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 October 2011

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Executive summary

This is the thirty-eighth 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 October 2011 to 31st October 2011. Diversion of river water to west branch, forming haul road at main stream, construction of retaining wall TR2, TR3 & TR5, construction of gabion wall TR1, excavation for construction of additional boulder trap and diversion of the existing utilities 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.

Ecological impact monitoring was conducted on 21st July 2011 by the Ecologist Dr. Mark Shea. The ecological impact monitoring report prepared by the Ecologist is attached in Appendix K. Next ecological monitoring was arranged in January 2012. It was agreed with green groups and AFCD that capture survey would be carried out in different phases. The 1st phase was carried out on 1st September 2011, and the 2nd phase was carried out on 3rd and 4th October 2011. The capture survey report is under preparation and will be provided in the upcoming monthly EM&A report. 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 regarding muddy water discharge was recorded in this reporting month. Details of the events and recommendations given please refer to Section 6.2

There were two formal complaints in relation to environmental issue received in the reporting month. Both complaints were concerning the observation of muddy water arisen from construction works along Upper Tai Po River, one from the public on 25th October 2011 and the other one from the EPD monitoring team on 27th October 2011. ET has conducted investigations for the incidents and details of findings, recommendations and outcome please refer to Section 2.7 and Appendix J.

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 & TR5, construction of gabion wall TR1, construction of additional boulder trap and demolition of the existing temporary steel bridge 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-eighth 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 October 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

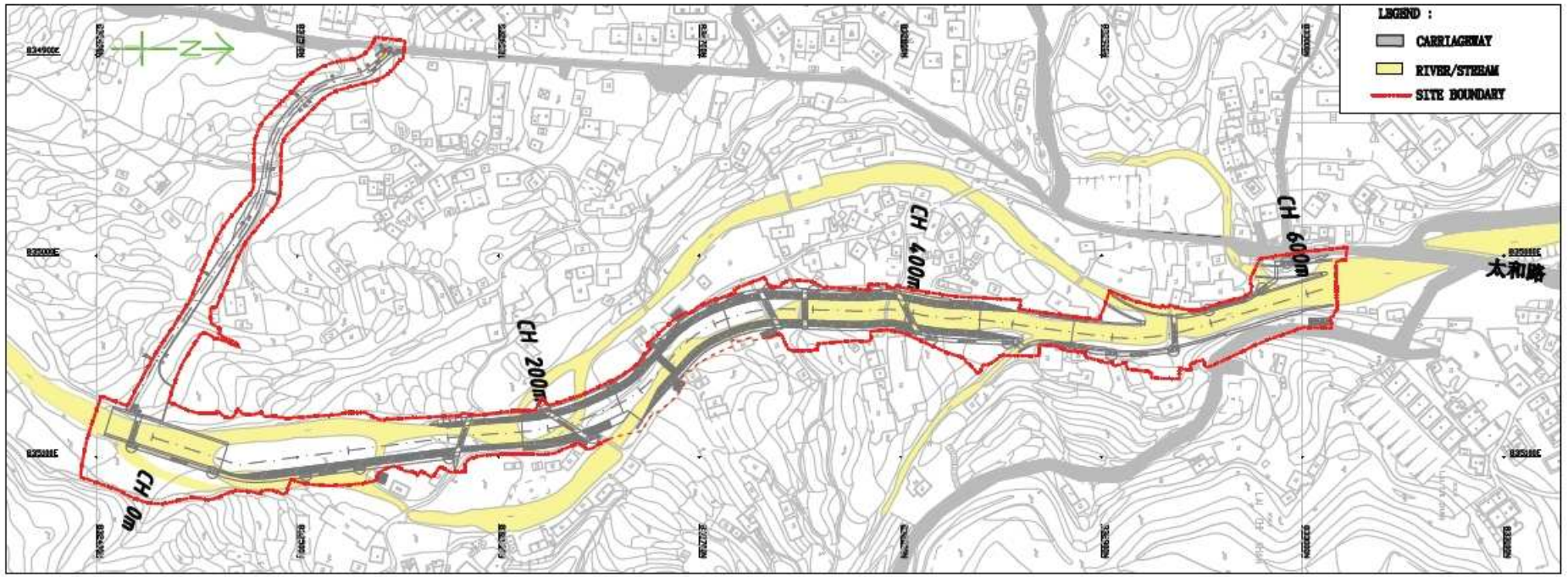
The construction of the proposed improvement works for Upper Tai Po River has been commenced on September 15th 2008 and anticipated to complete in April 2012.

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



2.4 Construction activities for the reporting period

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

1.) Diversion of river water to west branch
2.) Forming haul road at main stream
3.) Construction of retaining wall TR2, TR3 & TR5
4.) Construction of gabion wall TR1
5.) Excavation for construction of additional boulder trap
6.) Diversion of the existing utilities

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 & TR5
2.) Construction of gabion wall TR1
3.) Construction of additional boulder trap
4.) Demolition of the existing temporary steel bridge

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

There were two formal complaints in relation to environmental issue received in the reporting month. Both complaints were concerning the observation of muddy water arisen from construction works along Upper Tai Po River, one from the public on 25th October 2011 and the other one from the EPD monitoring team on 27th October 2011.

ET has conducted investigations with representatives from Contractor on 29th October 2011 and recommendations were given to the contractor to minimize environmental impacts generated from project works. The complaint investigation report with details of findings, recommendations and outcome were attached in Appendix J and was submitted to Environmental Protection Department (EPD) in accordance with the

requirement stated in EM&A manual.

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

Ecological impact monitoring was conducted on 21st July 2011 by the Ecologist Dr. Mark Shea. The ecological impact monitoring report prepared by the Ecologist is attached in Appendix K. 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 7th, 14th, 21st and 28th October 2011. Measured $L_{eq\ (30min)}$ results ranged from 48.6dB(A) to 74.8dB(A).

As the noise level measured approached to the limit level, Contractor was reminded to implement proper mitigation measures as stated in Environmental Permit and EM&A

Manual in order to minimize the noise impact to the nearby sensitive receivers, 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.

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 6th, 12th, 19th and 26th October 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 3rd, 10th, 17th, 24th and 31st October 2011. Details of findings were summarized in Table 6.2.

It was agreed with green groups and AFCD that capture survey would be carried out in different phases. The 1st phase has been carried out on 1st September 2011, and the 2nd phase was carried out on 3rd and 4th October 2011. The capture survey report is under preparation and will be provided in the upcoming month EM&A report.

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.	To be followed during the next reporting period.	Ongoing	--

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
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. Contractor was recommended to cover the river banks with tarpaulin to prevent soil erosion and runoff The discrepancy will be checked in next inspection	Ongoing	--
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.	To be followed during the next reporting period.	Ongoing	--
28 Sept 11	Oil stain was observed on the haul road at ch.0.	Observation	Contractor was reminded to removed the contaminated soil and dispose them as chemical waste.	As reported by Contractor, the contaminated soil on the haul road was removed and temporary stored as chemical waste. No oil stain on the haul road was observed in this site inspection.	6 Oct 11	--
28 Sept 11	The tree protective net was damaged by construction activities and materials at approximate ch.0.	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 preven further damage to the trees.	The broken tree protective net was repaired and the construction materials near the protective net were removed by Contractor.	6 Oct 11	--
28 Sept 11	Excavation works was being carried out at ch.200 which causing soil erosion and muddy water generation. A reported by Contractor, this is an emergency work for the preparation of the oncoming typhoon and storm.	Observation	Contractor was seriously reminded 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 to prevent river contamination.	The excavation works had been stopped by Contractor. However, Contractor was reminded that, as stated in Environmental Permit, dewatering of the excavation area and sufficient temporary earth bunds and coverage of exposed slope should be provided to prevent river contamination for all excavation works along Upper Tai Po River.	6 Oct 11	--
6 Oct 11	Stagnant water was observed inside an unused construction equipment at	Observation	Contractor was recommended to remove the stagnant water and turn over the equipment to avoid	The unused construction equipment was removed by Contractor	12 Oct 11	--

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
	ch.0 of UTPR.		accumulation of water.			
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	--
6 Oct 11	Excavation works was being carried out at ch.400 of UTPR which causing soil erosion and muddy water generation and deteriorating the water quality of downstream. Although the main river stream has been diverged, discharge of domestic wastewater and seeping of groundwater has caused water flow to the downstream.	Observation	Contractor was seriously reminded that discharge of contaminated water is an environmental offence and should be prohibited. Contractor was advised that sufficient temporary earth bunds and barriers should be used to entirely enclose the excavation area and exposed slope surface should be covered to prevent river contamination. Also, site water shall be well de-silted and treated before discharge.	Large boulder was used at ch.400 of UTPR for blocking muddy site water discharged in to the river to prevent water pollution.	19 Oct 11	--
12 Oct 11	It was observed that construction machine was being operated and driven within the river channel at ch.500 of UTPR without any mitigation measures, causing serious contamination to the river.	Observation	However, Contractor was seriously reminded that construction machines working within the river should be prohibited and adequate mitigation measures prior to any works must be implemented.	Contractor relocated the machine to the river bank as immediate action. As reported by Contractor, emergency works were being carried out to remove blockages within the river.	12 Oct 11	--
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.	To be followed during the next reporting period.	Ongoing	--
12 Oct 11	Fuel containers without drip tray were observed at ch.0 of UTPR.	Observation	Contractor was reminded to provide drip tray for the containers to prevent oil leakage.	The fuel containers were removed.	19 Oct 11	--
12 Oct 11	Oil stain was observed on the haul road at ch.50 of UTPR.	Observation	Contractor was reminded to removed the contaminated soil and dispose them as chemical waste.	To be followed during the next reporting period.	Ongoing	--
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.	To be followed during the next reporting period.	Ongoing	--
19 Oct 11	Muddy water was leaked from an overloaded wheel washing bay at ch.600 of	Observation	Contractor was advised to remove the muddy water with proper treatment and provide	To be followed during the next reporting period.	Ongoing	--

Date	Findings	Identification	Advice from ET	Action taken	Closing date	Remarks
	UTPR.		sandbags to prevent any muddy water run-off.			
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 barriers should be used to entirely enclose the excavation area and exposed slope surface should be covered to prevent river contamination.	No proper mitigation measure was implemented and muddy water was still observed. To be followed during the next reporting period.	Ongoing	--
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.	To be followed during the next reporting period.	Ongoing	--
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.	To be followed during the next reporting period.	Ongoing	--

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

Table 6.2 Summary results of ecological site inspection findings

Date	Observations	Advice from Ecologist	Action Taken	Closing Date
3 October 2011	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
10 October 2011	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
17 October 2011	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A

24 October 2011	No Major findings for this inspection	No Advice is required	No Action is required to be taken	N/A
31 October 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.

During the site inspection on 19th October 2011, the river steam was observed to be contaminated and muddy which caused by surface run-off at approximate ch.100 and direct discharge of muddy water from the excavation area at approximate ch.200. The muddy water was directly discharged into the river without any sufficient and effective treatment system and contaminated river water at downstream.

The above mal-practice was considered as non-compliance event under Water Pollution Control Ordinance (WPCO)(Cap.358), Environmental Permit (EP-223/2005/A) and Effluent Discharge Permits (no. 3678 for Upper Tai Po River) issued under the WPCO to the Contractor. No effective mitigation measures were implemented according to advices given by RE, IEC and ET.

Contractor was seriously reminded all surface run-off, muddy water and wastewater arisen from construction activities should be diverted to proper site water treatment system before discharge to fulfil statutory requirements. Quality of discharge should meet requirements stated in the applied discharged license. Contractor was also recommended to conduct assessment to the quantity and nature of silt water generated from site activities. Sedimentation tanks with sufficient capacity should be provided as to maintain appropriate flow rate of effluent discharge as well as the hydraulic detention time for sedimentation. Coagulation and flocculation process should be adopted to enhance efficiency of sedimentation should site water contain large amount of silt and fine grade suspended solids. Bared earth surface, such as riverbanks, earth bund, should be protected by geo-textile covering.

Covering of riverbanks with geo-textile was implemented by Contractor as the mitigation measure for muddy surface runoff, which observed during the site inspection on 2nd November 2011. However, muddy water was still observed in the downstream areas. As reported by Contractor, sedimentation tank is being setup and

earth bunds are being formed to further prevent muddy water generation, which anticipated to be completed by 16th November 2011. Contractor was reminded to implement the aforesaid mitigation measures and corrective actions as soon as possible as to avoid violation of environmental ordinance and/or regulations. Implementation status of follow up actions will be checked and reported from the weekly inspections in the next reporting month.

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.

There were some findings which were observed since August but still awaiting Contractor's rectification. Contractor was advised to implement mitigation measures and follow up actions immediately as recommended in Table 6.1. Implementation status of follow up actions will be checked and reported from the weekly inspections in the next reporting month.

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, the majority of C&D materials generated were reused at Lam Tsuen River for rock filling. The remaining inert waste, together with non-inert waste, were sent to the North East New Territories (NENT) Landfill. Chemical waste were first collected by a black plastic bag with labeling (collection point, chemical name, producer's name), then placed into the Chemical Storing Area for temporary storage. A licensed collector was appointed for the collection and disposal of the chemical waste. All chemical waste was transported to the Chemical Waste Treatment Centre (CWTC). The following table showed 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 October 2011

Type of waste	Amount generated	Amount reused	Amount disposed
Inert waste	740 m^3	725 m^3	15 m^3
Non-inert waste	48 kg	0	48 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	31st Aug, 2005	N/A	Superseded
Amended Environmental Permit	EP-223/2005/A	18th Nov, 2008	N/A	Issued
Construction Noise Permit	N/A	N/A	N/A	N/A
Effluent Discharge License	3678	14th Mar, 2008	31st Mar, 2013	Issued
Registration as a Chemical Waste Producer	5213-724-C3251-03	19th 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 & TR5, construction of gabion wall TR1, construction of additional boulder trap and demolition of the existing temporary steel bridge 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

Diversion of river water to west branch, forming haul road at main stream, construction of retaining wall TR2, TR3 & TR5, construction of gabion wall TR1, excavation for construction of additional boulder trap and diversion of the existing utilities 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.

Ecological impact monitoring was conducted on 21st July 2011 by the Ecologist Dr. Mark Shea. The ecological impact monitoring report prepared by the Ecologist is attached in Appendix K. Next ecological monitoring was arranged in January 2012. It was agreed with green groups and AFCD that capture survey would be carried out in different phases. The 1st phase was carried out on 1st September 2011, and the 2nd phase was carried out on 3rd and 4th October 2011. The capture survey report is under preparation and will be provided in the upcoming month EM&A report.

