

Contract No. : DC/2007/06
**River Improvement Works in Upper Lam Tsuen,
She Shan River and Upper Tai Po River**

ENVIRONMENTAL MONITORING AND AUDIT

MONTHLY EM&A REPORT of

UPPER TAI PO RIVER

for November 2011

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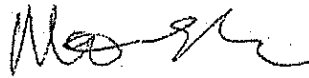
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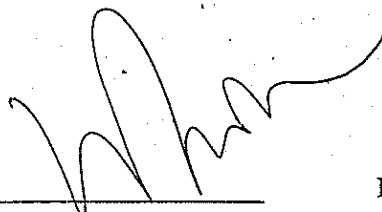
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Executive summary

This is the thirty-ninth monthly Environmental Monitoring and Audit (EM&A) Report for the river improvement works at Upper Tai Po River under Drainage Services Department Contract No. DC/2007/06 entitled “River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River”. This report concludes the impact monitoring for the activities undertaken during the period from 1st November 2011 to 30th November 2011. Construction of retaining walls TR2, TR3 & TR5, abutment of footbridge TB04 & TB05, additional boulder trap, inclined no-fines/mass concrete wall and demolition of existing steel footbridge at ch.230 were the major site activities being carried out in this reporting period.

The Environmental Team (ET) is responsible for the EM&A works required in the EM&A manual. Site inspections were carried out on weekly basis to investigate and audit the equipment and work methodologies with respect to pollution control and environmental mitigation. The weekly inspections records and photos taken were kept.

The next ecological monitoring was arranged in January 2012. The report of capture surveys, which were carried out in September & October 2011 were attached in Appendix J. The summary of ecological site inspection findings and implementation status of environmental protection and mitigation for ecology, prepared by the Ecologist, are provided in table 6.2 and Appendix G respectively.

Environmental Team had carried out construction noise monitoring on weekly basis and no exceedance was found. Noise monitoring records for the reporting month and the data are presented in Section 4. The location plan and the graphical plots presenting the data are provided in Appendix D.

Piling works has been omitted. Therefore, no vibration monitoring was conducted by ET during the reporting month.

A non-compliance event issued by IEC regarding continued generation of muddy water was recorded in this reporting month. Details of the events and recommendations given please refer to Section 6.2

There was no formal complaint in relation to environmental issue received in the

reporting month.

There was no breach of action and limit levels for this reporting month.

There was no reporting change for this month.

Construction of retaining walls TR2 & TR3, additional boulder trap and inclined no-fines mass concrete wall would be carried out in the upcoming month.

ET has reminded the contractor to provide environmental pollution control measures wherever necessary and to keep a good environmental management at site practice.

1.0 Introduction

This is the thirty-ninth monthly Environmental Monitoring and Audit (EM&A) Report for the river improvement works at Upper Tai Po River under Drainage Services Department Contract No. DC/2007/06 entitled “River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River”. The site layout plan is shown in Figure 2.1. The Environmental Team, Environmental Pioneers & Solutions Limited appointed by Chiu Hing Construction and Transportation Company Limited, prepares the report. The report is to be submitted to the Contractor, the Engineer and the IEC.

This report presents the results of the environmental monitoring of the project activities for Upper Tai Po River conducted during the month of November 2011. This included regular site inspections once per week for verification of implementation of the mitigation measures as recommended in the Environmental Permit (EP-223/2005/A) (EP), EM&A Manual and the Contractor’s Environmental Management Plan (EMP).

2.0 Environmental status

2.1 Project area

The location of the project site – Upper Tai Po River starts from Ta Tit Yan of Yai Mo Shan, flows from southeast to northeast alongside Wilson Trail, turning northward before joining the Lam Tsuen River and then runs towards Tai Po Market. For the east of the river, there are active and abandoned cultivated lands. The village settlements are mainly located on the west and northeast side of the river bank, where the San Uk Ka and Lai Chi Shan establishment also lie. The Project site is indicated in **Figure 2.1**.

2.2 Construction programme

Approximately 0.6km of Upper Tai Po River will be improved to enhance the hydraulic performance of the river. The improvement works comprise the following:

- (1) Re-profiling and realignment of the Channel;
- (2) Inclusion of gabions and retaining wall for bank protection whilst providing a natural channel bed; and
- (3) Re-provisioning of footbridges and footpaths along the channel

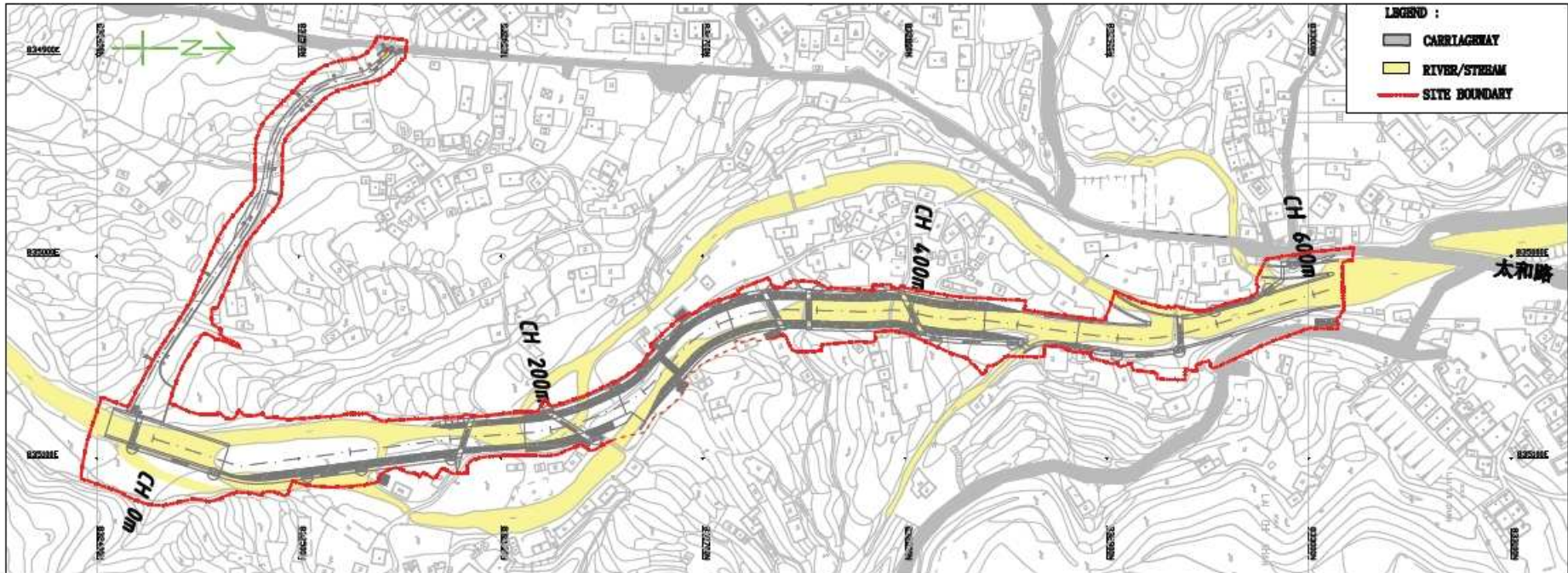
The construction of the proposed improvement works for Upper Tai Po River has been commenced on September 15th 2008 and anticipated to complete in April 2012.

2.3 Proposed construction sequences

The proposed construction sequences are shown in the following:

- (1) Site clearance and preparation works
- (2) Construction of the maintenance access which involves the construction of retaining walls
- (3) River channel construction and excavation, involving the excavation works, construction of retaining walls and gabion walls
- (4) Construction of additional boulder trap and additional stilling basins with baffle blocks
- (5) Provision of riverbed treatment
- (6) Re-provisioning of footbridges
- (7) Construction of footpaths
- (8) Landscaping works

Fig 2.1 Layout of construction area



Upper Tai Po River

2.4 Construction activities for the reporting period

Major construction activity carried out by the contractor during this reporting period includes:

- 1.) Construction of retaining walls TR2, TR3 & TR5
- 2.) Construction of abutment of footbridge TB04 & TB05
- 3.) Construction of additional boulder trap
- 4.) Construction of inclined no-fines/mass concrete wall and
- 5.) Demolition of existing steel footbridge at ch.230

2.5 Construction activities for the next reporting period

Major construction activities carried out by the contractor anticipated for the coming month include:

- 1.) Construction of retaining walls TR2 & TR3
- 2.) Construction of additional boulder trap
- 3.) Construction of inclined no-fines/mass concrete wall

2.6 Exceedance with the environmental performance limits

There was no exceedance with the environmental performance limits for this reporting month. The event and action plan for Ecology is shown in Appendix A. The action and limit level for Noise is shown in Appendix B. The reference standards for vibration are shown in Appendix C.

2.7 Summary of complaints

No formal complaint in relation to environmental issues was received in the reporting month. Totally twenty-one complaints had been received since the commencement of the contract. The cumulative complaint log is shown in Appendix F.

3.0 Ecological monitoring results

No ecological survey was carried out in this reporting period. The next ecological monitoring was arranged in January 2012.

4.0 Noise monitoring results

In accordance with the EM&A Manual, monitoring locations were established at 11 N.S.R. locations. The descriptions of all 11 N.S.R. are shown in Table 4.1.

TABLE 4.1 Description of Noise Sensitive Receivers

Sensitive Receiver No.	Location and Description
UTP1	54B, Sheung Wun Yiu
UTP2	Village House in Lai Chi Shan
UTP3	Village House near Upper Tai Po River
UTP4	Village House near Upper Tai Po River
UTP5	Village House near Upper Tai Po River
UTP6	Village House near Upper Tai Po River
UTP7	Village House near Upper Tai Po River
UTP8	Village House near Upper Tai Po River
UTP9	49A, Pun Shan Chau
UTP10	Village House near the proposed access road
UTP11	49G, San Uk Ka

Noise monitoring was carried out by the Environmental Team on weekly basis for this reporting month. The scheduled monitoring dates were 4th, 11th, 18th and 25th November 2011. Measured $L_{eq(30min)}$ results ranged from 45.5dB(A) to 68.4dB(A).

For further details of the monitoring results, graphical plots and the location plan, please refer to the Appendix D.

5.0 Vibration monitoring results

There was no vibration monitoring results for this reporting month. Vibration monitoring will be started once the piling works start in Upper Tai Po River.

6.0 Environmental issues and actions

6.1 Site inspections and key environmental issues

Site inspections were undertaken routinely to inspect the construction activities in Upper Tai Po River to ensure that appropriate environmental protection and pollution control mitigation measures are properly implemented. Implementation status of environmental protection and mitigation measures is shown in Appendix G.

Within this reporting month, site inspections were conducted on 2nd, 9th, 16th and 24th November 2011. A detailed checklist of each site inspections together with comments and relevant photos have been filed and kept for record. The findings from inspections were summarized in Table 6.1.

Ecological inspections by the Ecologist Dr. Mark Shea were carried out on 7th, 14th, 21st, 28th and 30th November 2011. Details of findings were summarized in Table 6.2.

The report of capture surveys, which were carried out in September & October 2011 were attached in Appendix J.

Table 6.1 Summary results of site inspections findings

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
3 Aug 11	Accumulated water was observed inside the construction holes along UTPR.	Observation	Contractor was recommended to remove the stagnant water as soon as possible to prevent mosquito breeding.	The construction holes along UTPR were filled with sand to prevent water accumulation	24 Nov 11	--
14 Sept 11	Excavation was being carried out close to the river channel at approximate ch.600. Water was observed inside the excavation area. Although the excavation area was enclosed by sand bags and bunds, spillage of muddy water into the river during excavation was observed, causing pollution of the river and impacts upon the downstream.	Observation	Contractor was seriously reminded that excavation work shall be carried out in sections and in enclosed dewatered condition. Dewatering of the excavation area should be carried out prior to excavation work. All site water shall be well de-silted and treated before discharge. Also, sufficient temporary earth bunds and barriers should be used to entirely enclose the excavation area and exposed slope surface should be covered (e.g. by tarpaulin sheet) to prevent river contamination.	Dewatering via a sedimentation tank was provided for excavation area. However, the river banks were observed to be steep and exposed. The river bank was covered with geo-textile at ch.600 at UTPR to prevent soil erosion	24 Nov 11	--
28 Sept 11	Equipment and materials attached with hydraulic oil were observed without preventive measure at ch.0.	Observation	Contractor was reminded to provide drip trays for the equipment and materials to prevent soil contamination.	As reported by Contractor on 16 November 2011, the equipment and materials attached with hydraulic oil at ch.0 of UTPR were	16 Nov 11	--

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
				removed. The contaminated soil was removed as chemical waste.		
6 Oct 11	Noise barriers were not yet erected by Contractor along UTPR.	Observation	Since more frequent construction works is expected in dry season, serious noise nuisance may be generated to the village nearby. Contractor was urged to install noise barriers to minimize the noise impact arisen from construction activities.	To be followed during the next reporting period.	Ongoing	--
12 Oct 11	The tree protective net was damaged by construction activities at approximate ch.0 of UTPR.	Observation	Contractor was advised to remove the materials near the fencing area and repair the fence. Also Contractor was recommended to prohibit construction activities around the tree protection zone to prevent further damage to the trees.	As reported by Contractor on 16 November 2011, the tree protective net at approximate ch.0 of UTPR was repaired for proper tree protection	16 Nov 11	--
12 Oct 11	Oil stain was observed on the haul road at ch.50 of UTPR.	Observation	Contractor was reminded to remove the contaminated soil and dispose them as chemical waste.	The contaminated soil on the haul road at ch.50 of UTPR was removed as chemical waste	2 Nov 11	--
19 Oct 11	No proper access for construction vehicles was observed at approximate ch.150 of UTPR.	Observation	Contractor was seriously reminded that construction vehicles driving across the river may cause soil erosion and significant contamination of the river and should be prohibited. Contractor was urged to rectify the mitigation measures and provide proper access for the construction vehicles.	The main river stream was diverted to avoid construction vehicles driven across river at approximate ch.150 of UTPR	24 Nov 11	--
19 Oct 11	Muddy water was leaked from an overloaded wheel washing bay at ch.600 of UTPR.	Observation	Contractor was advised to remove the muddy water with proper treatment and provide sandbags to prevent any muddy water run-off.	The wheel washing bay at ch.600 of UTPR was maintained by Contractor. No leakage of muddy water was observed.	9 Nov 11	--
19 Oct 11	Direct discharged of muddy water was observed without any proper treatment at Upper Tai Po River and contaminated the river water at downstream. The sources were identified as : i) muddy surface run-off discharging into the river at approximate ch.100 ; ii) direct discharge of muddy water from the excavation area at approximate ch.200.	Non-compliance	Contractor was seriously recommended to rectify the mitigation measures for surface runoff and divert the muddy site water for treatment properly and effectively prior to discharging into the river in order to comply with statutory requirements, such as WPCO and the applied effluent discharge license. Also, Contractor was seriously reminded that excavation work shall be carried out in sections and in enclosed dewatered condition. Dewatering of the excavation area should be carried out prior to excavation work. All site water shall be well de-silted and treated before discharge. Also, sufficient temporary earth bunds and	No muddy water was observed along UTPR. Earth bunds were setup which effectively blocked muddy surface runoff entering the river.	16 Nov 11	--

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
			barriers should be used to entirely enclose the excavation area and exposed slope surface should be covered to prevent river contamination.			
26 Oct 11	Leakage of fuel from a back hoe was observed at approximate ch.400 of UTPR.	Observation	Contractor was advised to provide maintenance for the construction equipments and remove contaminated soil as chemical waste.	No leakage of fuel from the concerned back hoe at approximate ch.400 of UTPR was observed. The contaminated soil was removed as chemical waste.	16 Nov 11	--
26 Oct 11	A wire was observed to be hanging on a preserved tree at approximate ch.300 of and the roots of trees was observed to be damaged by construction activities at approximate ch.400.	Observation	Contractor was reminded to provide proper measures for protecting the trees within the site. Contractor was advised to rectify the discrepancy as soon as possible.	The wire hanged on a preserved tree at ch.300 of UTPR was removed by Contractor. The tree roots at ch.400 was still exposed and damaged.	Ongoing	--
2 Nov 11	The sedimentation tank near ch.400 of UTPR was overflowed and slanted.	Observation	Contractor was recommended to properly relocate the tank and ensure the sedimentation tank has sufficient capacity for treating the site water	As reported by Contractor on 16 November 2011, the sedimentation tank near ch.400 of UTPR was properly relocated.	16 Nov 11	--
2 Nov 11	Continued generation of muddy water was observed due to the direct discharge of site water into the river at ch.450 and muddy surface runoff at ch.400.	Non-compliance	Contractor was seriously reminded to provide proper water treatment for site water before discharging into the river and provide sand bag barriers to avoid muddy surface runoff entering the river directly. Contractor was also reminded that discharge of contaminated water without treatment into freshwater bodies is an environmental offence.	Earth bunds were observed at ch.450 for blocking muddy surface runoff entering the river during site inspection on 16 Nov 11. No direct discharge of site water into the river was observed at ch.450 during site inspection at 24 Nov 11.	24 Nov 11	N.C. issued by IEC on 4 Nov 11
9 Nov 11	No particular observation	--	--	--	--	--
16 Nov 11	Cement bags was found near the river at ch.450 of UTPR.	Observation	Contractor was urged to remove the cement bags away from river channel to prevent river contamination and assign proper location for storage.	To be followed during the next reporting period.	Ongoing	--
24 Nov 11	Earthy stockpile was observed at ch.50.	Observation	Contractor was advised to cover the stockpile to avoid air pollution and surface runoff.	To be followed during the next reporting period.	Ongoing	--
24 Nov 11	Overflow of river water and construction vehicle operating within the river were observed at ch.500, which seriously contaminated the river	Observation	Contractor was urged to provide proper maintenance to the river channel and proper access for the vehicles to avoid further contamination to the river.	To be followed during the next reporting period.	Ongoing	--
24 Nov 11	Muddy waters and muddy surface runoff from exposed river banks were observed near ch.200 and ch.400 of UTPR which polluting the river	Observation	Contractor was advised to cover exposed soil of the river bank with geo-textile to avoid soil erosion and surface runoff. Contractor was also reminded to provide treatment to muddy	To be followed during the next reporting period.	Ongoing	--

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
	quality of downstream.		water and muddy surface runoff before discharging into the river.			

The summary of ecological inspection prepared by the Ecologist, Dr. Mark Shea is shown in Table 6.2.

Date	Observations	Advice from Ecologist	Action Taken	Closing Date
7 November 2011	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
14 November 2011	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
21 November 2011	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
28 November 2011	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
30 November 2011	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A

6.2 Non-compliance

A non-compliance event was recorded on 19th October 2011 regarding insufficient of mitigation measures causing sediment runoff and water quality impact to downstream. Proper follow up actions were not implemented within the reporting period of October EM&A report and investigation by ET was continued in November.

Prior to the site inspection carried out on 2nd November 2011, the exposed riverbanks at ch.50 had been covered by geo-textile for prevention of soil erosion. However, muddy water was observed in downstream areas during the inspection as some parts of the river banks were still left uncovered and muddy surface runoffs directly entered into the river body at ch.400. Contractor was advised to provide geo-textile and bund wall to protect the entire exposed riverbanks and earth bunds for prevention of surface runoff.

Contractor had carried out follow-up actions during the site inspection on 16th November 2011. It was observed that direct discharge of site water at ch.200 had been stopped by Contractor and bund wall and geo-textile covering had been provided by

Contractor which effectively blocked muddy surface runoff entering the river. No observation regarding muddy water was made during the inspection.

Another notice of non-compliance event was issued by IEC on 4th November 2011 with regards to the observation of continued generation of muddy water at Upper Tai Po River.

During the site inspection carried out on 2nd November 2011, it was observed that the soil on river banks was loose and construction mounds were left uncovered and muddy surface runoffs were entering directly into the river body at ch.400. Furthermore, muddy water from the sump pit near ch.450 was being pumped out and discharged directly into the river without any treatment. No proper water treatment or any mitigation measures to minimize direct discharge of untreated wastewater were observed to have been implemented prior to any excavation/construction works. As muddy water generation had been repeatedly observed since the inspection on 19th October 2011 and the seriousness of the condition, IEC considered the above mal-practice as non-compliance event under Water Pollution Control Ordinance (WPCO)(Cap. 358).

Advice on mitigation measures for maintaining river water quality was made by ET and IEC to Contractor, including provision of geo-textile and bund wall to protect the entire exposed riverbanks and earth bunds for prevention of surface runoff, and diverging of site water to water treatment facility for proper treatment and discharge

Follow up actions had been taken by Contractor for the abovementioned discrepancies. During the inspection on 16th November 2011, bund wall and geo-textile covering had been provided by Contractor as barrier which effectively blocked muddy surface runoff entering the river at ch.400. Also, sedimentation tank had been provided by Contractor at ch.400 and no direct discharge of site water was observed at ch.450 during the inspection on 24th November 2011. No observation regarding muddy water was made during the inspection.

