN11A	04JUN11A	
Skin Wall & Crest Platform									
11R2AI1210	Remove piling platform/Excavate & hack off grout	18	18	07JUN11A	05JUL11A	100	07JUN11A	05JUL11A	
11R2AI1212	Construct abutment	18	18	06JUL11A	26JUL11A	100	06JUL11A	26JUL11A	
11R2AI1214	Construct skin wall & capping beam	12	12	27JUL11A	09AUG11A	100	27JUL11A	09AUG11A	
11R2AI1216	Relocation of gully & construct catchpit; VO#067	14	14	10AUG11A	15AUG11A	100	10AUG11A	15AUG11A	
11R2AI1217	Construct run-in	7	7	15AUG11A	17AUG11A	100	15AUG11A	17AUG11A	
11R2AI1218	Reinstatement of masonry wall	14	14	18AUG11A	19SEP11A	100	18AUG11A	19SEP11A	
11R2AI1219	Reinstatement of carriageway	6	6	20SEP11A	18OCT11A	100	20SEP11A	18OCT11A	
Piling Works Above Inclined Access Ramp									
11R2AI1220	Mobilize piling rig & set up	6	6	17OCT11A	20OCT11A	100	17OCT11A	20OCT11A	
11R2AI1222	350mm dia. pre-bored H-piles (lower); 22 nos.	22	22	20OCT11A	04NOV11A	100	20OCT11A	04NOV11A	
11R2AI1224	Demobilize piling rig	3	3	05NOV11A	08NOV11A	100	05NOV11A	08NOV11A	
Skin Wall & Inclined Access Ramp									
11R2AI1226	Excavate & hack off grout	16	6	07AUG12A	24AUG12A	100	03SEP12	08SEP12	
11R2AI1228	Construct skin wall & ramp	18	30	24AUG12A	13SEP12	50	10SEP12	15OCT12	-288
11R2AI1232	Temporary backfill with pre-cast conc. blocks	4	4	14SEP12	18SEP12	0	16OCT12	19OCT12	-288
11R2AI1242	Remove pre-cast concrete block	6	0	11DEC12	17DEC12	0			-348
11R2AI1252	Construct ramp & additiona drainage works	21	0	18DEC12	14JAN13	0			-348
Remaining Works Prior to Handover									
Finishing Works									
07R1AI1F02	Water proofing work at Spiral Ramp	105	24	22MAY12A	24SEP12	72	02MAY12	29MAY12	-345
07R1AI1F12	Tiling works; stage 1	28	48	15AUG12A	15SEP12	65	30MAY12	26JUL12	-345
07R1AI1F22	Install hand rails at Spiral Ramp	16	16	02MAY12A	21MAY12A	100	27JUL12	14AUG12	
07R1AI1F32	Install GRP	29	29	27DEC12	30JAN13	0	15AUG12	17SEP12	-428
07R1AI1F42	Reinstate retaining wall	24	24	04DEC12	03JAN13	0	27AUG12	22SEP12	-339
07R1AI1F52	Construct drainage	18	18	11DEC12	03JAN13	0	20OCT12	10NOV12	-339
07R1AI1F62	Tiling works; stage 2	12	12	11DEC12	24DEC12	0	03SEP12	15SEP12	-428
07R1AI1F72	Remove temp. bridge	12	12	15JAN13	28JAN13	0	12NOV12	24NOV12	-348
PVO-TR-30	Vertical greening & water points at Spiral Ramp	48	0	31JAN13	03APR13	0			-428



ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
07R1AI1608	Pre-handover inspections and remedial works	30	30	29JAN14	07MAR14	0	08NOV12	12DEC12	-673
16R7AI1602	Landscaping works at Portion A	30	30	11DEC12	17JAN13	0	06OCT12	10NOV12	-369
16R7AI1604	Establishment Works at Portion A	365	365	18JAN13	17JAN14	0	11NOV12	10NOV13	-452
Schedule of Milestones for Cost Center No. 4L									
04L1AI1802	4L 1; On completion of 50% excavation	0	0		29JUN09A	100		29JUN09A	
04L1AI1804	4L 2; On completion of excavation	0	0		30JAN10A	100		30JAN10A	
04L1AI1806	4L 3; On completion of 25% concreting	0	0		20APR11A	100		20APR11A	
04L1AI1808	4L 4; On completion of 50% concreting	0	0		27MAY11A	100		27MAY11A	
04L1AI1810	4L 5; On completion of 75% concreting	0	0		11JUN11A	100		11JUN11A	
04L1AI1812	4L 6; On completion of Cascade	0	0		26SEP12	0		05JUL12	899
04L1AI1814	4L 7; On completion of connecting BC	0	0		26SEP12	0		05JUL12	899
04L1AI1816	4L 8; On completion of all works under this CC	0	0		07MAR14	0		12DEC12	372
Schedule of Milestones for Cost Centre No. 7R									
07R1AI1902	7R 1; On completion of trash grills	0	0		28FEB14	0		05DEC12	379
07R1AI1904	7R 2; On completion of 25% excavation	0	0		29JUN09A	100		29JUN09A	
07R1AI1906	7R 3; On completion of 50% excavation	0	0		27JUL09A	100		27JUL09A	
07R1AI1908	7R 4; On completion of 75% excavation	0	0		24OCT09A	100		24OCT09A	
07R1AI1910	7R 5; On completion of all excavation	0	0		26DEC09A	100		26DEC09A	
07R1AI1912	7R 6; On completion of spiral ramp to +80mPD	0	0		19MAY10A	100		19MAY10A	
07R1AI1914	7R 7; On completion of spiral ramp to +90mPD	0	0		30JUN10A	100		30JUN10A	
07R1AI1916	7R 8; On completion of spiral ramp to +100mPD	0	0		29SEP10A	100		29SEP10A	
07R1AI1918	7R 9; On completion of spiral access ramp	0	0		07MAR11A	100		07MAR11A	
07R1AI1920	7R 10; On completion of all works under this CC	0	0		07MAR14	0		12DEC12	372
Schedule of Milestones for Cost Centre No. 11R									
11R2AI1R02	11R 1; On completion of soil nailing works	0	0		06SEP08A	100		06SEP08A	
11R2AI1R04	11R 2; On completion of piling at platform	0	0		01JUN11A	100		01JUN11A	
11R2AI1R06	11R 3; On completion of piling at branch access	0	0		04NOV11A	100		04NOV11A	
11R2AI1R08	11R 4; On completion of all works under this CC	0	0		13SEP12	0		15OCT12	912
Construction of Intake I-2									
Preliminary Works									
Additional GI Works to Finalize Design									
AGIB-02	Erect platform/mibilization & set up GI rig	3	3	12SEP08A	16SEP08A	100	12SEP08A	16SEP08A	
AGIB-04	Drill 3 nos. GI holes for Intake Structures	22	22	17SEP08A	03NOV08A	100	17SEP08A	03NOV08A	
AGIB-06	Drill 1 hole for Intersection with Main Tunnel	12	12	11NOV08A	24NOV08A	100	11NOV08A	24NOV08A	
Diversion of CLP Overhead Cable									
01R1BU0102	Temporary diversion of CLP overhead cable	30	30	02SEP08A	17OCT08A	100	02SEP08A	17OCT08A	
Dievrsion of 100mm Watermain									
01R1BU0202	Temporary Diversion of 100mm dia. Watermain	64*	64*	03OCT08A	05DEC08A	100	03OCT08A	05DEC08A	



ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
01R1BU0204	Issue VO35 for temp. diversion	1	1	03OCT08A	03OCT08A	100	03OCT08A	03OCT08A	
01R1BU0206	Preparation works	26	26	04OCT08A	04NOV08A	100	04OCT08A	04NOV08A	
01R1BU0208	Install steel support	3	3	05NOV08A	07NOV08A	100	05NOV08A	07NOV08A	
01R1BU0210	Lay new watermain	2	2	08NOV08A	18NOV08A	100	08NOV08A	18NOV08A	
01R1BU0212	Obtain ICE certificate for temp. support	0	0		19NOV08A	100		19NOV08A	
01R1BU0214	Pressure test	2	2	20NOV08A	21NOV08A	100	20NOV08A	21NOV08A	
01R1BU0216	Sterilise new pipe & take water sample	3	3	22NOV08A	25NOV08A	100	22NOV08A	25NOV08A	
01R1BU0218	Watermain connection by WSD	10	10	26NOV08A	05DEC08A	100	26NOV08A	05DEC08A	
VO #11; Transperant Hoarding at I-2									
VO011-02	Receive VO11 for transparent hoarding	0	0		14JUL08A	100		14JUL08A	
VO011-04	Procure/prepare/install transparent hoarding	51	51	15JUL08A	13SEP08A	100	15JUL08A	13SEP08A	
VO#32; Replace Hoarding by Chain Link Fence									
VO032-I202	Receive VO-32 for replacing hoarding by CLF	0	0		16SEP08A	100		16SEP08A	
VO032-I204	Procure/prepare/install transparent hoarding	51	51	17SEP08A	17NOV08A	100	17SEP08A	17NOV08A	
01R1BI2102	Possession of Portion B -90d of DOC	0	0	26MAR08A		100	26MAR08A		
01R1BI2104	Obtain TTA (ingress & egress) approval	0	0		19APR08A	100		19APR08A	
01R1BI2108	Site clearance	30	30	02MAY08A	05SEP08A	100	02MAY08A	05SEP08A	
01R1BI2112	Erect hoarding	30	30	05JUN08A	16MAR09A	100	05JUN08A	16MAR09A	
01R1BI2116	Install remote contorl CCTV as per ER 4.4.10	12	12	28FEB09A	13MAR09A	100	28FEB09A	13MAR09A	
16R7BI2002	Tree transplanting; 1 no.	72	72	10DEC08A	23APR09A	100	10DEC08A	23APR09A	
Stream Diversion/Approach Channel/H-Pile Wall									
Revised Layout of Pile Wall at I-2									
VO022-02	Received VO22 for revised layout of pile wall	0	0		10JUL08A	100		10JUL08A	
VO022-04	SOR confirmed to demolish exit. ret. wall	38	38	11JUL08A	21AUG08A	100	11JUL08A	21AUG08A	
VO022-06	Demolish existing retaining wall	1	1	13SEP08A	13SEP08A	100	13SEP08A	13SEP08A	
VO022-16	Reinstate piling platform	2	2	16SEP08A	17SEP08A	100	16SEP08A	17SEP08A	
Phase 1; Construct 550 dia. H-pile Wall									
12R3BI2202	Form temp. access ramp along west side of stream	44	44	10JUN08A	31JUL08A	100	10JUN08A	31JUL08A	
12R3BI2204	Additional SI & engineering works	26	26	25AUG08A	24SEP08A	100	25AUG08A	24SEP08A	
12R3BI2206	Mobilize piling rig & set up	5	5	25SEP08A	30SEP08A	100	25SEP08A	30SEP08A	
12R3BI2208	Construct piles 1 to 18	13	13	02OCT08A	17OCT08A	100	02OCT08A	17OCT08A	
12R3BI2210	Piling works stopped by the SOR	8	8	18OCT08A	27OCT08A	100	18OCT08A	27OCT08A	
12R3BI2212	Construct piles 19-58	28	28	28OCT08A	26NOV08A	100	28OCT08A	26NOV08A	
12R3BI2214	SOR's instruction to delet pile 59	0	0		02DEC08A	100		02DEC08A	
12R3BI2216	Demobilize piling rig	4	4	03DEC08A	06DEC08A	100	03DEC08A	06DEC08A	
12R3BI2218	Construct skin wall/caping beam/u-channel	155*	155*	27JUL09A	29JAN10A	100	27JUL09A	29JAN10A	
12R3BI2220	Excavate for skin wall; 4 bays	18	18	27JUL09A	27AUG09A	100	27JUL09A	27AUG09A	
12R3BI2222	Construct for skin wall; 4 bays	24	24	05OCT09A	12NOV09A	100	05OCT09A	12NOV09A	
12R3BI2224	Construct capping beam	16	16	13NOV09A	01DEC09A	100	13NOV09A	01DEC09A	
12R3BI2226	Construct drainage	12	12	02DEC09A	29JAN10A	100	02DEC09A	29JAN10A	
Phase 1; Construct Dry Weather Flow Channel									
08R1BI2202	Excavate for new low flow channel	6	6	27MAR09A	03APR09A	100	27MAR09A	03APR09A	



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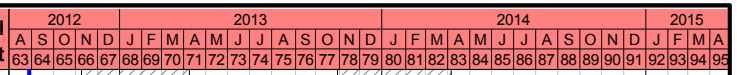
08R1BI2204	Construct new low flow channel	6	6	11JUN09A	17JUN09A	100	11JUN09A	17JUN09A	
08R3BI2208	Remove blcock wall/excavate for gantry footing	12	12	18JUN09A	22JUL09A	100	18JUN09A	22JUL09A	
08R3BI2212	Construct PC bund wall to protect gantry footing	6	6	23JUL09A	27JUL09A	100	23JUL09A	27JUL09A	
Phase 2; Construct Approach Channel West									
08R1BI2218	Construct temp. concrete block bund	12	12	16DEC09A	11JAN10A	100	16DEC09A	11JAN10A	
08R1BI2220	Excavate for western portion guide wall & slab	12	12	16DEC09A	20JAN10A	100	16DEC09A	20JAN10A	
08R1BI2222	Construct western portion of guide wall & slab	50	50	21JAN10A	13APR10A	100	21JAN10A	13APR10A	
08R1BI2224	Remove concrete block bund	6	6	14APR10A	17APR10A	100	14APR10A	17APR10A	
Phase 3; Construct Approach Channel North									
08R1BI2226	Construct temp. concrete block bund	6	6	01NOV11A	05NOV11A	100	01NOV11A	05NOV11A	
08R1BI2228	Excavate for L-shaped retaining wall; VO#113	50	50	01NOV10A	07JAN12A	100	01NOV10A	07JAN12A	
08R1BI2229	Formation & place blinding layer	11	11	19JAN12A	03FEB12A	100	19JAN12A	03FEB12A	
08R1BI2230	Construct L-shaped retaining wall; VO#113	26	26	04FEB12A	05MAR12A	100	04FEB12A	05MAR12	
08R1BI2234	Construct H piles 7# for boulder trap	12	12	09JAN12A	18JAN12A	100	09JAN12A	18JAN12A	
08R1BI2236	Construct eastern portion of guide wall & slab	16	16	06MAR12A	31MAR12A	100	06MAR12	23MAR12	
08R1BI2240	Construct temp. concrete blcok bund	6	6	26MAR12A	31MAR12A	100	24MAR12	30MAR12	
Phase 3a; Stone Pitching Works									
08R1BI2260	Channel modification & stone pitching	24	24	01NOV12*	28NOV12	0	01NOV12*	28NOV12	-341
08R1BI2270	Stone Pitching to Guide Wall	24	24	29NOV12	28DEC12	0	29NOV12	28DEC12	-341
08R1BI2280	Stone pitching to closing guide wall	12	12	08APR13	20APR13	0	02MAR13	15MAR13	-418
Phase 4 - Construct Remaining Appr. Channel									
08R1BI2238	Boulder traps; 7 nos.	12	12	28FEB13	13MAR13	0	16JAN13	29JAN13	-443
08R1BI2242	Remove noise enclosure/gantry crane/steel deck	25	25	13OCT12	12NOV12	0	30NOV12	31DEC12	-466
08R1BI2244	Excavation for remaining approach channel	25	12	13NOV12	11DEC12	0	02JAN13	15JAN13	-466
08R1BI2246	Construct Vortex & remaining approach channel	84	30	12DEC12	26MAR13	0	16JAN13	22FEB13	-466
08R1BI2248	Close out last section of guide wall	12	12	27MAR13	13APR13	0	23FEB13	08MAR13	-466
08R1BI2249	Removal of TDMP	24	0	01NOV13*	28NOV13	0			-679
08R1BI2250	Construct trash grill	72	18	29NOV13	28FEB14	0	16JAN13	05FEB13	-679
PVOABT2-10	Additional boulder traps	48	0	29DEC12	27FEB13	0			-443
PVOMLRW-10	Modif. to L-shap ret. wall & ground profile	48	0	01NOV12*	28DEC12	0			-443
Excavate & Construct Vortex/Drop Shaft									
Steel Deck & Gantry Crane/Noise Enclosure									
05L1BI2300	Construct 8 nos. mini piles	24	24	20JAN09A	21FEB09A	100	20JAN09A	21FEB09A	
05L1BI2301	Erect timber platform for mini piling	4	4	23FEB09A	26FEB09A	100	23FEB09A	26FEB09A	
05L1BI2302	Construct 6 nos. mini piles	12	12	27FEB09A	12MAR09A	100	27FEB09A	12MAR09A	
05L1BI2303	Excavation for footing/pile caps	12	12	13MAR09A	26MAR09A	100	13MAR09A	26MAR09A	
05L1BI2304	Construction of footing/pile caps	12	12	27MAR09A	18APR09A	100	27MAR09A	18APR09A	
05L1BI2305	Install steel deck	25	25	04MAY09A	15AUG09A	100	04MAY09A	15AUG09A	
05L1BI2316	Construct footing for gantry crane	12	12	09SEP09A	15OCT09A	100	09SEP09A	15OCT09A	
05L1BI2318	Install gantry crane	42	42	28OCT09A	01MAR10A	100	28OCT09A	01MAR10A	
05L1BI2328	Install noise enclosure	24	24	22MAR10A	27MAY10A	100	22MAR10A	27MAY10A	
Ground Treatment Works for Vortex Shaft									
05L1BI2306	Setting up	2	2	16JUL09A	16JUL09A	100	16JUL09A	16JUL09A	



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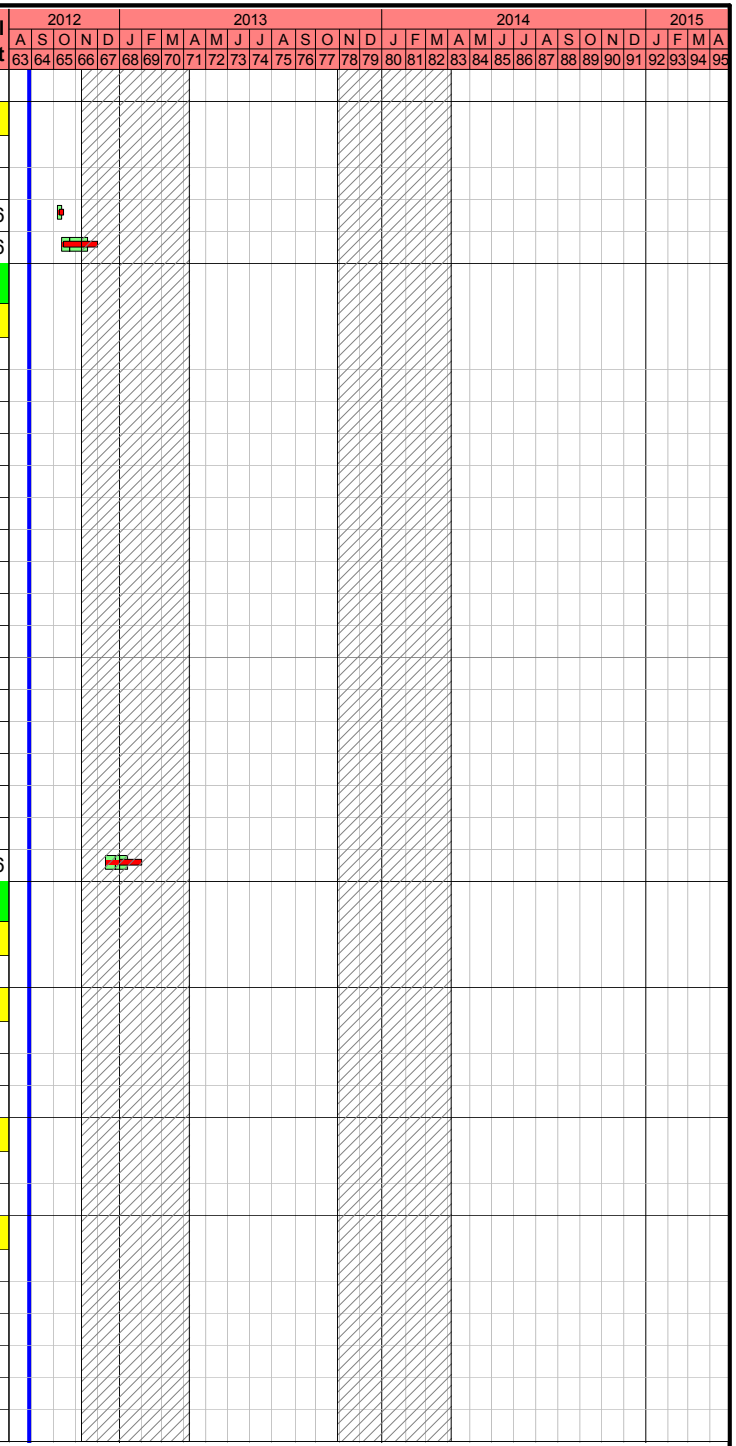
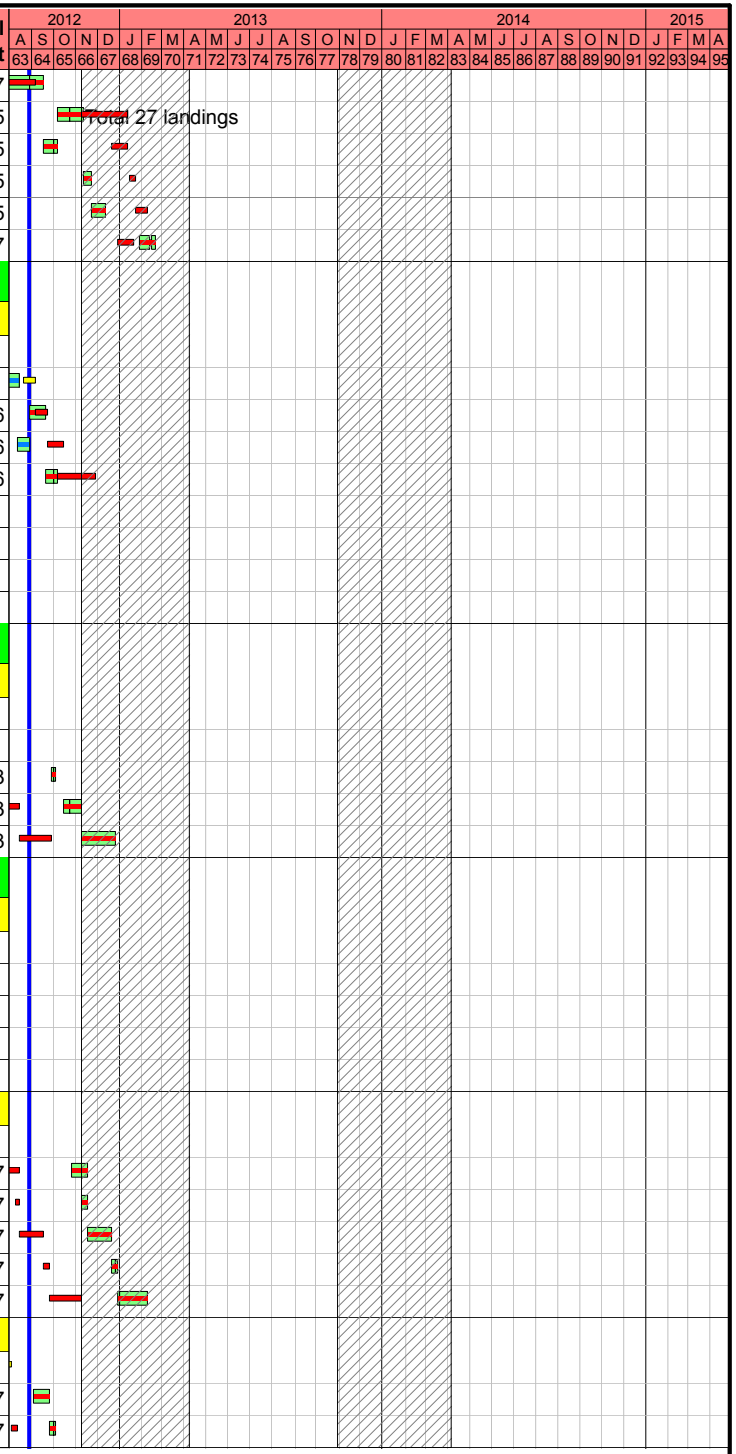
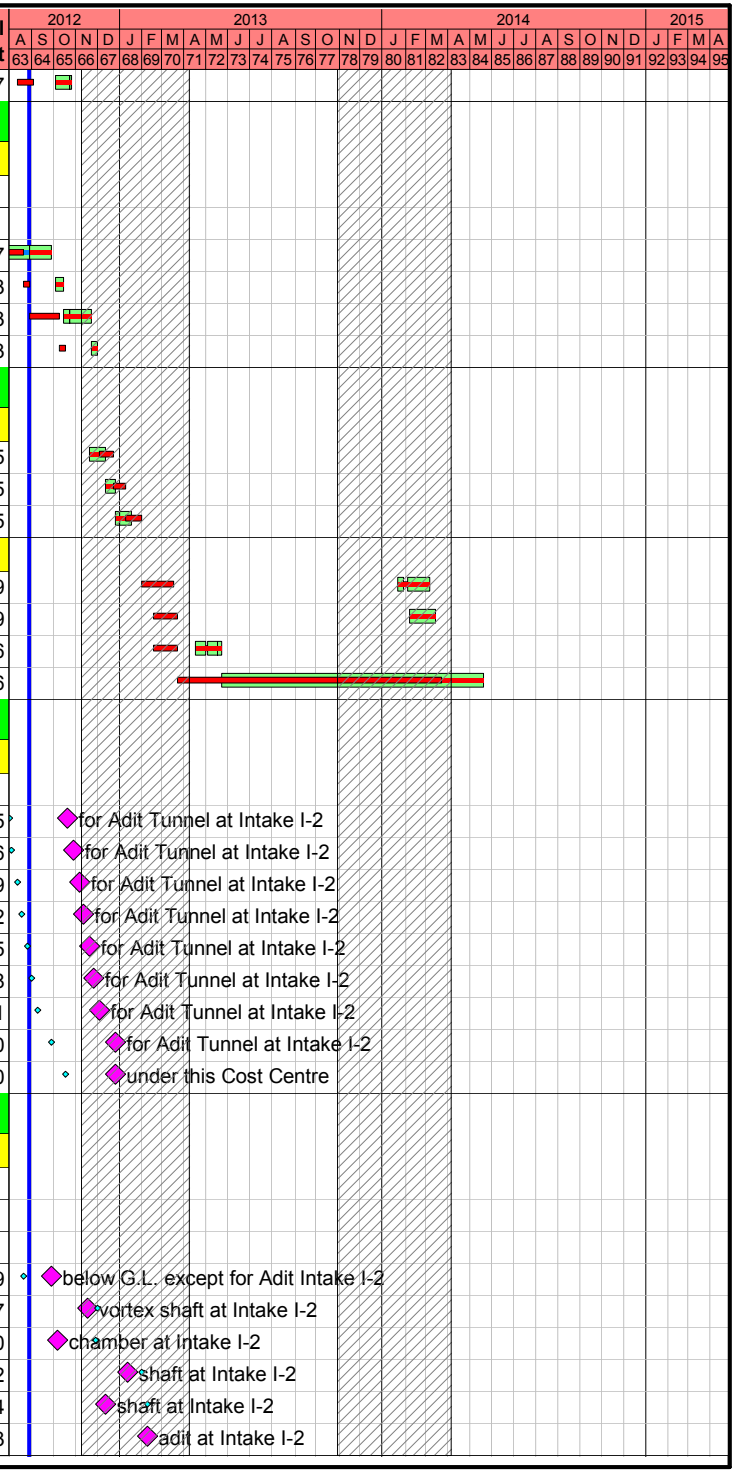
05L1BI2308	Probing & curtain grouting around shaft	37	37	17JUL09A	08SEP09A	100	17JUL09A	08SEP09A	
Excavation and Construction of Vortex Shaft									
05L1BI2319	Construct collar	6	6	02MAR10A	13MAR10A	100	02MAR10A	13MAR10A	
05L1BI2320	Excavate by conventional method; +99~+68mPD	337	337	30MAR10A	01AUG11A	100	30MAR10A	01AUG11A	
05L1BI2321	Set up for lining construction	6	6	06OCT12	12OCT12	0	09OCT12	15OCT12	-466
05L1BI2322	Construct permanent lining; 30m @ 6m/ 5days	30	38	13OCT12	17NOV12	0	16OCT12	29NOV12	-466
Excavate & Construct Air Vent Shaft									
05L1BI2418	Enlarge the platform for RCD operation	15	15	08DEC08A	27DEC08A	100	08DEC08A	27DEC08A	
05L1BI2420	Mobilize & set up RCD for excavation	6	6	29DEC08A	06JAN09A	100	29DEC08A	06JAN09A	
05L1BI2422	Bore shaft with RCD; 37.5m @1m/day	54	54	07JAN09A	13MAR09A	100	07JAN09A	13MAR09A	
05L1BI2424	Demobilize RCD rig	5	5	14MAR09A	19MAR09A	100	14MAR09A	19MAR09A	
05L1BI2426	Install permanent steel liner	3	3	20MAR09A	23MAR09A	100	20MAR09A	23MAR09A	
05L1BI2427	Preparation works for casting concrete	1	1	21MAR09A	25APR09A	100	21MAR09A	25APR09A	
05L1BI2428	Damage found on installed steel liner	0	0		25APR09A	100		25APR09A	
05L1BI2429	Removal of steel liner	31	31	27APR09A	04JUN09A	100	27APR09A	04JUN09A	
05L1BI2430	Remove RCD platform	17	17	05JUN09A	24JUN09A	100	05JUN09A	24JUN09A	
05L1BI2432	Construct PC bund wall	12	12	25JUN09A	15JUL09A	100	25JUN09A	15JUL09A	
05L1BI2434	Divert channel to West	0	0		15JUL09A	100		15JUL09A	
05L1BI2436	Footing for lifting frame	12	12	22JAN10A	12FEB10A	100	22JAN10A	12FEB10A	
05L1BI2438	Erection of lifting frame	18	18	09FEB10A	05MAR10A	100	09FEB10A	05MAR10A	
05L1BI2446	Install steel casing	36	36	09MAR10A	22MAR10A	100	09MAR10A	22MAR10A	
05L1BI2448	Survey checking & capping concrete	3	3	23MAR10A	29MAR10A	100	23MAR10A	29MAR10A	
05L1BI2450	Preparation & concreting	3	3	30MAR10A	19APR10A	100	30MAR10A	19APR10A	
05L1BI2452	Construct upstand wall	24	24	12DEC12	11JAN13	0	02JAN13	29JAN13	-376
Excavate & Construct Man Access Shaft									
Ground Treatment for Man Access Shaft									
05L1BI2502	Probing & curtain grouting around shaft	31	31	12AUG09A	15SEP09A	100	12AUG09A	15SEP09A	
Gantry Crane & Noise Enclosure at M. A. Shaft									
05L1BI2504	Excavate & construct 4 nos. gantry footings	12	12	30SEP09A	19NOV09A	100	30SEP09A	19NOV09A	
05L1BI2505	Install gantry crane	18	18	08JAN10A	24MAR10A	100	08JAN10A	24MAR10A	
05L1BI2515	Install noise enclosure	18	18	06MAY10A	27AUG10A	100	06MAY10A	27AUG10A	
ELS and Excavation upto Rock Head Level at M.A.									
05L1BI2503	Install sheet piles	6	6	28OCT09A	03NOV09A	100	28OCT09A	03NOV09A	
05L1BI2506	Excavation/wailing to rock head level	36	36	04NOV09A	11JAN10A	100	04NOV09A	11JAN10A	
Excavation & Construction of Man Access Shaft									
05L1BI2508	Excavate by conventional method; +102~ +70mPD	356	356	12JAN10A	16JUL11A	100	12JAN10A	16JUL11A	
05L1BI2510	Obtain Blasting Permit	0	0		22JUL11A	100		22JUL11A	
05L1BI2511	Preparation works prior to 1st blast	13	13	18JUL11A	01AUG11A	100	18JUL11A	01AUG11A	
05L1BI2518	Excavate;+70~68.0mPD	12	12	10AUG11A	07SEP11A	100	10AUG11A	07SEP11A	
05L1BI2522	Cleaning,blinding & base construction	11	6	18JUN12A	30JUN12A	100	05JUL12	11JUL12	
05L1BI2524	Set up for 37m shaft construction (wall only)	6	6	03JUL12A	07JUL12A	100	05JUL12	11JUL12	



ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
05L1BI2526	Construct wall & dismante mould; 3.6m/4day	61	48	09JUL12A	17SEP12	67	12JUL12	05SEP12	-327
05L1BI2527	Construct stairs; Precast & insitu stich concret	30	54	08OCT12	12NOV12	0	08NOV12	12JAN13	-315
05L1BI2528	Removal of noise enclosure & gantry crane	16	16	18SEP12	06OCT12	0	22DEC12	12JAN13	-315
05L1BI2530	Construct wall above ground level	9	9	13NOV12	22NOV12	0	14JAN13	23JAN13	-315
05L1BI2532	Construct shaft roof	15	15	23NOV12	10DEC12	0	24JAN13	09FEB13	-315
05L1BI2542	Install steel handrailing incl. at MAA	18	18	28JAN13	20FEB13	0	29DEC12	19JAN13	-377
Excavate & Construct Deaeration Chamber									
05L1BI2602	Excavate by drill & blasting	148	148	08AUG11A	23MAR12A	100	08AUG11A	14MAR12	
05L1BI2607	Wall between Chamber & MA Adit; 20m3	14	14	24JUL12A	15AUG12A	100	21AUG12	05SEP12	
05L1BI2608	Wall/Crown inclined section	17	14	30AUG12	18SEP12	0	06SEP12	21SEP12	-466
05L1BI2612	Wall/Crown beneath Vortex	14	19	13AUG12A	29AUG12	86	22SEP12	15OCT12	-466
05L1BI2614	Wall/Crown middle section	14	43	19SEP12	05OCT12	0	08OCT12	27NOV12	-466
05L1BLR002	Obtain Blasting Permit	0	0		22JUL11A	100		22JUL11A	
05L1BLR012	Cleaning & blinding	6	6	28MAR12A	11APR12A	100	09MAY12	15MAY12	
05L1BLR022	Construct base slab	41	12	16APR12A	05JUN12A	100	16MAY12	29MAY12	
05L1BLR032	Construct walls up 7m	38	26	06JUN12A	23JUL12A	100	30MAY12	29JUN12	
Excavate & Construct Main Adit Tunnel									
3BL1BI2101	Initial 4 # heading blast	19	19	03FEB12A	24FEB12A	100	03FEB12A	24FEB12A	
3BL1BI2102	Excavate by drill & blasting	110	110	28FEB12A	07JUL12A	100	28FEB12	13JUL12	
3BL1BI2104	Mucking out cleaning & blinding	6	6	27SEP12	04OCT12	0	14JUL12	20JUL12	-363
3BL1BI2110	Construct invert; 6mx8 bays (3 pours)	21	21	15OCT12	08NOV12	0	21JUL12	14AUG12	-363
3BL1BI2114	Construct wall & crown; 8 bays	39	39	09NOV12	24DEC12	0	15AUG12	28SEP12	-363
Excavate & Construct Man Access Adit									
Upper Horizontal Section									
05L1BI2806	Excavate by drill & blasting	102	102	02AUG11A	05DEC11A	100	02AUG11A	05DEC11A	
05L1BI2807	Cleaning & blinding incl. MAS	6	6	15MAR12A	21MAR12A	100	15MAR12	21MAR12	
05L1BI2808	Construct invert; 4 bays; 2 pourx6days	12	12	22MAR12A	21APR12A	100	22MAR12	05APR12	
05L1BI2830	Set up steel mould fwk	10	10	23APR12A	05MAY12A	100	10APR12	20APR12	
05L1BI2834	Construct wall & crown	24	24	07MAY12A	16JUN12A	100	21APR12	21MAY12	
Vertical Section									
05L1BI2810	Excavate by drill & blasting	84	84	01DEC11A	14MAR12A	100	01DEC11A	14MAR12	
05L1BI2822	Construct base & junction of raise shaft	18	18	27OCT12	16NOV12	0	26JUL12	15AUG12	-377
05L1BI2824	Set up for raise stairway const. (wall only)	6	6	10NOV12	16NOV12	0	09AUG12	15AUG12	-377
05L1BI2826	Construct wall only;	28	28	17NOV12	19DEC12	0	16AUG12	17SEP12	-377
05L1BI2836	Dismantle remove moulds	6	6	20DEC12	28DEC12	0	18SEP12	24SEP12	-377
05L1BI2846	Insitu stairs (6 pours) @ 6 days/pour	36	36	29DEC12	09FEB13	0	25SEP12	07NOV12	-377
Lower Horizontal Section									
05L1BI2814	Excavate by blasting; 4 # blasts	18	18	07FEB12A	02MAY12A	100	14JUL12	03AUG12	
05L1BI2815	Excavate rem. (0.5m) by mech./clean & blinding	18	0	04SEP12	24SEP12	0			-377
05L1BI2816	Construct invert	6	6	25SEP12	02OCT12	0	04AUG12	10AUG12	-377



ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
05L1BI2818	Construct wall & crown	20	20	03OCT12	26OCT12	0	11AUG12	03SEP12	-377
Junction Between Main Tunnel & Adit Tunnel									
3BL1BI2100	Remove TBM services/delivery of steel arches	0	0		24APR12A	100		03MAY12	
3BL1BI2106	Install steel arches from main tunnel	19	24	25APR12A	18MAY12A	100	04MAY12	31MAY12	
3BL1BI2107	Excavate (breathrough);2m	69	32	09JUL12A	26SEP12	45	14JUL12	20AUG12	-377
3BL1BI2108	Construct invert	8	8	05OCT12	13OCT12	0	21AUG12	29AUG12	-363
3BL1BI2118	Construct wall & crown	34	34	15OCT12	23NOV12	0	30AUG12	09OCT12	-343
3BL1BI2128	Remove steel arches	6	6	24NOV12	30NOV12	0	10OCT12	16OCT12	-343
Remaining Works Prior to Handover									
Radio Communication System									
VO180I205	Construct equipment room	18	18	20NOV12	10DEC12	0	03DEC12	22DEC12	-345
VO180I210	Lay tiles on equipment room	12	12	11DEC12	24DEC12	0	24DEC12	09JAN13	-345
VO180I215	Install radio comminication system	18	18	27DEC12	17JAN13	0	10JAN13	30JAN13	-345
08R1BI2102	Finishing & reinstatement works; Portion B	36	36	22JAN14	07MAR14	0	30JAN13	15MAR13	-679
08R1BI2103	Pre-handover inspections and remedial works	30	30	08FEB14	14MAR14	0	16FEB13	22MAR13	-679
16R7BI2102	Landscaping works at Portion B	30	30	15APR13	21MAY13	0	16FEB13	22MAR13	-466
16R7BI2104	Establishment Works at Portion B	365	365	22MAY13	21MAY14	0	23MAR13	22MAR14	-576
Schedule of Milestones for Cost Centre No. 3bL									
3BL1BI2A02	3bL 1; On establishing tunnelling equipments	0	0		20FEB12A	100		20FEB12A	
3BL1BI2A04	3bL 2; On completion of 12.5% perm. tunnel linin	0	0		20OCT12	0		27JUL12	875
3BL1BI2A06	3bL 3; On completion of 25% perm. tunnel lining	0	0		29OCT12	0		03AUG12	866
3BL1BI2A08	3bL 4; On completion of 37.5% perm. tunnel linin	0	0		05NOV12	0		10AUG12	859
3BL1BI2A10	3bL 5; On completion of 50% perm. tunnel lining	0	0		12NOV12	0		17AUG12	852
3BL1BI2A12	3bL 6; On completion of 62.5% perm. tunnel linin	0	0		19NOV12	0		24AUG12	845
3BL1BI2A14	3bL 7; On completion of 75% perm. tunnel lining	0	0		26NOV12	0		31AUG12	838
3BL1BI2A16	3bL 8; On completion of 87.5% perm. tunnel linin	0	0		03DEC12	0		07SEP12	831
3BL1BI2A18	3bL 9; On completion of perm. tunnel lining	0	0		24DEC12	0		28SEP12	810
3BL1BI2A20	3bL 10; On completion of all works under this CC	0	0		24DEC12	0		16OCT12	810
Schedule of Milestones for Cost Centre No. 5L									
05L1BI2M02	5L 1; On completion of 25% of excavation	0	0		27MAY11A	100		27MAY11A	
05L1BI2M04	5L 2; On completion of 50% of excavation	0	0		27DEC11A	100		27DEC11A	
05L1BI2M06	5L 3; On completion of 75% of excavation	0	0		14MAR12A	100		14MAR12	
05L1BI2M08	5L 4; On completion of all excavation	0	0		26SEP12	0		20AUG12	899
05L1BI2M10	5L 5; On completion of drop shaft & vortex shaft	0	0		17NOV12	0		29NOV12	847
05L1BI2M12	5L 6; On completion of de-aeration chamber	0	0		05OCT12	0		27NOV12	890
05L1BI2M14	5L 7; On completion of air vent shaft	0	0		11JAN13	0		29JAN13	792
05L1BI2M16	5L 8; On completion of man access shaft	0	0		10DEC12	0		09FEB13	824
05L1BI2M18	5L 9; On completion of man access adit	0	0		09FEB13	0		21MAY12	763



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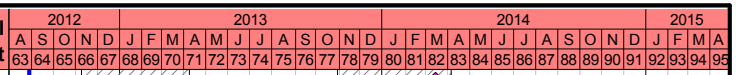
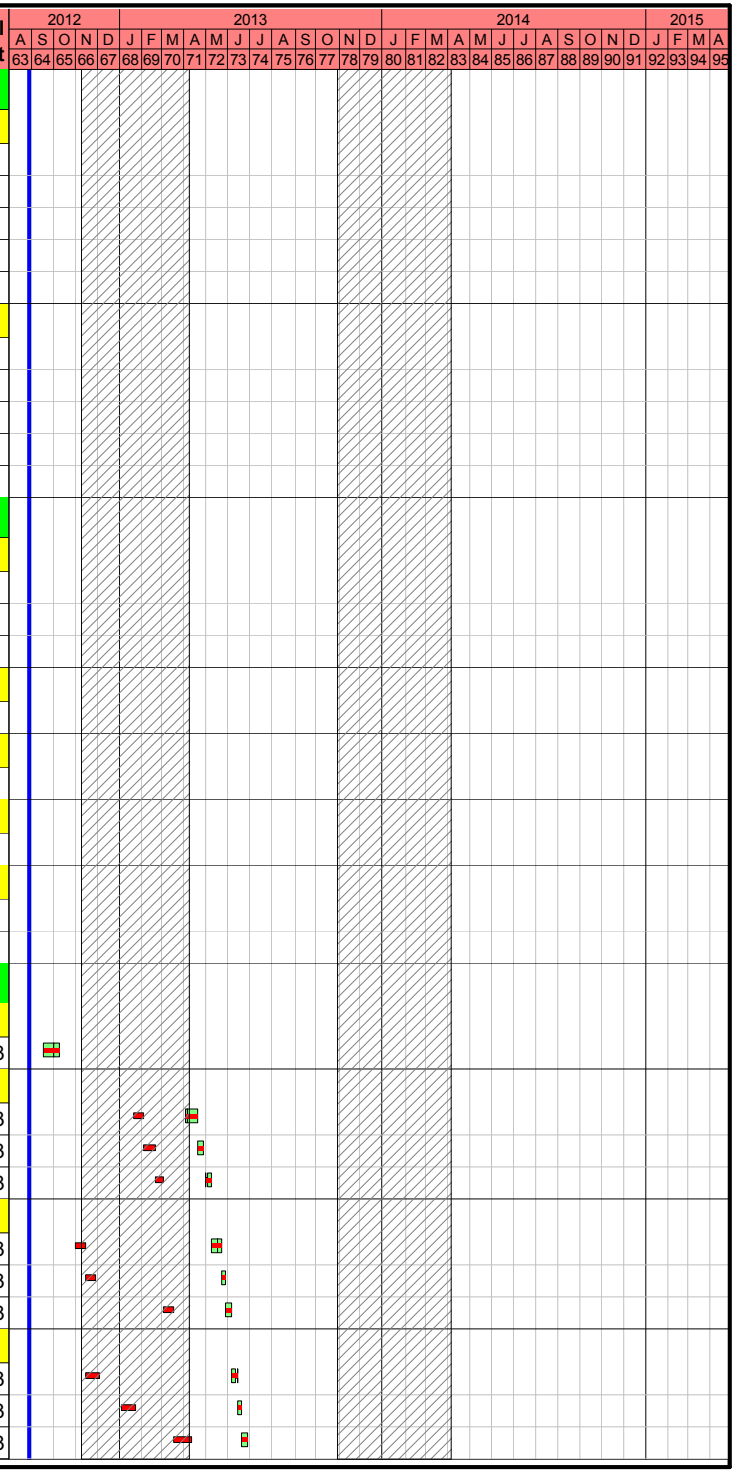
05L1BI2M20	5L 10; On completion of all works under this CC	0	0		14MAR14	0		22MAR13	365
Schedule of Milestones for Cost Centre No. 8R									
08R1BI2R02	8R 1; On completion of approach channel	0	0		13APR13	0		08MAR13	700
08R1BI2R04	8R 2; On completion of trash grill	0	0		28FEB14	0		05FEB13	379
08R1BI2R06	8R 3; On completion of all works under this CC	0	0		14MAR14	0		22MAR13	365
Schedule of Milestones for Cost Centre No. 12R									
12R3BI2S02	12R 1; On completion of 50% pile retain. wall	0	0		06NOV08A	100		06NOV08A	
12R3BI2S04	12R 2; On completion of pile retain. wall	0	0		26NOV08A	100		26NOV08A	
12R3BI2S06	12R 3; On completion of boulder traps	0	0		13MAR13	0		29JAN13	731
12R3BI2S08	12R 4; On completion of all works under this CC	0	0		14MAR14	0		22MAR13	365
Construction of Intake I-3									
Preliminary Works									
Additional GI Works To Finalize Design									
AGIC-02	Erect platform/mibilization & set up GI rig	3	3	03NOV08A	05NOV08A	100	03NOV08A	05NOV08A	
AGIC-04	Drill 3 nos. GI holes for Intake Structures	12	12	06NOV08A	19NOV08A	100	06NOV08A	19NOV08A	
VO#32; Replace Hoarding by Chain Link Fence									
VO032-I302	Received VO-32 for replacing hoarding by CLF	0	0		16SEP08A	100		16SEP08A	
VO032-I304	Procure/prepare/install transparent hoarding	80	80	17SEP08A	06MAR09A	100	17SEP08A	06MAR09A	
01R1CI3102	Possession of Portion C -90d of DOC	0	0	26MAR08A		100	26MAR08A		
01R1CI3104	Site clearance	40	40	22APR08A	20SEP08A	100	22APR08A	20SEP08A	
01R1CI3106	Haording at slope crest	48	48	03JUN08A	30JUL08A	100	03JUN08A	30JUL08A	
01R1CI3110	Set-up wheel washing facilities	6	6	30JUN08A	03JUL08A	100	30JUN08A	03JUL08A	
01R1CI3118	Install remote contorl CCTV as per ER 4.4.10	12	12	28OCT08A	10NOV08A	100	28OCT08A	10NOV08A	
Tree Transplanting Works									
16R7CI3202	Tree inspection & report	7	7	01APR08A	26APR08A	100	01APR08A	26APR08A	
16R7CI3204	Tree transplant for upper parts; 8 nos.	86*	86*	04JUN08A	13SEP08A	100	04JUN08A	13SEP08A	
16R7CI3206	1st stg tree pruning	2	2	04JUN08A	21JUN08A	100	04JUN08A	21JUN08A	
16R7CI3208	2nd stg tree pruning	2	2	04JUL08A	04JUL08A	100	04JUL08A	04JUL08A	
16R7CI3210	Final stg. tree pruning & tree uplifting	6	6	08SEP08A	13SEP08A	100	08SEP08A	13SEP08A	
16R7CI3212	Tree transplanting at Ch250-Ch200); 20 nos.	214*	214*	21JUN08A	09MAR09A	100	21JUN08A	09MAR09A	
16R7CI3214	1st stg tree pruning	3	3	21JUN08A	15JUL08A	100	21JUN08A	15JUL08A	
16R7CI3216	2nd stg tree pruning	3	3	15JUL08A	12SEP08A	100	15JUL08A	12SEP08A	
16R7CI3218	Final stg tree pruning & tree uplifting	8	8	28FEB09A	09MAR09A	100	28FEB09A	09MAR09A	
16R7CI3220	Tree transplanting at Ch100-Ch0	437*	437*	21JUN08A	07DEC09A	100	21JUN08A	07DEC09A	
16R7CI3222	1st stg tree pruning	4	4	21JUN08A	01DEC08A	100	21JUN08A	01DEC08A	
16R7CI3224	2nd stg tree pruning	4	4	05JAN09A	28OCT09A	100	05JAN09A	28OCT09A	
16R7CI3226	Final stg tree pruning & tree uplifting	10	10	10FEB09A	07DEC09A	100	10FEB09A	07DEC09A	



ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
H-Pile Retaining Wall for Wall A									
Piling Works									
13R4CI3400	Mobilize & set up piling rig	6	6	11AUG08A	16AUG08A	100	11AUG08A	16AUG08A	
13R4CI3401	Drill 28 nos. grout (partially) 11 nos. piles	1	1	18AUG08A	28AUG08A	100	18AUG08A	28AUG08A	
13R4CI3402	Piling stopped due to accessive grout loss	1	1	29AUG08A	22OCT08A	100	29AUG08A	22OCT08A	
13R4CI3403	Piling resumed date	1	1	26NOV08A	26NOV08A	100	26NOV08A	26NOV08A	
13R4CI3405	Complete all H-piles, Wall A; 347nos.	70	70	18AUG08A	21JAN09A	100	18AUG08A	21JAN09A	
Skin Wall									
13R4CI3406	Excavate for skin wall construction; 2130m3	60	60	14JAN09A	02MAR09A	100	14JAN09A	02MAR09A	
13R4CI3408	Hack off piles; piles 1 to 347	48	48	04FEB09A	02APR09A	100	04FEB09A	02APR09A	
13R4CI3410	Construct skin wall;	60	60	28FEB09A	19MAY09A	100	28FEB09A	19MAY09A	
13R4CI3414	Construct for capping beams;	24	24	14APR09A	04JUN09A	100	14APR09A	04JUN09A	
13R4CI3416	Construct U-channels	37	37	06MAY09A	18JUN09A	100	06MAY09A	18JUN09A	
Soil Nailing Works									
Soil Nailing Outside Excavation Area									
13R1CI3502	Scaffolding platform for soil nailing	18	18	08SEP08A	28OCT08A	100	08SEP08A	28OCT08A	
13R1CI3504	Mobilize & set up drilling & grouting plants	4	4	12SEP08A	17SEP08A	100	12SEP08A	17SEP08A	
13R1CI3506	Install & grout soil nails; 193 nos. + 8 Test N.	69	69	18SEP08A	09DEC08A	100	18SEP08A	09DEC08A	
Soil Nailing Within Excavation; Ch. 270-210									
13R1CI3508	Install & grout soil nails	89*	89*	03AUG09A	17NOV09A	100	03AUG09A	17NOV09A	
Soil Nailing Within Excavation; Ch. 210-130									
13R1CI3510	Install & grout soil nails	117*	117*	12DEC08A	11MAY09A	100	12DEC08A	11MAY09A	
Soil Nailing Within Excavation; Ch.130-0									
13R1CI3512	Install & grout soil nails	644*	644*	27OCT09A	24DEC11A	100	27OCT09A	24DEC11A	
Rem. Soil Nailing Outside Excavation									
13R1CI3522	Scoffolding platform for soil nailing	12	12	09JUL09A	03NOV09A	100	09JUL09A	03NOV09A	
13R1CI3532	Install & grout soil nails; 261 no.s + 3 Test N.	100	100	21JUL09A	12DEC09A	100	21JUL09A	12DEC09A	
Access Road Construction									
Concrete Pavement; Ch. 0-20									
09R1CI3706	Concrete pavement; Ch. 0 to 20 (6 bays)	18	0	18SEP12	09OCT12	0			-333
Concrete Pavement; Ch. 20-160									
09R1CI3714	Road formation	14	11	03APR13	19APR13	0	21JAN13	01FEB13	-473
09R1CI3724	Lay sub-base & kerb	7	11	20APR13	27APR13	0	02FEB13	18FEB13	-473
09R1CI3734	Concrete paving	7	11	29APR13	07MAY13	0	19FEB13	02MAR13	-473
Concrete Pavement; Ch. 160-300									
09R1CI3647	Road formation	11	12	08MAY13*	21MAY13	0	01NOV12*	14NOV12	-473
09R1CI3648	Lay sub-base and kerb	6	12	22MAY13	28MAY13	0	15NOV12	28NOV12	-473
09R1CI3654	Concrete paving	5	12	29MAY13	03JUN13	0	04MAR13	16MAR13	-473
Concrete Pavement; Ch. 300-420									
09R1CI3674	Road formation	8	16	04JUN13	13JUN13	0	15NOV12	03DEC12	-473
09R1CI3684	Lay sub-base and kerb	5	16	14JUN13	19JUN13	0	04JAN13	22JAN13	-473
09R1CI3694	Concrete paving; 190m @ 12m/day	7	16	20JUN13	27JUN13	0	18MAR13	09APR13	-473



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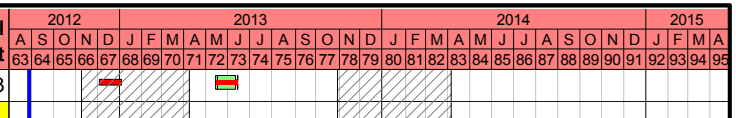
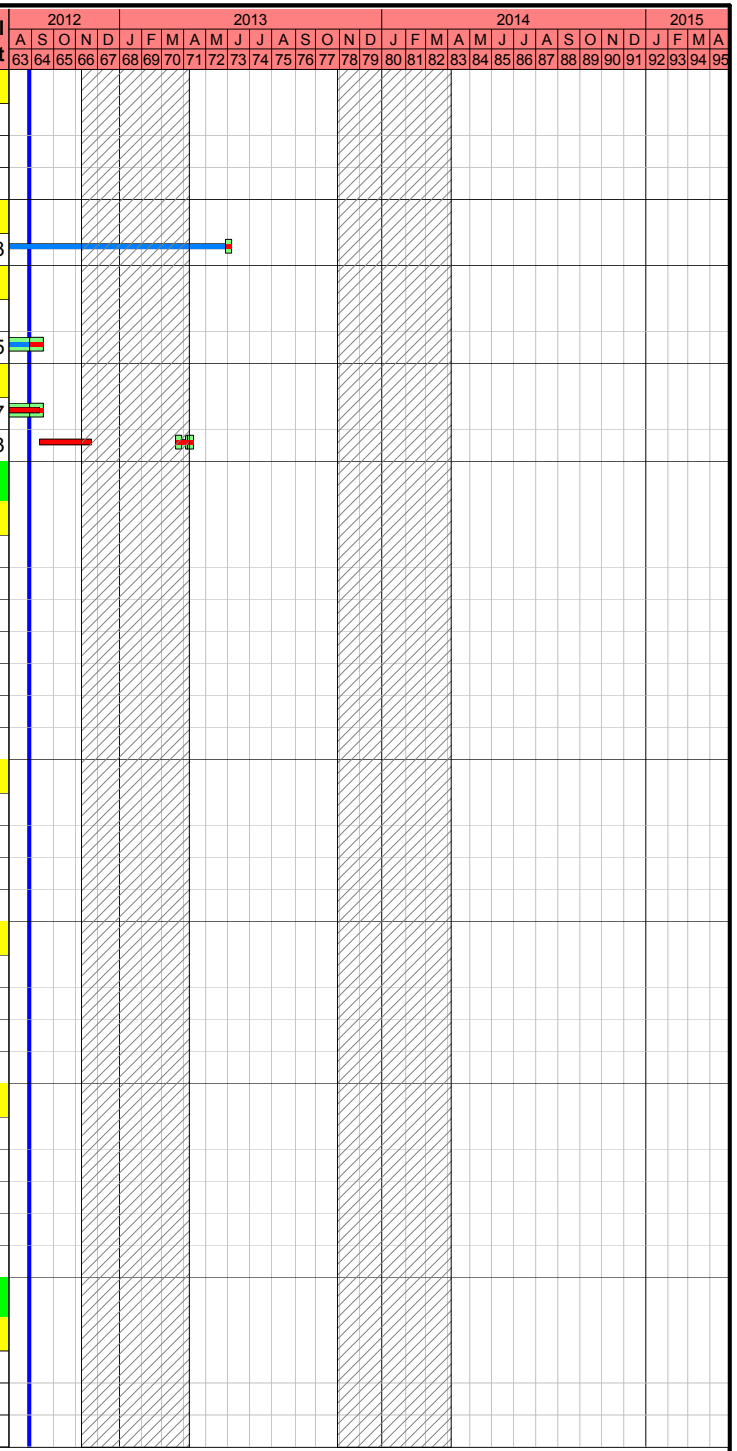
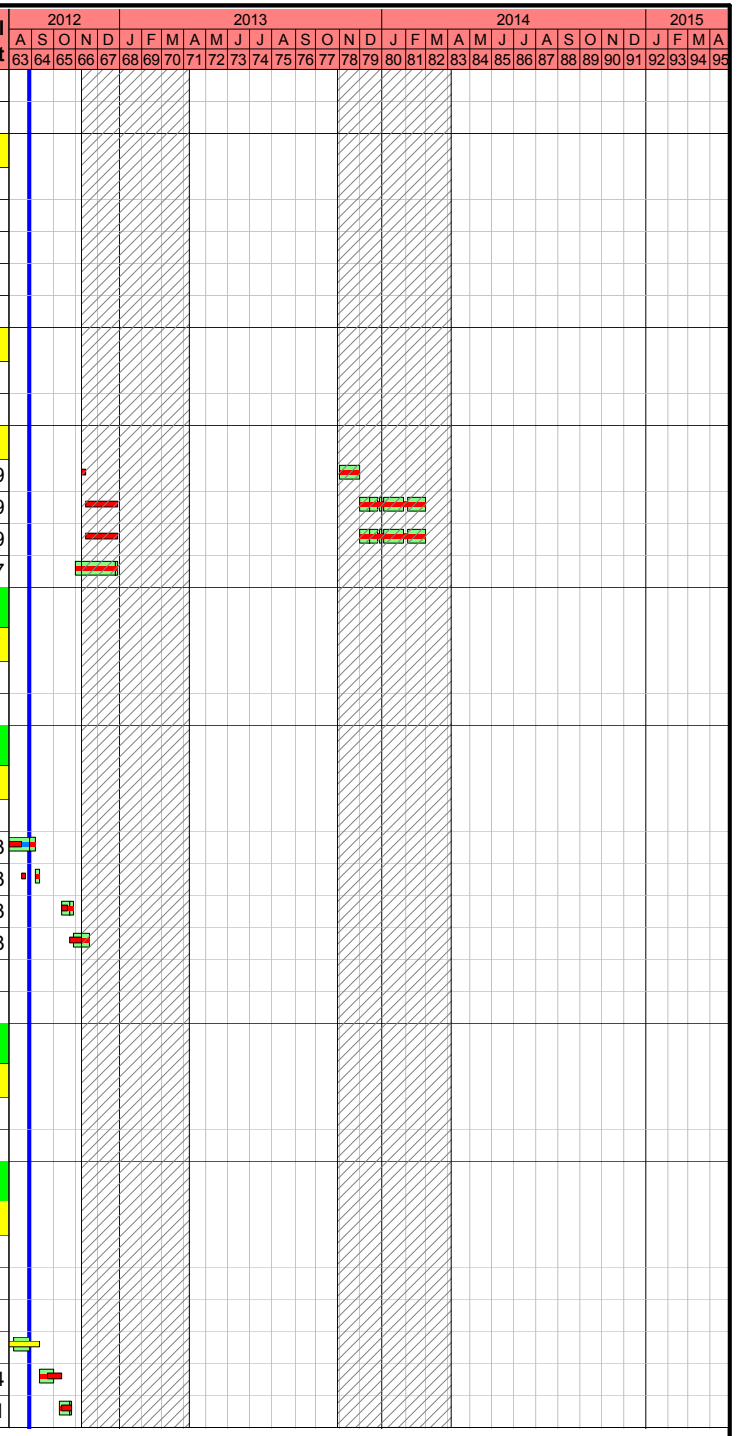
VO-095-02	Green slope arrangement as per VO# 095	24	24	15MAY13	13JUN13	0	04DEC12	03JAN13	-473
Preliminary Works for Works included VO#043									
VO043-010	Receive VO for revising design	0	0		02FEB09A	100		02FEB09A	
VO043-020	Recieve amendment to VO#043	0	0		05MAY09A	100		05MAY09A	
VO043-030	Procurement of lean mix concrete	12	12	06MAY09A	14MAY09A	100	06MAY09A	14MAY09A	
VO043-040	Testing & approval of lean mix concrete	18	18	15MAY09A	06JUN09A	100	15MAY09A	06JUN09A	
Mass Wall to Protect Retained Trees; VO #043									
VO043-120	Setting out at site	69	69	03FEB09A	28APR09A	100	03FEB09A	28APR09A	
VO043-130	Excavate & muck out manually; 50m @ 4m/day	2	2	29APR09A	30APR09A	100	29APR09A	30APR09A	
VO043-140	Erect formwork; 70m2 @ 14m2/day	5	5	04MAY09A	08MAY09A	100	04MAY09A	08MAY09A	
VO043-150	Set up for conreting	2	2	08MAY09A	09MAY09A	100	08MAY09A	09MAY09A	
VO043-160	Pour concrete & removal of formwork	2	2	09MAY09A	11MAY09A	100	09MAY09A	11MAY09A	
Ch.460 to 370; VO# 043									
VO043-060	Bulk excavation for benching;1061 @ 45m3/day	12	12	29MAY09A	09JUL09A	100	29MAY09A	09JUL09A	
VO043-070	Fill & compaction; 39 layers @ 1 day/layer	39	39	08JUN09A	09JUL09A	100	08JUN09A	09JUL09A	
Ch. 370 to Ch. 270; VO #043									
VO043-090	Excavation for access road Ch. 370 to 310	4	4	07AUG09A	15AUG09A	100	07AUG09A	15AUG09A	
VO043-100	Bulk excavation for benching; Ch. 310 to 270	7	7	28AUG09A	05SEP09A	100	28AUG09A	05SEP09A	
VO043-110	Fill & compaction lean mix concerete; 15 layers	7	7	07SEP09A	09SEP09A	100	07SEP09A	09SEP09A	
Works On & Above Access Road; Ch. 460-270									
09R1CI3610	Temporary concrete paving & curing	16	16	21AUG09A	11SEP09A	100	21AUG09A	11SEP09A	
09R1CI3620	Excavation of slope batter above access road	135	135	13JUL09A	19DEC09A	100	13JUL09A	19DEC09A	
Ch. 270 to Ch. 210									
09R1CI3624	Excavation & soil nailing	54	54	03AUG09A	17NOV09A	100	03AUG09A	17NOV09A	
09R1CI3626	Backfill (grade 200) & compaction	3	3	18NOV09A	20NOV09A	100	18NOV09A	20NOV09A	
Ch. 210 to Ch. 130									
09R1CI3630	Excavation as per conforming design	48	48	12DEC08A	11MAY09A	100	12DEC08A	11MAY09A	
09R1CI3632	Temporary road paving from Ch. 270 to 100	7	7	11MAR10A	12MAR10A	100	11MAR10A	12MAR10A	
VO-084-02	VO#084 revising the design received	0	0	12MAY09A		100	12MAY09A		
VO-084-12	Works resumed as per VO #084	0	0	16MAY09A		100	16MAY09A		
VO-084-22	Excavate slope profile as per VO#084	34	34	16MAY09A	25JUN09A	100	16MAY09A	25JUN09A	
VO-084-26	Remove excavated material off site; 6000m3	18	18	07OCT09A	29OCT09A	100	07OCT09A	29OCT09A	
VO-084-32	Soil nailing at Ch. 198 to 210	4	4	13NOV09A	17NOV09A	100	13NOV09A	17NOV09A	
VO-084-42	Excavate to access road formation	26	26	23NOV09A	10MAR10A	100	23NOV09A	10MAR10A	
VO-127-02	VO#127 received	0	0		26NOV09A	100		26NOV09A	
VO-127-12	Excavation & formation	24	24	30NOV09A	29DEC09A	100	30NOV09A	29DEC09A	
VO-127-22	Permanent soil nailing #24	18	18	30DEC09A	22JAN10A	100	30DEC09A	22JAN10A	
VO-127-32	Placing grade 200 rockfill	6	6	23JAN10A	26JAN10A	100	23JAN10A	26JAN10A	
Ch. 130 to Ch. 0; up to Temp. Access to Wall PB									
09R1CI3634	55 deg. cut slope & soil nailing	62	62	27OCT09A	27MAR10A	100	27OCT09A	27MAR10A	
09R1CI3636	Temporary access to wall PB	15	15	22JAN10A	27MAR10A	100	22JAN10A	27MAR10A	
09R1CI3646	10# additional soil nails instructed by SOR	0	0		25JAN10A	100		25JAN10A	