A non-compliance event regarding muddy water discharge was recorded in this reporting month. Contractor was urged to implement necessary mitigation measures and corrective actions as soon as possible.

There were two formal complaints in relation to environmental issue received in the reporting month. ET has conducted site investigation and the report was submitted to

EPD for their information and consideration. Contractor was also reminded to pay serious attention to prevent causing environmental concerns in the future by implementing good site practices.

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	62.5	64.8	50.5	7-Oct-11	16:00-16:30	N/A	Background noise Traffic noise	Cloudy	Façade
UTP 2	62.2	60.2	45.4	7-Oct-11	15:27-15:57	N/A	Background noise Traffic noise	Cloudy	Façade
UTP 3	62.4	62.3	55.2	7-Oct-11	14:53-15:23	N/A	Background noise	Cloudy	Façade
UTP 4	60.3	63.3	47.2	7-Oct-11	13:52-14:22	Construction yard sorting	Background noise	Cloudy	Façade
UTP 5	61.3	63.0	46.1	7-Oct-11	14:20-14:30	River sorting	Background noise	Cloudy	Façade
UTP 6	61.4	63.7	51.9	7-Oct-11	10:12-10:42	River construction	Background noise	Cloudy	Façade
UTP 7	66.5	69.8	50.3	7-Oct-11	10:43-11:13	Construction vehicle	Background noise	Cloudy	Façade
UTP 8	53.4	54.8	50.4	7-Oct-11	11:15-11:45	Construction (Rock gate)	Background noise	Cloudy	Façade
UTP 9	50.2	50.7	48.1	7-Oct-11	11:45-12:15	N/A	Background noise	Cloudy	Façade
UTP 10	59.3	61.5	42.0	7-Oct-11	9:30-10:00	Rock breaking Construction vehcile	Background noise	Cloudy	Façade
UTP 11	57.1	57.2	39.8	7-Oct-11	8:58-9:28	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	66.8	69.1	53.5	14-Oct-11	15:33-16:03	- Construction yard sorting - Piling	- Background noise - Traffic noise	Sunny	Façade
UTP 2	56.6	58.2	47.3	14-Oct-11	15:00-15:30	- Construction yard sorting	- Background noise - Traffic noise	Sunny	Façade
UTP 3	67.1	67.4	61.0	14-Oct-11	14:29-14:59	- Construction yard sorting	-Background noise	Sunny	Façade
UTP 4	61.4	64.2	51.2	14-Oct-11	13:26-13:56	- Construction yard sorting	-Background noise	Sunny	Façade
UTP 5	58.2	61.2	49.4	14-Oct-11	13:57-14:27	- Construction yard sorting	-Background noise	cloudy	Façade
UTP 6	66.1	67.8	52.9	14-Oct-11	10:28-10:58	- Rock gate manufacturing	-Background noise	cloudy	Façade
UTP 7	69.2	71.6	50.9	14-Oct-11	10:59-11:29	- Rock gate manufacturing	-Background noise	cloudy	Façade
UTP 8	69.9	71.3	50.7	14-Oct-11	11:30-12:00	- Rock gate manufacturing - Pipe installing	-Background noise	cloudy	Façade
UTP 9	58.1	60.4	53.1	14-Oct-11	12:00-12:30	N/A	-Background noise	cloudy	Façade
UTP 10	62.4	66.6	46.3	14-Oct-11	9:48-10:18	N/A	- Rain - Background noise	Rainy	Façade
UTP 11	70.6	73.4	65.9	14-Oct-11	9:14-9:44	N/A	- Rain - Background noise	Rainy	***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	66.5	69.6	54.4	21-Oct-11	14:43-15:13	Rock break	- Traffic noise - Background noise	Sunny	Façade
UTP 2	59.9	63.4	50.8	21-Oct-11	13:36-14:06	Rock transfer Rock break	- Traffic noise - Background noise	Sunny	Façade
UTP 3	74.8	70.2	68.3	21-Oct-11	14:14-14:44	Rock transfer	Background noise	Sunny	Façade
UTP 4	53.6	56.6	45.4	21-Oct-11	13:40-14:20	N/A	Background noise	Sunny	Façade
UTP 5	53.1	55.8	45.4	21-Oct-11	14:20-14:50	N/A	Background noise	Sunny	Façade
UTP 6	70.8	74.4	59.2	21-Oct-11	10:28-10:58	Construction machines	Background noise	Sunny	Façade
UTP 7	56.8	59.6	47.0	21-Oct-11	10:59-11:28	Construction machines	Background noise	Sunny	Façade
UTP 8	68.5	71.1	51.9	21-Oct-11	11:30-12:00	Rock transfer	Background noise	Sunny	Façade
UTP 9	60.1	60.2	51.1	21-Oct-11	12:00-12:30	N/A	Background noise	Sunny	Façade
UTP 10	62.4	63.4	40.9	21-Oct-11	9:42-10:12	Construction machines	Background noise	Sunny	Façade
UTP 11	61.7	51.6	43.6	21-Oct-11	9:10-9:40	Construction machines	Background noise	Sunny	***Free field**

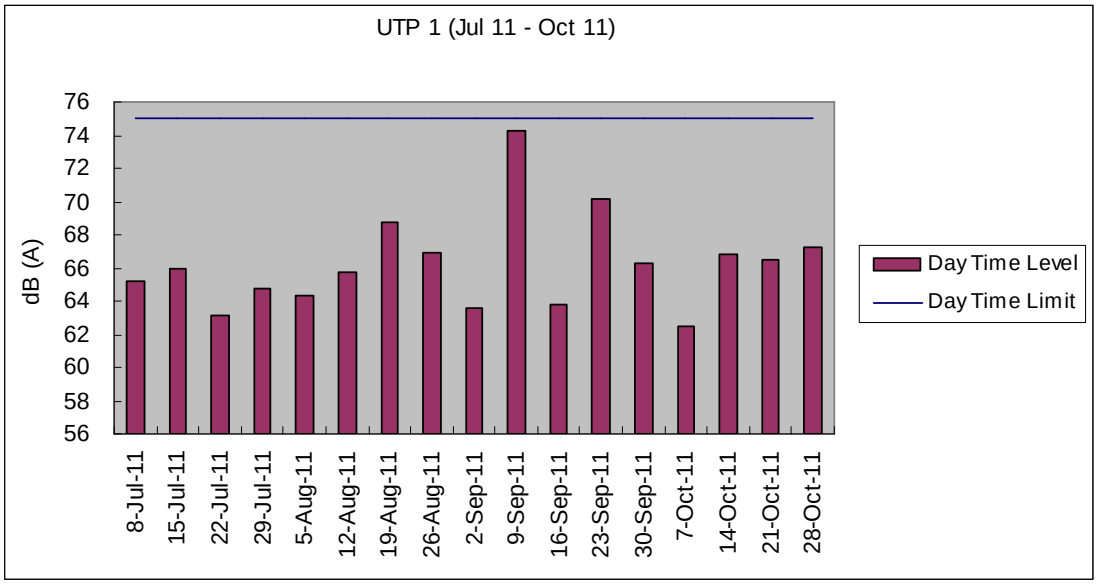
Note* An Additional of 3dB(A) had been added to the measurement result due to Free Field Correction

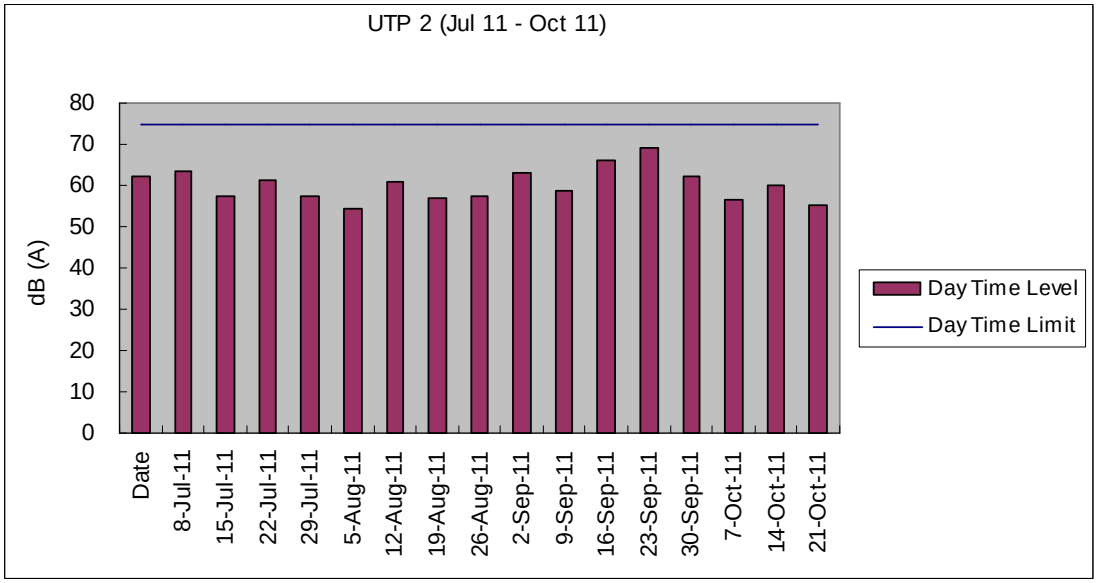
Location	Leq 30min	L_{10} 30min	L_{90} 30min	Date	Time Duration	Major Construction Noise	Other Noise source	Weather	Location description
UTP 1	67.2	69.7	52.0	28-Oct-11	15:19-15:49	N/A	- Background noise - Traffic noise	Cloudy	Façade
UTP 2	55.4	57.9	46.9	28-Oct-11	14:46-15:16	Rock transfer	- Background noise - Traffic noise	Cloudy	Façade
UTP 3	63.4	66.4	57.1	28-Oct-11	14:14-14:44	Road sorting	- Background noise	Sunny	Façade
UTP 4	62.6	66.1	49.6	28-Oct-11	13:11-13:41	Road sorting	- Background noise	Sunny	Façade
UTP 5	57.1	61.9	43.8	28-Oct-11	13:41-14:11	Road sorting	- Background noise	Sunny	Façade
UTP 6	56.0	59.0	45.2	28-Oct-11	9:55-10:25	Construction machines	- Background noise	Sunny	Façade
UTP 7	48.6	51.2	38.4	28-Oct-11	10:25-10:55	Construction machines	- Background noise	Sunny	Façade
UTP 8	61.1	56.2	46.2	28-Oct-11	10:55-11:25	Construction machines	- Background noise	Sunny	Façade
UTP 9	56.7	57.4	45.8	28-Oct-11	11:25-11:55	N/A	- Background noise	Sunny	Façade
UTP 10	54.9	56.5	35.3	28-Oct-11	9:21-9:51	N/A	- Background noise	Sunny	Façade
UTP 11	66.2	55.5	41.3	28-Oct-11	8:50-9:20	N/A	- Background noise	Sunny	***Free field**

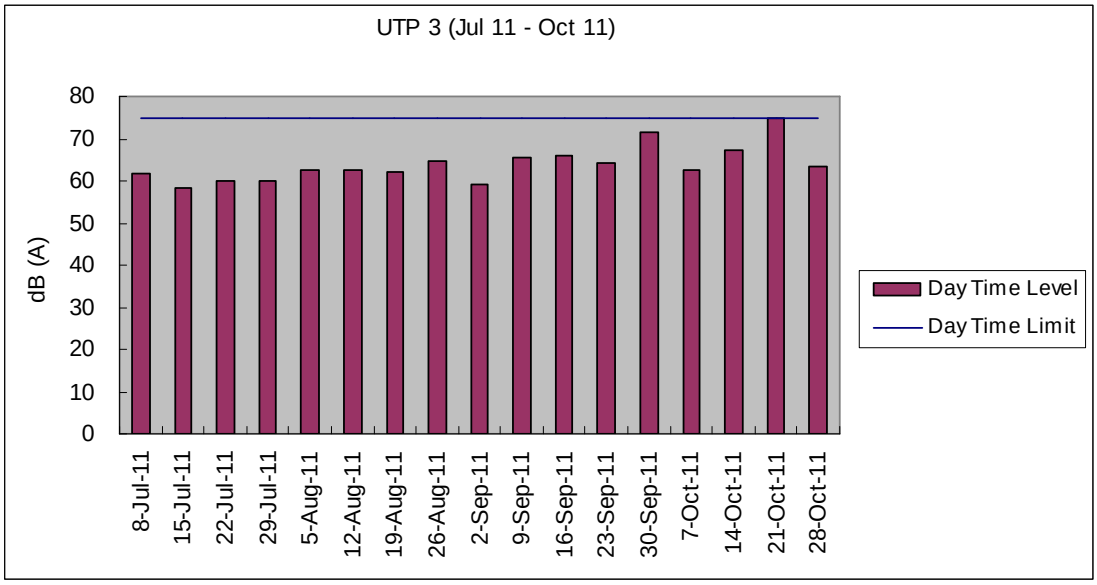
Note* An Additional of 3dB(A) had been added to the measurement result due to Free Field Correction