Contractor was reminded to be aware of the implementation of measures to avoid soil erosion and untreated water discharged and to prevent pollution to the river water.

6.3 Recommendations

Contractor was reminded that all the measures stated in the Environmental Permit should be followed. Contractor was advised that excavation work shall be carried out in sections and in enclosed dewatered condition. Dewatering of the excavation area should be carried out prior to excavation work. All site water shall be well de-silted and treated before discharge. Also, sufficient temporary earth bunds and barriers should be used to entirely enclose the excavation area and exposed slope surface should be covered (e.g. by tarpaulin sheet) to prevent river contamination. Contractor was reminded that discharge of contaminated water is an environmental offence and should be prohibited.

Also, Contractor was reminded to implement good housekeeping practice. Contractor shall assign proper waste collection area for segregation and storage before disposal. All waste generated should be properly collected, stored, and disposed as soon as possible to improve housekeeping performance of the construction site. Contractor was also reminded to provide drip tray for temporary storage of drums containing oil and chemical.

In order to minimize the noise impact to the noise sensitive receivers, Contractor was reminded to implement proper mitigation measures as stated in Environmental Permit and EM&A Manual, i.e. erecting 2m high noise barriers at locations stated in Environmental Permit, orientating noisy plants away from the nearby NSRs, using movable barriers and acoustic mat, etc.

6.4 Implementation status and effectiveness of the mitigation measures

Refer to the table 6.1 and Section 6.2, contractor was seriously recommended to implement necessary mitigation measures to address environmental problem arisen from site activities.

7.0 Waste management status

It is the contractor's responsibility to ensure that all wastes produced during construction phase for the drainage improvement works are handled, stored and disposed in accordance with good waste management practices and EPD's regulation and requirement. Waste materials generated during construction activities such as construction and demolition (C&D) material, chemical wastes and general refuse, are recommended to be audited at regular intervals to ensure that proper storage, transportation and disposal practices are being implemented. **Table 7.1** is the Waste Disposal recorded by the Contractor in this month.

From the report of Contractor, all the C&D materials generated were reused at Lam Tsuen River for rock filling. No inert waste was disposed from the Project. The non-inert waste was sent to the North East New Territories (NENT) Landfill. The following table showed the amount of waste generation, reused and disposed from this project site in this reporting month.

The following table showed amount of waste generation, reused and disposed from this project site in this reporting month.

Table 7.1 Summary of Waste generated and disposed in November 2011

Type of waste	Amount generated	Amount reused	Amount disposed
Inert waste	566 m ³	566 m ³	0 m ³
Non-inert waste	50 kg	0	50 kg
Chemical waste	0	N/A	0

The cumulative waste flow table is shown in Appendix H.

8.0 Status of environmental licensing and permit

This project requires different permits and licenses to be run legally. **Table 8.1** is the summary of permits/ licenses for this project.

Table 8.1 Summary of Environmental Licensing and Permit Status

Description	License / Permit No.	Date of Issue	Date of Expiry	Remarks
Environmental Permit	EP-223/2005	31 st Aug, 2005	N/A	Superseded
Amended Environmental Permit	EP-223/2005/A	18 th Nov, 2008	N/A	Issued
Construction Noise Permit	N/A	N/A	N/A	N/A
Effluent Discharge License	3678	14 th Mar, 2008	31 st Mar, 2013	Issued
Registration as a Chemical Waste Producer	5213-724-C3251-03	19 th Dec, 2007	Not applicable	Issued
Billing Account for Disposal of Construction Waste	7006101	N/A	N/A	N/A

9.0 Future key issues

Construction of retaining walls TR2 & TR3, additional boulder trap and inclined no-fines mass concrete wall would be carried out in the upcoming month. The construction activities for these items will generate environmental impacts in several aspects.

For the proposed construction activities, heavy plants and vehicles may be occupied and those would generate certain noise impacts to the sensitive receivers. To minimize noise generation, noisy activities should be well planned and scheduled to avoid parallel operation of multiple plants. Erection of noise barriers and/or movable barriers should be implemented whenever necessary.

To minimize water quality impact arising from construction activities within river channel, water quality mitigation measures should be implemented as far as practicable. Any muddy water, underground water or wastewater generated from construction activities should be diverted to proper treatment facility prior to discharge.

Contractor was reminded to provide regular water spraying to dusty static area for dust suppression. Excessive storage of earthy stockpile and/or C&D wastes should be prevented to minimize air quality impact arisen by wind erosion.

Aforementioned construction works may generate wastes on site. Contractor is advised to assign a site area for temporary waste storage and segregation. Wastes accumulation should be prevented on site; licensed waste collection and disposal should be implemented regularly for hygiene issues.

10.0 Conclusion

Construction of retaining walls TR2, TR3 & TR5, abutment of footbridge TB04 & TB05, additional boulder trap, inclined no-fines/mass concrete wall and demolition of existing steel footbridge at ch.230 were the major site activities being carried out in this reporting period.

Regular site meetings and inspection audits led by the seniors for discussing environmental issues were held among project proponent, Contractor and the Environmental Team on weekly basis.

Environmental Team had carried out construction noise monitoring on weekly basis. All results obtained were within limit and therefore no exceedance was recorded in this reporting month.

Piling works has been omitted. Therefore, no vibration monitoring was conducted during the reporting month.

From the summary of ecological site inspection findings and implementation status of environmental protection and mitigation for ecology, prepared by the Ecologist Dr. Mark Shea, there is no abnormal finding observed in the reporting month. The ecologist has no further advice and no action suggested to the contractor.

The next ecological monitoring was arranged in January 2012. The report of capture surveys, which were carried out in September & October 2011 were attached in Appendix J.

A non-compliance event issued by IEC regarding continued generation of muddy water was recorded in this reporting month.

There was no formal complaint in relation to environmental issue received in the reporting month.

The ET will continue to implement the environmental monitoring & audit programme in accordance with the EM&A Manual and Environmental Permit requirement.

Appendix A: Event and action plan for ecology

Event and action plan for ecology

In the event of non-compliance, the Event / Action plan prepared by the ecologist shall be followed. Detailed Event/ Action plan was shown in **Appendix Table 1** for reference.

It is not proposed to set population size of the three species (i.e. Three-lined Chinese Stream Catfish, Predaceous and the Hong Kong Newt) or other faunal species for the Action Level and Limit Level in the revised EM&A manual in considering the following reasons:

- I. The schedule capture surveys would let to decrease in the populations of the target species; and
- II. The planned drainage works would also temporally de-fauna the stream habitat.

It is considered logical and appropriate to audit non-compliance events in relation with ecological mitigation measures, which were specified in the EP and the PS of the project.

APPENDIX TABLE 1 Event / Action plan table for Ecology

Event	Action			
	ET	ER	IEC	Contractor
Non-conformity on one occasion	1. Identify Source 2. Inform the IEC and the ER 3. Discuss remedial actions with the IEC, the ER and the Contractor 4. Monitor remedial actions until rectification has been completed	1. Check report 2. Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures, 4. Advise the Contractor on effectiveness of proposed remedial measures 5. Check implementation of remedial measures	1. Ensure Remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake any necessary replacement
Repeated Non conformity	1. Identify Source 2. Inform the IEC and the ER 3. Increase monitoring frequency 4. Discuss remedial actions with the IEC, the ER and the Contractor 5. Monitor remedial actions until rectification has been completed 6. If exceedance stops, cease additional monitoring	1. Check monitoring report 2. Check the Contractor's working method 3. Discuss with the ET and the Contractor on possible remedial measures 4. Advise the Contractor on effectiveness of proposed remedial measures 5. Check implementation of remedial measures	1. Ensure Remedial measures are properly implemented	1. Amend working methods 2. Rectify damage and undertake any necessary replacement

Appendix B: Action and limit level for construction noise

The Action and Limit levels for construction noise are defined in **Appendix Table 2**

Appendix Table 2: Action and Limit Levels for Construction Noise

Time Period	Action	Limit
0700 – 1900 hrs on normal weekdays	When one documented complaint is received	75 dB(A)*
0700 – 2300hrs on holidays; and 1900 – 2300 hrs on all other days		Subject to the control of Noise Control Ordinance
2300 – 0700 hrs of next day		Subject to the control of Noise Control Ordinance

*Limit level set in accordance with Particular Specification Section 26

Appendix C: Reference standards for vibration

Guidance regarding vibration limits is provided by the following British Standards (or their equivalent ISO standards):

BS 7385 - Measurement and evaluation of vibration in buildings. Part 2: Guide to damage levels from ground borne vibration.

BS 7385 suggests vibration levels, below which damage is unlikely to occur in 95% of buildings. For cosmetic damage, the level is 15 mm/s at 4 Hz, increasing to 20 mm/s at 15 Hz, increasing to 50 mm/s at 40 Hz and above. Minor structural damage is possible at vibration levels twice those given above, major damage at four times the levels given.

Appendix Table 3: Transient vibration guide values for cosmetic building damage (BS7385:Part 2 1993)

	Type of Building	Peak component particle velocity (mm/s) in frequency range of predominant pulse
1	Reinforced or framed structures	50 at 4 Hz and above
2	Un-reinforced or light framed structures	15 at 4 Hz, increasing to 20 at 15 Hz, increasing to 50 at 40 Hz and above.

The vibration magnitudes and frequencies refer to Peak Particle Velocities (PPV) occurring in any single direction, measured on the ground level of the building concerned.

Appendix D: Noise monitoring results, graphical plots and location plan

Location	Leq 30min	L ₁₀ 30min	L ₉₀ 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP 1	61.7	63.7	49.6	4-Nov-11	15:31-16:01	N/A	- Background noise - Traffic noise	Sunny	Façade
UTP 2	58.3	62.9	46.9	4-Nov-11	14:59-15:29	Construction machines	- Background noise - Traffic noise	Sunny	Façade
UTP 3	65.5	68.0	55.5	4-Nov-11	14:28-14:58	Construction machines	- Background noise	Sunny	Façade
UTP 4	55.3	58.7	44.0	4-Nov-11	13:27-13:57	Construction machines	- Background noise	Sunny	Façade
UTP 5	48.5	50.6	41.3	4-Nov-11	13:57-14:27	Construction machines	- Background noise	Sunny	Façade
UTP 6	68.4	73.2	48.3	4-Nov-11	9:58-10:28	Soil sorting Rock block transfer	- Background noise	Sunny	Façade
UTP 7	55.8	56.5	42.2	4-Nov-11	10:28-10:58	Soil transfer Soil sorting	- Background noise	Sunny	Façade
UTP 8	55.6	59.1	47.4	4-Nov-11	10:58-11:28	Rock transfer	- Background noise	Sunny	Façade
UTP 9	58.4	61.7	46.3	4-Nov-11	11:28-11:58	Construction machines	- Background noise	Sunny	Façade
UTP 10	52.8	47.4	34.4	4-Nov-11	9:24-9:54	N/A	- Background noise	Sunny	Façade
UTP 11	54.3	55.2	40.2	4-Nov-11	8:53-9:23	N/A	- Background noise	Sunny	*Free field

Note* An Additional of 3dB(A) had been added to the measurement result due to Free Field Correction

Location	Leq 30min	L ₁₀ 30min	L ₉₀ 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP 1	60.1	60.7	48.8	11-Nov-11	15:07-15:37	N/A	- Background noise - Traffic noise	Cloudy	Façade
UTP 2	53.4	55.8	45.2	11-Nov-11	14:35-15:05	Construction machines	- Background noise - Traffic noise	Cloudy	Façade
UTP 3	67.4	70.4	59.7	11-Nov-11	14:05-14:35	Rock transfer	- Background noise	Cloudy	Façade
UTP 4	50.4	52.5	45.6	11-Nov-11	13:05-13:35	Soil transfer	- Background noise	Cloudy	Façade
UTP 5	54.7	56.3	47.4	11-Nov-11	13:35-14:05	Construction machines	- Background noise	Cloudy	Façade
UTP 6	57.5	59.9	49.0	11-Nov-11	10:00-10:30	Soil transfer	- Background noise	Cloudy	Façade
UTP 7	57.3	56.5	42.0	11-Nov-11	10:30-11:00	Pipe installing	- Background noise	Cloudy	Façade
UTP 8	55.2	59.9	41.6	11-Nov-11	11:00-11:30	Rock breaking	- Background noise	Cloudy	Façade
UTP 9	54.2	57.0	46.4	11-Nov-11	11:30-12:00	Rock breaking	- Background noise	Cloudy	Façade
UTP 10	45.6	44.8	26.0	11-Nov-11	9:26-9:56	N/A	- Background noise	Cloudy	Façade
UTP 11	47.8	48.8	39.1	11-Nov-11	8:56-9:26	N/A	- Background noise	Cloudy	*Free field

Note* An Additional of 3dB(A) had been added to the measurement result due to Free Field Correction

Location	Leq 30min	L ₁₀ 30min	L ₉₀ 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP 1	60.0	64.0	48.0	18-Nov-11	15:02-15:32	N/A	- Traffic noise - Background noise	Cloudy	Façade
UTP 2	55.0	56.5	43.4	18-Nov-11	14:30-15:00	N/A	- Traffic noise - Background noise	Cloudy	Façade
UTP 3	55.6	58.3	49.8	18-Nov-11	13:59-14:29	N/A	-Background noise	Cloudy	Façade
UTP 4	60.4	63.9	43.7	18-Nov-11	12:57-13:27	Soil transfer	-Background noise	Cloudy	Façade
UTP 5	61.4	64.0	50.6	18-Nov-11	13:27-13:57	Rock transfer Construction machines	-Background noise	Cloudy	Façade
UTP 6	60.1	62.5	39.0	18-Nov-11	11:24-11:54	Rock transfer	-Background noise	Cloudy	Façade
UTP 7	53.0	52.9	39.2	18-Nov-11	10:59-11:29	N/A	-Background noise	Cloudy	Façade
UTP 8	45.5	47.6	41.6	18-Nov-11	9:56-10:26	Construction machines	-Background noise	Cloudy	Façade
UTP 9	53.5	54.2	46.3	18-Nov-11	10:26-10:56	Rock breaking	-Background noise	Cloudy	Façade
UTP 10	57.8	57.2	38.5	18-Nov-11	9:17-9:47	Rock breaking	-Background noise	Cloudy	Façade
UTP 11	56.7	56.6	41.3	18-Nov-11	8:46-9:16	Rock breaking	-Background noise	Cloudy	*Free field

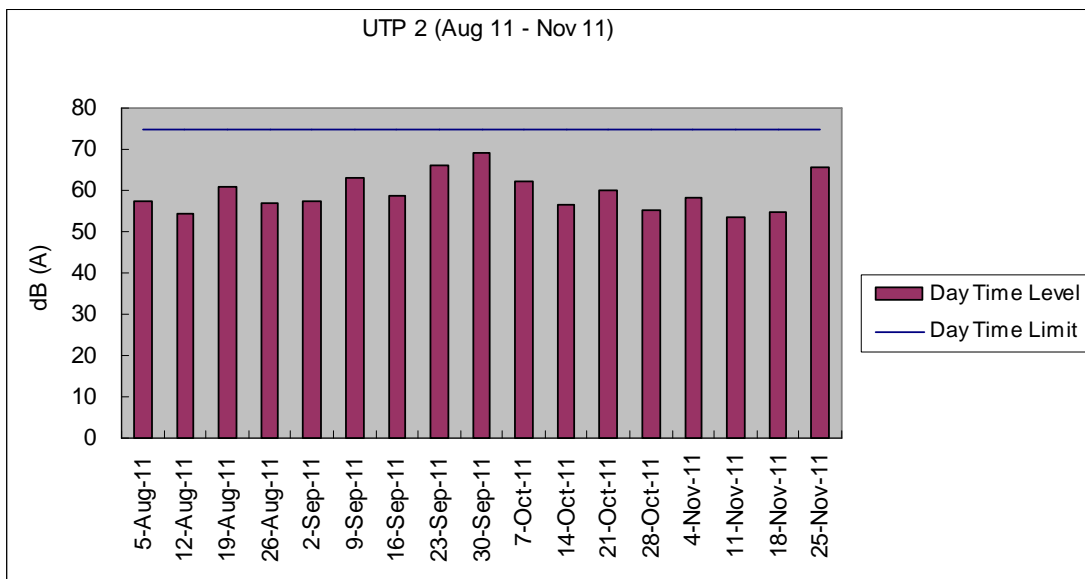
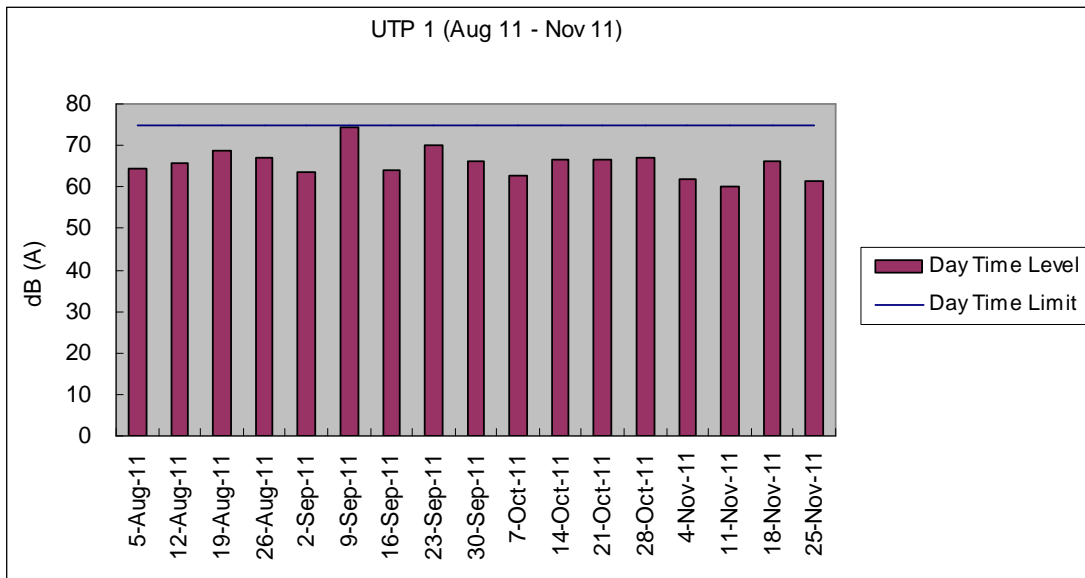
Note* An Additional of 3dB(A) had been added to the measurement result due to Free Field Correction