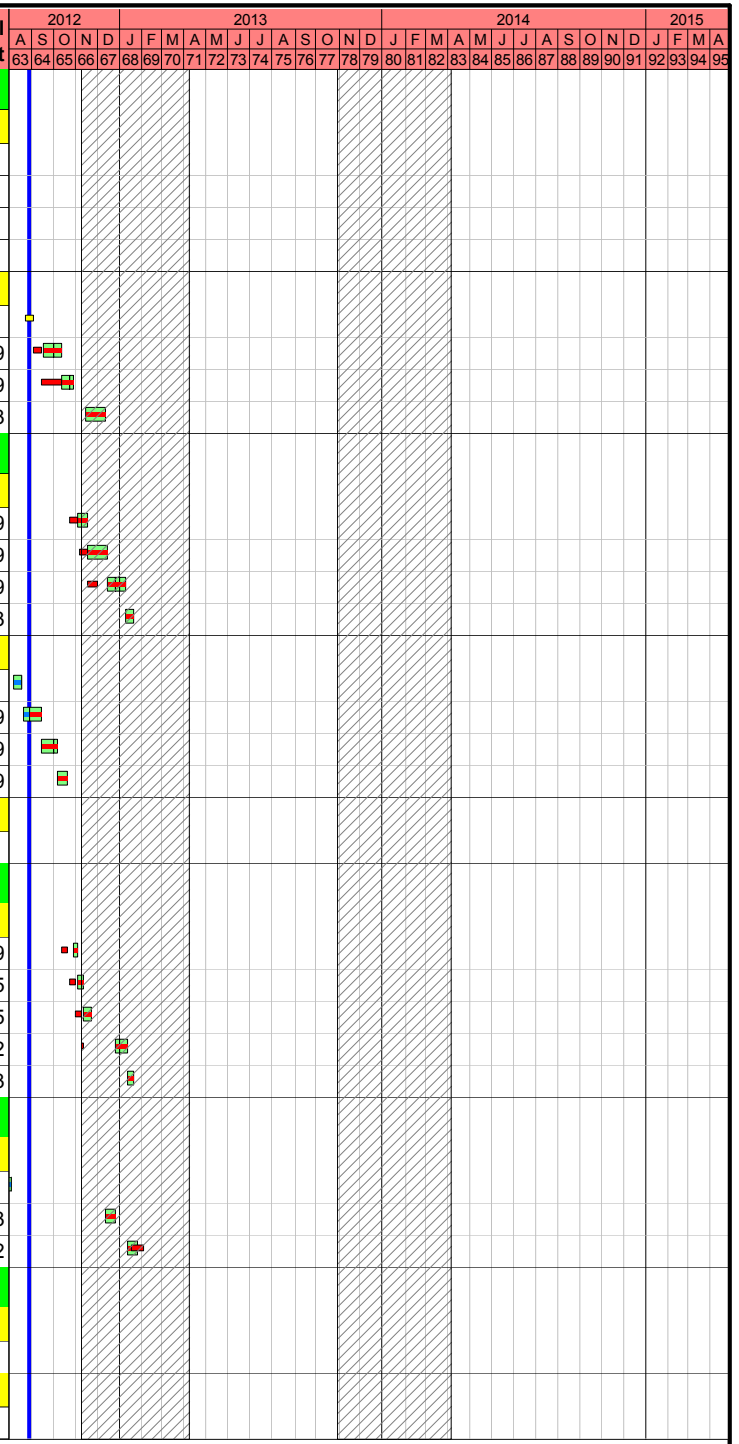
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Ch. 100 to Ch. 0; below Temp. Access to Wall PB									
09R1CI3638	55 deg. cut slope & soil nailing	41	41	12NOV11A	24DEC11A	100	12NOV11A	24DEC11A	
09R1CI3640	80 deg cut slope +68.5 to +63mPD; 1900m3	100	100	28DEC11A	07JUL12A	100	28DEC11A	03MAY12	
09R1CI3642	Rock excavation around edge of MAS; 100m3	10	10	17MAR12A	18JUL12A	100	04MAY12	15MAY12	
Road Drainage; Ch. 460 to Ch. 270									
09R1CI3664	Construct 375UC; 250m	50	50	26MAR12A	03JUN13	90	03APR12	06JUN12	-473
Road Drainage; Ch. 270 to Ch. 100									
09R1CI3644	Construct 375UC; along slope toe (outer curve)	44	44	23NOV11A	24MAR12A	100	23NOV11A	02APR12	
09R1CI3645	Construct 375UC; along inner curve	44	44	01JUN12A	17SEP12	59	07JUN12	30JUL12	-325
Road Drainage; Ch. 100 to Ch. 0									
09R1CI3704	Construct 900mm dia. & UC inner side	100	100	26MAR12A	17SEP12	82	16MAY12	11SEP12	-347
09R1CI3710	Construct 450mm dia. drainage & outer UC	18	60	19MAR13	12APR13	0	12SEP12	22NOV12	-473
H-Pile Retaining Wall for Wall B									
Additional land for Construction of Wall PB									
13R4CI3P02	Possession of additional land	0	0		01DEC09A	100		01DEC09A	
13R4CI3P12	Internal transplant for 11# trees	55	55	02DEC09A	04MAR10A	100	02DEC09A	04MAR10A	
13R4CI3P18	Form piling platform for Wall B	80	80	11MAR10A	19JUN10A	100	11MAR10A	19JUN10A	
13R4CI3P20	Reconstruct piling platform	77	77	28JUN10A	27SEP10A	100	28JUN10A	27SEP10A	
13R4CI3P22	Removal of piling platform	93	93	24MAR11A	27OCT11A	100	24MAR11A	27OCT11A	
13R4CI3P32	Slope reinstament	93	93	01APR11A	09NOV11A	100	01APR11A	09NOV11A	
13R4CI3P42	Planting 13# trees	4	4	10NOV11A	12NOV11A	100	10NOV11A	12NOV11A	
VO#188; Internal Transplant of Tree T765									
13R4CI3726	Issue VO #188	0	0		24MAY11A	100		24MAY11A	
13R4CI3736	Construct planter wall	28	28	25MAY11A	27JUN11A	100	25MAY11A	27JUN11A	
13R4CI3746	Tree pruning	1	1	28JUN11A	28JUN11A	100	28JUN11A	28JUN11A	
13R4CI3756	Tree removal	1	1	03AUG11A	03AUG11A	100	03AUG11A	03AUG11A	
Piling Works									
13R4CI3700	Demolish existing ret. wall/slope protection	28	28	15SEP10A	20OCT10A	100	15SEP10A	20OCT10A	
13R4CI3702	Mobilize & set up piling rig	6	6	22OCT10A	29OCT10A	100	22OCT10A	29OCT10A	
13R4CI3704	350mm dia. pre-bored H-piles, Wall B; 93 nos.	49	49	30OCT10A	11DEC10A	100	30OCT10A	11DEC10A	
13R4CI3705	Demobilize piling rig	6	6	13DEC10A	18DEC10A	100	13DEC10A	18DEC10A	
Skin Wall									
13R4CI3706	Extension of piles	18	18	20DEC10A	08JAN11A	100	20DEC10A	08JAN11A	
13R4CI3708	Excavate & hack off piles	24	24	10JAN11A	22JAN11A	100	10JAN11A	22JAN11A	
13R4CI3710	Construct skin wall & capping beams; 6 bays	24	24	24JAN11A	08MAR11A	100	24JAN11A	08MAR11A	
13R4CI3714	Construct end walls	6	6	09MAR11A	15MAR11A	100	09MAR11A	15MAR11A	
13R4CI3716	Backfill/reinstatement/U-channel	18	18	16MAR11A	31JUL12A	100	16MAR11A	07MAR12	
Channel Modification Works (Dry Season)									
River Diversion for Underground Works									
09R1CI3802	Form a temporay plant access to stream	60	60	12DEC08A	04FEB09A	100	12DEC08A	04FEB09A	
09R1CI3804	Break boulders	78	78	05FEB09A	24FEB09A	100	05FEB09A	24FEB09A	
09R1CI3806	Concrete bedding for bund wall (gabion)	11	11	25FEB09A	09MAR09A	100	25FEB09A	09MAR09A	



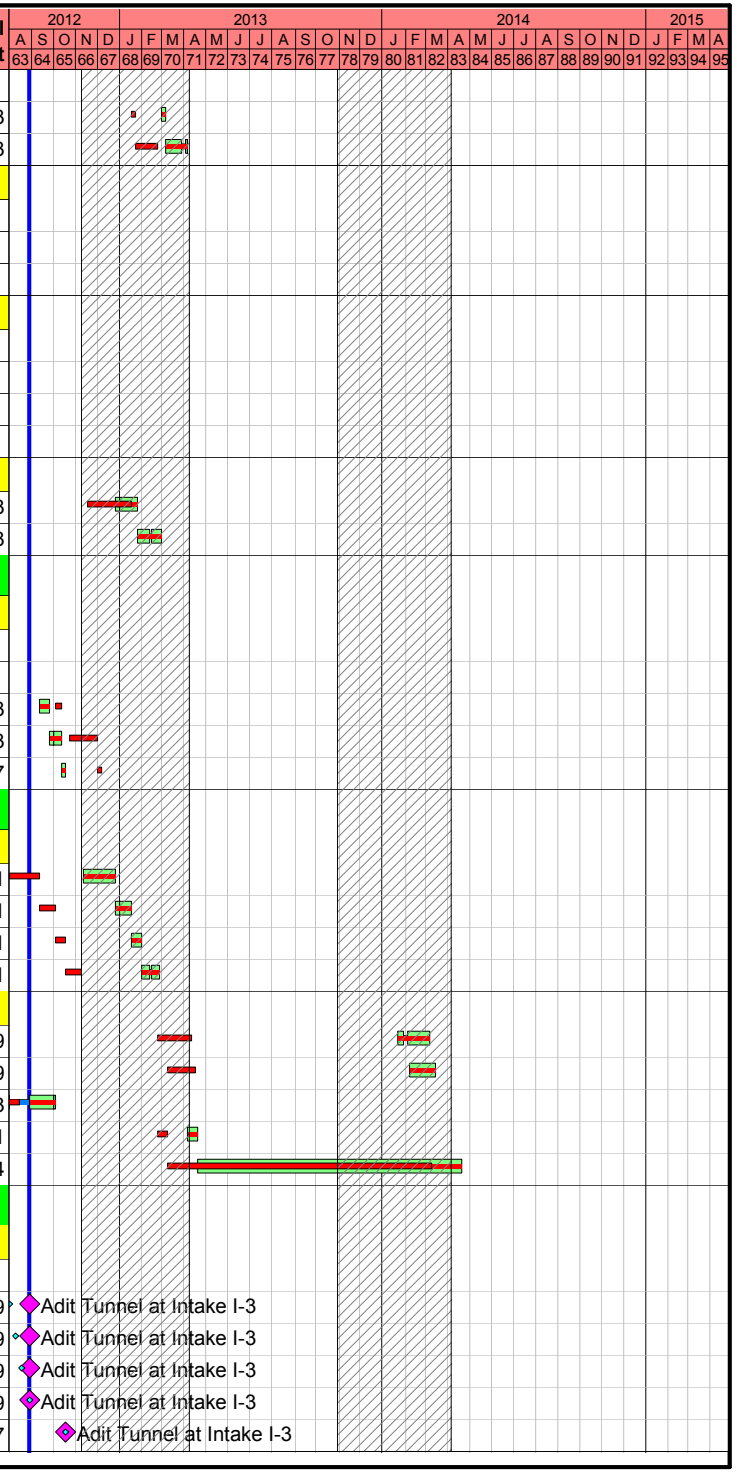
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
09R1CI3808	Construct bund wall (gabion)	22	22	10MAR09A	30APR09A	100	10MAR09A	30APR09A	
09R1CI3810	Divert channel to south west	0	0		30APR09A	100		30APR09A	
Channel Modification Works									
09R1CI3812	Breaking of large boulders	54	54	02NOV09A	24MAR10A	100	02NOV09A	24MAR10A	
09R1CI3814	Excavate stream bed & make good upper part	24	24	25JAN10A	24MAR10A	100	25JAN10A	24MAR10A	
09R1CI3816	Laying of rock armour	24	24	07DEC09A	15DEC09A	100	07DEC09A	15DEC09A	
09R1CI3818	Construct bund wall for approch channel const.	14	14	22MAR10A	17APR10A	100	22MAR10A	17APR10A	
09R1CI3820	Divert channel to south west	0	0		17APR10A	100		17APR10A	
Boulder Traps									
09R1C22002	Mobilization setup	6	6	23FEB11A	28FEB11A	100	23FEB11A	28FEB11A	
09R1C22012	Construction of boulder trap; 7 nos.	24	24	29MAR11A	12APR11A	100	29MAR11A	12APR11A	
Stone Pitching & Trash Grill									
09R1C3T010	Remove concrete bund wall	24	4	01NOV13*	28NOV13	0	10NOV12*	14NOV12	-679
09R1C3T020	Stone pitching to channel bed & wall	72	36	29NOV13	28FEB14	0	15NOV12	28DEC12	-679
09R1C3T040	Install trash grill & adjustable wire	72	36	29NOV13	28FEB14	0	15NOV12	28DEC12	-679
PVOABT3-10	Additional boulder traps	48	0	01NOV12*	28DEC12	0			-407
Excavation for AVS/VS/DC/MAS/MAA									
Open Excavation for Underground Structures									
06L1CI3906	Mobilize drilling rig, backhoes	1	1	11DEC09A	11DEC09A	100	11DEC09A	11DEC09A	
06L1CI3908	Excavation	571	571	04JAN10A	24DEC11A	100	04JAN10A	24DEC11A	
Excavation & Construction of Main Adit									
3CL1CI3101	Probe drill	6	6	09SEP11A	10SEP11A	100	09SEP11A	10SEP11A	
3CL1CI3102	Excavation for 2m buffer zone	62	30	29JUN12A	05SEP12	87	14JUL12	17AUG12	-473
3CL1CI3103	Cleaning & place blinding	4	4	06SEP12	10SEP12	0	18AUG12	22AUG12	-473
3CL1CI3104	Construct wall & crown (1 bay)	14	8	12OCT12	29OCT12	0	12OCT12	20OCT12	-473
3CL1CI3105	Construct wall & crown (2 bays)	18	14	30OCT12	19NOV12	0	22OCT12	07NOV12	-473
3CL1CI3111	Trial excavation (2m)	60	60	03DEC11A	27FEB12A	100	03DEC11A	27FEB12A	
3CL1CI3121	Excavation (11m)	110	110	28FEB12A	28JUN12A	100	28FEB12	13JUL12	
Construction of Man Access Adit (MAA)									
06L1CI3112	Construct invert;	7	7	01FEB12A	10FEB12A	100	01FEB12A	10FEB12A	
06L1CI3116	Construct wall & crown	19	19	24FEB12A	21MAR12A	100	24FEB12A	16MAR12	
Construction of Man Access Shaft (MAS)									
06L1CI3122	Construct base	9	9	14JAN12A	19JAN12A	100	14JAN12A	19JAN12A	
06L1CI3124	Set up formworks	6	6	23MAR12A	31MAR12A	100	17MAR12	23MAR12	
06L1CI3126	Construct wall; 5 lifts, 3.6m per lift	36	36	02APR12A	06JUN12A	100	24MAR12	11MAY12	
06L1CI3127	Install pre-cast stair with insitu stitch	27	40	07JUN12A	27AUG12A	100	27JUL12	11SEP12	
06L1CI3129	Construct shaft roof	15	15	13SEP12	29SEP12	0	22SEP12	10OCT12	-304
06L1CI3139	Install steel hadraining	12	12	10OCT12	24OCT12	0	11OCT12	25OCT12	-311



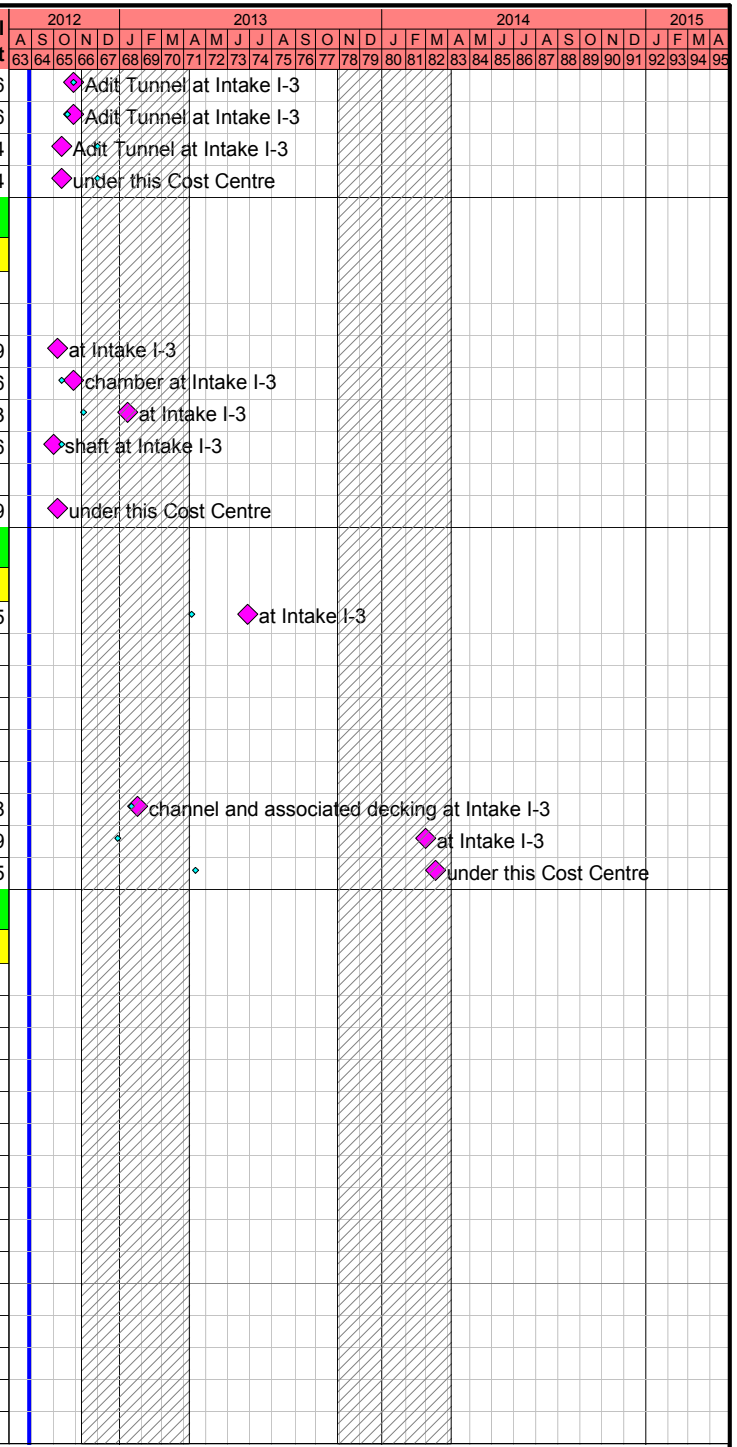
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Construction of Deaerarion Chamber (DC)									
East Side, Around Drop Shaft									
06L1CI3E02	Clean & place blinding for all area	6	6	28DEC11A	03JAN12A	100	28DEC11A	03JAN12A	
06L1CI3E12	Construct base; 95m3	8	8	30MAR12A	11APR12A	100	17MAR12	26MAR12	
06L1CI3E22	Construct walls; 100m3	13	13	21APR12A	10MAY12A	100	27MAR12	14APR12	
06L1CI3E32	Construct crown; 150m3	25	25	11MAY12A	09JUN12A	100	16APR12	16MAY12	
West Side, Connecting to Main Adit									
06L1CI3W12	Construct base; 95m3	6	9	16JUN12A	22JUN12A	100	23AUG12	01SEP12	
06L1CI3W22	Construct walls	20	11	18SEP12	11OCT12	0	03SEP12	14SEP12	-469
06L1CI3W32	Construct crown stage 1	14	22	12OCT12	29OCT12	0	15SEP12	11OCT12	-469
06L1CI3W42	Construct crown stage 2	22	0	15NOV12	10DEC12	0			-473
Construction of Vortex Shaft (VS)									
Vortex; East Side									
06L1CIE010	Construct Vortex; base	12	11	03NOV12	16NOV12	0	22OCT12	03NOV12	-469
06L1CIE020	Construct Vortex; wall stg 1	23	11	17NOV12	13DEC12	0	05NOV12	16NOV12	-469
06L1CIE030	Construct Vortex; wall stg 2 with roof	18	11	14DEC12	07JAN13	0	17NOV12	29NOV12	-469
06L1CIE040	Construct Vortex; planter wall	11	0	08JAN13	19JAN13	0			-383
Vortex, West Side									
06L1CIW010	Construct Vortex; base	12	11	06AUG12A	18AUG12A	100	12JUN12	25JUN12	
06L1CIW020	Construct Vortex; wall stg 1	23	11	20AUG12A	14SEP12	30	26JUN12	09JUL12	-419
06L1CIW030	Construct Vortex; wall stg 2 with roof	18	11	15SEP12	06OCT12	0	10JUL12	21JUL12	-419
06L1CIW040	Construct Vortex; planter wall	11	0	08OCT12	19OCT12	0			-319
06L1CI3142	Construct drop shaft	12	12	16JUN12A	14JUL12A	100	17MAY12	30MAY12	
Construction of Air Vent Shaft Shaft (AVS)									
06L1CI3152	Install pre-cast #1 & construct collar ring	4	8	30OCT12	02NOV12	0	12OCT12	20OCT12	-469
06L1CI3514	Temp. works & granular fill	8	8	03NOV12	12NOV12	0	22OCT12	31OCT12	-445
06L1CI3515	Install pre-cast #2 & granular fill	8	8	13NOV12	21NOV12	0	01NOV12	09NOV12	-445
06L1CI3516	Install pre-cast #3 to #6 & granular fill	12	2	27DEC12	10JAN13	0	10NOV12	12NOV12	-472
06L1CI3526	Construct insitu (top of AVS)	8	0	11JAN13	19JAN13	0			-383
Backfill Around Structure									
06L1CI3162	Granular fill at east of DC up to base of Vortex	10	10	17JUL12A	04AUG12A	100	31MAY12	11JUN12	
06L1CI3164	Granular fill at west of AVS below bay 6 of A.C.	12	6	11DEC12	24DEC12	0	23JUL12	28JUL12	-473
06L1CI3174	Granular fill for bay 7 of A.C.	12	13	11JAN13	24JAN13	0	18JAN13	01FEB13	-472
Construction of Approach Channel									
Excavation & Formation									
09R1CI3172	Excavation for Approach Channel	40	40	28SEP10A	21FEB11A	100	28SEP10A	21FEB11A	
Tower Crane									
09R1C17002	Construction of base for tower crane	10	10	21DEC10A	24DEC10A	100	21DEC10A	24DEC10A	



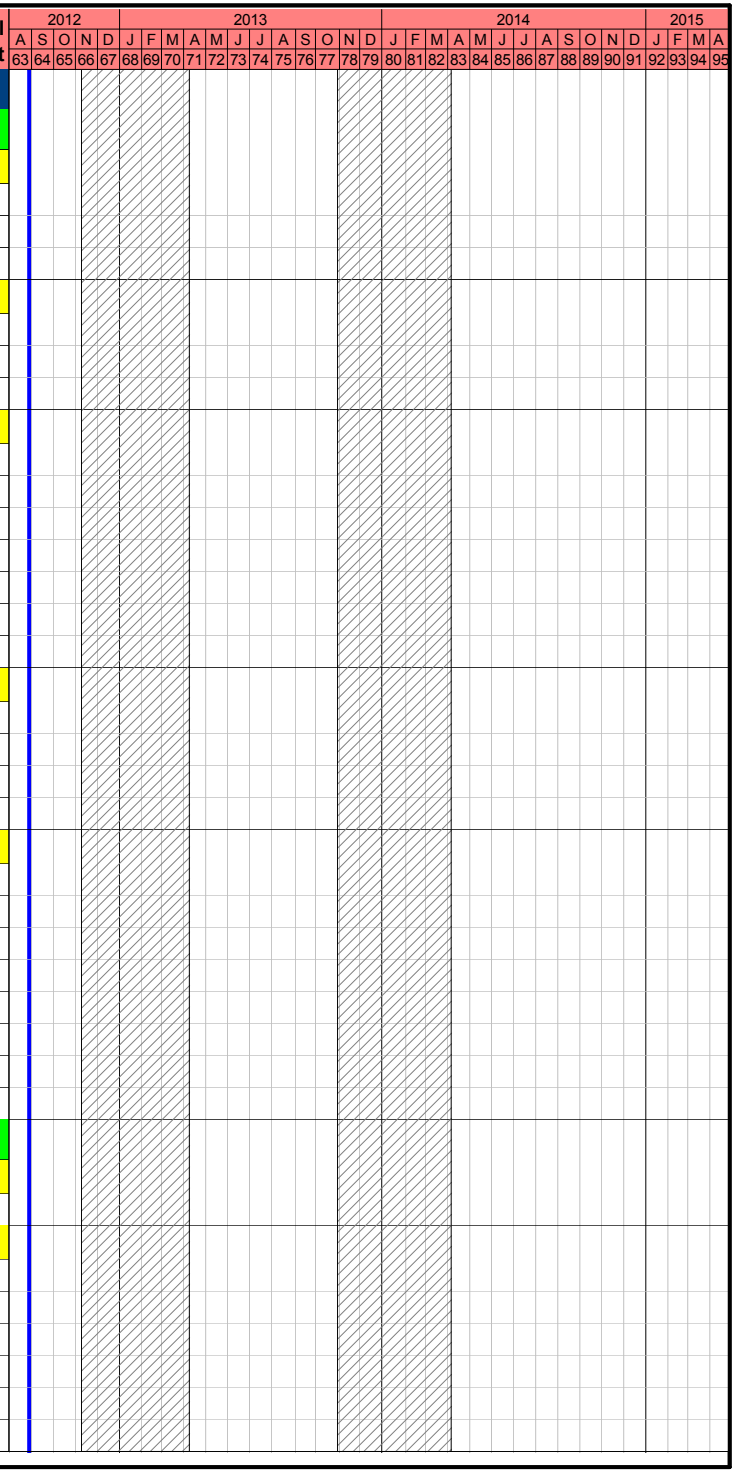
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
09R1C17012	Erection and T&C of tower crane	6	6	03JAN11A	05JAN11A	100	03JAN11A	05JAN11A	
09R1C17022	Removal of tower crane	4	4	28FEB13	04MAR13	0	18JAN13	22JAN13	-473
09R1C17032	Construct approach channel at TC location	24	24	05MAR13	05APR13	0	23JAN13	22FEB13	-473
Bays 1-4; Base and 1st Lift Wall									
09R1C18002	Construction of Approach Channel	32	32	02FEB11A	25MAR11A	100	02FEB11A	25MAR11A	
09R1C18012	Modification of temporary bund wall	18	18	15MAR11A	12APR11A	100	15MAR11A	12APR11A	
09R1C18022	Nullah widening works	32	32	14FEB11A	26MAR11A	100	14FEB11A	26MAR11A	
Bays 1-4 (remaining) & bay 5									
09R1C19002	Remove concrete bund wall	10	10	12NOV11A	19NOV11A	100	12NOV11A	19NOV11A	
09R1C19004	Construct remaining sections of bays 1-4	66	66	21NOV11A	18JAN12A	100	21NOV11A	18JAN12A	
09R1C19006	Construct base, walls & roof of bay 5	36	36	19JAN12A	17MAR12A	100	19JAN12A	09MAR12	
09R1C19008	Erect concrete bund wall	12	12	19MAR12A	31MAR12A	100	10MAR12	23MAR12	
Bays 6 & 7									
09R1C2102	Construct bay 6	25	50	27DEC12	25JAN13	0	17NOV12	17JAN13	-473
09R1C2112	Construct bay 7	25	0	26JAN13	27FEB13	0			-473
Junction Between Main Tunnel & Adit Tunnel									
3CL1CI3100	Install steel arches at I-2 Junction	0	0		18MAY12A	100		29MAR12	
3CL1CI3106	Install steel arches from main tunnel	24	24	19MAY12A	16JUN12A	100	30MAR12	03MAY12	
3CL1CI3108	Construct invert including for main adit	12	8	11SEP12	24SEP12	0	03OCT12	11OCT12	-473
3CL1CI3118	Construct wall & crown	14	34	25SEP12	11OCT12	0	22OCT12	30NOV12	-473
3CL1CI3128	Remove steel arches	6	6	12OCT12	18OCT12	0	01DEC12	07DEC12	-367
Remaining Works Prior to Handover to Client									
Radio Communication System									
VO180CI305	Lay CLP power cable	36	36	13NOV12	24DEC12	0	01AUG12	11SEP12	-361
VO180CI310	Construct equipment room	18	18	27DEC12	17JAN13	0	12SEP12	03OCT12	-361
VO180CI315	Lay tiles on equipment room	12	12	18JAN13	31JAN13	0	04OCT12	17OCT12	-361
VO180CI340	Install radio communicaition system	18	18	01FEB13	25FEB13	0	18OCT12	08NOV12	-361
09R1CI3142	Finishing & reinstatement works; Portion C	36	36	22JAN14	07MAR14	0	22FEB13	09APR13	-679
09R1CI3143	Pre-handover inspections and remedial works	30	30	08FEB14	14MAR14	0	08MAR13	16APR13	-679
16R7CI3142	Landscaping works	108	108	14MAY12A	04OCT12	70	02APR12	14AUG12	-283
16R7CI3143	Planting works at Aprroach Channel	12	12	06APR13	19APR13	0	23FEB13	08MAR13	-441
16R7CI3144	Establishment Works at Portion C	365	365	20APR13	19APR14	0	09MAR13	08MAR14	-544
Schedule of Milestones for Cost Centre No. 3cL									
3CL1CI3A02	3cL 1; On establishing tunnelling equipments	0	0		27JUN12A	100		20JUL12	
3CL1CI3A04	3cL 2; On completion of 12.5% perm. tunnel linin	0	0		27AUG12	0		30JUL12	929
3CL1CI3A06	3cL 3; On completion of 25% perm. tunnel lining	0	0		27AUG12	0		08AUG12	929
3CL1CI3A08	3cL 4; On completion of 37.5 perm. tunnel lining	0	0		27AUG12	0		17AUG12	929
3CL1CI3A10	3cL 5; On completion of 50% perm. tunnel lining	0	0		27AUG12	0		27AUG12	929
3CL1CI3A12	3cL 6; On completion of 62.5% perm. tunnel linin	0	0		18OCT12	0		18OCT12	877



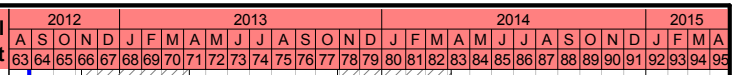
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
3CL1CI3A14	3cL 7; On completion of 75% perm. tunnel lining	0	0		29OCT12	0		29OCT12	866
3CL1CI3A16	3cL 8; On completion of 87.5% perm. tunnel linin	0	0		29OCT12	0		20OCT12	866
3CL1CI3A18	3cL 9; On completion of perm. tunnel lining	0	0		11OCT12	0		30NOV12	884
3CL1CI3A20	3cL 10; On completion of all works under this CC	0	0		11OCT12	0		30NOV12	884
Schedule of Milestones for Cost Centre No. 6L									
06L1CI3M02	6L 1; On completion of 50% of excavation	0	0		27MAY10A	100		27MAY10A	
06L1CI3M04	6L 2; On completion of excavation works	0	0		24DEC11A	100		24DEC11A	
06L1CI3M08	6L 3; On completion of vortex shaft	0	0		06OCT12	0		21JUL12	889
06L1CI3M10	6L 4; On completion of de-aeration chamber	0	0		29OCT12	0		11OCT12	866
06L1CI3M12	6L 5; On completion of vent shaft	0	0		10JAN13	0		12NOV12	793
06L1CI3M14	6L 6; On completion of man access shaft	0	0		29SEP12	0		10OCT12	896
06L1CI3M16	6L 7; On completion of man access adit	0	0		21MAR12A	100		16MAR12	
06L1CI3M18	6L 8; On completion of all works under this CC	0	0		06OCT12	0		21JUL12	889
Schedule of Milestone for Cost Centre No. 9R									
09R1CI3R02	9R 1; On completion of access road	0	0		27JUN13	0		09APR13	625
09R1CI3R04	9R 2; On completion of 25% of excavation at G.L	0	0		11JUN09A	100		11JUN09A	
09R1CI3R06	9R 3; On completion of 50% of excavation at G.L	0	0		15AUG09A	100		15AUG09A	
09R1CI3R08	9R 4; On completion of 75% of excavation at G.L	0	0		27MAR10A	100		27MAR10A	
09R1CI3R10	9R 5; On completion of excavation at G.L.	0	0		07JUL12A	100		03MAY12	
09R1CI3R12	9R 6; On completion of 50% of approach channel	0	0		18JAN12A	100		18JAN12A	
09R1CI3R14	9R 7; On completion of approach channel	0	0		25JAN13	0		17JAN13	778
09R1CI3R16	9R 8; On completion of trash grill	0	0		28FEB14	0		28DEC12	379
09R1CI3R18	9R 9; On completion of all works under this CC	0	0		14MAR14	0		16APR13	365
Schedule of Milestones for Cost Centre No. 13R									
13R4CI3S01	13R 1; On completion of 30% soil nailing	0	0		26SEP09A	100		26SEP09A	
13R4CI3S02	13R 2; On completion of 60% soil nailing	0	0		12DEC09A	100		12DEC09A	
13R4CI3S03	13R 3; On completion of all soil naing works	0	0		24DEC11A	100		24DEC11A	
13R4CI3S04	13R 4; On completion of 10% piles by number	0	0		05DEC08A	100		05DEC08A	
13R4CI3S05	13R 5; On completion of 20% piles by number	0	0		13DEC08A	100		13DEC08A	
13R4CI3S06	13R 6; On completion of 30% piles by number	0	0		18DEC08A	100		18DEC08A	
13R4CI3S07	13R 7; On completion of 40% piles by number	0	0		23DEC08A	100		23DEC08A	
13R4CI3S08	13R 8; On completion of 50% piles by number	0	0		02JAN09A	100		02JAN09A	
13R4CI3S09	13R 9; On completion of 60% piles by number	0	0		09JAN09A	100		09JAN09A	
13R4CI3S10	13R 10; On completion of 70% piles by number	0	0		16JAN09A	100		16JAN09A	
13R4CI3S11	13R 11; On completion of 80% piles by number	0	0		21JAN09A	100		21JAN09A	
13R4CI3S12	13R 12; On completion of 90% piles by number	0	0		04DEC10A	100		04DEC10A	
13R4CI3S13	13R 13; On completion of all piling works	0	0		11DEC10A	100		11DEC10A	
13R4CI3S14	13R 14; On completion of boulder traps	0	0		12APR11A	100		12APR11A	
13R4CI3S15	13R 15; On completion of all work under this CC	0	0		24DEC11A	100		24DEC11A	



ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Construction of Outfall O-1									
Preliminary Works									
VO # 06; Transperant Hoarding at Outfall									
01R1DO0106	Receive VO6 for transperant hoarding	0	0		16APR08A	100		16APR08A	
01R1DO0108	Procurement for transperent hoarding	21	21	17APR08A	20MAY08A	100	17APR08A	20MAY08A	
01R1DO0110	Erect hoarding	18	18	21APR08A	02JUL08A	100	21APR08A	02JUL08A	
VO #16; Chain Link Fence at O-1									
V01602	Issue VO16 for chain link fence	0	0		02JUL08A	100		02JUL08A	
V01612	Preparation works for chain link fence	1	1	03JUL08A	18AUG08A	100	03JUL08A	18AUG08A	
V01622	Erect chain link fence; 460m	38	38	19AUG08A	19SEP08A	100	19AUG08A	19SEP08A	
Temporary CLP Power Supply for TBM Operation									
01R1DCLP02	Application/approval for temp. CLP Power Supply	200	200	07MAR08A	01AUG08A	100	07MAR08A	01AUG08A	
01R1DCLP14	Appoint sub-contractor for design & build TX Rm	67	67	14JUL08A	07NOV08A	100	14JUL08A	07NOV08A	
01R1DCLP24	Design for transformer room	24	24	08NOV08A	11MAR09A	100	08NOV08A	11MAR09A	
01R1DCLP34	Constuct transformer room	60	60	12MAR09A	14MAY09A	100	12MAR09A	14MAY09A	
01R1DCLP44	CLP inspection & defect rectification	14	14	15MAY09A	10JUN09A	100	15MAY09A	10JUN09A	
01R1DCLP54	CLP cabling to TX room & commissioning	32	32	11JUN09A	30OCT09A	100	11JUN09A	30OCT09A	
01R1DCLP74	CLPE cabling from TX room to 24mPD platform	18	18	28OCT09A	17NOV09A	100	28OCT09A	17NOV09A	
VO#25; Revised Fencig Details at O-1 Next to GVT									
V025-02	Receive VO16 for revised details next to GVT	0	0		17SEP08A	100		17SEP08A	
V025-12	Preparation works	24	24	22JAN09A	07FEB09A	100	22JAN09A	07FEB09A	
V025-22	Erect proposed transparent hoarding	4	4	09FEB09A	02MAR09A	100	09FEB09A	02MAR09A	
V055-02	Receive VO#55 in lieu of VO#25	0	0		21JAN09A	100		21JAN09A	
01R1DO0102	Obtain TTA (ingress & egress) approval	0	0		18APR08A	100		18APR08A	
01R1DO0103	Implment TTA for diverting footpath	1	1	19APR08A	19APR08A	100	19APR08A	19APR08A	
01R1DO0104	Obtain excavation permit	0	0		29MAY08A	100		29MAY08A	
01R1DO0112	Erect catch fencing	10	10	26MAY08A	02JUL08A	100	26MAY08A	02JUL08A	
01R1DO0114	Site establishment	30	30	21APR08A	15JUL08A	100	21APR08A	15JUL08A	
01R1DO0116	Site clearance	30	30	21APR08A	05SEP08A	100	21APR08A	05SEP08A	
01R1DO0118	Install remote contorl CCTV as per ER 4.4.10	12	12	28OCT08A	10NOV08A	100	28OCT08A	10NOV08A	
16R1DO0110	Tree inspection & report	7	7	13MAR08A	28MAR08A	100	13MAR08A	28MAR08A	
Form Temporary Access/Tree Felling									
Works Suspension Due to Obstruct. from Villagers									
WSO02	Works suspension due to obstruct. frm villagers	24	24	19JUL08A	10AUG08A	100	19JUL08A	10AUG08A	
10R1DO0202	Form temp. access road from +14mPD to +69mPD	158*	158*	19JUN08A	24DEC08A	100	19JUN08A	24DEC08A	
10R1DOAR04	Const. temp. steel decking over exist Outfall W	11	11	26AUG08A	06SEP08A	100	26AUG08A	06SEP08A	
10R1DOAR08	Form temp. access road from 14mPD to 28mPD	12	12	19JUN08A	18JUL08A	100	19JUN08A	18JUL08A	
10R1DOAR12	Preparation works for transplanting T160	53	53	11AUG08A	25OCT08A	100	11AUG08A	25OCT08A	
10R1DOAR42	Mobilze & set up crane for tree transplant	1	1	27OCT08A	27OCT08A	100	27OCT08A	27OCT08A	
10R1DOAR44	Crown pruning for T160	2	2	28OCT08A	29OCT08A	100	28OCT08A	29OCT08A	

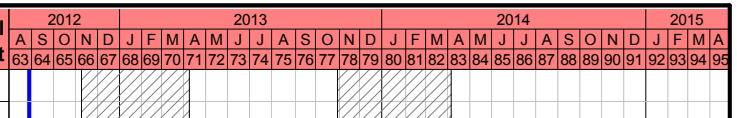


ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
10R1DOAR46	Cut root & uplift T160	1	1	30OCT08A	30OCT08A	100	30OCT08A	30OCT08A	
10R1DOAR54	Crown pruning/Cut root & uplift T142	10	10	21FEB09A	21FEB09A	100	21FEB09A	21FEB09A	
10R1DOAR56	Construct access road from +43 to +55mPD	30	30	31OCT08A	24DEC08A	100	31OCT08A	24DEC08A	
16R7DO0202	Tree transplant at Outfall O-1	105	105	02JUN08A	06MAR09A	100	02JUN08A	06MAR09A	
16R7DO0204	Tree transplant above +62mPD	11	11	31OCT08A	12NOV08A	100	31OCT08A	12NOV08A	
Form Temporary Launching Platform									
Slope Cut & Soil Nailing; +71mPD to +40mPD									
10R1DO030	+71 to +40mPD (rows to A to P)	217*	217*	13NOV08A	08AUG09A	100	13NOV08A	08AUG09A	
10R1DO031	Remove boulder/Cut slope for rows A to D	9	9	13NOV08A	06DEC08A	100	13NOV08A	06DEC08A	
10R1DO032	Erect scaffold & Drill/install/grout/P1at row C	12	12	02DEC08A	16DEC08A	100	02DEC08A	16DEC08A	
10R1DO033	Drill/install/grout rows B to C; 18 nos.	14	14	17DEC08A	06JAN09A	100	17DEC08A	06JAN09A	
10R1DO034	Drill/install/grout/testing for P2 at row D	8	8	30DEC08A	06JAN09A	100	30DEC08A	06JAN09A	
10R1DO035	Drill/install/grout D1 to D11	7	7	07JAN09A	16JAN09A	100	07JAN09A	16JAN09A	
10R1DO036	Cut slope for E1 to G20; soil 620m3	2	2	15JAN09A	20JAN09A	100	15JAN09A	20JAN09A	
10R1DO037	Drill/install/grout E1 to G20: 51 nos.	19	19	20JAN09A	11FEB09A	100	20JAN09A	11FEB09A	
10R1DO038	Construct nail heads/remove platform; rows B-G	10	10	02FEB09A	17FEB09A	100	02FEB09A	17FEB09A	
10R1DO039	Erosion mat, wire mesh & hydroseed; rows B-G	10	10	21FEB09A	24FEB09A	100	21FEB09A	24FEB09A	
10R1DO040	Cut slope for H1 to I25; soil 1819m3	12	12	02FEB09A	17FEB09A	100	02FEB09A	17FEB09A	
10R1DO041	Drill/install/grout H1 to I25; 47 nos.	13	13	18FEB09A	04MAR09A	100	18FEB09A	04MAR09A	
10R1DO042	Cut slope for J1 to M37; soil 5834m3	20	20	19FEB09A	13MAR09A	100	19FEB09A	13MAR09A	
10R1DO043	Erect working platform for rows J to M	14	14	28FEB09A	16MAR09A	100	28FEB09A	16MAR09A	
10R1DO044	Test nails for P3, P4, P5 & P10	12	12	05MAR09A	07APR09A	100	05MAR09A	07APR09A	
10R1DO045	Drill/install/grout J1 to M37; 134 nos.	20	20	12MAR09A	07APR09A	100	12MAR09A	07APR09A	
10R1DO047	Construct nail heads/remove platform; rows H-M	20	20	14MAR09A	18APR09A	100	14MAR09A	18APR09A	
10R1DO048	Erosion mat, wire mesh & hydroseed; rows H-M	6	6	29MAY09A	04JUN09A	100	29MAY09A	04JUN09A	
10R1DO049	Excavate soil 5600m3 & boulde 229m3; Rows N to P	22	22	14MAR09A	18APR09A	100	14MAR09A	18APR09A	
10R1DO050	Erect working platform for rows N to P	10	10	20APR09A	24APR09A	100	20APR09A	24APR09A	
10R1DO051	Drill/install/grout N1 to P31; 111 nos.	20	20	23APR09A	13MAY09A	100	23APR09A	13MAY09A	
10R1DO053	Construct nail heads/remove platform; row N to P	14	14	14MAY09A	02JUN09A	100	14MAY09A	02JUN09A	
10R1DO054	Erosion mat, wire mesh & hydroseed; rows N to P	6	6	03JUN09A	09JUN09A	100	03JUN09A	09JUN09A	
Slope Cut & Soil Nailing; +40mPD to +24mPD									
10R1DO130	+40 to +24mPD (rows Q to X)	180*	180*	20APR09A	23NOV09A	100	20APR09A	23NOV09A	
10R1DO131	Excavation; 40 to 30mPD; soil 8291m3/rock 2778m3	43	43	20APR09A	18AUG09A	100	20APR09A	18AUG09A	
10R1DO132	Reinstate temp. access	30	30	21APR09A	27MAY09A	100	21APR09A	27MAY09A	
10R1DO133	Erect working platfrom for rows Q to U	22	22	11MAY09A	15AUG09A	100	11MAY09A	15AUG09A	
10R1DO134	Test nails for P4, P5, P6 and P12	12	12	21MAY09A	25AUG09A	100	21MAY09A	25AUG09A	
10R1DO135	Drill/install/grout Q1 to U7; 96 nos.	13	13	12MAY09A	25AUG09A	100	12MAY09A	25AUG09A	
10R1DO136	Excavation; 30 to 24mPD; soil 4197m3/rock 7592m3	95	95	27MAY09A	23NOV09A	100	27MAY09A	23NOV09A	
TBM Launching Chamber									
10R1DO1305	Pipe pile roof support	9	9	08SEP09A	30SEP09A	100	08SEP09A	30SEP09A	
10R1DO1310	Excavate/construct TBM launching chamber	63	63	17OCT09A	11JAN10A	100	17OCT09A	11JAN10A	
10R1DO1315	Form launching chamber cradle	12	12	13JAN10A	27FEB10A	100	13JAN10A	27FEB10A	

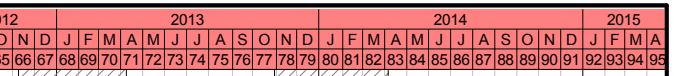


ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Slope Cut & TBM Access Road; +24 to +14mPD									
10R1DO230	+24 to +14mPD	252*	252*	08JUN09A	13APR10A	100	08JUN09A	13APR10A	
10R1DO240	Relocate sedimentation tank	0	0		06JUN09A	100		06JUN09A	
10R1DO250	Form access for big breaker	12	12	08JUN09A	20JUN09A	100	08JUN09A	20JUN09A	
10R1DO260	Mobilization of big breaker	0	0		20JUN09A	100		20JUN09A	
10R1DO270	Form new TBM access western section	40	40	08SEP09A	19NOV09A	100	08SEP09A	19NOV09A	
10R1DO272	Form new TBM access eastern section (bend)	32	32	09NOV09A	23DEC09A	100	09NOV09A	23DEC09A	
10R1DO274	From TBM access remaining section incl. paving	18	18	09DEC09A	16JAN10A	100	09DEC09A	16JAN10A	
10R1DO280	Demobilze 300T mobile crane	0	0		10MAR10A	100		10MAR10A	
10R1DO290	Demolish masonry & ret. wall at +14mPD	45	45	20JUL09A	13APR10A	100	20JUL09A	13APR10A	
TBM Assembly Area at +24mPD									
10R1DO185	Construct drainage & slab at west	6	6	24NOV09A	30NOV09A	100	24NOV09A	30NOV09A	
10R1DO195	Construct drainage & slab at east & middle	12	12	25JAN10A	20FEB10A	100	25JAN10A	20FEB10A	
3AL1DO0314	Commence TBM initial assembly	0	0	22FEB10A		100	22FEB10A		
Tower Crane									
3AL1DO2005	Foundation	40	40	28DEC09A	25FEB10A	100	28DEC09A	25FEB10A	
3AL1DO2010	Erection	3	3	26FEB10A	01MAR10A	100	26FEB10A	01MAR10A	
3AL1DO2015	Test & commissioning	1	1	01MAR10A	02MAR10A	100	01MAR10A	02MAR10A	
TBM Platform									
3AL1DO2505	Pre-fabrication	40	40	18JUN09A	04NOV09A	100	18JUN09A	04NOV09A	
3AL1DO2515	Foundation	24	24	20NOV09A	24DEC09A	100	20NOV09A	24DEC09A	
3AL1DO2525	Erect steel framework	18	18	28DEC09A	18FEB10A	100	28DEC09A	18FEB10A	
3AL1DO2535	Install platform	9	9	20JAN10A	23APR10A	100	20JAN10A	23APR10A	
3AL1DO2545	ICE certification	3	3	19FEB10A	19FEB10A	100	19FEB10A	19FEB10A	
Noise Enclosure									
3AL1DO3005	Pre-fabrication	42	42	22JUN09A	27OCT09A	100	22JUN09A	27OCT09A	
3AL1DO3015	Foundation	12	12	21OCT09A	17NOV09A	100	21OCT09A	17NOV09A	
3AL1DO3025	Erect steel framework	18	18	01DEC09A	10FEB10A	100	01DEC09A	10FEB10A	
3AL1DO3035	Cladding	22	22	12MAY10A	27SEP10A	100	12MAY10A	27SEP10A	
3AL1DO3045		1	0	21OCT09A	27SEP10A	100			
3AL1FT0802	Apply to EPD for CNP for 24 hrs. tunnel work	11	11	19OCT10A	25OCT10A	100	19OCT10A	25OCT10A	
3AL1FT0804	EPD process/approve CNP application	12	12	20OCT10A	29NOV10A	100	20OCT10A	29NOV10A	
3AL1FT0812		1	0	19OCT10A	29NOV10A	100			
105 Ton Gantry Crane									
3AL1DO3505	Manufacture	99	99	29MAY09A	03SEP09A	100	29MAY09A	03SEP09A	
3AL1DO3515	Shipping to Hong Kong	6	6	14SEP09A	21SEP09A	100	14SEP09A	21SEP09A	
3AL1DO3525	Assembly	8	8	29DEC09A	23JAN10A	100	29DEC09A	23JAN10A	
3AL1DO3535	Install rails	4	4	05JAN10A	12FEB10A	100	05JAN10A	12FEB10A	
3AL1DO3545	Test & commission	3	3	17FEB10A	19FEB10A	100	17FEB10A	19FEB10A	
3AL1DO3555	Receive initial segments and stock	6	6	06MAR10A	27MAR10A	100	06MAR10A	27MAR10A	
Muck Hopper									
3AL1DO4005	Pre-fabrication	75	75	22JUN09A	13MAR10A	100	22JUN09A	13MAR10A	
3AL1DO4015	Foundation incl. piles for steel platform	31	31	15MAR10A	25MAY10A	100	15MAR10A	25MAY10A	

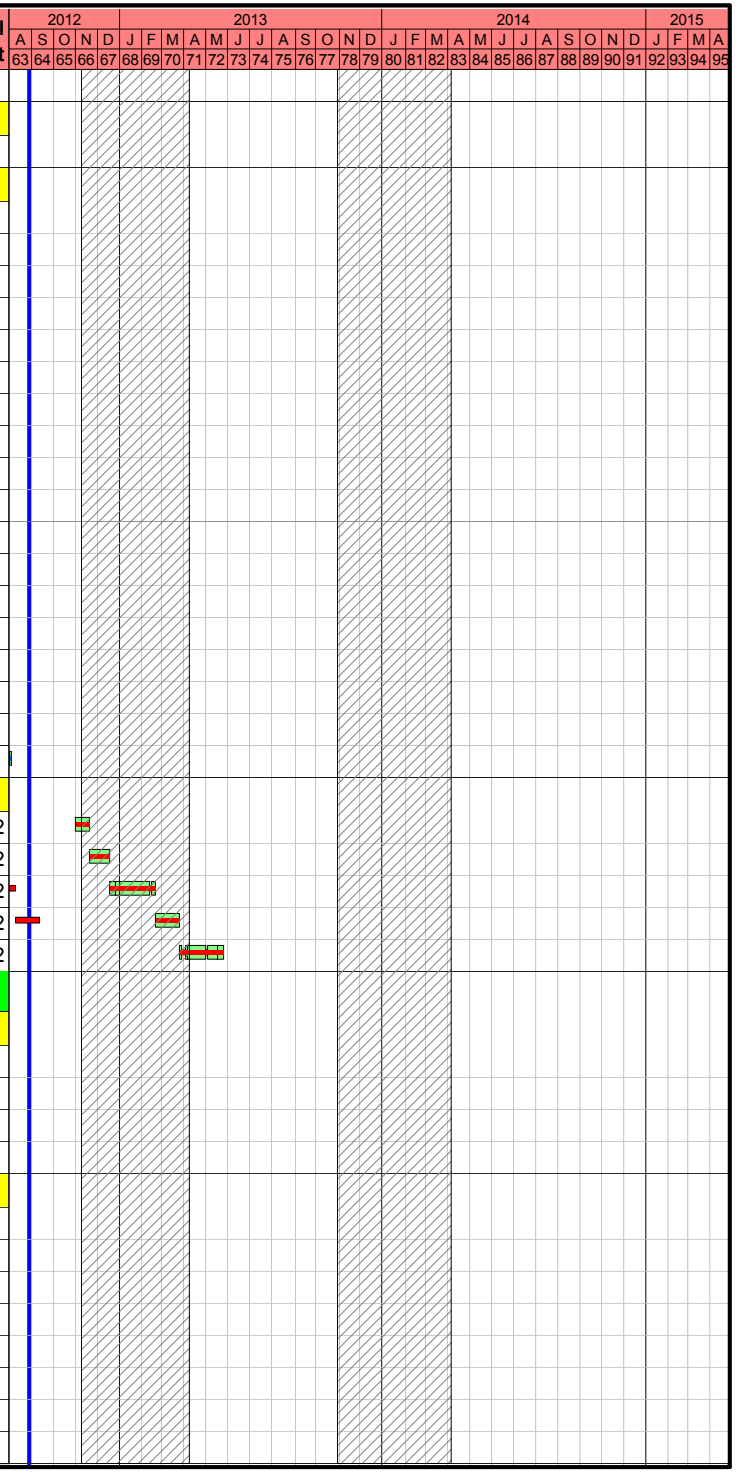
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
3AL1DO4025	Erect steelwork	18	18	26MAY10A	19JUN10A	100	26MAY10A	19JUN10A	
3AL1DO4035	Erect hopper	18	18	21JUN10A	29JUL10A	100	21JUN10A	29JUL10A	
3AL1DO4045	Install transfer conveyor	4	4	30JUL10A	04AUG10A	100	30JUL10A	04AUG10A	
3AL1DO4055	M&E works	6	6	05AUG10A	21AUG10A	100	05AUG10A	21AUG10A	
3AL1DO4065	Test & commissioning	3	3	23AUG10A	02OCT10A	100	23AUG10A	02OCT10A	
Marti Conveyor									
3AL1DO4505	Engineering	50	50	29MAY09A	24OCT09A	100	29MAY09A	24OCT09A	
3AL1DO4515	Pre-fabrication	60	60	17AUG09A	30NOV09A	100	17AUG09A	30NOV09A	
3AL1DO4525	Delivery to Hong Kong	25	25	01DEC09A	17DEC09A	100	01DEC09A	17DEC09A	
3AL1DO4535	Pre-assembly at Portion I	6	6	11JAN10A	16JAN10A	100	11JAN10A	16JAN10A	
3AL1DO4555	Install winch & extension towers	24	24	29MAY10A	24JUN10A	100	29MAY10A	24JUN10A	
3AL1DO4565	Install transfer conveyor	1	1	29JUL10A	29JUL10A	100	29JUL10A	29JUL10A	
3AL1DO4575	Install belt conveyor stage 2	16	16	09AUG10A	24AUG10A	100	09AUG10A	24AUG10A	
3AL1DO4585	M&E works	2	2	25AUG10A	27AUG10A	100	25AUG10A	27AUG10A	
3AL1DO4595	Test & commission	1	1	28AUG10A	28AUG10A	100	28AUG10A	28AUG10A	
LV Station									
3AL1DO5005	Delivery & install containers 1/2/3	4	4	08DEC09A	11DEC09A	100	08DEC09A	11DEC09A	
3AL1DO5015	M&E works	12	12	12DEC09A	14JAN10A	100	12DEC09A	14JAN10A	
3AL1DO5025	Test & commision	12	12	15JAN10A	25JAN10A	100	15JAN10A	25JAN10A	
Cooling Water System									
3AL1DO5505	Pre-fabrication	53	53	18JUL09A	07DEC09A	100	18JUL09A	07DEC09A	
3AL1DO5515	Foundation	10	10	08DEC09A	31DEC09A	100	08DEC09A	31DEC09A	
3AL1DO5525	Erect cooling system	12	12	09JAN10A	20FEB10A	100	09JAN10A	20FEB10A	
3AL1DO5535	M&E works	4	4	22FEB10A	27FEB10A	100	22FEB10A	27FEB10A	
3AL1DO5545	Test & commission	2	2	26APR10A	28APR10A	100	26APR10A	28APR10A	
Grout System									
3AL1DO6005	Pre-fabrication	90	90	22JUN09A	12DEC09A	100	22JUN09A	12DEC09A	
3AL1DO6015	Erect system	6	6	02AUG10A	10AUG10A	100	02AUG10A	10AUG10A	
3AL1DO6025	M&E works	3	3	11AUG10A	13AUG10A	100	11AUG10A	13AUG10A	
3AL1DO6035	Test & commission	1	1	14AUG10A	14AUG10A	100	14AUG10A	14AUG10A	
Pea Gravel Plant									
3AL1DO7505	Pre-fabrication	36	36	22JUN09A	29APR10A	100	22JUN09A	29APR10A	
3AL1DO7515	Install hopper	4	4	02AUG10A	04SEP10A	100	02AUG10A	04SEP10A	
3AL1DO7525	Erect conveyor	2	2	07AUG10A	13AUG10A	100	07AUG10A	13AUG10A	
3AL1DO7535	M&E works	4	4	25AUG10A	04SEP10A	100	25AUG10A	04SEP10A	
3AL1DO7545	Test & commission	0	0		04SEP10A	100		04SEP10A	
3AL1DO7555	Install conveyor connecting to TBM	4	4	18AUG10A	04SEP10A	100	18AUG10A	04SEP10A	
Ventilation System									
3AL1DO8005	Pre-fabrication	72	72	29MAY09A	27AUG09A	100	29MAY09A	27AUG09A	
3AL1DO8015	Erect system	2	2	24JUL10A	06AUG10A	100	24JUL10A	06AUG10A	
3AL1DO8025	M&E works	1	1	07AUG10A	07AUG10A	100	07AUG10A	07AUG10A	
3AL1DO8035	Test & commission	1	1	09AUG10A	09AUG10A	100	09AUG10A	09AUG10A	