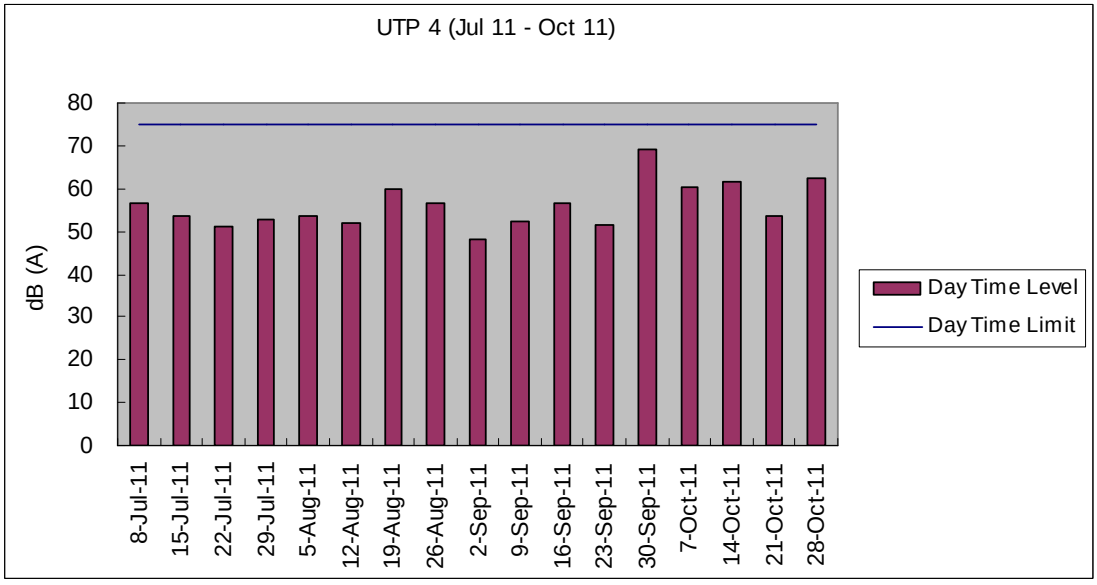
Graphical plot for noise measurements

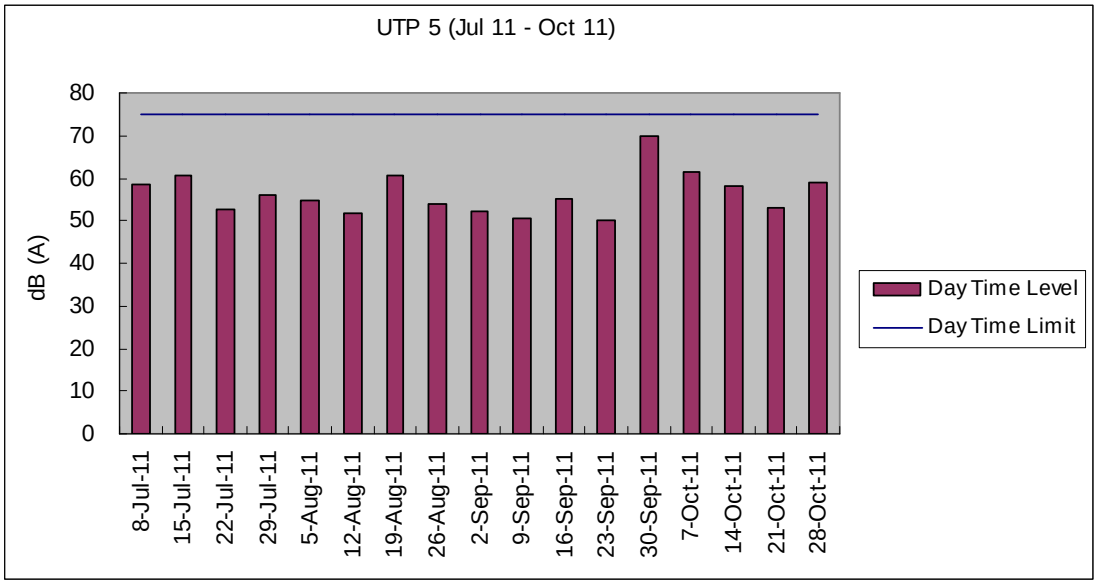
The followings were the graphical plots for the 11 monitoring locations. Each plot showed the date of measurement taken, day time limit of 75 dB(A) as well as the measured daytime level for each location. The graphs contain the data recorded from July 2011 to October 2011.

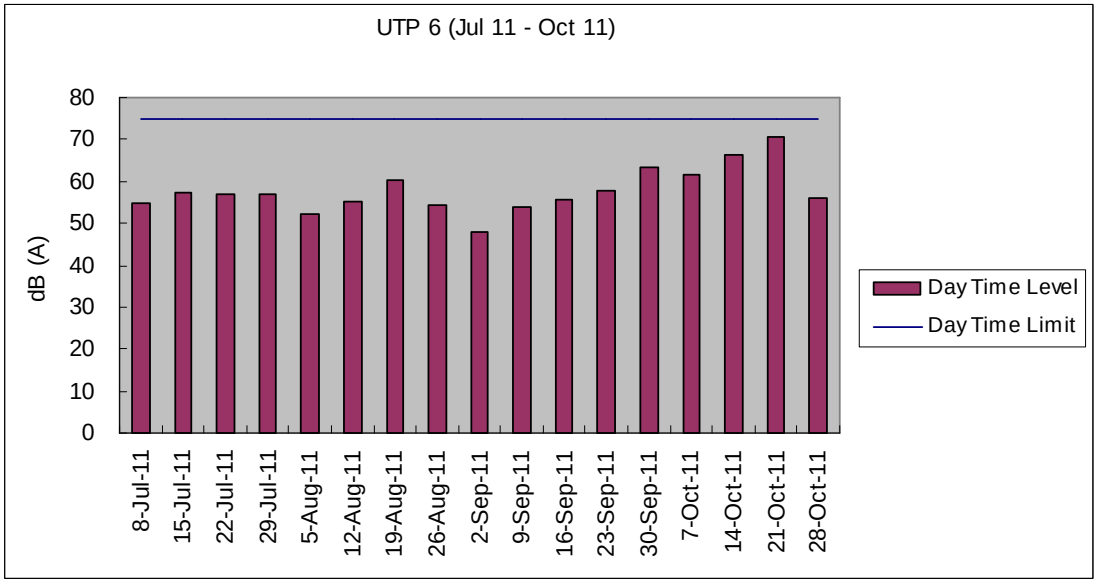





UTP 3 (Jul 11 - Oct 11)
dB (A)
80
70
60
50
40
30
20
10
0
8-Jul-11
15-Jul-11
22-Jul-11
29-Jul-11
5-Aug-11
12-Aug-11
19-Aug-11
26-Aug-11
2-Sep-11
9-Sep-11
16-Sep-11
23-Sep-11
30-Sep-11
7-Oct-11
14-Oct-11
21-Oct-11
28-Oct-11
Day Time Level
Day Time Limit


UTP 4 (Jul 11 - Oct 11)
dB (A)
80
70
60
50
40
30
20
10
0
8-Jul-11
15-Jul-11
22-Jul-11
29-Jul-11
5-Aug-11
12-Aug-11
19-Aug-11
26-Aug-11
2-Sep-11
9-Sep-11
16-Sep-11
23-Sep-11
30-Sep-11
7-Oct-11
14-Oct-11
21-Oct-11
28-Oct-11
Day Time Level
Day Time Limit


UTP 5 (Jul 11 - Oct 11)
dB (A)
80
70
60
50
40
30
20
10
0
8-Jul-11
15-Jul-11
22-Jul-11
29-Jul-11
5-Aug-11
12-Aug-11
19-Aug-11
26-Aug-11
2-Sep-11
9-Sep-11
16-Sep-11
23-Sep-11
30-Sep-11
7-Oct-11
14-Oct-11
21-Oct-11
28-Oct-11
Day Time Level
Day Time Limit


UTP 6 (Jul 11 - Oct 11)
dB (A)
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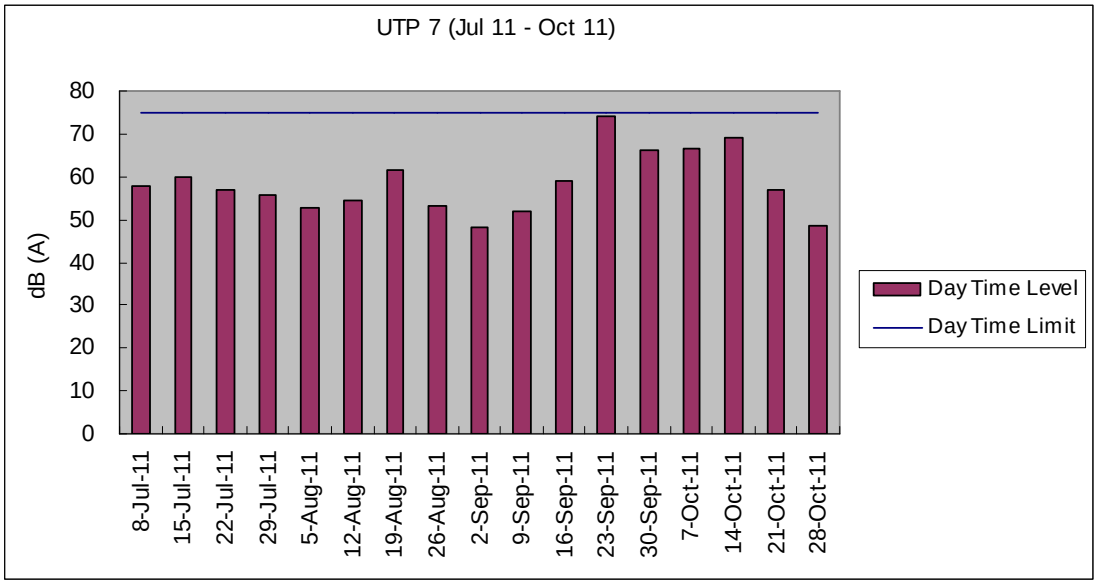
70
60
50
40
30
20
10
0
8-Jul-11
15-Jul-11
22-Jul-11
29-Jul-11
5-Aug-11
12-Aug-11
19-Aug-11
26-Aug-11
2-Sep-11
9-Sep-11
16-Sep-11
23-Sep-11
30-Sep-11
7-Oct-11
14-Oct-11
21-Oct-11
28-Oct-11
Day Time Level
Day Time Limit


UTP 7 (Jul 11 - Oct 11)
dB (A)
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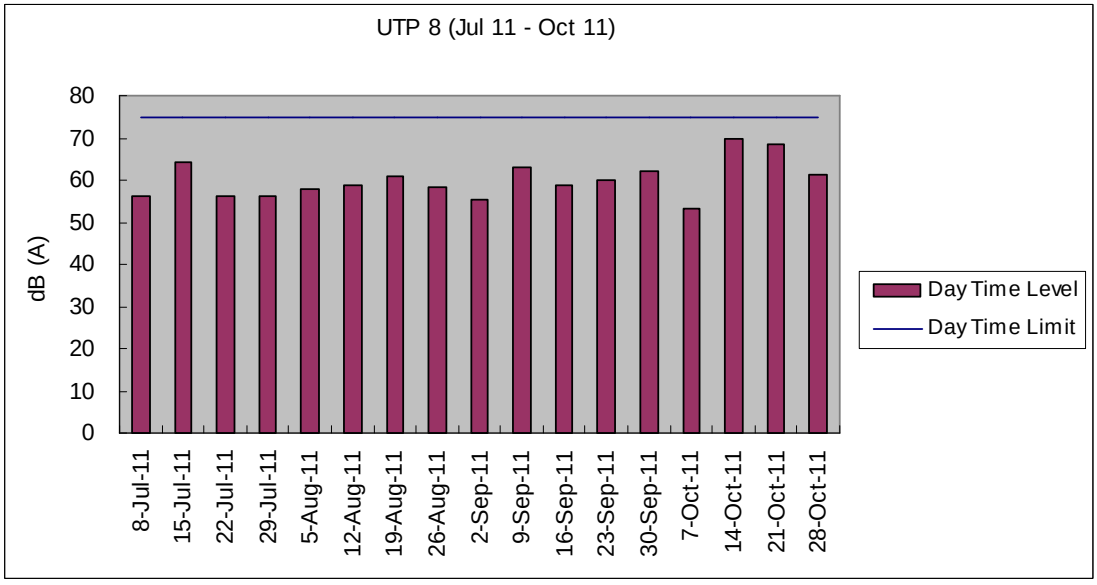
70
60
50
40
30
20
10
0
8-Jul-11
15-Jul-11
22-Jul-11
29-Jul-11
5-Aug-11
12-Aug-11
19-Aug-11
26-Aug-11
2-Sep-11
9-Sep-11
16-Sep-11
23-Sep-11
30-Sep-11
7-Oct-11
14-Oct-11
21-Oct-11
28-Oct-11
Day Time Level
Day Time Limit


UTP 8 (Jul 11 - Oct 11)
dB (A)
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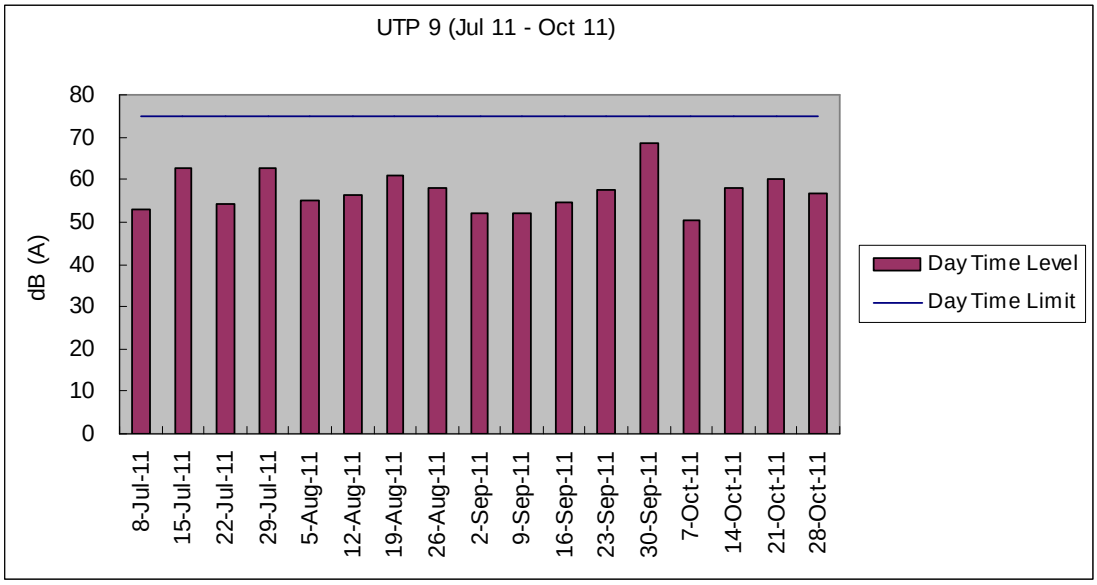
70
60
50
40
30
20
10
0
8-Jul-11
15-Jul-11
22-Jul-11
29-Jul-11
5-Aug-11
12-Aug-11
19-Aug-11
26-Aug-11
2-Sep-11
9-Sep-11
16-Sep-11
23-Sep-11
30-Sep-11
7-Oct-11
14-Oct-11
21-Oct-11
28-Oct-11
Day Time Level
Day Time Limit