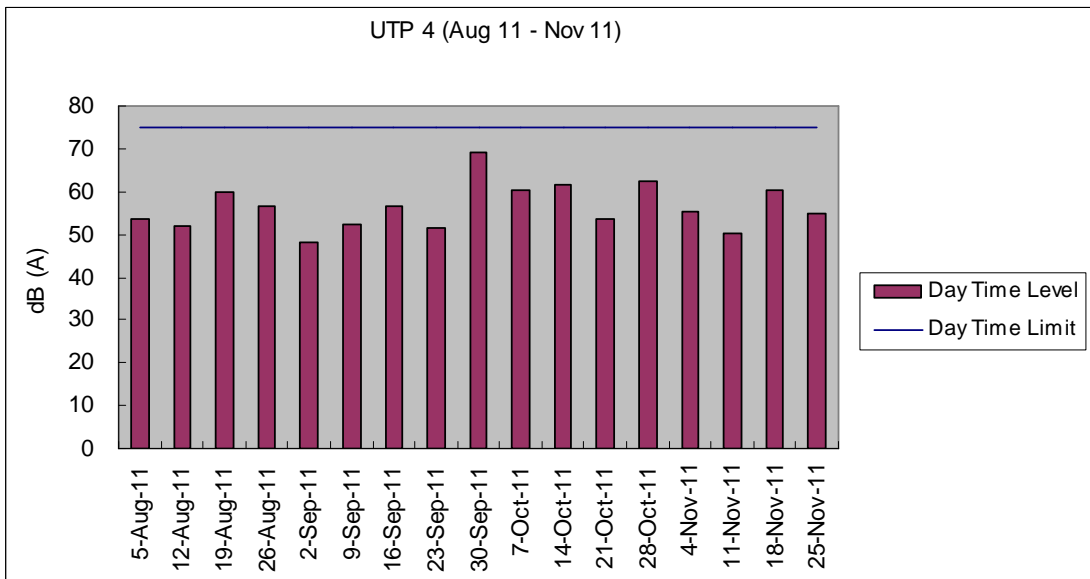
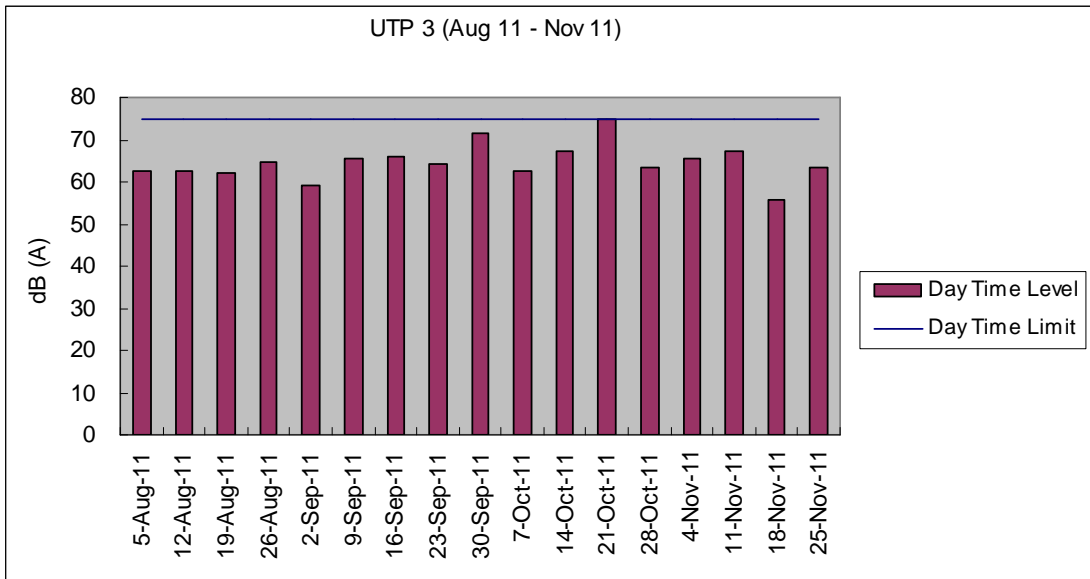
Location	Leq 30min	L ₁₀ 30min	L ₉₀ 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP 1	61.5	63.5	48.2	25-Nov-11	15:00-15:30	N/A	- Traffic noise - Background noise	Cloudy	Façade
UTP 2	65.7	67.4	48.9	25-Nov-11	14:30-15:00	Construction machines	- Traffic noise - Background noise	Cloudy	Façade
UTP 3	63.6	65.4	52.6	25-Nov-11	13:58-14:28	Rock transfer	- Background noise	Cloudy	Façade
UTP 4	54.9	57.9	42.0	25-Nov-11	12:56-13:26	Stone pipe transfer	- Background noise	Cloudy	Façade
UTP 5	54.5	57.9	44.0	25-Nov-11	13:26-13:56	N/A	- Background noise	Cloudy	Façade
UTP 6	61.2	63.3	45.2	25-Nov-11	11:12-11:42	Brigde demolition	- Background noise	Cloudy	Façade
UTP 7	61.8	65.6	44.9	25-Nov-11	10:42-11:12	Brigde demolition	- Background noise	Cloudy	Façade
UTP 8	57.2	60.3	55.6	25-Nov-11	10:10-10:40	Brigde demolition	- Background noise	Cloudy	Façade
UTP 9	51.9	54.5	50.7	25-Nov-11	9:40-10:10	Soil transfer	- Background noise	Cloudy	Façade
UTP 10	53.2	57.4	52.9	25-Nov-11	9:08-9:38	N/A	- Background noise	Cloudy	Façade
UTP 11	59.5	54.6	56.4	25-Nov-11	8:37-9:07	N/A	- Background noise	Cloudy	*Free field

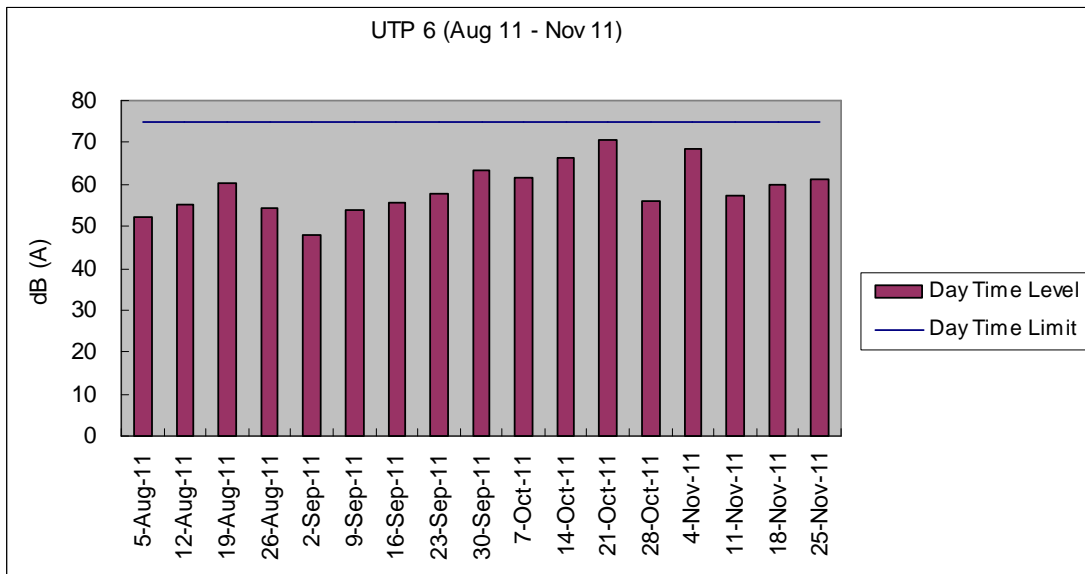
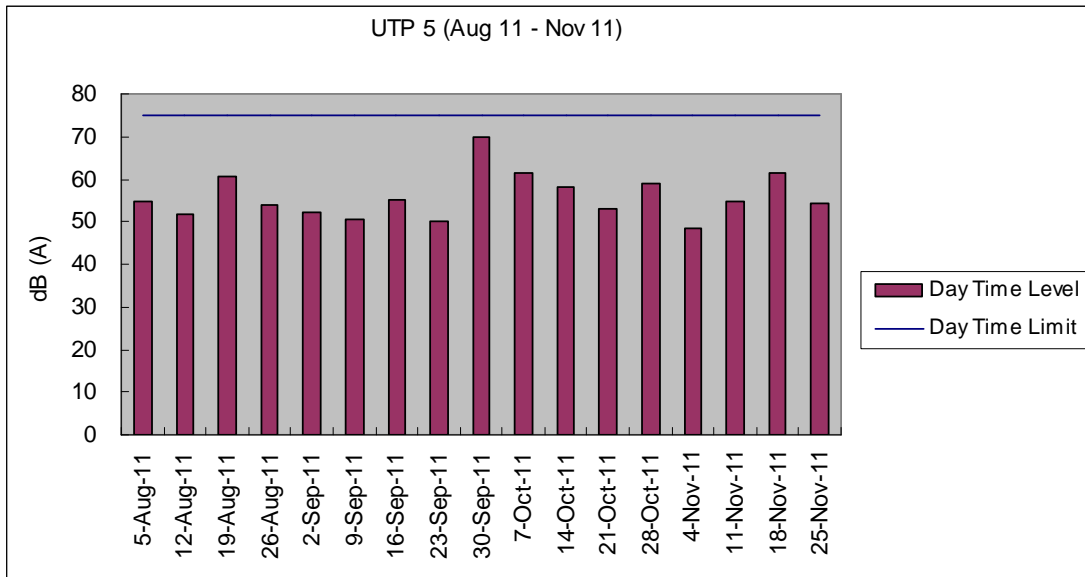
Note* An Additional of 3dB(A) had been added to the measurement result due to Free Field Correction

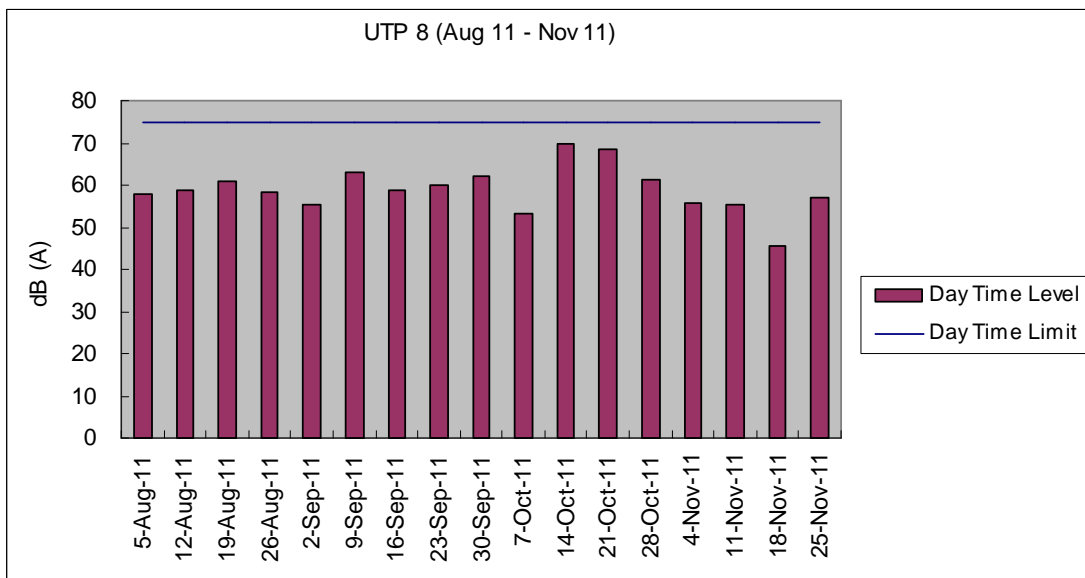
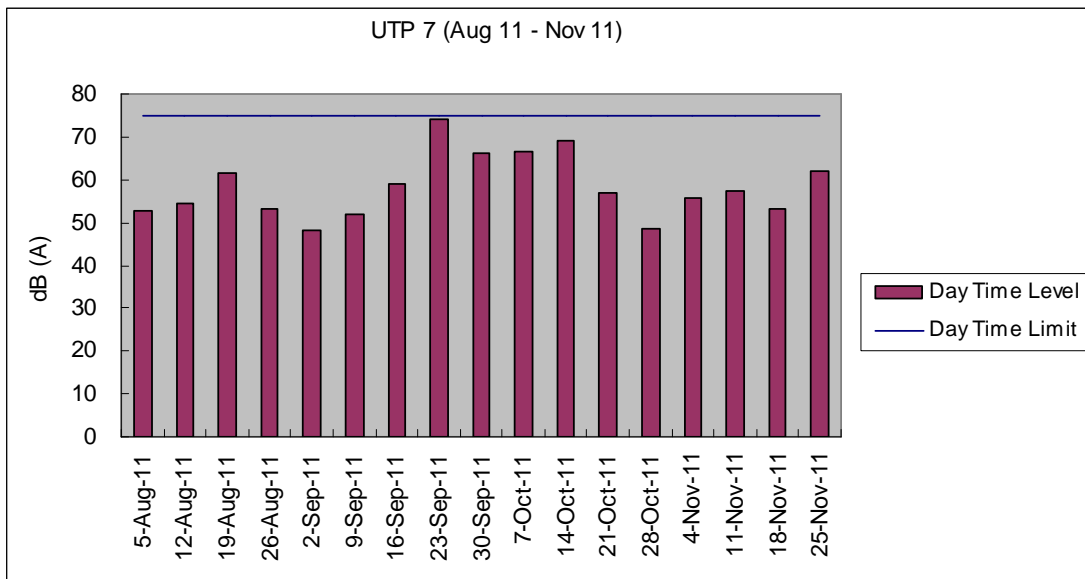
Graphical plot for noise measurements

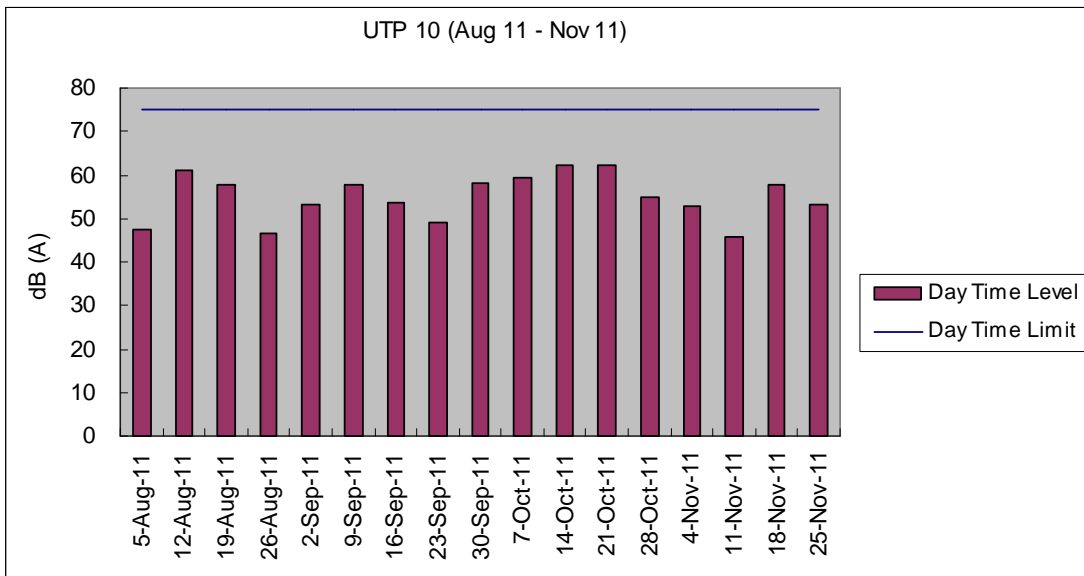
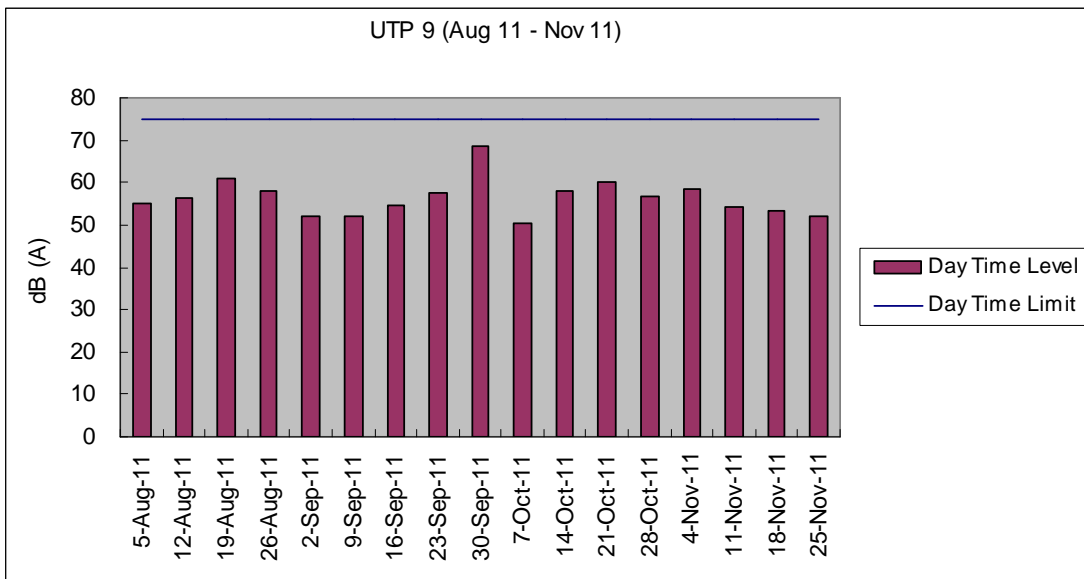
The followings were the graphical plots for the 11 monitoring locations. Each plot showed the date of measurement taken, day time limit of 75 dB(A) as well as the measured daytime level for each location. The graphs contain the data recorded from August 2011 to November 2011.

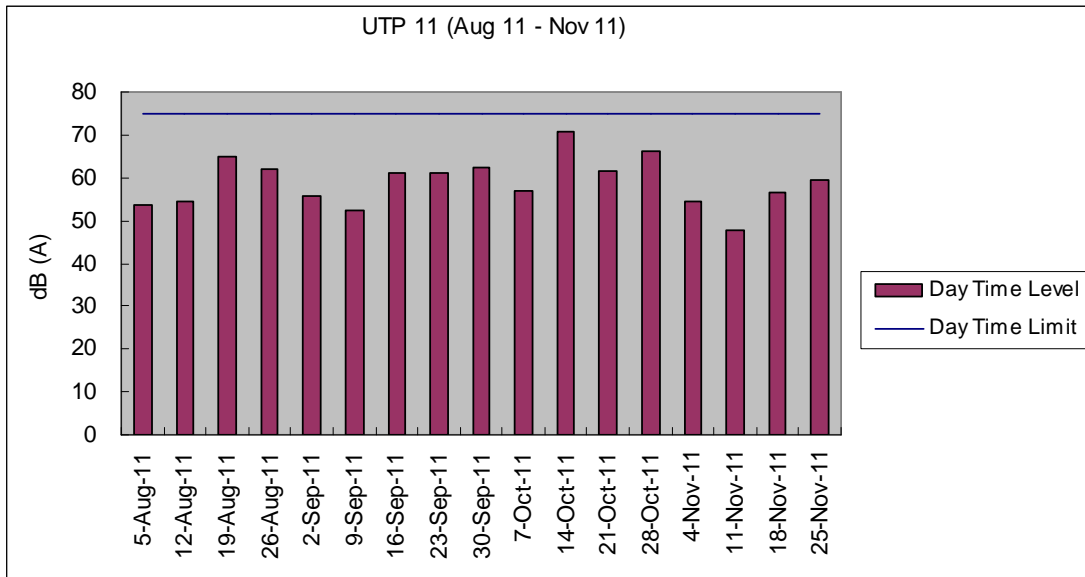


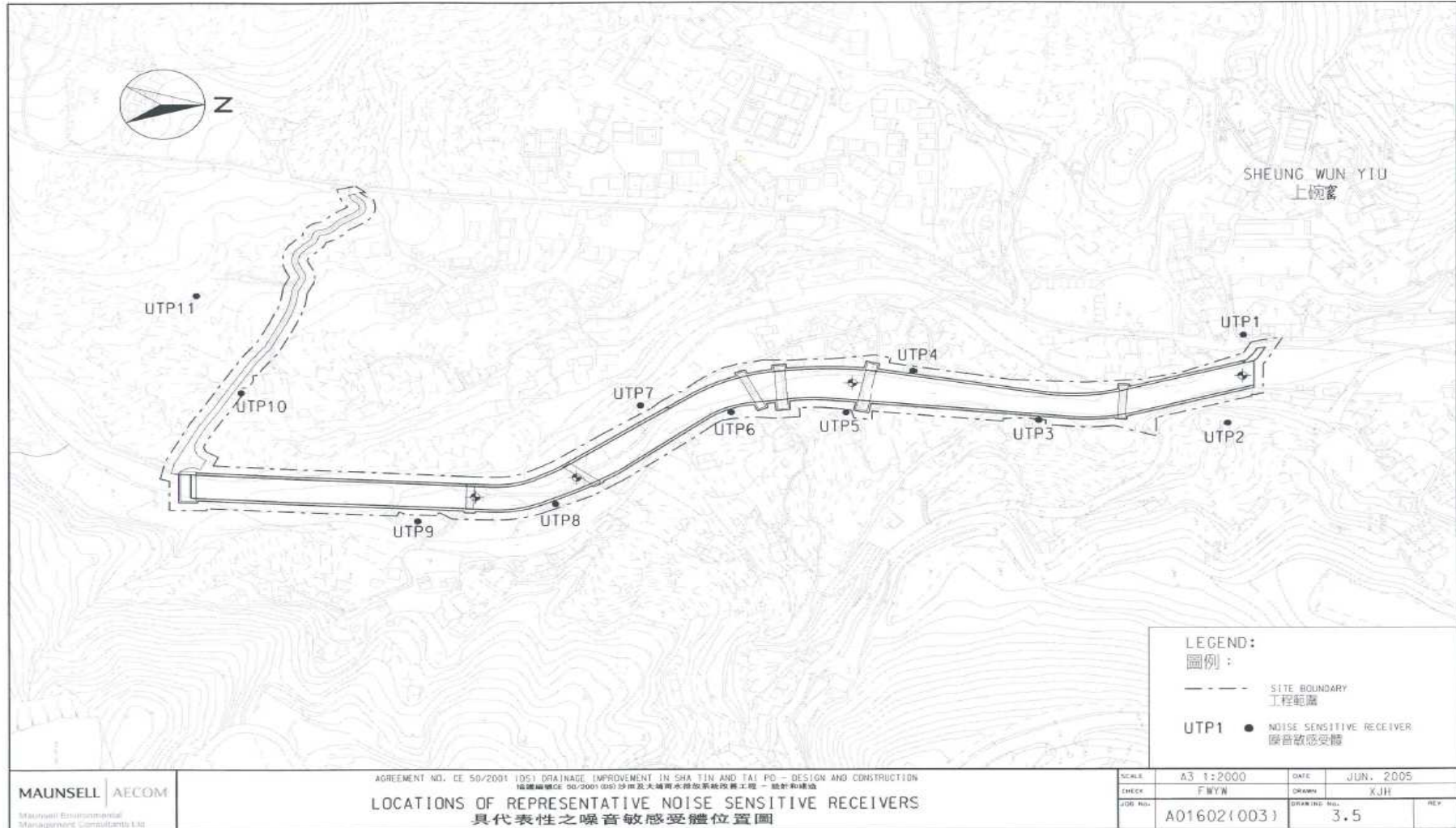












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AGREEMENT NO. CE 50/2001 (05) DRAINAGE IMPROVEMENT IN SHA TIN AND TAI PO - DESIGN AND CONSTRUCTION
 協議編號 CE 50/2001 (05) 沙田及大埔雨水排放系統改善工程 - 設計和建造
LOCATIONS OF REPRESENTATIVE NOISE SENSITIVE RECEIVERS
 具代表性之噪音敏感受體位置圖

SCALE	A3 1:2000	DATE	JUN. 2005
CHECK	F.W.Y.N.	DRAWN	X.J.H.
JOB NO.	A01602(003)	DRAWING NO.	3.5
		REV.	