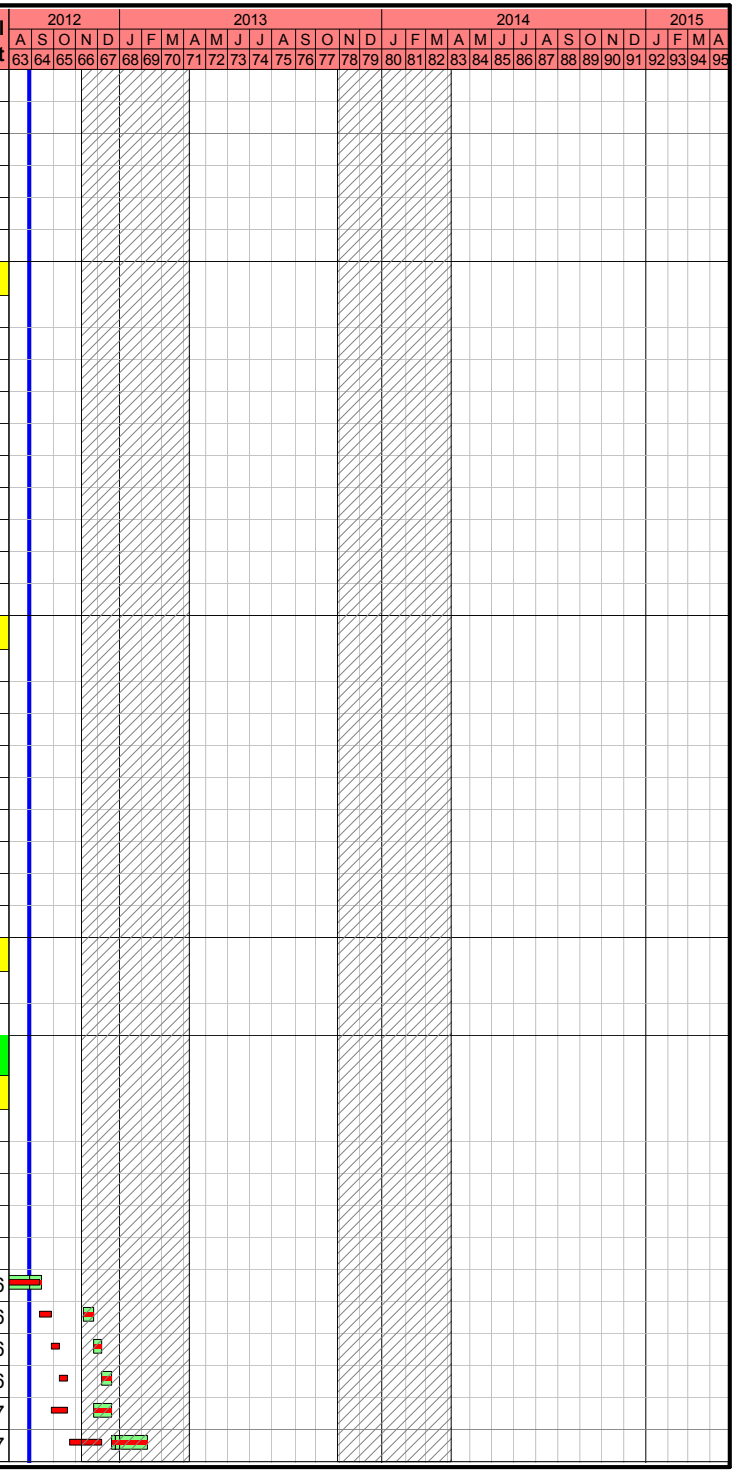
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Micsellaneous									
3AL1DO8502	Install transformer & hormonic filter	2	2	07JUN10A	10JUL10A	100	07JUN10A	10JUL10A	
3AL1DO8512	Remove invert segments	2	2	24JUL10A	06AUG10A	100	24JUL10A	06AUG10A	
3AL1DO8522	Make good slab	3	3	06AUG10A	07AUG10A	100	06AUG10A	07AUG10A	
3AL1DO8532	Install rail switch	1	1	23AUG10A	24AUG10A	100	23AUG10A	24AUG10A	
VO # 49 & 53; Additional Drainage & Stairway									
VO-04910	Received Variation orders	0	0		26FEB09A	100		26FEB09A	
VO-04920	Preparation works for varied works	14	14	27FEB09A	14MAR09A	100	27FEB09A	14MAR09A	
VO-04930	Construct u-channel & stairway; +71mPD to +55mPD	60	60	16MAR09A	29MAY09A	100	16MAR09A	29MAY09A	
VO-04940	Construct u-channel & stairway;+55mPD to +47mPD	27	27	05JUN09A	07JUL09A	100	05JUN09A	07JUL09A	
VO-04950	Construct u-channel & stairway; +47mPD to +41mPD	40	40	08JUL09A	08AUG09A	100	08JUL09A	08AUG09A	
VO-04960	Construct u-channel & stairway at middle portion	60	60	01NOV12*	12JAN13	0	30MAR12	14JUN12	-365
VO #88/#094/#103; Revised Slope Design									
VO-088000	Received VO #088	0	0		27MAY09A	100		27MAY09A	
VO-088005	Excavate from 38.5mPD to 36.5mPD	6	6	29MAY09A	04JUN09A	100	29MAY09A	04JUN09A	
VO-088010	Procure and prepare materials	9	9	29MAY09A	08JUN09A	100	29MAY09A	08JUN09A	
VO-088015	SOR confirm soil nails location	2	2	05JUN09A	06JUN09A	100	05JUN09A	06JUN09A	
VO-088020	Drill/install/grout soil nails; rows AA-AB	7	7	09JUN09A	16JUN09A	100	09JUN09A	16JUN09A	
VO-088025	Install wire mesh & shorcrete 150mm	3	3	17JUN09A	19JUN09A	100	17JUN09A	19JUN09A	
VO-088030	Excavate from +36.5 mPD to 34.5mPD	6	6	20JUN09A	26JUN09A	100	20JUN09A	26JUN09A	
VO-088035	SOR confirm soil nails location	2	2	27JUN09A	29JUN09A	100	27JUN09A	29JUN09A	
VO-088040	Drill/install/grout soil nails; rows AC-AD	7	7	30JUN09A	08JUL09A	100	30JUN09A	08JUL09A	
VO-088045	Install wire mesh & shorcrete 150mm	3	3	09JUL09A	11JUL09A	100	09JUL09A	11JUL09A	
VO-088050	Excavate from +34.5 mPD to 32.5mPD	6	6	13JUL09A	18JUL09A	100	13JUL09A	18JUL09A	
VO-088055	SOR confirm soil nails location	2	2	20JUL09A	21JUL09A	100	20JUL09A	21JUL09A	
VO-088060	Drill/install/grout soil nails; rows AE-AF	7	7	22JUL09A	29JUL09A	100	22JUL09A	29JUL09A	
VO-088065	Install wire mesh & shorcrete 150mm	3	3	30JUL09A	01AUG09A	100	30JUL09A	01AUG09A	
VO-088070	Excavate from +34.5 mPD to 32.5mPD	6	6	03AUG09A	18AUG09A	100	03AUG09A	18AUG09A	
VO-088075	SOR confirm soil nails location	2	2	17AUG09A	18AUG09A	100	17AUG09A	18AUG09A	
VO-088080	Drill/install/grout soil nails; row AG	5	5	19AUG09A	24AUG09A	100	19AUG09A	24AUG09A	
VO-088085	Install wire mesh & shorcrete 150mm	3	3	25AUG09A	28AUG09A	100	25AUG09A	28AUG09A	
VO-10302	Drill & install rock dowels below +30 to 24mPD	6	6	06OCT09A	19NOV09A	100	06OCT09A	19NOV09A	
Instruction from SOR/VO#093 Add. Noise Barriers									
SORI-10	Suspension of rock drilling & breaking	1	1	20JUN09A	20JUN09A	100	20JUN09A	20JUN09A	
SORI-20	Erection/relocation of noise bearriers	30	30	22JUN09A	10NOV09A	100	22JUN09A	10NOV09A	
Construct Spiral Ramp									
ELS & Excavation for Spiral Ramp									
10R1DELS02	Install pipe piles/slope trim & protection works	104	104	01JUN10A	04OCT10A	100	01JUN10A	04OCT10A	
10R1DELS12	Pre-drilling for rock breaking & splitting	26	26	20AUG10A	18SEP10A	100	20AUG10A	18SEP10A	
10R1DELS22	Excavate to +13.5mPD & construct capping beam	24	24	20SEP10A	26OCT10A	100	20SEP10A	26OCT10A	
10R1DELS32	Excavate/rock dowels/ring beam/shotcete; 11.5mPD	30	30	27OCT10A	06DEC10A	100	27OCT10A	06DEC10A	
10R1DELS42	Excavate/rock dowels/ring beam/shotcrete; 9.5mPD	33	33	07DEC10A	13JAN11A	100	07DEC10A	13JAN11A	
10R1DELS52	Excavate/rock dowels/ring beam/shotcrete; 7.5mPD	37	37	14JAN11A	01MAR11A	100	14JAN11A	01MAR11A	



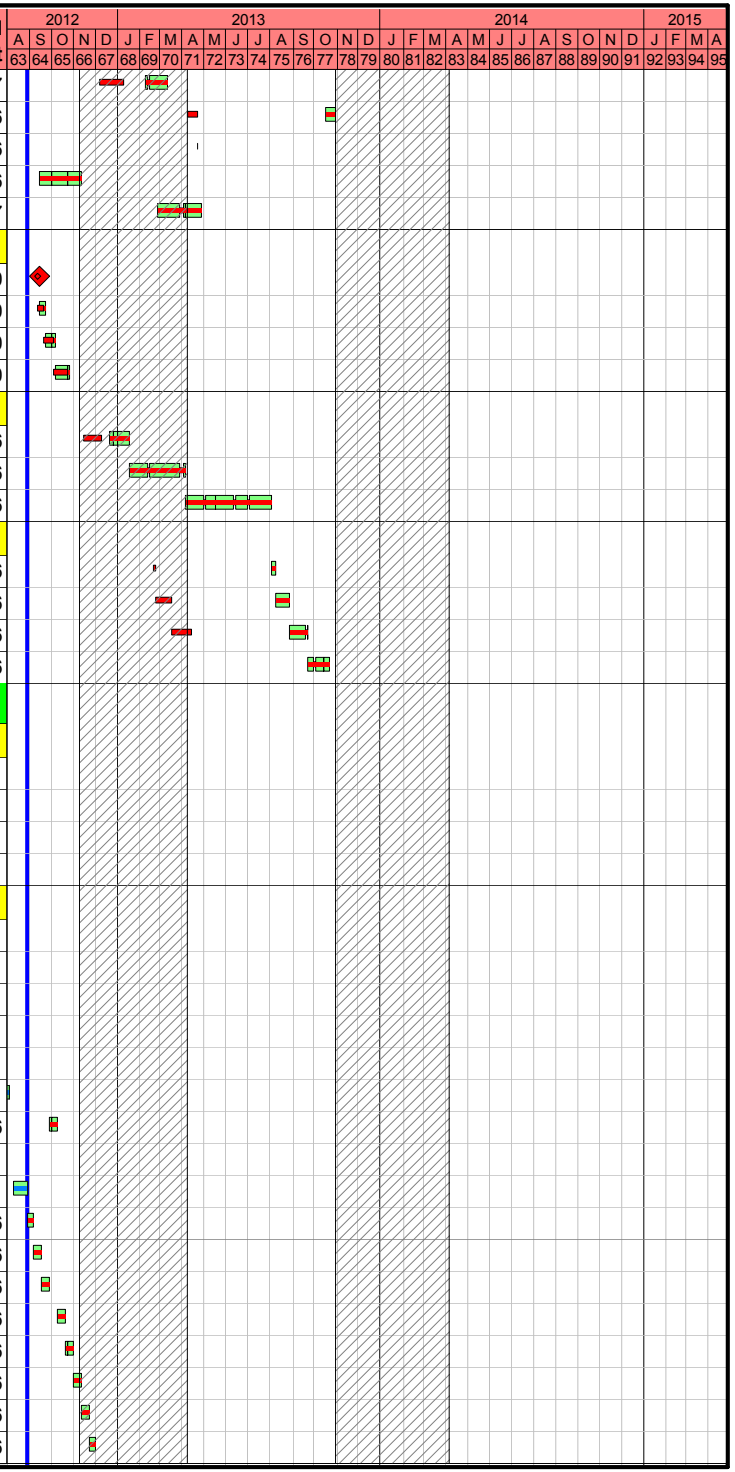
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
10R1DELS62	Excavate/rock dowels/ring beam/shotcre;3.2mPD	82	82	02MAR11A	08JUN11A	100	02MAR11A	08JUN11A	
Base for Spiral Ramp									
10R1DO0414	Construct base	14	14	09JUN11A	20JUN11A	100	09JUN11A	20JUN11A	
Spiral Ramp from +4.30mPD to +28.43mPD									
10R1DO0S02	Cast bay 1A	28	28	21JUN11A	23JUL11A	100	21JUN11A	23JUL11A	
10R1DO0S03	Cast bay 1B	11	11	25JUL11A	04AUG11A	100	25JUL11A	04AUG11A	
10R1DO0S04	Cast bay 2	11	11	05AUG11A	30AUG11A	100	05AUG11A	30AUG11A	
10R1DO0S06	Cast bay 3	11	11	27AUG11A	08SEP11A	100	27AUG11A	08SEP11A	
10R1DO0S08	Cast bay 4	8	8	05SEP11A	20SEP11A	100	05SEP11A	20SEP11A	
10R1DO0S10	Cast bay 5	8	8	09SEP11A	04OCT11A	100	09SEP11A	04OCT11A	
10R1DO0S12	Cast bay 6	8	8	06OCT11A	18OCT11A	100	06OCT11A	18OCT11A	
10R1DO0S14	Cast bay 7	8	8	24OCT11A	08NOV11A	100	24OCT11A	08NOV11A	
10R1DO0S16	Cast bay 8	8	8	07NOV11A	16NOV11A	100	07NOV11A	16NOV11A	
10R1DO0S18	Cast bay 9	8	8	14NOV11A	24NOV11A	100	14NOV11A	24NOV11A	
10R1DO0S20	Cast bay 10	8	8	25NOV11A	02DEC11A	100	25NOV11A	02DEC11A	
10R1DO0S22	Cast bay 11	8	8	01DEC11A	12DEC11A	100	01DEC11A	12DEC11A	
10R1DO0S24	Cast bay 12	8	8	09DEC11A	22DEC11A	100	09DEC11A	22DEC11A	
10R1DO0S26	Cast bay 13	8	8	19DEC11A	16JAN12A	100	19DEC11A	16JAN12A	
10R1DO0S28	Cast bay 14	8	8	03JAN12A	20JAN12A	100	03JAN12A	20JAN12A	
10R1DO0S29	Cast bay 15	31	31	16JAN12A	21FEB12A	100	16JAN12A	21FEB12A	
10R1DO0S30	Preparation & fill central void;	11	11	23APR12A	27JUL12A	100	29MAR12	14APR12	
10R1DO0S32	Construct spiral ramp top; Outfall O-1	8	8	28JUL12A	04AUG12A	100	16APR12	24APR12	
Finishing Works on Spiral Ramp									
10R1DO0F10	Install handrails	16	16	01NOV12*	19NOV12	0	25APR12	15MAY12	-512
10R1DO0F20	Water proofing works	24	24	20NOV12	17DEC12	0	16MAY12	12JUN12	-512
10R1DO0F30	Tiling works	48	48	18DEC12	18FEB13	0	13JUN12	09AUG12	-512
10R1DO0F40	Install GRP	29	29	19FEB13	23MAR13	0	10AUG12	12SEP12	-512
PVO-TR-20	Vertical greening & water points at Spiral Ramp	48	0	25MAR13	25MAY13	0			-512
Lower Part Box Culvert/Open Channel by Open Cut									
Approval for TTA & XP									
10R1DOD102	Prepare TTA scheme	100	100	28FEB09A	30MAY09A	100	28FEB09A	30MAY09A	
10R1DOD104	Obtain TTA approval from rel. authorities/SOR	60	60	02JUN09A	17NOV09A	100	02JUN09A	17NOV09A	
10R1DOD106	Obtain XP from HyD	60	60	28SEP09A	04DEC09A	100	28SEP09A	04DEC09A	
10R1DOD108	Preparatory works prior to implement TTA	59	59	04JAN10A	15JUN10A	100	04JAN10A	15JUN10A	
Stage 1 TTA; Fast Lane Closure of E/B C'way									
10R1DOD202	Trial run to close one lane of E/B C'way	1	1	13JUL10A	13JUL10A	100	13JUL10A	13JUL10A	
10R1DOD212	Trial pit excavation	28	28	17JUN10A	07AUG10A	100	17JUN10A	07AUG10A	
10R1DOD222	Install stage 1(32#) pipe piles	60	60	09AUG10A	20OCT10A	100	09AUG10A	20OCT10A	
10R1DOD224	Drainage & traffic diversion to close fast lane	13	13	21OCT10A	04NOV10A	100	21OCT10A	04NOV10A	
10R1DOD226	Install stg 2 (25# pipe piles) & 10# king posts	42	42	17NOV10A	26JAN11A	100	17NOV10A	26JAN11A	
10R1DOD232	Excavation & temp. support to exist. services	149	149	29NOV10A	29JUN11A	100	29NOV10A	29JUN11A	
10R1DOD330	Construct box culvert incl upstand wall	47	47	27JUN11A	20AUG11A	100	27JUN11A	20AUG11A	
10R1DOD430	Backfill up to base of retain. wall & blinding	11	11	22AUG11A	03SEP11A	100	22AUG11A	03SEP11A	



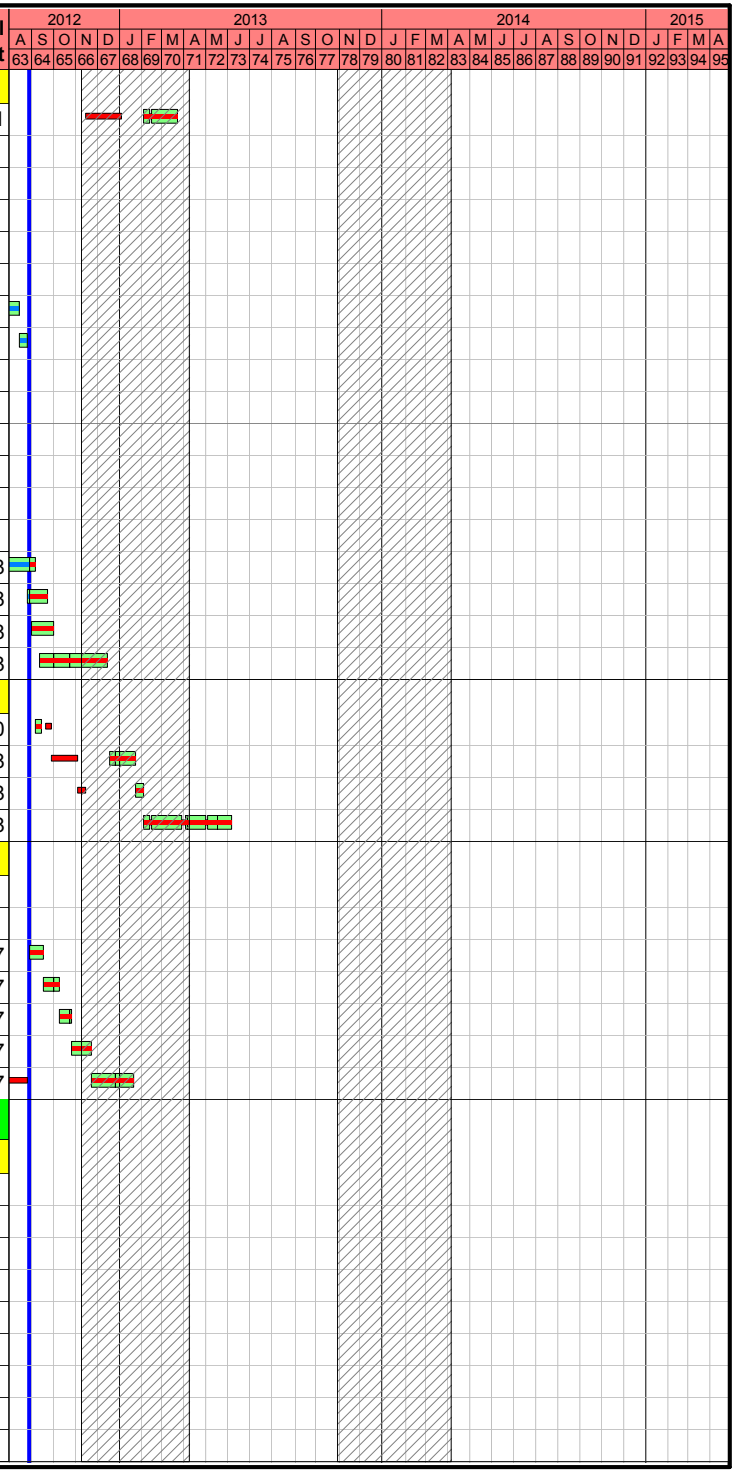
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
10R1DOD440	Construct base for L-shapped retaining wall	14	14	02SEP11A	22SEP11A	100	02SEP11A	22SEP11A	
10R1DOD442	Reinst. sewer pipe/modify supports to watermain	12	12	17OCT11A	27OCT11A	100	17OCT11A	27OCT11A	
10R1DOD444	Construct wall for L-shapped retaining wall	23	23	12SEP11A	22OCT11A	100	12SEP11A	22OCT11A	
10R1DOD450	Backfill to top & remove temp. supports	24	24	07OCT11A	30NOV11A	100	07OCT11A	30NOV11A	
10R1DOD460	Road works	12	12	01DEC11A	19DEC11A	100	01DEC11A	19DEC11A	
10R1DOD470	Re-open fast lane of E/B C'way	1	1	21DEC11A	21DEC11A	100	21DEC11A	21DEC11A	
Open Channel Between Box Culvert & Seawall; East									
10R1DOE005	Formation & blinding	6	6	05SEP11A	15SEP11A	100	05SEP11A	15SEP11A	
10R1DOE015	Base inside Arch Bridge	7	7	15SEP11A	03OCT11A	100	15SEP11A	03OCT11A	
10R1DOE025	Walls inside Arch Bridge	20	20	06OCT11A	08DEC11A	100	06OCT11A	08DEC11A	
10R1DOE030	Delivery of formliner at site	0	0		04OCT11A	100		04OCT11A	
10R1DOE035	Coping at East end with formlier	12	12	10OCT11A	24OCT11A	100	10OCT11A	24OCT11A	
10R1DOE045	Base of T Shapped Wall	7	7	27OCT11A	02NOV11A	100	27OCT11A	02NOV11A	
10R1DOE055	Wall of T Shapped Wall with formliner	10	10	03NOV11A	09NOV11A	100	03NOV11A	09NOV11A	
10R1DOE065	Base outside Arch Bridge	7	7	10NOV11A	15NOV11A	100	10NOV11A	15NOV11A	
10R1DOE075	Wall outside Arch Bridge with formliner	10	10	16NOV11A	23NOV11A	100	16NOV11A	23NOV11A	
10R1DOE085	Reinstage rock armour	24	24	28NOV11A	09JAN12A	100	28NOV11A	09JAN12A	
Open Channel Between Box Culvert & Seawall; West									
10R1DOW005	Formation & blinding	6	6	12SEP11A	21SEP11A	100	12SEP11A	21SEP11A	
10R1DOW015	Base inside Arch Bridge	7	7	04OCT11A	11OCT11A	100	04OCT11A	11OCT11A	
10R1DOW025	Walls inside Arch Bridge	20	20	18OCT11A	28NOV11A	100	18OCT11A	28NOV11A	
10R1DOW035	Coping at West end with formliner	12	12	25OCT11A	27OCT11A	100	25OCT11A	27OCT11A	
10R1DOW045	Base of T Shapped Wall	7	7	02NOV11A	09NOV11A	100	02NOV11A	09NOV11A	
10R1DOW055	Wall of T Shapped Wall with formliner	10	10	10NOV11A	17NOV11A	100	10NOV11A	17NOV11A	
10R1DOW065	Base outside Arch Bridge	7	7	21NOV11A	25NOV11A	100	21NOV11A	25NOV11A	
10R1DOW075	Wall outside Arch Bridge with formliner	10	10	26NOV11A	30NOV11A	100	26NOV11A	30NOV11A	
10R1DOW085	Reinstage rock armour	50	50	30JAN12A	20MAR12A	100	30JAN12A	24MAR12	
Coping & Baffle Walls									
10R1DOM005	Seawall coping with formliner; 9 bays	18	18	28OCT11A	21NOV11A	100	28OCT11A	21NOV11A	
10R1DOM015	Type G baffle walls with formliner; 16#	16	16	05DEC11A	04FEB12A	100	05DEC11A	04FEB12A	
Vehicular Access/Upper Box Culvert/Cascade									
Stage 2 TTA; Upper B/C/Lower Cascade/V. Access									
10ELS002	TBM advance to Ch. 0.00	0	0		28FEB12A	100		28FEB12	
10ELS012	Removel of Muck Hopper	24	24	01MAR12A	28MAR12A	100	01MAR12	28MAR12	
10ELS014	Trial pits/identify utilities/elevated footpath	64	64	22DEC11A	27MAR12A	100	22DEC11A	12MAR12	
10ELS022	Install 27# pipe piles	34	34	09JAN12A	20FEB12A	100	09JAN12A	20FEB12A	
10ELS032	Install remaining 15# pipe piles	24	24	29MAR12A	25APR12A	100	29MAR12	02MAY12	
10R1DO0706	Excavate & temp. support to services incl. V. A.	135	135	29MAR12A	13SEP12	89	29MAR12	11SEP12	-606
10R1DO0707	Construct base slab; 690m3 (2 pours)	13	13	12NOV12	26NOV12	0	12SEP12	26SEP12	-606
10R1DO0708	Construct step 1; 403m3	10	10	27NOV12	07DEC12	0	27SEP12	09OCT12	-606
10R1DO0709	Construct step 2 & 3; 362m3	10	10	08DEC12	19DEC12	0	10OCT12	20OCT12	-606
10R1DO0710	Construct type F baffle walls; 8#	20	20	27NOV12	19DEC12	0	27SEP12	20OCT12	-527
10R1DO0712	Construct walls, roof & upstand; 860m3 (4 pours)	40	40	20DEC12	07FEB13	0	22OCT12	07DEC12	-527



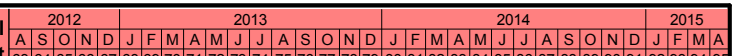
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
10R1DO0716	Backfill include removal of king posts	24	24	08FEB13	11MAR13	0	08DEC12	08JAN13	-527
10R1DO0726	Road paving & reinstate footpath	12	12	16OCT13	29OCT13	0	08APR13	20APR13	-606
10R1DO0728	Re-open slow lane of E/B C'way	1	1	30OCT13	30OCT13	0	22APR13	22APR13	-606
10R1DO0736	Additional ELS & key excavation	48	0	14SEP12	10NOV12	0			-606
PVO-W-10	Modification of existing Outfall "W"	48	0	26FEB13	26APR13	0			-527
Construction of Vehicular Access									
10R1DO0407	Complete excavation with open cut/blinding	0	0		13SEP12	0		11SEP12	-440
10R1DO0408	Construct base	8	8	14SEP12	22SEP12	0	12SEP12	20SEP12	-440
10R1DO0410	Construct walls	10	10	24SEP12	05OCT12	0	21SEP12	03OCT12	-440
10R1DO0412	Construct roof	16	16	06OCT12	25OCT12	0	04OCT12	22OCT12	-440
Construction of Upper Cascade; Bays 16-21									
10R1DO0730	Construct base (1682m3); (6x7)/2=21 days	21	21	20DEC12	16JAN13	0	15NOV12	08DEC12	-606
VO-245-200	Construct walls; 15 pours	60	0	17JAN13	03APR13	0			-606
VODLNDAD60	Construct roof & planter wall; 6 pours	98	0	05APR13	01AUG13	0			-606
Reinstate Slope at West of Spiral Ramp									
10R1DOSW10	Removal of Tower Crane	4	4	02AUG13	06AUG13	0	19FEB13	22FEB13	-606
10R1DOSW20	Excavate & construct mass conc. walls	18	18	07AUG13	27AUG13	0	23FEB13	15MAR13	-606
10R1DOSW30	Slope reinstatement & drainage works	21	21	28AUG13	21SEP13	0	16MAR13	13APR13	-606
VOADIS10	Additional Irrigation Sys Pump House	24	0	23SEP13	22OCT13	0			-606
Permanent Works at +24mPD									
Removal of TBM Services & Excavation at +24mPD									
10R1DO0600	Remove TBM services from tunnel; 24 hrs works	24	24	02MAR12A	30APR12A	100	02MAR12	29MAR12	
10R1DO0601	Remove TBM serivces outside tunel; day time	44	44	02MAR12A	09JUN12A	100	02MAR12	26APR12	
10R1DO0602	Excavate tapered channel inside Noise Enclosure	25	25	18APR12A	16JUN12A	100	30MAR12	04MAY12	
10R1DO0603	Excavate tapered channel outside Noise Enclosre	32	32	21MAY12A	10JUL12A	100	05MAY12	11JUN12	
Construction of Buttress Wall (VO#233)									
VO-233-005	Receive VO#233	0	0	19APR12A		100			
VO-233-010	Excavation/Formation/Blinding	9	0	14MAY12A	23MAY12A	100			
VO-233-015	Bay B, 1st pour; +23.8mPD~+27.0mPD	9	0	24MAY12A	02JUN12A	100			
VO-233-020	Bay B, 2nd pour; +27mPD~+31mPD	11	0	04JUN12A	15JUN12A	100			
VO-233-025	Bay B, 3rd pour; +31.0mPD~+35.0mPD	13	0	26JUN12A	11JUL12A	100			
VO-233-030	Bay B, 4th pour; +35.0mPD~+39.0mPD	20	0	12JUL12A	03AUG12A	100			
VO-233-035	Bay B, Upper planter wall	9	0	28SEP12	09OCT12	0			-546
VO-233-040	Bay A, 1st pour; +23.8mPD~+27.0mPD	7	0	16JUN12A	25JUN12A	100			
VO-233-045	Bay A, 2nd pour; +27mPD~+31mPD	15	0	10AUG12A	27AUG12A	100			
VO-233-050	Bay A, 3rd pour; +31.0mPD~+35.0mPD	9	0	28AUG12	06SEP12	0			-546
VO-233-055	Bay A, 4th pour; +35.0mPD~+39.0mPD	9	0	07SEP12	17SEP12	0			-546
VO-233-060	Bay A, Upper planter wall	9	0	18SEP12	27SEP12	0			-546
VO-233-065	Bay C, 1st pour; +23.8mPD~+27.0mPD	9	0	10OCT12	19OCT12	0			-546
VO-233-070	Bay C, 2nd pour; +27.0mPD~+31.0mPD	9	0	20OCT12	31OCT12	0			-546
VO-233-075	Bay C, 3rd pour; +31.0mPD~+35.0mPD	9	0	01NOV12	10NOV12	0			-546
VO-233-085	Bay C, 4th pour; +35.0mPD~+39.0mPD	9	0	12NOV12	21NOV12	0			-546
VO-233-090	Bay C, Upper planter wall	9	0	22NOV12	01DEC12	0			-546



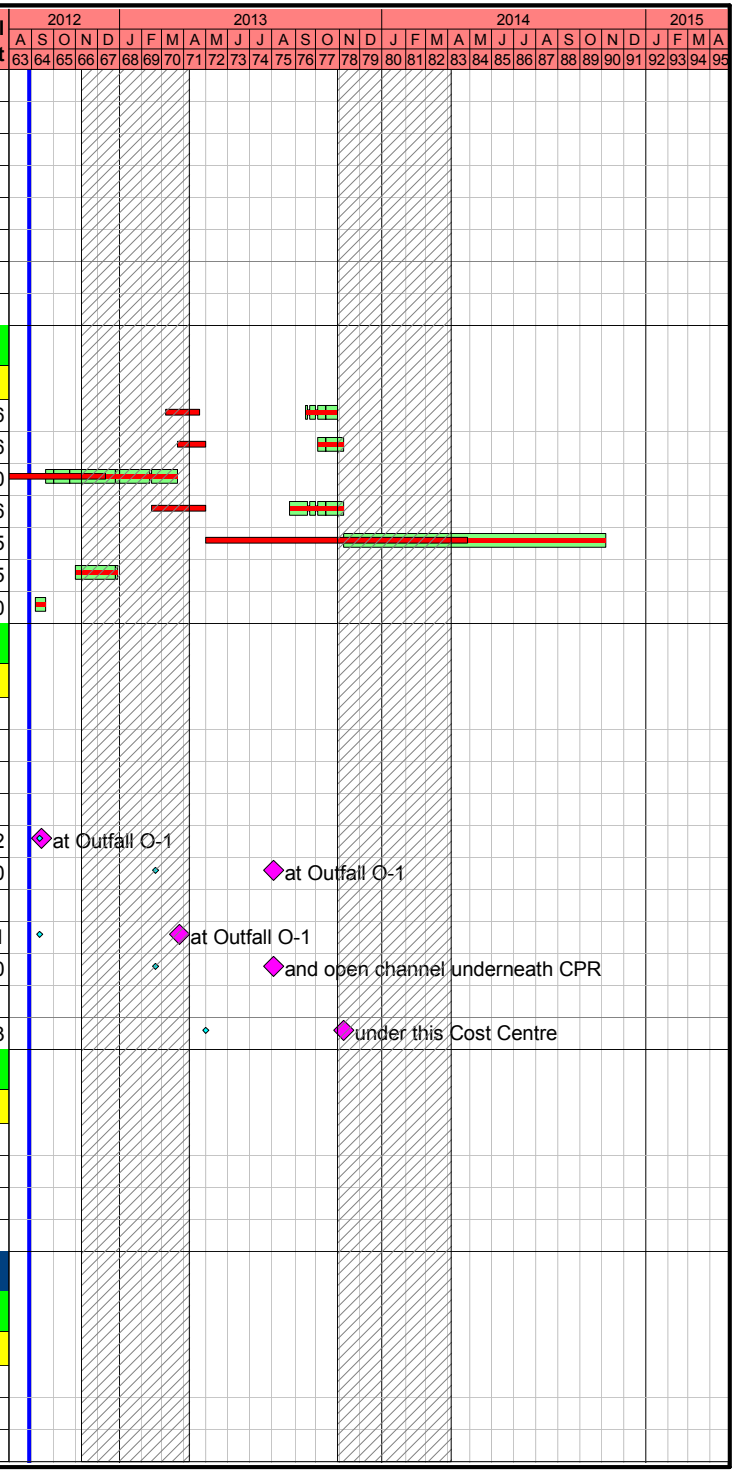
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
Construction of Tapered Channel (VO#245)									
10R1DO0644	Install penstock & testing	39	39	02FEB13	22MAR13	0	15NOV12	02JAN13	-501
VO-245-005	Receive VO#245	0	0	19APR12A		100			
VO-245-010	Bay B1; Blinding & survey setting out	2	0	23MAY12A	24MAY12A	100			
VO-245-015	Bay B1; Base slab	14	0	25MAY12A	12JUN12A	100			
VO-245-020	Bay B1; Wall B1A	15	0	13JUN12A	10JUL12A	100			
VO-245-025	Bay B1; Wall B1B	15	0	11JUL12A	25JUL12A	100			
VO-245-030	Bay B1; Wall B1C	15	0	26JUL12A	13AUG12A	100			
VO-245-035	Bay B1; Wall B1D	15	0	14AUG12A	25AUG12A	100			
VO-245-040	Bay B2A; Blinding & survey setting out	2	0	16JUN12A	16JUN12A	100			
VO-245-045	Bay B2A; Base slab	10	0	19JUN12A	29JUN12A	100			
VO-245-060	Bay B2B; Blinding & survey setting out	2	0	25JUN12A	27JUN12A	100			
VO-245-065	Bay B2B; Base slab	10	0	28JUN12A	09JUL12A	100			
VO-245-080	Bay B2C; Blinding & survey setting out	2	0	11JUL12A	20JUL12A	100			
VO-245-085	Bay B2C; Base slab	10	0	13JUL12A	31JUL12A	100			
VO-245-090	Walls for Bay 2A, 2B and 2C	56	0	30JUN12A	04SEP12	87			-558
VO-245-105	Baffle walls (28#)	25	0	25AUG12A	22SEP12	8			-558
VO-245-115	Columns (12#)	25	0	01SEP12	29SEP12	0			-558
VODLNDAD10	Construct additional landscap deck	80	0	12SEP12	15DEC12	0			-558
Platform at East of Tappered Channel									
10R1DO0P10	Formation	8	8	05SEP12	13SEP12	0	20SEP12	28SEP12	-480
10R1DO0P20	Const. slope toe planter wall/surface drainage	28	28	17DEC12	21JAN13	0	29SEP12	02NOV12	-558
10R1DO0P30	Lay sub-base & construct slab	10	10	22JAN13	01FEB13	0	03NOV12	14NOV12	-558
VOADT-10	Additional Trellis	96	0	02FEB13	04JUN13	0			-558
Reinstate Slope at North & East of Spiral Ramp									
10R1DO0E10	Prepare slope reinstatement report	49	49	20JUN11A	31MAY12A	100	20JUN11A	09MAR12	
10R1DO0E30	Obtain consent from SOR & GEO	170	170	08SEP11A	14JUL12A	100	08SEP11A	09MAY12	
10R1DO0E35	CLP disconnect power to TR	18	0	28AUG12	17SEP12	0			-557
10R1DO0E40	Demolish transformer room	18	18	18SEP12	09OCT12	0	25APR12	17MAY12	-557
10R1DO0E50	Construct ret. wall at entrance of Spiral Ramp	12	12	10OCT12	24OCT12	0	18MAY12	31MAY12	-557
10R1DO0E60	Reinstate slope; +14mPD to +21mPD	24	24	25OCT12	21NOV12	0	01JUN12	29JUN12	-557
10R1DO0E70	Reinstate slope; +21mPD to +28mPD	48	48	22NOV12	19JAN13	0	30JUN12	25AUG12	-557
Seabed Protection Works									
Preliminary Works As Per VO#061									
10R1DO0502	Site possession of Portion E-650d of DOC	0	0	09JUL09A		100	09JUL09A		
VO061-002	Receive VO # 061	0	0		30JUN09A	100		30JUN09A	
VO061-004	Appoint Independent Hydrographic Surveyor	60	60	02JUL09A	26SEP09A	100	02JUL09A	26SEP09A	
VO061-006	Carry out sounding survey	6	6	02OCT09A	10OCT09A	100	02OCT09A	10OCT09A	
VO061-008	Prepare/submit drwgs./report of sounding survey	6	6	04NOV09A	03NOV09A	100	04NOV09A	03NOV09A	
VO061-010	SOR approves drwgs./report of sounding survey	6	6	04NOV09A	10NOV09A	100	04NOV09A	10NOV09A	
VO061-012	SOR issue Supplm. Environmental Review Report	30	30	02JUL09A	05OCT09A	100	02JUL09A	05OCT09A	
VO061-014	Apply for Variation to FEP	6	6	05OCT09A	05OCT09A	100	05OCT09A	05OCT09A	
VO061-016	EPD review/issue FEP	30	30	06OCT09A	28OCT09A	100	06OCT09A	28OCT09A	



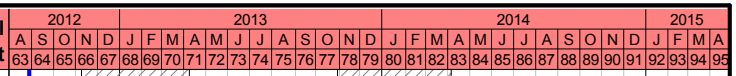
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
VO061-018	Prepare/submit Revised EM&A Manual by ET	30	30	29OCT09A	02DEC09A	100	29OCT09A	02DEC09A	
VO061-020	IEC endorse Revised EM&A Manual	12	12	03DEC09A	30DEC09A	100	03DEC09A	30DEC09A	
VO061-022	EPD acknowledge Revised EM&A Manual	6	6	02JAN10A	06JAN10A	100	02JAN10A	06JAN10A	
VO061-032	Appoint sub-contractor for varied works	60	60	02JUL09A	17OCT09A	100	02JUL09A	17OCT09A	
VO061-034	Submit & review of method statement	65	65	10DEC09A	02MAR10A	100	10DEC09A	02MAR10A	
VO061-040	Apply for marine notice	6	6	05NOV09A	11NOV09A	100	05NOV09A	11NOV09A	
VO061-042	Revew/issue marine notice by Marine Department	30	30	12NOV09A	24DEC09A	100	12NOV09A	24DEC09A	
VO061-044	Apply for dumping permit	10	10	13AUG10A	24AUG10A	100	13AUG10A	24AUG10A	
VO061-046	Review/issue dumping permit by EPD	31	31	16AUG10A	20SEP10A	100	16AUG10A	20SEP10A	
VO061-050	6# pre-drilling for ground investigation	40	40	02FEB10A	03MAY10A	100	02FEB10A	03MAY10A	
Preliminary Works As Per Alternative Design									
ALP-002	Submit Contractor's proposal; alternative design	0	0	03JUL10A	17SEP10A	100	03JUL10A	17SEP10A	
ALP-012	Review/approval of Contractor's proposal by SOR	87	87	05JUL10A	26NOV10A	100	05JUL10A	26NOV10A	
ALP-022	Submit method statement for basin construction	36	36	19AUG10A	22SEP10A	100	19AUG10A	22SEP10A	
ALP-032	Review/approval of method statement by ICE	12	12	30SEP10A	30NOV10A	100	30SEP10A	30NOV10A	
ALP-042	Review/approval of method statement by SOR	47	47	20AUG10A	11OCT10A	100	20AUG10A	11OCT10A	
ALP-062	Review/approval of alternative design by SOR	41	41	27AUG10A	26NOV10A	100	27AUG10A	26NOV10A	
ALP-072	Review/approval of alternative design by ICE	32	32	03SEP10A	27OCT10A	100	03SEP10A	27OCT10A	
Basin Construction As Per Alternative Design									
ALC002	Commence basin construction	0	0	25OCT10A		100	25OCT10A		
ALC012	Intial works	70*	70*	26OCT10A	18JAN11A	100	26OCT10A	18JAN11A	
ALC022	Install silt curtain	3	3	26OCT10A	28OCT10A	100	26OCT10A	28OCT10A	
ALC032	Dredge marine deposit	33	33	29OCT10A	06DEC10A	100	29OCT10A	06DEC10A	
ALC052	Remove rock armor	34	34	07DEC10A	18JAN11A	100	07DEC10A	18JAN11A	
ALC062	Form Seawall Type North & Eest	64*	64*	24JAN11A	12APR11A	100	24JAN11A	12APR11A	
ALC072	Dredge	39	39	24JAN11A	12MAR11A	100	24JAN11A	12MAR11A	
ALC082	Place concrete and levelling layer	11	11	14MAR11A	25MAR11A	100	14MAR11A	25MAR11A	
ALC092	Place seawall blocks	7	7	26MAR11A	02APR11A	100	26MAR11A	02APR11A	
ALC102	Backfill seawall	7	7	04APR11A	12APR11A	100	04APR11A	12APR11A	
ALC112	Form Seawall Wing Wall at East	38*	38*	13APR11A	31MAY11A	100	13APR11A	31MAY11A	
ALC132	Place concrete and levelling layer	16	16	13APR11A	04MAY11A	100	13APR11A	04MAY11A	
ALC142	Place seawall blocks	13	13	05MAY11A	20MAY11A	100	05MAY11A	20MAY11A	
ALC152	Backfill seawall	9	9	21MAY11A	31MAY11A	100	21MAY11A	31MAY11A	
ALC172	Form Seawall at North & West	55*	55*	28JUN11A	31AUG11A	100	28JUN11A	31AUG11A	
ALC182	Dredge	22	22	28JUN11A	23JUL11A	100	28JUN11A	23JUL11A	
ALC192	Place back concrete and levelling layer	9	9	25JUL11A	03AUG11A	100	25JUL11A	03AUG11A	
ALC202	Place seawall blocks; 71#	24	24	04AUG11A	20AUG11A	100	04AUG11A	20AUG11A	
ALC212	Backfill seawall	10	10	30AUG11A	31AUG11A	100	30AUG11A	31AUG11A	
ALC214	Form temp. conc. block wall	6	6	22AUG11A	27AUG11A	100	22AUG11A	27AUG11A	
ALC222	Form Seawall Wing Wall at West	168*	174*	01SEP11A	24MAR12A	100	01SEP11A	31MAR12	
ALC332	Dredging	6	6	01SEP11A	14SEP11A	100	01SEP11A	14SEP11A	
ALC342	Place back concrete and levelling layer	6	6	15SEP11A	19SEP11A	100	15SEP11A	19SEP11A	
ALC352	Place seawall blocks (1st stage); 48#	11	11	20SEP11A	30SEP11A	100	20SEP11A	30SEP11A	



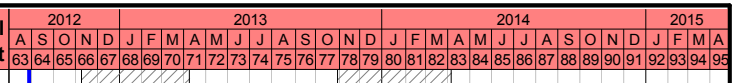
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
ALC362	Backfill seawall	6	6	07OCT11A	15OCT11A	100	07OCT11A	15OCT11A	
ALC366	Place seawall blocks (2nd stage); 12#	6	6	23MAR12A	24MAR12A	100	26MAR12	31MAR12	
ALC372	Place Concere Blocks in Apron Invert	137*	155*	25OCT11A	12APR12A	100	25OCT11A	05MAY12	
ALC382	Dredge	18	18	25OCT11A	08NOV11A	100	25OCT11A	08NOV11A	
ALC392	Place levelling layer	25	25	09NOV11A	26NOV11A	100	09NOV11A	26NOV11A	
ALC402	Place step blocks	58	58	28NOV11A	27MAR12A	100	28NOV11A	05MAR12	
ALC412	Place type 2 arour infront of seawall	24	24	13MAR12A	12APR12A	100	02APR12	05MAY12	
ALC522	Complete Outfall Basin	0	0		12APR12A	100		05MAY12	
Remaining Works Prior to Handover									
10R1DO0904	Finishing & reinstatement works; Portion D	36	36	16SEP13	30OCT13	0	07MAR13	22APR13	-606
10R1DO0906	Pre-handover inspections and remedial works	30	30	02OCT13	06NOV13	0	21MAR13	29APR13	-606
16R7DO0900	Landscaping works upper part of slope	150	150	19SEP12	21MAR13	0	15JUN12	11DEC12	-420
16R7DO0902	Landscaping works lower part of slope	60	60	26AUG13	06NOV13	0	14FEB13	29APR13	-606
16R7DO0904	Establishment Works at Portion D	365	365	07NOV13	06NOV14	0	30APR13	29APR14	-745
PVO-AP-10	Anti-pedestrian Apron Slab at Outfall D	48	0	01NOV12*	28DEC12	0			-395
PVO-TR-10	Tree survey as per revised planting schedule	12	0	05SEP12	18SEP12	0			-420
Schedule of MIlestones for Cost Centre No. 10R									
10R1DO1002	10R 1; On completion of 20% excavation works	0	0		09APR09A	100		09APR09A	
10R1DO1004	10R 2; On completion of 40% excavation works	0	0		28AUG09A	100		28AUG09A	
10R1DO1006	10R 3; On completion of 60% excavation works	0	0		13APR10A	100		13APR10A	
10R1DO1008	10R 4; On completion of 80% excavation works	0	0		08JUN11A	100		08JUN11A	
10R1DO1010	10R 5; On completion all excavation works	0	0		13SEP12	0		11SEP12	912
10R1DO1012	10R 6; On completion of cascade structure	0	0		01AUG13	0		18FEB13	590
10R1DO1014	10R 7; On completion of spiral ramp to +16mPD	0	0		07NOV11A	100		07NOV11A	
10R1DO1016	10R 8; On completion of spiral access ramp	0	0		23MAR13	0		12SEP12	721
10R1DO1018	10R 9; On completion box-culvert & open channel	0	0		01AUG13	0		18FEB13	590
10R1DO1020	10R 10; On completion of seabed protection wks	0	0		12APR12A	100		05MAY12	
10R1DO1022	10R 11; On completion of all works under this CC	0	0		06NOV13	0		29APR13	493
Schedule of Milestones for Cost Centre No. 14R									
14R5DO1102	14R 1; On complet. of remove exist. rock armour	0	0		22JAN11A	100		22JAN11A	
14R5DO1104	14R 2; On complet. of 50% soil nailing by number	0	0		07APR09A	100		07APR09A	
14R5DO1106	14R 3; On completion all soil nailng works	0	0		19NOV09A	100		19NOV09A	
14R5DO1108	14R 4; On completion of all works under this CC	0	0		22JAN11A	100		22JAN11A	
Drainage Improvement Works at Portion G									
Preliminary Works									
Site Establishment Works									
01R6GG0114	Possession of Portion G -700d of DOC	0	0	26NOV09A		100	26NOV09A		
01R6GG0116	Site clearance	30	30	26NOV09A	02JAN10A	100	26NOV09A	02JAN10A	
VO-125G05	VO#125 received for revised hoarding & fencing	0	0		02JAN10A	100		02JAN10A	



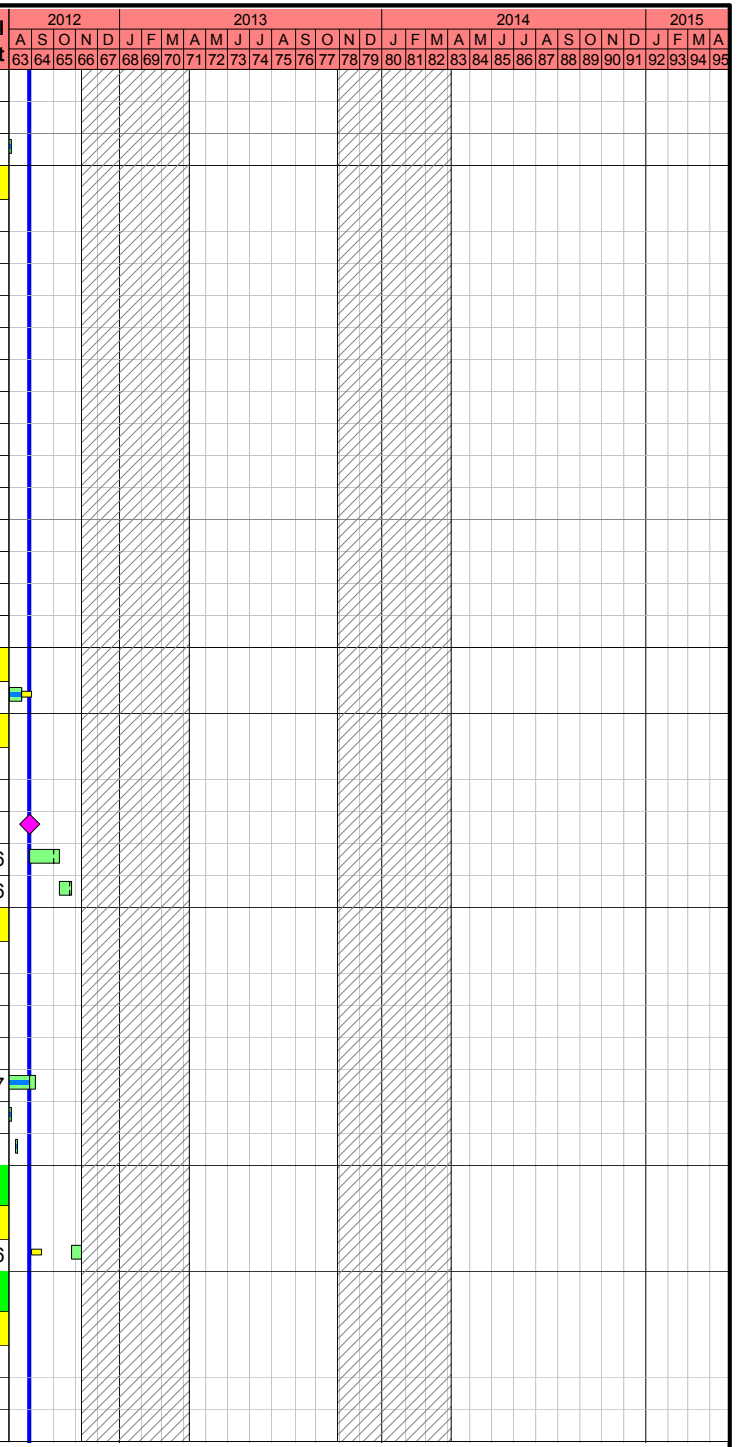
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
VO-125G10	Fenceing/Hoarding erection	50	50	05JAN10A	01MAR10A	100	05JAN10A	01MAR10A	
G.I. Works (VO#126)									
VO-126G05	Slope stripping for RS-3	14	14	09DEC09A	24DEC09A	100	09DEC09A	24DEC09A	
VO-126G10	Timber platform for predrilling works	12	12	15JAN10A	20JAN10A	100	15JAN10A	20JAN10A	
VO-126G15	Predriliing for H-piling works & soil nailing	36	36	20JAN10A	04MAR10A	100	20JAN10A	04MAR10A	
VO-126G20	Submission of drilling report	14	14	18FEB10A	18FEB10A	100	18FEB10A	18FEB10A	
Tree Felling/Transplanting Works (VO#126)									
VO-126T05	Tree survey & report submission	14	14	16DEC09A	04JAN10A	100	16DEC09A	04JAN10A	
VO-126T15	Obtain tree felling permit	105	105	05JAN10A	15MAY10A	100	05JAN10A	15MAY10A	
VO-126T25	Tree felling	24	24	14JUN10A	12OCT10A	100	14JUN10A	12OCT10A	
Soil Nailing Works (VO#126)									
Soil Nailing Works at Area A									
VO-126S05	Erect wokring platform & mobilization	8	8	19MAR10A	30MAR10A	100	19MAR10A	30MAR10A	
VO-126S10	Test nails	8	8	01APR04A	17APR04A	100	01APR04A	17APR04A	
VO-126S15	Permanent soil nails 64#	30	30	19APR10A	13MAY10A	100	19APR10A	13MAY10A	
VO-126S20	Soil nail heads	20	20	14MAY10A	01JUN10A	100	14MAY10A	01JUN10A	
VO-126S25	Removal of platform	7	7	02JUN10A	09JUN10A	100	02JUN10A	09JUN10A	
Soil Nailing Works at Area B									
VO-126S35	Erect wokring platform & mobilization	8	8	19MAR10A	30MAR10A	100	19MAR10A	30MAR10A	
VO-126S40	Test nails	8	8	01APR04A	17APR04A	100	01APR04A	17APR04A	
VO-126S45	Permanent soil nails 19#	10	10	19APR10A	13MAY10A	100	19APR10A	13MAY10A	
VO-126S50	Soil nail heads	12	12	14MAY10A	01JUN10A	100	14MAY10A	01JUN10A	
VO-126S55	Removal of platform	7	7	02JUN10A	09JUN10A	100	02JUN10A	09JUN10A	
Piling Works (VO#0126)									
Piling Platform									
VO-126P05	Obtain SO's consent for temp. works design	0	0		23JUN10A	100		23JUN10A	
VO-126P20	Platform for mini piling	16	16	11JUN10A	30JUN10A	100	11JUN10A	30JUN10A	
VO-126P30	Mobilization & set up for mini piling	3	3	02JUL10A	05JUL10A	100	02JUL10A	05JUL10A	
VO-126P35	Mini piling & pile caps construction	104	104	06JUL10A	06NOV10A	100	06JUL10A	06NOV10A	
VO-126P37	Erect steel platform for H-piling	47	47	08NOV10A	04JAN11A	100	08NOV10A	04JAN11A	
VO-126P39	Remove steel platform; grid 2-4	5	5	30MAY11A	03JUN11A	100	30MAY11A	03JUN11A	
VO-126P41	Remove steel platform; grid 4-6	3	3	20JUN11A	22JUN11A	100	20JUN11A	22JUN11A	
VO-126P43	Remove steel platform; grid 6-10	9	9	28NOV11A	03DEC11A	100	28NOV11A	03DEC11A	
VO-126P44	Remove steel platform; grid 10-14	5	5	03JUN11A	09JUN11A	100	03JUN11A	09JUN11A	
H-Piling Works									
VO-126P45	Mibilization & set up for H-piling	18	18	05JAN11A	25JAN11A	100	05JAN11A	25JAN11A	
VO-126P50	H-piling types 1 & 2; 38 nos.	93	93	26JAN11A	23MAY11A	100	26JAN11A	23MAY11A	
VO-126P55	Demobilize piling rig	5	5	24MAY11A	28MAY11A	100	24MAY11A	28MAY11A	
Skin Wall									
VO-126P60	Excavate; Bays 1, 5 & 6	52	52	10JUN11A	20AUG11A	100	10JUN11A	20AUG11A	
VO-126P65	Construct skin wall; Bays 1, 5 & 6	27	27	15JUL11A	07SEP11A	100	15JUL11A	07SEP11A	
VO-126P70	Construct capping beam; Bays 1, 5 & 6	18	18	27OCT11A	23NOV11A	100	27OCT11A	23NOV11A	



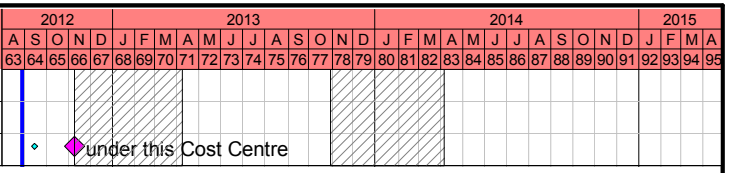
ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
VO-126P75	Excavate; Bays 2, 3 & 4	30	30	05DEC11A	21JAN12A	100	05DEC11A	21JAN12A	
VO-126P80	Construct skin wall; Bays 2, 3 & 4	24	24	21JAN12A	18FEB12A	100	21JAN12A	18FEB12A	
VO-126P85	Construct capping beam; Bays 2, 3 & 4	18	18	10APR12A	05MAY12A	100	18APR12	10MAY12	
Drainage Improvement Works (VO#128)									
Pipe Jacking Between SM1 & SM2									
15R6GG0301	Obtain approval of ELS design package incl MS	0	0		04JUN10A	100		04JUN10A	
15R6GG0302	Install ELS & construct shaft for pipe jacking	51	51	08APR10A	08JUN10A	100	08APR10A	08JUN10A	
15R6GG0303	Mobilization & set up	12	12	09JUN10A	23JUN10A	100	09JUN10A	23JUN10A	
15R6GG0304	Pipe jacking	320	320	24JUN10A	30JUL11A	100	24JUN10A	30JUL11A	
15R6GG0314	Construct receiving shaft	24	24	06JUN11A	05JUL11A	100	06JUN11A	05JUL11A	
15R6GG0324	Demobilization	6	6	01AUG11A	06AUG11A	100	01AUG11A	06AUG11A	
1.5m dia. Drainage beween SM2 & CP2									
15R6GG0200	Excavate existing tow wall & formation for pipe	18	18	10AUG11A	10SEP11A	100	10AUG11A	10SEP11A	
15R6GG0205	Construct SM2 & CP2	18	18	13AUG11A	28OCT11A	100	13AUG11A	28OCT11A	
15R6GG0210	Construct 300UC along 1.5m dia. drainage (~12m)	12	12	27AUG11A	31OCT11A	100	27AUG11A	31OCT11A	
15R6GG0215	Construct 1.5m dia. drainage with CS (~12m)	12	12	12SEP11A	14OCT11A	100	12SEP11A	14OCT11A	
15R6GG0220	Construct 1.5m dia. drainage with CS (~20m)	18	18	14MAR12A	10APR12A	100	09MAR12	29MAR12	
15R6GG0230	Construct SM3	12	12	02APR12A	24APR12A	100	30MAR12	17APR12	
15R6GG0240	Construct 300UC & install/certify hoisting syst.	16	16	20FEB12A	08MAR12A	100	20FEB12A	08MAR12	
750UC, 750SC & CP1 at Area B									
15R6GG0340	Obtain TTA scheme approval from SOR	30	30	01DEC09A	26MAR10A	100	01DEC09A	26MAR10A	
15R6GG0345	Implement TTA	1	1	14FEB11A	14FEB11A	100	14FEB11A	14FEB11A	
15R6GG0350	Construct 750 UC, SC & CP1	72	72	20DEC10A	19MAR11A	100	20DEC10A	19MAR11A	
1.5m dia. Drainage, WS1 & Outlet Structure									
15R6GG0355	Construct WS1 at Area A	25	25	10FEB11A	10MAR11A	100	10FEB11A	10MAR11A	
15R6GG0385	Construct cross road 750UC at Area A	17	17	08APR11A	30APR11A	100	08APR11A	30APR11A	
15R6GG0390	Revised details received	0	0		08JUL11A	100		08JUL11A	
15R6GG0395	ELS works and excavation for 1.5m drainage	46	46	09JUL11A	22OCT11A	100	09JUL11A	22OCT11A	
15R6GG0405	Strenthen existing masonry wall	18	18	01SEP11A	22OCT11A	100	01SEP11A	22OCT11A	
15R6GG0415	Install 1.5m dia. drainage with CS	10	10	22OCT11A	04NOV11A	100	22OCT11A	04NOV11A	
15R6GG0425	Backfill & reinstate	12	12	05NOV11A	02DEC11A	100	05NOV11A	02DEC11A	
15R6GG0435	Excavate for Outlet (additional)	18	18	03DEC11A	12DEC11A	100	03DEC11A	12DEC11A	
15R6GG0445	Construct Outlet (additional)	18	18	13DEC11A	16JAN12A	100	13DEC11A	16JAN12A	
15R6GG0455	Steel works	6	6	28MAY12A	31MAY12A	100	30MAR12	10APR12	
1.5m SC & Steel Staircase connecting to CP2									
15R6GG0500	Excavate for 1.5m stepped channel	30	30	11JUL11A	13AUG11A	100	11JUL11A	13AUG11A	
15R6GG0520	Construct 1.5m stepped channel (~14m)	0	0		19SEP11A	100		19SEP11A	
15R6GG0522	Receive VO#219	0	0		15SEP11A	100		15SEP11A	
15R6GG0530	Install steel staircase (additional)	12	12	19MAY12A	27JUN12A	100	18APR12	03MAY12	
15R6GG0532	Excavate additional outlet	12	12	20SEP11A	22OCT11A	100	20SEP11A	22OCT11A	
15R6GG0542	Construct additional outlet	12	12	24OCT11A	15NOV11A	100	24OCT11A	15NOV11A	
15R6GG0552	Excavate for mass concrete	6	6	16NOV11A	19NOV11A	100	16NOV11A	19NOV11A	
15R6GG0562	Construct mass wall	4	4	21NOV11A	25NOV11A	100	21NOV11A	25NOV11A	



ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
15R6GG0564	Receive VO#251 for modification of outlet	0	0		29MAR12A	100			
15R6GG0566	Preparation works for VO#251	1	0	30MAR12A	10APR12A	100			
15R6GG0570	Modify outlet; VO#251	86	0	11APR12A	03AUG12A	100			
1.5m dia. Drainage, WS2 at Area C									
15R6GG0605	Confirm additional land by SOR	0	0		12JUL11A	100		12JUL11A	
15R6GG0610	Insurance cover for additional land	6	6	13JUL11A	19JUL11A	100	13JUL11A	19JUL11A	
15R6GG0615	Procurement for hoarding	18	18	13JUL11A	02AUG11A	100	13JUL11A	02AUG11A	
15R6GG0620	Confirm mobilization with house owner	7	7	03AUG11A	12AUG11A	100	03AUG11A	12AUG11A	
15R6GG0625	Erect hoarding	6	6	13AUG11A	17AUG11A	100	13AUG11A	17AUG11A	
15R6GG0630	Trial pit excavation	6	6	18AUG11A	22AUG11A	100	18AUG11A	22AUG11A	
15R6GG0635	Issue VO#223 & 216 with revised drainage details	12	12	23AUG11A	11OCT11A	100	23AUG11A	11OCT11A	
15R6GG0640	Confirm site clearance with SOR/house owner	12	12	12OCT11A	01NOV11A	100	12OCT11A	01NOV11A	
15R6GG0642	Site clerance & removal of trees	12	12	02NOV11A	15NOV11A	100	02NOV11A	15NOV11A	
15R6GG0645	ELS design & with ICE endorsement	18	18	16NOV11A	23DEC11A	100	16NOV11A	23DEC11A	
15R6GG0650	Excavation & construction of WS2	18	18	16NOV11A	01DEC11A	100	16NOV11A	01DEC11A	
15R6GG0655	Excavate/construct drainage; 6.5m	29	29	02DEC11A	06JAN12A	100	02DEC11A	06JAN12A	
15R6GG0660	Excavate/construct drainage; 23.5m + SM1A	136	85	07JAN12A	30JUN12A	100	07JAN12A	23APR12	
15R6GG0665	Backfill & reinstate	12	12	03JUL12A	31JUL12A	100	24APR12	09MAY12	
800UC at Area C									
15R6GG0755	Construct 800UC cross road & reinstate	12	12	01AUG12A	16AUG12A	100	18AUG12	31AUG12	
750UC Crossroad connecting to CP2									
15R6GG0801	Receive VO#252 for revised 750UC	0	0	31MAR12A		100			
15R6GG0803	Trial pit excavation	1	0	11MAY12A	26MAY12A	100			
15R6GG0808	Receive further revised 750UC details	0	0		27AUG12A	100			
15R6GG0810	Fabrication of pre-cast UC	36	24	28AUG12	09OCT12	0	11MAY12	07JUN12	696
15R6GG0820	Excavation & installation of pre-cast UC	12	12	10OCT12	24OCT12	0	08JUN12	21JUN12	696
Mass Concrete Beam, 300UC, 300SC, at Slope									
15R6GG0900	Excavate for mass concrete beam	12	12	07SEP11A	28SEP11A	100	07SEP11A	28SEP11A	
15R6GG0910	Construct mass concrete beam	6	6	20SEP11A	31OCT11A	100	20SEP11A	31OCT11A	
15R6GG0920	Construct 300UC, 300SC & conc. stair	48	48	12SEP11A	31JAN12A	100	12SEP11A	31JAN12A	
15R6GG0930	Install steel stair & steel gate	12	12	25MAY12A	14JUL12A	100	04MAY12	17MAY12	
15R6GG0940	Install hand railing;	18	18	24MAY12A	06SEP12	50	25APR12	17MAY12	747
15R6GG0950	Lay erosoin control mat	6	6	05JUN12A	02AUG12A	100	18MAY12	24MAY12	
15R6GG0960	Hydroseeding	1	2	10AUG12A	10AUG12A	100	25MAY12	26MAY12	
Remaning Works Prior to Handover to Client									
15R6GG0370	Pre-handover inspections and remedial works	12	12	25OCT12	07NOV12	0	01SEP12	14SEP12	696
Schedule of Milestones for Cost Centre No. 15R									
15R6GG0502	15R 1; On completion of all temp. works	0	0		04JAN11A	100		04JAN11A	
15R6GG0504	15R 2; On completion of 25% of pipejacking	0	0		08OCT10A	100		08OCT10A	
15R6GG0506	15R 3; On completion of 50% of pipejacking	0	0		12FEB11A	100		12FEB11A	



ID	Activity Description	WP10 Dur	WP09 Dur	WP10 Start	WP10 Finish	% Comp	WP09 Start	WP09 Finish	Total Float
15R6GG0508	15R 4; On completion of 75% of pipejacking	0	0		19MAR11A	100		19MAR11A	
15R6GG0510	15R 5; On completion of all pipejacking	0	0		30JUL11A	100		30JUL11A	
15R6GG0512	15R 6; On completion of all wks under this CC	0	0		07NOV12	0		14SEP12	857



Appendix D

Implementation Status of Environmental Mitigation Measures

Appendix D

IMPLEMENTATION SCHEDULE June 2013

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
Air Quality					
3.6.1	**Specific** As mentioned in Section 3.5, exceedances of 1-hour and 24-hour average TSP guideline levels have been predicted at most of the ASRs. Hence, mitigation measures are considered necessary in order to suppress the potential dust impact.	DSD's Contractor	Construction Work Sites	Air Pollution Control (Construction Dust) Regulation	✓
	The dust suppression measures set out in the *Air Pollution Control (Construction Dust) Regulation*, in fact, are more extensive. Therefore, it is expected that with watering the construction site every four times daily together with strict implementation of dust suppression measures as stipulated in the *Air Pollution Control (Construction Dust) Regulation*, the dust level is expected to be reduced by over 75%.				✓
	General To further ensure compliance with the guideline and AQO limit at the ASRs at all time, it is recommended to implement the *Air Pollution Control (Construction Dust) Regulation* and include good site practice in the contract clauses to minimize cumulative dust impact. In addition, a comprehensive dust monitoring and audit programme is recommended to ensure proper implementation of the identified mitigation measures. Details of the monitoring and audit requirements are provided in a separate EM&A Manual.				
	• effective dust screens, sheeting or netting should be provided to enclose the scaffolding from the ground floor level of the building or if a canopy is provided at the first floor level, from the first floor level, up to the highest level of the scaffolding where a scaffolding is erected around the perimeter of a building under construction;				N/A
	• dump truck for material transport should be totally enclosed by impervious sheeting;				✓
	• any excavated dusty materials or stockpile of dusty materials should be covered entirely by impervious sheeting or sprayed with water so as to maintain the entire surface wet, and recovered or backfilled or reinstated within 24 hours of the excavation or unloading;				✓
	• stockpile of dusty materials should not extend beyond the pedestrian barriers, fencing or traffic cones;				✓
	• dusty materials remaining after a stockpile is removed should be wetted with water and cleared from the surface of roads;				✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
3.6.1	• the area where vehicle washing takes place and the section of the road between the washing facilities and the exit point should be paved with concrete, bituminous materials or hardcores;	DSD's Contractor	Construction Work Sites	Air Pollution Control (Construction Dust) Regulation	✓
	• where a site boundary adjoins a road, street or other area accessible to the public, hoarding of not less than 2.4m high from ground level should be provided along the entire length except for a site entrance or exit;				✓
	• every main haul road should be scaled with concrete and kept clear of dusty materials or sprayed with water so as to maintain the entire road surface wet;				✓
	• the portion of road leading only to a construction site that is within 30m of a designated vehicle entrance or exit should be kept clear of dusty materials;				✓
	• stockpile of dusty materials should be either covered entirely by impervious sheeting, placed in an area sheltered on the top and the 3 sides; or sprayed with water so as to maintain the entire surface wet;				✓
	• all dusty materials should be sprayed with water prior to any loading, unloading or transfer operation so as to maintain the dusty material wet;				✓
	• vehicle speed should be limited to 10 kph except on completed access roads;				✓
	• every vehicle should be washed to remove any dusty materials from its body and wheels before leaving the construction sites;				✓
	• the load of dusty materials carried by vehicle leaving a construction site should be covered entirely by clean impervious sheeting to ensure that the dusty materials do not leak from the vehicle; and				✓
	• the working area of excavation should be sprayed with water immediately before, during and immediately after the operations so as to maintain the entire surface wet.				✓
Noise					
4.6.1	**During Construction** Appropriate mitigation measures such as the use of quiet equipment and movable barriers will be developed to ensure that noise can be reduced to acceptable levels without causing programme delays	DSD's Contractor	Construction Work Sites	PN 2/93 Noise from Construction Activities & EIAO	✓
	Good Site Practice Good site practice and noise management can significantly reduce the impact of construction site activities on nearby NSRs. The following package of measures should be followed during construction:				
	• only well-maintained plant should be operated on-site and plant should be serviced regularly during the construction works;				✓
	• machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum;				✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
4.6.1	• plant known to emit noise strongly in one direction should, where possible, be orientated to direct noise away from the NSRs;	DSD's Contractor	Construction Work Sites	PN 2/93 Noise from Construction Activities & EIAO	✓
	• mobile plant should be sited as far away from NSRs as possible; and				✓
	• material stockpiles and other structures should be effectively utilised, where practicable, to screen noise from on-site construction activities.				✓
	For Drill and Blast Works • Charge mass per delay should be decreased by minimising the number of blastholes firing on each delay.				N/A
	• Smaller blasthole patterns and longer delays should be used between dependent charges.				N/A
	• Times of blasting should be established to suit the situation and firing blasts when neighbours are busy with their daily tasks (and at a regular time such as lunch time).				N/A
	For TBM Tunnelling • For the tunnel excavation, it is anticipated that beyond the initial length (say within 30m), excavation will be carried out well within the tunnel and door should be provided to further minimize the noise nuisance to the nearby receivers.				N/A
4.6.2	**During Operation** Good site practice and noise management can significantly reduce the impact of maintenance activities on nearby NSRs. The following package of measures should be followed during construction	DSD's Contractor	Project Area	NCO & EIAO	
	• only well-maintained plant should be operated on-site;				N/A
	• machines and plant that may be in intermittent use should be shut down between work periods or should be throttled down to a minimum; and				N/A
	• plant known to emit noise strongly in one direction should, where possible, be orientated to direct noise away from the NSRs.				N/A
Water Quality					
5.9.1	**During Construction** Mitigation measures and a spill control and response plan have been prepared for works at the intakes and work sites.	DSD's Contractor	Construction Work Sites	Practice Note for Professional Persons with regard to site drainage (ProPECC PN 1/94) and WQO	✓
	Precautions to be taken at any time of year when rainstorms are likely: • Temporarily exposed surfaces should be covered e.g. by tarpaulin.				✓
	• Temporary access roads should be protected by crushed stone or gravel.				✓
	• Trenches should be dug and backfilled in short sections. Measures should be taken to minimize the ingress of rainwater into trenches.				✓
	Actions to be taken when a rainstorm is imminent or forecast: • Silt removal facilities, should be checked to ensure that they can function properly.				✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
5.9.1	• Open stockpiles of construction materials on site should be covered with tarpaulin or similar fabric.	DSD's Contractor	Construction Work Sites	WQO	✓
	• All temporary covers to slopes and stockpiles should be secured.				✓
	Actions to be taken during or after rainstorms: • Silt removal facilities should be checked and maintained to ensure satisfactory working conditions.				✓
	Spill Control and Response Plan				
	1 Prevention and Precaution Measures				
	General Precautions • No discharge of silty water into watercourses.				✓
	• All materials to be used during construction and operation shall be identified and their hazard potential evaluated.				✓
	• Maintenance of vehicles and equipment involving activities with potential for leakage and spillage shall only be undertaken with the areas appropriately equipped to control these discharges.				✓
	• Any soil contaminated with chemicals/oils shall be removed from site and the void created shall be filled with suitable materials.				✓
	• Any construction plant which causes pollution to catchwaters or water gathering ground due to leakage of oil or fuel shall be removed off-site immediately.				✓
	• Suitable containers shall be used to hold the chemical wastes to avoid leakage or spillage during storage, handling and transport				✓
	• Chemical waste containers shall be suitably labelled to notify and warn the personnel who are handling the wastes to avoid accidents.				✓
	• Storage areas shall be selected at safe locations on site and adequate space shall be allocated to the storage area.				✓
	• Prevent obstructions and tripping hazards.				✓
	Storage Precautions • All chemical storage containers shall be correctly labelled.				✓
	• Solid and impermeable enclosure walls or storage shelves shall be used.				✓
	• Only compatible chemical wastes shall be stored in the same storage area.				✓
	• The storage areas shall be inspected to detect any leakages or defective containers on a regular basis.				✓
	• Suitable notices warning of hazards, emergency response plans, telephone numbers etc shall be posted around the site, including storage areas.				✓
	• Large and heavy containers shall be stored at ground level.				✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
	• Chemical waste containers shall be stored below eye level.				✓
5.9.1	• Adequate space for handling of the containers shall be provided	DSD's Contractor	Construction Work Sites	WQO	✓
	• Spill response kits shall be located adjacent/near to the storage areas.				✓
	• A log of chemical wastes shall be maintained.				✓
	• Incompatible chemicals shall be stored separately.				✓
	2 Responses/Action Plan				
	All Workers shall be made aware of emergency telephone numbers and the location of all relevant pollution control equipment. Training be given in emergency response/action plans. The action include the following steps:				✓
	• Only trained personnel who are equipped with protective clothing and equipment shall be allowed to enter the spillage area for clean up.				✓
	• Spills shall be transferred appropriate back into containers using suitable equipment.				✓
	• Absorbent materials shall be used to clean up the spills and shall be disposed of as chemical wastes.				✓
	• Where appropriate suitable solvents may be used to clean the contaminated area after removal of all contaminated materials.				✓
	• All necessary protective devices, safety equipment, containers and clean up materials for emergency use shall be maintained to a high standard.				✓
	3 Spill Clean Up and Disposal				
	Effect the response plan.				✓
	Control the leakage and absorb the spillage using suitably absorbent materials.				✓
	Provide safety equipment and personal protective equipment for handling of chemical wastes would be similar to that for handling of chemicals.				✓
	Safety equipment includes but is not limited to: • Fire extinguishers.				✓
	• Spades, brushes, dustpan, mop and bucket (or similar readily available on site).				✓
	• Absorbent material such as dry sand, tissues and toweling (all materials readily available on-site).				✓
	• Containers including plaster bags, drums, etc.				✓
	• Absorbing materials.				✓
	• Pumps.				✓
	Personal protective equipment includes as appropriate: • First-aid kits.				✓
	• Safety helmet and goggles.				✓
	• Gloves which can resist chemical reaction.				✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
	• Protective boot and clothing.	DSD's Contractor	Construction Work Sites	WQO	✓
5.9.1	• Respirators and gas masks.				✓
	• Face visor and masks.				✓
5.9.2	**Emergency Responses to Spillages** Emergency plans and clean up procedures will need to be provided by the Contractor recognising his specific working methods and construction programme, activities and sequences. Agreement must be sought prior to commencement of the construction work but the following principles should be considered.				
	The emergency plans should include the procedures for: • spill prevention and precaution;				✓
	• response actions; and				✓
	• spill clean up and disposal.				✓
	Spill prevention and precaution embraces good site practice and covers: • good housekeeping practices;				✓
	• chemical storage requirements; and				✓
	• chemical transfer and transport.				✓
5.9.3	**During Operation** Regular inspection of the tunnels is essential to monitor the structural integrity and proper functioning of the drainage tunnel, which allows repairing of structural deterioration when it begins to develop. It is recommended that routine inspection shall be carried out at least two times per year for the drainage tunnel at the beginning and end of wet season from April to September.	DSD's Contractor	Project Area		N/A
Waste Management					
6.5.1	**During Construction** *Vegetation Removed from Site Clearance* Wastes generated from site clearance shall be sorted and excavated topsoil segregated from roots for re-use in landscaping works, thus eliminating the need for off-site disposal.	DSD's Contractor	Construction Work Sites	Waste Disposal Ordinance (Cap.354); Waste Disposal (Chemical Wastes) (General) Regulation (Cap 354) and ETWBTC No. 15/2003, Waste anagement on Construction Site	✓
	Construction and Demolition Materials The Contractor should reuse any C&D material on-site. C&D waste should be segregated and stored in different containers to other wastes to encourage the re-use or recycling of materials and their proper disposal. The use of wooden hoardings shall not be allowed. An alternative material, which can be reused or recycled, for example, metal (aluminium, alloy, etc) shall be used.				✓

Appendix D

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
6.5.1	As referred to the section 6.4.1, the 317,936m3 of inert surplus material generated by the project is suitable for public fill. The public fill reception facility at Tuen Mun Area 38 provides a suitable facility for the reuse of surplus inert C&D material generated from the project.	DSD's Contractor	Construction Work Sites	WDO (Cap.354), ETWBTC No. 15/ 2003, ETWBTC No. 12/2002 and ETWBTC No. 31/2004	
	Under the contract, the contractor will be required to minimise the generation of C&D material and reuse it on site through the following:				
	(a) to plan in the design and construction, methods to minimise the generation of C&D material;				✓
	(b) to submit a Waste Management Plan (WMP) in accordance with Environment Transport and Works Bureau Technical Circular (ETWBTC) No. 15/2003 or any superseding circular(s);				✓
	(c) to reuse recycled aggregates in accordance with ETWBTC No. 12/2002 or any superseding circular(s);				✓
	(d) to observe the requirements of the Trip-Ticket System, stipulated in ETWBTC No. 31/2004 or any superceding circular(s), for disposal of C&D material;				✓
	(e) to incorporate a Waste Management System into the WMP for effective management and control of C&D materials to avoid/reduce/minimise the generation of C&D material during construction.				✓
	The contractor will be required to properly sort into inert C&D materials, metals, timber and other non-inert C&D material in the workplace to prevent cross-contamination.				✓
	In addition, DSD will conduct site inspection to monitor the contractors' performance in the implementation of the WMP and other relevant specified requirements.	DSD	Construction Work Sites	WDO (Cap.354) and ETWBTC No. 15/2003	✓
	Excavated Materials Excavated materials should be segregated from other wastes to avoid contamination thereby ensuring acceptability at public filling areas and avoiding the need for disposal at landfill.	DSD's Contractor	Construction Work Sites	WDO (Cap.354) and ETWBTC No. 15/2003	✓
	Municipal Waste Temporary refuse collection facilities should be set-up by the contractor and wastes should be stored in appropriate containers prior to collection and disposal.				✓
	Domestic effluent generated by the workforce will be directed to foul sewer or chemical toilets if public facilities are not available.				✓
6.5.1	*Waste Management Plan* A Waste Management Plan (WMP) for the construction of the Project should be prepared as part of the contractors submission. It will provide recommendations for appropriate recycling or disposal route and should include method statement for stockpiling and transportation of the excavated material and other construction wastes should also be included in the WMP and approved before the commencement of construction. All mitigation measures arising from the approved WMP shall be fully implemented.	DSD's Contractor	Construction Work Sites	WDO (Cap.354), ETWBTC No. 15/2003 and ETWBTC No. 33/2002	✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
	For the purpose of enhancing the management of C&D material including rock, and to minimize its generation at source, a C&D Material Management Plan (C&DMMP) has been prepared for this project and would be processed in accordance with the Environment, Transport and Works Bureau Technical Circular (Works) No. 33/2002 - Management of Construction and Demolition Material Including Rock.				N/A
Ecology					
7.7.1	**Avoidance** The surface structures are located mainly on existing disturbed areas (ie pollution and urbanisation) and have generally avoided the natural stream sections of higher species diversity and abundance of aquatic organisms.	DSD's Contractor	Construction Work Sites	EIAO	✓
	The major construction activities at streams are scheduled to avoid wet season of high water flow which may adversely affect the downstream natural habitats due to the construction runoff.				✓
7.7.2	**Minimisation** The previous discussion in Section 7.6.4 has indicated that the impacts on ecological resources due to the construction and operation of the proposed Project are generally expected to be low. The following mitigation measures to minimise impacts and disturbance to the surrounding habitats, are recommended.				
	Measures for Construction Runoff Install sheet piles/cofferdam/weir along the boundary of the works area within the stream habitats in particular Sam Dip Tam Stream and Tso Kung Tam Stream before the commencement of works to prevent construction runoff during construction. Provision of adequate designed sand/ silt removal facilities such as sand traps, silt traps and sediment basin in the areas which could potentially be affected may be required.				✓
	Good Construction Practice				✓
	Erect fences along the boundary of the works area before the commencement of works to prevent tipping, vehicle movements, and encroachment of personnel onto adjacent areas, particularly the stream habitats.	DSD's Contractor	Construction Work Sites	EIAO	✓
	Avoid any damage and disturbance, particularly those caused by filling and illegal dumping, to the remaining and surrounding natural stream habitats.				✓
	Regularly check the work site boundaries to ensure that they are not breached and that no damage occurs to surrounding areas.				✓
	Prohibit and prevent open fires within the site boundary during construction and provide temporary fire fighting equipment in the work areas.				✓
	Treat any damage that may have occurred to individual major trees in the adjacent area with surgery.				✓

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
	Reinstate temporary work sites/disturbed areas, particularly stream of natural bottom and bank, plantation, intertidal habitat, and the areas located within the proposed Ecological Park, immediately after completion of the construction works, ie through on-site tree/shrub planting and reprovision of natural or semi-natural bottom (also refer to Section 7.7.3), in order to facilitate the recolonisation of the wildlife recorded during the baseline surveys. Tree/shrub species used should make reference from those in the surrounding area	DSD's Contractor	Construction Work Sites	EIAO	✓
7.7.3	**Compensation** Provide natural stream bed (approximately 0.03 ha) for the new Dry Weather Flow Channel (created from village-orchard) by laying natural stones at Intake I-2 (Figure 7.7). The reinstated stream bed shall mimic the existing natural conditions with certain portion of big boulders creating the lentic and lotic zones for the aquatic fauna, and while it will be developed during detailed design may draw on concepts shown in Figure 2.18.				N/A
	Provide natural stream bed (approximately 0.5 ha,) for the Approach Channel and Dry Weather Flow Channel by laying natural stones at Intake I-3 (Figure 7.8). The reinstated stream bed shall mimic the existing natural conditions (rocky bottom with very limited aquatic plants) with certain portion of big boulders creating the lentic and lotic zones for the aquatic fauna, and while it will be developed during detailed design may draw on concepts shown in Figure 2.18.				N/A
	Provide natural bottom (ie retain the existing stream bed or reinstate the stream bed by providing boulders/ rocks, riprap or gabion) for the affected stream sections (Figure 7.8) in order to allow natural colonisation of aquatic fauna.				N/A
	Provide at least 2.2 ha of compensatory planting on the permanent and temporary affected plantation areas, particularly the slopes along access road and adjacent to Intake I-3 and cascade at Outfall O-1, after construction to stabilise the slope to present soil erosion and consequent stream sedimentation. Among the 2.2 ha compensatory planting, at least 0.5 ha of compensatory tree planting on the new formed slope along the access road of the Intake I-3 and 0.5 ha of compensatory tree planting over the cascade (by constructing intermediate platform) at Outfall O-1 will be provided (location refer to Figures 7.4 – 7.6). Species used for planting should take reference from the species identified in Appendix F and be native to Hong Kong or South China region.				N/A
	Provide armour rocks for the affected intertidal habitat in order to allow natural colonisation of intertidal organisms.				N/A

EIA Ref.	Recommended Mitigation Measures	Who to implement the measure ?	Location of the measure	What requirements or standards for the measure to achieve ?	Status
Cultural Heritage					
8.6	As no impacts on recorded archaeological sites or area with archaeological potential were identified within the Study Area, no mitigation measure for archaeological resources is considered necessary.				N/A
	The construction methods to be employed should seek to avoid potential vibration impacts to Kuen Yuen Tung Monastery at Lo Wai, the Western Monastery, Yuen Yuen Home for the Aged, Hong Hoi Chee Hong Temple, Chiu Yum Tsing Yuen, Tse's Grave, Wan Lin Bridge and Sam Dip Tam Rock Carving in Sam Dip Tam and the Tin Hau Temple, Yam Kom Tau Village Rural Committee and the Yeung's Ancestral Hall in Yau Kom Tau as these sites fall within 50 m of the Preferred Option of the drainage tunnel alignment or associated Intakes/Outfall construction activities. Construction works that generates excessive vibration in close proximity to these sites should be restricted to protect the building from adverse vibration impacts and to ensure that the building structures will not be damaged as a result of these impacts.	DSD's Contractor	Construction Work Sites	EIAO	✓
	In order to ensure that no structural or superficial damage will be caused by the construction activities, a precautionary approach involving a pre-construction condition survey and establishment of appropriate vibration limits for the potentially impacted structures should be adopted. Protection measures for the potentially impacted structures, if considered necessary from the pre-construction condition survey, should be implemented prior to the commencement of construction works. Vibration monitoring during the construction phase should be undertaken as part of the EM&A programme.	Qualified archaeologist/ built heritage specialist	Construction Work Sites	EIAO	✓
Fisheries					
10.6	In accordance with the guidelines in the *EIAO-TM* on fisheries impact assessment the general policy for mitigating impacts to fisheries, in order of priority are avoidance, minimization and compensation.	DSD's Contractor	Construction Work Sites	EIAO	N/A
	Impacts to fisheries resources and fishing operations have largely been avoided during the construction and operation of the drainage tunnel through the avoidance of dredging, reclamation and filling activities. Good construction practice and associated measures were recommended in Water Quality Assessment in Section 5 to control water quality impacts to within acceptable levels and are also expected to control impacts to fisheries resources. Hence, no fisheries-species mitigation measures are required during construction and operation of the drainage tunnel.				N/A

Remarks:
- ✓ Compliance of mitigation measure
- × Non-compliance of mitigation measure
- N/A Not applicable

Appendix E

Status of License and Permit

Updated Status of Environmental Permit & Licence

Application Date	Environmental Permit / Licence	Issued Date	Ref No.	Account No.	Permit / Licence No.	Permit / Licence Validity Date	Remarks
2 Jan 2008	Waste Disposal (Charges for Disposal of Construction Waste) Regulation - Billing Account	17 Jan 2008	WFG06289	7006574	----	----	Valid
10 Jan 2008	Notification Pursuant to Section 3(1) of the Air Pollution Control (Construction Dust) Regulation	10 Jan 2008	001026901	----	----	----	Valid
18 Apr 2008	Water Discharge Licence – Intake I-1	19 Jun 2008	001029978	----	EP760/327/013315I	19 Jun 2008 - 30 Jun 2013	Expired
18 Apr 2008	Water Discharge Licence – Intake I-2	2 Jul 2008	001029959	----	EP760/321/013020I	02 Jul 2008 - 31 Jul 2013	Valid
18 Apr 2008	Water Discharge Licence – Intake I-3	5 Aug 2008	001029960	----	EP760/323/013324I	05 Aug 2008 - 31 Aug 2013	Valid
18 Apr 2008	Water Discharge Licence – Portion I	26 Jun 2008	001029974	----	EP760/350/013334I	26 Jun 2008 - 30 Jun 2013	Expired
23 Jul 2008	Water Discharge Licence – Intake I-1 (Intersection of Wo Yi Hop Lane and Ho Fung College)	27 Aug 2008	001031974	----	EP760/325/013536I	27 Aug 2008 - 31 Aug 2013	Valid
2 Sep 2008	Variation of Environmental Permit	25 Sep 2008	VEP-271/2008	----	EP-275/2007/B	----	Valid
29 Apr 2009	Water Discharge Licence – Intake I-3 (Additional Discharge Point)	25 Mar 2010	305058	----	WT00005917-2010	25 Mar 2010 - 31 Mar 2015	Valid
4 Sep 2010	Water Discharge Licence – Portion G	28 Oct 2010	321337	----	WT00007685-2010	28 Oct 2010 - 31 Oct 2015	Valid
16 Nov 2010	Water Discharge Licence - Outfall	17 Nov 2011	(14) in EP/RW/0000080206	----	WT-00008094-2010	17 Nov 2011 - 30 Nov 2016	Valid
6 Aug 2012	Further Environmental Permit	29 Aug 2012	FEP-140/2012	----	FEP-02/275/2007/B	----	Valid
26 Jul 2012	Waste Disposal (Chemical Waste) (General) - Chemical Waste Producer	9 Oct 2012	(7) in EP/RW/0000062354	----	5111-324-M2703-01	----	Valid
23 Jan 2013	Construction Noise Permit - Intake I-3	04 Feb 2013	(5) in EP/RW/0000080194	----	GW-RW0071-13	13 Feb 2013 - 12 Aug 2013	Valid
23 Jan 2013	Construction Noise Permit - Portion I	06 Feb 2013	(4) in EP/RW/0000080230	----	GW-RW0096-13	11 Feb 2013 - 10 Aug 2013	Valid
6 Mar 2013	Construction Noise Permit - Outfall	18 Mar 2013	(4) in EP/RW/0000301563	----	GW-RW0172-13	19 Mar 2013 - 17 Sept 2013	Valid

Appendix F

Calibration Certificates

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Ho Fung College (ASR 1)
Calibration Date: 29-May-13
Calibration Due Date 29-Jul-13
Time: 8:15

Sampler Model:	BM2000HX
Serial No.:	4994
Calibrator Orifice no.:	1785
Slope (m):	2.00979
Intercept (b):	-0.01403
Correction coeff. (r)	0.99995

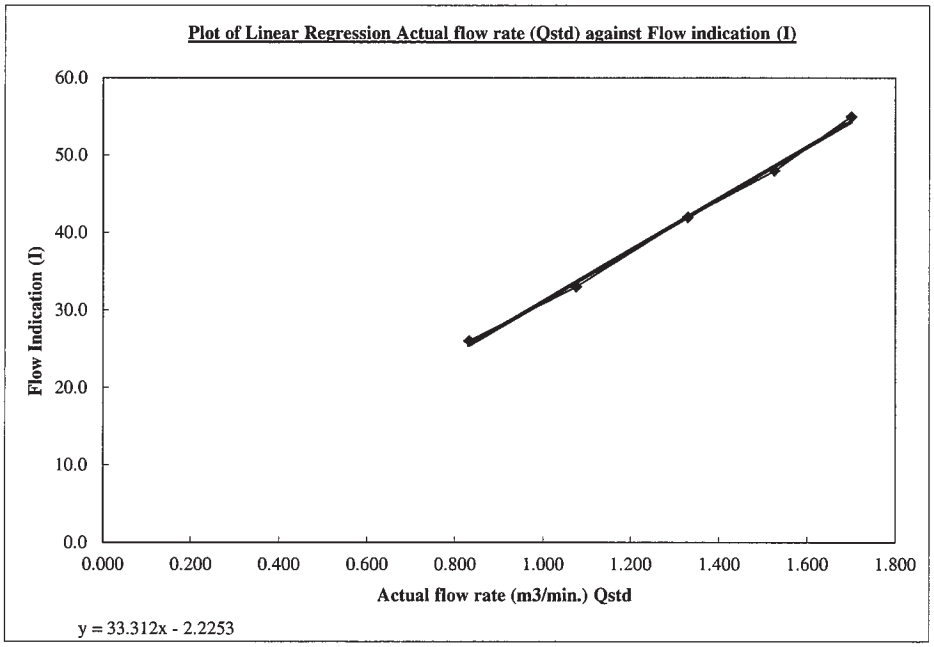
Standard pressure (mmHg) Pstd:	763.9
Standard temp. (K) Tstd:	290.8
Calibration pressure (mmHg) Pa:	758.2
Calibration temp. (K) Ta:	301.9

$$Flow(corrected) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Qstd = \frac{1}{m} \times (\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b)$$

Sample no.	Pressure Drop (H), inch	Flow (corrcted), m^3/min	Actual flow rate (Qstd), m^3/min	Flow indication (I), arbitrary
1	11.8	3.400	1.699	55.0
2	9.5	3.051	1.525	48.0
3	7.2	2.656	1.328	42.0
4	4.7	2.146	1.075	33.0
5	2.8	1.656	0.831	26.0

Correlation Coefficient : 0.9987



Remark
1HPa = 0.750062 mmHg

Calibrated by: **Ray TAM** **Date: 29 May 2013**
( )

Checked by: **F.C. Tsang** **Date: 29 May 2013**
( )

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Hong Hoi Chi Hong Ship Temple (ASR 3)
Calibration Date: 29-May-13
Calibration Due Date 29-Jul-13
Time: 9:00

Sampler Model:	BM2000HX
Serial No.:	5875
Calibrator Orifice no.:	1785
Slope (m):	2.00979
Intercept (b):	-0.01403
Correction coeff. (r)	0.99995

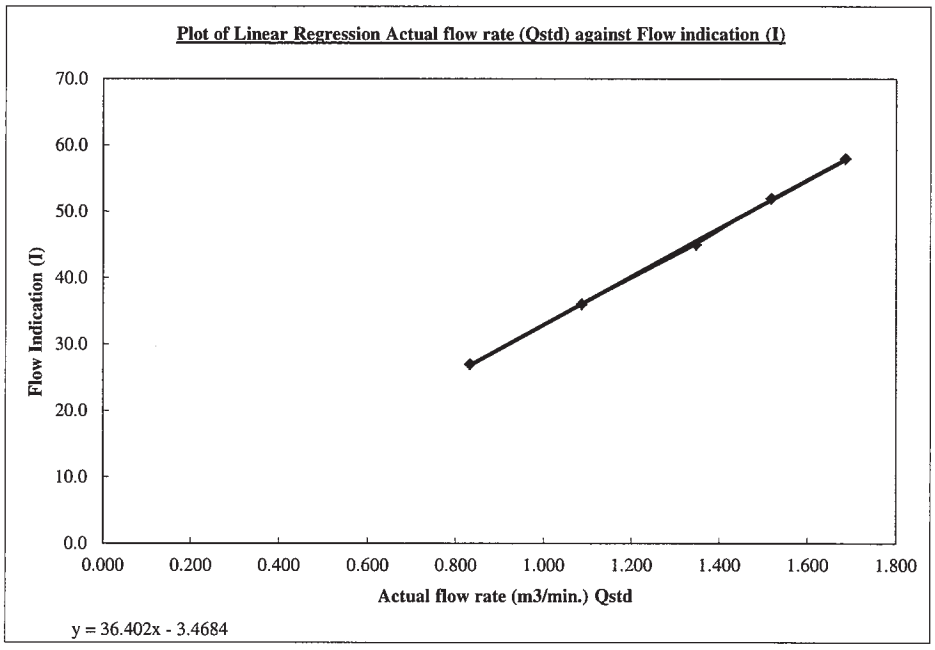
Standard pressure (mmHg) Pstd:	763.9
Standard temp. (K) Tstd:	290.8
Calibration pressure (mmHg) Pa:	758.2
Calibration temp. (K) Ta:	301.9

$$Flow(corrected) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Qstd = \frac{1}{m} \times (\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b)$$

Sample no.	Pressure Drop (H), inch	Flow (corrcted), m^3/min	Actual flow rate (Qstd), m^3/min	Flow indication (I), arbitrary
1	11.6	3.371	1.684	58.0
2	9.4	3.035	1.517	52.0
3	7.4	2.693	1.347	45.0
4	4.8	2.169	1.086	36.0
5	2.8	1.656	0.831	27.0

Correlation Coefficient : 0.9996



Remark
1HPa = 0.750062 mmHg

Calibrated by: **Ray Tam** **Date: 29 May 2013**
( )

Checked by: **F.C. Tsang** **Date: 29 May 2013**
( )

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Long Beach Garden (ASR 8)
Calibration Date: 29-May-13
Calibration Due Date 29-Jul-13
Time: 8:30

Sampler Model:	TE5005X
Serial No.:	1059
Calibrator Orifice no.:	1785
Slope (m):	2.00979
Intercept (b):	-0.01403
Correction coeff. (r)	0.99995

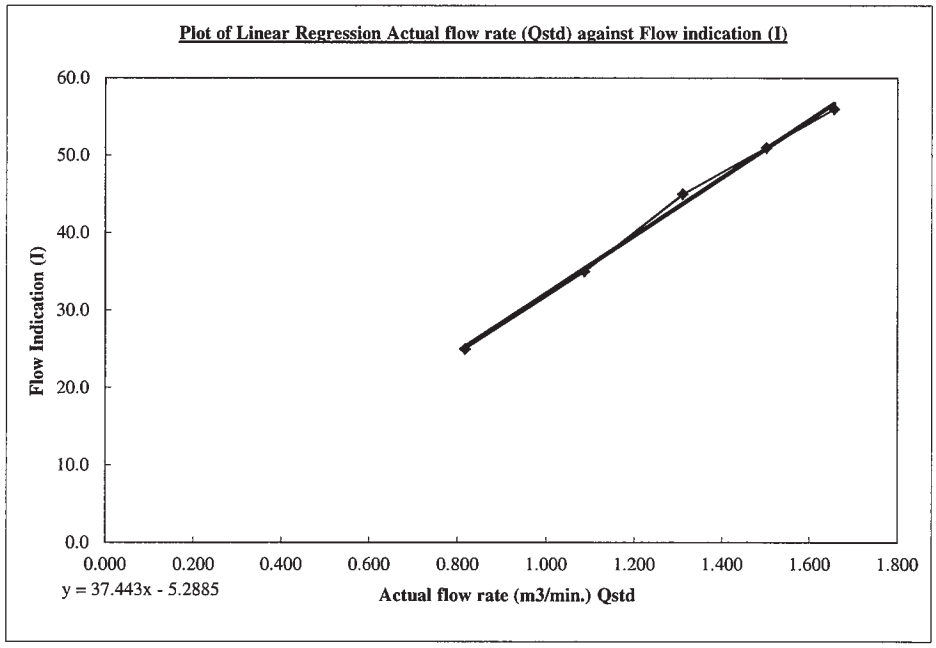
$$Flow(corrected) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

$$Qstd = \frac{1}{m} \times \left(\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b\right)$$

Standard pressure (mmHg) Pstd:	763.9
Standard temp. (K) Tstd:	290.8
Calibration pressure (mmHg) Pa:	758.2
Calibration temp. (K) Ta:	301.9

Sample no.	Pressure Drop (H), inch	Flow (corrcted), m^3/min	Actual flow rate (Qstd), m^3/min	Flow indication (I), arbitrary
1	11.2	3.313	1.655	56.0
2	9.2	3.002	1.501	51.0
3	7.0	2.619	1.310	45.0
4	4.8	2.169	1.086	35.0
5	2.7	1.626	0.816	25.0

Correlation Coefficient : 0.9982



Remark
1HPa = 0.750062 mmHg

Calibrated by: **Ray Tam** ( ) **Date: 29 May 2013**

Checked by: **F.C. Tsang** ( ) **Date: 29 May 2013**

High Volume Air Sampler Calibration Worksheet

Project Title: Design and Construction of Tsuen Wan Drainage Tunnel
Monitoring Location: Greenview Terrace (ASR 9)
Calibration Date: 29-May-13
Calibration Due Date 29-Jul-13
Time: 8:00

Sampler Model:	TE5005X
Serial No.:	1713
Calibrator Orifice no.:	1785
Slope (m):	2.00979
Intercept (b):	-0.01403
Correction coeff. (r)	0.99995

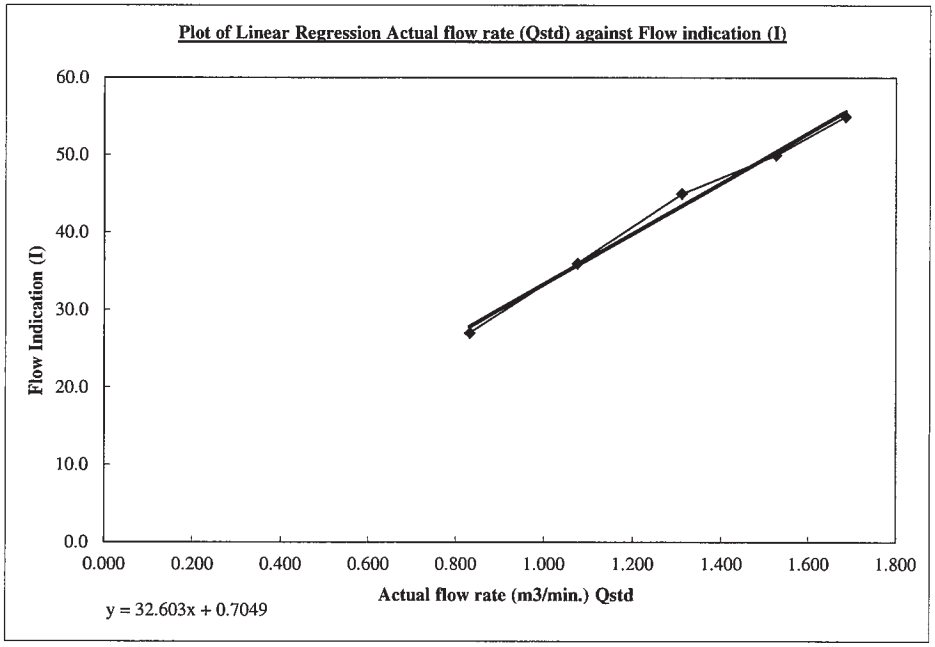
$$Flow(corrected) = \sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}}$$

Standard pressure (mmHg) Pstd:	763.9
Standard temp. (K) Tstd:	290.8
Calibration pressure (mmHg) Pa:	758.2
Calibration temp. (K) Ta:	301.9

$$Qstd = \frac{1}{m} \times \left(\sqrt{H \times \frac{Pa}{Pstd} \times \frac{Tstd}{Ta}} - b\right)$$

Sample no.	Pressure Drop (H), inch	Flow (corrcted), m^3/min	Actual flow rate (Qstd), m^3/min	Flow indication (I), arbitrary
1	11.6	3.371	1.684	55.0
2	9.5	3.051	1.525	50.0
3	7.0	2.619	1.310	45.0
4	4.7	2.146	1.075	36.0
5	2.8	1.656	0.831	27.0

Correlation Coefficient : 0.9962



Remark
1HPa = 0.750062 mmHg

Calibrated by: **Ray Tam** ( ) **Date: 29 May 2013**

Checked by: **F.C. Tsang** ( ) **Date: 29 May 2013**

TISCH ENVIROMENTAL, INC.
145 SOUTH MIAMI AVE.
VILLAGE OF CLEVES, OH 45002
513.467.9000
877.263.7610 TOLL FREE
513.467.9009 FAX
WWW.TISCH-ENV.COM

AIR POLLUTION MONITORING EQUIPMENT

ORIFICE TRANSFER STANDARD CERTIFICATION WORKSHEET TE-5025A

Date - Apr 15, 2013 Rootsmeter S/N 0438320 Ta (K) - 294
Operator Tisch Orifice I.D. - 1785 Pa (mm) - 750.57

PLATE OR Run #	VOLUME START (m3)	VOLUME STOP (m3)	DIFF VOLUME (m3)	DIFF TIME (min)	METER DIFF Hg (mm)	ORFICE DIFF H2O (in.)
1	NA	NA	1.00	1.4050	3.2	2.00
2	NA	NA	1.00	0.9870	6.4	4.00
3	NA	NA	1.00	0.8850	7.9	5.00
4	NA	NA	1.00	0.8420	8.7	5.50
5	NA	NA	1.00	0.6960	12.7	8.00

DATA TABULATION

Vstd	(x axis) Qstd	(y axis)		Va	(x axis) Qa	(y axis)
0.9967	0.7094	1.4149		0.9957	0.7087	0.8851
0.9925	1.0056	2.0010		0.9915	1.0045	1.2517
0.9904	1.1191	2.2372		0.9894	1.1179	1.3995
0.9894	1.1751	2.3464		0.9884	1.1739	1.4678
0.9840	1.4139	2.8299		0.9830	1.4124	1.7702
Qstd slope (m) =		2.00979		Qa slope (m) =		1.25849
intercept (b) =		-0.01403		intercept (b) =		-0.00878
coefficient (r) =		0.99995		coefficient (r) =		0.99995
y axis = SQRT[H2O(Pa/760)(298/Ta)]				y axis = SQRT[H2O(Ta/Pa)]		

CALCULATIONS

Vstd = Diff. Vol[(Pa-Diff. Hg)/760](298/Ta)
Qstd = Vstd/Time

Va = Diff Vol [(Pa-Diff Hg)/Pa]
Qa = Va/Time

For subsequent flow rate calculations:

Qstd = 1/m{[SQRT(H2O(Pa/760)(298/Ta))]- b}
Qa = 1/m{[SQRT H2O(Ta/Pa)]- b}

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C123580
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-1472)

Description / 儀器名稱	:	Sound Level Meter
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NL-31
Serial No. / 編號	:	00410224
Supplied By / 委託者	:	Envirotech Services Co. Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 15 June 2012

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Precision Measurement Ltd., UK
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : L K Yeung

Certified By 核證 : K C Lee

Date of Issue 簽發日期 : 15 June 2012

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4 F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail 電郵: callab@suncreation.com Website 網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C123580
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C120016
CL281	Multifunction Acoustic Calibrator	DC110233

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.7	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	93.7 (Ref.)
				104.00		103.7
				114.00		113.7

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.7	Ref.
			Slow			93.6	± 0.3

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

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輝創工程有限公司 – 校正及檢測實驗所
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Certificate of Calibration
校正證書

Certificate No. : C123580
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	63 Hz	67.3	-26.2 ± 1.5
					125 Hz	77.4	-16.1 ± 1.5
					250 Hz	85.0	-8.6 ± 1.4
					500 Hz	90.4	-3.2 ± 1.4
					1 kHz	93.7	Ref.
					2 kHz	95.0	+1.2 ± 1.6
					4 kHz	94.8	+1.0 ± 1.6
					8 kHz	92.7	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.8	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	63 Hz	92.8	-0.8 ± 1.5
					125 Hz	93.5	-0.2 ± 1.5
					250 Hz	93.7	0.0 ± 1.4
					500 Hz	93.8	0.0 ± 1.4
					1 kHz	93.7	Ref.
					2 kHz	93.6	-0.2 ± 1.6
					4 kHz	93.1	-0.8 ± 1.6
					8 kHz	90.8	-3.0 (+2.1 ; -3.1)
					12.5 kHz	88.0	-6.2 (+3.0 ; -6.0)

Remarks : - Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value : 94 dB : 63 Hz - 125 Hz : ± 0.35 dB
  250 Hz - 500 Hz : ± 0.30 dB
  1 kHz : ± 0.20 dB
  2 kHz - 4 kHz : ± 0.35 dB
  8 kHz : ± 0.45 dB
  12.5 kHz : ± 0.70 dB
  104 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)
  114 dB : 1 kHz : ± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel/電話: 2927 2606 Fax/傳真: 2744 8986 E-mail/電郵: callab@suncreation.com Website/網址: www.suncreation.com

輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C133573
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC13-1422)

Description / 儀器名稱	:	Sound Level Meter
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NL-31
Serial No. / 編號	:	00410224
Supplied By / 委託者	:	Envirotech Services Co. Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 14 June 2013

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : K C Lee

Certified By 核證 : K K Wong

Date of Issue 簽發日期 : 17 June 2013

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
c/o 香港新界屯門興安里一號青山灣機樓四樓
Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail 電郵: callab@suncreation.com Website 網址: www.suncreation.com

Certificate of Calibration
校正證書

Certificate No. : C133573
證書編號

1. The unit-under-test (UUT) was allowed to stabilize in the laboratory for over 12 hours, and switched on to warm up for over 10 minutes before the commencement of the test.

2. Self-calibration was performed before the test.

3. The results presented are the mean of 3 measurements at each calibration point.

4. Test equipment :

Equipment ID	Description	Certificate No.
CL280	40 MHz Arbitrary Waveform Generator	C130019
CL281	Multifunction Acoustic Calibrator	DC110233

5. Test procedure : MA101N.

6. Results :

6.1 Sound Pressure Level

6.1.1 Reference Sound Pressure Level

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.6	± 1.1

6.1.2 Linearity

UUT Setting				Applied Value		UUT Reading (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)	
30 - 120	L_A	A	Fast	94.00	1	93.6 (Ref.)
				104.00		103.6
				114.00		113.6

IEC 61672 Class 1 Spec. : ± 0.6 dB per 10 dB step and ± 1.1 dB for overall different.

6.2 Time Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq. (kHz)		
30 - 120	L_A	A	Fast	94.00	1	93.6	Ref.
			Slow			93.5	± 0.3

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Certificate of Calibration
校正證書

Certificate No. : C133573
證書編號

6.3 Frequency Weighting

6.3.1 A-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_A	A	Fast	94.00	63 Hz	67.3	-26.2 ± 1.5
					125 Hz	77.3	-16.1 ± 1.5
					250 Hz	84.9	-8.6 ± 1.4
					500 Hz	90.3	-3.2 ± 1.4
					1 kHz	93.6	Ref.
					2 kHz	94.9	+1.2 ± 1.6
					4 kHz	94.8	+1.0 ± 1.6
					8 kHz	92.6	-1.1 (+2.1 ; -3.1)
					12.5 kHz	89.7	-4.3 (+3.0 ; -6.0)

6.3.2 C-Weighting

UUT Setting				Applied Value		UUT Reading (dB)	IEC 61672 Class 1 Spec. (dB)
Range (dB)	Mode	Frequency Weighting	Time Weighting	Level (dB)	Freq.		
30 - 120	L_C	C	Fast	94.00	63 Hz	92.7	-0.8 ± 1.5
					125 Hz	93.4	-0.2 ± 1.5
					250 Hz	93.6	0.0 ± 1.4
					500 Hz	93.7	0.0 ± 1.4
					1 kHz	93.7	Ref.
					2 kHz	93.5	-0.2 ± 1.6
					4 kHz	93.0	-0.8 ± 1.6
					8 kHz	90.7	-3.0 (+2.1 ; -3.1)
					12.5 kHz	87.9	-6.2 (+3.0 ; -6.0)

Remarks : - UUT Microphone Model No. : UC-53A & S/N : 307154

- Mfr's Spec. : IEC 61672 Class 1

- Uncertainties of Applied Value :

94 dB	: 63 Hz - 125 Hz	:	± 0.35 dB
	250 Hz - 500 Hz	:	± 0.30 dB
	1 kHz	:	± 0.20 dB
	2 kHz - 4 kHz	:	± 0.35 dB
	8 kHz	:	± 0.45 dB
	12.5 kHz	:	± 0.70 dB
104 dB	: 1 kHz	:	± 0.10 dB (Ref. 94 dB)
114 dB	: 1 kHz	:	± 0.10 dB (Ref. 94 dB)

- The uncertainties are for a confidence probability of not less than 95 %.

Note :
The values given in this Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environment changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Sun Creation Engineering Limited shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C126333
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-2717)

Description / 儀器名稱	:	Integrating Sound Level Meter
Manufacturer / 製造商	:	Brüel & Kjær
Model No. / 型號	:	2238
Serial No. / 編號	:	2448529
Supplied By / 委託者	:	Hyder Consulting Limited 47/F., Hopewell Centre, 183 Queen's Road East, Wanchai, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 3 November 2012

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Precision Measurement Ltd., UK
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : K C Lee

Certified By 核證 : C C Cheung

Date of Issue 簽發日期 : 5 November 2012

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory
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輝創工程有限公司
Sun Creation Engineering Limited
Calibration and Testing Laboratory

Certificate of Calibration
校正證書

Certificate No. : C126665
證書編號

ITEM TESTED / 送檢項目 (Job No. / 序引編號 : IC12-2878)

Description / 儀器名稱	:	Sound Level Calibrator
Manufacturer / 製造商	:	Rion
Model No. / 型號	:	NC-73
Serial No. / 編號	:	10486660
Supplied By / 委託者	:	Envirotech Services Co. Shop 6, G/F., Casio Mansion, 209 Shaukeiwan Road, Hong Kong

TEST CONDITIONS / 測試條件

Temperature / 溫度 : (23 ± 2)°C
Relative Humidity / 相對濕度 : (55 ± 20)%
Line Voltage / 電壓 : ---

TEST SPECIFICATIONS / 測試規範

Calibration check

DATE OF TEST / 測試日期 : 19 November 2012

TEST RESULTS / 測試結果

The results apply to the particular unit-under-test only.
All results are within manufacturer's specification.
The results are detailed in the subsequent page(s).

The test equipment used for calibration are traceable to National Standards via :
- The Government of The Hong Kong Special Administrative Region Standard & Calibration Laboratory
- Rohde & Schwarz Laboratory, Germany
- Fluke Everett Service Center, USA
- Agilent Technologies, USA

Tested By 測試 : K C Lee

Certified By 核證 : C C Cheung

Date of Issue 簽發日期 : 21 November 2012

The test equipment used for calibration are traceable to the Nation Standards as specified in this certificate. This certificate shall not be reproduced except in full, without the prior written approval of this laboratory.
本證書所載校正用之測試器材均可溯源至國際標準。局部複印本證書需先獲本實驗所書面批准。

Sun Creation Engineering Limited – Calibration & Testing Laboratory
c/o 4/F, Tsing Shan Wan Exchange Building, 1 Hing On Lane, Tuen Mun, New Territories, Hong Kong
輝創工程有限公司 – 校正及檢測實驗所
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Tel 電話: 2927 2606 Fax 傳真: 2744 8986 E-mail 電郵: callab@suncreation.com Website 網址: www.suncreation.com

Hong Kong Calibration Ltd.
香 港 校 正 有 限 公 司

Calibration Certificate

Certificate No. 28658 Page 1 of 2 Pages

Customer : Hyder Consulting Limited

Address : 47/F., Hopewell Centre, 183 Queens Road East, Wanchai, Hong Kong

Order No. : Q23280 **Date of receipt :** 17-Dec-12

Item Tested

Description : Sound Level Calibrator

Manufacturer : B&K

Model : Type 4231 **Serial No. :** 2699361

Test Conditions

Date of Test : 28-Dec-12 **Supply Voltage :** --

Ambient Temperature : (23 ± 3)°C **Relative Humidity :** (50 ± 25) %

Test Specifications

Calibration check.

Ref. Document/Procedure : F21, Z02.

Test Results

All results were within the IEC 942 Class 1 specification.

The results are shown in the attached page(s).

Main Test equipment used:

Equipment No.	Description	Cert. No.	Traceable to
S014	Spectrum Analyzer	13535	NIM-PRC & SCL-HKSAR
S024	Sound Level Calibrator	28588	NIM-PRC & SCL-HKSAR
S041	Universal Counter	28347	SCL-HKSAR
S206	Sound Level Meter	16338	SCL-HKSAR

The values given in this Calibration Certificate only relate to the values measured at the time of the test and any uncertainties quoted will not include allowance for the equipment long term drift, variations with environmental changes, vibration and shock during transportation, overloading, mis-handling, or the capability of any other laboratory to repeat the measurement. Hong Kong Calibration Ltd. shall not be liable for any loss or damage resulting from the use of the equipment.

The test equipment used for calibration are traceable to International System of Units (SI).
The test results apply to the above Unit-Under-Test only

Calibrated by : P. F. Wong

Approved by : Dorothy Cheuk

Date: 28-Dec-12

This Certificate is issued by:
Hong Kong Calibration Ltd.
Unit 8B, 24/F., Well Fung Industrial Centre, No. 58-76, Ta Chuen Ping Street,Kwai Chung, NT,Hong Kong.
Tel: 2425 8801 Fax: 2425 8646

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E

Calibration Certificate

Results :

1. Level Accuracy

UUT Nominal Value (dB)	Measured Value (dB)	IEC 942 Class 1 Spec.
94	94.10	± 0.3 dB
114	114.14	

Uncertainty : ± 0.1 dB

2. Frequency

UUT Nominal Value	Measured Value	IEC 942 Class 1 Spec.
1 kHz	1.000 kHz	± 2 %

Uncertainty : $\pm 3.6 \times 10^{-6}$

3. Level Stability : 0.0 dB
IEC 942 Class 1 Spec. : ± 0.1 dB
Uncertainty : ± 0.01 dB

4. Total Harmonic Distortion : < 0.5 %
IEC 942 Class 1 Spec. : < 3 %
Uncertainty : ± 2.3 % of reading

Remark : 1. UUT : Unit-Under-Test
2. The above measured values are the mean of 3 measurement.
3. The uncertainty claimed is for a confidence probability of not less than 95%.
4. Atmospheric Pressure : 1005 hPa.

--------- END ---------

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1306753
Date of Issue: 15/03/2013
Client: HYDER CONSULTING LIMITED

Description: Multimeter
Brand Name: YSI
Model No.: Professional Plus
Serial No.: 11J100824
Equipment No.: --
Date of Calibration: 15 March, 2013 Date of next Calibration: 15 June, 2013

Parameters:

Dissolved Oxygen

Method Ref: APHA (21st edition), 4500O: G

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
2.73	2.82	0.09
5.36	5.51	0.15
8.65	8.74	0.09
	Tolerance Limit (±mg/L)	0.20

Temperature

Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
9.0	9.1	0.1
23.0	22.5	-0.5
45.0	46.3	1.3
	Tolerance Limit (±°C)	2.0

pH Value

Method Ref: APHA 21st Ed. 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.00	0.00
7.0	6.97	-0.03
10.0	9.96	-0.04
	Tolerance Limit (±pH unit)	0.20

Conductivity

Method Ref: APHA (21st edition), 2510B

Expected Reading (uS/cm)	Displayed Reading (uS/cm)	Tolerance (%)
146.9	138.4	-5.8
6667	6154	-7.7
12890	11994	-7.0
58670	55390	-5.6
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR FAN CHEONG TSANG	**WORK ORDER:**	HK1315445
CLIENT:	HYDER CONSULTING LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	47/F, HOPEWELL CENTRE, 183 QUEEN`S ROAD EAST, WANCHAI, HONG KONG	**DATE RECEIVED:**	10/06/2013
		DATE OF ISSUE:	13/06/2013
PROJECT:	DC2007/12 DESIGN AND CONSTRUCTION OF TSUEN WAN DRAINAGE TUNNEL		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	pH, Conductivity, Dissolved Oxygen and Temperature
Equipment Type:	Multimeter
Brand Name:	YSI
Model No.:	Professional Plus
Serial No.:	11J100824
Equipment No.:	--
Date of Calibration:	11 June, 2013

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

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1-3 Wing Yip Street
Kwai Chung
HONG KONG

Phone: 852-2610 1044
Fax: 852-2610 2021
Email: hongkong@alsglobal.com

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1315445
Date of Issue: 13/06/2013
Client: HYDER CONSULTING LIMITED

Description: Multimeter
Brand Name: YSI
Model No.: Professional Plus
Serial No.: 11J100824
Equipment No.: --
Date of Calibration: 11 June, 2013 Date of next Calibration: 11 September, 2013

Parameters:

Dissolved Oxygen **Method Ref: APHA (21st edition), 4500O: G**

Expected Reading (mg/L)	Displayed Reading (mg/L)	Tolerance (mg/L)
3.62	3.78	0.16
5.67	5.67	0.00
7.94	7.94	0.00
	Tolerance Limit (±mg/L)	0.20

Temperature **Method Ref: Section 6 of International Accreditation New Zealand Technical Guide No. 3 Second edition March 2008: Working Thermometer Calibration Procedure.**

Expected Reading (°C)	Displayed Reading (°C)	Tolerance (°C)
10.5	10.4	-0.1
20.0	20.1	0.1
39.5	39.2	-0.3
	Tolerance Limit (±°C)	2.0

Conductivity **Method Ref: APHA (21st edition), 2510B**

Expected Reading (uS/cm)	Displayed Reading (uS/cm)	Tolerance (%)
146.9	146.7	-0.1
6667	6462	-3.1
12890	12588	-2.3
58670	54459	-7.2
	Tolerance Limit (±%)	10.0

pH Value **Method Ref: APHA 21st Ed. 4500H:B**

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	3.93	-0.07
7.0	6.92	-0.08
10.0	9.93	-0.07
	Tolerance Limit (±pH unit)	0.20

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1306041
Date of Issue: 08/03/2013
Client: HYDER CONSULTING LIMITED

Description: Turbidimeter
Brand Name: HANNA
Model No.: HI 98703-02
Serial No.: 08498735
Equipment No.: --
Date of Calibration: 08 March, 2013 Date of next Calibration: 08 June, 2013

Parameters:

Turbidity

Method Ref: APHA 21st Ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.05	--
4	4.17	4.3
40	42.2	5.5
80	85.7	7.1
400	410	2.5
800	829	3.6
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR FAN CHEONG TSANG	**WORK ORDER:**	HK1314681
CLIENT:	HYDER CONSULTING LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	47/F, HOPEWELL CENTRE, 183 QUEEN`S ROAD EAST, WANCHAI, HONG KONG	**DATE RECEIVED:**	03/06/2013
		DATE OF ISSUE:	05/06/2013
PROJECT:	--		

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	Turbidity
Equipment Type:	Turbidimeter
Brand Name:	HANNA
Model No.:	HI 98703
Serial No.:	08498735
Equipment No.:	--
Date of Calibration:	04 June, 2013

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

Address

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Phone: 852-2610 1044
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Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1314681
Date of Issue: 05/06/2013
Client: HYDER CONSULTING LIMITED

Equipment Type: Turbidimeter
Brand Name: HANNA
Model No.: HI 98703
Serial No.: 08498735
Equipment No.: --
Date of Calibration: 04 June, 2013 Date of next Calibration: 04 September, 2013

Parameters:

Turbidity

Method Ref: APHA 21st Ed. 2130B

Expected Reading (NTU)	Displayed Reading (NTU)	Tolerance (%)
0	0.07	--
4	4.13	3.3
40	39.8	-0.5
80	79.0	-1.3
400	395	-1.3
800	799	-0.1
	Tolerance Limit (±%)	10.0

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1307213
Date of Issue: 20/03/2013
Client: HYDER CONSULTING LIMITED

Description: pH meter
Brand Name: Hanna
Model No.: HI-8014
Serial No.: SN 08345212
Equipment No.: --
Date of Calibration: 20 March, 2013 Date of next Calibration: 20 June, 2013

Parameters:

pH Value

Method Ref: APHA 21st Ed. 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.06	0.06
7.0	7.09	0.09
10.0	10.02	0.02
	Tolerance Limit (±pH unit)	0.20

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager
Greater China & Hong Kong

ALS Technichem (HK) Pty Ltd

REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

CONTACT:	MR FAN CHEONG TSANG	**WORK ORDER:**	HK1316644
CLIENT:	HYDER CONSULTING LIMITED	**LABORATORY:**	HONG KONG
ADDRESS:	47/F, HOPEWELL CENTRE, 183 QUEEN`S ROAD EAST, WANCHAI, HONG KONG	**DATE RECEIVED:**	21/06/2013
		DATE OF ISSUE:	25/06/2013

PROJECT: --

COMMENTS

It is certified that the item under calibration/checking has been calibrated/checked by corresponding calibrated equipment in the laboratory.
Maximum Tolerance and calibration frequency stated in the report, unless otherwise stated, the internal aceptance criteria of ALS will be followed.

Scope of Test:	pH
Equipment Type:	pH meter
Brand Name:	Hanna
Model No.:	HI-8014
Serial No.:	SN 08345212
Equipment No.:	--
Date of Calibration:	25 June, 2013

NOTES

This is the Final Report and supersedes any preliminary report with this batch number.
Results apply to sample(s) as submitted. All pages of this report have been checked and approved for release.

ISSUING LABORATORY: HONG KONG

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Phone: 852-2610 1044
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Email: hongkong@alsglobal.com

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

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REPORT OF EQUIPMENT PERFORMANCE CHECK/CALIBRATION

Work Order: HK1316644
Date of Issue: 25/06/2013
Client: HYDER CONSULTING LIMITED

Description: pH meter
Brand Name: Hanna
Model No.: HI-8014
Serial No.: SN 08345212
Equipment No.: --
Date of Calibration: 25 June, 2013 Date of next Calibration: 25 September, 2013

Parameters:

pH Value

Method Ref: APHA 21st Ed. 4500H:B

Expected Reading (pH Unit)	Displayed Reading (pH Unit)	Tolerance (pH unit)
4.0	4.01	0.01
7.0	7.11	0.11
10.0	10.02	0.02
	Tolerance Limit (±pH unit)	0.20

Remark: "Displayed Reading" presents the figures shown on item under calibration / checking regardless of equipment precision or significant figures.