UTP 9 (Jul 11 - Oct 11)
dB (A)
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70
60
50
40
30
20
10
0
8-Jul-11
15-Jul-11
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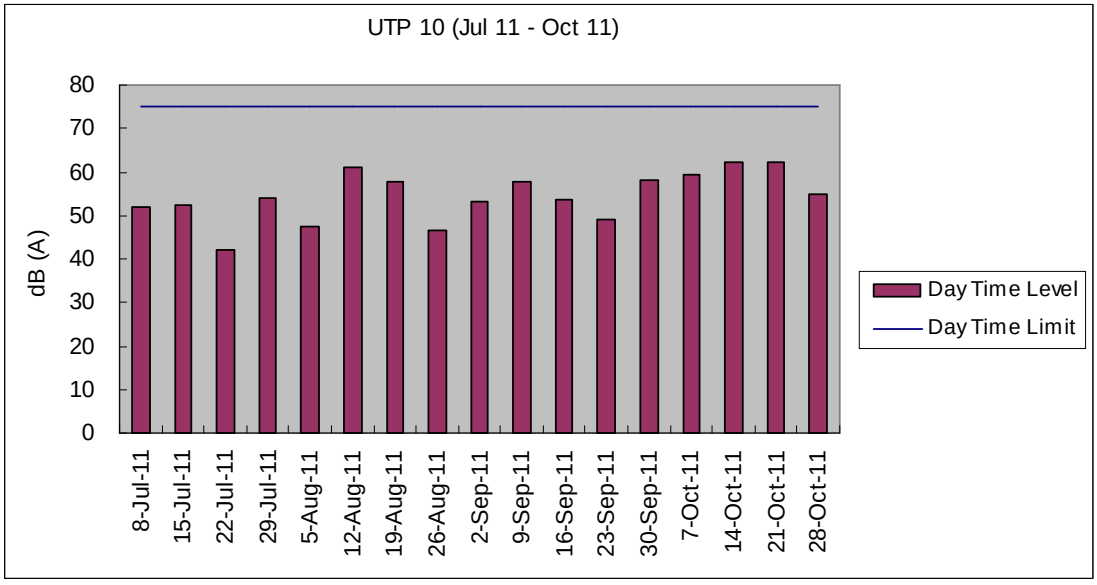
5-Aug-11
12-Aug-11
19-Aug-11
26-Aug-11
2-Sep-11
9-Sep-11
16-Sep-11
23-Sep-11
30-Sep-11
7-Oct-11
14-Oct-11
21-Oct-11
28-Oct-11
Day Time Level
Day Time Limit


UTP 10 (Jul 11 - Oct 11)
dB (A)
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70
60
50
40
30
20
10
0
8-Jul-11
15-Jul-11
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29-Jul-11
5-Aug-11
12-Aug-11
19-Aug-11
26-Aug-11
2-Sep-11
9-Sep-11
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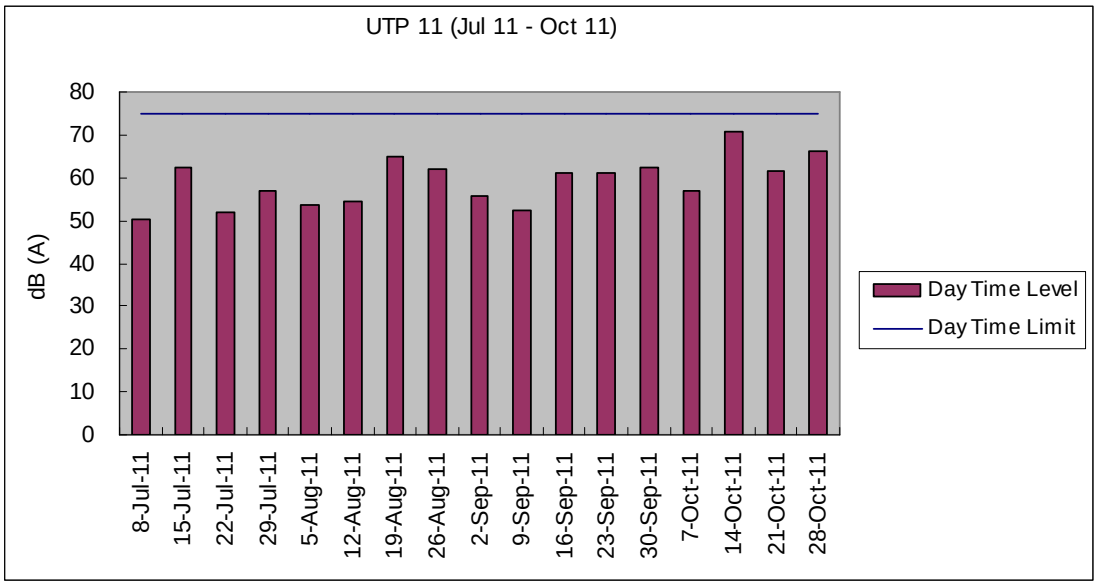
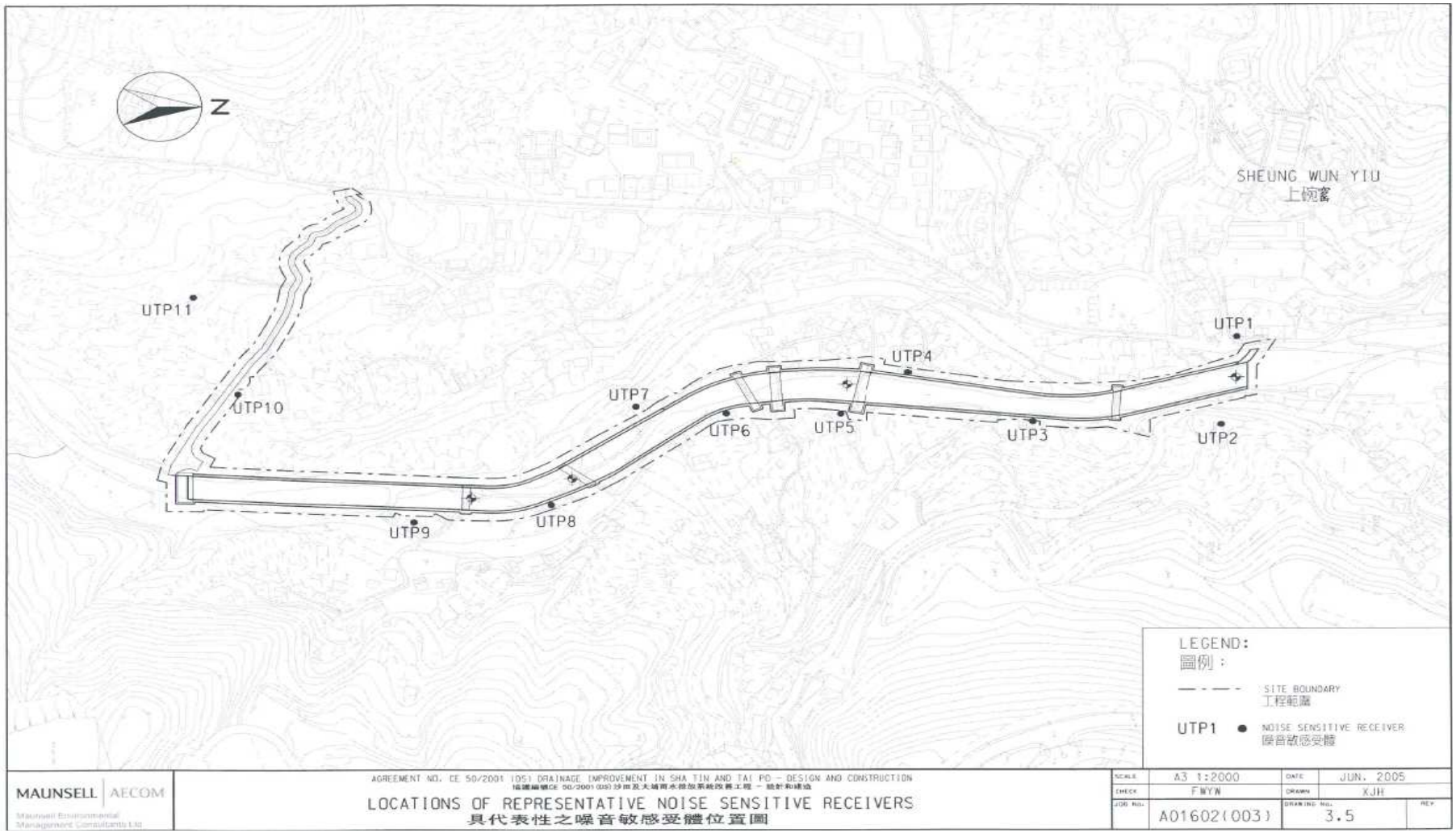
14-Oct-11
21-Oct-11
28-Oct-11
Day Time Level
Day Time Limit


UTP 11 (Jul 11 - Oct 11)
dB (A)
80
70
60
50
40
30
20
10
0
8-Jul-11
15-Jul-11
22-Jul-11
29-Jul-11
5-Aug-11
12-Aug-11
19-Aug-11
26-Aug-11
2-Sep-11
9-Sep-11
16-Sep-11
23-Sep-11
30-Sep-11
7-Oct-11
14-Oct-11
21-Oct-11
28-Oct-11
Day Time Level
Day Time Limit


N
SHEUNG WUN YIU
上碗窰
UTP11
UTP10
UTP9
UTP8
UTP7
UTP6
UTP5
UTP4
UTP3
UTP2
UTP1
LEGEND:
圖例：
SITE BOUNDARY
工程範圍
UTP1
NOISE SENSITIVE RECEIVER
噪音敏感受體
MAUNSELL AECOM
Maunsell Environmental Management Consultants Ltd
AGREEMENT NO. CE 50/2001 (DS) DRAINAGE IMPROVEMENT IN SHA TIN AND TAI PO – DESIGN AND CONSTRUCTION
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 FWYW
DRAWN KJH
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 October 2011

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
						01/10
02/10	03/10	04/10	05/10	06/10	07/10	08/10
	Ecological site inspection 2nd Capture Survey	2nd Capture Survey		Site inspection at afternoon	Noise Monitoring	
09/10	10/10	11/10	12/10	13/10	14/10	15/10
	Ecological site inspection		Site inspection at afternoon		Noise Monitoring	
16/10	17/10	18/10	19/10	20/10	21/10	22/10
	Ecological site inspection		Site inspection and SSEMC at afternoon		Noise Monitoring	
23/10	24/10	25/10	26/10	27/10	28/10	29/10
	Ecological site inspection		Site inspection at afternoon		Noise Monitoring	
30/10	31/10					
	Ecological site inspection					

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
					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	26/110
	Ecological site inspection			Site inspection and SSEMC at afternoon	Noise Monitoring	
27/11	28/11	29/11	30/11			
	Ecological site inspection		Site inspection at afternoon			

Appendix F: Cumulative complaint log

Environmental Parameters	**Cumulative no. Brought forward**	**No. of complaint October 2011**	**Overall Total**
Air/Dust	5	0	5
Noise	5	0	5
Water	9	2	11
House Keeping Hygiene	0	0	0
Chemical waste	0	0	0
Total	19	2	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		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	Deficient	Ongoing
	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	Non-compliance identified	Ongoing

	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	Non-compliance identified	Ongoing
	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 4th 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 table

Cumulative 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
Total	**6053.9m^3**	**6002m^3**	**51.9m^3**	**2.473 tonnes**	**0**	**2.473 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. 16)

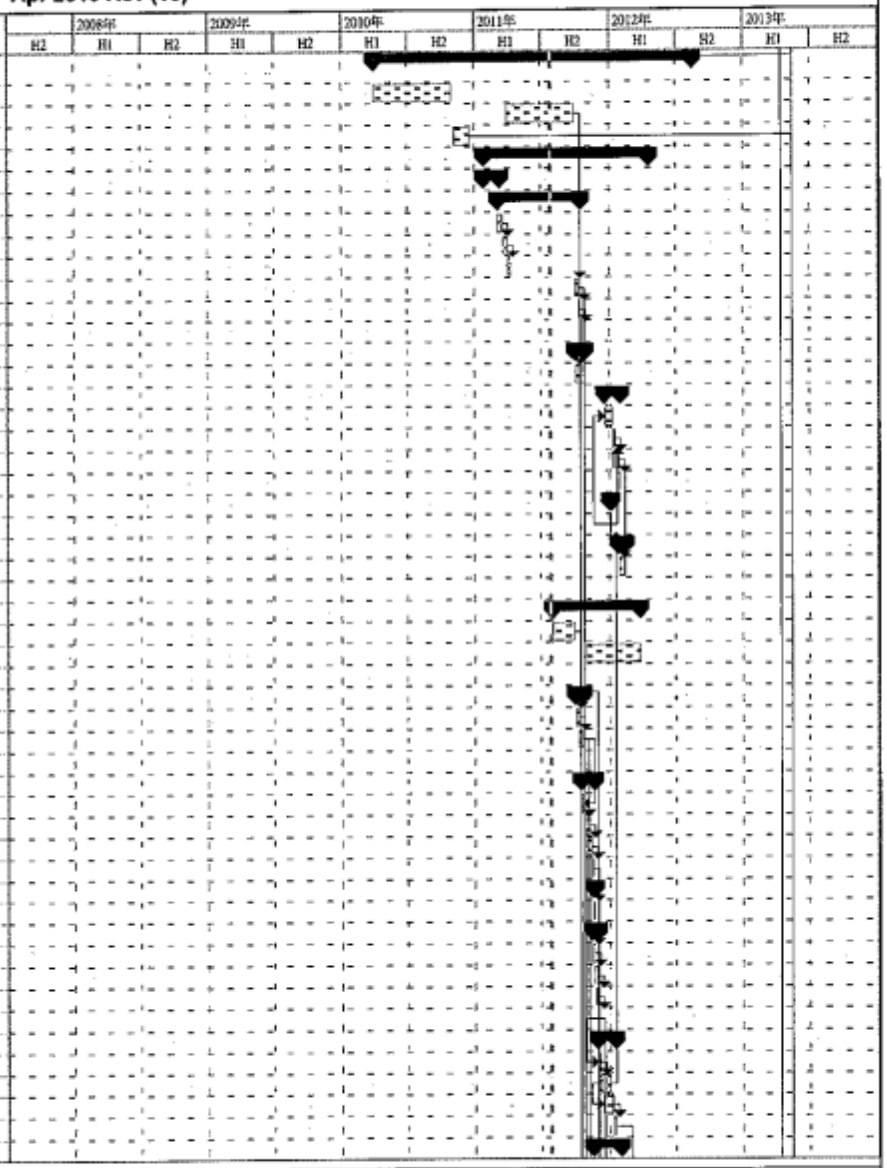
Drainage Services Department

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 (16)