Appendix E: Monitoring schedule for the present and next reporting period

Master Schedule of EM&A works in November 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
		01/11	02/11	03/11	04/11	05/11
			Site inspection at afternoon		Noise Monitoring	
06/11	07/11	08/11	09/11	10/11	11/11	12/11
	Ecological site inspection		Site inspection at afternoon		Noise Monitoring	
13/11	14/11	15/11	16/10	17/10	18/10	19/10
	Ecological site inspection		Site inspection at afternoon		Noise Monitoring	
20/11	21/11	22/11	23/11	24/11	25/11	26/11
	Ecological site inspection			Site inspection and SSEMC at afternoon	Noise Monitoring	
27/11	28/11	29/11	30/11			
	Ecological site inspection		Ecological site inspection			

Master Schedule of EM&A works in December 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
				01/12	02/12	03/12
				Site inspection at afternoon	Noise Monitoring	
04/12	05/12	06/12	07/12	08/12	09/12	10/12
	Ecological site inspection		Site inspection at afternoon		Noise Monitoring	
11/12	12/12	13/12	14/12	15/12	16/12	17/12
	Ecological site inspection		Site inspection at afternoon		Noise Monitoring	
18/12	19/12	20/12	21/12	22/12	23/12	24/12
	Ecological site inspection		Site inspection and SSEMC at afternoon		Noise Monitoring	
25/12	26/12	27/12	28/12	29/12	30/12	31/12
	Ecological site inspection		Site inspection at afternoon		Noise Monitoring	

Appendix F: Cumulative complaint log

Environmental Parameters	Cumulative no. Brought forward	No. of complaint November 2011	Overall Total
Air/Dust	5	0	5
Noise	5	0	5
Water	11	0	11
House Keeping Hygiene	0	0	0
Chemical waste	0	0	0
Total	21	0	21

Appendix G: Implementation status of environmental protection and mitigation measures

Implementation status of environmental protection and mitigation

Environmental Aspect	Protection / Mitigation Measures	Implementation status	Follow-up action
Construction Noise	No percussive piling shall be carried out	Implemented	Not required
	-Use well maintained construction plant	Implemented	Not required
	-Shut down plants between work periods	Implemented	Not required
	-Install silencers on construction equipment	Implemented	Not required
	-Locate mobile plant far away from NSRs	Implemented	Not required
	-Quiet plants should be used	Implemented	Not required
	-2m high temporary noise barriers, as stipulated in EP condition 2.9, shall be installed	Deficient	Ongoing
Fugitive Dust Emission	-Implement regular watering and vehicle washing facilities	Implemented	Not required
	-Cover excavated or stockpile of dusty material by impervious sheeting or sprayed with water	Implemented	Not required
	-Use tarpaulin to cover dusty materials on vehicles	Implemented	Not required
Water Quality	Excavation works within the Tai Po River within the Project shall be carried out in stages and excavation area for each stage shall be limited to section of half width of the channel and less than 100m long at any one time in order to maintain water flow within the river during construction stage	Implemented	Not required
	Land-based plant shall be employed and site run-off shall be directed towards regularly cleaned and maintained silt traps and oil / grease separators to minimize leakage and loss of sediments during excavation	Implemented	Not required
	Large boulders removed from the Tai Po River within the Project during excavation shall be re-instated upon completion of works A section of 150m long natural riverbank on the western side of the river channel (Ch0 –Ch150) shall be retained	Implemented	Not required
	The excavation area shall be enclosed with bunds or barriers and dewatered prior to excavation to minimize the impacts upon the downstream of the Tai Po River	Implemented	Not required

	Provide silt trap and oil interceptor to remove the oil, lubricants, grease, silt, grit and debris from the wastewater before pumped to the public storm water drainage system	Implemented	Not required
	Provide site toilet facilities	Implemented	Not required
Waste Management	Reuse excavated material as far as possible	Implemented	Not required
	Recycle scrap metals or abandoned equipment	Implemented	Not required
	Adopt a trip ticket system for the disposal of C&D materials	Implemented	Not required
	All general refuse should be segregated and stored in enclosed bins or compaction units	Implemented	Not required
Vibration	Percussive piling is to be replaced by bore-hole piling to minimize vibration impacts to the two identified Declared monuments	Not applicable at this stage	Not required
	Carrying out of vibration monitoring to ensure that vibration associated with the construction phase do not exceed the threshold limit otherwise contractor have to review the work method and construction activities have to be slow down or rescheduled to reduce the impacts	Not applicable at this stage	Not required
	Close monitoring and measurement on the cracks of the external wall of Fan Sin Temple during construction works will be carried out. Any changes on the cracks will be recorded for the contractor to slow down the construction activities accordingly; and to review the work methods and equipments immediately	Not Applicable at this stage	Not required

Implementation status of environmental protection and mitigation for ecology,
 prepared by the Ecologist, Dr. Mark Shea.

Environmental Aspect	Protection / Mitigation Measures	Implementation status	Follow-up action
Ecology	Large boulders will be returned to the riverbed following the excavation works.	Not applicable	Not required
	Construction works from Ch. 0.0m – Ch. 150m would be along one side of the river only	Not applicable	Not required
	Approximately 150m of the existing natural riverbank on the western side of the river would be retained.	Implemented	Not required
	Excavation works within the river channel should be restricted to an enclosed dewater section of the river, and would be limited to sections 50-100m long at any one time.	Implemented	Not required
	Flows to the area downstream shall be maintained at all times during the construction phase	Implemented	Not required
	Capture survey shall be conducted within the Tai Po River before commencement of works. The captured target species shall be relocated to areas of the watercourse upstream of the watercourse upstream of the Tai Po River	Capture surveys had been conducted at the beginning of the Contract, during the wet season July/August 2008 and 4 th November 2008	Not required
	Temporary noise barriers should be constructed to control noise impacts to habitats and associated wildlife within and adjacent to the proposed works area	Implemented	Not required
	Excavation works shall be carried out by land based plant within enclosed dry section of river channel.	Implemented	Not required
	Compensatory planting of trees and other vegetation along the banks of the newly improved drainage channel should be provided to compensate for the loss of riparian vegetation.	Not applicable	Not required
	Operation phase activities in the improved drainage channel would be limited to periodic channel maintenance such as de-silting.	Not applicable	Not required

Appendix H: Cumulative waste flow tableCumulative waste flow table showing amount of wastes generated, reused and disposed since 15th September 2008

Type of waste	Inert Waste			Non-Inert Waste			Chemical Waste	
	Amount generated	Amount reused	Amount disposed	Amount generated	Amount reused	Amount disposed	Amount generated	Amount disposed*
Year 2008 to 2009	36.9m ³	0	36.9m ³	2.000 tonnes	0	2.000 tonnes	20kg	20kg
Year 2010	1955m ³	1955m ³	0	0.192 tonnes	0	0.192 tonnes	0	0
January 2011	117m ³	117m ³	0	0.040 tonnes	0	0.040 tonnes	0	0
February 2011	581m ³	581m ³	0	0.045 tonnes	0	0.045 tonnes	0	0
March 2011	927m ³	927m ³	0	0.047 tonnes	0	0.047 tonnes	0	0
April 2011	467m ³	467m ³	0	0.050 tonnes	0	0.050 tonnes	0	0
May 2011	835 m ³	835 m ³	0	0.015 tonnes	0	0.015 tonnes	0	0
June 2011	3 m ³	3 m ³	0	0.001 tonnes	0	0.001 tonnes	0	0
July 2011	0	0	0	0	0	0	0	0
August 2011	0	0	0	0	0	0	0	0
September 2011	392 m ³	392 m ³	0	0.035 tonnes	0	0.035 tonnes	2kg	2kg
October 2011	740 m ³	725 m ³	15 m ³	0.048 tonnes	0	0.048 tonnes	0	0
November 2011	566 m ³	566 m ³	0	0.050 tonnes	0	0.050 tonnes	0	0
Total	6619.9m³	6568m³	51.9m³	2.523 tonnes	0	2.523 tonnes	22kg	22kg

Remark*: Chemical wastes generated from the project sites including Upper Tai Po River, Lam Tsuen River and She Shan River were centralized for disposal

Appendix I: Construction programme (Rev. No. 17)

Drainage Services Department
Contract No. DC/2007/06
River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River

Revised Master Programme Aug 2010 - Apr 2013 Rev (17)

識別碼	任務名稱	工期	開始時間	完成時間	前置任務	資源名稱	2012年		
							H2	H1	H2
1139	Section 2 - She Shan River (Area K) Ch 1850 to 1550	735 days	2010/7/20	2012/11/19			[Gantt bar spanning H2, H1, H2]		
1140	From CHL 1850 to CHL 1550	442 days	2011/5/31	2012/11/19			[Gantt bar spanning H1, H2]		
1141	Dwarf wall (Ch1755-1857)(VO178)	48 days	2012/6/27	2012/8/22	1133		[Gantt bar in H2]		
1142	Footpath construction at LHS (Ch1550 to 1850)	45 days	2012/8/23	2012/10/15	1141		[Gantt bar in H2]		
1143	Drainage pipe and U-channel construction (Ch1550-1850)	45 days	2012/8/23	2012/10/15	1141		[Gantt bar in H2]		
1144	Install Handrails/Change Markers	28 days	2012/10/16	2012/11/19	1142		[Gantt bar in H2]		
1145	Chainlink fencing	28 days	2012/10/16	2012/11/19	1142		[Gantt bar in H2]		
1146	Footbridge SB01 - Dwarf Wall	60 days	2011/5/31	2011/8/10			[Gantt bar in H2]		
1147	Drawpit and Ducting Construction	60 days	2011/8/11	2011/10/21	1146		[Gantt bar in H2]		
1148	Public Lighting Installation (CE2278/79)	14 days	2011/10/22	2011/11/17	1147		[Gantt bar in H2]		
1149	T&C	7 days	2011/11/18	2011/11/15	1148		[Gantt bar in H2]		
1150	Watermain Diversion	21 days	2011/10/22	2011/11/15	1147		[Gantt bar in H2]		
1151									
1152	Variation Order No. 116	564 days	2010/7/20	2012/4/25			[Gantt bar spanning H2, H1, H2]		
1153	Fabrication of Precast Concrete Planter	35 days	2010/7/20	2010/8/23			[Gantt bar in H2]		
1154	Material delivery	14 days	2010/8/24	2010/9/6	1153		[Gantt bar in H2]		
1155	Temp. drainage diversion/ haul rd	14 days	2011/6/1	2011/6/17	1154		[Gantt bar in H2]		
1156	Blinding layer	3 days	2011/6/18	2011/6/21	1155		[Gantt bar in H2]		
1157	PVC sheeting	3 days	2011/6/22	2011/6/24	1156		[Gantt bar in H2]		
1158	Installation of Planters	14 days	2011/6/25	2011/7/12	1157		[Gantt bar in H2]		
1159	Infill of Planting Soil	12 days	2012/4/12	2012/4/25			[Gantt bar in H2]		
1160	Variation Order No. 232	30 days	2012/4/26	2012/6/1			[Gantt bar in H2]		
1168	Variation Order No. 145	38 days	2012/6/2	2012/7/18			[Gantt bar in H2]		
1173									
1174	Programme of Upper Tai Po River	759 days?	2010/4/1	2012/8/7			[Gantt bar spanning H2, H1, H2]		
1175	Wet Season of 2010	214 days	2010/4/1	2010/10/31			[Gantt bar in H2]		
1176	Wet Season of 2011	149 days	2011/4/1	2011/9/30			[Gantt bar in H2]		
1177	Works Suspended Due to Villager's Rally	42 days?	2010/11/7	2010/12/18			[Gantt bar in H2]		
1178	Ch 230-350	366 days?	2011/1/28	2012/4/17			[Gantt bar spanning H2, H1, H2]		
1179	Gabion Wall (Ch 230-275 RHS) TG1/FG1A	40 days	2011/1/28	2011/3/12			[Gantt bar in H2]		
1183	Retaining Wall (Ch 275-330 RHS) TR1 (replaced by AD1)	183 days?	2011/3/7	2011/10/15	TP2		[Gantt bar spanning H2, H1, H2]		
1184	Excavation and Formation	12 days	2011/3/7	2011/3/19	1181		[Gantt bar in H2]		
1185	Laying Concrete block and gabion units (Ch275-330 RHS)	12 days	2011/3/21	2011/4/2	1184		[Gantt bar in H2]		
1186	Backfilling	6 days	2011/4/4	2011/4/11	1185		[Gantt bar in H2]		
1187	Excavation and Formation	7 days	2011/10/1	2011/10/10	1176		[Gantt bar in H2]		
1188	Laying Concrete block and gabion units (Ch330-330 RHS)	4 days	2011/10/11	2011/10/14	1187		[Gantt bar in H2]		
1189	Backfilling	1 day?	2011/10/15	2011/10/15	1188		[Gantt bar in H2]		
1190	Drainage & Footpath (Ch 275-320 RHS)	21 days	2011/10/1	2011/10/26			[Gantt bar in H2]		
1191	Construction of drainage & footpath	21 days	2011/10/1	2011/10/26	1176		[Gantt bar in H2]		
1192	Gabion Wall (Ch 315-330 LHS) TG2A (Inclined gabion)	29 days	2011/12/24	2012/2/22			[Gantt bar in H2]		
1193	Remove Concrete Blocks and shotcrete	5 days	2011/12/24	2011/12/31	1199SS-14 edays		[Gantt bar in H2]		
1194	Excavation and 1st stage No fine concrete	5 days	2012/1/12	2012/1/17	1199		[Gantt bar in H2]		
1195	Mass concrete wall	7 days	2012/1/16	2012/1/26	1194FS-3 edays		[Gantt bar in H2]		
1196	2nd stage no-fine concrete and inclined gabion	4 days	2012/1/27	2012/1/31	1195		[Gantt bar in H2]		
1197	Concrete blocks at slope toe and Backfilling	2 days	2012/2/1	2012/2/2	1196		[Gantt bar in H2]		
1198	Maintenance Staircase (Ch 315 LHS)	4 days	2012/1/7	2012/1/11			[Gantt bar in H2]		
1199	Formwork and concreting	4 days	2012/1/7	2012/1/11	1227		[Gantt bar in H2]		
1200	Drainage & Footpath (Ch 307-330 LHS)	14 days	2012/1/27	2012/2/11			[Gantt bar in H2]		
1201	Construction of drainage & footpath	14 days	2012/1/27	2012/2/11	1195		[Gantt bar in H2]		
1202									
1203	Temp Utility and Pedestrian Diversion at Ch230	148 days	2011/9/27	2012/3/24			[Gantt bar spanning H2, H1, H2]		

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							H2	H1	H2
1204	Temp UU diversion near Ch230	29 days	2011/09/27	2011/10/31					
1205	Implementation of Pedestrian diversion Scheme	119 days	2011/1/1/1	2012/3/24					
1206									
1207	Demolition of Interim Footbridge at Ch230	17 days	2011/11/1	2011/11/19		TP2A			
1208	Construct Temp crossing at Ch230	7 days	2011/1/1/1	2011/1/1/8	1204				
1209	Demolition of Interim Footbridge	10 days	2011/1/1/9	2011/1/1/19	1208				
1210									
1211	Gabion Wall (Ch 230-257 LHS) TG2/TG2A/TG2B (Inclined gabion)	19 days	2011/1/1/15	2011/1/2/6		TP2A			
1212	Remove Shotcrete & concrete block	5 days	2011/1/1/15	2011/1/1/19	1209FF				
1213	Excavation and 1st stage No fine concrete	5 days	2011/1/1/21	2011/1/1/25	1212				
1214	Mass concrete wall	7 days	2011/1/1/19	2011/1/1/26	1213FS-7 edays				
1215	2nd stage no-fine concrete and inclined gabion	4 days	2011/1/1/28	2011/1/2/1	1214				
1216	Concrete blocks at slope toe and Backfilling	2 days	2011/1/1/22	2011/1/2/3	1215				
1217	Maintenance Staircase (Ch 242 LHS)	4 days	2011/1/1/22	2011/1/2/6		TP2A			
1218	Formwork and concreting	4 days	2011/1/1/22	2011/1/2/6	1215				
1219	Gabion Wall (Ch 257-270 LHS) TG4 (Inclined gabion)	19 days	2011/1/1/30	2011/1/2/21		TP2A			
1220	Remove Shotcrete & concrete block	5 days	2011/1/1/30	2011/1/2/5	1215FS-2 days				
1221	Excavation and 1st stage No fine concrete	5 days	2011/1/1/26	2011/1/2/10	1220				
1222	Mass concrete wall	7 days	2011/1/2/10	2011/1/2/17	1221FS-1 day				
1223	2nd stage no-fine concrete and inclined gabion	4 days	2011/1/2/15	2011/1/2/19	1222FS-3 days				
1224	Concrete blocks at slope toe and Backfilling	2 days	2011/1/2/20	2011/1/2/21	1223				
1225	Retaining Wall (Ch 275-315 LHS) TR1 (replaced by AD1)	35 days	2011/1/2/20	2012/2/4		TP2A			
1226	Remove Concrete Blocks and shotcrete	5 days	2011/1/2/20	2011/1/2/24	1224SS				
1227	Excavation and 1st stage No fine concrete	8 days	2011/1/2/28	2012/1/6	1226				
1228	Mass concrete wall	14 days	2012/1/4	2012/1/19	1227SS+7 edays				
1229	2nd stage no-fine concrete and inclined gabion	7 days	2012/1/20	2012/1/31	1228				
1230	Concrete blocks at slope toe and Backfilling	4 days	2012/2/1	2012/2/4	1229				
1231	Drainage & Footpath (Ch 200-307 LHS)	60 days	2011/1/2/2	2012/2/16					
1233	River Bed formation (Ch205-236)	21 days	2011/1/1/21	2011/1/2/14		TP2A			
1234	Excavation (Ch205-236) From TB03 to Step2	7 days	2011/1/1/21	2011/1/1/28	1209				
1235	Placement of Concrete Block at Embankment Toe	7 days	2011/1/1/29	2011/1/2/6	1234				
1236	Fixing steel meshes	7 days	2011/1/2/7	2011/1/2/14	1235				
1237	Step 2 & Stilling Basin (Ch 236)	20 days	2011/1/1/1	2011/1/1/23					
1238	Construction of Step 2 (Assume Mass Concrete)	10 days	2011/1/1/1	2011/1/1/11	1204				
1239	Construction of Stilling Basin (base slab)	7 days	2011/1/1/12	2011/1/1/19	1238				
1240	Construction of Baffle Blocks	3 days	2011/1/1/21	2011/1/1/23	1239				
1241	Cascade (Ch 275)	31 days	2011/1/1/17	2011/1/2/22		TP2A			
1242	River Bed formation (Ch236-275)	7 days	2011/1/1/17	2011/1/1/24	1239FS-3 days				
1243	Construction of Cascade (Ch 275)	14 days	2011/1/1/25	2011/1/2/10	1242				
1244	Construction of Stilling Basin (base slab)	7 days	2011/1/2/12	2011/1/2/19	1243				
1245	Construction of Baffle Blocks	3 days	2011/1/2/20	2011/1/2/22	1244				
1246	Step 3 (Ch 307)	28 days	2011/1/2/8	2012/1/12					
1247	River Bed formation (Ch275-307)	7 days	2011/1/2/8	2011/1/2/16	1243FS-3 days	TP2			
1248	Construction of Step 3 (Assume Mass Concrete)	10 days	2011/1/2/17	2011/1/2/30	1247				
1249	Construction of Stilling Basin (base slab)	7 days	2011/1/2/31	2012/1/9	1248				
1250	Construction of Baffle Blocks	3 days	2012/1/10	2012/1/12	1249				
1251	River Bed formation (Ch 307-330)	29 days	2011/1/2/20	2012/1/28		T2A			
1252	Excavation (Ch205-236) From 307-330	15 days	2011/1/2/20	2012/1/9	1249FF				
1253	Placement of Concrete Block at Embankment Toe	7 days	2012/1/10	2012/1/17	1252				
1254	Fixing steel meshes	7 days	2012/1/18	2012/1/28	1253				
1255	Lighting at CH 250-320	45 days	2012/2/17	2012/4/12					