Mr. Fung Lim Chee, Richard
General Manager -
Greater China & Hong Kong

Appendix G

Monitoring Locations

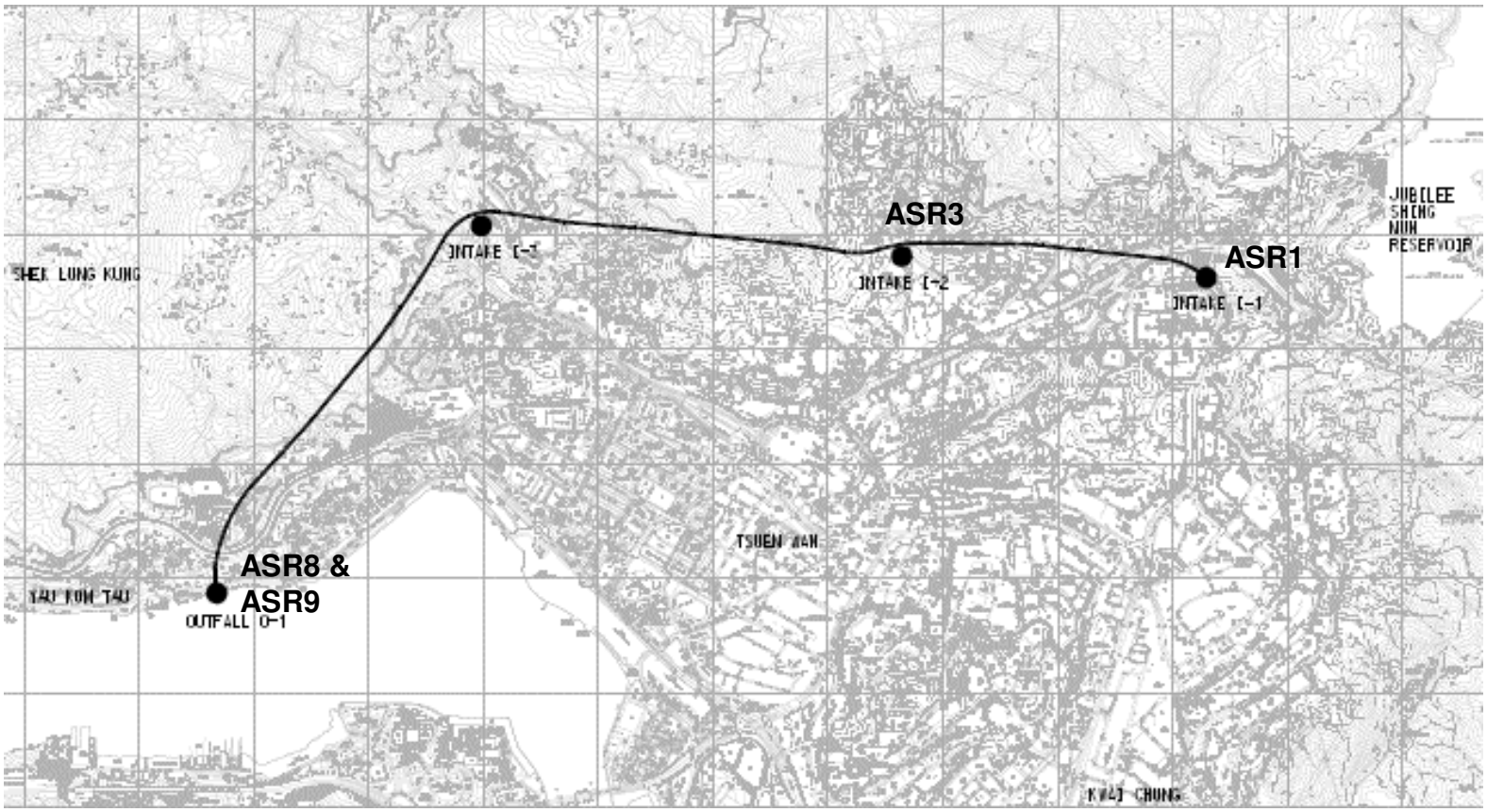


Figure 1 **Air Quality Monitoring Stations**

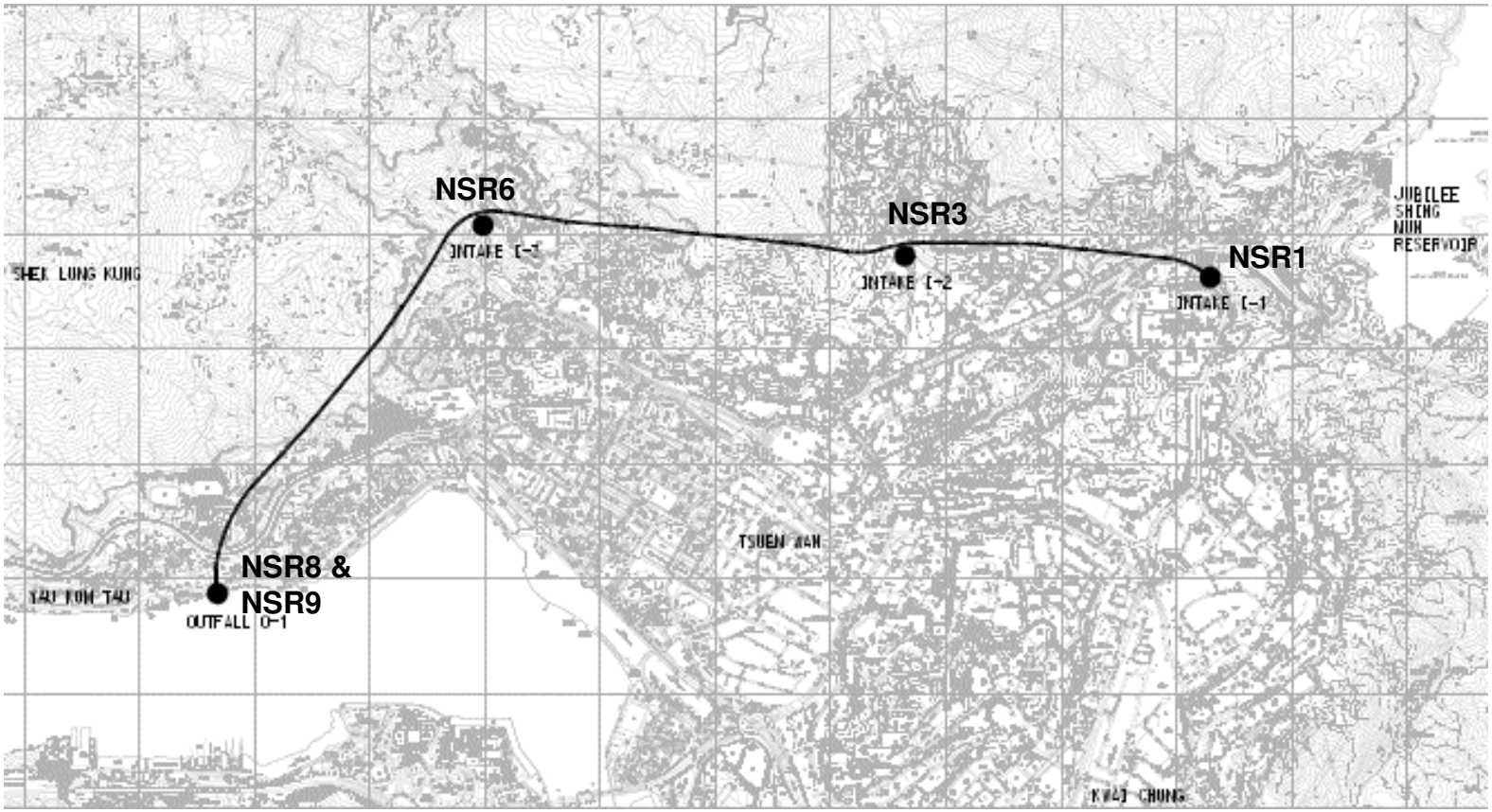


Figure 2 Noise Monitoring Stations

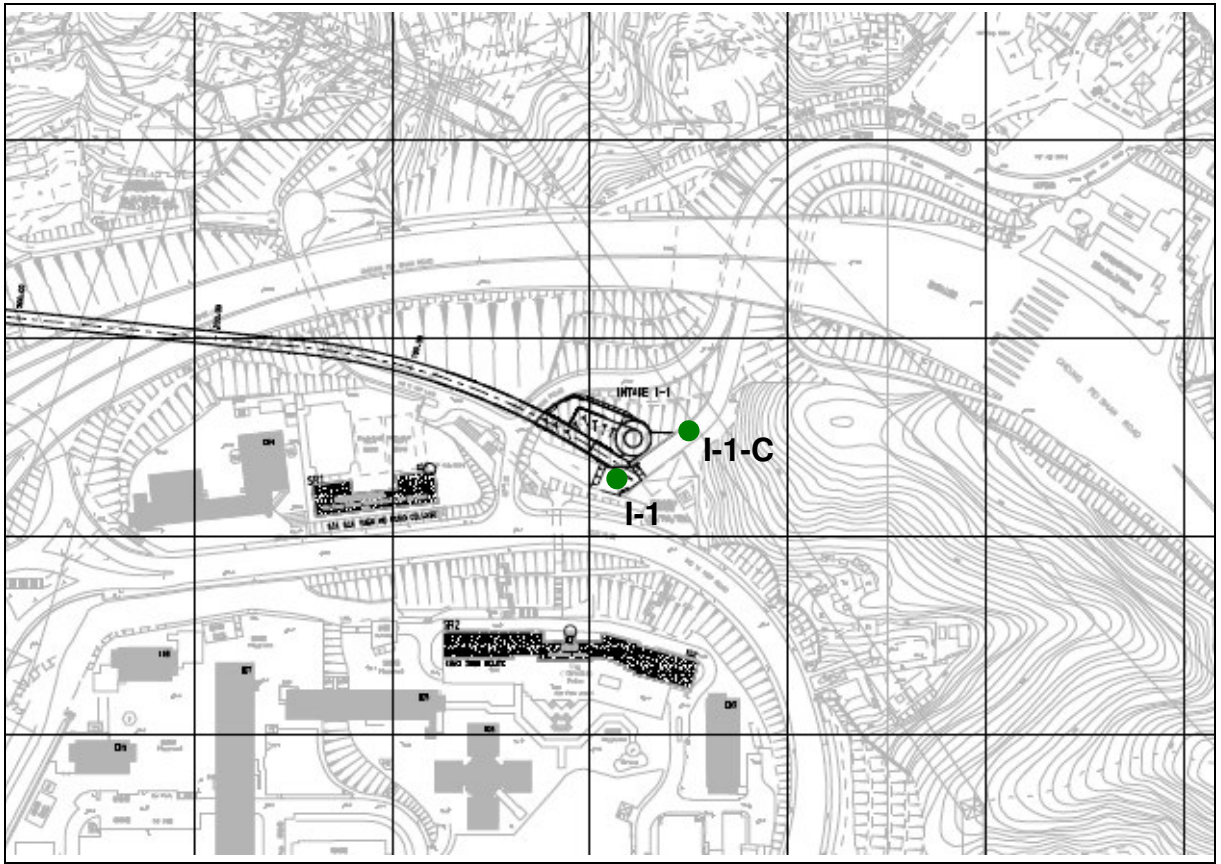


Figure 3 Water Quality Monitoring Stations: I-1 & I-1-C at Intake I-1

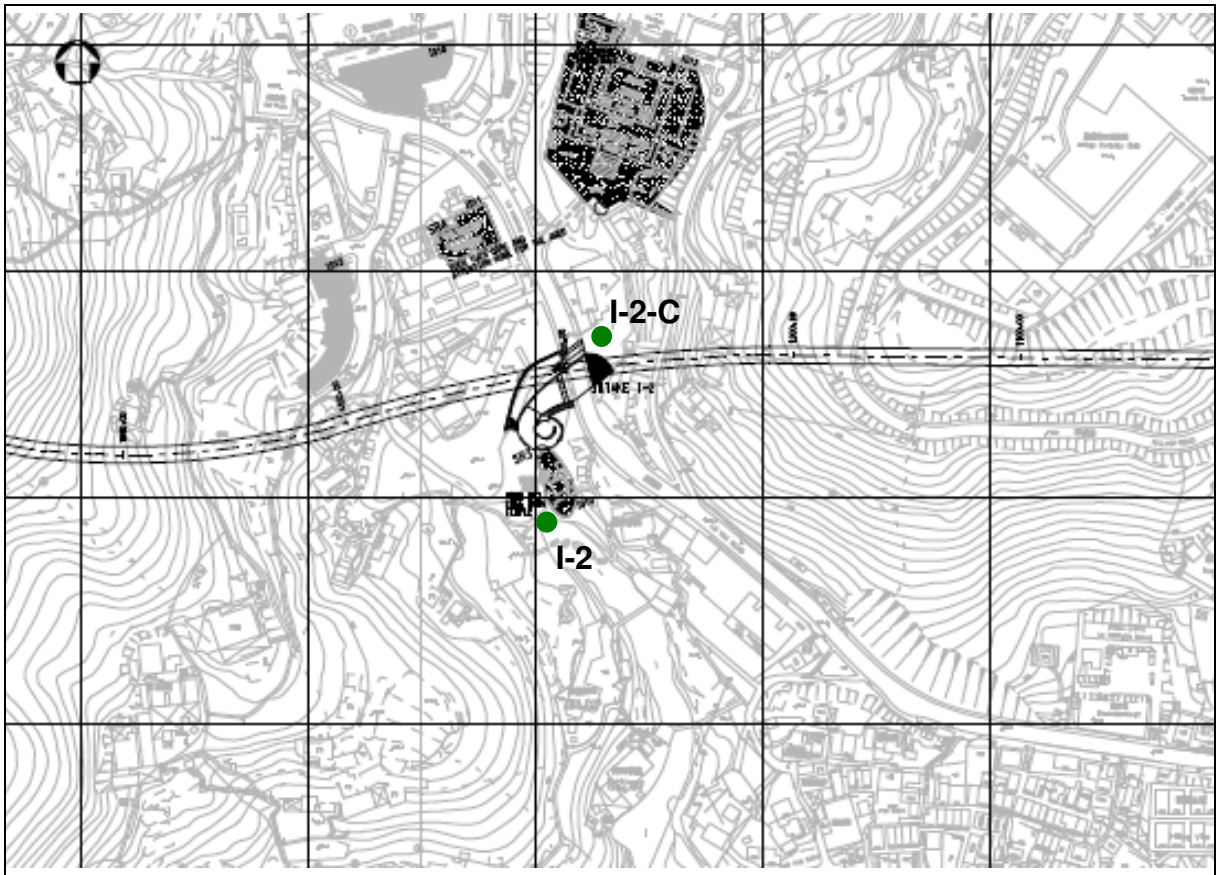


Figure 4 **Water Quality Monitoring Stations: I-2 & I-2-C at Intake I-2**

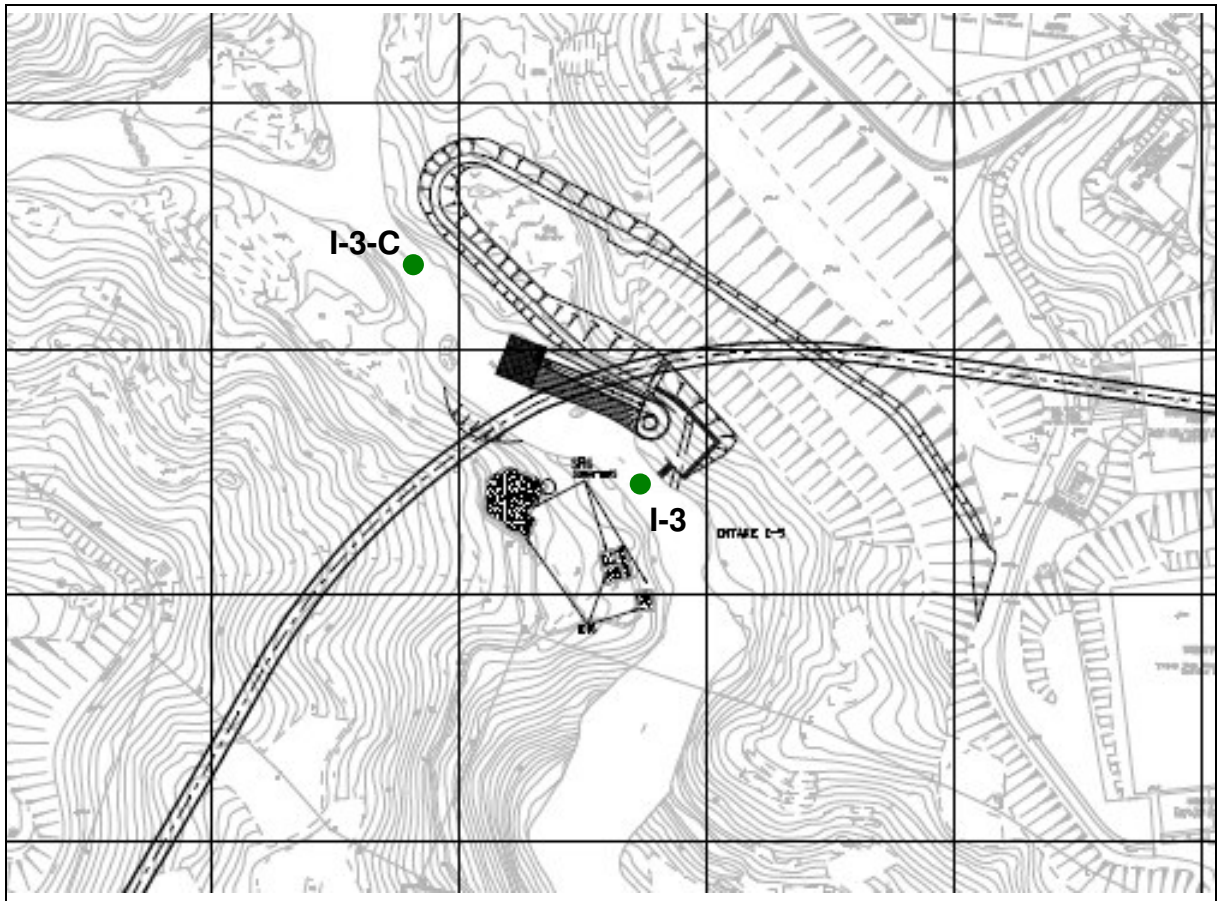


Figure 5 **Water Quality Monitoring Stations: I-3 & I-3-C at Intake I-3**

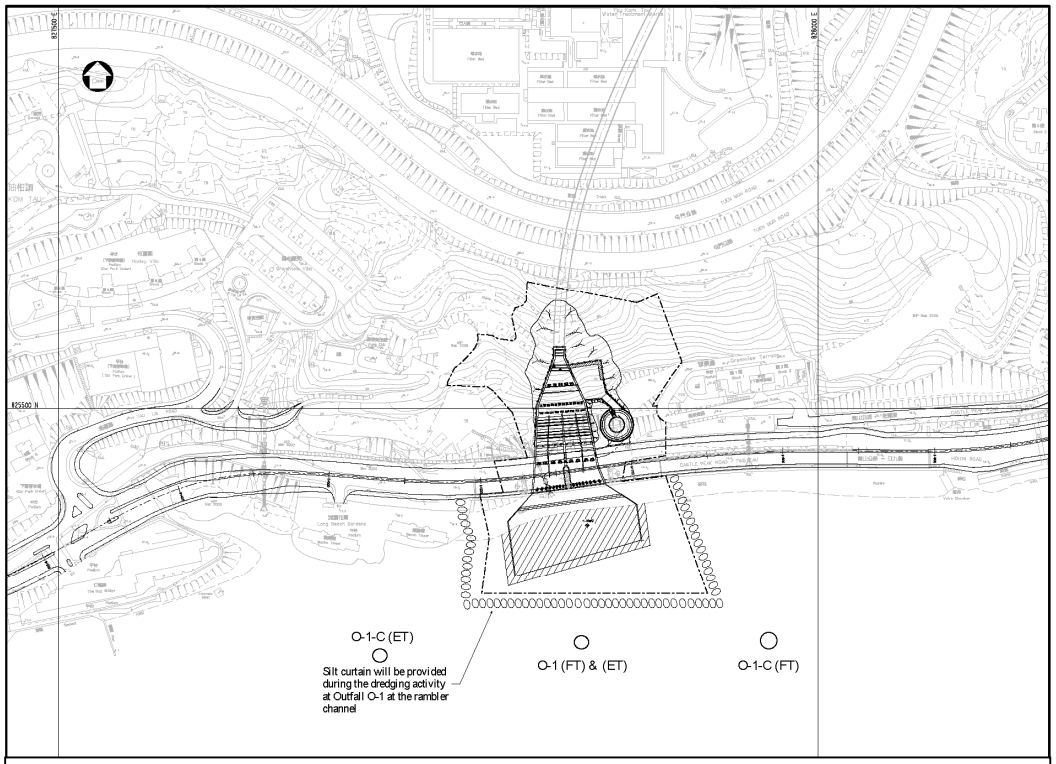


Figure 6 Water Quality Monitoring Stations: O-1 (FT) & (ET), O-1-C(FT) & O-1-C(FT) at Outfall O-1

Appendix H

EM&A Schedule

Contract No. DC/2007/12 – Design and Construction of
Tsuen Wan Drainage Tunnel
Impact Monitoring Programme – June 13 (Tentative)

Date		Air	Noise	Water
1-Jun-13	Sat			
2-Jun-13	Sun			
3-Jun-13	Mon			✓
4-Jun-13	Tue			
5-Jun-13	Wed	✓	✓	✓
6-Jun-13	Thu			
7-Jun-13	Fri			✓
8-Jun-13	Sat			
9-Jun-13	Sun			
10-Jun-13	Mon			✓
11-Jun-13	Tue	✓	✓	
12-Jun-13	Wed			
13-Jun-13	Thu			✓
14-Jun-13	Fri			
15-Jun-13	Sat			✓
16-Jun-13	Sun			
17-Jun-13	Mon	✓	✓	✓
18-Jun-13	Tue			
19-Jun-13	Wed			✓
20-Jun-13	Thu			
21-Jun-13	Fri	✓		✓
22-Jun-13	Sat			
23-Jun-13	Sun			
24-Jun-13	Mon			✓
25-Jun-13	Tue			
26-Jun-13	Wed			✓
27-Jun-13	Thu	✓	✓	
28-Jun-13	Fri			✓
29-Jun-13	Sat			
30-Jun-13	Sun			

Note:
Shaded area indicates public holiday.
Air – Monitoring 1-hour TSP is undertaken three times per every six days
Noise – Noise measurements is undertaken once every week at (0700-1900 Monday to Saturday)
Water –Water quality monitoring is undertaken three times per week

Contract No. DC/2007/12 – Design and Construction of
Tsuen Wan Drainage Tunnel
Impact Monitoring Programme – Jul 13 (Tentative)

Date		Air	Noise	Water
1-Jul-13	Mon			
2-Jul-13	Tue			✓
3-Jul-13	Wed	✓	✓	
4-Jul-13	Thu			✓
5-Jul-13	Fri			
6-Jul-13	Sat			✓
7-Jul-13	Sun			
8-Jul-13	Mon			✓
9-Jul-13	Tue	✓	✓	
10-Jul-13	Wed			✓
11-Jul-13	Thu			
12-Jul-13	Fri			✓
13-Jul-13	Sat			
14-Jul-13	Sun			
15-Jul-13	Mon	✓	✓	✓
16-Jul-13	Tue			
17-Jul-13	Wed			✓
18-Jul-13	Thu			
19-Jul-13	Fri	✓		✓
20-Jul-13	Sat			
21-Jul-13	Sun			
22-Jul-13	Mon			✓
23-Jul-13	Tue			
24-Jul-13	Wed			✓
25-Jul-13	Thu	✓	✓	
26-Jul-13	Fri			✓
27-Jul-13	Sat			
28-Jul-13	Sun			
29-Jul-13	Mon			✓
30-Jul-13	Tue			
31-Jul-13	Wed	✓	✓	✓

Note:
Shaded area indicates public holiday.
Air – Monitoring 1-hour TSP is undertaken three times per every six days
Noise – Noise measurements is undertaken once every week at (0700-1900 Monday to Saturday)
Water –Water quality monitoring is undertaken three times per week

Contract No. DC/2007/12 – Design and Construction of
Tsuen Wan Drainage Tunnel
Impact Monitoring Programme – August 13 (Tentative)

Date		Air	Noise	Water
1-Aug-13	Thu			
2-Aug-13	Fri			✓
3-Aug-13	Sat			
4-Aug-13	Sun			
5-Aug-13	Mon			✓
6-Aug-13	Tue	✓	✓	
7-Aug-13	Wed			✓
8-Aug-13	Thu			
9-Aug-13	Fri			✓
10-Aug-13	Sat			
11-Aug-13	Sun			
12-Aug-13	Mon	✓	✓	✓
13-Aug-13	Tue			
14-Aug-13	Wed			✓
15-Aug-13	Thu			
16-Aug-13	Fri	✓		✓
17-Aug-13	Sat			
18-Aug-13	Sun			
19-Aug-13	Mon			✓
20-Aug-13	Tue			
21-Aug-13	Wed			✓
22-Aug-13	Thu	✓	✓	
23-Aug-13	Fri			✓
24-Aug-13	Sat			
25-Aug-13	Sun			
26-Aug-13	Mon			✓
27-Aug-13	Tue			
28-Aug-13	Wed	✓	✓	✓
29-Aug-13	Thu			
30-Aug-13	Fri			✓
31-Aug-13	Sat			

Note:
Shaded area indicates public holiday.
Air – Monitoring 1-hour TSP is undertaken three times per every six days
Noise – Noise measurements is undertaken once every week at (0700-1900 Monday to Saturday)
Water –Water quality monitoring is undertaken three times per week

Contract No. DC/2007/12 – Design and Construction of
Tsuen Wan Drainage Tunnel
Impact Monitoring Programme – September 13 (Tentative)

Date		Air	Noise	Water
1-Sep-13	Sun			
2-Sep-13	Mon			✓
3-Sep-13	Tue	✓	✓	
4-Sep-13	Wed			✓
5-Sep-13	Thu			
6-Sep-13	Fri			✓
7-Sep-13	Sat			
8-Sep-13	Sun			
9-Sep-13	Mon	✓	✓	✓
10-Sep-13	Tue			
11-Sep-13	Wed			✓
12-Sep-13	Thu			
13-Sep-13	Fri	✓		✓
14-Sep-13	Sat			
15-Sep-13	Sun			
16-Sep-13	Mon			✓
17-Sep-13	Tue			
18-Sep-13	Wed			✓
19-Sep-13	Thu	✓	✓	
20-Sep-13	Fri			
21-Sep-13	Sat			✓
22-Sep-13	Sun			
23-Sep-13	Mon			✓
24-Sep-13	Tue			
25-Sep-13	Wed	✓	✓	✓
26-Sep-13	Thu			
27-Sep-13	Fri			✓
28-Sep-13	Sat			
29-Sep-13	Sun			
30-Sep-13	Mon			✓

Note:
Shaded area indicates public holiday.
Air – Monitoring 1-hour TSP is undertaken three times per every six days
Noise – Noise measurements is undertaken once every week at (0700-1900 Monday to Saturday)
Water –Water quality monitoring is undertaken three times per week

Appendix I

Monitoring Results

Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel

Air Quality Impact Monitoring Results (1-Hour TSP)

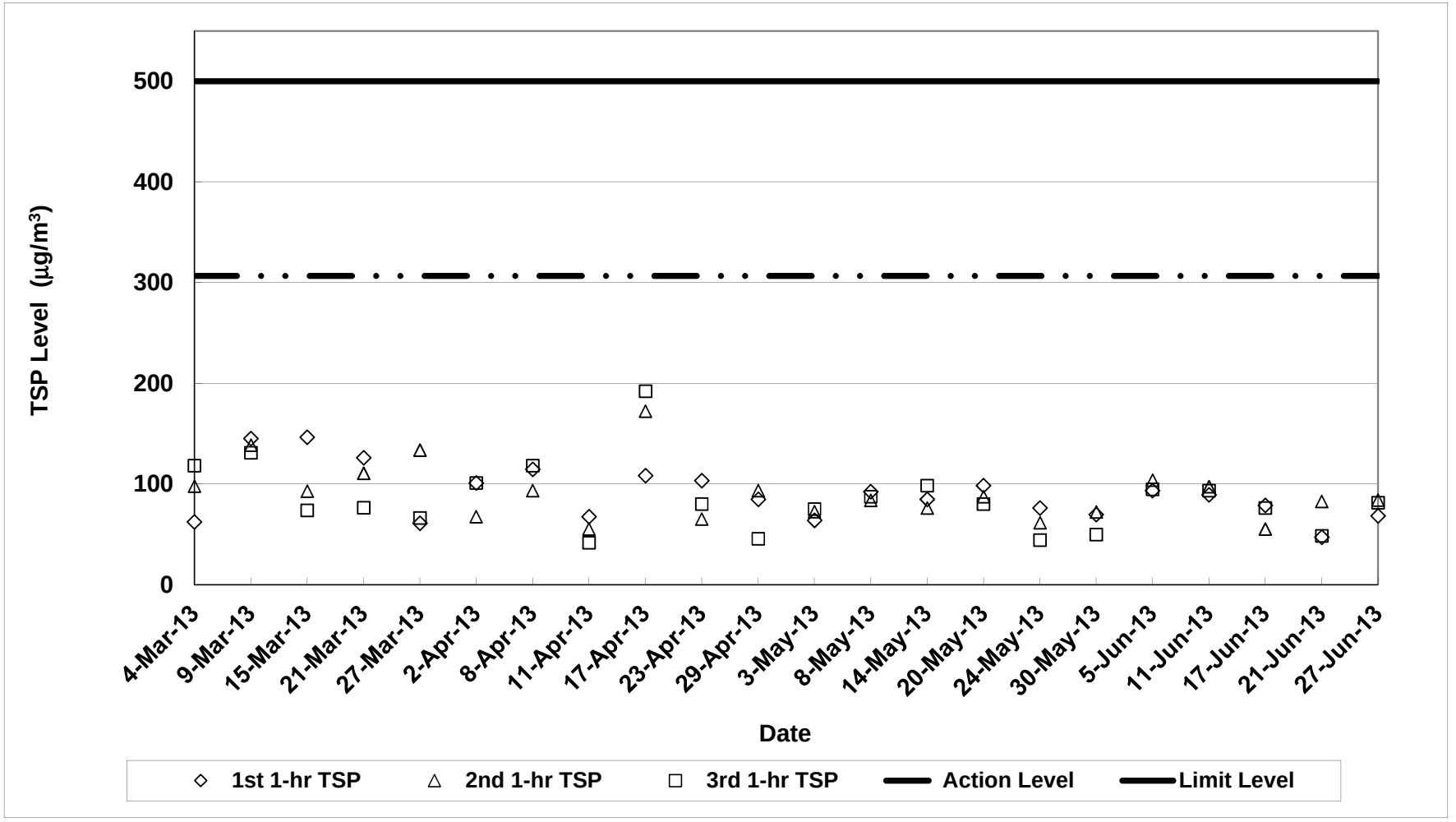
Location	Monitoring Date	Weather Conditions	Wind Speed with Direction (m/s)	Temp (°C)	Timer-I	Timer-F	Time (mins)	Flow-I (CFM)	Flow-F (CFM)	Flow-I (m^3/min)	Flow-F (m^3/min)	Flow-avg (m^3/min)	Volume (m^3)	Weight-I (g)	Weight-f (g)	Weight-diff. (g)	1-hr TSP (μg/m^3)	Average 1-Hr TSP (μg/m^3)	Action/Limit Levels (μg/m^3)	Observation / Site Condition	Other Possible Dust Sources
Sik Sik Yuen Ho Fung College - Intake (ASR1)	5-Jun-13	Sunny	0.5E	29	654442	654542	60.0	40	40	1.27	1.27	1.27	76.05	2.8604	2.8675	0.0071	93.4	97.3	306.6/500	Nil	Vehicles
		Sunny	0.5E	29	654542	654642	60.0	40	40	1.27	1.27	1.27	76.05	2.8483	2.8562	0.0079	103.9				
		Sunny	0.5E	29	654642	654742	60.0	40	40	1.27	1.27	1.27	76.05	2.8770	2.8842	0.0072	94.7				
	11-Jun-13	Rainy	0.8E	23	654742	654842	60.0	40	40	1.27	1.27	1.27	76.05	2.8453	2.8521	0.0068	89.4	93.4		Nil	Vehicles
		Rainy	0.8E	23	654842	654942	60.0	40	40	1.27	1.27	1.27	76.05	2.8360	2.8434	0.0074	97.3				
		Rainy	0.8E	23	654942	655042	60.0	40	40	1.27	1.27	1.27	76.05	2.8465	2.8536	0.0071	93.4				
	17-Jun-13	Cloudy	0.3E	30	655042	655142	60.0	40	40	1.27	1.27	1.27	76.05	2.8540	2.8600	0.0060	78.9	70.1		Nil	Vehicles
		Cloudy	0.3E	30	655142	655242	60.0	40	40	1.27	1.27	1.27	76.05	2.8589	2.8631	0.0042	55.2				
		Cloudy	0.3E	30	655242	655342	60.0	40	40	1.27	1.27	1.27	76.05	2.8652	2.8710	0.0058	76.3				
	21-Jun-13	Sunny	0.6E	32	655342	655442	60.0	40	40	1.27	1.27	1.27	76.05	2.8746	2.8782	0.0036	47.3	59.6		Nil	Vehicles
		Sunny	0.6E	32	655442	655542	60.0	40	40	1.27	1.27	1.27	76.05	2.8762	2.8825	0.0063	82.8				
		Sunny	0.6E	32	655542	655642	60.0	40	40	1.27	1.27	1.27	76.05	2.8410	2.8447	0.0037	48.6				
	27-Jun-13	Sunny	0.4E	31	655642	655742	60.0	40	40	1.27	1.27	1.27	76.05	3.8149	3.8201	0.0052	68.4	78.0		Nil	Vehicles
		Sunny	0.4E	31	655742	655842	60.0	40	40	1.27	1.27	1.27	76.05	3.7752	3.7816	0.0064	84.2				
		Sunny	0.4E	31	655842	655942	60.0	40	40	1.27	1.27	1.27	76.05	3.7868	3.7930	0.0062	81.5				
Hong Hoi Chee Hong Temple - Intake (ASR3)	5-Jun-13	Sunny	0.3E	29	623290	623390	60.0	40	40	1.19	1.19	1.19	71.65	2.8803	2.8830	0.0027	37.7	90.3	327.4/500	Crane operation and concrete work	Vehicles
		Sunny	0.3E	29	623390	623490	60.0	40	40	1.19	1.19	1.19	71.65	2.8790	2.8863	0.0073	101.9				
		Sunny	0.3E	29	623490	623590	60.0	40	40	1.19	1.19	1.19	71.65	2.8526	2.8620	0.0094	131.2				
	11-Jun-13	Rainy	0.5E	23	623590	623690	60.0	40	40	1.19	1.19	1.19	71.65	2.8236	2.8324	0.0088	122.8	137.7		Crane operation and concrete work	Vehicles
		Rainy	0.5E	23	623690	623790	60.0	40	40	1.19	1.19	1.19	71.65	2.8551	2.8641	0.0090	125.6				
		Rainy	0.5E	23	623790	623890	60.0	40	40	1.19	1.19	1.19	71.65	2.8718	2.8836	0.0118	164.7				
	17-Jun-13	Cloudy	0.3E	30	623890	623990	60.0	40	40	1.19	1.19	1.19	71.65	2.8588	2.8655	0.0067	93.5	80.5		Crane operation and excavation work	Vehicles
		Cloudy	0.3E	30	623990	624090	60.0	40	40	1.19	1.19	1.19	71.65	2.8662	2.8715	0.0053	74.0				
		Cloudy	0.3E	30	624090	624190	60.0	40	40	1.19	1.19	1.19	71.65	2.8875	2.8928	0.0053	74.0				
	21-Jun-13	Sunny	0.5E	32	624190	624290	60.0	40	40	1.19	1.19	1.19	71.65	2.8567	2.8607	0.0040	55.8	83.3		Crane operation and excavation work	Vehicles
		Sunny	0.5E	32	624290	624390	60.0	40	40	1.19	1.19	1.19	71.65	2.8568	2.8662	0.0094	131.2				
		Sunny	0.5E	32	624390	624490	60.0	40	40	1.19	1.19	1.19	71.65	2.8562	2.8607	0.0045	62.8				
	27-Jun-13	Sunny	0.3E	31	624490	624590	60.0	40	40	1.19	1.19	1.19	71.65	3.7649	3.7727	0.0078	108.9	74.9		Crane operation	Vehicles
		Sunny	0.3E	31	624590	624690	60.0	40	40	1.19	1.19	1.19	71.65	3.7683	3.7731	0.0048	67.0				
		Sunny	0.3E	31	624690	624790	60.0	40	40	1.19	1.19	1.19	71.65	3.7940	3.7975	0.0035	48.9				
Long Beach Gardens - Outfall (ASR8)	5-Jun-13	Sunny	0.5E	29	617434	617534	60.0	40	40	1.21	1.21	1.21	72.57	2.8487	2.8538	0.0051	70.3	93.7	336.6/500	Crane operation and excavation work	Vehicles
		Sunny	0.5E	29	617534	617634	60.0	40	40	1.21	1.21	1.21	72.57	2.8585	2.8660	0.0075	103.3				
		Sunny	0.5E	29	617634	617734	60.0	40	40	1.21	1.21	1.21	72.57	2.8468	2.8546	0.0078	107.5				
	11-Jun-13	Rainy	1.2E	23	617734	617834	60.0	40	40	1.21	1.21	1.21	72.57	2.8606	2.8697	0.0091	125.4	97.4		Crane operation and excavation work	Vehicles
		Rainy	1.2E	23	617834	617934	60.0	40	40	1.21	1.21	1.21	72.57	2.8678	2.8760	0.0082	113.0				
		Rainy	1.2E	23	617934	618034	60.0	40	40	1.21	1.21	1.21	72.57	2.8616	2.8655	0.0039	53.7				
	17-Jun-13	Cloudy	0.5E	30	618034	618134	60.0	40	40	1.21	1.21	1.21	72.57	2.8758	2.8806	0.0048	66.1	77.2		Crane operation and excavation work	Vehicles
		Cloudy	0.5E	30	618134	618234	60.0	40	40	1.21	1.21	1.21	72.57	2.8635	2.8686	0.0051	70.3				
		Cloudy	0.5E	30	618234	618334	60.0	40	40	1.21	1.21	1.21	72.57	2.8461	2.8530	0.0069	95.1				
	21-Jun-13	Sunny	0.8E	32	618334	618434	60.0	40	40	1.21	1.21	1.21	72.57	2.8504	2.8581	0.0077	106.1	99.7		Crane operation and excavation work	Vehicles
		Sunny	0.8E	32	618434	618534	60.0	40	40	1.21	1.21	1.21	72.57	2.8499	2.8562	0.0063	86.8				
		Sunny	0.8E	32	618534	618634	60.0	40	40	1.21	1.21	1.21	72.57	2.8514	2.8591	0.0077	106.1				
	27-Jun-13	Sunny	0.5E	31	618634	618734	60.0	40	40	1.21	1.21	1.21	72.57	3.7323	3.7352	0.0029	40.0	104.3		Crane operation and excavation work	Vehicles
		Sunny	0.5E	31	618734	618834	60.0	40	40	1.21	1.21	1.21	72.57	3.7360	3.7449	0.0089	122.6				
		Sunny	0.5E	31	618834	618934	60.0	40	40	1.21	1.21	1.21	72.57	3.7315	3.7424	0.0109	150.2				
Greenview Terrace - Outfall (ASR9)	5-Jun-13	Sunny	0.5E	29	609980	610080	60.0	40	40	1.21	1.21	1.21	72.32	2.8600	2.8635	0.0035	48.4	89.0	329.2/500	Crane operation and excavation work	Vehicles
		Sunny	0.5E	29	610080	610180	60.0	40	40	1.21	1.21	1.21	72.32	2.8626	2.8703	0.0077	106.5				
		Sunny	0.5E	29	610180	610280	60.0	40	40	1.21	1.21	1.21	72.32	2.8760	2.8841	0.0081	112.0				
	11-Jun-13	Rainy	0.8E	23	610280	610380	60.0	40	40	1.21	1.21	1.21	72.32	2.8685	2.8768	0.0083	114.8	109.2		Crane operation and excavation work	Vehicles
		Rainy	0.8E	23	610380	610480	60.0	40	40	1.21	1.21	1.21	72.32	2.8368	2.8465	0.0097	134.1				
		Rainy	0.8E	23	610480	610580	60.0	40	40	1.21	1.21	1.21	72.32	2.8441	2.8498	0.0057	78.8				
	17-Jun-13	Cloudy	0.5E	30	610580	610680	60.0	40	40	1.21	1.21	1.21	72.32	2.8420	2.8476	0.0056	77.4	80.7		Crane operation and excavation work	Vehicles
		Cloudy	0.5E	30	610680	610780	60.0	40	40	1.21	1.21	1.21	72.32	2.8595	2.8653	0.0058	80.2				
		Cloudy	0.5E	30	610780	610880	60.0	40	40	1.21	1.21	1.21	72.32	2.8553	2.8614	0.0061	84.4				
	21-Jun-13	Sunny	1.0E	32	610880	610980	60.0	40	40	1.21	1.21	1.21	72.32	2.8332	2.8423	0.0091	125.8	89.0		Crane operation and excavation work	Vehicles
		Sunny	1.0E	32	610980	611080	60.0	40	40	1.21	1.21	1.21	72.32	2.8508	2.8554	0.0046	63.6				
		Sunny	1.0E	32	611080	611180	60.0	40	40	1.21	1.21	1.21	72.32	2.8630	2.8686	0.0056	77.4				
	27-Jun-13	Sunny	0.5E	31	611180	611280	60.0	40	40	1.21	1.21	1.21	72.32	3.7422	3.7520	0.0098	135.5	106.5		Crane operation and excavation work	Vehicles
		Sunny	0.5E	31	611280	611380	60.0	40	40	1.21	1.21	1.21	72.32	3.7455	3.7514	0.0059	81.6				
		Sunny	0.5E	31	611380	611480	60.0	40	40	1.21	1.21	1.21	72.32	3.7486	3.7560	0.0074	102.3				

Note:

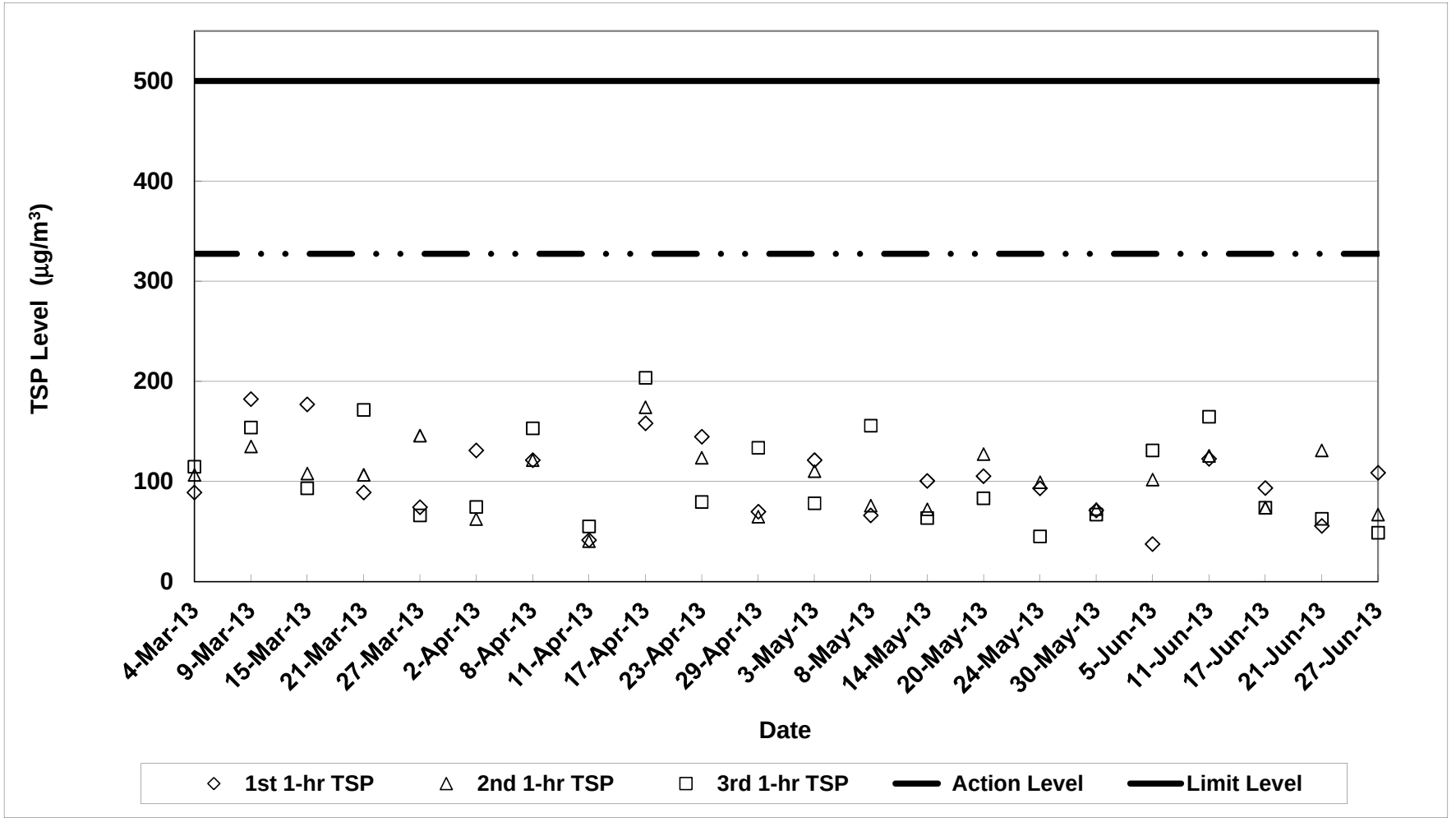
Italic font and yellow shaded indicates an exceedance of Action Level

Bold font and red shaded area indicates an exceedance of Limit Level

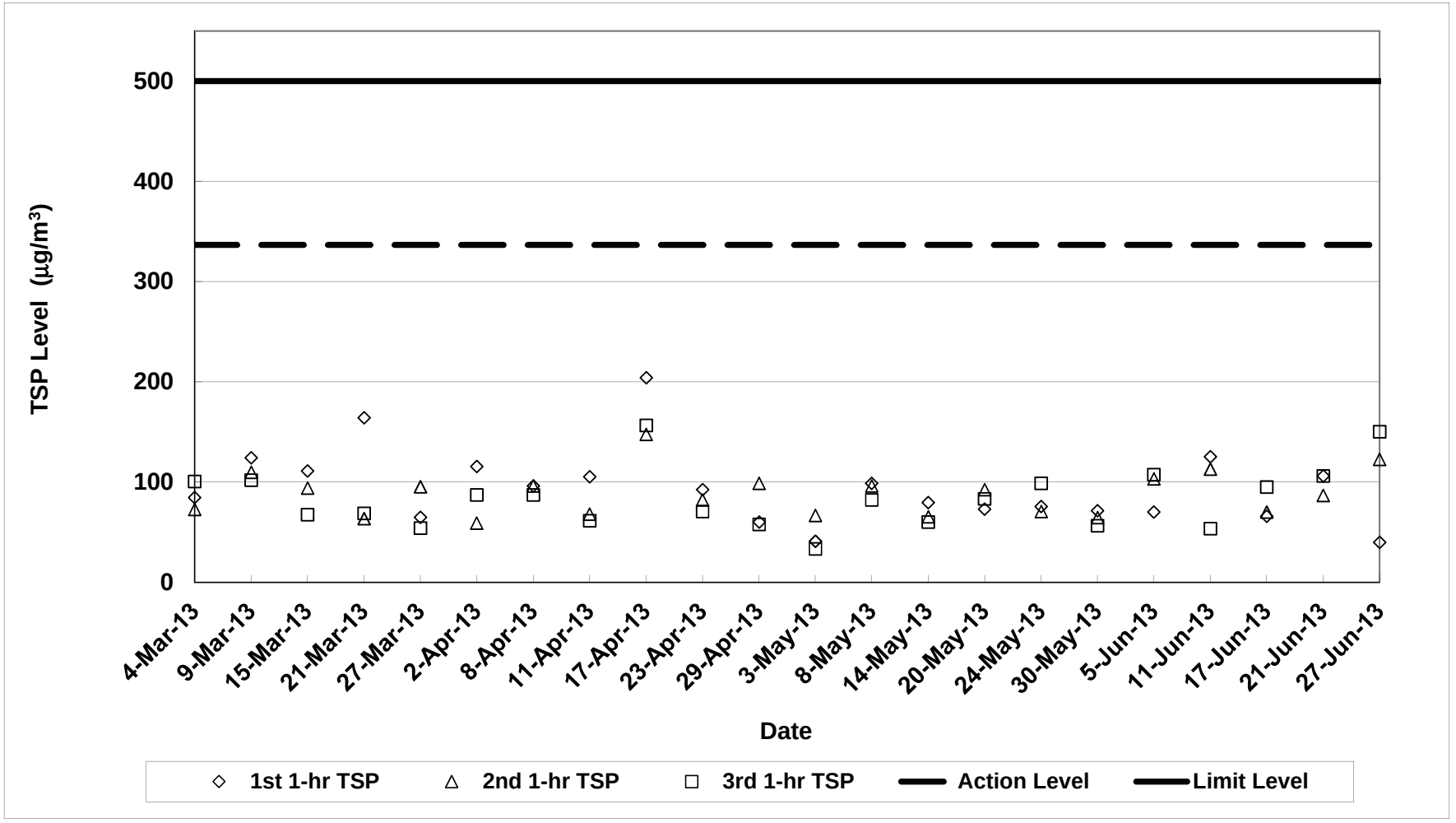
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Air Quality Monitoring (1-hr TSP) Results at Sik Sik Yuen Ho Fung College - Intake (ASR1)
Mar-13 to Jun-13



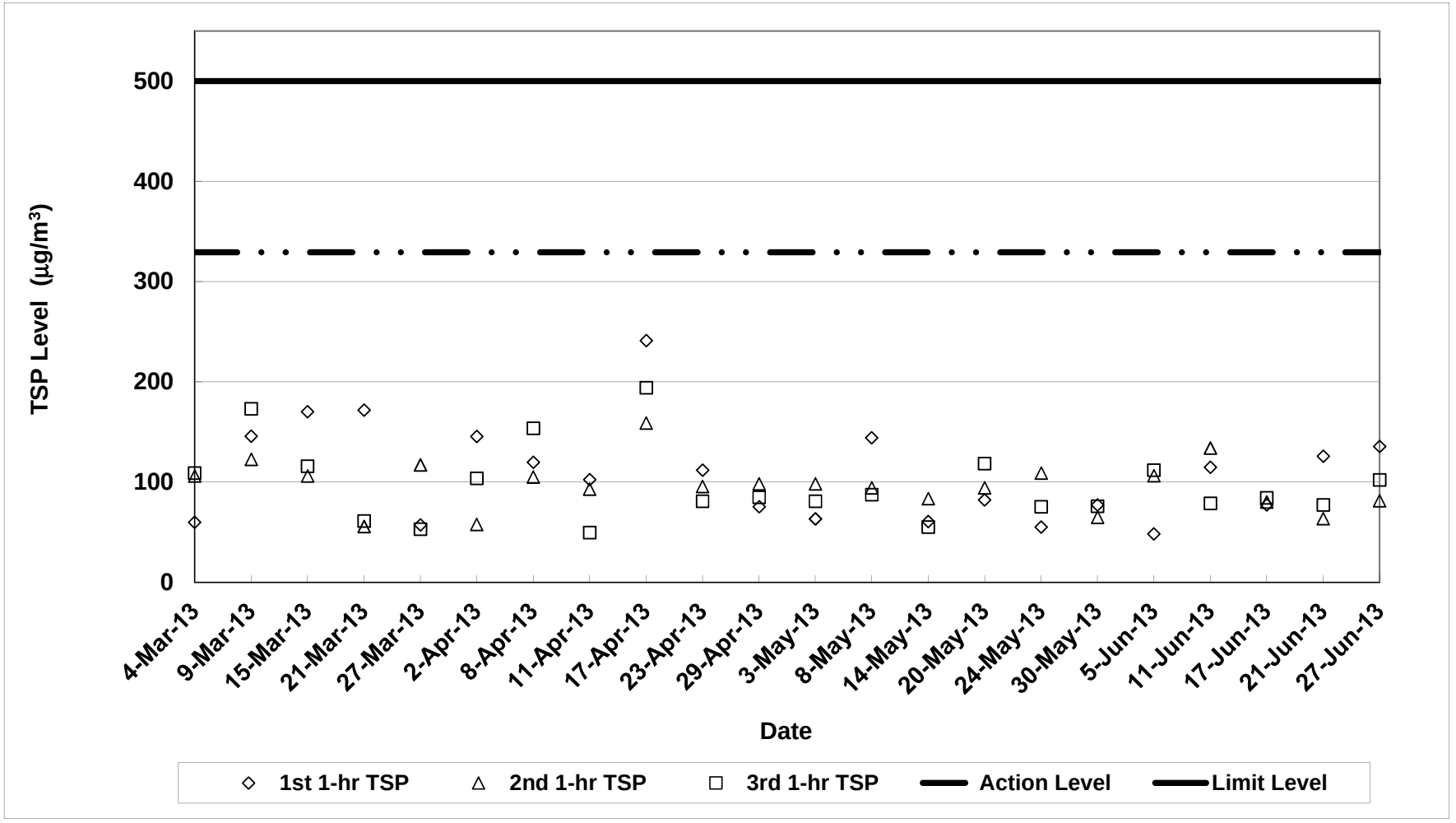
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Air Quality Monitoring (1-hr TSP) Results at Hong Hoi Chee Hong Temple - Intake (ASR3)
Mar-13 to Jun-13



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Air Quality Monitoring (1-hr TSP) Results at Long Beach Gardens - Outfall (ASR8)
Mar-13 to Jun-13



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Air Quality Monitoring (1-hr TSP) Results at Greenview Terrace - Outfall (ASR9)
Mar-13 to Jun-13



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel

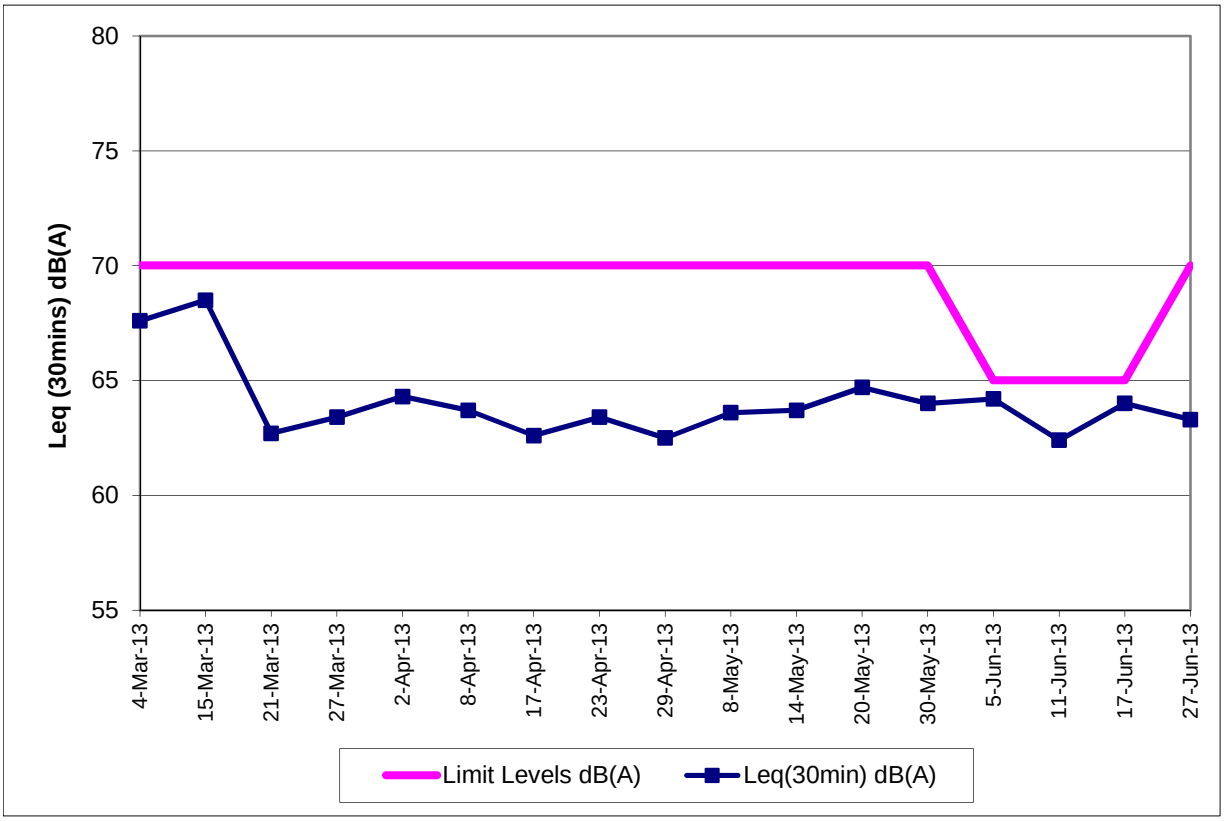
Noise Impact Monitoring Results

Monitoring Locations	Date	Weather Conditions	Temperature (^{o}C)	Wind Speed (m/s)	Wind Direction	Start Time	End Time	BL[1] dB(A)	LL[2] dB(A)	$L_{eq(30min)}$ dB(A)	$L_{10(30min)}$ dB(A)	$L_{90(30min)}$ dB(A)	CNL[3] dB(A)	Observation / Site Condition	Other Noise Sources
Sik Sik Yuen Ho Fung College NSR 1	5-Jun-13	Sunny	29	0.3	E	13:05	13:35	66.1	65	64.2	66.5	59.6	-	Nil	Traffic noise
	11-Jun-13	Rainy	23	0.3	E	15:30	16:00		65	62.4	64.8	58.6	-	Nil	Traffic noise
	17-Jun-13	Cloudy	30	0.3	E	16:44	17:14		65	64.0	66.5	58.4	-	Nil	Traffic noise
	27-Jun-13	Sunny	31	0.4	E	15:11	15:41		70	63.3	66.1	58.6	-	Nil	Traffic noise
									70				-		
Hong Hoi Chee Hong Temple NSR 3	5-Jun-13	Sunny	29	0.3	E	13:45	14:15	57.9	75	62.9	64.7	60.7	-	Crane operation and concrete work	Traffic noise
	11-Jun-13	Rainy	23	0.5	E	16:25	16:55		75	64.1	65.4	62.4	-	Crane operation and concrete work	Traffic noise
	17-Jun-13	Cloudy	30	0.3	E	16:05	16:35		75	59.3	61.0	57.5	-	Crane operation and excavation work	Traffic noise
	27-Jun-13	Sunny	31	0.3	E	15:50	16:20		75	62.7	66.0	58.0	-	Crane operation	Traffic noise
									75				-		
Squatters NSR 6	5-Jun-13	Sunny	29	0.3	E	14:58	15:08	61.2	75	56.7	58.9	54.1	-	Rock breaking and excavation work	Birds
	11-Jun-13	Rainy	23	0.5	E	16:45	17:15		75	55.7	56.9	53.1	-	Concrete work and excavation work	Birds
	17-Jun-13	Cloudy	30	0.2	E	11:14	11:44		75	54.4	56.7	51.8	-	Crane operation and excavation work	Birds
	27-Jun-13	Sunny	31	0.2	E	11:14	11:44		75	56.3	60.0	51.0	-	Excavation work	Birds and insect noise
									75				-		
Long Beach Gardens NSR 8	5-Jun-13	Sunny	29	0.4	E	10:33	11:03	60.9	75	64.4	66.3	62.1	-	Crane operation and excavation work	Traffic noise
	11-Jun-13	Rainy	23	1.2	E	15:00	15:30		75	63.5	65.5	59.2	-	Crane operation and excavation work	Traffic noise
	17-Jun-13	Cloudy	30	0.5	E	10:33	11:03		75	64.1	65.7	62.1	-	Crane operation and excavation work	Traffic noise
	27-Jun-13	Sunny	31	0.5	E	10:34	11:04		75	64.0	66.4	61.2	-	Crane operation and excavation work	Traffic noise
									75				-		
Greenview Terrace NSR 9	5-Jun-13	Sunny	29	0.6	E	11:14	11:44	59.7	75	63.7	65.9	61.4	-	Crane operation and excavation work	Traffic noise and insect noise
	11-Jun-13	Rainy	23	0.8	E	15:40	16:10		75	64.0	67.3	61.0	-	Crane operation and excavation work	Traffic noise
	17-Jun-13	Cloudy	30	0.5	E	9:55	10:25		75	64.5	66.2	62.6	-	Crane operation and excavation work	Traffic noise
	27-Jun-13	Sunny	31	0.5	E	9:55	10:25		75	67.7	69.8	64.5	-	Crane operation and excavation work	Traffic noise and aircraft noise
									75				-		

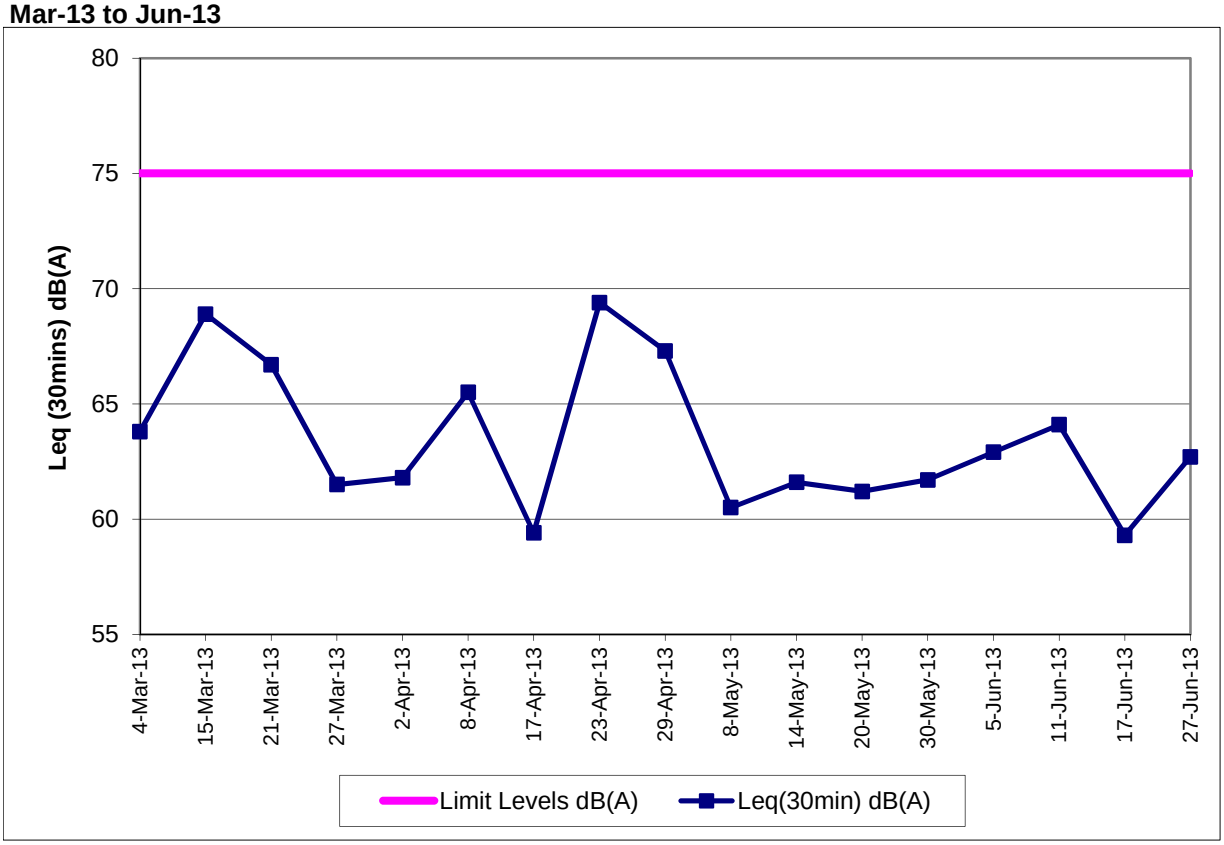
1: Baseline Noise Level
2: Limit Level
3: Corrected Noise Level