識別號	任務名稱	工期	開始時間	完成時間	前置任務	資源名稱
1174	**Programme of Upper Tai Po River**	**764 days?**	**2010/4/1**	**2012/8/15**		
1175	Wet Season of 2010	214 days	2010/4/1	2010/10/31		
1176	Wet Season of 2011	149 days	2011/4/1	2011/9/30		
1177	Works Suspended Due to Villager's Rally	42 days?	2010/11/7	2010/12/18		
1178	**Ch 230-350**	**366 days?**	**2011/1/28**	**2012/4/19**		
1179	**Gabion Wall (Ch 230-275 RHS) TG1/TG1A**	**40 days**	**2011/1/28**	**2011/3/12**		
1183	**Retaining Wall (Ch 275-330 RHS) TR1 (replaced by AD1)**	**183 days?**	**2011/3/7**	**2011/10/17**		TP2
1184	*Excavation and Formation*	*12 days*	*2011/3/7*	*2011/3/19*	*1181*	
1185	*Laying Concrete block and gabion units (Ch275-320 RHS)*	*12 days*	*2011/3/21*	*2011/4/2*	*1184*	
1186	*Backfilling*	*6 days*	*2011/4/4*	*2011/4/11*	*1185*	
1187	Excavation and Formation	7 days	2011/10/3	2011/10/11	1176	
1188	Laying Concrete block and gabion units (Ch320-330 RHS)	4 days	2011/10/12	2011/10/15	1187	
1189	Backfilling	1 day?	2011/10/17	2011/10/17	1188	
1190	**Drainage & Footpath (CH 275-320 RHS)**	**21 days**	**2011/10/3**	**2011/10/27**		
1191	Construction of drainage & footpath	21 days	2011/10/3	2011/10/27	1176	
1192	**Gabion Wall (Ch 315-330 LHS) TG2A**	**29 days**	**2011/12/21**	**2012/1/30**		
1193	Remove Concrete Blocks and shotcrete	14 days	2011/12/21	2012/1/9	1198SS-14 edays	
1194	Excavation and Formation	7 days	2012/1/9	2012/1/16	1198	
1195	Gabion Wall Construction (Ch 315-330 LHS)	9 days	2012/1/14	2012/1/27	1194FS-3 edays	
1196	Backfilling	2 days	2012/1/28	2012/1/30	1195	
1197	**Maintainence Staircase (Ch 315 LHS)**	**4 days**	**2012/1/4**	**2012/1/7**		
1198	Formwork and concreting	4 days	2012/1/4	2012/1/7	1224	
1199	**Drainage & Footpath (Ch 307-330 LHS)**	**14 days**	**2012/1/28**	**2012/2/13**		
1200	Construction of drainage & footpath	14 days	2012/1/28	2012/2/13	1195	
1201						
1202	**Temp Utility and Pedestrian Diversion at Ch230**	**195 days**	**2011/8/1**	**2012/3/24**		
1203	Temp UU diversion near Ch230	52 days	2011/8/1	2011/9/30		
1204	Implementation of Pedestrian diversion Scheme	119 days	2011/11/1	2012/3/24		
1205						
1206	**Demolition of Interim Footbridge at Ch230**	**17 days**	**2011/10/3**	**2011/10/22**		TP2A
1207	Construct Temp crossing at Ch230	7 days	2011/10/3	2011/10/11	1203	
1208	Demolition of Interim Footbridge	10 days	2011/10/12	2011/10/22	1207	
1209						
1210	**Gabion Wall (Ch 230-257 LHS) TG2/TG2A/TG2B**	**31 days**	**2011/10/18**	**2011/11/22**		TP2A
1211	Remove Shotcrete & concrete block	5 days	2011/10/18	2011/10/22	1208FF	
1212	Excavation and Formation	13 days	2011/10/24	2011/11/7	1211	
1213	Gabion Wall Construction (Ch 230-257 LHS)	12 days	2011/11/1	2011/11/14	1212FS-7 edays	
1214	Backfilling	3 days	2011/11/15	2011/11/17	1213	
1215	**Maintainence Staircase (Ch 242 LHS)**	**4 days**	**2011/11/18**	**2011/11/22**		TP2A
1216	Formwork and concreting	4 days	2011/11/18	2011/11/22	1214	
1217	**Gabion Wall (Ch 257-270 LHS) TG4**	**15 days**	**2011/11/16**	**2011/12/2**		TP2A
1218	Remove Concrete Blocks and shotcrete	5 days	2011/11/16	2011/11/21	1214FS-2 days	
1219	Excavation and Formation	8 days	2011/11/21	2011/11/29	1218FS-1 day	
1220	Gabion Wall Construction (Ch 257-270 LHS)	4 days	2011/11/26	2011/11/30	1219FS-3 days	
1221	Backfilling	2 days	2011/12/1	2011/12/2	1220	
1222	**Retaining Wall (Ch 275-315 LHS) TR1 (replaced by AD1)**	**39 days**	**2011/12/1**	**2012/1/18**		TP2A
1223	Remove Concrete Blocks and shotcrete	5 days	2011/12/1	2011/12/6	1221SS	
1224	Excavation and Formation	21 days	2011/12/7	2012/1/3	1223	
1225	Laying Concrete block and gabion units	21 days	2011/12/14	2012/1/10	1224SS+7 edays	
1226	Backfilling	7 days	2012/1/11	2012/1/18	1225	
1227	**Drainage & Footpath (Ch 200-307 LHS)**	**60 days**	**2011/11/18**	**2012/2/2**		



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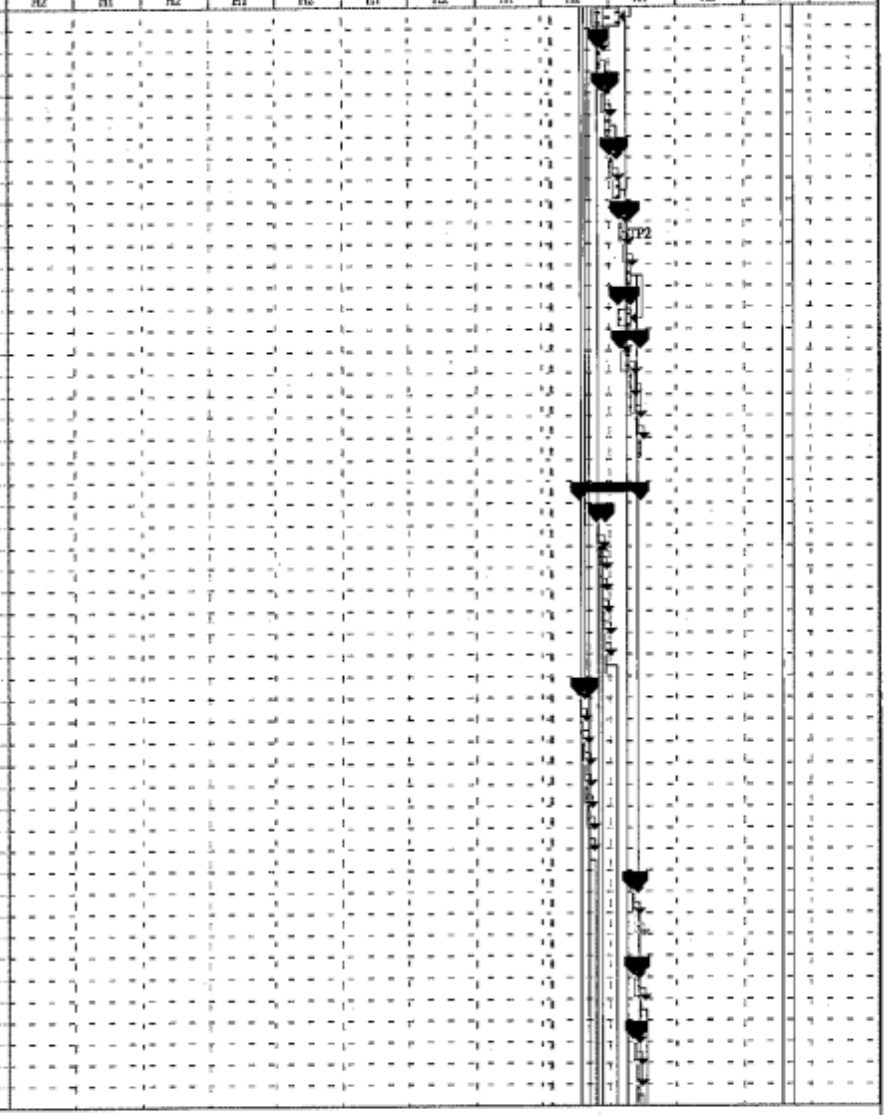
Drainage Services Department

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 (16)

識別號	任務名稱	工期	開始時間	完成時間	前置任務	資源名稱
1228	Construction of drainage & footpath (Ch 200-307 LHS)	60 days	2011/11/18	2012/2/2	1214,1236FF+7 e	
1229	**River Bed formation (Ch205-236)**	**7 days**	**2011/12/3**	**2011/12/10**		**TP2A**
1230	River Bed formation (Ch205-236)(From TB03 to Step2)	7 days	2011/12/3	2011/12/10	1221	
1231	**Step 2 & Stilling Basin (Ch 236)**	**20 days**	**2011/12/12**	**2012/1/6**		
1232	Construction of Step 2 (Assume Mass Concrete)	10 days	2011/12/12	2011/12/22	1230	
1233	Construction of Stilling Basin (Assume Precast Conc Blocks)	10 days	2011/12/23	2012/1/6	1232	
1234	**Cascade (Ch 275)**	**21 days**	**2012/1/4**	**2012/1/31**		**TP2A**
1235	River Bed formation (Ch236-275)	7 days	2012/1/4	2012/1/11	1233FS-3 days	
1236	Construction of Cascade (Ch 275)	14 days	2012/1/12	2012/1/31	1235	
1237	**Step 3 (Ch 307)**	**28 days**	**2012/1/30**	**2012/3/1**		
1238	River Bed formation (Ch275-307)	7 days	2012/1/30	2012/2/7	1236FS-3 days	TP2
1239	Construction of Step 3 (Assume Mass Concrete)	10 days	2012/2/8	2012/2/18	1238	
1240	Construction of Stilling Basin (Assume Precast Conc Blocks)	10 days	2012/2/20	2012/3/1	1239	
1241	**River Bed formation (Ch 236-330)**	**30 days**	**2012/1/27**	**2012/3/1**		**T2A**
1242	Placing Grade 500 rock Stone	30 days	2012/1/27	2012/3/1	1240FF	
1243	**Lighting at CH 250-320**	**45 days**	**2012/2/3**	**2012/3/26**		
1244	Construction of Drawpits / Ductings	21 days	2012/2/3	2012/2/27	1218	
1245	Public lighting Installation (CE2318)	12 days	2012/2/28	2012/3/12	1244	
1246	Public lighting Installation (CE2317)	12 days	2012/2/28	2012/3/12	1244	
1247	T&C	6 days	2012/3/13	2012/3/19	1245,1246	
1248	Removal of existing lighting (VA1311-Z1)	6 days	2012/3/20	2012/3/26	1247	
1249						
1250	**Footbridge TB04 (Ch 330)**	**137 days**	**2011/10/12**	**2012/3/26**		
1251	**Construction of Abutment A (LHS)**	**22 days**	**2011/11/28**	**2011/12/22**		
1252	Excavation and Blinding	5 days	2011/11/28	2011/12/2	1331	
1253	Formwork and rebar fixing for base slab	5 days	2011/12/3	2011/12/8	1252	
1254	Concreting of base slab	1 day	2011/12/9	2011/12/9	1253	
1255	Stripping off formwork	3 days	2011/12/10	2011/12/13	1254	
1256	Rebar fixing and shuttering formwork for column	5 days	2011/12/14	2011/12/19	1255	
1257	Concreting of column	1 day	2011/12/20	2011/12/20	1256	
1258	Stripping off formwork	2 days	2011/12/21	2011/12/22	1257	
1259	**Construction of Abutment B (RHS)**	**24 days**	**2011/10/12**	**2011/11/8**		**TP2**
1260	Remove shotcrete	2 days	2011/10/12	2011/10/13	1187	
1261	Excavation and Blinding	5 days	2011/10/14	2011/10/19	1260	
1262	Formwork and rebar fixing for base slab	5 days	2011/10/20	2011/10/25	1261	
1263	Concreting of base slab	1 day	2011/10/26	2011/10/26	1262	
1264	Stripping off formwork	3 days	2011/10/27	2011/10/29	1263	
1265	Rebar fixing and shuttering formwork for column	5 days	2011/10/31	2011/11/4	1264	
1266	Concreting of base slab	1 day	2011/11/5	2011/11/5	1265	
1267	Stripping off formwork	2 days	2011/11/7	2011/11/8	1266	
1268	Construction of decking (steel deck)	16 days	2012/2/2	2012/2/20		
1269	Erection of steel deck + rein. fabr	6 days	2012/2/2	2012/2/8	1267	
1270	Deck finishing	10 days	2012/2/2	2012/2/13	1267	
1271	Railing installation	2 days	2012/2/14	2012/2/15	1270	
1272	**Demolition of Bridge TB-A**	**17 days**	**2012/3/7**	**2012/3/26**		
1273	Water Pipe Diversion	14 days	2012/3/7	2012/3/22	1269	
1274	Remove concrete pipes and demolition works	3 days	2012/3/23	2012/3/26	1273	
1275	**Lighting at Footbridge TB04**	**11 days**	**2012/3/7**	**2012/3/19**		
1276	Construction of Drawpits / Ductings	7 days	2012/3/7	2012/3/14	1269	
1277	Public lighting Installation (CE2315)	3 days	2012/3/15	2012/3/17	1276	
1278	Public lighting Installation (CE2316)	3 days	2012/3/15	2012/3/17	1276	



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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 (16)