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							H2	H1
1256	Construction of Drawpits / Ductings	21 days	2012/2/17	2012/3/12	1252			
1257	Public lighting Installation (CE2318)	12 days	2012/3/13	2012/3/26	1256			
1258	Public lighting Installation (CE2317)	12 days	2012/3/13	2012/3/26	1256			
1259	T&C	6 days	2012/3/27	2012/4/1	1257,1258			
1260	Removal of existing lighting (VA1311-Z1)	6 days	2012/4/2	2012/4/12	1259			
1261								
1262	Footbridge TB04 (Ch 330)	94 days	2011/10/11	2012/2/3				
1263	Construction of Abutment A (RHS)	22 days	2011/11/18	2011/12/13				
1264	Excavation and Blinding	5 days	2011/11/18	2011/11/23	1344			
1265	Formwork and rebar fixing for base slab	5 days	2011/11/24	2011/11/29	1264			
1266	Concreting of base slab	1 day	2011/11/30	2011/11/30	1265			
1267	Stripping off formwork	3 days	2011/12/1	2011/12/3	1266			
1268	Rebar fixing and shuttering formwork for column	5 days	2011/12/5	2011/12/9	1267			
1269	Concreting of column	1 day	2011/12/10	2011/12/10	1268			
1270	Stripping off formwork	2 days	2011/12/12	2011/12/13	1269			
1271	Construction of Abutment B (LHS)	24 days	2011/10/11	2011/11/7		TP2		
1272	Remove shotcrete	2 days	2011/10/11	2011/10/12	1187			
1273	Excavation and Blinding	7 days	2011/10/13	2011/10/20	1272			
1274	Formwork and rebar fixing for base slab	3 days	2011/10/21	2011/10/24	1273			
1275	Concreting of base slab	1 day	2011/10/25	2011/10/25	1274			
1276	Stripping off formwork	3 days	2011/10/26	2011/10/28	1275			
1277	Rebar fixing and shuttering formwork for column	5 days	2011/10/29	2011/11/3	1276			
1278	Concreting of column	1 day	2011/11/4	2011/11/4	1277			
1279	Stripping off formwork	2 days	2011/11/5	2011/11/7	1278			
1280	Construction of decking (steel deck)	16 days	2012/1/10	2012/1/31				
1281	Erection of steel deck+ conc deck	4 days	2012/1/10	2012/1/13	1249			
1282	Deck finishing	10 days	2012/1/14	2012/1/28	1281			
1283	Railing installation	2 days	2012/1/30	2012/1/31	1282			
1284	Demolition of Bridge TB-A	21 days	2012/1/7	2012/2/3				
1285	Remove concrete pipes and re-provide footpath	14 days	2012/1/7	2012/1/26	1227			
1286	Complete removal of TB-A crossing	3 days	2012/2/1	2012/2/3	1283			
1287	Lighting at Footbridge TB04	11 days	2012/1/14	2012/1/30				
1288	Construction of Drawpits / Ductings	7 days	2012/1/14	2012/1/21	1281			
1289	Public lighting Installation (CE2315)	3 days	2012/1/26	2012/1/28	1288			
1290	Public lighting Installation (CE2316)	3 days	2012/1/26	2012/1/28	1288			
1291	T&C	1 day	2012/1/30	2012/1/30	1290			
1292	Construction of Gabion Wall at TB-A?	5 days	2012/2/4	2012/2/9				
1293	Excavation and Formation	2 days	2012/2/4	2012/2/6	1286			
1294	Gabion Wall Construction (adj TBA LHS)	2 days	2012/2/7	2012/2/8	1293			
1295	Backfilling	1 day	2012/2/9	2012/2/9	1294			
1296								
1297	Footbridge TB05 (ch 350)	329 days	2011/3/10	2012/4/17				
1298	Construction of Abutment A (LHS)	20 days	2011/12/20	2012/1/14				
1299	Excavation and Blinding	5 days	2011/12/20	2011/12/24	1335			
1300	Formwork and rebar fixing for base slab	4 days	2011/12/28	2011/12/31	1299			
1301	Concreting of base slab	1 day	2012/1/3	2012/1/3	1300			
1302	Stripping off formwork	3 days	2012/1/4	2012/1/6	1301			
1303	Rebar fixing and shuttering formwork for column	4 days	2012/1/7	2012/1/11	1302			
1304	Concreting of column	1 day	2012/1/12	2012/1/12	1303			
1305	Stripping off formwork	2 days	2012/1/13	2012/1/14	1304			
1306	Construction of Abutment B (RHS)	19 days	2011/3/10	2011/3/31				

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							H2	H1	H2
1314	Construction of decking	27 days	2012/1/16	2012/2/18					
1315	Modification of table top	10 days	2012/1/16	2012/1/30	1305				
1316	Erection of steel deck + conc deck	4 days	2012/2/1	2012/2/4	1350				
1317	Deck finishing	10 days	2012/2/5	2012/2/16	1316				
1318	Railing installation	2 days	2012/2/17	2012/2/18	1317				
1319	Demolition of Bridge TB-B	89 days	2011/12/20	2012/4/11					
1320	Remove concrete pipes and reprovide footpath	14 days	2011/12/20	2012/1/7	1335				
1321	Remove concrete pipes and demolition works	3 days	2012/4/5	2012/4/11	1320				
1322	Lighting at Footbridge TB05	10 days	2012/1/31	2012/2/10					
1323	Construction of Drawpits / Ductings	6 days	2012/1/31	2012/2/6	1315				
1324	Public lighting Installation (CE2313)	3 days	2012/2/7	2012/2/9	1323				
1325	Public lighting Installation (CE2314)	3 days	2012/2/7	2012/2/9	1323				
1326	T&C	1 day	2012/2/10	2012/2/10	1325				
1327	Construction of Gabion Wall at TB-B	5 days	2012/4/12	2012/4/17					
1328	Excavation and Formation	2 days	2012/4/12	2012/4/13	1321				
1329	Gabion Wall Construction (adj TBB LHS)	2 days	2012/4/14	2012/4/16	1328				
1330	Backfilling	1 day	2012/4/17	2012/4/17	1329				
1331									
1332									
1333	Gabion Wall (Ch 335-345 LHS) TG2/TG2A	15 days	2011/12/12	2011/12/30		TP2			
1334	Remove Concrete Blocks and shotcrete	2 days	2011/12/12	2011/12/13	1270FF				
1335	Excavation and 1st stage No fine concrete	5 days	2011/12/14	2011/12/19	1334				
1336	Mass concrete wall	5 days	2011/12/17	2011/12/22	1335FS-3 edays				
1337	2nd stage no-fine concrete and inclined gabion	2 days	2011/12/23	2011/12/24	1336				
1338	Concrete blocks at slope toe and Backfilling	3 days	2011/12/28	2011/12/30	1337				
1339	Drainage & Footpath (Ch 335-345 LHS)	12 days	2011/12/31	2012/1/14					
1340	Construction of drainage & footpath	12 days	2011/12/31	2012/1/14	1338				
1341	Gabion Wall (Ch 330-345 RHS) TG2	15 days	2011/11/17	2011/11/23		TP2			
1342	Remove Concrete Blocks and shotcrete	2 days	2011/11/8	2011/11/9	1279				
1343	Excavation and 1st stage No fine concrete	5 days	2011/11/7	2011/11/11	1342FS-3 edays				
1344	Mass concrete wall	5 days	2011/11/12	2011/11/17	1343				
1345	2nd stage no-fine concrete and inclined gabion	2 days	2011/11/18	2011/11/19	1344				
1346	Concrete blocks at slope toe and Backfilling	3 days	2011/11/21	2011/11/23	1345				
1347	Drainage & Footpath (Ch 330-340 RHS)	12 days	2011/11/24	2011/12/7					
1348	Construction of drainage & footpath	12 days	2011/11/24	2011/12/7	1346				
1349									
1350	River Bed formation (Ch 330-350)	12 days	2012/1/14	2012/1/31		TP2			
1351	Excavation	4 days	2012/1/14	2012/1/18	1281				
1352	Placement of Concrete Block at Embankment Toe	4 days	2012/1/19	2012/1/25	1351				
1353	Fixing steel meshes	4 days	2012/1/27	2012/1/31	1352				
1354	Step 4 (Ch 350)	23 days	2012/2/6	2012/3/2					
1355	River Bed formation (Ch340-350)	3 days	2012/2/6	2012/2/8	1316				
1356	Construction of Step 3 (Assume Mass Concrete)	10 days	2012/2/9	2012/2/20	1355				
1357	Construction of Stilling Basin (base slab)	7 days	2012/2/21	2012/2/28	1356				
1358	Construction of Baffle Blocks	3 days	2012/2/29	2012/3/2	1357				
1359	Ch 45-230	493 days	2010/11/1	2012/6/5		TP1			
1360	Additional Boulder Trap	145 days	2011/10/3	2012/3/27	1176				
1361	Access Road (LHS)	21 days	2012/3/28	2012/4/24	1360				
1362	Footbridge TB02 (Ch 150)	493 days	2010/11/1	2012/6/5		TP1a			
1363	Construction of Abutment A (LHS)	23 days	2010/11/1	2010/11/23					
1371	Construction of decking	14 days	2012/3/28	2012/4/16					

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							H2	H1	H2
1372	Erection of steel deck+ conc deck	4 days	2012/3/28	2012/3/31	1464				
1373	XXConcreting	0 days	2012/3/31	2012/3/31	1372				
1374	Deck finishing	10 days	2012/4/1	2012/4/16	1372				
1375	Railing installation	7 days	2012/4/1	2012/4/12	1372				
1376	Lighting at Footbridge TB02	51 days	2012/4/1	2012/6/5					
1377	Construction of Drawpits / Ductings	21 days	2012/4/1	2012/4/30	1372				
1378	Public lighting Installation (CE2308)	12 days	2012/5/2	2012/5/15	1377				
1379	Public lighting Installation (CE2309)	12 days	2012/5/16	2012/5/29	1378				
1380	Removal of existing lighting (VA2642-A1)	6 days	2012/5/30	2012/6/5	1379				
1381									
1382	River Bed formation (Ch 100-150)	20 days	2012/4/1	2012/4/27					
1383	Excavation	10 days	2012/4/1	2012/4/16	1372				
1384	Placement of Concrete Block at Embankment Toe	12 days	2012/4/1	2012/4/18	1383FS-10 days				
1385	Fixing steel meshes	8 days	2012/4/19	2012/4/27	1384				
1386	Gabion Wall (Ch 150-178 LHS) TG3A	188 days	2011/4/4	2011/11/18		TP1			
1387	Excavation and formation	19 days	2011/4/4	2011/4/29					
1388	Construction of 450 Pipe/Pit at back of Gabion Wall	10 days	2011/10/27	2011/11/17	1392				
1389	Gabion Wall construction (Ch 150-178 LHS)	5 days	2011/1/18	2011/1/12	1388				
1390	Backfilling	5 days	2011/1/14	2011/1/18	1389				
1391	Gabion Wall (Ch 178-230 LHS) TG5A/TG2	15 days	2011/10/15	2011/1/1		TP1			
1392	Gabion Wall construction (Ch 178-230 LHS)	10 days	2011/10/15	2011/10/25	1176FS+14 edays				
1393	Backfilling	5 days	2011/10/27	2011/1/1	1392				
1394	Maintenance Staircase (Ch 178 LHS)	4 days	2011/1/14	2011/1/17					
1395	Formwork and concreting	4 days	2011/1/14	2011/1/17	1389				
1396	Drainage & Footpath (Ch 150-Ch230 LHS)	21 days	2011/1/10	2011/1/23					
1397	Drainage & Footpath	21 days	2011/1/10	2011/1/23					
1398	Gabion Wal (Ch 100-150 RHS) TG2	24 days	2011/12/5	2012/1/4		TP1			
1399	Remove Concrete Blocks and shotcrete	5 days	2011/1/25	2011/1/29	1412				
1400	Excavation and 1st stage No fine concrete	10 days	2011/1/28	2011/12/19	1399FS-2 edays				
1401	Mass concrete wall	14 days	2011/1/25	2011/12/20	1400FS-16 edays				
1402	2nd stage no-fine concrete and inclined gabion	5 days	2011/1/22	2011/12/28	1401				
1403	Concrete blocks at slope toe and Backfilling	5 days	2011/1/29	2012/1/4	1402				
1404	Maintenance Staircase (Ch 130 RHS)	4 days	2011/1/22	2011/1/28					
1405	Formwork and concreting	4 days	2011/1/22	2011/1/28	1402FF				
1406	Drainage & Footpath (Ch 0-150 RHS)	45 days	2011/1/29	2012/2/23					
1407	Construction of drainage & footpath	45 days	2011/1/29	2012/2/23	1402				
1408									
1409	Gabion Wall (Ch 150-178 RHS) TG4A	23 days	2011/1/17	2011/12/13		TP1			
1410	Remove Existing footpath and shotcrete	2 days	2011/1/17	2011/1/18	1390FF				
1411	Excavation and 1st stage No fine concrete	8 days	2011/1/19	2011/1/28	1410				
1412	Mass concrete wall	8 days	2011/1/25	2011/1/23	1411FS-4 edays				
1413	2nd stage no-fine concrete and inclined gabion	4 days	2011/1/25	2011/1/28	1412				
1414	Concrete blocks at slope toe and Backfilling	4 days	2011/1/29	2011/12/13	1413				
1415	Footbridge TB03 (Ch 200)	108 days	2011/1/21	2012/3/31					
1416	Construction of Abutment B (RHS)	34 days	2011/1/21	2011/12/31					
1417	Excavation and Blinding, temp work	14 days	2011/1/21	2011/1/26	1209				
1418	Formwork and rebar fixing of base slab	7 days	2011/1/27	2011/12/14	1417				
1419	Concreting of base slab	1 day	2011/12/15	2011/12/15	1418				
1420	Stripping off formwork	2 days	2011/12/16	2011/12/17	1419				
1421	Rebar fixing and shuttering formwork for column	7 days	2011/12/19	2011/12/28	1420				
1422	Concreting	1 day	2011/12/29	2011/12/29	1421				

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							H2	H1	H2
1423	Stripping off formwork	2 days	2011/12/30	2011/12/31	1422				
1424	Construction of Decking (TB03)	34 days	2011/12/27	2012/1/18					
1425	Modification of LHS table top	25 days	2011/12/7	2012/1/7	1417				
1426	Erection of steel deck+ conc deck	4 days	2012/1/3	2012/1/6	1423				
1427	Deck finishing	10 days	2012/1/7	2012/1/18	1426				
1428	Railing installation	2 days	2012/1/7	2012/1/9	1426				
1429	Lighting at Footbridge TB03	27 days	2012/1/10	2012/2/13					
1430	Construction of Drawpits / Ductings	12 days	2012/1/10	2012/1/26	1428				
1431	Public lighting Installation (CE2321)	6 days	2012/1/27	2012/2/2	1430				
1432	Public lighting Installation (CE2322)	6 days	2012/2/3	2012/2/9	1431				
1433	T&C	1 day	2012/2/10	2012/2/10	1432				
1434	Removal of existing lighting (VA1309-Z1)	2 days	2012/2/11	2012/2/13	1433				
1435									
1436	TR6 at Ch220	34 days	2011/11/21	2011/12/31	1209				
1437	Excavation and Blinding, temp work	14 days	2011/11/21	2011/12/6	1209				
1438	Formwork and rebar fixing of base slab	7 days	2011/12/7	2011/12/14	1437				
1439	Concreting of base slab	1 day	2011/12/15	2011/12/15	1438				
1440	Stripping off formwork	2 days	2011/12/16	2011/12/17	1439				
1441	Rebar fixing and shuttering formwork for column	7 days	2011/12/19	2011/12/28	1440				
1442	Concreting	1 day	2011/12/29	2011/12/29	1441				
1443	Stripping off formwork	2 days	2011/12/30	2011/12/31	1442				
1444									
1445	Cascade at Ch230	42 days	2011/11/21	2012/1/11					
1446	Excavation and Blinding, temp work	14 days	2011/11/21	2011/12/6	1209				
1447	Formwork and rebar fixing of base slab	7 days	2011/12/16	2011/12/23	1439				
1448	Concreting of base slab	1 day	2011/12/24	2011/12/24	1447				
1449	Stripping off formwork	2 days	2011/12/28	2011/12/29	1448				
1450	Rebar fixing and shuttering formwork for column	7 days	2011/12/30	2012/1/7	1449				
1451	Concreting	1 day	2012/1/9	2012/1/9	1450				
1452	Stripping off formwork	2 days	2012/1/10	2012/1/11	1451				
1453									
1454	River Bed formation (Ch178-230)	30 days	2012/1/10	2012/2/16					
1455	River Bed formation (Ch178-230)	20 days	2012/1/10	2012/2/4	1451				
1456	Placement of Concrete Block at Embankment Toe	7 days	2012/2/6	2012/2/13	1455				
1457	Fixing steel meshes	3 days	2012/2/14	2012/2/16	1456				
1458	Step 1 (Ch 178)	20 days	2012/2/17	2012/3/10					
1459	Construction of Step 3 (Assume Mass Concrete)	10 days	2012/2/17	2012/2/28	1457				
1460	Construction of Stilling Basin (base slab)	7 days	2012/2/29	2012/3/7	1459				
1461	Construction of Baffle Blocks	3 days	2012/3/8	2012/3/10	1460				
1462	River Bed formation (Ch 150-178)	18 days	2012/3/12	2012/3/31					
1463	Excavation	10 days	2012/3/12	2012/3/22	1461				
1464	Placement of Concrete Block at Embankment Toe	4 days	2012/3/23	2012/3/27	1463				
1465	Fixing steel meshes	4 days	2012/3/28	2012/3/31	1464				
1466									
1467									
1468	Ch -23-45	608 days	2010/8/30	2012/8/7					
1469	<i>Retaining Wall at Access D (Boulder Trap)</i>	<i>41 days</i>	<i>2010/9/1</i>	<i>2010/10/11</i>					
1489	<i>Filling Work at Boulder Trap (RHS of downstream)</i>	<i>6 days</i>	<i>2010/8/30</i>	<i>2010/9/4</i>					
1491	Dwarf Wall (Ch 60-75) RHS	23 days	2011/10/15	2011/11/10					
1492	Excavation and Blinding	4 days	2011/10/15	2011/10/19	1176FS+14 edays				
1493	Formwork and rebar fixing of base slab	5 days	2011/10/20	2011/10/25	1492				