Note:
The limit level of NSR1 is 65dB(A) during school examination period.
Red Bold indicates an exceedance of Limit Level

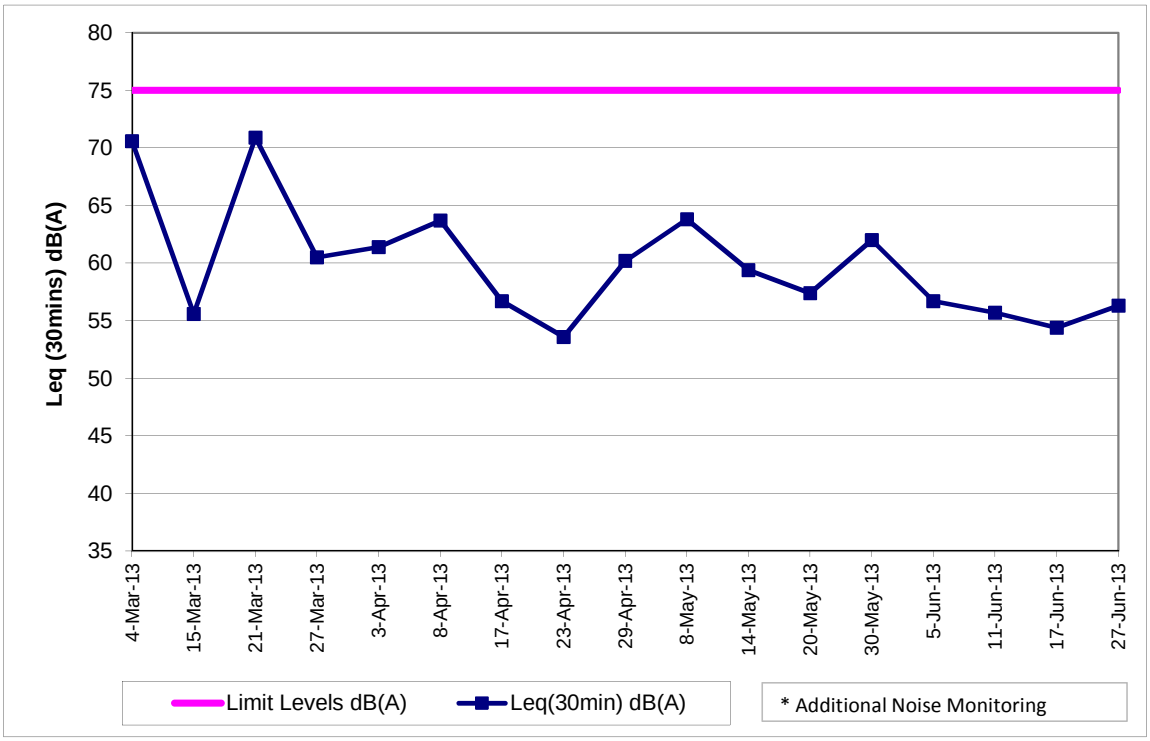
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Sik Sik Yuen Ho Fung College (NSR 1)
Mar-13 to Jun-13



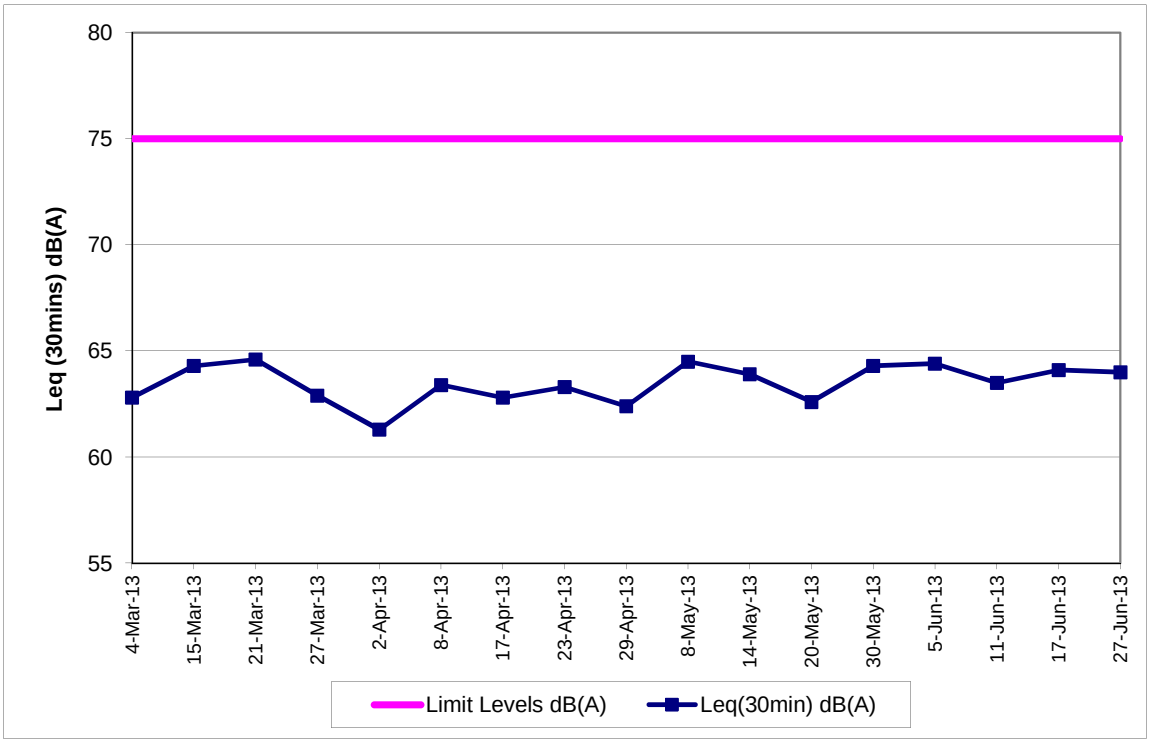
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Hong Hoi Chee Hong Temple (NSR 3)
Mar-13 to Jun-13



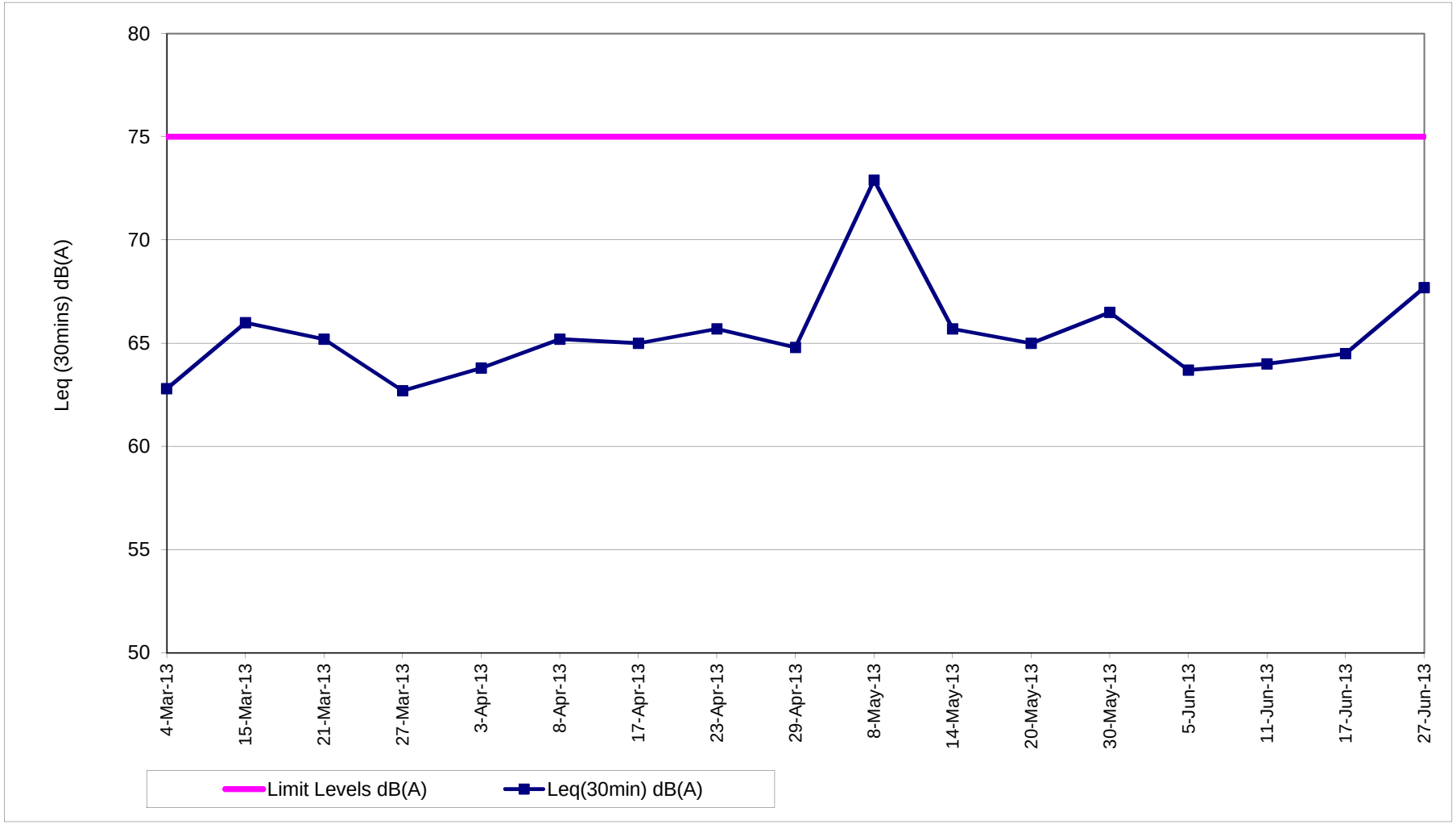
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Squatters (NSR 6)
Mar-13 to Jun-13



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Long Beach Gardens (NSR 8)
Mar-13 to Jun-13



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Noise Monitoring Results at Greenview Terrace (NSR 9)
Mar-13 to Jun-13



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel

Water Quality Impact Monitoring Results

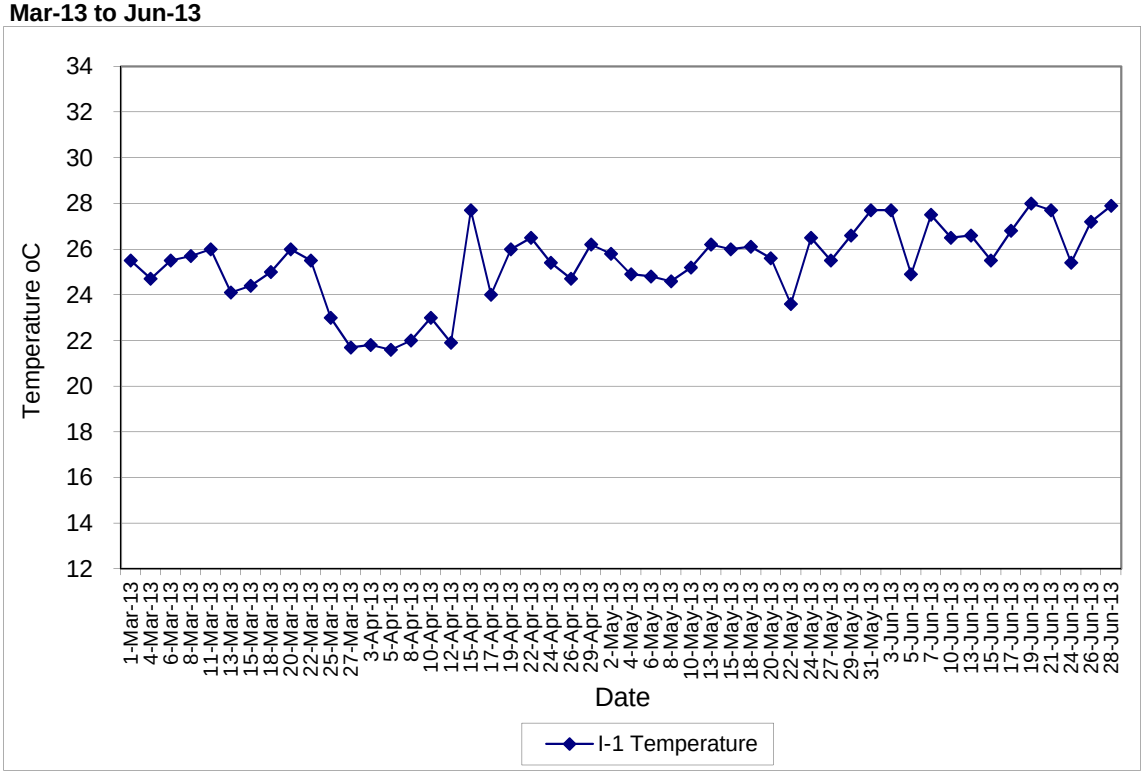
Monitoring Locations	Date	Start Time	Weather	Water Depth(m)	Temp			DO (mg/L)			Action/Limit Level of DO(mg/L)	pH			Turbidity (NTU)			Action/Limit Level of Tby	SS (mg/L)			Action/Limit Level of SS(mg/L)	Remarks	Action to be taken
					1	2	Avg	1	2	Avg		1	2	Avg	1	2	Avg		1	2	Avg			
Sik Sik Yuen Ho Fung College I-1	3-Jun-13	16:46	Sunny	<1	27.70	27.70	27.70	8.69	8.73	8.71	3.42 / 3.34	7.80	7.80	7.80	4.86	4.91	4.89	9.75 / 12.47	5.10	4.50	4.80	8.85 / 10.17	Nil	Nil
	5-Jun-13	16:38	Rainy	<1	24.90	24.90	24.90	7.93	7.97	7.95		7.95	7.95	7.95	3.80	3.82	3.81		3.10	2.50	2.80		Nil	Nil
	7-Jun-13	14:36	Sunny	<1	27.50	27.50	27.50	8.46	8.42	8.44		7.96	7.96	7.96	7.80	7.85	7.83		10.40	9.30	*9.85*		Nil	Nil
	10-Jun-13	16:00	Cloudy	<1	26.50	26.50	26.50	7.98	8.04	8.01		7.96	7.96	7.96	9.60	9.72	9.66		6.00	5.10	5.55		Nil	Nil
	13-Jun-13	15:51	Cloudy	<1	26.60	26.60	26.60	7.92	7.96	7.94		7.85	7.85	7.85	2.62	2.66	2.64		<2.00	<2.00	<2.00		Nil	Nil
	15-Jun-13	10:08	Rainy	<1	25.50	25.50	25.50	7.94	7.99	7.97		7.95	7.95	7.95	21.00	21.10	**21.05**		10.50	10.30	**10.40**		Nil	Nil
	17-Jun-13	17:04	Cloudy	<1	26.80	26.80	26.80	8.66	8.69	8.68		7.91	7.91	7.91	2.97	2.95	2.96		<2.00	<2.00	<2.00		Nil	Nil
	19-Jun-13	15:22	Sunny	<1	28.00	28.00	28.00	9.08	9.02	9.05		7.95	7.95	7.95	2.70	2.72	2.71		2.20	2.30	2.25		Nil	Nil
	21-Jun-13	15:22	Sunny	<1	27.70	27.70	27.70	9.08	9.05	9.07		7.96	7.96	7.96	3.02	3.14	3.08		2.20	2.40	2.30		Nil	Nil
	24-Jun-13	13:16	Rainy	<1	25.40	25.40	25.40	9.20	9.24	9.22		7.82	7.82	7.82	27.00	27.90	**27.45**		36.20	36.20	**36.20**		Nil	Nil
	26-Jun-13	12:01	Sunny	<1	27.20	27.20	27.20	8.99	9.04	9.02		7.98	7.98	7.98	6.50	6.62	6.56		7.20	7.40	7.30		Nil	Nil
	28-Jun-13	11:25	Sunny	<1	27.90	27.90	27.90	9.14	9.18	9.16		7.85	7.85	7.85	3.01	3.07	3.04		2.80	2.70	*2.75*		Nil	Nil
				<1																				-
				<1																				-
Sik Sik Yuen Ho Fung College I-1-C	3-Jun-13	16:35	Sunny	<1	27.70	27.70	27.70	8.62	8.65	8.64	- /-	7.80	7.80	7.80	4.73	4.80	4.77	- /-	5.20	5.00	5.10	- /-	Nil	Nil
	5-Jun-13	16:27	Rainy	<1	24.90	24.90	24.90	7.86	7.90	7.88		7.95	7.95	7.95	3.77	3.86	3.82		2.20	3.10	2.65		Nil	Nil
	7-Jun-13	14:25	Sunny	<1	27.50	27.50	27.50	8.50	8.53	8.52		7.96	7.96	7.96	7.60	7.77	7.69		9.90	11.20	10.55		Nil	Nil
	10-Jun-13	15:50	Cloudy	<1	26.50	26.50	26.50	7.90	7.93	7.92		7.96	7.96	7.96	9.91	9.87	9.89		5.20	5.20	5.20		Nil	Nil
	13-Jun-13	15:40	Cloudy	<1	26.60	26.60	26.60	7.85	7.87	7.86		7.85	7.85	7.85	2.70	2.65	2.68		<2.00	<2.00	<2.00		Nil	Nil
	15-Jun-13	9:57	Rainy	<1	25.50	25.50	25.50	7.86	7.91	7.89		7.95	7.95	7.95	21.20	21.30	21.25		14.30	13.80	14.05		Nil	Nil
	17-Jun-13	16:53	Cloudy	<1	26.80	26.80	26.80	8.62	8.59	8.61		7.91	7.91	7.91	2.89	2.94	2.92		<2.00	<2.00	<2.00		Nil	Nil
	19-Jun-13	15:10	Sunny	<1	28.00	28.00	28.00	9.12	9.15	9.14		7.95	7.95	7.95	2.85	2.74	2.80		2.20	2.10	2.15		Nil	Nil
	21-Jun-13	15:10	Sunny	<1	27.70	27.70	27.70	9.15	9.18	9.17		7.96	7.96	7.96	3.10	3.17	3.14		2.60	2.00	2.30		Nil	Nil
	24-Jun-13	13:05	Rainy	<1	25.40	25.40	25.40	9.18	9.15	9.17		7.82	7.82	7.82	27.10	27.00	27.05		35.60	35.10	35.35		Nil	Nil
	26-Jun-13	11:50	Sunny	<1	27.20	27.20	27.20	8.90	8.93	8.92		7.98	7.98	7.98	6.78	6.92	6.85		6.50	6.60	6.55		Nil	Nil
	28-Jun-13	11:13	Sunny	<1	27.90	27.90	27.90	9.06	9.09	9.08		7.85	7.85	7.85	3.03	3.11	3.07		2.10	2.20	2.15		Nil	Nil
				<1																				-
				<1																				-
Hong Hoi Chee Hong Temple I-2	3-Jun-13	16:21	Sunny	<1	27.80	27.80	27.80	8.54	8.57	8.56	3.66 / 3.63	7.82	7.82	7.82	1.31	1.34	1.33	6.63 / 6.99	<2.00	<2.00	<2.00	7.68 / 8.34	Crane operation	Nil
	5-Jun-13	16:15	Rainy	<1	24.90	24.90	24.90	7.78	7.76	7.77		7.91	7.91	7.91	2.18	2.16	2.17		2.50	2.00	2.25		Crane operation and concrete work	Nil
	7-Jun-13	14:10	Sunny	<1	27.60	27.60	27.60	8.32	8.30	8.31		7.95	7.95	7.95	1.37	1.39	1.38		<2.00	<2.00	<2.00		Crane operation and rock breaking	Nil
	10-Jun-13	16:25	Cloudy	<1	26.60	26.60	26.60	8.11	8.16	8.14		7.95	7.95	7.95	1.30	1.34	1.32		<2.00	<2.00	<2.00		Crane operation	Nil
	13-Jun-13	16:21	Cloudy	<1	26.60	26.60	26.60	7.94	7.90	7.92		7.86	7.86	7.86	1.18	1.21	1.20		2.00	<2.00	2.00		Crane operation and rock breaking	Nil
	15-Jun-13	9:45	Rainy	<1	25.40	25.40	25.40	7.80	7.77	7.79		7.96	7.96	7.96	22.60	22.50	**22.55**		19.50	18.90	**19.20**		Crane operation	Nil
	17-Jun-13	16:26	Cloudy	<1	26.60	26.60	26.60	8.55	8.53	8.54		7.90	7.90	7.90	1.60	1.65	1.63		<2.00	<2.00	<2.00		Crane operation and excavation work	Nil
	19-Jun-13	15:46	Sunny	<1	28.10	28.10	28.10	8.96	8.93	8.95		7.96	7.96	7.96	1.36	1.41	1.39		2.50	2.70	2.60		Crane operation and rock breaking	Nil
	21-Jun-13	15:46	Sunny	<1	27.80	27.80	27.80	9.06	9.11	9.09		7.95	7.95	7.95	1.42	1.46	1.44		<2.00	<2.00	<2.00		Crane operation and excavation work	Nil
	24-Jun-13	13:40	Rainy	<1	25.50	25.50	25.50	9.20	9.14	9.17		7.80	7.80	7.80	22.20	22.10	**22.15**		18.90	17.60	**18.25**		Nil	Nil
	26-Jun-13	11:40	Sunny	<1	27.30	27.30	27.30	9.09	9.07	9.08		7.96	7.96	7.96	2.37	2.35	2.36		2.10	2.20	2.15		Crane operation	Nil
	28-Jun-13	11:00	Sunny	<1	27.70	27.70	27.70	8.97	8.92	8.95		7.80	7.80	7.80	1.44	1.41	1.43		<2.00	<2.00	<2.00		Crane operation	Nil
				<1																				-
				<1																				-
Hong Hoi Chee Hong Temple I-2-C	3-Jun-13	16:10	Sunny	<1	27.80	27.80	27.80	8.60	8.57	8.59	- /-	7.82	7.82	7.82	1.33	1.30	1.32	- /-	2.00	<2.00	2.00	- /-	Nil	Nil
	5-Jun-13	16:05	Rainy	<1	24.90	24.90	24.90	7.81	7.84	7.83		7.91	7.91	7.91	2.27	2.30	2.29		<2.00	<2.00	<2.00		Nil	Nil
	7-Jun-13	13:58	Sunny	<1	27.60	27.60	27.60	8.39	8.35	8.37		7.95	7.95	7.95	1.45	1.42	1.44		<2.00	<2.00	<2.00		Nil	Nil
	10-Jun-13	16:13	Cloudy	<1	26.60	26.60	26.60	8.08	8.14	8.11		7.95	7.95	7.95	1.25	1.31	1.28		<2.00	<2.00	<2.00		Nil	Nil
	13-Jun-13	16:10	Cloudy	<1	26.60	26.60	26.60	7.99	7.97	7.98		7.86	7.86	7.86	1.22	1.25	1.24		<2.00	<2.00	<2.00		Nil	Nil
	15-Jun-13	9:35	Rainy	<1	25.40	25.40	25.40	7.86	7.84	7.85		7.96	7.96	7.96	22.40	22.50	22.45		21.60	22.30	21.95		Nil	Nil
	17-Jun-13	16:14	Cloudy	<1	26.60	26.60	26.60	8.52	8.49	8.51		7.90	7.90	7.90	1.66	1.74	1.70		<2.00	<2.00	<2.00		Nil	Nil
	19-Jun-13	15:35	Sunny	<1	28.10	28.10	28.10	8.99	9.02	9.01		7.96	7.96	7.96	1.42	1.48	1.45		<2.00	<2.00	<2.00		Nil	Nil
	21-Jun-13	15:35	Sunny	<1	27.80	27.80	27.80	9.00	8.98	8.99		7.95	7.95	7.95	1.50	1.54	1.52		<2.00	<2.00	<2.00		Nil	Nil
	24-Jun-13	13:28	Rainy	<1	25.40	25.40	25.40	9.30	9.26	9.28		7.80	7.80	7.80	22.00	22.10	22.05		17.60	17.20	17.40		Nil	Nil
	26-Jun-13	11:30	Sunny	<1	27.20	27.20	27.20	9.08	9.12	9.10		7.96	7.96	7.96	2.23	2.30	2.27		2.60	2.20	2.40		Nil	Nil
	28-Jun-13	10:50	Sunny	<1	27.70	27.70	27.70	9.02	9.05	9.04		7.80	7.80	7.80	1.48	1.53	1.51		<2.00	<2.00	<2.00		Nil	Nil
				<1																				-
				<1																				-
Squatters I-3	3-Jun-13	15:42	Sunny	<1	27.90	27.90	27.90	8.47	8.44	8.46	3.65 / 3.51	7.82	7.82	7.82	2.07	2.05	2.06	3.99 / 4.18	<2.00	<2.00	<2.00	6.13 / 7.23	Excavation work	Nil
	5-Jun-13	15:32	Rainy	<1	24.80	24.80	24.80	7.95	8.00	7.98		7.89	7.89	7.89	3.40	3.35	3.38		<2.00	<2.00	<2.00		Rock breaking and excavation work	Nil
	7-Jun-13	13:30	Sunny	<1	27.70	27.70	27.70	8.47	8.52	8.50		7.96	7.94	7.95	2.07	2.05	2.06		<2.00	<2.00	<2.00		Rock breaking and excavation work	Nil
	10-Jun-13	17:05	Cloudy	<1	26.70	26.70	26.70	8.01	7.98	8.00		7.90	7.90	7.90	3.57	3.62	3.60		2.60	2.20	2.40		Excavation work	Nil
	13-Jun-13	17:07	Cloudy	<1	26.50	26.50	26.50	8.02	8.05	8.04		7.80	7.80	7.80	1.81	1.85	1.83		<2.00	<2.00	<2.00		Concrete work and excavation work	Nil
	15-Jun-13	9:12	Rainy	<1	25.40	25.40	25.40	7.79	7.81	7.80		7.97	7.97	7.97	20.70	20.60	**20.65**		13.60	13.40	**13.50**		Excavation work	Nil
	17-Jun-13	11:37	Cloudy	<1	26.50	26.50	26.50	8.47	8.50	8.49		7.88	7.88	7.88	2.20	2.26	2.23		<2.00	<2.00	<2.00		Crane operation and excavation work	Nil
	19-Jun-13	16:20	Sunny	<1	28.10	28.10	28.10	8.92	8.88	8.90		7.90	7.90	7.90	1.71	1.75	1.73		<2.00	<2.00	<2.00		Excavation work	Nil
	21-Jun-13	16:17	Sunny	<1	27.80	27.80	27.80	9.20	9.17	9.19		7.91	7.91	7.91	1.70	1.77	1.74		<2.00	<2.00	<2.00		Excavation work	Nil
	24-Jun-13	14:11	Rainy	<1	25.50	25.50	25.50	9.03	9.01	9.02		7.86	7.86	7.86	27.50	27.60	**27.55**		32.70	32.80	**32.75**		Excavation work	Nil
	26-Jun-13	11:00	Sunny	<1	27.40	27.40	27.40	8.92	8.95	8.94		7.90	7.90	7.90	4.22	4.27	**4.25**		2.10	2.90	2.50		Excavation work	Nil
	28-Jun-13	10:26	Sunny	<1	27.70	27.70	27.70	8.87	8.83	8.85		7.81	7.81	7.81	2.43	2.40	2.42		<2.00	<2.00	<2.00		Excavation work	Nil
				<1																				-
				<1																				-
Squatters I-3-C	3-Jun-13	15:30	Sunny	<1	27.90	27.90	27.90	8.52	8.50	8.51	- /-	7.82	7.82	7.82	2.10	2.13	2.12	- /-	<2.00	<2.00	<2.00	- /-	Nil	Nil
	5-Jun-13	15:20	Rainy	<1	24.80	24.80	24.80	7.89	7.92	7.91		7.89	7.89	7.89	3.47	3.42	3.45		<2.00	2.10	2.05		Nil	Nil
	7-Jun-13	13:18	Sunny	<1	27.70	27.70	27.70	8.37	8.40	8.39		7.95	7.95	7.95	2.12	2.18	2.15		<2.00	<2.00	<2.00		Nil	Nil
	10-Jun-13	16:53	Cloudy	<1	26.70	26.70	26.70	8.07	8.03	8.05		7.90	7.90	7.90	3.60	3.71	3.66		3.00	2.80	2.90		Nil	Nil
	13-Jun-13	16:55	Cloudy	<1	26.50	26.50	26.50	7.96	7.99	7.98		7.80	7.80	7.80	1.86	1.89	1.88		<2.00	<2.00	<2.00		Nil	Nil
	15-Jun-13	9:00	Rainy	<1	25.40	25.40	25.40	7.72	7.75	7.74		7.97	7.97	7.97	20.80	20.90	20.85		10.20	9.50	9.85		Nil	Nil
	17-Jun-13	11:25	Cloudy	<1	26.50	26.50	26.50	8.41	8.44	8.43		7.88	7.88	7.88	2.15	2.18	2.17		<2.00	<2.00	<2.00		Nil	Nil
	19-Jun-13	16:08	Sunny	<1	28.10	28.10	28.10	9.00	8.97	8.99		7.90	7.90	7.90	1.76	1.79	1.78		<2.00	<2.00	<2.00		Nil	Nil
	21-Jun-13	16:05	Sunny	<1	27.80	27.80	27.80	9.20	9.23	9.22		7.91	7.91	7.91	1.82	1.74	1.78		<2.00	<2.00	<2.00		Nil	Nil
	24-Jun-13	13:58	Rainy	<1	25.50	25.50	25.50	9.10	9.06	9.08		7.86	7.86	7.86	27.90	28.00	27.95		35.10	34.00	34.55		Nil	Nil
	26-Jun-13	10:50	Sunny	<1	27.40	27.40	27.40	8.86	8.84	8.85		7.91	7.91	7.91	4.10	4.18	4.14		2.50	2.20	2.35		Nil	Nil
	28-Jun-13	10:15	Sunny	<1	27.70	27.70	27.70	8.90	8.94	8.92		7.81	7.81	7.81	2.51	2.62	2.57		<2.00	<2.00	<2.00		Nil	Nil
				<1																				-
				<1																				-

Note:

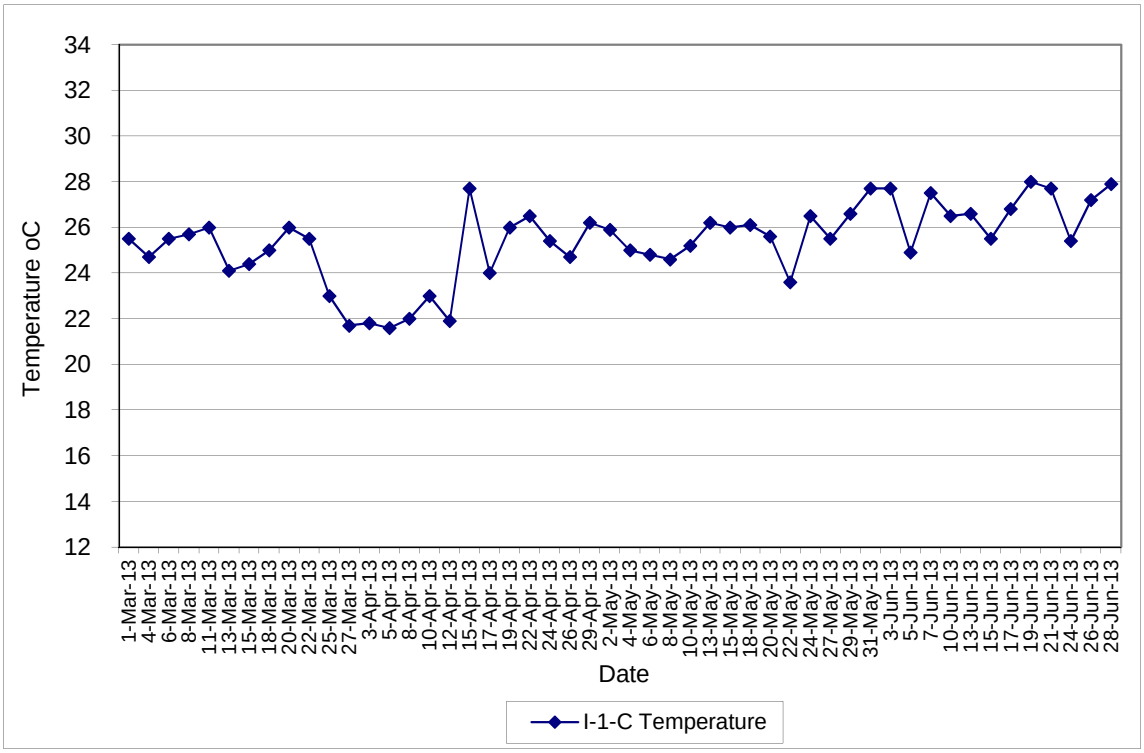
Blue Italic indicates an exceedance of Action Level

Red Bold indicates an exceedance of Limit Level

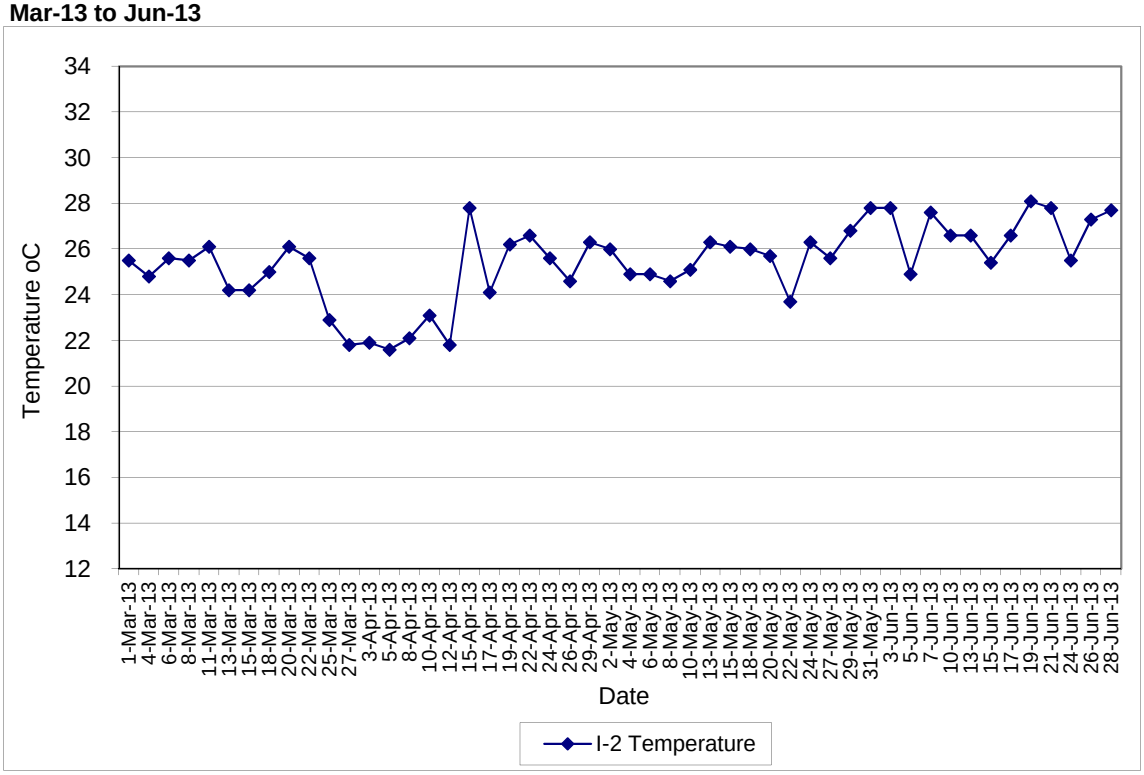
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
Mar-13 to Jun-13



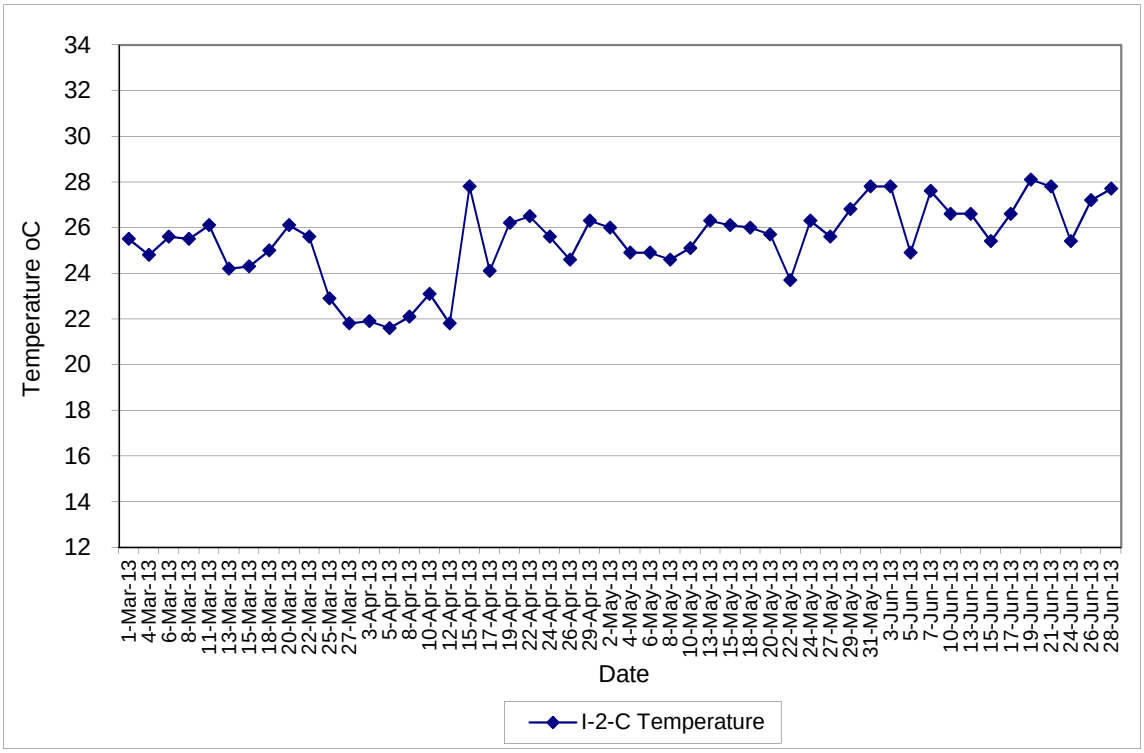
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Mar-13 to Jun-13



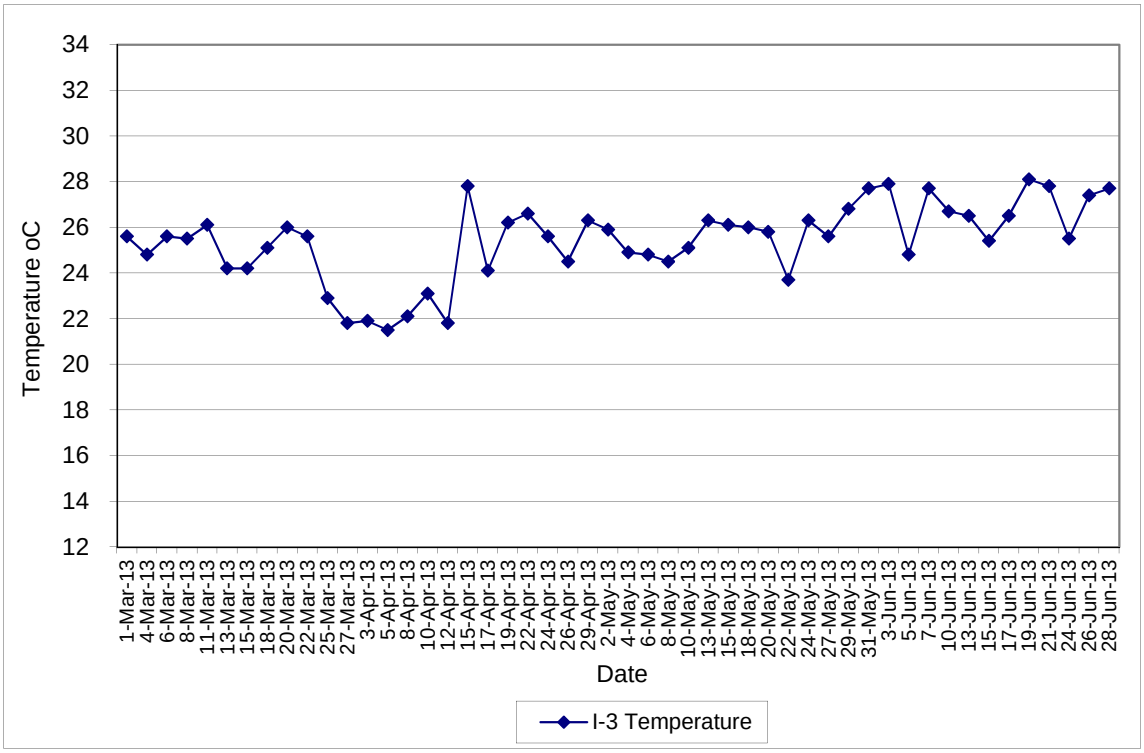
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Mar-13 to Jun-13



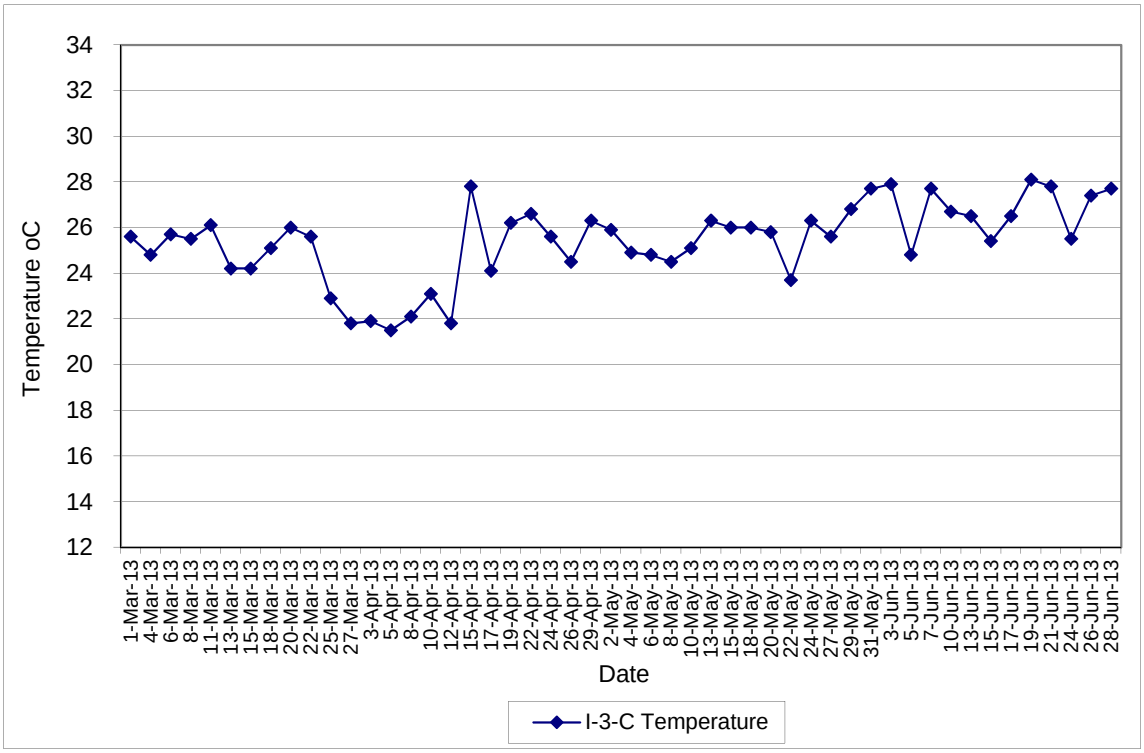
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Mar-13 to Jun-13



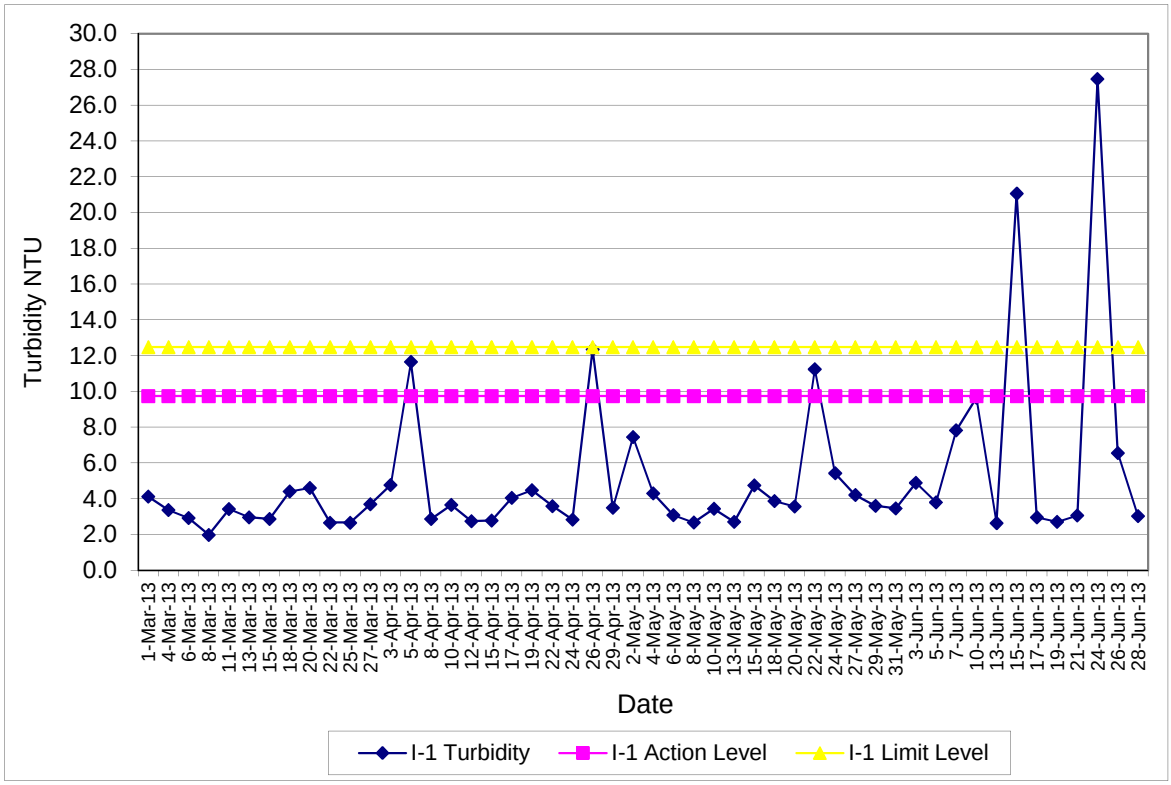
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Mar-13 to Jun-13



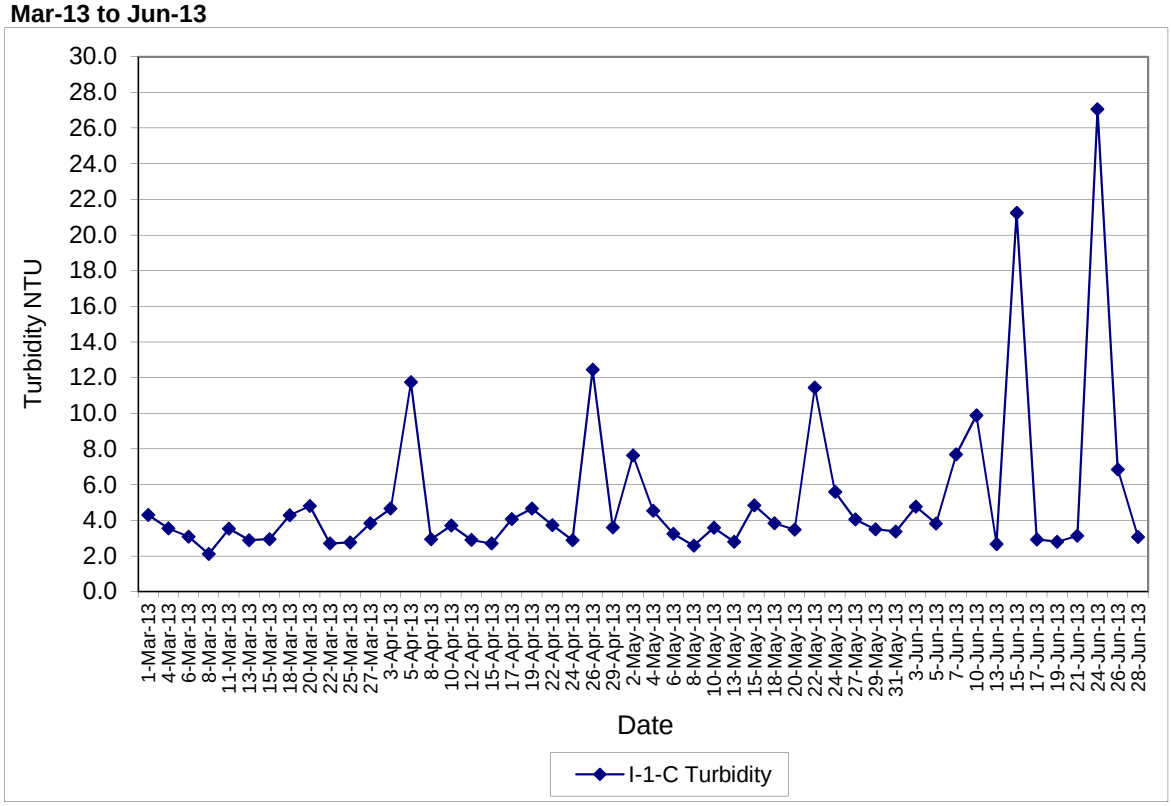
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Mar-13 to Jun-13



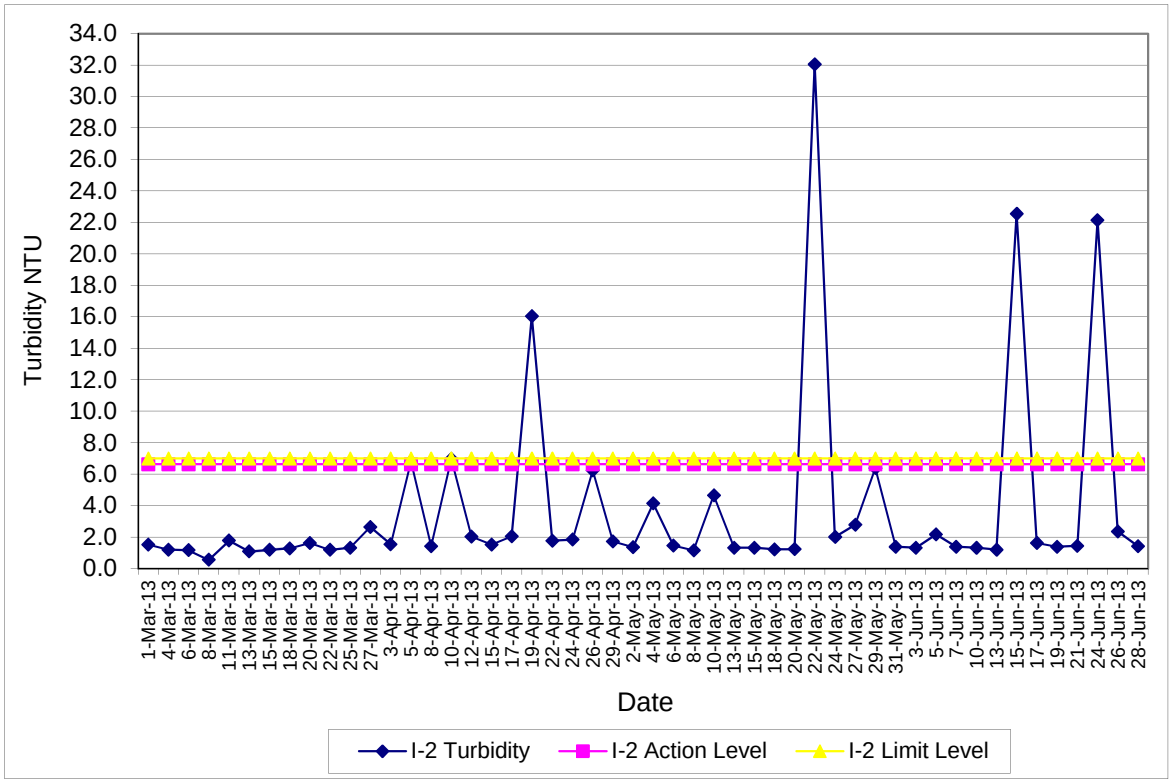
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
Mar-13 to Jun-13



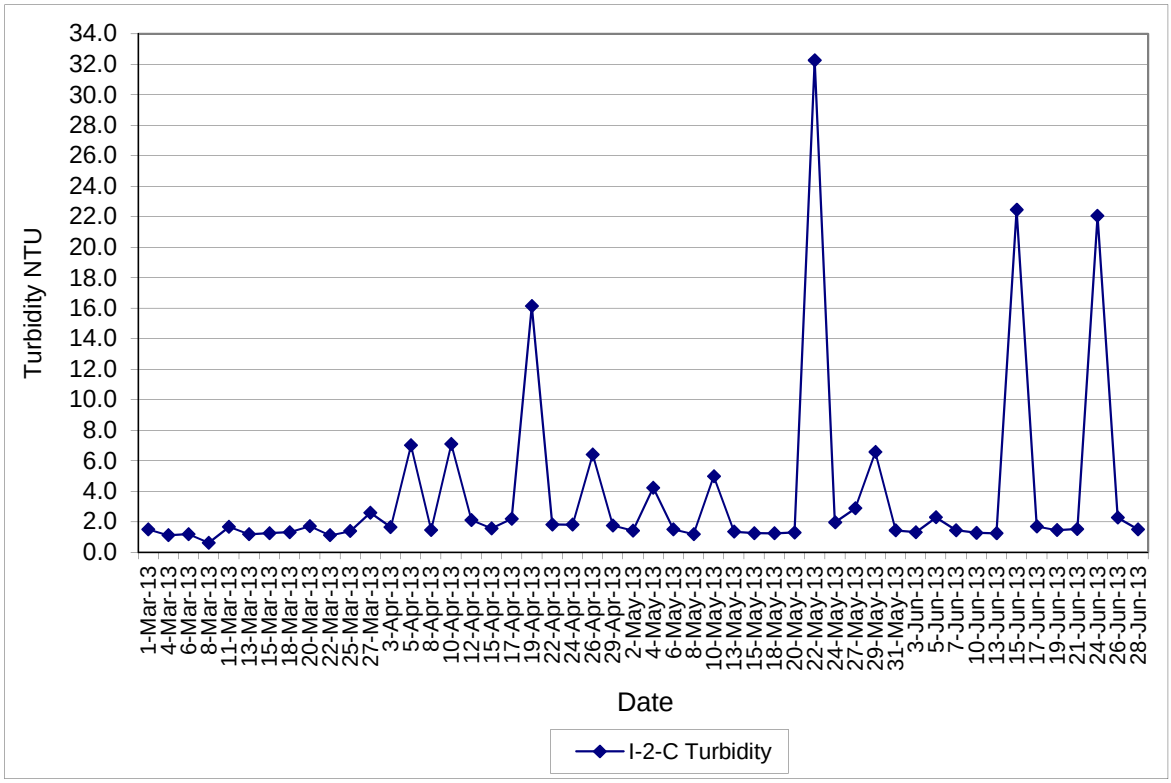
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Mar-13 to Jun-13



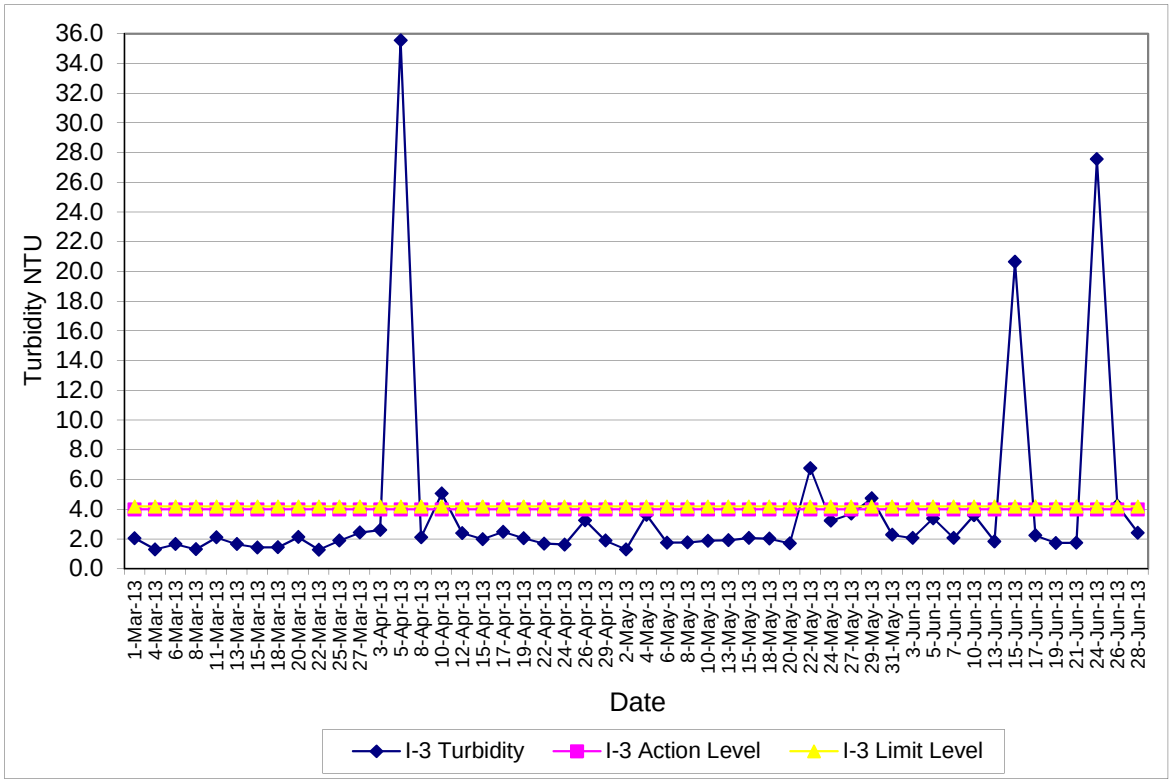
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Mar-13 to Jun-13



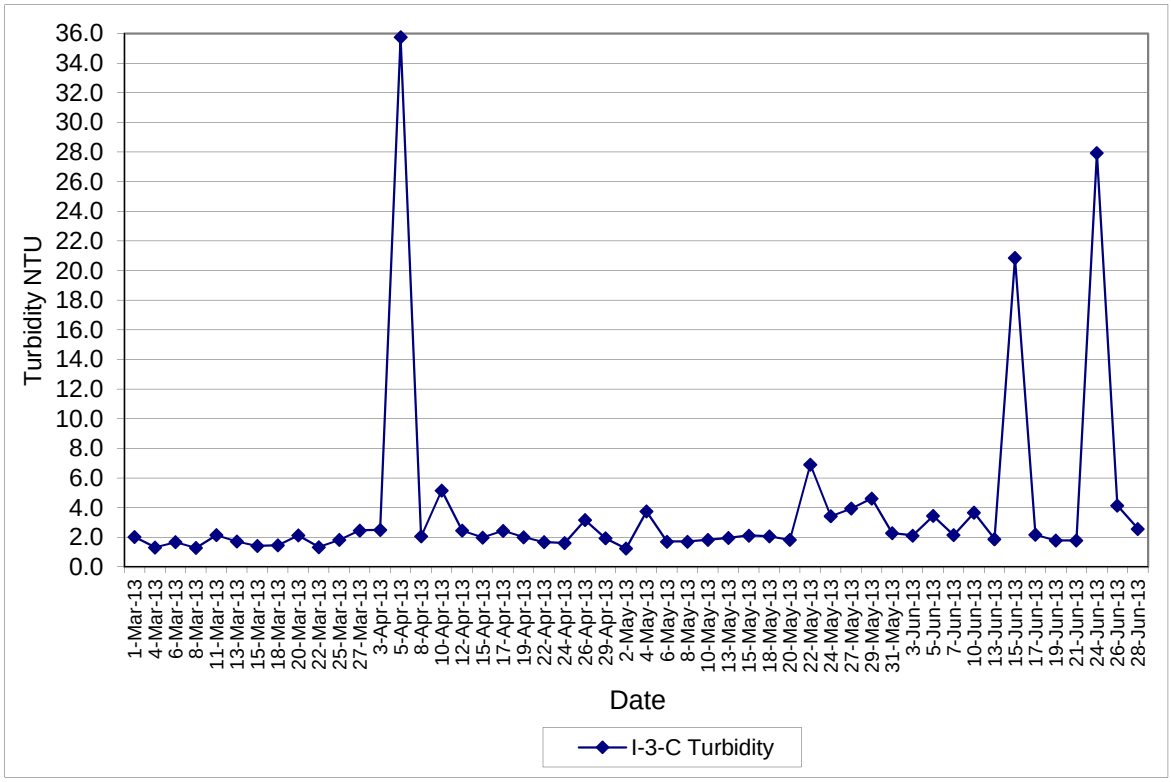
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Mar-13 to Jun-13



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Mar-13 to Jun-13

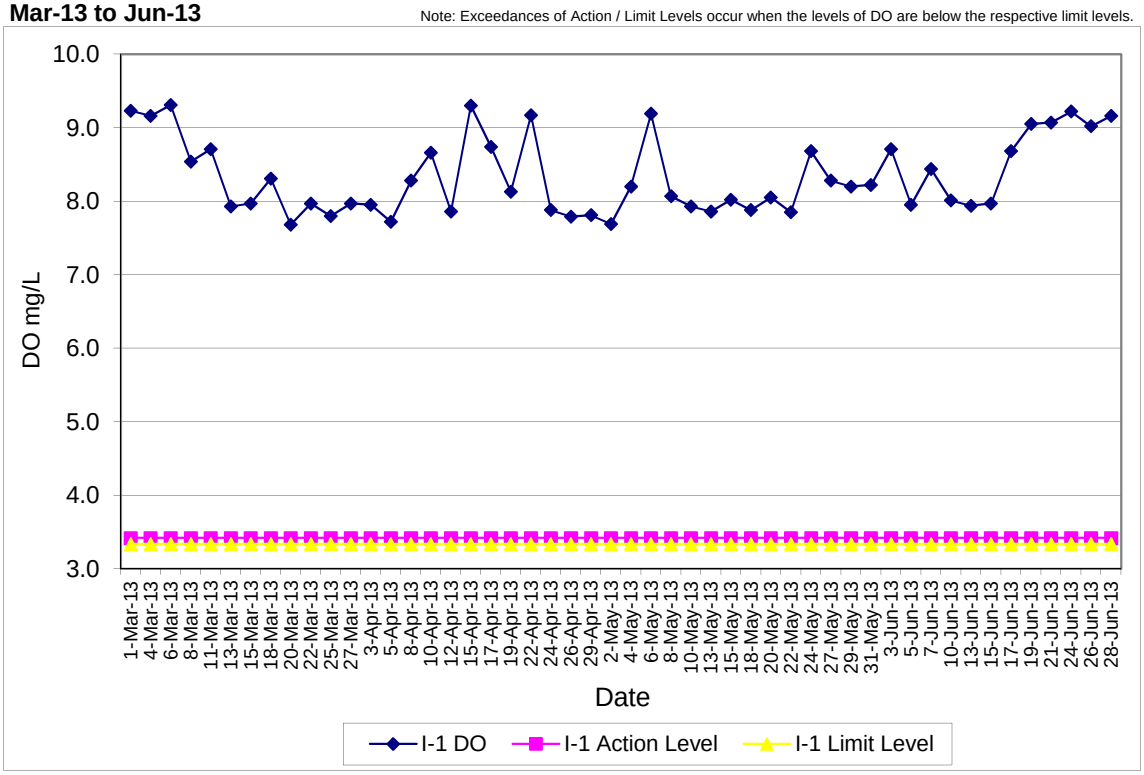


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Mar-13 to Jun-13

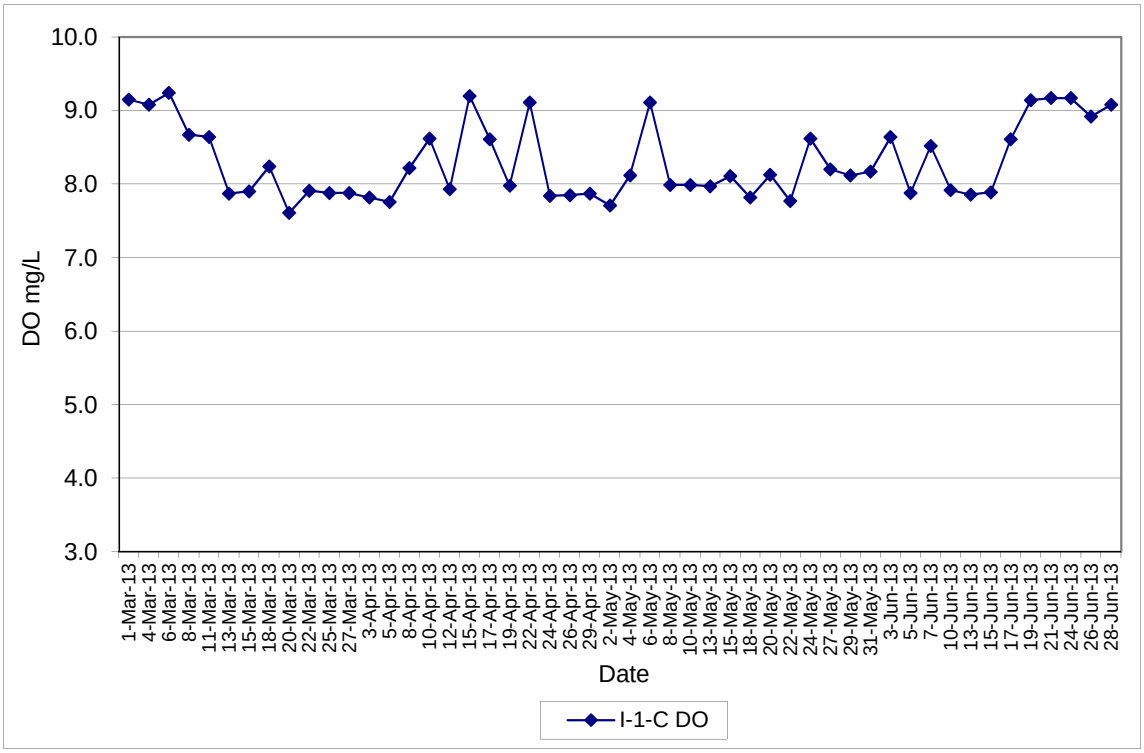


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
Mar-13 to Jun-13

Note: Exceedances of Action / Limit Levels occur when the levels of DO are below the respective limit levels.