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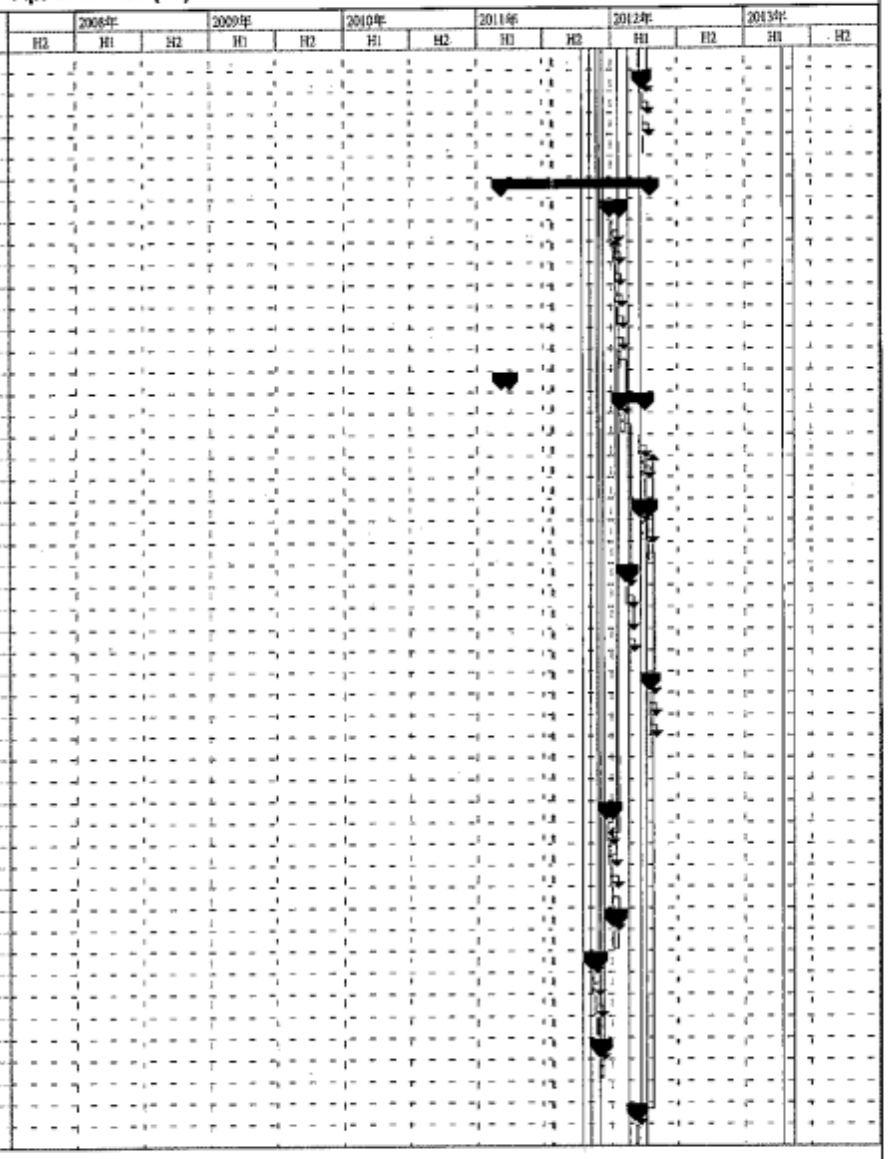
1279	T&C	1 day	2012/3/19	2012/3/19	1278	
1280	**Construction of Gabion Wall at TB-A**	**5 days**	**2012/3/27**	**2012/3/31**		
1281	Excavation and Formation	2 days	2012/3/27	2012/3/28	1274	
1282	Gabion Wall Construction (adj TBA LHS)	2 days	2012/3/29	2012/3/30	1281	
1283	Backfilling	1 day	2012/3/31	2012/3/31	1282	
1284						
1285	**Footbridge TB05 (ch 350)**	**329 days**	**2011/3/10**	**2012/6/19**		
1286	**Construction of Abutment A (LHS)**	**20 days**	**2011/12/31**	**2012/1/27**		
1287	Excavation and Blinding	5 days	2011/12/31	2012/1/6	1323	
1288	Formwork and rebar fixing for base slab	4 days	2012/1/7	2012/1/11	1287	
1289	Concreting of base slab	1 day	2012/1/12	2012/1/12	1288	
1290	Stripping off formwork	3 days	2012/1/13	2012/1/16	1289	
1291	Rebar fixing and shuttering formwork for column	4 days	2012/1/17	2012/1/20	1290	
1292	Concreting of column	1 day	2012/1/21	2012/1/21	1291	
1293	Stripping off formwork	2 days	2012/1/25	2012/1/27	1292	
1294	***Construction of Abutment B (RHS)***	***19 days***	***2011/3/10***	***2011/3/31***		
1302	**Construction of docking**	**57 days**	**2012/1/28**	**2012/4/3**		
1303	Mud flushing (4 days ago)	10 days	2012/3/25	2012/4/3	1273	
1304	Erection of steel dock cofferdam	4 days	2012/3/16	2012/3/20	1303	
1305	Dock flushing	10 days	2012/3/21	2012/3/31	1304	
1306	Subsequent action	3 days	2012/4/2	2012/4/4	1305	
1307	**Demolition of Bridge TB-B**	**17 days**	**2012/3/21**	**2012/4/13**		
1308	Water Pipe Diversion	14 days	2012/3/21	2012/4/10	1304	
1309	Remove concrete pipes and demolition works	3 days	2012/4/11	2012/4/13	1308	
1310	**Lighting at Footbridge TB05**	**10 days**	**2012/2/9**	**2012/2/20**		
1311	Construction of Draupits / Ductings	6 days	2012/2/9	2012/2/15	1303	
1312	Public lighting Installation (CE2313)	3 days	2012/2/16	2012/2/18	1311	
1313	Public lighting Installation (CE2314)	3 days	2012/2/16	2012/2/18	1311	
1314	T&C	1 day	2012/2/20	2012/2/20	1313	
1315	**Construction of Gabion Wall at TB-B**	**5 days**	**2012/4/14**	**2012/4/19**		
1316	Excavation and Formation	2 days	2012/4/14	2012/4/16	1309	
1317	Gabion Wall Construction (adj TBB LHS)	2 days	2012/4/17	2012/4/18	1316	
1318	Backfilling	1 day	2012/4/19	2012/4/19	1317	
1319						
1320						
1321	**Gabion Wall (Ch 335-345 LHS) TG2/TG2A**	**11 days**	**2011/12/21**	**2012/1/5**		TP2
1322	Remove concrete blocks and shotcrete	2 days	2011/12/21	2011/12/22	1258FF	
1323	Excavation and Formation	5 days	2011/12/23	2011/12/30	1322	
1324	Gabion Wall Construction (Ch 335-345 LHS)	5 days	2011/12/28	2012/1/3	1323FS-3 edays	
1325	Backfilling	2 days	2012/1/4	2012/1/5	1324	
1326	**Drainage & Footpath (Ch 335-345 LHS)**	**12 days**	**2012/1/6**	**2012/1/19**		
1327	Construction of drainage & footpath	12 days	2012/1/6	2012/1/19	1325	
1328	**Gabion Wall (Ch 330-345 RHS) TG2**	**16 days**	**2011/11/9**	**2011/11/26**		TP2
1329	Excavation and Formation	6 days	2011/11/9	2011/11/15	1267	
1330	Gabion Wall Construction (Ch 330-345 RHS)	8 days	2011/11/14	2011/11/22	1329FS-3 edays	
1331	Backfilling	4 days	2011/11/23	2011/11/26	1330	
1332	**Drainage & Footpath (Ch 330-340 RHS)**	**12 days**	**2011/11/28**	**2011/12/10**		
1333	Construction of drainage & footpath	12 days	2011/11/28	2011/12/10	1331	
1334						
1335	**River Bed formation (Ch 330-350)**	**8 days**	**2012/3/7**	**2012/3/15**		TP2
1336	Placing Grade 500 toe Stone	8 days	2012/3/7	2012/3/15	1269	



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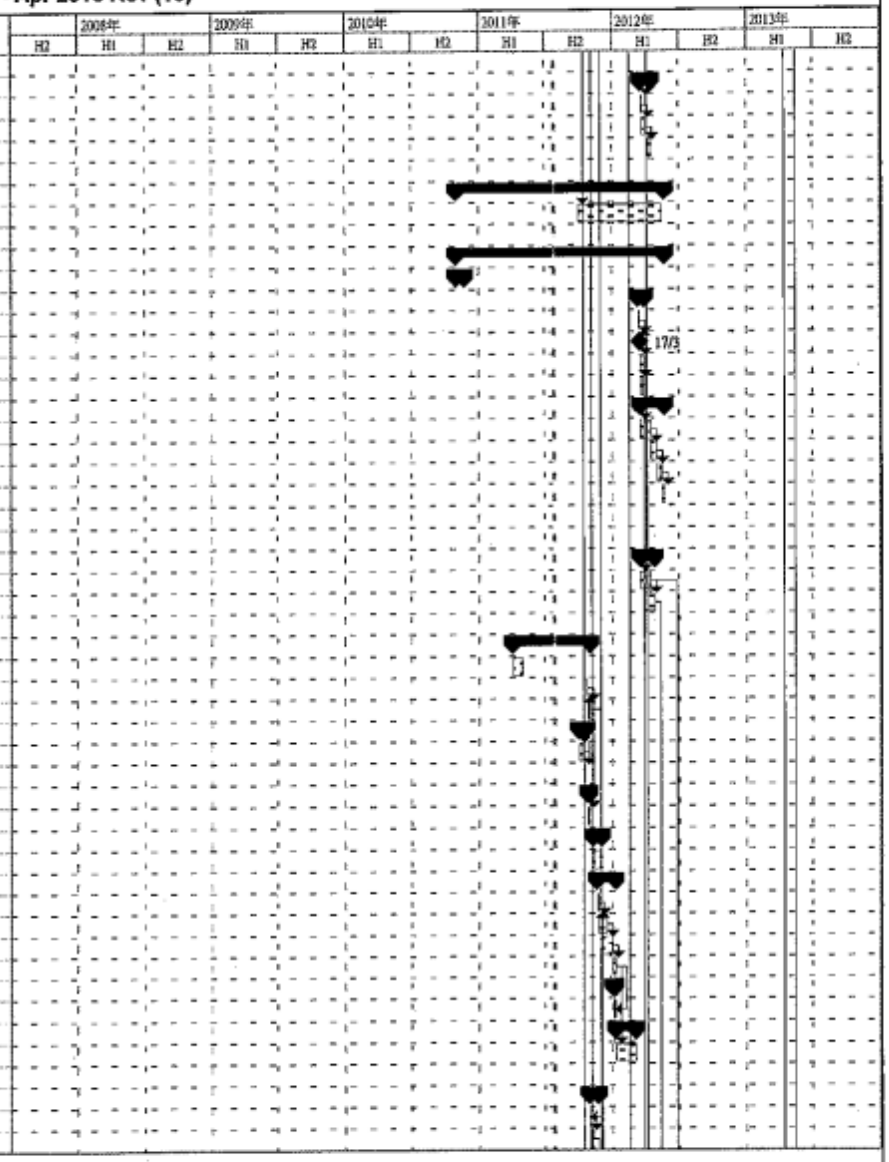
Drainage Services Department

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 (16)

識別號	任務名稱	工期	開始時間	完成時間	前置任務	資源名稱
1337						
1338	**Step 4 (Ch 350)**	**20 days**	**2012/3/21**	**2012/4/17**		
1339	River Bed formation (Ch340-350)	3 days	2012/3/21	2012/3/23	1304	
1340	Construction of Step 3 (Associe Mass Concrete)	10 days	2012/3/24	2012/4/5	1339	
1341	Construction of Stilling Basin (Assume Precast Conc Blocks)	7 days	2012/4/10	2012/4/17	1340	
1342						
1343	**Ch 45-100**	**480 days**	**2010/11/1**	**2012/5/29**		**TP1**
1344	Additional Boulder Trap	180 days	2011/10/3	2012/5/14	1176	
1345						
1346	**Footbridge TB02 (Ch 150)**	**480 days**	**2010/11/1**	**2012/5/23**		**TP1a**
1347	***Construction of Abutment A (LHS)***	***23 days***	***2010/11/1***	***2010/11/23***		
1355	Construction of decking	14 days	2012/5/14	2012/5/29		
1356	Erection of steel roof + mesh deck	5 days	2012/5/14	2012/5/18	1355	
1357	Welding	8 days	2012/5/17	2012/5/25	1356	
1358	Lock fastening	10 days	2012/5/17	2012/5/29	1356	
1359	Painting (steel)	7 days	2012/5/18	2012/5/25	1356	
1360	**Lighting at Footbridge TB02**	**51 days**	**2012/3/19**	**2012/5/23**		
1361	Construction of Drawpits / Ductings	21 days	2012/3/19	2012/4/16	1356	
1362	Public lighting Installation (CE230S)	12 days	2012/4/17	2012/5/2	1361	
1363	Public lighting Installation (CE230S)	12 days	2012/5/3	2012/5/16	1362	
1364	Removal of existing lighting (VA2642-A1)	6 days	2012/5/17	2012/5/23	1363	
1365						
1366						
1367	**River Bed formation (Ch 100-150)**	**30 days**	**2012/3/19**	**2012/4/26**		
1368	Excavation	20 days	2012/3/19	2012/4/14	1356	
1369	Place Gabion mattress	20 days	2012/3/30	2012/4/26	1368FS-10 days	
1370						
1371	**Gabion Wall (Ch 150-178 LHS) TG3A**	**172 days**	**2011/4/4**	**2011/11/1**		**TP1**
1372	*Excavation and formation*	*19 days*	*2011/4/4*	*2011/4/29*		
1373	Gabion Wall construction (Ch 150-178 LHS)	10 days	2011/10/15	2011/10/26	1376	
1374	Backfilling	5 days	2011/10/27	2011/11/1	1373	
1375	**Gabion Wall (Ch 178-230 LHS) TG5A/TG2**	**15 days**	**2011/10/3**	**2011/10/20**		**TP1**
1376	Gabion Wall construction (Ch 178-230 LHS)	10 days	2011/10/3	2011/10/14	1176	
1377	Backfilling	5 days	2011/10/15	2011/10/20	1376	
1378	**Maintainence Staircase (Ch 178 LHS)**	**4 days**	**2011/10/27**	**2011/10/31**		
1379	Formwork and concreting	4 days	2011/10/27	2011/10/31	1373	
1380	**Drainage & Footpath (Ch 150-Ch230 LHS)**	**21 days**	**2011/11/10**	**2011/12/3**		
1381	Drainage & Footpath	21 days	2011/11/10	2011/12/3		
1382	**Gabion Wal (Ch 100-150 RHS) TG2**	**40 days**	**2011/11/21**	**2012/1/9**		**TP1**
1383	Remove shotcrete	5 days	2011/11/21	2011/11/25	1395	
1384	Excavation and formation	21 days	2011/11/24	2011/12/17	1383FS-2 edays	
1385	Gabion Wall construction (Ch 100-150 RHS)	24 days	2011/12/2	2011/12/31	1384FS-16 edays	
1386	Backfilling	6 days	2012/1/3	2012/1/9	1385	
1387	**Maintainence Staircase (Ch 130 RHS)**	**4 days**	**2012/1/5**	**2012/1/9**		
1388	Formwork and concreting	4 days	2012/1/5	2012/1/9	1386FF	
1389	**Drainage & Footpath (Ch 0-150 RHS)**	**45 days**	**2012/1/10**	**2012/3/5**		
1390	Construction of drainage & footpath	45 days	2012/1/10	2012/3/5	1386	
1391						
1392	**Gabion Wall (Ch 150-178 RHS) TG4A**	**22 days**	**2011/10/31**	**2011/11/24**		**TP1**
1393	Remove Shotcrete	2 days	2011/10/31	2011/11/1	1374FF	
1394	Excavation and formation	8 days	2011/11/2	2011/11/10	1393	