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							H2	H1	H2
1494	Concreting of base slab	1 day	2011/10/26	2011/10/26	1493				
1495	Stripping off formwork	1 day	2011/10/27	2011/10/27	1494				
1496	Rebar fixing and shuttering formwork for column	5 days	2011/10/28	2011/11/2	1495				
1497	Concreting	1 day	2011/11/3	2011/11/3	1496				
1498	Stripping off formwork	1 day	2011/11/4	2011/11/4	1497				
1499	Backfill	5 days	2011/11/5	2011/11/10	1498				
1500	Box Culvert 03 (Ch 45)	31 days	2011/11/11	2011/12/16					
1501	Construction of Base Slab	21 days	2011/11/11	2011/12/5					
1502	Remove boulder and wire fence	5 days	2011/11/11	2011/11/16	1499				
1503	Excavation and Blinding	7 days	2011/11/17	2011/11/24	1502				
1504	Formwork and rebar fixing	5 days	2011/11/25	2011/11/30	1503				
1505	Concreting	1 day	2011/12/1	2011/12/1	1504				
1506	Stripping off formwork	3 days	2011/12/2	2011/12/5	1505				
1507	Construction of Wall Stem and Top Slab	10 days	2011/12/6	2011/12/16					
1508	Formwork and rebar fixing	4 days	2011/12/6	2011/12/9	1506				
1509	Concreting	1 day	2011/12/10	2011/12/10	1508				
1510	Stripping off formwork	5 days	2011/12/12	2011/12/16	1509				
1511	Retaining Wall at Access D (Boulder Trap)	317 days	2011/7/18	2012/8/7					
1512	Retaining Wall (LHS)	49 days	2012/4/19	2012/6/16					
1513	Excavation and blinding	14 days	2012/4/19	2012/5/7	1384				
1514	Construction of Base Slab, Bay 2	8 days	2012/5/8	2012/5/16					
1515	Formwork and rebar fixing	4 days	2012/5/8	2012/5/11	1513				
1516	Concreting	1 day	2012/5/12	2012/5/12	1515				
1517	Stripping off formwork	3 days	2012/5/14	2012/5/16	1516				
1518	Construction of Base Slab, Bay 1	8 days	2012/5/17	2012/5/25					
1519	Formwork and rebar fixing	4 days	2012/5/17	2012/5/21	1517				
1520	Concreting	1 day	2012/5/22	2012/5/22	1519				
1521	Stripping off formwork	3 days	2012/5/23	2012/5/25	1520				
1522	Construction of Wall Stem, Bay 2	8 days	2012/5/26	2012/6/4					
1523	Formwork and rebar fixing	4 days	2012/5/26	2012/5/30	1521				
1524	Concreting	1 day	2012/5/31	2012/5/31	1523				
1525	Stripping off formwork	3 days	2012/6/1	2012/6/4	1524				
1526	Construction of Wall Stem, Bay 1	11 days	2012/6/5	2012/6/16					
1527	Formwork and rebar fixing	4 days	2012/6/5	2012/6/8	1525				
1528	Concreting	1 day	2012/6/9	2012/6/9	1527				
1529	Stripping off formwork	3 days	2012/6/11	2012/6/13	1528				
1530	Backfill the Retaining Wall	3 days	2012/6/14	2012/6/16	1529				
1531	Vehicle Access D	317 days	2011/7/18	2012/8/7					
1532	Road Kerb and formation	64 days	2011/7/18	2011/9/30					
1533	Pavement	30 days	2012/6/18	2012/7/24	1383,1530				
1534	Railing and street furniture	12 days	2012/7/25	2012/8/7	1533				
1535	Lighting at Access D	100 days	2011/11/21	2012/3/22					
1536	Construction of Drawpits / Ductings	21 days	2011/11/21	2011/12/14	1207				
1537	Public lighting Installation (CE2300)	3 days	2012/3/14	2012/3/16					
1538	Public lighting Installation (CE2301)	3 days	2012/3/14	2012/3/16					
1539	Public lighting Installation (CE2302)	3 days	2012/3/14	2012/3/16					
1540	T&C	1 day	2012/3/17	2012/3/17	1539				
1541	Removal of existing lighting (VA1278-A1)	2 days	2012/3/19	2012/3/20	1540				
1542	Removal of existing lighting (VA1279-A1)	2 days	2012/3/21	2012/3/22	1541				
1543									
1544	Ch 350-450	390 days	2011/1/3	2012/4/16					

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							H2	H1	H2
1545	Gabion Wall (Ch 350-400 LHS) TR1 (AD)	24 days	2011/10/19	2011/11/15					
1546	Remove Existing footpath and shotcrete	7 days	2011/10/26	2011/11/2	1545				
1547	Excavation and 1st stage No fine concrete	10 days	2011/10/31	2011/11/10	1546FS-3 edays				
1548	Mass concrete wall	10 days	2011/10/19	2011/10/29	1547FS-20 days				
1549	2nd stage no-fine concrete and inclined gabion	7 days	2011/10/31	2011/11/7	1548				
1550	Concrete blocks at slope toe and Backfilling	7 days	2011/11/8	2011/11/15	1549				
1551	Gabion Wall (Ch 400-450 LHS) TR1 (AD)	24 days	2011/10/28	2011/11/24					
1552	Remove Existing footpath and shotcrete	7 days	2011/10/31	2011/11/7	1548				
1553	Excavation and 1st stage No fine concrete	10 days	2011/11/5	2011/11/16	1552FS-3 edays				
1554	Mass concrete wall	10 days	2011/10/28	2011/11/8	1553FS-20 edays				
1555	2nd stage no-fine concrete and inclined gabion	7 days	2011/11/9	2011/11/16	1554				
1556	Concrete blocks at slope toe and Backfilling	7 days	2011/11/17	2011/11/24	1555				
1557	River Bed formation (Ch 350-400)	390 days	2011/1/3	2012/4/16					
1558	Excavation	14 days	2012/2/6	2012/2/21	1554,1316				
1559	Placement of Concrete Block at Embankment Toe	7 days	2012/2/22	2012/2/29	1558				
1560	Fixing steel meshes	7 days	2012/3/1	2012/3/8	1559				
1561	Footbridge TB06 (Ch 400)	110 days	2011/10/31	2012/3/13					
1562	Construction of Abutment A (LHS)	30 days	2011/10/31	2011/12/3					
1563	Remove Concrete block and shotcrete	3 days	2011/10/31	2011/11/2	1548				
1564	Excavation and Blinding	10 days	2011/11/3	2011/11/14	1563				
1565	Formwork and rebar fixing of base slab	5 days	2011/11/15	2011/11/19	1564				
1566	Concreting of base slab	1 day	2011/11/21	2011/11/21	1565				
1567	Stripping off formwork	2 days	2011/11/22	2011/11/23	1566				
1568	Rebar fixing and shuttering formwork for column	5 days	2011/11/24	2011/11/29	1567				
1569	Concreting	1 day	2011/11/30	2011/11/30	1568				
1570	Stripping off formwork	3 days	2011/12/1	2011/12/3	1569				
1571	Construction of decking	14 days	2012/3/22	2012/3/38					
1572	Erection of steel deck+ conc deck	4 days	2012/2/22	2012/2/25	1558				
1573	Deck finishing	10 days	2012/2/27	2012/3/8	1572				
1574	NA	0 days	2012/2/25	2012/2/25	1572				
1575	Railing installation	2 days	2012/2/27	2012/2/28	1572				
1576	Lighting at Footbridge TB06	14 days	2012/3/27	2012/3/13					
1577	Construction of Drawpits / Ductings	6 days	2012/2/27	2012/3/3	1572				
1578	Public lighting Installation (CE2311)	3 days	2012/3/5	2012/3/7	1577				
1579	Public lighting Installation (CE2310)	3 days	2012/3/8	2012/3/10	1578				
1580	T&C	2 days	2012/3/12	2012/3/13	1579				
1581	Demolition of Bridge TB-C	100 days	2011/11/1	2012/3/2					
1582	Water Pipe Diversion	6 days	2011/11/1	2011/11/7	1204				
1583	Remove concrete pipes and reprovide footpath	4 days	2011/11/8	2011/11/11	1582				
1584	Remove concrete pipes and demolition works	3 days	2012/2/29	2012/3/2	1575				
1585	Consturction of Gabion Wall at TB-C	7 days	2012/3/3	2012/3/10					
1586	Excavation and Formation	3 days	2012/3/3	2012/3/6	1584				
1587	Gabion Wall Construction (TBC LHS)	2 days	2012/3/7	2012/3/8	1586				
1588	Backfilling	2 days	2012/3/9	2012/3/10	1587				
1589									
1590	Gabion Wall (Ch 400-450 RHS) TR1 (replaced by AD1)	30 days	2011/1/3	2011/2/1					
1594	Gabion Wall (Ch 400-450 LHS) TR1 (replaced by AD1)	0 days	2011/11/24	2011/11/24					
1599	Maintenance Staircase (Ch 420 LHS)	108 days	2011/11/12	2012/3/23					
1600	Formwork and concreting	4 days	2011/11/12	2011/11/16	1555FF				
1601									
1602	Step 5 (Ch 410)	23 days	2012/2/27	2012/3/23	TP3				

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							H2	H1	H2
1603	River Bed Formation (Ch400-410)	2 days	2012/2/27	2012/2/28	1572				
1604	Construction of Step 3 (Assume Mass Concrete)	10 days	2012/2/29	2012/3/10	1603				
1605	Construction of Stilling Basin (base slab)	7 days	2012/3/12	2012/3/19	1604				
1606	Construction of Baffle Blocks	4 days	2012/3/20	2012/3/23	1605				
1607	River Bed formation (Ch 410-450)	21 days	2012/3/20	2012/4/16		TP3			
1608	Excavation	7 days	2012/3/27	2012/3/27	1605				
1609	Placement of Concrete Block at Embankment Toe	7 days	2012/3/28	2012/4/3	1608				
1610	Fixing steel meshes	7 days	2012/4/5	2012/4/16	1609				
1611	<i>Box Culvert TB01 (Ch 450)</i>	<i>40 days</i>	<i>2011/3/10</i>	<i>2011/4/29</i>					
1612	<i>Construction of Base Slab</i>	<i>21 days</i>	<i>2011/3/10</i>	<i>2011/4/2</i>	1592				
1617	<i>Construction of Wall Stem and Top Slab</i>	<i>19 days</i>	<i>2011/4/4</i>	<i>2011/4/29</i>					
1621									
1622	Drainage & Footpath (Ch350-450) LHS & RHS	45 days	2011/11/9	2012/1/3					
1623	Drainage & Footpath (Ch350-450) LHS & RHS	45 days	2011/11/9	2012/1/3	1554				
1624									
1625	Lighting at CH 350-380	23 days	2012/1/4	2012/2/2					
1626	Construction of Drawpits / Ductings	14 days	2012/1/4	2012/1/19	1623				
1627	Public lighting Installation (CE2312)	7 days	2012/1/20	2012/1/31	1626				
1628	T&C	2 days	2012/2/1	2012/2/2	1627				
1629									
1630	Ch 450-525	340 days	2011/3/16	2012/5/8					
1631	Retaining Wall (ch 450-500) TR2 (RHS)	49 days	2011/10/1	2011/11/28		TP4			
1632	Remove Concrete block and shotcrete	7 days	2011/10/1	2011/10/10	1176				
1633	Excavation and Formation	35 days	2011/10/7	2011/11/16	1632SS+4 days				
1634	Base Slab Construction Bay 1+3 (RHS)	12 days	2011/10/17	2011/10/29					
1635	Formwork and rebar fixing	10 days	2011/10/17	2011/10/27	1633SS+10 edays				
1636	Concreting	1 day	2011/10/28	2011/10/28	1635				
1637	Stripping off formwork	1 day	2011/10/29	2011/10/29	1636				
1638	Wall Stem Construction Bay 1+3 (RHS)	13 days	2011/10/31	2011/11/14					
1639	Formwork and rebar fixing	6 days	2011/10/31	2011/11/5	1637				
1640	Concreting	1 day	2011/11/7	2011/11/7	1639				
1641	Stripping off formwork	2 days	2011/11/8	2011/11/9	1640				
1642	Backfill	4 days	2011/11/10	2011/11/14	1641				
1643	Base Slab Construction Bay 2 (RHS) del	0 days	2011/10/29	2011/10/29					
1647	Wall Stem Construction Bay 2 (RHS) del	0 days	2011/10/29	2011/10/29					
1652	Base Slab Construction Bay 2 + 4 + step 6(RHS)	12 days	2011/10/31	2011/11/12					
1653	Formwork and rebar fixing	10 days	2011/10/31	2011/11/10	1637				
1654	Concreting	1 day	2011/11/11	2011/11/11	1653				
1655	Stripping off formwork	1 day	2011/11/12	2011/11/12	1654				
1656	Wall Stem Construction Bay 2 + 4(RHS)	13 days	2011/11/14	2011/11/28					
1657	Formwork and rebar fixing	6 days	2011/11/14	2011/11/19	1655				
1658	Concreting	1 day	2011/11/21	2011/11/21	1657				
1659	Stripping off formwork	2 days	2011/11/22	2011/11/23	1658				
1660	Backfill	4 days	2011/11/24	2011/11/28	1659				
1661	NA	0 days	2011/11/28	2011/11/28					
1662	NA	0 days	2011/11/28	2011/11/28	1660				
1663	NA	0 days	2011/11/28	2011/11/28	1662				
1664	NA	0 days	2011/11/28	2011/11/28	1663				
1665	NA	0 days	2011/11/28	2011/11/28	1664				
1666	NA	0 days	2011/11/28	2011/11/28	1664				
1667	NA	0 days	2011/11/28	2011/11/28	1666				

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							H2	H1	H2
1668	NA	0 days	2011/11/28	2011/11/28	1667				◆ 28/11
1669	NA	0 days	2011/11/28	2011/11/28	1668				◆ 28/11
1670	NA	0 days	2011/11/28	2011/11/28					◆ 28/11
1671	NA	0 days	2011/11/28	2011/11/28	1664				◆ 28/11
1672	NA	0 days	2011/11/28	2011/11/28	1671				◆ 28/11
1673	NA	0 days	2011/11/28	2011/11/28	1672				◆ 28/11
1674	NA	0 days	2011/11/28	2011/11/28					◆ 28/11
1675	NA	0 days	2011/11/28	2011/11/28	1673				◆ 28/11
1676	NA	0 days	2011/11/28	2011/11/28	1675				◆ 28/11
1677	NA	0 days	2011/11/28	2011/11/28	1676				◆ 28/11
1678	NA	0 days	2011/11/28	2011/11/28	1677				◆ 28/11
1679	Retaining Wall (ch 450-500) TR2 (LHS)	42 days	2011/11/29	2012/1/19		TP4			◆ 28/11
1680	Demolition of House 2 Sha Po Tsai	7 days	2011/12/8	2011/12/15	1682SS-7 edays				◆ 28/11
1681	Excavation and Formation for TR2 Bay 1 to Bay 3	14 days	2011/11/29	2011/12/14	1675				◆ 28/11
1682	Excavation and Formation for TR2 Bay 4 to Bay 5	14 days	2011/12/15	2012/1/3	1681				◆ 28/11
1683	Base Slab Construction Bay 1+3 (LHS)	12 days	2011/12/12	2011/12/24					◆ 28/11
1684	Formwork and rebar fixing (with DWF)	10 days	2011/12/12	2011/12/22	1681FS-3 days				◆ 28/11
1685	Concreting	1 day	2011/12/23	2011/12/23	1684				◆ 28/11
1686	Stripping off formwork	1 day	2011/12/24	2011/12/24	1685				◆ 28/11
1687	Wall Stem Construction Bay 1+3 (LHS)	14 days	2011/12/28	2012/1/13					◆ 28/11
1688	Formwork and rebar fixing	8 days	2011/12/28	2012/1/6	1686				◆ 28/11
1689	Concreting	1 day	2012/1/7	2012/1/7	1688				◆ 28/11
1690	Stripping off formwork	1 day	2012/1/9	2012/1/9	1689				◆ 28/11
1691	Backfill	4 days	2012/1/10	2012/1/13	1690				◆ 28/11
1692	Base Slab Construction Bay 2 (LHS) del	0 days	2011/12/24	2011/12/24					◆ 24/12
1696	Wall Stem Construction Bay 2 (LHS) del	0 days	2011/12/24	2011/12/24					◆ 24/12
1701	Base Slab Construction Bay 2 +4 + step 6 (LHS)	10 days	2011/12/23	2012/1/6					◆ 24/12
1702	Formwork and rebar fixing (with DWF)	8 days	2011/12/23	2012/1/4	1681,1713				◆ 24/12
1703	Concreting	1 day	2012/1/5	2012/1/5	1702				◆ 24/12
1704	Stripping off formwork	1 day	2012/1/6	2012/1/6	1703				◆ 24/12
1705	Wall Stem Construction Bay 2 + 4 (LHS)	11 days	2012/1/7	2012/1/19					◆ 24/12
1706	Form work and rebar fixing	5 days	2012/1/7	2012/1/12	1704,1717				◆ 24/12
1707	Concreting	1 day	2012/1/13	2012/1/13	1706				◆ 24/12
1708	Stripping off formwork	1 day	2012/1/14	2012/1/14	1707				◆ 24/12
1709	Backfill	4 days	2012/1/16	2012/1/19	1708				◆ 24/12
1710	NA	0 days	2011/12/22	2011/12/22					◆ 22/12
1711	NA	0 days	2011/12/22	2011/12/22	1682SS+7 days				◆ 22/12
1712	NA	0 days	2011/12/22	2011/12/22	1711				◆ 22/12
1713	NA	0 days	2011/12/22	2011/12/22	1712				◆ 22/12
1714	NA	0 days	2011/12/22	2011/12/22					◆ 22/12
1715	NA	0 days	2011/12/22	2011/12/22	1713				◆ 22/12
1716	NA	0 days	2011/12/22	2011/12/22	1715				◆ 22/12
1717	NA	0 days	2011/12/22	2011/12/22	1716				◆ 22/12
1718	NA	0 days	2011/12/22	2011/12/22	1717				◆ 22/12
1719	NA	0 days	2012/1/3	2012/1/3					◆ 3/1
1720	NA	0 days	2012/1/3	2012/1/3	1682,1713				◆ 3/1
1721	NA	0 days	2012/1/3	2012/1/3	1720				◆ 3/1
1722	NA	0 days	2012/1/3	2012/1/3	1721				◆ 3/1
1723	NA	0 days	2012/1/3	2012/1/3					◆ 3/1
1724	NA	0 days	2012/1/3	2012/1/3	1722				◆ 3/1
1725	NA	0 days	2012/1/3	2012/1/3	1724				◆ 3/1

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							H2	H1	H2
1726	NA	0 days	2012/1/3	2012/1/3	1725				
1727	NA	0 days	2012/1/3	2012/1/3	1726				
1728									
1729	Drainage & Footpath (Ch 450-490 RHS)	14 days	2011/11/29	2011/12/14					
1730	Construction of drainage & footpath	14 days	2011/11/29	2011/12/14	1660				
1731	Retaining Wall (Ch 500-530) TR3 (RHS)	270 days	2011/3/16	2012/2/10					
1732	Base Slab Construction Bay 1 (incl. Step 7) (RHS)	28 days	2011/3/16	2011/4/18					
1737	Wall Stem Construction Bay 1 (RHS)	10 days	2011/4/19	2011/5/3					
1742	Base Slab Construction Bay 2 (incl. Step 7)(RHS)	20 days	2012/1/4	2012/1/30		TP4			
1743	Excavation and Formation	12 days	2012/1/4	2012/1/17	1727,1718				
1744	Formwork and rebar fixing	6 days	2012/1/18	2012/1/27	1743				
1745	Concreting	1 day	2012/1/28	2012/1/28	1744				
1746	Stripping off formwork	1 day	2012/1/30	2012/1/30	1745				
1747	Wall Stem Construction Bay 2 (RHS)	10 days	2012/1/31	2012/2/10					
1748	Formwork and rebar fixing	4 days	2012/1/31	2012/2/3	1746				
1749	Concreting	1 day	2012/2/4	2012/2/4	1748				
1750	Stripping off formwork	1 day	2012/2/6	2012/2/6	1749				
1751	Backfill	4 days	2012/2/7	2012/2/10	1750				
1752									
1753	Cascades (Ch 500 LHS)	28 days	2011/10/1	2011/11/3		TP5			
1754	Water Diversion	7 days	2011/10/1	2011/10/10	1176				
1755	Excavation	9 days	2011/10/11	2011/10/20	1754				
1756	Formwork and rebar fixing	10 days	2011/10/21	2011/11/1	1755				
1757	Concreting	1 day	2011/11/2	2011/11/2	1756				
1758	Stripping off formwork	1 day	2011/11/3	2011/11/3	1757				
1759									
1760	Retaining Wall (Ch 500-530) TR3 (LHS)	55 days	2011/1/3	2012/1/9					
1761	Base Slab Construction Bay 1 (incl. Step 7)(LHS)	18 days	2011/1/3	2011/1/23					
1762	Remove Concrete Block and shotcrete	4 days	2011/1/3	2011/1/8	1757				
1763	Excavation & blinding	6 days	2011/1/17	2011/1/12	1762FS-2 days				
1764	Formwork and rebar fixing (with DWF)	7 days	2011/1/14	2011/1/21	1763				
1765	Concreting	1 day	2011/1/22	2011/1/22	1764				
1766	Stripping off formwork	1 day	2011/1/23	2011/1/23	1765				
1767	Wall Stem Construction Bay 1 (LHS)	10 days	2011/1/24	2011/1/25					
1768	Formwork and rebar fixing	4 days	2011/1/24	2011/1/28	1766				
1769	Concreting	1 day	2011/1/29	2011/1/29	1768				
1770	Stripping off formwork	1 day	2011/1/30	2011/1/30	1769				
1771	Backfill	4 days	2011/1/21	2011/1/25	1770				
1772	Base Slab Construction Bay 2 (incl. Step 7)(LHS)	19 days	2011/1/23	2011/1/24					
1773	Remove Concrete Block and shotcrete	4 days	2011/1/23	2011/1/27	1771FS-2 days				
1774	Excavation & blinding	6 days	2011/1/28	2011/1/24	1773				
1775	Formwork and rebar fixing (with DWF)	7 days	2011/1/215	2011/1/222	1774				
1776	Concreting	1 day	2011/1/223	2011/1/223	1775				
1777	Stripping off formwork	1 day	2011/1/224	2011/1/224	1776				
1778	Wall Stem Construction Bay 2 (LHS)	10 days	2011/1/228	2012/1/9					
1779	Formwork and rebar fixing	4 days	2011/1/228	2011/1/231	1777				
1780	Concreting	1 day	2012/1/3	2012/1/3	1779				
1781	Stripping off formwork	1 day	2012/1/4	2012/1/4	1780				
1782	Backfill	4 days	2012/1/5	2012/1/9	1781				
1783									
1784	Drainage & Footpath (Ch 490-525 RHS)	30 days	2012/2/7	2012/3/12					