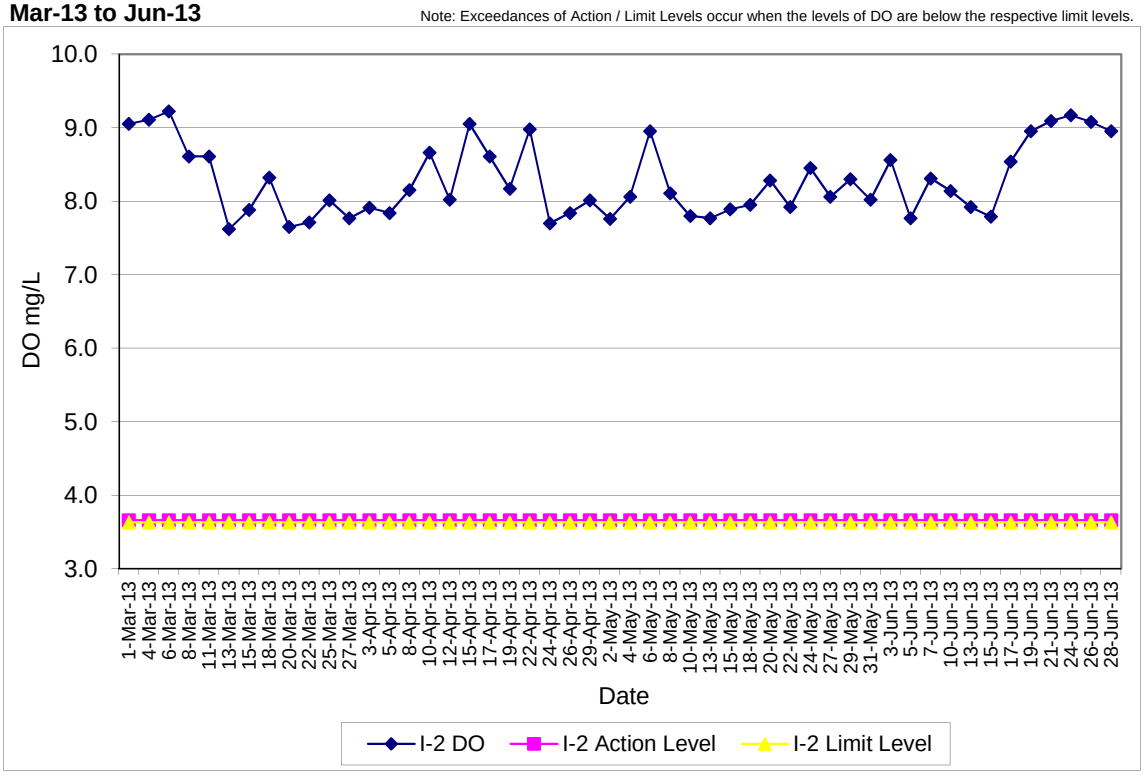


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Mar-13 to Jun-13

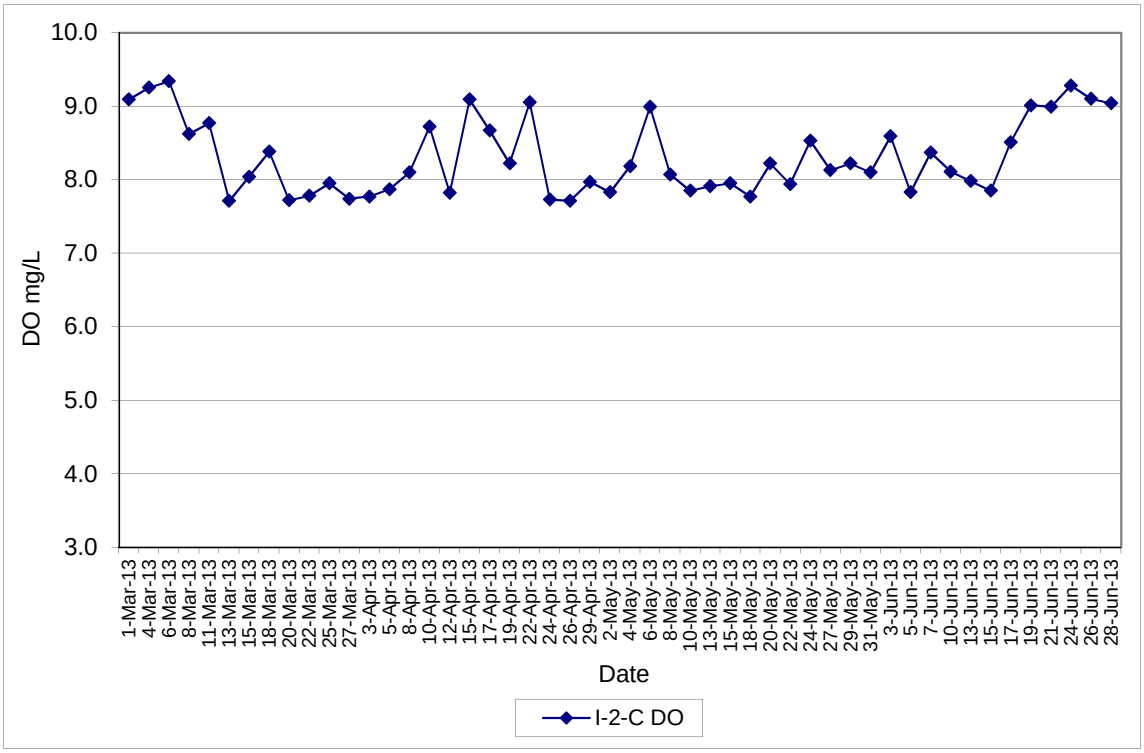


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Mar-13 to Jun-13

Note: Exceedances of Action / Limit Levels occur when the levels of DO are below the respective limit levels.

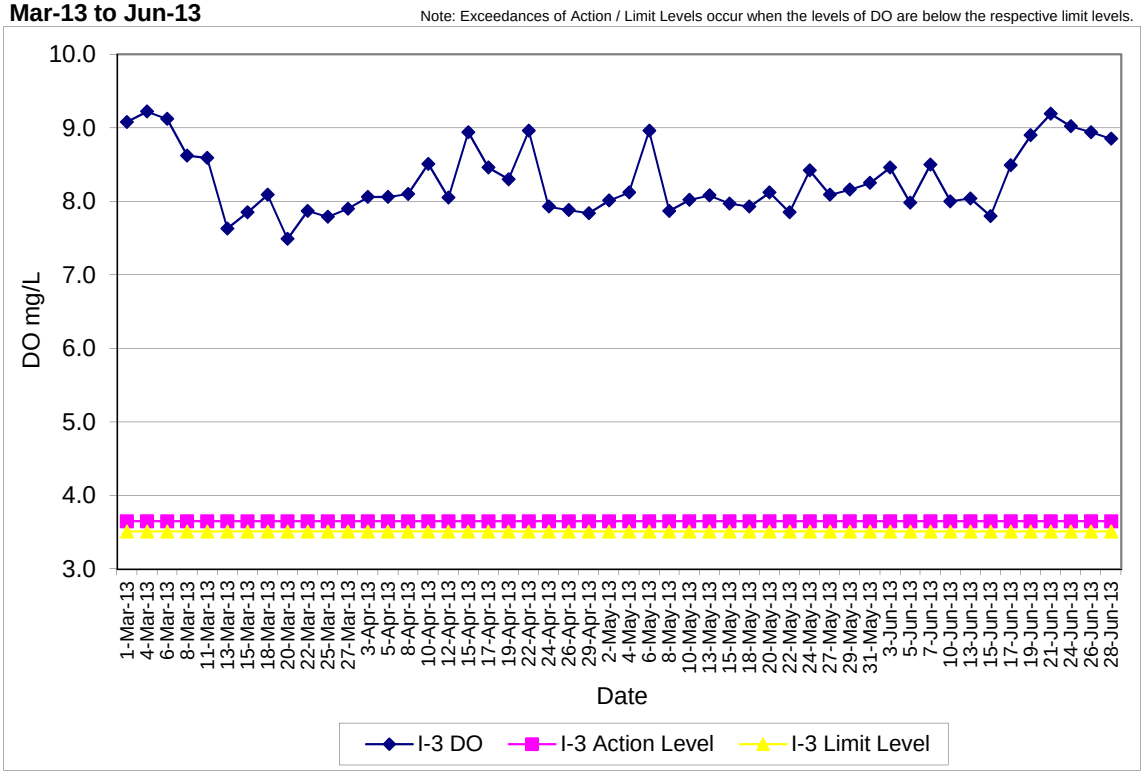


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Mar-13 to Jun-13

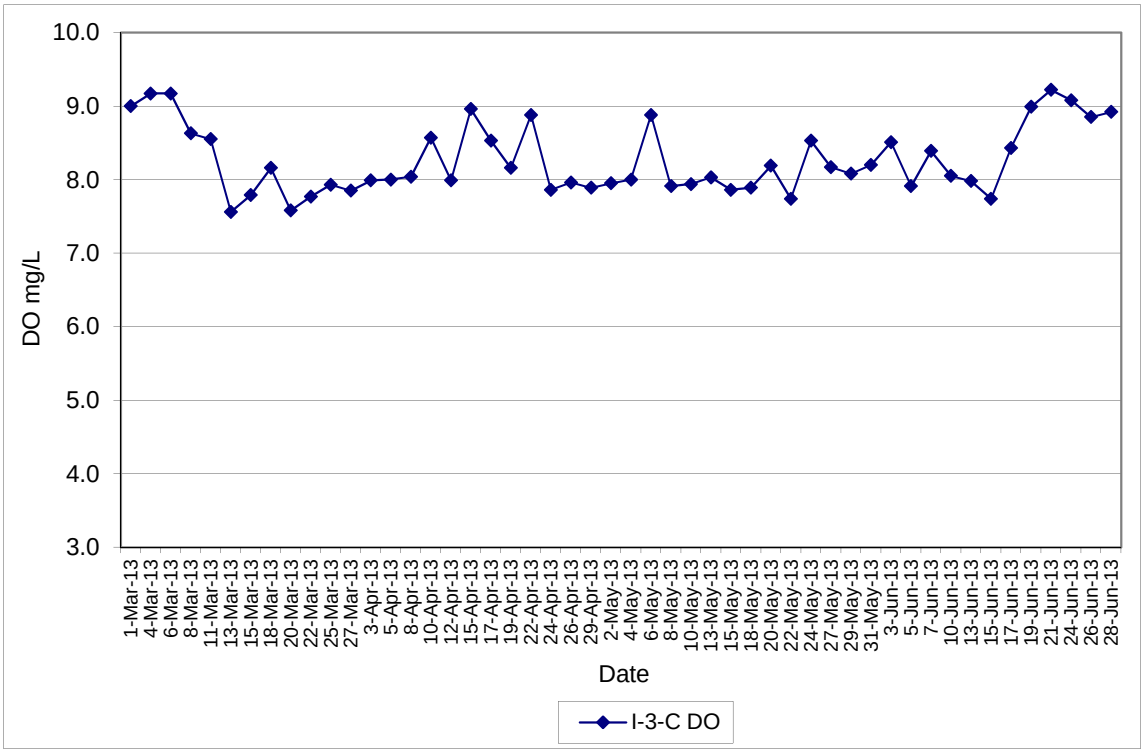


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Mar-13 to Jun-13

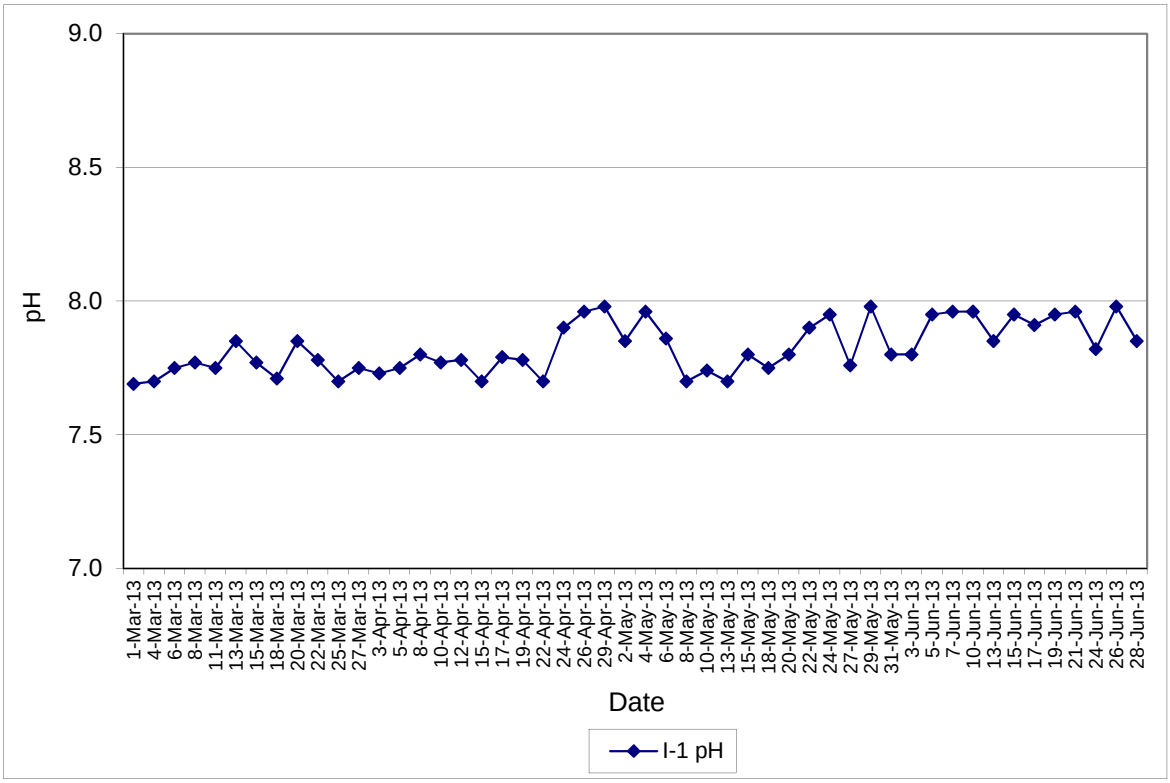
Note: Exceedances of Action / Limit Levels occur when the levels of DO are below the respective limit levels.



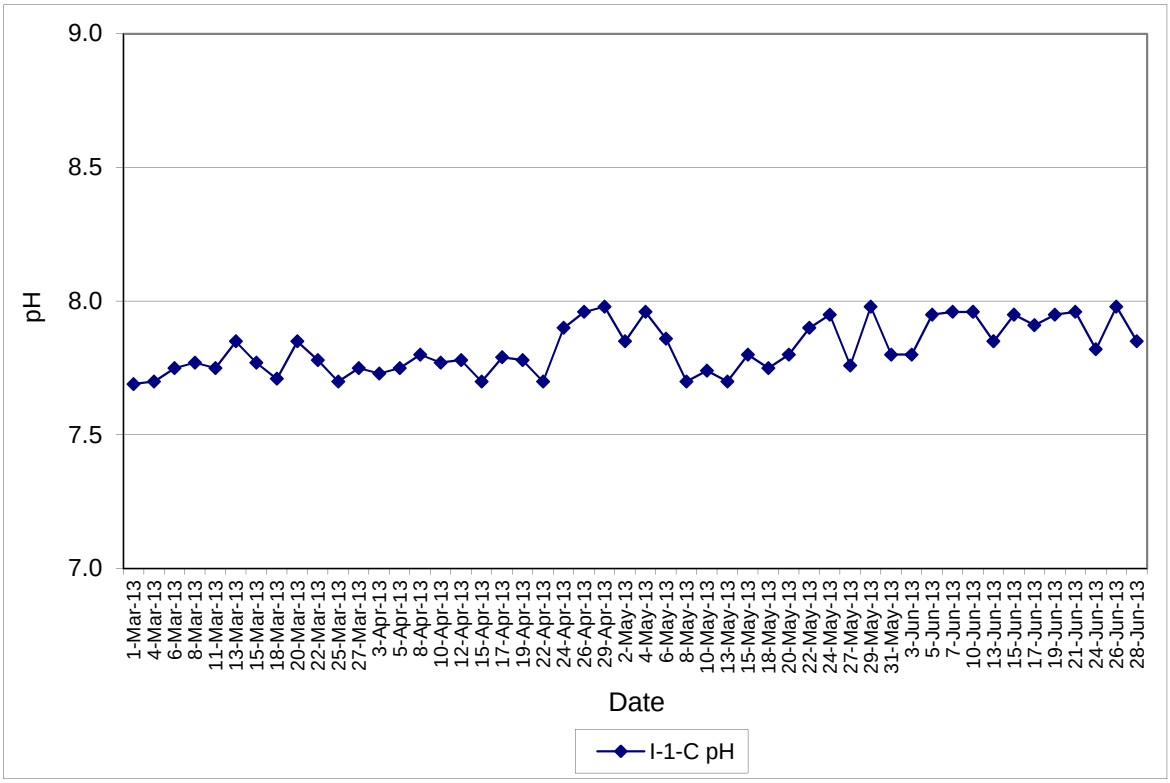
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Mar-13 to Jun-13



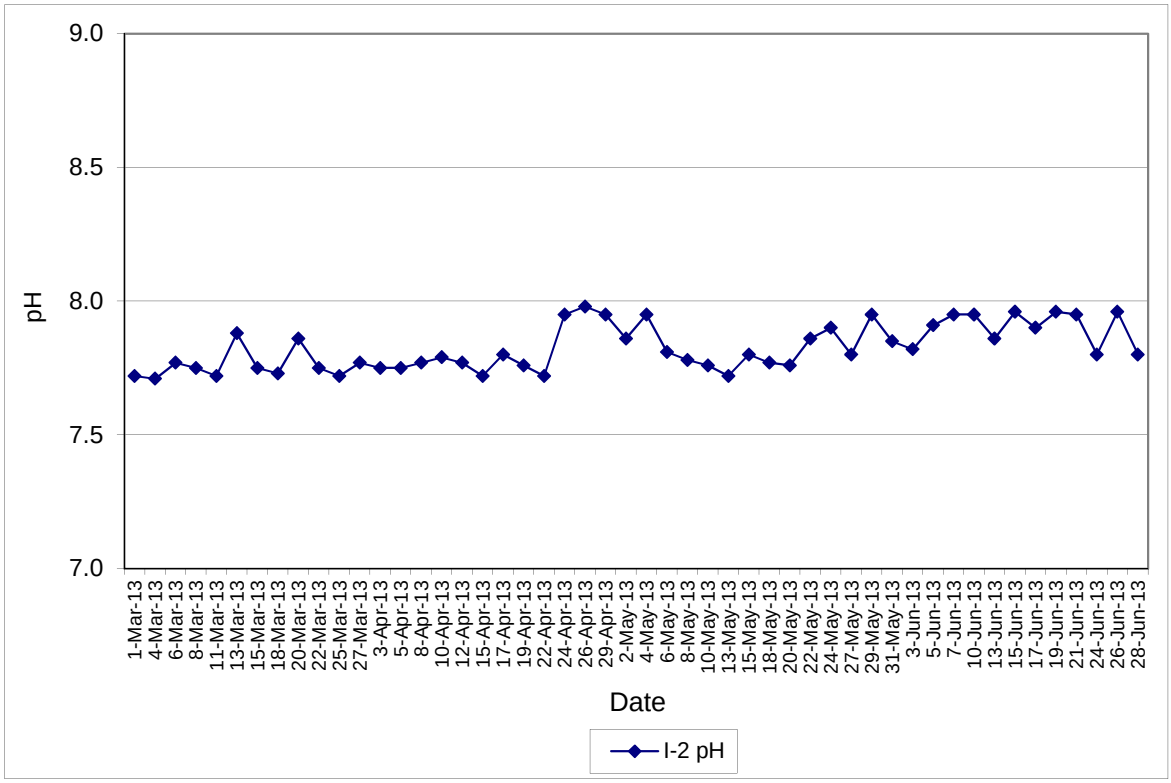
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
Mar-13 to Jun-13



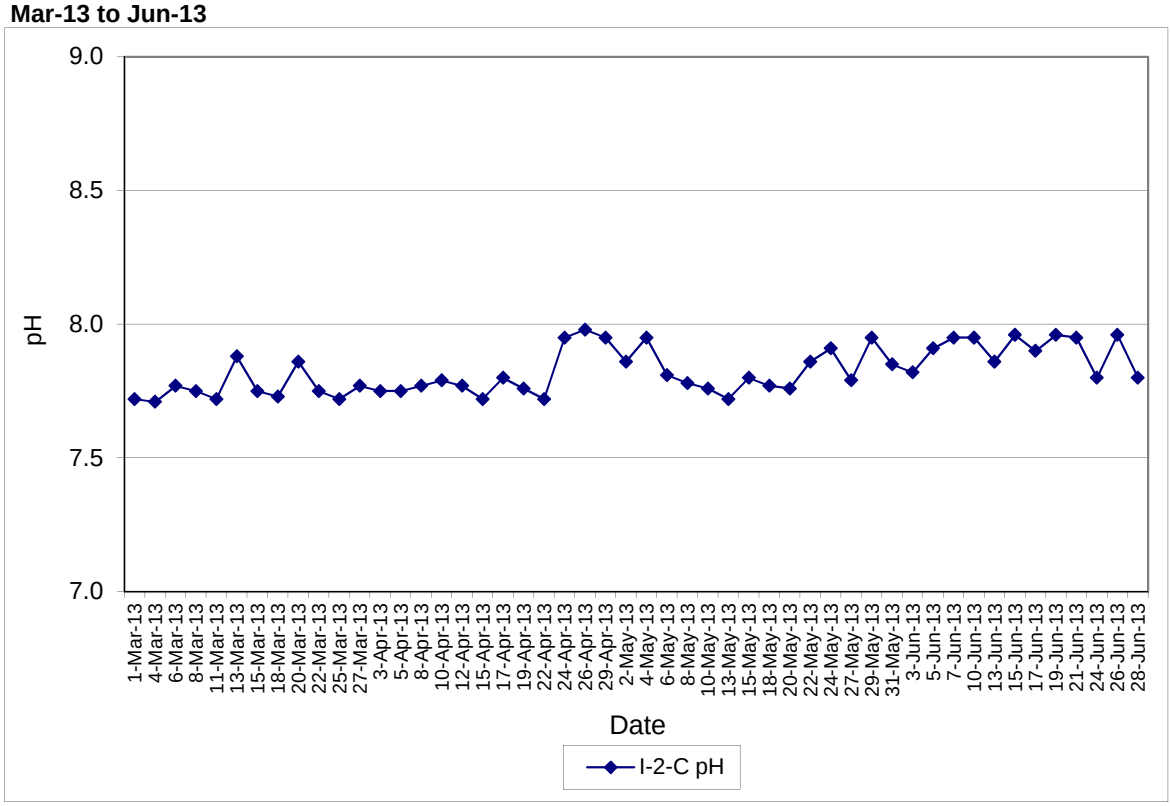
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Mar-13 to Jun-13



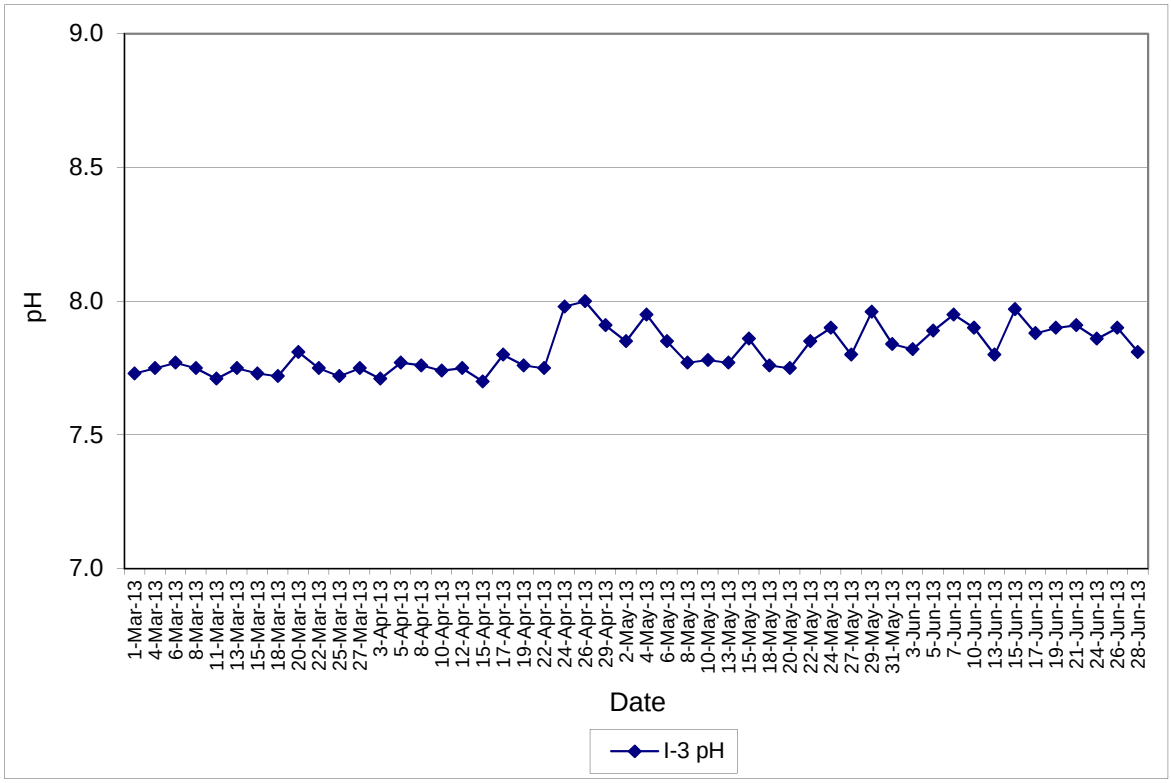
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Mar-13 to Jun-13



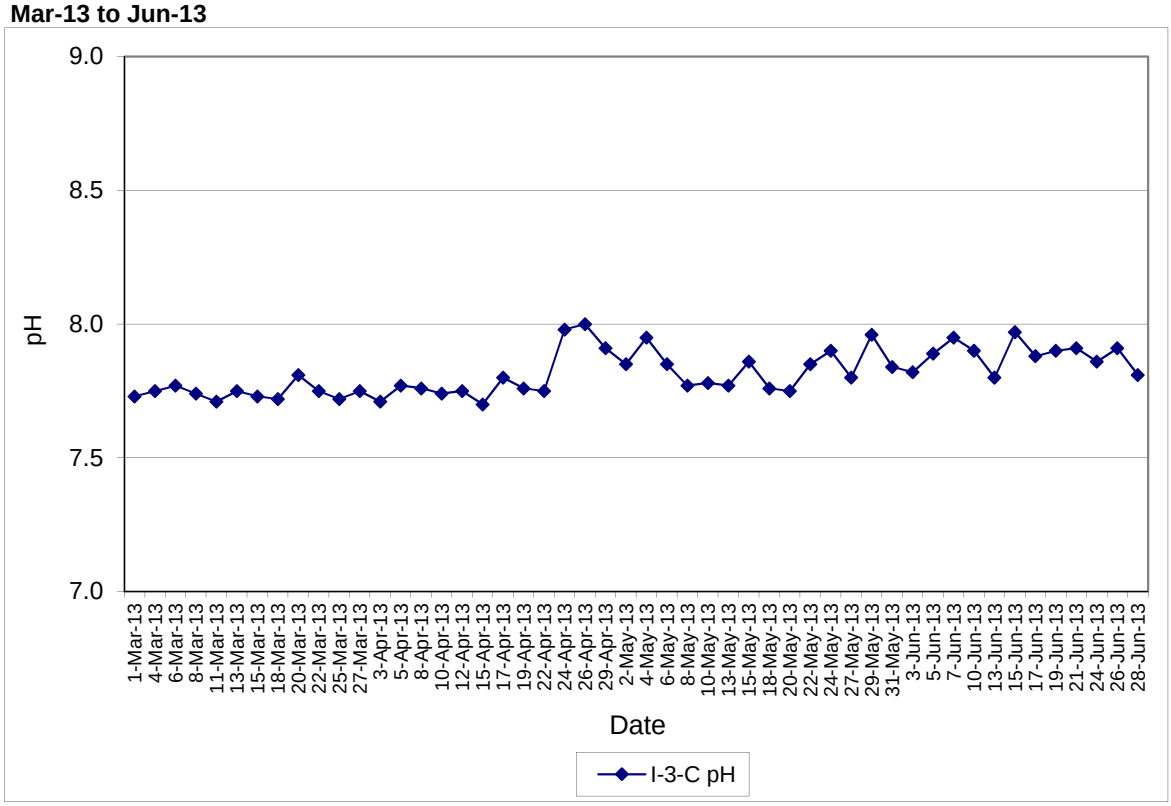
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Mar-13 to Jun-13



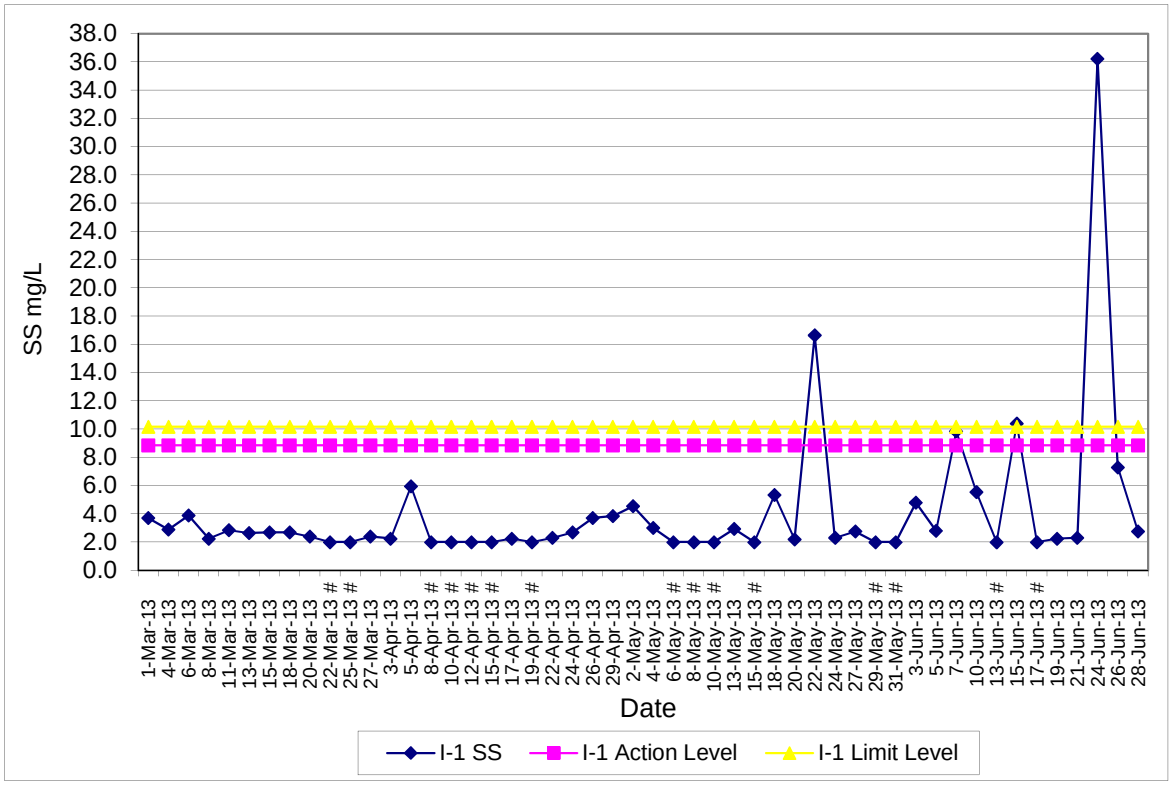
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Mar-13 to Jun-13



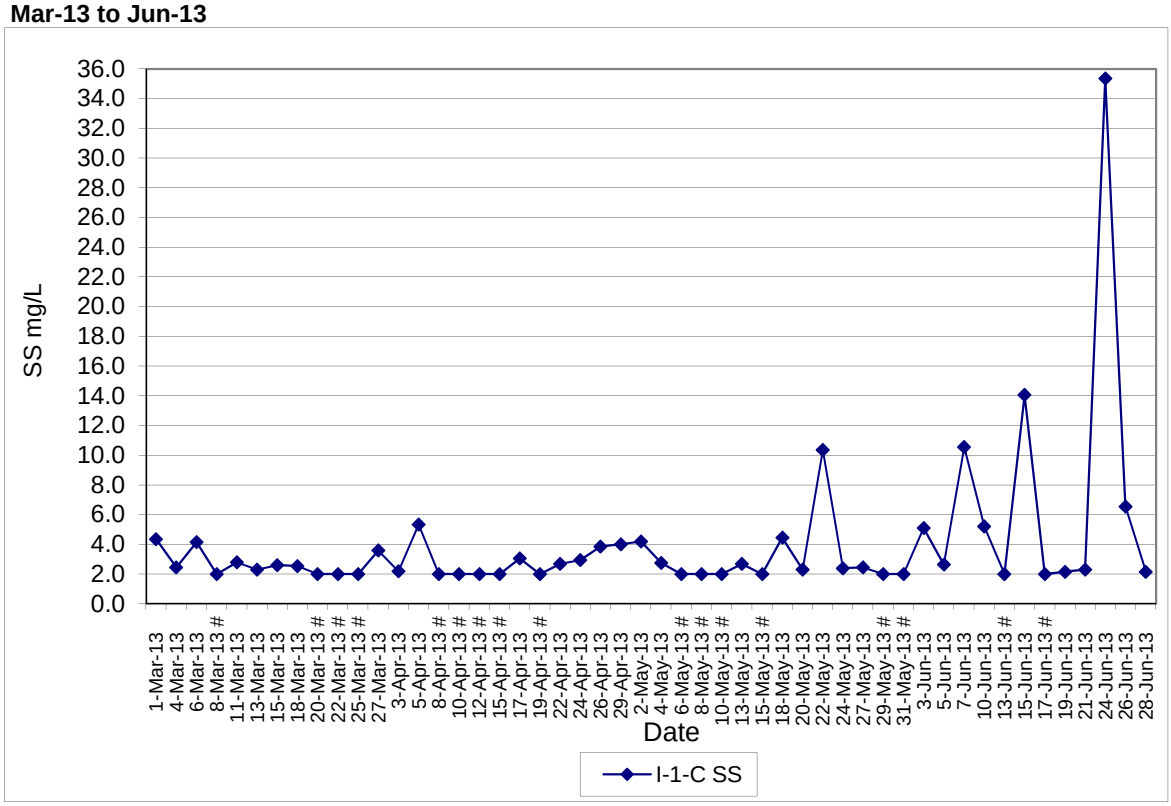
Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Mar-13 to Jun-13



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1)
Mar-13 to Jun-13

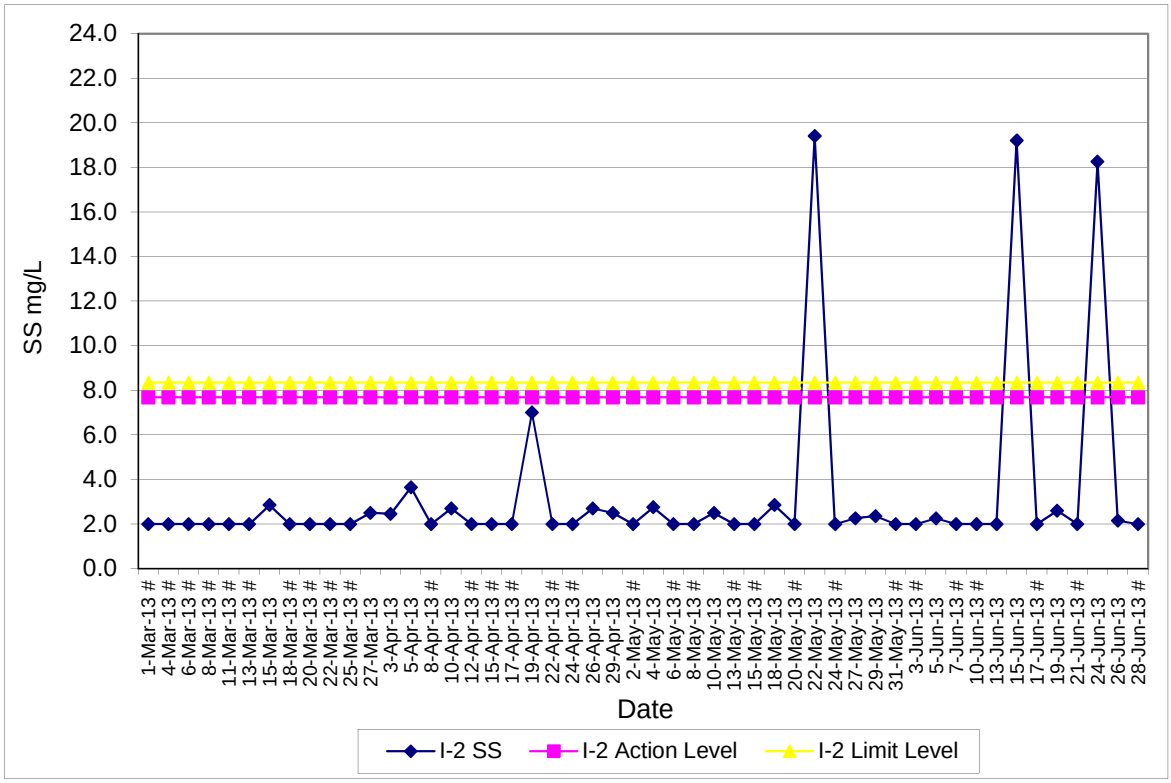


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Sik Sik Yuen Ho Fung College (I-1-C)
Mar-13 to Jun-13

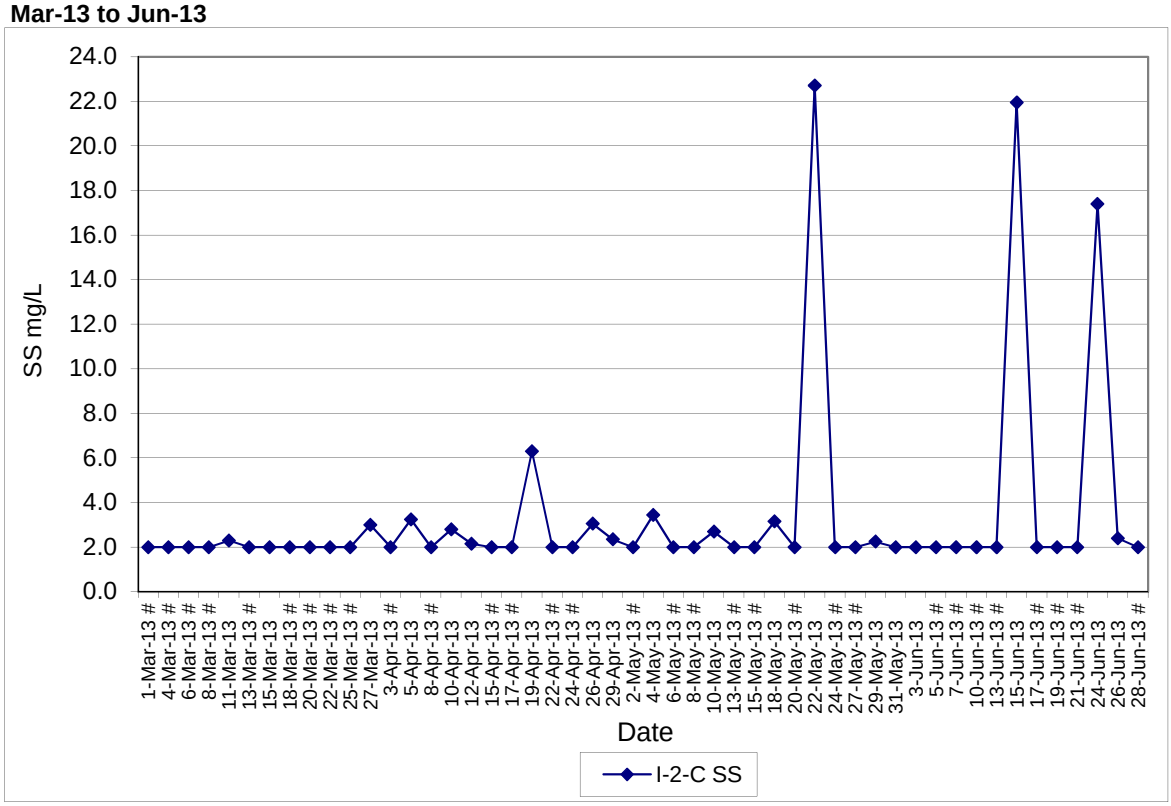


Note:# - For average SS level smaller than 2 mg/L, the level is plotted as 2 mg/L in the graph

Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2)
Mar-13 to Jun-13

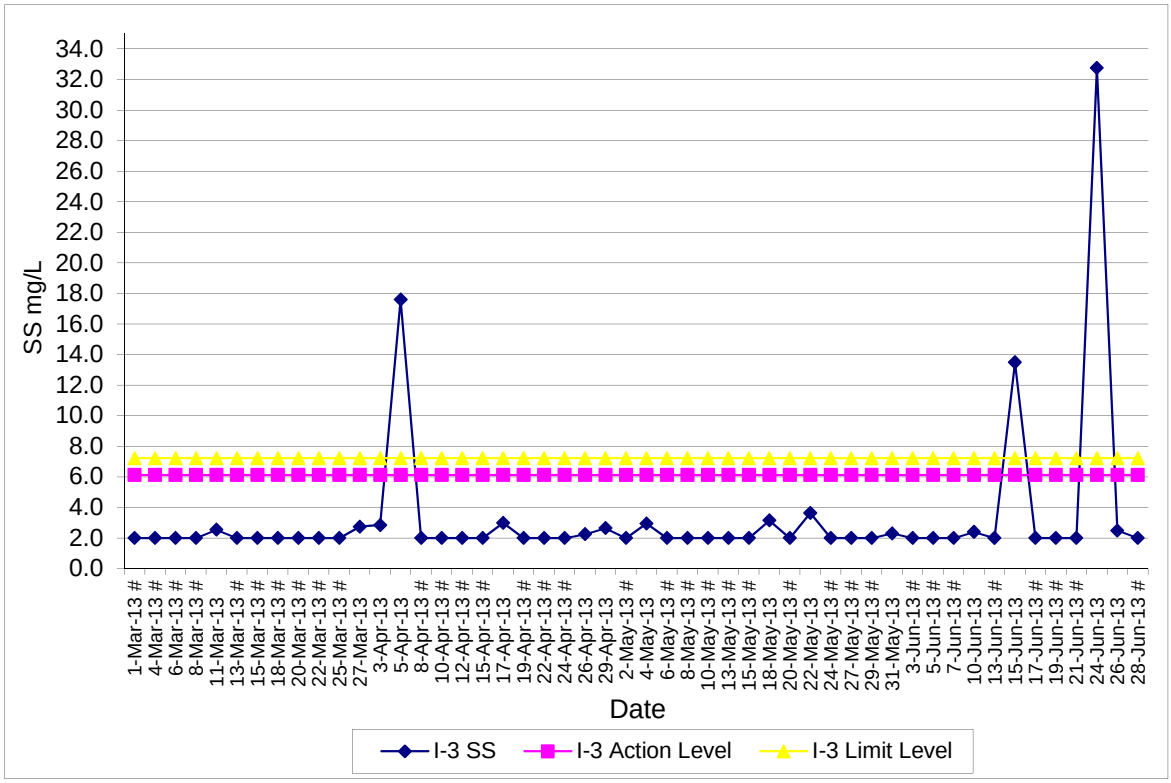


Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Hong Hoi Chee Hong Temple (I-2-C)
Mar-13 to Jun-13

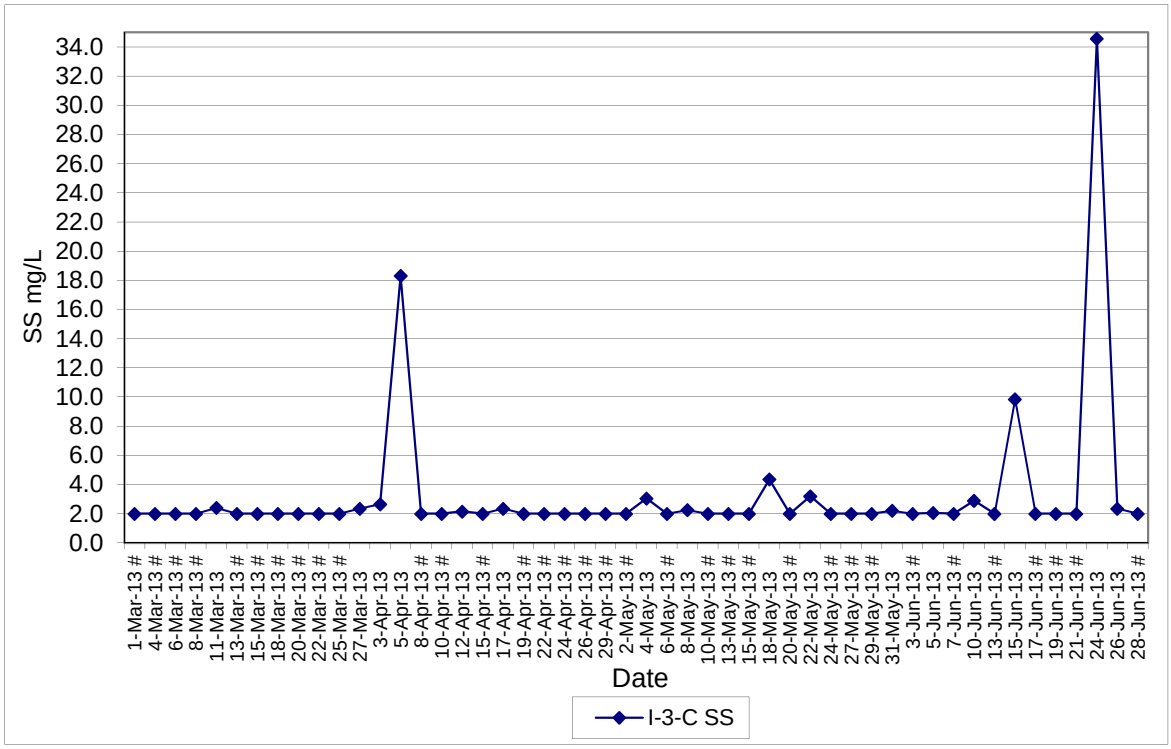


Note:# - For average SS level smaller than 2 mg/L, the level is plotted as 2 mg/L in the graph

Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3)
Mar-13 to Jun-13



Contract No. DC/2007/12 - Design and Construction of Tsuen Wan Drainage Tunnel
Water Quality Results at Squatters (I-3-C)
Mar-13 to Jun-13



Note:# - For average SS level smaller than 2 mg/L, the level is plotted as 2 mg/L in the graph

Appendix J

Interim Notifications of Environmental Quality Limits Exceedances

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	15-Jun-13
Time	10:08 AM
Monitoring Location	Sik Sik Yuen Ho Fung College (I-1)
Parameter	Turbidity
Action & Limit Levels (NTU)	9.75 / 12.47
Measured Level (NTU)	21.05
Control Station	I-1-C
Measured Level at the Control Station (NTU)	21.25
Possible reason for Action or Limit Level Non-compliance	The measured turbidity level was higher than the baseline limit level, but lower than the turbidity level of the control station (I-1-C). General site cleaning and housekeeping, and patching up tie-bolt hole on the internal face of spiral ramp for temporary lighting were undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 69 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 9:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 18-Jun-13

Photographic record for exceedance of Turbidity recorded at Sik Sik Yuen Ho Fung College (I-1) on 15-Jun-13

Photo taken at I-1

Photo of I-1-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	15-Jun-13
Time	9:45 AM
Monitoring Location	Hong Hoi Chee Hong Temple (I-2)
Parameter	Turbidity
Action & Limit Levels (NTU)	6.63 / 6.99
Measured Level (NTU)	22.55
Control Station	I-2-C
Measured Level at the Control Station (NTU)	22.45
Possible reason for Action or Limit Level Non-compliance	The measured turbidity level was higher than the baseline limit level, but lower than 120% of the turbidity level of the control station (I-2-C). General site cleaning and housekeeping, and making good of concrete surface at shaft lining of lower man access shaft LMAS were undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 69 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 9:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 18-Jun-13

Photographic record for exceedance of Turbidity recorded at Hong Hoi Chee Hong Temple (I-2) on 15-Jun-13

Photo taken at I-2

Photo of I-2-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	15-Jun-13
Time	9:12 AM
Monitoring Location	Squatters (I-3)
Parameter	Turbidity
Action & Limit Levels (NTU)	3.99 / 4.18
Measured Level (NTU)	20.65
Control Station	I-3-C
Measured Level at the Control Station (NTU)	20.85
Possible reason for Action or Limit Level Non-compliance	The measured turbidity level was higher than the baseline limit level, but lower than the turbidity level of the control station (I-3-C). General site cleaning and housekeeping were undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 58 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 8:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	The following mitigation measure was provided on-site during monitoring: (1) wastewater was collected and diverted to wastewater treatment plant for treatment before discharge.
Remarks	None

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 18-Jun-13

Photographic record for exceedance of Turbidity recorded at Squatters (I-3) on 15-Jun-13

Photo taken at I-3

Photo of I-3-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Action Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	7-Jun-13
Time	2:36 PM
Monitoring Location	Sik Sik Yuen Ho Fung College (I-1)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	8.85 / 10.17
Measured Level (mg/L)	9.85
Control Station	I-1-C
Measured Level at the Control Station (mg/L)	10.55
Possible reason for Action or Limit Level Non-compliance	The measured SS level was higher than the baseline action level, but lower than the SS level of the control station (I-1-C). Reinstatement of Wo Yi Hop Road footpath, erection of security fencing and placement of concrete for the fencing footing, and installation of precast concrete cover of 150 U-channel on roof of spiral ramp were undertaken during the monitoring day. No direct disturbance was observed from the site. Therefore, the exceedance was considered to be contributed by natural variation. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 19-Jun-13

Photographic record for exceedance of Suspended Solids (SS) recorded at Sik Sik Yuen Ho Fung College (I-1) on 07-Jun-13

Photo taken at I-1

Photo taken at I-1-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	15-Jun-13
Time	10:08 AM
Monitoring Location	Sik Sik Yuen Ho Fung College (I-1)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	8.85 / 10.17
Measured Level (mg/L)	10.40
Control Station	I-1-C
Measured Level at the Control Station (mg/L)	14.05
Possible reason for Action or Limit Level Non-compliance	The measured SS level was higher than the baseline limit level, but lower than the SS level of the control station (I-1-C). General site cleaning and housekeeping, and patching up tie-bolt hole on the internal face of spiral ramp for temporary lighting were undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 69 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 9:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high SS level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 24-Jun-13

Photographic record for exceedance of Suspended Solids (SS) recorded at Sik Sik Yuen Ho Fung College (I-1) on 15-Jun-13

Photo taken at I-1

Photo taken at I-1-C

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Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	15-Jun-13
Time	9:45 AM
Monitoring Location	Hong Hoi Chee Hong Temple (I-2)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	7.68 / 8.34
Measured Level (mg/L)	19.20
Control Station	I-2-C
Measured Level at the Control Station (mg/L)	21.95
Possible reason for Action or Limit Level Non-compliance	The measured SS level was higher than the baseline limit level, but lower than the SS level of the control station (I-2-C). General site cleaning and housekeeping, and making good of concrete surface at shaft lining of lower man access shaft LMAS were undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 69 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 9:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high SS level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 24-Jun-13

Photographic record for exceedance of Suspended Solids (SS) recorded at Hong Hoi Chee Hong Temple (I-2) on 15-Jun-13

Photo taken at I-2

Photo of I-2-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	15-Jun-13
Time	9:12 AM
Monitoring Location	Squatters (I-3)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	6.13 / 7.23
Measured Level (mg/L)	13.50
Control Station	I-3-C
Measured Level at the Control Station (mg/L)	9.85
Possible reason for Action or Limit Level Non-compliance	The measured SS level was higher than the baseline limit level, and higher than 130% of the SS level of the control station (I-3-C). General site cleaning and housekeeping were undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 58 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 8:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	The following mitigation measure was provided on-site during monitoring: (1) All wastewater was collected and diverted to wastewater treatment plant prior to discharge.
Remarks	None

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 24-Jun-13

Photographic record for exceedance of Suspended Solids (SS) recorded at Squatters (I-3) on 15-Jun-13

Photo taken at I-3

Photo of I-3-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	24-Jun-13
Time	1:16 PM
Monitoring Location	Sik Sik Yuen Ho Fung College (I-1)
Parameter	Turbidity
Action & Limit Levels (NTU)	9.75 / 12.47
Measured Level (NTU)	27.45
Control Station	I-1-C
Measured Level at the Control Station (NTU)	27.05
Possible reason for Action or Limit Level Non-compliance	The measured turbidity level was higher than the baseline limit level, but lower than 120% of the turbidity level of the control station (I-1-C). General site cleaning and housekeeping were undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 27-Jun-13

Photographic record for exceedance of Turbidity recorded at Sik Sik Yuen Ho Fung College (I-1) on 24-Jun-13

Photo taken at I-1

Photo of I-1-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	24-Jun-13
Time	1:40 PM
Monitoring Location	Hong Hoi Chee Hong Temple (I-2)
Parameter	Turbidity
Action & Limit Levels (NTU)	6.63 / 6.99
Measured Level (NTU)	22.15
Control Station	I-2-C
Measured Level at the Control Station (NTU)	22.05
Possible reason for Action or Limit Level Non-compliance	The measured turbidity level was higher than the baseline limit level, but lower than 120% of the turbidity level of the control station (I-2-C). Applying joint sealant for gap between shaft wall and staircase was undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 27-Jun-13

Photographic record for exceedance of Turbidity recorded at Hong Hoi Chee Hong Temple (I-2) on 24-Jun-13

Photo taken at I-2

Photo of I-2-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	24-Jun-13
Time	2:11 PM
Monitoring Location	Squatters (I-3)
Parameter	Turbidity
Action & Limit Levels (NTU)	3.99 / 4.18
Measured Level (NTU)	27.55
Control Station	I-3-C
Measured Level at the Control Station (NTU)	27.95
Possible reason for Action or Limit Level Non-compliance	The measured turbidity level was higher than the baseline limit level, but lower than the turbidity level of the control station (I-3-C). General site cleaning and housekeeping were undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high turbidity level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 27-Jun-13

Photographic record for exceedance of Turbidity recorded at Squatters (I-3) on 24-Jun-13

No photo taken at I-3 and I-3-C as the camera was out of order during monitoring

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Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	19-Jun-13
Time	3:46 PM
Monitoring Location	Hong Hoi Chee Hong Temple (I-2)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	7.68 / 8.34
Measured Level (mg/L)	2.60
Control Station	I-2-C
Measured Level at the Control Station (mg/L)	<2.00
Possible reason for Action or Limit Level Non-compliance	The measured SS level was lower than the baseline action level, but higher than 130% of the SS level of the control station (I-2-C). Breaking concrete footing of 15 tonne gantry, excavation for access platform, making good of concrete surface for 400mm U-channel and 400mm step channel, tiling works for upper man access shaft, and backfilling soil on vortex shaft and approach channel planter were undertaken during the monitoring day. No direct disturbance was observed from the site. Therefore, the exceedance was considered to be contributed by natural variation. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 27-Jun-13

Photographic record for exceedance of Suspended Solids (SS) recorded at Hong Hoi Chee Hong Temple (I-2) on 19-Jun-13

Photo taken at I-2

Photo of I-2-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	24-Jun-13
Time	1:16 PM
Monitoring Location	Sik Sik Yuen Ho Fung College (I-1)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	8.85 / 10.17
Measured Level (mg/L)	36.20
Control Station	I-1-C
Measured Level at the Control Station (mg/L)	35.35
Possible reason for Action or Limit Level Non-compliance	The measured SS level was higher than the baseline limit level, but lower than 120% of the SS level of the control station (I-1-C). General site cleaning and housekeeping were undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high SS level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 2-Jul-13

Photographic record for exceedance of Suspended Solids (SS) recorded at Sik Sik Yuen Ho Fung College (I-1) on 24-Jun-13

Photo taken at I-1

Photo taken at I-1-C

Contract No. DC/2007/12
Design and Construction of Tsuen Wan Drainage Tunnel
Environmental Monitoring & Audit Manual

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	24-Jun-13
Time	1:40 PM
Monitoring Location	Hong Hoi Chee Hong Temple (I-2)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	7.68 / 8.34
Measured Level (mg/L)	18.25
Control Station	I-2-C
Measured Level at the Control Station (mg/L)	17.40
Possible reason for Action or Limit Level Non-compliance	The measured SS level was higher than the baseline limit level, but lower than 120% of the SS level of the control station (I-2-C). Applying joint sealant for gap between shaft wall and staircase was undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high SS level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 2-Jul-13

Photographic record for exceedance of Suspended Solids (SS) recorded at Hong Hoi Chee Hong Temple (I-2) on 24-Jun-13

Photo taken at I-2

Photo of I-2-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	24-Jun-13
Time	2:11 PM
Monitoring Location	Squatters (I-3)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	6.13 / 7.23
Measured Level (mg/L)	32.75
Control Station	I-3-C
Measured Level at the Control Station (mg/L)	34.55
Possible reason for Action or Limit Level Non-compliance	The measured SS level was higher than the baseline limit level, but lower than the SS level of the control station (I-3-C). General site cleaning and housekeeping were undertaken during the monitoring day. No direct disturbance was observed from the site. Heavy rain was observed and about 270 mm rainfall was recorded at Tsuen Wan by the Hong Kong Observatory between 0:45 and 11:45 on the monitoring day. Therefore, the exceedance was considered to be contributed by heavy rainfall and high SS level at upstream location. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 2-Jul-13

Photographic record for exceedance of Suspended Solids (SS) recorded at Squatters (I-3) on 24-Jun-13

No photo was taken at I-3 and I-3-C as the camera was out of order during monitoring

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Limit Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	26-Jun-13
Time	11:00 AM
Monitoring Location	Squatters (I-3)
Parameter	Turbidity
Action & Limit Levels (NTU)	3.99 / 4.18
Measured Level (NTU)	4.25
Control Station	I-3-C
Measured Level at the Control Station (NTU)	4.14
Possible reason for Action or Limit Level Non-compliance	The measured turbidity level was higher than the baseline limit level, but lower than 120% of the turbidity level of the control station (I-3-C). General site cleaning and housekeeping, planting at platform behind PA wall, construction of U-channel, and installation of K1 kerb were undertaken during the monitoring day. No direct disturbance was observed from the site. Therefore, the exceedance was considered to be contributed by natural variation. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	The following mitigation measure was provided on-site during monitoring: (1) All wastewater was collected and diverted to wastewater treatment plant prior to discharge.
Remarks	None

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 3-Jul-13

Photographic record for exceedance of Turbidity recorded at Squatters (I-3) on 26-Jun-13

Photo taken at I-3

Photo of I-3-C

Interim Notification of Environmental Quality Limit Exceedance

Incident Report on Action Level Non-compliance

Project	Tsuen Wan Drainage Tunnel
Date	28-Jun-13
Time	11:25 AM
Monitoring Location	Sik Sik Yuen Ho Fung College (I-1)
Parameter	Suspended Solids (SS)
Action & Limit Levels (mg/L)	8.85 / 10.17
Measured Level (mg/L)	2.75
Control Station	I-1-C
Measured Level at the Control Station (mg/L)	2.15
Possible reason for Action or Limit Level Non-compliance	The measured SS level was lower than the baseline limit level, but higher than 120% of the SS level of the control station (I-1-C). General site cleaning and housekeeping, and installation of high security main gates inside spiral ramp were undertaken during the monitoring day. No direct disturbance was observed from the site. Therefore, the exceedance was considered to be contributed by natural variation. Since the exceedance was non-project related, no further action was required.
Actions taken / to be taken	None
Remarks	No wastewater discharge for the above work activities.