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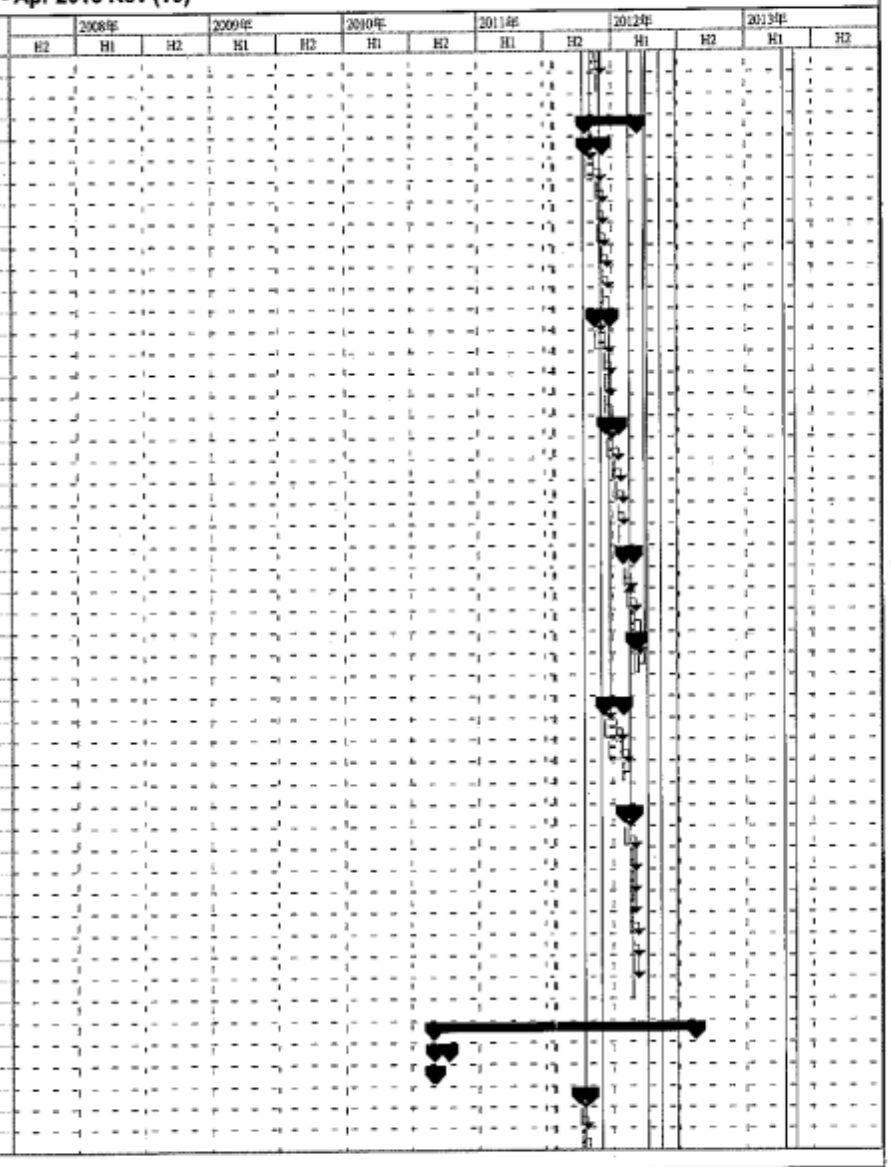
識別號	任務名稱	工期	開始時間	完成時間	前置任務	資源名稱
1395	Construction of Gabion Wall (Ch 160-178 RHS)	12 days	2011/11/7	2011/11/19	1394FS-4 edays	
1396	Backfilling	4 days	2011/11/21	2011/11/24	1395	
1397						
1398	**Footbridge TB03 (Ch 200)**	**116 days**	**2011/10/24**	**2012/3/13**		
1399	**Construction of Abutment B (RHS)**	**41 days**	**2011/10/24**	**2011/12/9**		
1400	Excavation and Blinding, temp work	21 days	2011/10/24	2011/11/16	1208	
1401	Formwork and rebar fixing of base slab	7 days	2011/11/17	2011/11/24	1400	
1402	Concreting of base slab	1 day	2011/11/25	2011/11/25	1401	
1403	Stripping off formwork	2 days	2011/11/26	2011/11/28	1402	
1404	Rebar fixing and shuttering formwork for column	7 days	2011/11/29	2011/12/6	1403	
1405	Concreting	1 day	2011/12/7	2011/12/7	1404	
1406	Stripping off formwork	2 days	2011/12/8	2011/12/9	1405	
1407	**Construction of Decking (TB03)**	**34 days**	**2011/11/17**	**2011/12/28**		
1408	Modification of U/S table top	5 days	2011/11/17	2011/11/23	1406	
1409	Erection of steel falsework	4 days	2011/11/30	2011/12/3	1408	
1410	Deck finishing	19 days	2011/12/15	2012/1/10	1409	
1411	Railing installation	2 days	2011/12/15	2011/12/16	1409	
1412	**Lighting at Footbridge TB03**	**27 days**	**2011/12/17**	**2012/1/20**		
1413	Construction of Drawpits / Ductings	12 days	2011/12/17	2012/1/3	1411	
1414	Public lighting Installation (CE2321)	6 days	2012/1/4	2012/1/10	1413	
1415	Public lighting Installation (CE2322)	6 days	2012/1/11	2012/1/17	1414	
1416	T&C	1 day	2012/1/18	2012/1/18	1415	
1417	Removal of existing lighting (VA1309-Z1)	2 days	2012/1/19	2012/1/20	1416	
1418	**Step 1 (Ch 178)**	**25 days**	**2012/2/2**	**2012/3/1**		
1419	River Bed formation (Ch178-205)	5 days	2012/2/2	2012/2/7	1428	
1420	Construction of Step 1 (Assume Mass Concrete)	10 days	2012/2/8	2012/2/18	1419	
1421	Construction of Stilling Basin (Assume Precast Conc Blocks)	10 days	2012/2/20	2012/3/1	1420	
1422	**River Bed formation (Ch 150-178)**	**10 days**	**2012/3/2**	**2012/3/13**		
1423	Place Gabion mattress	10 days	2012/3/2	2012/3/13	1421	
1424						
1425	**Gabion Wall (Ch 178-222 RHS) TG1/TG1A**	**40 days**	**2011/12/10**	**2012/2/1**		
1426	Excavation and formation	25 days	2011/12/10	2012/1/11	1406	
1427	Construction of Gabion Wall (Ch 178-210 RHS)	25 days	2011/12/23	2012/1/27	1426FS-20 edays	
1428	Backfilling	4 days	2012/1/28	2012/2/1	1427	
1429						
1430	**Lighting CH 175-250**	**21 days**	**2012/2/3**	**2012/2/27**		
1431	Construction of Drawpits / Ductings	12 days	2012/2/3	2012/2/16	1228	
1432	Public lighting Installation (CE2319)	6 days	2012/2/17	2012/2/23	1431	
1433	Public lighting Installation (CE2320)	6 days	2012/2/17	2012/2/23	1431	
1434	Public lighting Installation (CE2323)	6 days	2012/2/17	2012/2/23	1431	
1435	Public lighting Installation (CE2324)	6 days	2012/2/17	2012/2/23	1431	
1436	T&C	1 day	2012/2/24	2012/2/24	1435	
1437	Removal of existing lighting (VE2641-A1)	2 days	2012/2/25	2012/2/27	1436	
1438	Removal of existing lighting (VA1310-A1)	2 days	2012/2/25	2012/2/27	1436	
1439						
1440	**Ch -23-45**	**613 days**	**2010/8/30**	**2012/8/15**		
1441	***Retaining Wall at Access D (Boulder Trap)***	***41 days***	***2010/9/1***	***2010/10/11***		
1461	***Filling Work at Boulder Trap (RHS of downstream)***	***6 days***	***2010/8/30***	***2010/9/4***		
1463	**Dwarf Wall (Ch 60-75) RHS**	**23 days**	**2011/10/3**	**2011/10/29**		
1464	Excavation and Blinding	4 days	2011/10/3	2011/10/7	1176	
1465	Formwork and rebar fixing of base slab	5 days	2011/10/8	2011/10/13	1464	



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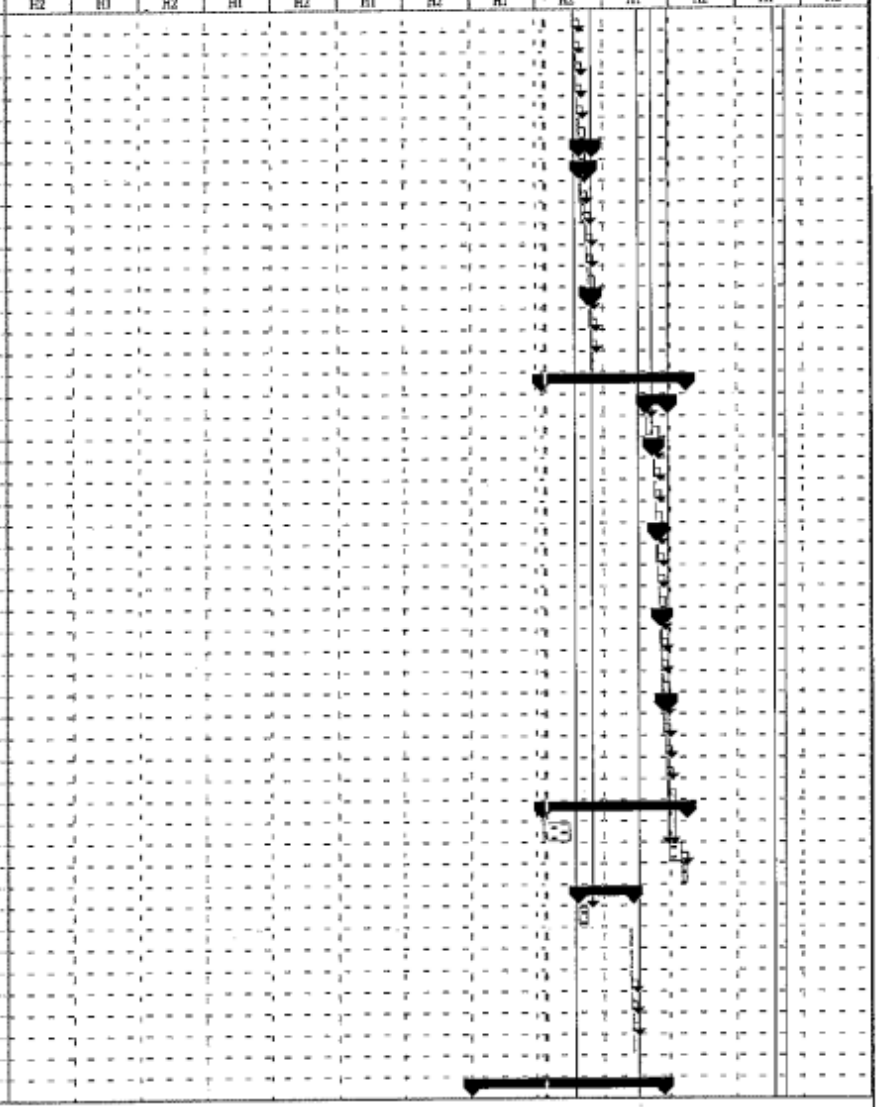
1466	Concreting of base slab	1 day	2011/10/14	2011/10/14	1465	
1467	Stripping off formwork	1 day	2011/10/15	2011/10/15	1466	
1468	Rebar fixing and shuttering formwork for column	5 days	2011/10/17	2011/10/21	1467	
1469	Concreting	1 day	2011/10/22	2011/10/22	1468	
1470	Stripping off formwork	1 day	2011/10/24	2011/10/24	1469	
1471	Backfill	5 days	2011/10/25	2011/10/29	1470	
1472	**Box Culvert 03 (Ch 45)**	**31 days**	**2011/10/31**	**2011/12/5**		
1473	**Construction of Base Slab**	**21 days**	**2011/10/31**	**2011/11/23**		
1474	Remove boulder and wire fence	5 days	2011/10/31	2011/11/4	1471	
1475	Excavation and Blinding	7 days	2011/11/5	2011/11/12	1474	
1476	Formwork and rebar fixing	5 days	2011/11/14	2011/11/18	1475	
1477	Concreting	1 day	2011/11/19	2011/11/19	1476	
1478	Stripping off formwork	5 days	2011/11/21	2011/11/23	1477	
1479	**Construction of Wall Stem and Top Slab**	**10 days**	**2011/11/24**	**2011/12/5**		
1480	Formwork and rebar fixing	4 days	2011/11/24	2011/11/28	1478	
1481	Concreting	1 day	2011/11/29	2011/11/29	1480	
1482	Stripping off formwork	5 days	2011/11/30	2011/12/5	1481	
1483	**Retaining Wall at Access D (Boulder Trap)**	**322 days**	**2011/7/18**	**2012/8/15**		
1484	**Retaining Wall (LHS)**	**49 days**	**2012/4/27**	**2012/6/26**		
1485	Excavation and blinding	14 days	2012/4/27	2012/5/15	1369	
1486	**Construction of Base Slab, Bay 2**	**8 days**	**2012/5/16**	**2012/5/24**		
1487	Formwork and rebar fixing	4 days	2012/5/16	2012/5/19	1485	
1488	Concreting	1 day	2012/5/21	2012/5/21	1487	
1489	Stripping off formwork	3 days	2012/5/22	2012/5/24	1488	
1490	**Construction of Base Slab, Bay 1**	**8 days**	**2012/5/25**	**2012/6/2**		
1491	Formwork and rebar fixing	4 days	2012/5/25	2012/5/29	1489	
1492	Concreting	1 day	2012/5/30	2012/5/30	1491	
1493	Stripping off formwork	3 days	2012/5/31	2012/6/2	1492	
1494	**Construction of Wall Stem, Bay 2**	**8 days**	**2012/6/4**	**2012/6/12**		
1495	Formwork and rebar fixing	4 days	2012/6/4	2012/6/7	1493	
1496	Concreting	1 day	2012/6/8	2012/6/8	1495	
1497	Stripping off formwork	3 days	2012/6/9	2012/6/12	1496	
1498	**Construction of Wall Stem, Bay 1**	**11 days**	**2012/6/13**	**2012/6/26**		
1499	Formwork and rebar fixing	4 days	2012/6/13	2012/6/16	1497	
1500	Concreting	1 day	2012/6/18	2012/6/18	1499	
1501	Stripping off formwork	3 days	2012/6/19	2012/6/21	1500	
1502	Backfill the Retaining Wall	3 days	2012/6/22	2012/6/26	1501	
1503	**Vehicular Access D**	**322 days**	**2011/7/18**	**2012/8/15**		
1504	Road Kerb and formation	64 days	2011/7/18	2011/9/30		
1505	Pavement	30 days	2012/6/27	2012/8/1	1368,1502	
1506	Railing and street furniture	12 days	2012/8/2	2012/8/15	1505	
1507	**Lighting at Access D**	**124 days**	**2011/10/24**	**2012/3/22**		
1508	Construction of Draw-pits / Ductings	21 days	2011/10/24	2011/11/16	1206	
1509	Public lighting Installation (CE2300)	3 days	2012/3/14	2012/3/16		
1510	Public lighting Installation (CE2301)	3 days	2012/3/14	2012/3/16		
1511	Public lighting Installation (CE2302)	3 days	2012/3/14	2012/3/16		
1512	T&C	1 day	2012/3/17	2012/3/17	1511	
1513	Removal of existing lighting (VA1278-A1)	2 days	2012/3/19	2012/3/20	1512	
1514	Removal of existing lighting (VA1279-A1)	2 days	2012/3/21	2012/3/22	1513	
1515						
1516	Ch 350-450	436 days?	2011/1/3	2012/6/13		