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							H2	H1	H2
1785	Construction of drainage & footpath	30 days	2012/2/7	2012/3/12	1750				
1786									
1787	Footbridge TB07 (Ch 525)	121 days	2011/10/3	2012/2/28		TP6			
1788	Temporary Pedestrian Division	15 days	2011/10/3	2011/10/20					
1789	Temporary Pedestrian Division (at grade)	14 days	2011/10/3	2011/10/20	1176	TP6			
1790	Demolition of existing Footbridge TB-D (Ch 525)	3 days	2011/10/21	2011/10/24					
1791	Remove concrete pipes and demolition works	3 days	2011/10/21	2011/10/24	1789				
1792	Construction of Abutment A	28 days	2011/10/27	2011/11/28					
1793	Excavation and Blinding	7 days	2011/10/27	2011/11/3	1825				
1794	Formwork and rebar fixing for base slab	5 days	2011/11/4	2011/11/9	1793				
1795	Concreting of base slab	1 day	2011/11/10	2011/11/10	1794				
1796	Stripping off formwork	3 days	2011/11/11	2011/11/14	1795				
1797	Rebar fixing and shuttering formwork for column	4 days	2011/11/15	2011/11/18	1796				
1798	Concreting	1 day	2011/11/19	2011/11/19	1797				
1799	Stripping off formwork	3 days	2011/11/21	2011/11/23	1798				
1800	Backfill	4 days	2011/11/24	2011/11/28	1799				
1801	Construction of Abutment B	33 days	2012/1/18	2012/2/28					
1802	Excavation and Blinding	12 days	2012/1/18	2012/2/3	1743				
1803	Formwork and rebar fixing for base slab	5 days	2012/2/4	2012/2/9	1802				
1804	Concreting of base slab	1 day	2012/2/10	2012/2/10	1803				
1805	Stripping off formwork	3 days	2012/2/11	2012/2/14	1804				
1806	Rebar fixing and shuttering formwork for column	4 days	2012/2/15	2012/2/18	1805				
1807	Concreting	1 day	2012/2/20	2012/2/20	1806				
1808	Stripping off formwork	3 days	2012/2/21	2012/2/23	1807				
1809	Backfill	4 days	2012/2/24	2012/2/28	1808				
1810	Footbridge TB07 (Ch 525)	31 days	2012/3/28	2012/5/8					
1811	Construction of decking	16 days	2012/3/28	2012/4/18					
1812	Erection of steel deck+ conc deck	4 days	2012/3/28	2012/3/31	1809,1808				
1813	Deck finishing	10 days	2012/4/1	2012/4/16	1812				
1814	NA	0 days	2012/4/16	2012/4/16	1813				
1815	Railing installation	2 days	2012/4/17	2012/4/18	1814				
1816	Footbridge TB07 Lighting	15 days	2012/4/19	2012/5/8					
1817	Construction of Drawpits / Ducting	7 days	2012/4/19	2012/4/26	1815				
1818	Public lighting Installation (CE2328)	6 days	2012/4/27	2012/5/5	1817				
1819	Public lighting Installation (CE2329)	6 days	2012/4/27	2012/5/5	1817				
1820	T&C	2 days	2012/5/7	2012/5/8	1819				
1821									
1822	Ch 525-615	492 days	2010/10/15	2012/5/15					
1823		7 days	2011/10/1	2011/10/10	1176				
1824	Retaining Wall (Ch 535-546) TR4 (LHS)	37 days	2011/10/11	2011/11/22					
1825	Excavation and Formation	14 days	2011/10/11	2011/10/26	1823				
1826	Base Slab Construction Bay 1&2 (LHS)	11 days	2011/10/27	2011/11/8					
1827	Formwork and rebar fixing	8 days	2011/10/27	2011/11/4	1825				
1828	Concreting	1 day	2011/11/5	2011/11/5	1827				
1829	Stripping off formwork	2 days	2011/11/7	2011/11/8	1828				
1830	Wall Stem Construction Bay 1 (LHS) delete	0 days	2011/11/8	2011/11/8					
1835	Base Slab Construction Bay 2 (LHS) del	0 days	2011/11/5	2011/11/5					
1839	Wall Stem Construction Bay 1&2 (LHS)	12 days	2011/11/9	2011/11/22					
1840	Formwork and rebar fixing	6 days	2011/11/9	2011/11/15	1829				
1841	Concreting	1 day	2011/11/16	2011/11/16	1840				
1842	Stripping off formwork	1 day	2011/11/17	2011/11/17	1841				

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							H2	H1
1843	Backfill	4 days	2011/11/18	2011/11/22	1842			
1844								
1845	Retaining Wall (Ch 535-546) TR4 (RHS)	36 days	2012/2/4	2012/3/16		TP6		
1846	Excavation and Formation	12 days	2012/2/4	2012/2/17	1802			
1847	Base Slab Construction Bay 1+2 (RHS)	11 days	2012/2/18	2012/3/1	1846			
1848	Formwork and rebar fixing (with DWF)	8 days	2012/2/18	2012/2/27	1846			
1849	Concreting	1 day	2012/2/28	2012/2/28	1848			
1850	Stripping off formwork	2 days	2012/2/29	2012/3/1	1849			
1851	Wall Stem Construction Bay 1 (RHS) del	0 days	2012/3/1	2012/3/1	1850			
1856	Base Slab Construction Bay 2 (RHS) del	0 days	2012/3/1	2012/3/1	1854			
1860	Wall Stem Construction Bay 1+2 (RHS)	13 days	2012/3/2	2012/3/16	1859			
1861	Formwork and rebar fixing	6 days	2012/3/2	2012/3/8	1850			
1862	Concreting	1 day	2012/3/9	2012/3/9	1861			
1863	Stripping off formwork	2 days	2012/3/10	2012/3/12	1862			
1864	Backfill	4 days	2012/3/13	2012/3/16	1863			
1865	Retaining Wall TR5 Ch (546-596 RHS) TR5 (AD)	306 days	2010/10/15	2011/9/27				
1866	Construction of temp haul road	25 days	2010/10/15	2010/11/8				
1867	Demolition of existing structure at slope crest	8 days	2010/11/9	2010/11/16	1866			
1868	Suspension of Work due to villagers rally	17 days	2010/12/2	2010/12/18				
1869	Construction of temporary ground beam	5 days	2010/12/19	2010/12/23	1868			
1870	Trimming of rock slope (from downstream to upstream)	73 days	2010/12/24	2011/3/1	1869			
1871	Install rock dowel	45 days	2011/2/22	2011/4/4				
1872	Construction of skin wall (from D/S to U/S, from toe to crest)	165 days	2011/3/10	2011/9/27				
1873								
1874	Retaining Wall TR5A CH546-585 LHS	37 days	2011/11/18	2012/1/3		TP7		
1875	River diversion, Excavation and Formation	24 days	2011/1/18	2011/2/15	1842			
1876	Base Slab Construction TR5A Bay 1 LHS	8 days	2011/1/22	2011/1/210				
1877	Formwork and rebar fixing	6 days	2011/1/22	2011/1/28	1875SS+14 edays			
1878	Concreting	1 day	2011/1/29	2011/1/29	1877			
1879	Stripping off formwork	1 day	2011/1/210	2011/1/210	1878			
1880	Wall Stem Construction TR5A Bay 1 LHS	9 days	2011/1/22	2011/1/221				
1881	Formwork and rebar fixing	4 days	2011/1/212	2011/1/215	1879			
1882	Concreting	1 day	2011/1/216	2011/1/216	1881			
1883	Stripping off formwork	1 day	2011/1/217	2011/1/217	1882			
1884	Backfill	3 days	2011/1/219	2011/1/221	1883			
1885	Base Slab Construction TR5A Bay 2 LHS	8 days	2011/1/212	2011/1/220				
1886	Formwork and rebar fixing	6 days	2011/1/212	2011/1/217	1879			
1887	Concreting	1 day	2011/1/219	2011/1/219	1886			
1888	Stripping off formwork	1 day	2011/1/220	2011/1/220	1887			
1889	Wall Stem Construction TR5A Bay 2 LHS	9 days	2011/1/221	2012/1/3				
1890	Formwork and rebar fixing	4 days	2011/1/221	2011/1/224	1888			
1891	Concreting	1 day	2011/1/228	2011/1/228	1890			
1892	Stripping off formwork	1 day	2011/1/229	2011/1/229	1891			
1893	Backfill	3 days	2011/1/230	2012/1/3	1892			
1894	Base Slab Construction TR5A Bay 3 LHS	8 days	2011/1/22	2011/1/210				
1895	Formwork and rebar fixing	6 days	2011/1/22	2011/1/28	1877SS			
1896	Concreting	1 day	2011/1/29	2011/1/29	1895			
1897	Stripping off formwork	1 day	2011/1/210	2011/1/210	1896			
1898	Wall Stem Construction TR5A Bay 3 LHS	10 days	2011/1/212	2011/1/222				
1899	Formwork and rebar fixing	4 days	2011/1/212	2011/1/215	1897			
1900	Concreting	1 day	2011/1/216	2011/1/216	1899			

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							H2	H1	H2
1901	Stripping off formwork	1 day	2011/12/17	2011/12/17	1900				
1902	Backfill	4 days	2011/12/19	2011/12/22	1901				
1903									
1904	Box Culvert TB02 (ch 580)	39 days	2012/1/10	2012/2/27					
1905	Haul Road Diversion to TR3 Bay 3, River diversion, Excavation and Blinding	10 days	2012/1/10	2012/1/20	1782				
1906	Construction of Base Slab	8 days	2012/1/21	2012/2/2					
1907	Formwork and rebar fixing	6 days	2012/1/21	2012/1/31	1905				
1908	Concreting	1 day	2012/2/1	2012/2/1	1907				
1909	Stripping off formwork	1 day	2012/2/2	2012/2/2	1908				
1910	Construction of Wall Stem and Top Slab	21 days	2012/2/3	2012/2/27					
1911	Formwork and rebar fixing	6 days	2012/2/3	2012/2/9	1909				
1912	Concreting	1 day	2012/2/10	2012/2/10	1911				
1913	Stripping off formwork	14 days	2012/2/11	2012/2/27	1912				
1914									
1915	Retaining Wall TR5A & TR6 CH585-595 LHS	50 days	2012/1/21	2012/3/22					
1916	River/Haul Road Diversion (to TR3 and TR5 RHS)	3 days	2012/1/21	2012/1/27	1905				
1917	Excavation and Blinding	14 days	2012/1/28	2012/2/13	1916				
1918	Base Slab Construction TR6 Bay 1 LHS	10 days	2012/2/14	2012/2/24					
1919	Formwork and rebar fixing	8 days	2012/2/14	2012/2/22	1917				
1920	Concreting	1 day	2012/2/23	2012/2/23	1919				
1921	Stripping off formwork	1 day	2012/2/24	2012/2/24	1920				
1922	Wall Stem Construction TR6 Bay 1 LHS	10 days	2012/2/25	2012/3/7					
1923	Formwork and rebar fixing	4 days	2012/2/25	2012/2/29	1921				
1924	Concreting	1 day	2012/3/1	2012/3/1	1923				
1925	Stripping off formwork	1 day	2012/3/2	2012/3/2	1924				
1926	Backfill	4 days	2012/3/3	2012/3/7	1925				
1927	Base Slab Construction TR5A Bay 4 LHS	8 days	2012/2/24	2012/3/3					
1928	Formwork and rebar fixing	6 days	2012/2/24	2012/3/1	1920				
1929	Concreting	1 day	2012/3/2	2012/3/2	1928				
1930	Stripping off formwork	1 day	2012/3/3	2012/3/3	1929				
1931	Wall Stem Construction TR5A Bay 4 LHS	10 days	2012/3/5	2012/3/15					
1932	Formwork and rebar fixing	4 days	2012/3/5	2012/3/8	1930				
1933	Concreting	1 day	2012/3/9	2012/3/9	1932				
1934	Stripping off formwork	1 day	2012/3/10	2012/3/10	1933				
1935	Backfill	4 days	2012/3/12	2012/3/15	1934				
1936	Base Slab Construction TR5A Bay 5 LHS	8 days	2012/3/2	2012/3/10					
1937	Formwork and rebar fixing	6 days	2012/3/2	2012/3/8	1928				
1938	Concreting	1 day	2012/3/9	2012/3/9	1937				
1939	Stripping off formwork	1 day	2012/3/10	2012/3/10	1938				
1940	Wall Stem Construction TR5A Bay 5 LHS	10 days	2012/3/12	2012/3/22					
1941	Formwork and rebar fixing	4 days	2012/3/12	2012/3/15	1939				
1942	Concreting	1 day	2012/3/16	2012/3/16	1941				
1943	Stripping off formwork	1 day	2012/3/17	2012/3/17	1942				
1944	Backfill	4 days	2012/3/19	2012/3/22	1943				
1945									
1946	Retaining Wall (ch 595-615) TR3 (Bay 3)	48 days	2011/10/1	2011/11/26	6.1				
1947	River diversion, Excavation and Formation	14 days	2011/10/1	2011/10/18	1176				
1948	Base Slab Construction Bay 3 RHS	12 days	2011/10/13	2011/10/25					
1949	Formwork and rebar fixing	10 days	2011/10/13	2011/10/24	1947FS-5 days				
1950	Concreting	1 day	2011/10/25	2011/10/25	1949				
1951	Stripping off formwork	1 day	2011/10/26	2011/10/26	1950				

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							H2	H1	H2
1952	Wall Stem Construction TR3 Bay 3 RHS	6 days	2011/10/27	2011/11/2					
1953	Formwork and rebar fixing	4 days	2011/10/27	2011/10/31	1951				
1954	Concreting	1 day	2011/11/1	2011/11/1	1953				
1955	Stripping off formwork	1 day	2011/11/2	2011/11/2	1954				
1956	Base Slab Construction Bay 3 LHS	12 days	2011/11/3	2011/11/16	1955				
1957	Formwork and rebar fixing	10 days	2011/11/3	2011/11/14	1951				
1958	Concreting	1 day	2011/11/15	2011/11/15	1957				
1959	Stripping off formwork	1 day	2011/11/16	2011/11/16	1958				
1960	Wall Stem Construction TR3 Bay 3 LHS	9 days	2011/11/17	2011/11/26					
1961	Formwork and rebar fixing	4 days	2011/11/17	2011/11/21	1959				
1962	Concreting	1 day	2011/11/22	2011/11/22	1961				
1963	Stripping off formwork	1 day	2011/11/23	2011/11/23	1962				
1964	back fill & diversion	3 days	2011/11/24	2011/11/26	1963				
1965	Concrete Slab (Ch546 - Ch596) LHS	20 days	2012/4/1	2012/4/27					
1966	Bay 1	10 days	2012/4/1	2012/4/16					
1967	Excavation/Blinding	3 days	2012/4/1	2012/4/3	1944,1812				
1968	Formwork and rebar fixing for DWF	2 days	2012/4/5	2012/4/10	1967				
1969	Concreting of DWF	1 day	2012/4/11	2012/4/11	1968				
1970	Formwork and rebar fixing for slab	3 days	2012/4/11	2012/4/13	1968SS+2 days				
1971	Concreting of slab	1 day	2012/4/14	2012/4/14	1970				
1972	Stripping off formwork	1 day	2012/4/16	2012/4/16	1971				
1973	Bay 2	9 days	2012/4/5	2012/4/18					
1974	Excavation/Blinding	2 days	2012/4/5	2012/4/10	1967				
1975	Formwork and rebar fixing for DWF	2 days	2012/4/11	2012/4/12	1974,1968				
1976	Concreting of DWF	1 day	2012/4/13	2012/4/13	1975				
1977	Formwork and rebar fixing for slab	3 days	2012/4/13	2012/4/16	1975SS+2 days				
1978	Concreting of slab	1 day	2012/4/17	2012/4/17	1977				
1979	Stripping off formwork	1 day	2012/4/18	2012/4/18	1978				
1980	Bay 3	11 days	2012/4/11	2012/4/23					
1981	Excavation/Blinding	2 days	2012/4/11	2012/4/12	1974				
1982	Formwork and rebar fixing for DWF	2 days	2012/4/16	2012/4/17	1981,1971				
1983	Concreting of DWF	1 day	2012/4/18	2012/4/18	1982,1975				
1984	Formwork and rebar fixing for slab	3 days	2012/4/18	2012/4/20	1983FF+2 days				
1985	Concreting of slab	1 day	2012/4/21	2012/4/21	1984				
1986	Stripping off formwork	1 day	2012/4/23	2012/4/23	1985				
1987	Bay 4	11 days	2012/4/13	2012/4/25					
1988	Excavation/Blinding	2 days	2012/4/13	2012/4/14	1981				
1989	Formwork and rebar fixing for DWF	2 days	2012/4/18	2012/4/19	1988,1982				
1990	Concreting of DWF	1 day	2012/4/20	2012/4/20	1989				
1991	Formwork and rebar fixing for slab	3 days	2012/4/20	2012/4/23	1990FF+2 days				
1992	Concreting of slab	1 day	2012/4/24	2012/4/24	1991				
1993	Stripping off formwork	1 day	2012/4/25	2012/4/25	1992				
1994	Bay 5	11 days	2012/4/16	2012/4/27					
1995	Excavation/Blinding	2 days	2012/4/16	2012/4/17	1988				
1996	Formwork and rebar fixing for DWF	2 days	2012/4/20	2012/4/21	1995,1989				
1997	Concreting of DWF	1 day	2012/4/23	2012/4/23	1996				
1998	Formwork and rebar fixing for slab	3 days	2012/4/23	2012/4/25	1997FF+2 days				
1999	Concreting of slab	1 day	2012/4/26	2012/4/26	1998				
2000	Stripping off formwork	1 day	2012/4/27	2012/4/27	1999				
2001									
2002	Drainage and Footpath (Ch525-615 LHS & RHS)	48 days	2012/3/3	2012/5/3					

Revised Master Prog (Aug10-Apr13)
 日期: 2011/11/7

任務		里程碑		上層型任務		上層型進度		外部任務		摘要群組	
進度		摘要		上層型里程碑		分割		專案摘要		期限	

Drainage Services Department
Contract No. DC/2007/06
River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River

Revised Master Programme Aug 2010 - Apr 2013 Rev (17)