Prepared by: Fan Cheong Tsang

Designation: Environmental Team Leader

Signature:

Date: 11-Jul-13

Photographic record for exceedance of Suspended Solids (SS) recorded at Sik Sik Yuen Ho Fung College (I-1) on 28-Jun-13

Photo taken at I-1

Photo taken at I-1-C

Appendix K

Complaint Log

APPENDIX K

COMPLAINT LOG

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
1	CIR-001	9 March 2009 at Outfall	Public through EPD	EPD has received a complaint (EPD ref: EP3/N22/RW/04846-09) regarding to muddy effluent discharged from the outfall of the construction site from a public on 9 March 2009. Site investigation was also carried out by EPD with the Contractor on the same day.	Findings/ Observations In the afternoon on 9 March 2009, the Contractor was carrying out regular maintenance for removing silt accumulated in the wastewater treatment plant. During the maintenance works, some residual silt inside the plant was accidentally leaked out to the outfall discharge outlet. The reason was that a flexible pipe for disposing silt was found connecting to the concrete platform of the outfall discharge outlet. Conclusion/Remedial Action The complaint was valid and it was due to maintenance works at the wastewater treatment plant at the outfall area. The contractor had cleaned up the silt at discharge outlet and the channel at the outfall area on 12 March 2009 as shown in the attached photo. The ET will closely inspect the discharge outlet and the channel during the routine site inspections and provide advice to the Contractor. The Contractor was also advised to provide mitigation measures during any occasion of the maintenance work on the wastewater treatment plant. The discharge pipe of the treatment plant should be plugged and ensure not functioned when carrying out maintenance works on the wastewater treatment plant in order to prevent the discharge of silt or muddy water to the outlet. Flexible pipe for discharge of sludge should not be placed on the concrete platform under the outfall discharge outlet. For disposal of slit or sludge in the wastewater treatment plant, tanker should be used.	Closed
2	CIR-002	8 May 2009 at Outfall	Public through EPD	EPD has received a complaint (EPD ref: EP3/N22/RW/09755-09) regarding to construction dust from the outfall	Findings/ Observations Regular 1-hour TSP monitoring, in accordance with EM&A Manual, is performed by Environmental Team. The monitoring station concerned is ASR9 (i.e. at the podium level of Greenview Terrace facing to the construction site). The closest date for the 1-hour TSP concentration monitoring was on 6	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
				construction site on 8 May 2009. Site investigation was also carried out by EPD with the Contractor on 14 May 2009.	May 2009 and 12 May 2009 at Greenview Terrace, ASR9. Soil nailing works and loading & unloading excavated materials were observed during monitoring. In accordance with the EM&A Manual and the Baseline Monitoring Report, all 1-hour TSP concentrations at ASR9 were below the established Action and Limit Levels. No exceedance was recorded on 6 and 12 May 2009. The contractor and the environmental team were also undertaken site investigation on the subject area in response to the complaint. It was confirmed that the air quality mitigation measures as recommended in EIA have been provided by the Contractor. The mitigation measures are as follows: • Water spraying was provided to the exposed surface. • Several automatic sprinklers were provided at the outfall construction site for water spraying of the haul road. • Water spraying was provided during dust generating works (e.g. rock breaking and soil nailing works). <u>Conclusion/Remedial Action</u> Based on the site inspection and monitoring results, the complaint is considered not justifiable since no action & limit level exceedance on construction dust are identified. Air quality mitigation measures as recommended in EIA have been implemented in order to control and minimise the air quality impact and nuisance arising from the construction activities. Nevertheless, in view of the recent dry and sunny weather, the haul road and the exposed area would be dry very quickly. The Contractor was recommended to provide more frequent water spraying especially in the dry and sunny weather.	
3	CIR-003	14 May 2009 at Outfall	Public through EPD	EPD has received a complaint (EPD ref: EP/RW/080206) regarding to daytime construction rock breaking at 7:15 am	The closest date to the complaint for the 1-hour TSP monitoring & daytime construction noise monitoring was on 12, 18 and 27 May 2009 at Greenview Terrace, ASR9 and NSR9. Soil nailing, excavation, rock breaking, loading and unloading the materials were observed during monitoring period. The measured noise levels complied with the limit level in accordance with the EIAO-TM. All 1-hour TSP concentrations at ASR9 were below the established Action and Limit Levels. No 1-hour TSP	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
				and dusty at the outfall construction site on 14 May 2009.	exceedance was recorded. The contractor and the environmental team were also undertaken site investigation on the subject area in response to the complaint. Air quality mitigation measures as recommended in EIA have been implemented by the Contractor. However, noise mitigation measures could be further improved. Based on our site inspection and monitoring results, the complaint for dust is considered not justifiable since no action & limit level exceedance on construction dust is identified. Air quality mitigation measures as recommended in EIA have also been implemented in order to control and minimise the air quality impact arising from the construction activities. In view of the recent dry and sunny weather, the haul road and the exposed area would be dry very quickly. The Contractor was recommended to enhance water spraying especially in the dry and sunny weather. On the other hand, the complaint for noise is considered due to works and the Contractor was agreed to improve the on-site noise mitigation measures such as the following measures. ET's site inspection and the joint inspection with relevant parties was conducted on 29 May 2009 and 4 June 2009 respectively to confirm all the below measures have been implemented. • For the idling plant, it should be switched off to reduce noise level generated. • The sound insulation sheets and noise insulation materials should be placed to enclose the breaking tip tightly and also aside or surrounding the breaking activities as recommended in the following photos 1-3 in noise mitigation measures. • Noise monitoring frequency was increased in order to check the effectiveness of the mitigation measures. The additional measurement was taken on 27 May, 8 June, 10 June and 12 June 2009 after all the measures implemented. The noise levels ($L_{eq, 30\ min}$) were 70.9 dB (A), 70.5 dB (A), 70.3 dB (A) and 70.3 dB (A) respectively, which comply with the limit level in accordance with the EIAO-TM. Soil nailing, excavation and rock breaking were observed during monitoring period.	

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					The measures were well in place and seemed effective during the measurement.	
4	CIR-004	10 July 2009 at Outfall	Public through EPD	EPD has received a complaint (EPD ref: EP3/N22/RW/15137-09) regarding to construction dust from the outfall construction site on 10 July 2009.	Findings/ Observations 1-hour TSP concentration monitoring was on 10 July 2009 at Greenview Terrace, ASR9. Soil nailing works, concrete breaking, excavation and loading & unloading excavated materials were observed during monitoring. All 1-hour TSP concentrations at ASR9 were below the established Action and Limit Levels. No exceedance was recorded on 10 July 2009. The contractor and the environmental team were also undertaken site investigation on the subject area in response to the complaint. It was confirmed that the air quality mitigation measures as recommended in EIA have been provided by the Contractor. The mitigation measures are as follows: • Water spraying was provided to the exposed surface. • Automatic sprinklers were provided at the outfall construction site for water spraying of the haul road. • Water spraying was provided during dust generating works (e.g. rock breaking and soil nailing works). • Tarpaulin was used for covering the dusty works in the Portal area. Conclusion/Remedial Action The complaint is considered not justifiable since no action & limit level exceedance on construction dust are identified	Closed
5 & 6	CIR-005	29 July 2009 & 11 August 2009 at Outfall	Public through SOR	SOR has received two complaints (SOR ref: (DC/2007/12)/M45/500/02480, 02500) from Greenview Terrace regarding to daytime construction noise exceedance	Findings/ Observations Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in July and August 2009. According to the noise monitoring results from 6 July 2009 to 31 August 2009 at NSR 9, the measured noise levels complied with the limit level in accordance with the EIAO-TM. All 1-hour TSP concentrations at ASR9 were below the established Action and Limit Levels from 6 July 2009 to 25 August 2009. Conclusion/Remedial Action The dust complaint on 22 July 2009 was due to the soil nailing works. The	Same Case with Complaint No. 11

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
				recorded at NSR9 on 8, 22, 23, 27 and 29 July 2009 and a large amount dust generated at the outfall construction site. The complaint dates were corresponded to 29 July and 11 August 2009.	Contractor was reminded enhance the dust mitigation measures during soil nailing works. A designated staff was provided to spray water continuously during soil nailing. A nylon bag was placed on the drilling hole and keeping wet to suppress dust. A sprinkler was added at the hillside of the site and water spraying was provided continuously during operation of drilling to suppress dust. The documented complaint for noise is considered to trigger the action level and the Contractor was also reminded to enhance the on-site noise mitigation measures continuously. The enhanced mitigation measures are proposed as follows: • A staff from the Contractor was designated to take the reading of Leq (5mins) at the roof of Greenview Terrace. In case of the Leq (5min) exceed 73 dB(A), the Contractor would re-schedule the noisy plants to mitigate the escalation of noise level. • The designated staff was reminded to record all the weather condition including raining and wind speed. • Tools box talk for the Contractor's Team was carried out for reminding that the movable barrier should be placed to the breaking activities as much as possible. • Movable noise barriers were placed on site and the movable noise barriers were also modified. • Existing 25 ton rock breaker had been replaced by the another breaker. • The breaking tap of the 25 ton rock breaker had been replaced by another breaking tap. • A joint filler wall was installed at the vertical face of westbound to mitigate the noise rebound from the vertical face to high level of Greenview Terrace. From the additional monitoring data and monitoring data under regular EM&A requirements, noise level ($L_{eq,\ 30\ min}$) between 6 July to 31 August 2009 was in the range of 71 to 74 dB(A) to the nearest integer. The noise monitoring frequency was maintained in twice per week to check whether the mitigation measures are effective. From the information of the Contractor, all the mitigation measures were implemented on 31 August	

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					2009. Noise levels ($L_{eq,\ 30\ min}$) were also re-measured after the implementation of the mitigation measures. Noise level ($L_{eq,\ 30\ min}$) from 4 Sep to 28 Sep 2009 was in the range of 70 to 73 dB(A) to the nearest integer after the implementation of the mitigation measures. In our investigation, there was no exceedance of the measured noise level at Greenview Terrace.	
7	CIR-006	12 August 2009 at Outfall	Public through SOR	SOR has received a complaint (SOR ref: (DC/2007/12)/M45/500/02527) from Greenview Terrace, via Apple Daily regarding to daytime construction noise level ($L_{eq(30min)}$) was sometimes more than 80 dB(A) and a large amount dust generated at the outfall construction site. The complaint date was corresponded to 12 August 2009.	Findings/ Observations Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in July and August 2009. According to the noise monitoring results from 6 July 2009 to 31 August 2009 at NSR 9, the measured noise levels complied with the limit level in accordance with the EIAO-TM. All 1-hour TSP concentrations at ASR9 were below the established Action and Limit Levels from 6 July 2009 to 25 August 2009. Conclusion/Remedial Action The dust complaint was considered not justifiable since no action & limit level exceedance on construction dust were identified. However, it was a recurrent case from Greenview Terrace. The Contractor was recommended to enhance water spraying continuously especially in rock breaking activities. On the other hand, there was no noise levels ($L_{eq(30min)}$) from the measurement taken from ET was more than 80 dB(A). However, it was a recurrent case from Greenview Terrace. The Contractor was reminded to enhance the on-site noise mitigation measures. The enhanced mitigation measures are proposed as follows: • A staff from the Contractor was designated to take the reading of Leq (5mins) at the roof of Greenview Terrace. In case of the Leq (5min) exceed 73 dB(A), the Contractor would re-schedule the noisy plants to mitigate the escalation of noise level. • The designated staff was reminded to record all the weather condition including raining and wind speed. • Tools box talk for the Contractor's Team was carried out for reminding that the movable barrier should be placed to the breaking activities as	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					much as possible. • Movable noise barriers were placed on site and the movable noise barriers were also modified. • Existing 25 ton rock breaker had been replaced by the another breaker. • The breaking tap of the 25 ton rock breaker had been replaced by another breaking tap. • A joint filler wall was installed at the vertical face of westbound to mitigate the noise rebound from the vertical face to high level of Greenview Terrace. From the additional monitoring data and monitoring data under regular EM&A requirements, noise level ($L_{eq, 30\ min}$) from 6 July to 31 August 2009 was in the range of 71 to 74 dB(A) to the nearest integer. The noise monitoring frequency was maintained in twice per week to check whether the mitigation measures are effective. From the information of the Contractor, all the mitigation measures were implemented on 31 August 2009. Noise levels ($L_{eq, 30\ min}$) were also re-measured after the implementation of the mitigation measures. Noise level ($L_{eq, 30\ min}$) from 4 Sep to 28 Sep 2009 was in the range of 70 to 73 dB(A) to the nearest integer after the implementation of the mitigation measures.	
8	CIR-007	14 August 2009 at Outfall	Public through EPD	EPD has received a complaint (EPD ref: EP3/N22/RW/17978-09) from Greenview Terrace regarding to daytime construction noise from the outfall construction site. The complaint date was corresponded to 14 August 2009.	<u>Findings/ Observations</u> Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in July and August 2009. According to the noise monitoring results from 6 July 2009 to 31 August 2009 at NSR 9, the measured noise levels complied with the limit level in accordance with the EIAO-TM. <u>Conclusion/Remedial Action</u> This was a recurrent case from Greenview Terrace. The documented complaint for noise is considered to trigger the action level and the Contractor was reminded to enhance the on-site noise mitigation measures continuously. The enhanced mitigation measures are proposed as follows: • A staff from the Contractor was designated to take the reading of Leq	Same Case with Complaint No. 11

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					(5mins) at the roof of Greenview Terrace. In case of the Leq (5min) exceed 73 dB(A), the Contractor would re-schedule the noisy plants to mitigate the escalation of noise level. • The designated staff was reminded to record all the weather condition including raining and wind speed. • Tools box talk for the Contractor's Team was carried out for reminding that the movable barrier should be placed to the breaking activities as much as possible. • Movable noise barriers were placed on site and the movable noise barriers were also modified. • Existing 25 ton rock breaker had been replaced by the another breaker. • The breaking tap of the 25 ton rock breaker had been replaced by another breaking tap. • A joint filler wall was installed at the vertical face of westbound to mitigate the noise rebound from the vertical face to high level of Greenview Terrace. From the additional monitoring data and monitoring data under regular EM&A requirements, noise level ($L_{eq, 30\ min}$) from 6 July to 31 August 2009 was in the range of 71 to 74 dB(A) to the nearest integer. The noise monitoring frequency would be maintained in twice per week to check whether the mitigation measures are effective. From the information of the Contractor, all the mitigation measures were implemented on 31 August 2009. Noise levels ($L_{eq, 30\ min}$) were also re-measured after the implementation of the mitigation measures. Noise level ($L_{eq, 30\ min}$) from 4 Sep to 28 Sep 2009 was in the range of 70 to 73 dB(A) to the nearest integer after the implementation of the mitigation measures.	
9	CIR-008	17 August 2009 at Portion D of the Site	Public through SOR	SOR has received a complaint (SOR ref:(DC/2007/12)/M45/500/02546) from Long Bench Garden	<u>Findings/ Observations</u> Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in August 2009. The monitoring results from 3 August 2009 to 31 August 2009 at NSR 8 showed the measured noise levels complied with the limit level in accordance with the EIAO-TM. The contractor and the environmental	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
				regarding to noise nuisance generated from the daytime construction work (rock-breaking) in Portion D of the Site. The complaint date was corresponded to 17 August 2009.	team were also undertaken site investigation on the subject area in response to the complaint. Noise mitigation measures should be enhanced continuously due to this complaint. Conclusion/Proposed Action The documented complaint for noise is considered to trigger the action level and the Contractor was reminded to enhance the on-site noise mitigation measures continuously. The enhanced mitigation measures are recommended as follows: • Movable noise barriers had been placed towards the direction of Long Bench Garden, particular for the pipe pile works in the portal. • Tools box talk for construction team was carried out for reminding that the movable barrier should be placed to the breaking activities as much as possible. • The existing noisy 25 ton rock breaker had been replaced by the other breaker. • A joint filler wall had been fixed on the vertical face of west bound to absorb the noise generated towards Long Beach Garden. Noise monitoring frequency was increased twice per week by ET due to this complaint. The measured noise levels were complied with the limit level in accordance with the EIAO-TM. No further complaint was received from Long Bench Garden within the reporting month.	
10	CIR-009	22 August 2009 at Outfall	Public through SOR	A complaint (SOR ref: (DC/2007/12)/M45/500/02628) was received from Greenview Terrace regarding to daytime construction noise level (Leq(30min)) was sometimes exceeded 75 dB(A)	Findings/ Observations Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in July and August 2009. The monitoring results from 6 July 2009 to 31 August 2009 at NSR 9 showed the measured noise levels complied with the limit level in accordance with the EIAO-TM. The contractor and the environmental team were also undertaken site investigation on the subject area in response to the complaint. Noise mitigation measures should be enhanced continuously due to this complaint. Conclusion/Proposed Action The documented complaint for noise is considered to trigger the action level and the Contractor was reminded to enhance the on-site noise	Same Case with Complaint No. 11

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
				at the outfall construction site. The complaint date was corresponded to 22 August 2009.	mitigation measures continuously. The enhanced mitigation measures are recommended as follows: • A staff from the Contractor was designated to take the reading of Leq (5mins) at the roof of Greenview Terrace. In case of the Leq (5min) exceed 73 dB(A), the Contractor would re-schedule the noisy plants to mitigate the escalation of noise level. • The designated staff was reminded to record all the weather condition including raining and wind speed. • Tools box talk for the Contractor's Team was carried out for reminding that the movable barrier should be placed to the breaking activities as much as possible. • Movable noise barriers were placed on site and the movable noise barriers were also modified. • Existing 25 ton rock breaker had been replaced by the another breaker. • The breaking tap of the 25 ton rock breaker had been replaced by another breaking tap. • A joint filler wall was installed at the vertical face of westbound to mitigate the noise rebound from the vertical face to high level of Greenview Terrace. From the additional monitoring data and monitoring data under regular EM&A requirements, noise level ($L_{eq, 30\ min}$) from 6 July to 31 August 2009 was in the range of 71 to 74 dB(A) to the nearest integer. The noise monitoring frequency was maintained in twice per week to check whether the mitigation measures are effective. From the information of the Contractor, all the mitigation measures were implemented on 31 August 2009. Noise levels ($L_{eq, 30\ min}$) were also re-measured after the implementation of the mitigation measures. Noise level ($L_{eq, 30\ min}$) from 4 Sep to 28 Sep 2009 was in the range of 70 to 73 dB(A) to the nearest integer after the implementation of the mitigation measures. In our investigation, there was no exceedance of the measured noise level at Greenview Terrace.	

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
11	CIR-010	24 September 2009 at Outfall	Public through SOR	A complaint (SOR ref: (DC/2007/12)/M45/500/02749) was received from Greenview Terrace regarding to daytime construction noise level (Leq(30min)) was sometimes exceeded 75 dB(A) at the outfall construction site.	Findings/ Observations Soil nailing, excavation, rock breaking and drilling, loading and unloading the materials were generally observed during monitoring period in July and September 2009. The monitoring results from 6 July 2009 to 29 October 2009 at NSR 9 showed the measured noise levels complied with the limit level in accordance with the EIAO-TM. The contractor and the environmental team were also undertaken site investigation on the subject area in response to the complaint. Noise mitigation measures have been enhanced continuously due to this complaint. Conclusion/Proposed Action The documented complaint for noise is considered to trigger the action level and the Contractor was reminded to enhance the on-site noise mitigation measures continuously. The enhanced mitigation measures were implemented as follows: • A staff from the Contractor was designated to take the reading of Leq (5mins) at the roof of Greenview Terrace. In case of the Leq (5min) exceed 73 dB(A), the Contractor would re-schedule the noisy plants to mitigate the escalation of noise level. • The designated staff was reminded to record all the weather condition including raining and wind speed. • Tools box talk for the Contractor's Team was carried out for reminding that the movable barrier should be placed to the breaking activities as much as possible. • Movable noise barriers were placed on site and the movable noise barriers were also modified. • Existing 25 ton rock breaker had been replaced by the another breaker. • The breaking tap of the 25 ton rock breaker had been replaced by another breaking tap. • A joint filler wall was installed at the vertical face of westbound to mitigate the noise rebound from the vertical face to high level of Greenview Terrace.	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					From the additional monitoring data above and the regular monitoring under EM&A requirements, the measured noise levels were complied with the limit level in accordance with the EIAO-TM. From the noise level on 25 September 2009 and 2 October 2009, the trend of noise level seemed to be increased since the decoration work at 14/F Greenview Terrace was the domain noise source during the monitoring. The noise level during that time would be considered for reference only. There was no exceedance of the measured noise level at Greenview Terrace in our investigation.	
12	CIR-011	2 October 2009 at I-3	Public through EPD	EPD has received a complaint (EPD ref: EP3/N22/RW/22016-09) regarding to construction dust at the Intake-3 on 2 October 2009.	<u>Findings/ Observations</u> There is no representative air monitoring location as stated in the EM&A Manual. The contractor and the environmental team were undertaken site investigation on the subject area at 08-Oct-09 in response to the complaint. Air quality mitigation measures as recommended in EIA have been implemented by the Contractor. However, the dust impact by exposed area could be further improved. The mitigation measures during the site investigation were observed as follows: • Water spraying was provided to the exposed surface. • Wheel washing facilities for dump trucks was provided at the site exit. • Water spraying was provided during excavation and loading/unloading works <u>Conclusion/Proposed Action</u> Based on our site inspection, the complaint for dust is considered justifiable as it is due to windy erosion on the exposed surface. Air quality mitigation measures as recommended in EIA have also been implemented in order to control and minimise the air quality impact arising from the construction activities. In view of the recent dry season, the haul road and the exposed area would be dry very quickly. The Contractor was recommended to provide water spraying more frequently especially in the dry season.	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
13	(DC/2007/12)/ M45/500/2923 & email on 11 November 2009 from MCSJV	9 November 2009 at Outfall	Greenview Terrace through EPD	Movable noise barrier was not placed close enough to the piling machine.	Immediate Action The rig was re-orientated and the barrier was placed closed to the drilling head. Follow-up Action • Training was conducted to the operator to ensure that the workers aware that the barrier should be placed closed not the drilling head not the machine itself. • In order to prevent future occurrence, a permit to dig system was adopted. It should be checked by the Contractor and endorsed by the SOR before starting the drilling rig. The follow up action was checked and a permit to dig system has been implemented.	Closed
14	(DC/2007/12)/ M45/500/2978 & email on 19 November 2009 from MCSJV	18 November 2009 at Outfall	Greenview Terrace through EPD	Rock-breaking activity carried out in the eastern area of Portion D, closest to Greenview Terrace, was not totally screened and line of sight of the breaker was observed from the NSR.	Follow up Action • The bamboo scaffold was extended further away from stage 3 scaffold to further screen off the activities to the Greenview. The length of the extension was about 8 to 10 m. • A strong reminded was given to the relevant staff and sub-contractor and the barrier should be placed in the right orientation before breaking. • The mitigation measures were strictly followed as stated in the proposal. The follow up action and relevant records was checked.	Closed
15.	CIR-12	19 January 2010 at Intake-3 construction site	Public through EPD	EPD has received a public complaint (EPD ref: EP3/N22/RW/01270-10) regarding effluent discharge at Intake-3 construction site on 19 January 2010.	Findings/ Observations The effluent discharge on 19 January 2010 was due to the leakage of Gabion wall at I3. The water from the rock drilling work was flowing through the gap of the Gabion Wall to the watercourses at I3. Immediate Action The contractor had sealed the gap at the Gabion Wall immediately after the incident. Conclusion/Proposed Action Based on our site inspection, the complaint was due to leakage of Gabion	Closed.

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					wall. The area would be checked and maintained continuously to avoid recurrence case. The above identified mitigation measures have been implemented by the Contractor on 22 January 2010 and ET has also checked the implementation on 31 January 2010. The ET will closely inspect the watercourses during the routine site inspections and provide advice to the Contractor.	
16	CIR-13	19 January 2010 at Intake-3 construction site	Public through EPD	EPD has received a public complaint (EPD ref: EP3/N22/RW/01319-10) regarding daytime construction noise at Intake-3 construction site on 19 January 2010.	Findings/ Observations The monitoring station concerned is NSR6 (i.e. at Squatter facing to the construction site). Excavation, soil nailing, rock drilling and breaking, loading and unloading the materials were generally observed during monitoring period in mid-January 2010. The measured noise levels in January 2010 complied with the limit level in accordance with the EM&A Manual. These cases would also be treated as two action level exceedances on noise. The Contractor and the Environmental Team were also undertaken site investigation on the subject area in response to complaint. The noise mitigation measures during the site investigation were recommended as follows: • Sound insulation sheets were installed covering the working area during breaking and rock drilling in order to block the line of sight to the NSR. • Noise insulation materials were used to enclose the drilling rig tightly. Conclusion/Proposed Action Based on the site inspection and monitoring results, the complaint was due to noise generated by rock breaking work. The identified mitigation measures have been discussed with the Contractor and the Contractor has submitted the remedial proposal. The proposal was implemented by the Contractor on 25 January 2010 and ET has also checked the implementation on 31 January 2010. The Contractor was also advised to review the mitigation measures from time to time near the NSR at I3. The ET will closely inspect the area during the routine site inspections and provide advice to the Contractor.	Closed.
17	CIR-13	21 January 2010 at Intake-3	Public through	EPD has received a public complaint (EPD ref:	Refers to Investigation /Mitigation Action for Complaint No. 16.	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
		construction site	EPD	EP3/N22/RW/01444-10) regarding daytime construction noise at Intake-3 construction site on 21 January 2010.		
18	CIR-14	27 August 2010 near Intake-2 construction site	Public through DSD	DSD has received a public complaint regarding choked sewage manhole (MH1) at Lo Wai Road construction site on 27 August 2010.	Findings/ Observations During DSD inspection on 30 August 2010, improper discharge from the site to manhole, MH3, which is located downstream of MH1 was observed. ET had received those information from the Contractor on 09 September 2010. Site investigation was also carried out by SOR's representative with the Contractor on 01 September 2010. Checking with the site log, the construction activity at Lo Wai on 27 August 2010 was pipe jacking only. No site formation works was undertaken. The contractor and SOR's representative have undertaken site investigation on the subject area on 01 September 2010. On-site flow test at Portion G had conducted. ● Maeda works area is located at the lower section of Lo Wai Road and manhole MH3 is adjacent to the works area. MH1 (choked sewage manhole) is located at the upper section of Lo Wai Road. MH2 manhole is located middle section of Lo Wai Road. MH1 and MH2 are outside the works area. ● Water flow test for manhole MH2 and MH3 and no blockage was observed. ● Sewage overflow was found at MH1 during the joint site inspection on 01 September 2010 ● It was reported that there were water pipes connected between the site and the MH3. Discharge was found in MH3 during DSD inspection. ● The contractor claimed that the purpose of the water pipes was to direct the storm water and underground water inside the concrete pipe "pipe jacking". ● There was no discharge license for that portion. The Contractor had stopped on 01 September 2010 the water pumping to MH3 and	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					apply the discharge license for the Lo Wai site. Conclusion/Proposed Action Based on the joint site inspection, the choked manhole MH1 was not due to works activities. The Contractor had clean up the choked manhole MH1 and no sewage overflow from MH1 was observed. The Contractor was requested to divert the storm water to desilting system prior to discharge while no such discharge can be made until a valid discharge license is granted. The ET will closely inspect the vicinity area during the routine site inspections and provide advice to the Contractor as necessary.	
19&20	CIR-15	17 November 2010 at outfall construction site	Public through EPD	EPD has received a public complaint (EPD ref: EP3/N22/RW/24002-10 and EP3/N22/RW/24006-10) regarding daytime construction noise about derrick barge squeaking and rock breaking at Outfall construction site on 17 November 2010.	Findings/ Observations Drilling, excavation, marine mud dredging, rock breaking, mucking-out process and crane operation were observed during site inspections on 2 and 17 December 2010. The monitoring results measured on 15 November 2010 and 25 November at NSR 9 showed that the measured noise levels complied with the limit level (75 dB(A)) in accordance with the EIAO-TM. As part of the investigation of the noise complaints, the Contractor and the ET conducted additional site inspections and reviewed and audited the current noise mitigation practices and the Contractor's environmental performance on-site. Conclusion / Proposed Action The documented complaints for noise triggered the action level of the noise monitoring. The Contractor had implemented the following on-site noise mitigation measures: ● Erection of temporary noise insulation sheet at the rim of the spiral ramp construction site; ● Moveable barriers for rock breaker; ● Wrapping noise absorptive material at the rock breaker head; ● Tailor made noise enclosure for drilling rig; ● Semi-enclosed muck out process at muck hopper; ● Use of rock splitter (which is a relatively quieter method in contrast to rock breaker); and ● Noise insulation blanket enclosing the crane engine of derrick barge. Noise monitoring was increased to twice per week and the results were	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					reported in the Complaint Investigation Report submitted on 24 December 2010. The measured noise level after implementation of the noise mitigation measures ranged from 69 to 73 dB(A) to the nearest integer and complied with the limit level in accordance with the EIAO-TM. The results showed that noise mitigation measures were effective. The contractor was advised to review the mitigation measures from time to time near the NSR 9. The ET would closely inspect the area during the routine site inspections and provide advice to the Contractor.	
21	CIR-16	10 January 2011 at outfall construction site	Public through EPD	EPD has received a public complaint (EPD ref: EP3/N22/RW/00484-11) regarding dark smoke emission from derrick barge and construction noise and dust at Outfall construction site on 10 January 2011.	Findings/ Observations 1. Dark Smoke Emission from Derrick Barge Dark smoke emitted from the derrick barge was promptly investigated after the receipt of the complaint. The issue was found specific to the mechanical operation of the barge working at the site at that moment. The derrick barge being complained was then replaced by another barge without the relevant mechanical issue. No further complaint was received since then. 2. Construction Dust Regular 1-hour TSP monitoring, in accordance with EM&A Manual, was carried out by the Environmental Team (ET). The monitoring station concerned is ASR 9, located at the podium level of Greenview Terrace facing the construction site. In January, 1 hour TSP concentration monitoring had been conducted on 4, 10, 14, 20 and 26 January 2011 at Greenview Terrace (ASR). Rock breaking, drilling and excavation were observed during monitoring. No exceedance was recorded. The contractor and the environmental team were also undertaken site investigation at the subject area on 21 January 2011 in response to the complaint. It was confirmed that the air quality mitigation measures as recommended in EIA had been provided by the Contractor. The mitigation measures are as follows: ● Water spraying surrounding the spiral ramp; ● Water spraying for rock drilling and rock breaking; ● Water spraying for C&D material before loading and unloading to	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					derrick barge; ● Water spraying for the exposed surface and the haul road; ● Water spraying for trucks and vehicles at the site exit. 3. <u>Construction Noise</u> The documented complaints for noise triggered the action level of the noise monitoring. The Contractor had implemented the following on-site noise mitigation measures: ● Extension of Temporary noise insulation barrier (made of noise blanket) at the rim of the spiral ramp construction site facing Greenview Terrace; ● Movable noise barriers to surround the rock breaking activities at the spiral ramp where it is in safe ground condition; ● Tailor made noise enclosure for rock drilling machine; ● Semi-enclosed muck out process at muck hopper (with noise curtain underneath); ● Use of temporary noise enclosure for piling work at Castle Peak Road; ● Noise insulation blanket enclosing the crane engine of derrick barge; ● Additional noise blanket along the railings of the spiral ramp; and ● Use of rock splitter (which is a relatively quieter method in contrast to rock breaker). Noise monitoring has been increased to twice per week and the results will be reported in the Complaint Investigation Report to be submitted in mid-February 2011. The measured noise level after implementation of the noise mitigation measures ranged from 71 to 74 dB(A) to the nearest integer and complied with the limit level in accordance with the EIAO-TM. The results showed that noise mitigation measures were effective. The contractor was advised to review the mitigation measures from time to time near the NSR 9. The ET would closely inspect the area during the routine site inspections and provide advice to the Contractor. <u>Conclusion / Proposed Action</u> 1. <u>Dark Smoke Emission from Derrick Barge</u> Dark smoke emitted from the derrick barge was considered a stand-alone	

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					incident and was specific to the derrick barge being complained. No further complaint was received after the barge was replaced by another. 2. Construction Dust Based on our site inspection and monitoring results, the complaint was considered not justifiable since no action and limit level exceedance on construction dust were identified. Air quality mitigation measures as recommended in EIA were implemented in order to control and minimize the air quality impact and nuisance arising from the construction activities. Nevertheless, the Contractor was reminded to enhance the air quality mitigation measures such as increasing the water spraying frequency and ensure proper functioning of the automatic sprinklers at the Outfall construction site. 3. Construction Noise Noise measurement results between 10 and 28 January 2011 were below the limit level (75 dB(A)) and complied with the noise criterion. The Contractor had implemented various mitigation measures on site to alleviate the construction noise impact. The ET will remind the Contractor to enhance and maintain the normal functioning of the measures continuously to minimize the impact. The Contractor should also closely liaise with the nearby residents and inform the progress of the construction and the implementation of the environmental mitigation measures at the Outfall construction site.	
22	CIR-17	30 June 2011 at Intake-3 construction site	Public through EPD	EPD has received a public complaint (EPD ref: EP3/N22/RW/12759-11) regarding construction dust and daytime construction noise from the Intake-3 construction site on 30 June	1. Findings / Observations Checking with the site log, construction activities conducted at I-3 were breaking / mucking out and rock splitting inside the shaft, curing of planter wall, backfilling at tree pit, slope reinstatement and backfilling at PB wall, monitoring of de-formation monitoring point, and general site cleaning and housekeeping. The Contractor and ET undertook site investigations on the subject area on 8 and 20 July 2011. The following dust and noise mitigation measures were implemented during site investigations: Dust Mitigation Measures (implemented prior to the complaint) ● All the main haul road was paved;	Closed

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
				2011.	● Material transported by a dump truck was covered with impervious sheeting; ● Exposed soil slope surface near the PB wall was covered by tarpaulin sheets; ● Hoardings (with 2.4 m high) were provided along the site boundary next to the access road; ● Regular watering on haul roads by sprinklers was observed; ● Vehicle speed limit of 5 km per hour was implemented within the construction site; ● Water spraying for dust suppression of on-going "dusty" activities (essentially including drilling and rock breaking within the shaft of about 16.5 m below ground) was observed; <u>Construction Noise Mitigation Measures (implemented prior to the complaint)</u> ● Temporary noise barriers (about 4 m high) were erected on the shaft concrete block wall; ● Quiet plant (rock splitter) was employed for shaft excavation; ● Noise from generator was screened by a temporary noise barrier; and ● Breaker heads of rock breaking machine were wrapped with sound insulating materials. 2. <u>Conclusion / Proposed Action</u> As there are no substantial noise sources at I-3 other than the project construction activities, it is considered that the noise complaint is project-related. In accordance with the Event / Action Plan for Construction Noise specified in the EM&A Manual, noise monitoring frequency at the squatters (NSR 6) near I-3 were increased to twice per week (from 11 July 2011 to 30 July 2011) due to this complaint. The measured noise levels ($L_{eq, 30\ min}$) are shown in the following table. The measured noise levels, ranged from 60.0 dB(A) to 68.9 dB(A), are well below the limit level (75 dB(A)) in accordance with the EIAO-TM. During the site investigations on 8 and 20 July 2011, the above noise mitigation measures were continuously implemented. No further noise complaint was received in July 2011. Thus, with the consideration of the noise measurement results	

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<tr><th>Complaint No.</th><th>Log Ref.</th><th>Date/Location</th><th>Complainant</th><th>Details of Complaint</th><th>Investigation / Mitigation Action</th><th>Status</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>and implementation of the above noise mitigation measures, the construction noise is considered acceptable. The Contractor will maintain the noise mitigation measures mentioned above to minimise noise nuisance.
<table>
<tr><th>Date</th><th>Start Time</th><th>End Time</th><th>L_{eq}, dB(A)</th><th>Limit Level, dB(A)</th><th>Major Construction Noise Sources</th></tr>
<tr><td>6-Jul-11</td><td>11:17</td><td>11:47</td><td>60.0</td><td>75</td><td>Crane operation</td></tr>
<tr><td>14-Jul-11</td><td>16:00</td><td>16:30</td><td>67.0</td><td>75</td><td>Drilling and rock breaking</td></tr>
<tr><td>15-Jul-11</td><td>17:00</td><td>17:30</td><td>68.9</td><td>75</td><td>Drilling and rock breaking</td></tr>
<tr><td>18-Jul-11</td><td>13:30</td><td>14:00</td><td>65.7</td><td>75</td><td>Drilling and crane operation</td></tr>
<tr><td>20-Jul-11</td><td>13:10</td><td>13:40</td><td>68.1</td><td>75</td><td>Drilling and rock breaking</td></tr>
<tr><td>28-Jul-11</td><td>13:35</td><td>14:05</td><td>64.9</td><td>75</td><td>Drilling and excavation</td></tr>
<tr><td>30-Jul-11</td><td>09:10</td><td>09:40</td><td>63.6</td><td>75</td><td>Drilling and crane operation</td></tr>
</table>
Remark:
The location of powered mechanical equipment (PME) will change occasionally and the utilization time for each PME may not be constant.

As observed during the site investigation on 8 July 2011, dust suppression measures aforementioned were implemented on site. Additional dust control measures have been implemented at I-3 by the Contractor in early July 2011 to further suppress dust emission:

1) Tailor-made frame with blankets has been installed for the drilling rig;
2) Water hoses have been installed to the drilling rig within the tailor-made frame during drilling; and
3) Water smog device installed at the edge of intermediate platform of</td><td></td></tr>
</table>

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					the shaft. The Contractor have continuously applied all the above mentioned dust suppression measures to minimise airborne dust generation, as observed during the site investigation on 20 July 2011. No dust dispersion from the construction site was observed during the site investigations on 8 and 20 July 2011. In addition, no further construction dust complaint is received in July 2011. As such, it is considered that the dust suppression measures implemented on site are adequate to minimise dust nuisance. The Contractor will maintain these measures on site for construction dust control. 3. <u>Follow Up Action(s)</u> For this complaint, the Contractor has implemented adequate mitigation measures for construction dust and noise control. As no further complaint is received in July 2011, it is considered that the complaint is closed. Nevertheless, the ET will continuously review the condition of the site during the routine site inspections, inspect proper functioning of the aforementioned construction dust and noise mitigation measures, and provide advice to the Contractor to be vigilant and tailor mitigation measures in advance of future planned site work activities.	
23	CIR-18	2 September 2011 at Sheung Kok Shan near Intake 2	Mr. Cheung through EPD	EPD have received a complaint from Mr. Cheung, who lived in Sheung Kok Shan, concerning construction noise arising from the use of the TBM at night time. He alleged that the noise emanated from the tunnelling works had caused	1. <u>Findings / Observations</u> According to the approved EIA Report, it is recommended to restrict the tunnel boring machine (TBM) operation in the non-restricted period for tunnel section from chainage 1295 m to 1449 m. Checking with the site log, the Contractor has strictly followed the EIA recommendation for the TBM operation within the non-restricted period between the chainage 1295 m to 1449 m. TBM moved from CH1449 on 11 August 2011 and passed through CH1295 on 23 August 2011, and the Contractor resumed night time TBM operation afterwards. TBM was operating at night time (from 01:10 to 07:00) on 26 August 2011 (about 55 m away from the EIA restricted zone and about 22 m away from Mr. Cheung's house, which is located near CH1218).	Closed

<table>
<tr><th>Complaint No.</th><th>Log Ref.</th><th>Date/Location</th><th>Complainant</th><th>Details of Complaint</th><th>Investigation / Mitigation Action</th><th>Status</th></tr>
<tr><td></td><td></td><td></td><td></td><td>nuisance to him since 26 August 2011.</td><td>First verbal complaint from Mr. Cheung was received in the morning of 26 August 2001 by the Contractor. The Contractor had stopped TBM night time operation from 26 August to 01 September 2011 accordingly. On 01 September 2011, TBM was located 38 m away from Mr. Cheung's house and the Contractor attempted to resume the night time operation.

Second verbal complaint from Mr. Cheung was received on 02 September 2011 by EPD. The Contractor took immediate measure to stop the night time operation from 02 to 07 September 2011. On 08 September 2011, TBM moved 109 m away from Mr. Cheung's house. The Contractor attempted to resume night time operation and no further complaint was received after that.

2. <u>Mitigation Measure Implemented after Receiving the Complaints</u>

Night time operation of the TBM was restricted as shown in the following table:

<table>
<tr><th>Period</th><th>Night Time Operation[1]</th><th>Remark</th></tr>
<tr><td>25 - 26 Aug 2011</td><td>From 01:10 to 07:00 (26 Aug)</td><td>The Contractor received a verbal complaint in the morning (26 Aug 2011). The Contractor began to stop night time TBM operation. TBM was located about 22 m away from Mr. Cheung's house.</td></tr>
<tr><td>26 - 27 Aug 2011</td><td>-</td><td>No night time TBM operation</td></tr>
<tr><td>27 - 28 Aug 2011</td><td>-</td><td>No night time TBM operation</td></tr>
<tr><td>28 - 29 Aug 2011</td><td>-</td><td>No night time TBM operation</td></tr>
<tr><td>29 - 30 Aug 2011</td><td>-</td><td>No night time TBM operation</td></tr>
</table>
</td><td></td></tr>
</table>

<table>
<tr><th>Complaint No.</th><th>Log Ref.</th><th>Date/Location</th><th>Complainant</th><th>Details of Complaint</th><th>Investigation / Mitigation Action</th><th>Status</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>30 - 31 Aug 2011</td><td>-</td><td>No night time TBM operation</td></tr>
<tr><td>31 Aug - 01 Sep 2011</td><td>- -</td><td>No night time TBM operation. TBM was located about 38 m away from Mr. Cheung’s house.</td></tr>
<tr><td>01 - 02 Sep 2011</td><td>From 23:00 (01 Sep) to 04:50 (02 Sep)</td><td>The Contractor attempted to resume night time TBM operation on 01 Sep 2011. ET received a complaint via EPD in the morning (2 Sep 2011). The Contractor began to stop night time TBM operation on 02 Sep 2011.</td></tr>
<tr><td>02 - 03 Sep 2011</td><td>-</td><td>No night time TBM operation</td></tr>
<tr><td>03 - 04 Sep 2011</td><td>-</td><td>No night time TBM operation</td></tr>
<tr><td>04 - 05 Sep 2011</td><td>-</td><td>No night time TBM operation</td></tr>
<tr><td>05 - 06 Sep 2011</td><td>-</td><td>No night time TBM operation</td></tr>
<tr><td>06 – 07 Sep 2011</td><td>-</td><td>No night time TBM operation</td></tr>
<tr><td>07 – 08 Sep 2011</td><td>From 06:00 to 07:00 (08 Sep 2011)</td><td>TBM was located about 109 m away from Mr. Cheung’s house. The Contractor attempted to resume TBM night time operation and no further complaint was received.</td></tr>
</table>
Remark: 1. ”Night Time” refers to 23:00 to 07:00 of the following day.

3. <u>Conclusion / Proposed Action</u>

Having reviewed the timing of the complaints and periods of TBM operation during the night time on 25 - 26 August 2011 and 1 - 2</td><td></td></tr>
</table>

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					September 2011, it is believed that the complaints are related to the TBM operation during the night time. The Contractor has undertaken swift and appropriate action in response to Mr. Cheung's complaints. The night time operation of the TBM was restricted following the complaint. As the TBM continues to operate during the day time and moves further away from Mr. Cheung's house, the ground-borne noise nuisance upon Mr. Cheung gradually fades away. It is considered that the nuisance caused by TBM night time operation is then imperceptible from the complainant. No further complaint is received after 2 September 2011. As such, no further action is required. 4. Follow Up Action(s) For this complaint, the Contractor has implemented adequate mitigation measure (that is, restricting the TBM to operate during the day time only) for ground-borne noise control. The TBM has moved further away from Mr. Cheung's house and no further complaint is received after the Contractor resumed the TBM night time operation (08 September 2011). Thus, it is considered that the complaint is closed.	
24	CIR-19	8 February 2012 at Intake-3 Construction Site	Mr. Cheng through SOR	SOR has received a public complaint regarding daytime construction noise from the Intake-3 construction site on 8 February 2012.	1) Findings / Observations Checking with the site log, construction activities conducted at I-3 in that morning was rock breaking by hydraulic breaker at the proposed access road. The Contractor and ET undertook site investigations on the subject area on 9 February 2012. The following noise mitigation measures were implemented during site investigations: Construction Noise Mitigation Measures (implemented prior to the complaint) 1) Noise barrier on the top of vortex shaft was maintained; 2) Silent type breaker tip was utilized; and 3) Breaker tip was wrapped by acoustic insulating material.	Closed

<table>
<tr><th>Complaint No.</th><th>Log Ref.</th><th>Date/Location</th><th>Complainant</th><th>Details of Complaint</th><th>Investigation / Mitigation Action</th><th>Status</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>
2) <u>Conclusion / Proposed Action</u>

As there are no substantial noise sources at I-3 other than the project construction activities, it is considered that the noise complaint is project-related. In accordance with the Event / Action Plan for Construction Noise specified in the EM&A Manual, noise monitoring frequency at the squatters (NSR 6) near I-3 were increased to twice per week (from 10 February 2012 to 29 February 2012) due to this complaint. The measured noise levels ($L_{eq, 30\ minutes}$) are shown in the following table. The measured noise levels, ranged from 59.5 dB(A) to 68.1 dB(A), are well below the limit level (75 dB(A)) in accordance with the EIAO-TM. During the site investigations on 9 and 23 February 2012, the above noise mitigation measures were continuously implemented. No further noise complaint was received in February 2012. Thus, with the consideration of the noise measurement results and implementation of the above noise mitigation measures, the construction noise is considered acceptable. The Contractor will maintain the noise mitigation measures mentioned above to minimise noise nuisance.
<table>
<tr><th>Date</th><th>Start Time</th><th>End Time</th><th>L_{eq}, dB(A)</th><th>Limit Level, dB(A)</th><th>Major Construction Noise Sources</th></tr>
<tr><td>7-Feb-2012</td><td>13:28</td><td>13:58</td><td>60.2</td><td>75</td><td>Crane operation and rock breaking</td></tr>
<tr><td>10-Feb-2012</td><td>15:15</td><td>15:45</td><td>62.1</td><td>75</td><td>Crane operation and excavation works</td></tr>
<tr><td>13-Feb-2012</td><td>13:35</td><td>14:05</td><td>68.1</td><td>75</td><td>Crane operation and rock breaking</td></tr>
</table>
</td><td></td></tr>
</table>

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status

17-Feb-2012	16:20	16:50	60.2	75	Crane operation and excavation works
20-Feb-2012	13:33	14:03	66.4	75	Crane operation and rock breaking
23-Feb-2012	14:30	15:00	64.3	75	Crane operation and rock breaking
27-Feb-2012	11:10	11:40	63.4	75	Crane operation and rock breaking
29-Feb-2012	13:26	13:56	59.5	75	Crane operation and rock breaking

Remark:
The location of powered mechanical equipment (PME) will change occasionally and the utilization time for each PME may not be constant.

Additional noise mitigation measures have been implemented at I-3 by the Contractor to further reduce the construction noise:

- Noise barrier comprised of acoustic blankets installed close to the rock breaking area was erected on the site.

The Contractor have continuously applied all the above mentioned noise mitigation measures to minimise construction noise, as observed during the site investigation on 9 and 23 February 2012. No further construction noise complaint was received in February 2012. As such, it is considered that the noise mitigation measures implemented on site are adequate to minimise construction noise nuisance. The Contractor will maintain these measures on site for construction noise control.

<table>
<tr><th>Complaint No.</th><th>Log Ref.</th><th>Date/Location</th><th>Complainant</th><th>Details of Complaint</th><th>Investigation / Mitigation Action</th><th>Status</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>3) <u>FOLLOW UP ACTION(S)</u>
For this complaint, the Contractor has implemented adequate mitigation measures for construction noise control. As no further complaint is received in February 2012, it is considered that the complaint is closed. Nevertheless, the ET will continuously review the condition of the site during the routine site inspections, inspect proper functioning of the aforementioned construction noise mitigation measures, and provide advice to the Contractor to be vigilant and tailor mitigation measures in advance of future planned site work activities. This case will be reported as an action level exceedance on noise and also in the complaint log in the monthly EM&A Report (February 2012).</td><td></td></tr>
<tr><td>25</td><td>CIR-20</td><td>10 August 2012 at Intake-3 Construction Site</td><td>Mr. Cheng through ICC</td><td>1823 Call Centre (ICC) received a verbal complaint regarding the deterioration of water quality at Tso Kung Tam due to the construction works at Intake 3 construction site on 10 August 2012.</td><td>1) <u>Findings / Observations</u>
Routine water quality monitoring upstream (I-3-C) and downstream (I-3) of the construction site at Intake 3 has been carried out since the commencement of construction works. Monitoring was conducted on 8 August 2012 and 10 August 2012. The results, as presented in the following table, indicate full compliance of water quality at I-3 with the action / limit levels of the water quality monitoring programme.
<table>
<tr><th rowspan="2">Date</th><th rowspan="2">Parameters</th><th colspan="2">Stations</th><th rowspan="2">Action Level</th><th rowspan="2">Limit Level</th><th rowspan="2">Exceedance</th></tr>
<tr><th>Impact (I-3)</th><th>Control (I-3-C)</th></tr>
<tr><td rowspan="3">8 August 2012</td><td>Water Temperature (℃)</td><td>31.6</td><td>31.7</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>pH</td><td>7.91</td><td>7.92</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Dissolved Oxygen (mg/L)</td><td>6.89</td><td>6.85</td><td>3.65</td><td>3.51</td><td>No</td></tr>
</table></td><td>Closed</td></tr>
</table>

<table>
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<tr><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td></td><td>Turbidity (NTU)</td><td>2.21</td><td>2.25</td><td>3.99 NTU or 120% of upstream control station's turbidity</td><td>4.18 NTU or 130% of upstream control station's turbidity</td><td>No</td></tr>
<tr><td></td><td>Suspended Solids (SS) (mg/L)</td><td>< 2.00</td><td>< 2.00</td><td>6.13 mg/L or 120% of upstream control station's SS</td><td>7.23 mg/L or 130% of upstream control station's SS</td><td>No</td></tr>
<tr><td rowspan="5">10 August 2012</td><td>Water Temperature (℃)</td><td>29.1</td><td>29.0</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>pH</td><td>7.90</td><td>7.90</td><td>-</td><td>-</td><td>-</td></tr>
<tr><td>Dissolved Oxygen (mg/L)</td><td>7.22</td><td>7.12</td><td>3.65</td><td>3.51</td><td>No</td></tr>
<tr><td>Turbidity (NTU)</td><td>3.07</td><td>3.20</td><td>3.99 NTU or 120% of upstream control station's turbidity</td><td>4.18 NTU or 130% of upstream control station's turbidity</td><td>No</td></tr>
<tr><td>Suspended Solids (SS) (mg/L)</td><td>< 2.00</td><td>< 2.00</td><td>6.13 mg/L or 120% of upstream control station's SS</td><td>7.23 mg/L or 130% of upstream control station's SS</td><td>No</td></tr>
</table>

The following mitigation measures were implemented on-site during monitoring on 8 and 10 August 2012:
(1) Wastewater was collected and diverted to waste water treatment plant prior to discharge; and
(2) site area and existing stream were separated by sealed concrete block wall.
</td><td></td></tr>
</table>

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					Clear flowing stream water was visually observed during the monitoring at I-3 on 10 August 2012. No significant water pollution source from the construction site was identified. 2) Conclusion / Proposed Action Based on the site observation and the water quality monitoring data collected at I-3 and I-3-C on 8 and 10 August 2012, it is concluded that the construction works at I-3 did not generate unacceptable water quality impact at Tso Kung Tam. As such, the concerned complaint is not considered related to the construction works at Intake 3. No further action is, therefore, required. 3) FOLLOW UP ACTION(S) Prior to the receipt of this complaint, the Contractor has already implemented adequate mitigation measures for construction effluent discharge. As no unacceptable water quality impact from the construction works was identified during the investigation, the complaint is considered as non-project related and is closed. Nevertheless, the ET will continuously monitor the water quality at Intake 3 under the current EM&A programme, review the condition of the site during the routine site inspections, and inspect proper functioning of the waste water treatment facilities.	
26	CIR-21	5 September 2012 at Chung Kee Store at Lo Wai Road (NSR 3)	Through ICC	1823 Call Center (ICC) received a complaint (5 September 2012) regarding daytime construction noise nuisance generated by the power supply	1) Findings / Observations Checking with the site log, an air compressor was located opposite to Chung Kee Store on 5 September 2012. As there was no other powered mechanical equipment located nearby and the construction was only undertaken during the daytime, it is considered that the complaint is about the noise nuisance generated from the air compressor during the daytime operation.	Closed

<table>
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<tr><td></td><td></td><td></td><td></td><td>machine opposite to Chung Kee Store at Lo Wai Road.</td><td>In response to the complaint, the Contractor has implemented the following measures:

• The concerned air compressor (AC1) located opposite to Chung Kee Store near the Vortex Drop Shaft (VDS) entrance (as “L1” shown in the attached I-2 layout plan) was de-mobilised for maintenance on 7 September 2012 and replaced by another air compressor (AC2);
• A layer of acoustic sheet was installed next to AC2 at L1 to minimise the noise nuisance, as observed during the site investigation on 11 September 2012;
• A third air compressor (AC3) was mobilized on site and placed behind the sub-contractor’s office container (as “L2” shown in the attached I-2 layout plan) that screened off the noise from AC3 and minimised potential noise nuisance to the public. AC3 had been operated for another stage of construction activities since 14 September 2012 (as observed during the site investigation on 20 September 2012); and
• AC2 at L1 had ceased operation since 14 September 2012 and was demobilised off-site on 18 September 2012. As observed during the site investigation on 20 September 2012, no air compressor or other mechanical equipment was located at L1.

Regular daytime construction noise monitoring is currently undertaken by the ET at NSR 3 (that is, Hong Hoi Chee Hong Temple) in accordance with the contract specific EM&A Manual. According to the Manual, the complaint was considered as an exceedance of action level of construction air-borne noise. Following the Event / Action Plan for air-borne noise in the Manual, the noise monitoring frequency at NSR 3 was increased from once to twice per week between 10 September and 26 September 2012. The noise measurement results (as $L_{eq(30\text{-minute})}$) at NSR 3 in September 2012 were presented in the following table:

<table>
<tr><th>Date</th><th>Start Time</th><th>End Time</th><th>L_{eq}, dB(A)</th><th>Limit Level, dB(A)</th><th>Dominant Noise Sources</th></tr>
<tr><td>4-Sep-12</td><td>15:50</td><td>16:20</td><td>62.6</td><td>75</td><td>Drilling</td></tr>
<tr><td>10-Sep-12</td><td>14:05</td><td>14:35</td><td>62.2</td><td>75</td><td>Drilling and concrete work</td></tr>
</table>
</td><td></td></tr>
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<table>
<tr><th>Complaint No.</th><th>Log Ref.</th><th>Date/Location</th><th>Complainant</th><th>Details of Complaint</th><th>Investigation / Mitigation Action</th><th>Status</th></tr>
<tr><td></td><td></td><td></td><td></td><td></td><td>
<table>
<tr><td>14-Sep-12</td><td>11:00</td><td>11:30</td><td>64.1</td><td>75</td><td>Drilling</td></tr>
<tr><td>17-Sep-12</td><td>15:20</td><td>15:50</td><td>64.3</td><td>75</td><td>Drilling</td></tr>
<tr><td>20-Sep-12</td><td>14:02</td><td>14:32</td><td>64.8</td><td>75</td><td>Drilling and concrete work</td></tr>
<tr><td>24-Sep-12</td><td>13:20</td><td>13:50</td><td>63.7</td><td>75</td><td>Drilling and concrete work</td></tr>
<tr><td>26-Sep-12</td><td>16:00</td><td>16:30</td><td>64.6</td><td>75</td><td>Drilling and concrete work</td></tr>
</table>

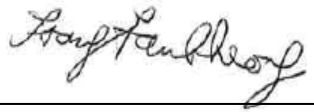
The measured noise levels, ranged from 62.2 dB(A) to 64.8 dB(A), are below the limit level (75 dB(A)) in accordance with the approved EIA Report and the Contract Specific EM&A Manual.

2) <u>Conclusion / Proposed Action</u>
With the consideration of the noise measurement results and implementation of the above noise mitigation measures, construction noise nuisance is considered minimised with no further complaint received. As the concerned air compressor has been demobilised and the air compressor currently deployed on site is screened by a site container to minimise construction noise nuisance to the public, no further action is considered necessary.

3) <u>Follow Up Actions</u>
As the noise source of complaint was removed from the site and no further complaint was received, it is considered that the complaint is closed. Nevertheless, the ET will continuously review the condition of the site during the routine site inspections, inspect proper functioning of the construction noise mitigation measures implemented on site, and provide advice to the Contractor to be vigilant and tailor mitigation measures in advance of future planned site work activities. This case will be reported as an action level exceedance on construction noise.</td><td></td></tr>
<tr><td>27</td><td>CIR-22</td><td>5 April 2013 at Outfall Basin</td><td>Through EPD</td><td>The incident was referred to the Contractor by EPD by phone on 5 April 2013 regarding</td><td>1) <u>Findings / Observations</u>
After throughout investigation (including checking the source of chemical containers, type of chemical, and existence of chemical containers left behind the tunnel, associated structures and intakes), it was considered</td><td>Closed</td></tr>
</table>

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
				chemical stain and containers observed at the Outfall Basin and on the sea in the vicinity. The ET was informed on 8 April 2013. As advised by the EPD, the incident was filed as a formal compliant on 9 April 2013.	that some used chemical containers, which contained residual chemical and were accidentally retained in the Man Access Adit at Intake I-2 (Lo Wai), were not properly stored and secured. The chemical was used for backfill grouting of the Adit Tunnel. According to the Contractor's record, the grouting was completed and all unused chemical containers were removed from the Adit Tunnel before the incident. Nevertheless, the used containers were mistakenly left inside on the site. When heavy rainfall occurred on 5 April 2013, the used chemical containers were flowed with the runoff along the Tunnel towards the Outfall. They were then stuck on the Outfall Basin by the rocks known as anti-pedestrian measure. Chemical stains were observed at the Outfall Basin and floating on the sea in the vicinity. In response to the event, the Contractor has implemented the following measures: • Removed the chemical drums at the Outfall Basin in the afternoon of 5 April 2013; • Checked out any chemical drums left and retained in the Man Access Adit at Intake 2 on 6 April 2013 under safe weather condition; • Double checked the sea condition on 6 April 2013 and no more plume was found on the sea; • Inspected the tunnel and other intakes on 6 April 2013 and confirmed that there was no chemical container retained elsewhere within the Tunnel, associate structures and intakes; and • Conducted tool box talk to all site personnel in connection with tunnel works to remind them to check and remove any chemical or diesel containers or drums from the tunnel and all associated structures to prevent potential leakage right after the incident. Site investigation at the Outfall Basin was undertaken by the ET on 9 April 2013. No containers and stain were observed on the Basin and no chemical plume was observed on the sea in the vicinity. The pre-event environmental condition of the site has been reinstated. 2) <u>Conclusion / Proposed Action</u> Taking account of the corrective and preventive measures undertaken and	

Complaint No.	Log Ref.	Date/Location	Complainant	Details of Complaint	Investigation / Mitigation Action	Status
					the findings of site investigation, the pollution sources (residual chemical) have been removed and there is no further impact of chemical stains on site. The event is considered as an accidental incident and the Contractor has undertaken proper measures to rectify the incident and prevent future recurrence. 3) Follow Up Actions As the pollution source of the complaint was removed from the site and the pre-event environmental condition has been reinstated, it is considered that the complaint is closed. Nevertheless, the ET will continuously review the condition of the site during the routine site inspections, inspect proper site management and implementation of preventive measures against accidental chemical spillage, and provide advice to the Contractor to be vigilant and tailor mitigation measures in advance of future planned site work activities.	

Signed by Environmental Team Leader:  Date: 28 June 2013