識別碼	任務名稱	工期	開始時間	完成時間	前置任務	資源名稱	2012年		
							H2	H1	H2
2003	Construction of footpath & drainage works	48 days	2012/3/3	2012/5/3	1925				
2004	Lighting at CH 550-610	10 days	2012/5/4	2012/5/15					
2005	Construction of Drawpits / Ducting	6 days	2012/5/4	2012/5/10	2003				
2006	Public lighting Installation (CE2325)	2 days	2012/5/11	2012/5/12	2005				
2007	Public lighting Installation (CE2326)	2 days	2012/5/11	2012/5/12	2005				
2008	Public lighting Installation (CE2327)	2 days	2012/5/11	2012/5/12	2005				
2009	T&C	1 day	2012/5/14	2012/5/14	2008				
2010	Removal of existing lighting (CE1600-B2)	1 day	2012/5/15	2012/5/15	2009				
2011									
2012	Section 4 - Box Culvert at Ping Long	0 days	2009/1/29	2009/1/29					
2013	<i>Section 4 - Box Culvert (Area A)</i>	<i>0 days</i>	<i>2009/1/29</i>	<i>2009/1/29</i>					
2014	<i>Completion of Work at Section 4</i>	<i>0 days</i>	<i>2009/1/29</i>	<i>2009/1/29</i>					
2015									
2016	Section 5 - Landscape Establishemnt Works (Portion B, C, D, E, F, G,	1951 days?	2007/9/28	2013/7/1					
2017	Section 5 Landscape Works	1665 days	2007/9/28	2012/7/26					
2018	Commencement of Works	1 day	2007/9/28	2007/9/28					
2019	Material Submission	120 days	2007/9/29	2008/1/26	2018				
2020	Submission Approval	0 days	2008/2/9	2008/2/9	2019FS+14 days				
2021	Landscapeing Hardworks	1541 days?	2007/11/11	2012/4/19					
2022	Landscapeing Softworks	365 days	2011/1/30	2012/4/18					
2023	Submission of Tree Survey	400 days	2007/9/29	2008/11/1	2018				
2024	Preservation and Protection of Preserved Trees	1550 days	2008/1/12	2013/7/1	2023				
2025	Landscape Establishment Works	1550 days	2008/1/12	2013/7/1	2023				
2026	Completion of Works	0 days	2013/7/1	2013/7/1	2024,2025				
2027									
2028	Section 6 - Landscape Establishemnt Works (Portion J, K & M)	1701 days?	2007/9/28	2012/9/6					
2029	Section 6 Landscape Works	1665 days	2007/9/28	2012/7/26					
2030	Commencement of Works	1 day	2007/9/28	2007/9/28					
2031	Material Submission	120 days	2007/9/29	2008/1/26	2030				
2032	Submission Approval	0 days	2008/2/9	2008/2/9	2031FS+14 days				
2033	Landscapeing Hardworks	1161 days?	2008/1/25	2012/4/19					
2034	Landscapeing Softworks	365 days	2011/1/31	2012/4/19					
2035	Submission of Tree Survey	400 days	2007/9/29	2008/11/1	2030				
2036	Preservation and Protection of Preserved Trees	1300 days	2008/1/12	2012/9/6	2035				
2037	Landscape Establishment Works	1300 days	2008/1/12	2012/9/6	2035				
2038	Completion of Works	0 days	2012/9/6	2012/9/6	2036,2037				
2039									
2040	Section 7 - Landscape Establishemnt Works (Portion L, N & P)	1701 days?	2007/9/28	2012/9/6					
2041	Section 7 Landscape Works	1665 days	2007/9/28	2012/7/26					
2042	Commencement of Works	1 day	2007/9/28	2007/9/28					
2043	Material Submission	120 days	2007/9/29	2008/1/26	2042				
2044	Submission Approval	0 days	2008/2/9	2008/2/9	2043FS+14 days				
2045	Landscapeing Hardworks	1176 days?	2008/1/10	2012/4/19					
2046	Landscapeing Softworks	365 days	2011/1/31	2012/4/19					
2047	Submission of Tree Survey	400 days	2007/9/29	2008/11/1	2042				
2048	Preservation and Protection of Preserved Trees	1300 days	2008/1/12	2012/9/6	2047				
2049	Landscape Establishment Works	1300 days	2008/1/12	2012/9/6	2047				
2050	Completion of Works	0 days	2012/9/6	2012/9/6	2048,2049				
2051									
2052	Section 8 - All Remaining Work at All Portions	1950 day	2007/9/28	2013/6/29					
2053	Commencement of Works	1 day	2007/9/28	2007/9/28					

Revised Master Prog (Aug10-Apr13)
 日期: 2011/1/17

任務進度 里程碑 上顯型任務 上顯型進度 外部任務 摘要群組 摘要 上顯型里程碑 分割 專案摘要 期限

Drainage Services Department
 Contract No. DC/2007/06
 River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River

Revised Master Programme Aug 2010 - Apr 2013 Rev (17)

識別碼	任務名稱	工期	開始時間	完成時間	前置任務	資源名稱	2012年		
							H2	H1	H2
2054	All remaining works at all Area	1950 days	2007/9/28	2013/6/29					
2055	Completion of Works	0 days	2013/2/13	2013/2/13	2,555,1174,1177				



Appendix J: Capture Survey Reports

Contract No. DC/2007/06
River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper
Tai Po River

Ecological Capture Survey
Trip Report for Upper Tai Po River
(Survey Date: 1st September 2011)
(Wet Season)



Ecological Capture Survey Trip Report For Upper Tai Po River (Wet Season)

1 INTRODUCTION

Upon completion of the Sha Tin and Tai Po Drainage Master Plan (DMP) Study, Drainage Services Department (DSD) of the Hong Kong SAR Government commissioned Maunsell Consultants Asia Ltd. (Maunsell) to undertake Agreement No. CE50/2001 (DS) Drainage Improvement in Sha Tin and Tai Po – Design and Construction, for implementing the drainage improvement works at various locations to alleviate the potential flooding problems in Sha Tin and Tai Po districts.

The proposed works at the Upper Tai Po River have the potential to impact fish and amphibian species of conservation interest. To minimize these potential impacts, it was recommended that capture-surveys of the proposed works areas should be conducted prior to the commencement of construction works in the channel. The surveys should include the Three-lines Bagrid Fish (*Pseudobagrus trilineatus*), Predaceous Chub (*Parazacco spilurus*) and Hong Kong Newt (*Paramesotriton hongkongensis*). Any of these species caught during the surveys should be relocated to areas of the watercourse upstream of the proposed works areas. Capture-surveys of fish and amphibians are an obvious and simple measure that would prevent direct injury to species of conservation importance during the construction phase.

2 OBJECTIVE

The objective was to capture Three-lines Bagrid Fish (*Pseudobagrus trilineatus*), Predaceous Chub (*Parazacco spilurus*) and Hong Kong Newt (*Paramesotriton hongkongensis*) along river channel within project site. All captured target species was released to upper stream far away from project site.

3 METHODOLOGY

Two fish species, i.e. Three-lines Bagrid Fish, Predaceous Chub and concerned newt species were the target species for capture survey by live trapping and hand netting. One suitable relocation point was identified at the upper stream channel where the habitats will not be affected by the river improvement works. The captured fish and newt was carefully transferred to a container with powered aeration provided and then to be transported to the identified relocation site and to be released.

During the capture survey, 10 man power were deployed (i.e. 4 field workers from China-Hong Kong Ecology Consultant and 6 environmental assistant from Chiu Hing Construction & Transportation Co. Ltd).

4 SCOPE OF SURVEY

Scope of surveys is detailed in the Table 1.

No.	Species	Fauna type	Methodology	Locations*	Frequency#	Duration
1	Hong Kong Newt <i>Paramesotriton hongkongensis</i>	Amphibian	live trapping, netting	Entire river channel within project area	1	Daytime 1 st Sept. 11
2	Three-lines bagrid fish <i>Pseudobagrus trilineatus</i>	Fish	live trapping, netting	Entire river channel within project area	1	Nighttime 1 st Sept. 11
3	Predaceous chub <i>Parazacco spilurus</i>	Fish	live trapping, netting	Entire river channel within project area	1	Daytime 1 st Sept. 11

* Entire river channel within project area starts at Sheung Wu Yiu and ends near hilltop garden-Wai King terrace. The total length for works area is 600m.
#No of capture survey carried out during wet season

5 RESULTS OF CAPTURE SURVEYS

5.1 Hong Kong Newt and target fish

Capture survey for wet season was undertaken within works boundary along the Upper Tai Po river during night time and daytime on the 1st Sept 2011. Only 4 individuals of target species, *Parazacco spilurus*, were captured at the upper Tai Po River. The capture route and release site was shown in figure 1 and 2. Result of capture survey was presented in the table below:

Table 2 showing the result of capture survey carried out on 1st Sept. 11

Species Name	Species name in Chinese	No of captured	No of individuals released at Upper stream section
<i>Paramesotriton hongkongensis</i>	香港蠵蟾	0	0
<i>Pseudobagrus trilineatus</i>	三線擬鱔	0	0
<i>Parazacco spilurus</i>	異鱔	4	4

5.2 Previous result for capture survey

Table 3 showing the result of capture survey carried out from previous capture survey.

Species Name	Species name in Chinese	No of captured on 4th Nov. 08	No of captured on 27-28th Oct. 09	No of captured on 15th Oct. 10
<i>Paramesotriton hongkongensis</i>	香港蠵蟾	0	0	0
<i>Pseudobagrus trilineatus</i>	三線擬鱔	0	0	0
<i>Parazacco spilurus</i>	異鱔	220	60	0

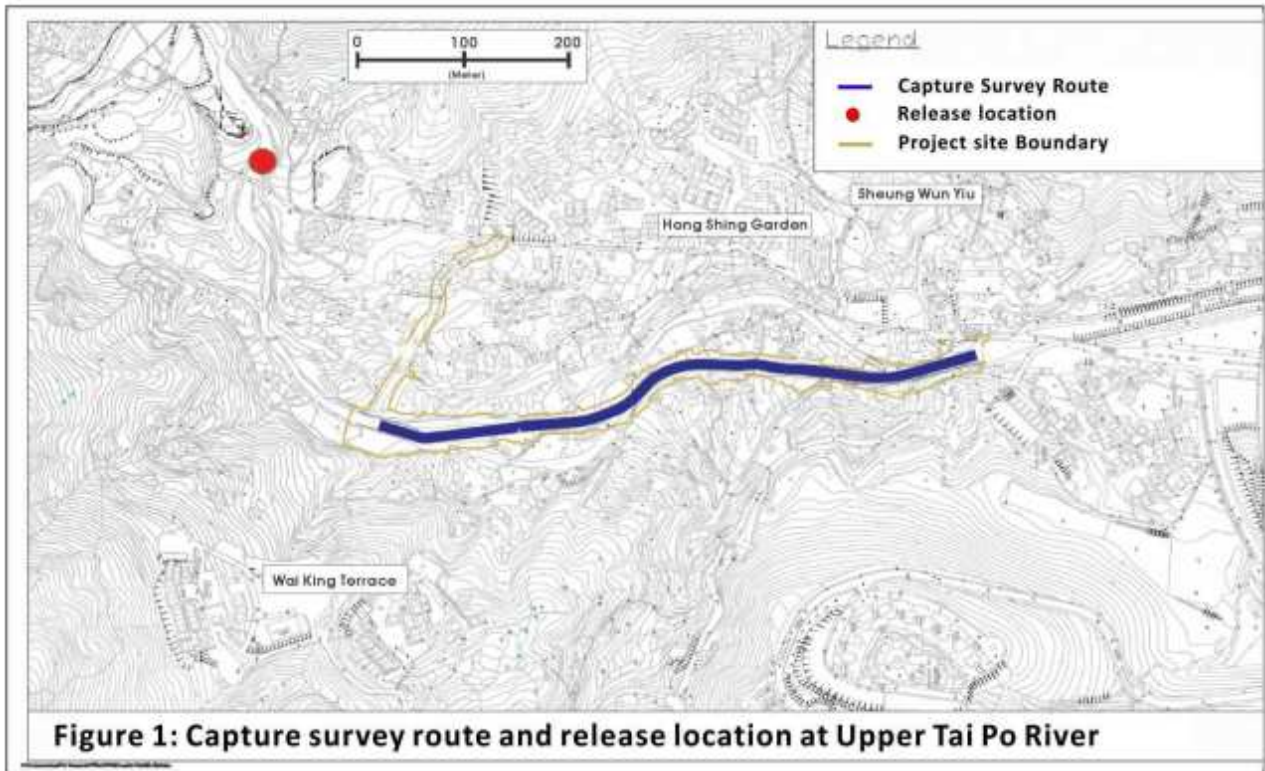
6 DISCUSSION

Methodology and duration for current capture survey were the same as before. The manpower involved was similar to the previous capture survey. However, the number individual of captured target species was still low compared with previous capture survey in 2008 and 2009. That would likely be due to the river bed modification, which was stated in project profile (Reference no: PP-248/2005). The river habitats especially river substratum was strongly disturbed. Riparian flora provides shelter places for aquatic fauna. Most of the riparian flora was cleared during construction work. Currently, only newly exposed soil and rock was observed along the river channel. This was considered the main factor led to the low number of the aquatic animals. The low number of the captured target species is in-line with the predictions of the project profile and the impact is considered acceptable. In addition, the low number of the aquatic animals would partially contribute by the previous capture and release exercise. The number of target species have not restored to normal level during survey. Only 4 individuals of target stream fauna were captured during capture survey on 1st September 11. Another capture survey for dry season will be undertaken in October 2011.

7 PHOTO



Capture survey at Upper Tai Po River on 1st September 11



Note: Base map was sourced from project profile



Contract No. DC/2007/06
River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper
Tai Po River

Ecological Capture Survey
Trip Report for Upper Tai Po River
(Survey Date: 3rd October 2011)
(Dry Season)



Ecological Capture Survey Trip Report For Upper Tai Po River (Dry Season)

1 INTRODUCTION

Upon completion of the Sha Tin and Tai Po Drainage Master Plan (DMP) Study, Drainage Services Department (DSD) of the Hong Kong SAR Government commissioned Maunsell Consultants Asia Ltd. (Maunsell) to undertake Agreement No. CE50/2001 (DS) Drainage Improvement in Sha Tin and Tai Po – Design and Construction, for implementing the drainage improvement works at various locations to alleviate the potential flooding problems in Sha Tin and Tai Po districts.

The proposed works at the Upper Tai Po River have the potential to impact fish and amphibian species of conservation interest. To minimize these potential impacts, it was recommended that capture-surveys of the proposed works areas should be conducted prior to the commencement of construction works in the channel. The surveys should include the Three-lines Bagrid Fish (*Pseudobagrus trilineatus*), Predaceous Chub (*Parazacco spilurus*) and Hong Kong Newt (*Paramesotriton hongkongensis*). Any of these species caught during the surveys should be relocated to areas of the watercourse upstream of the proposed works areas. Capture-surveys of fish and amphibians are an obvious and simple measure that would prevent direct injury to species of conservation importance during the construction phase.

2 OBJECTIVE

The objective was to capture Three-lines Bagrid Fish (*Pseudobagrus trilineatus*), Predaceous Chub (*Parazacco spilurus*) and Hong Kong Newt (*Paramesotriton hongkongensis*) along river channel within project site. All captured target species was released to upper stream far away from project site.

3 METHODOLOGY

Two fish species, i.e. Three-lines Bagrid Fish, Predaceous Chub and concerned newt species were the target species for capture survey by live trapping and hand netting. One suitable relocation point was identified at the upper stream channel where the habitats will not be affected by the river improvement works. The captured fish and newt was carefully transferred to a container with powered aeration provided and then to be transported to the identified relocation site and to be released.

During the capture survey, 10 man power were deployed (i.e. 4 field workers from China-Hong Kong Ecology Consultant and 6 environmental assistant from Chiu Hing Construction & Transportation Co. Ltd).

4 SCOPE OF SURVEY

Scope of surveys is detailed in the Table 1.

Table 1 Summary of scope of ecological capture survey *

No.	Species	Fauna Type	Methodology	Locations*	Frequency#	Duration
1	Hong Kong Newt <i>Paramesotriton hongkongensis</i>	Amphibian	live trapping, netting	Entire river channel within project area	1	Daytime 3 rd Oct. 11
2	Three-lines bagrid fish <i>Pseudobagrus trilineatus</i>	Fish	live trapping, netting	Entire river channel within project area	1	Nighttime 3 rd Oct. 11
3	Predaceous chub <i>Parazacco spilurus</i>	Fish	live trapping, netting	Entire river channel within project area	1	Daytime 3 rd Oct. 11

* Entire river channel within project area starts at Sheung Wu Yiu and ends near hilltop garden-Wai King terrace. The total length for works area is 600m.

#No of capture survey carried out during dry season

5 RESULTS OF CAPTURE SURVEYS

5.1 Hong Kong Newt and target fish

Capture survey for dry season was undertaken within works boundary along the Upper Tai Po river during night time and daytime on the 3rd Oct. 11. 17 individuals of target species, *Parazacco spilurus*, were captured at the upper Tai Po River. The capture route and release site was shown in figure 1 and 2. Result of capture survey was presented in the table below:

Table 2 showing the result of capture survey carried out on 3rd Oct. 11

Species Name	Species name in Chinese	No of captured	No of individuals released at Upper stream section
<i>Paramesotriton hongkongensis</i>	香港蠵蟾	0	0
<i>Pseudobagrus trilineatus</i>	三線擬鱮	0	0
<i>Parazacco spilurus</i>	異鱮	17	17

5.2 Previous result for capture survey

Table 3 showing the result of capture survey carried out from previous capture survey.

Species Name	Species name in Chinese	No of captured on 4th Nov. 08	No of captured on 27-28th Oct. 09	No of captured on 15th Oct. 10	No of captured on 1st Sept. 11
<i>Paramesotriton hongkongensis</i>	香港蠵蟾	0	0	0	0
<i>Pseudobagrus trilineatus</i>	三線擬鱮	0	0	0	0
<i>Parazacco spilurus</i>	異鱮	220	60	0	4

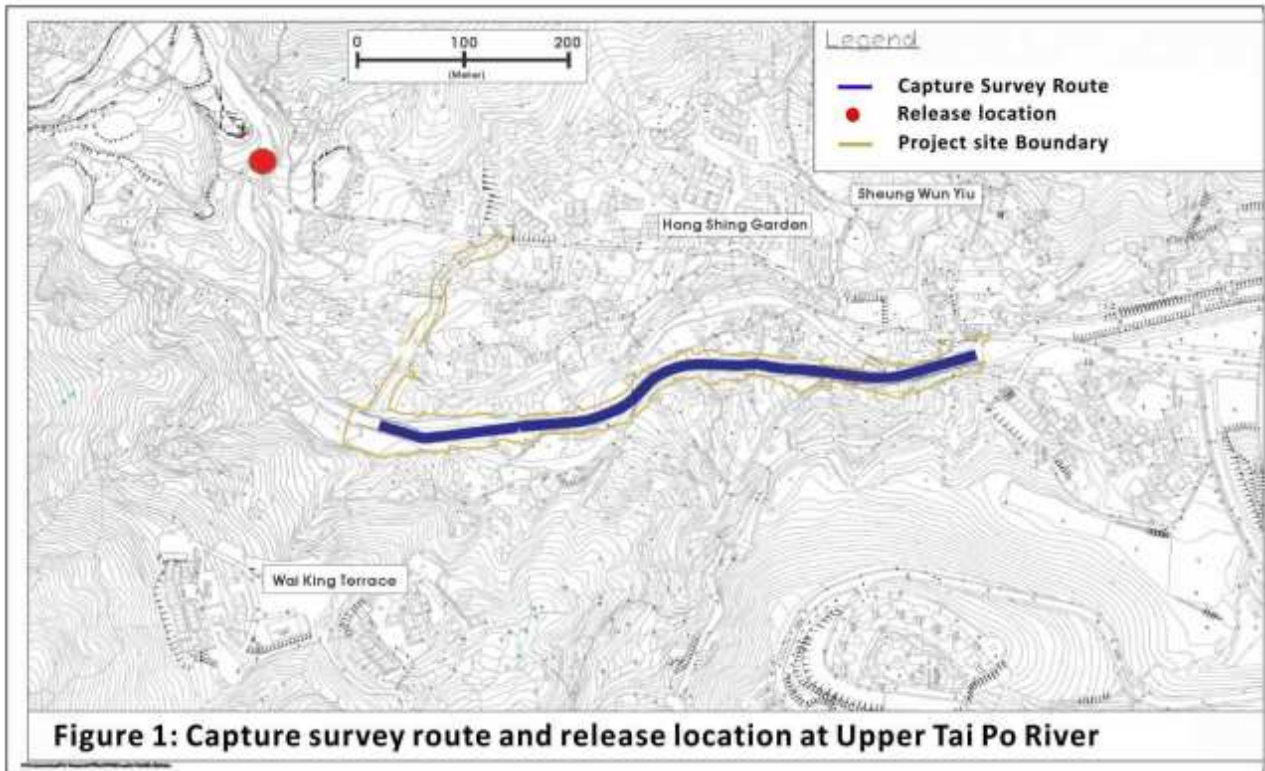
6 DISCUSSION

Methodology and duration for current capture survey were the same as before. The manpower involved was same as previous capture survey. However, the number individual of captured target species was still low compared with previous capture survey in 2008 and 2009. That would likely be due to the river bed modification, which was stated in project profile (Reference no: PP-248/2005). The river habitats especially river substratum was strongly disturbed. Riparian flora provides shelter places for aquatic fauna. Most of the riparian flora was cleared during construction work. Currently, only newly exposed soil and rock was observed along the river channel. This was considered the main factor led to the low number of the aquatic animals. The low number of the captured target species is in-line with the predictions of the project profile and the impact is considered acceptable. In addition, the low number of the aquatic animals would partially contribute by the previous capture and release exercise. The number of target species have not restored to normal level during survey. 17 individuals of target stream fauna were captured during capture survey on 3rd Oct. 11.

7 PHOTO



Capture survey at Upper Tai Po River on 3rd October 11



Note: Base map was sourced from project profile