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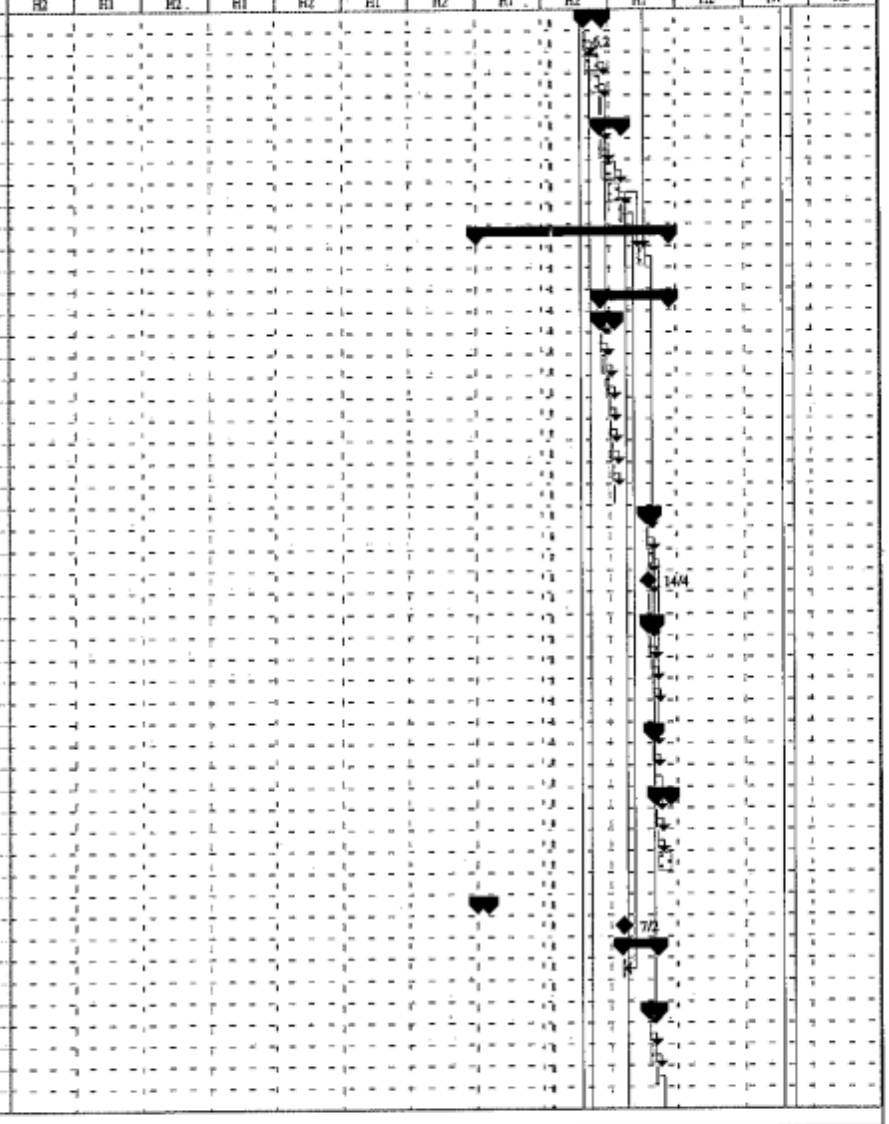
1517	**Gabion Wall (Ch 350-400 LHS) TR1 (AD)**	**42 days**	**2011/10/27**	**2011/12/14**		
1518	Remove Concrete block and shotcrete	7 days	2011/10/27	2011/11/3	1917	6.2
1519	Excavation and Formation	30 days	2011/11/1	2011/12/5	1518FS-3 edays	
1520	Laying concrete blocks and gabion blocks	23 days	2011/11/12	2011/12/8	1519FS-20 days	
1521	Backfilling	5 days	2011/12/9	2011/12/14	1520	
1522	**Gabion Wall (Ch 400-450 LHS) TR1 (AD)**	**46 days**	**2011/12/9**	**2012/2/7**		
1523	Remove Concrete block and shotcrete	7 days	2011/12/9	2011/12/16	1520	
1524	Excavation and Formation	30 days	2011/12/14	2012/1/20	1523FS-3 edays	
1525	Laying concrete blocks and gabion blocks	23 days	2012/1/3	2012/2/1	1524FS-20 edays	
1526	Backfilling	5 days	2012/2/2	2012/2/7	1525	
1527	**River Bed formation (Ch 350-400)**	**436 days?**	**2011/1/3**	**2012/6/13**		
1528	Placing Grade 500 toe Stone	14 days	2012/3/21	2012/4/10	1525,1304	
1529						
1530	**Footbridge TB06 (Ch 400)**	**149 days?**	**2011/12/9**	**2012/6/13**		
1531	**Construction of Abutment A (LHS)**	**30 days**	**2011/12/9**	**2012/1/16**		
1532	Remove Concrete block and shotcrete	3 days	2011/12/9	2011/12/12	1520	
1533	Excavation and Blinding	10 days	2011/12/13	2011/12/23	1532	
1534	Formwork and rebar fixing of base slab	5 days	2011/12/24	2011/12/31	1533	
1535	Concreting of base slab	1 day	2012/1/3	2012/1/3	1534	
1536	Stripping off formwork	2 days	2012/1/4	2012/1/5	1535	
1537	Rebar fixing and shuttering formwork for column	5 days	2012/1/6	2012/1/11	1536	
1538	Concreting	1 day	2012/1/12	2012/1/12	1537	
1539	Stripping off formwork	3 days	2012/1/13	2012/1/16	1538	
1540	**Construction of decking**	**14 days**	**2012/4/11**	**2012/4/26**		
1541	Erection of steel decks and deck	4 days	2012/4/11	2012/4/14	1528	
1542	Deck finishing	10 days	2012/4/16	2012/4/25	1541	
1543	NA	0 days	2012/4/14	2012/4/14	1541	
1544	Railing installation	2 days	2012/4/15	2012/4/16	1543	
1545	**Lighting at Footbridge TB06**	**14 days**	**2012/4/16**	**2012/5/3**		
1546	Construction of Drawpits / Ductings	6 days	2012/4/16	2012/4/21	1541	
1547	Public lighting Installation (CE2311)	3 days	2012/4/23	2012/4/25	1546	
1548	Public lighting Installation (CE2310)	3 days	2012/4/26	2012/4/30	1547	
1549	T&C	2 days	2012/5/2	2012/5/3	1548	
1550	**Demolition of Bridge TB-C**	**4 days?**	**2012/4/27**	**2012/5/3**		
1551	Water Pipe Diversion	1 day?	2012/4/27	2012/4/27	1542	
1552	Pedestrian Diversion/Demolition works	3 days	2012/4/30	2012/5/3	1551	
1553	**Construction of Gabion Wall at TB-C**	**35 days**	**2012/5/4**	**2012/6/13**		
1554	Excavation and Formation	3 days	2012/5/4	2012/5/7	1552	
1555	Gabion Wall Construction (TBC LHS)	2 days	2012/5/8	2012/5/9	1554	
1556	Backfilling	30 days	2012/5/10	2012/6/13	1555	
1557						
1558	***Gabion Wall (Ch 400-450 RHS) TR1 (replaced by AD1)***	***30 days***	***2011/1/3***	***2011/2/1***		
1562	***Gabion Wall (Ch 400-450 LHS) TR1 (replaced by AD1)***	***0 days***	***2012/2/7***	***2012/2/7***		dnl 1531
1567	**Maintainance Staircase (Ch 420 LHS)**	**77 days**	**2012/2/3**	**2012/5/9**		
1568	Formwork and concreting	4 days	2012/2/3	2012/2/7	1526FF	
1569						
1570	**Step 5 (Ch 410)**	**19 days**	**2012/4/16**	**2012/5/9**		TP3
1571	River Bed Formation (Ch400-410)	2 days	2012/4/16	2012/4/17	1541	
1572	Construction of Step 5 (Assume Mass Concrete)	10 days	2012/4/18	2012/4/30	1571	
1573	Construction of Stilling Basin (Assume Precast Conc Blocks)	7 days	2012/5/2	2012/5/9	1572	
1574						



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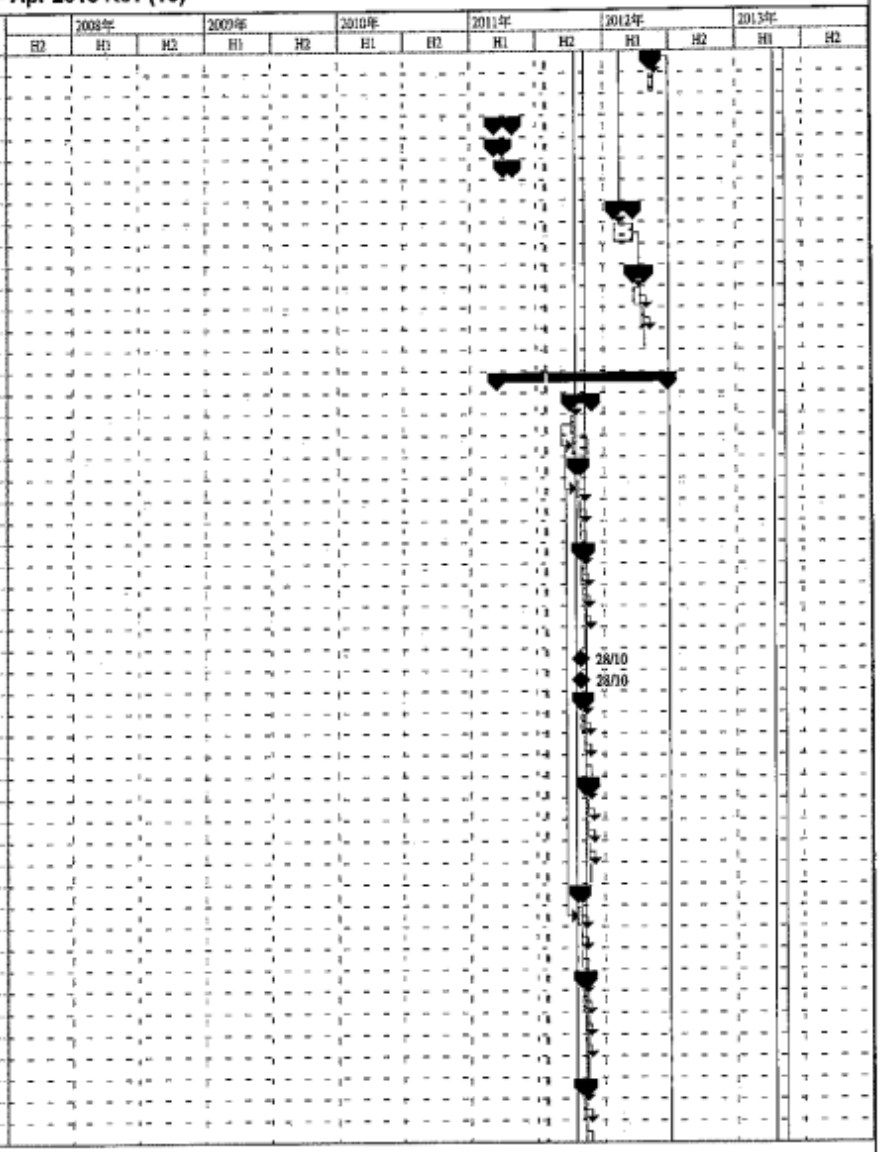
1575	**River Bed formation (Ch 410-450)**	**10 days**	**2012/5/10**	**2012/5/21**		TP5
1576	Placing Grade 500 toe Stone	10 days	2012/5/10	2012/5/21	1573	
1577						
1578	***Box Culvert TB01 (Ch 450)***	***40 days***	***2011/3/10***	***2011/4/29***		
1579	***Construction of Base Slab***	***21 days***	***2011/3/10***	***2011/4/2***	*1560*	
1584	***Construction of Wall Stem and Top Slab***	***19 days***	***2011/4/4***	***2011/4/29***		
1588						
1589	**Drainage & Footpath (Ch350-450) LHS & RHS**	**45 days**	**2012/2/2**	**2012/3/24**		
1590	Drainage & Footpath (Ch350-450) LHS & RHS	45 days	2012/2/2	2012/3/24	1525	
1591						
1592	**Lighting at CH 350-380**	**23 days**	**2012/3/26**	**2012/4/25**		
1593	Construction of Draw pits / Ductings	14 days	2012/3/26	2012/4/14	1590	
1594	Public lighting Installation (CE2312)	7 days	2012/4/16	2012/4/23	1593	
1595	T&C	2 days	2012/4/24	2012/4/25	1594	
1596						
1597	**Ch 450-525**	**380 days**	**2011/3/16**	**2012/6/27**		
1598	**Retaining Wall (ch 450-500) TR2 (RHS)**	**50 days**	**2011/10/3**	**2011/11/30**		TP4
1599	Remove Concrete block and shotcrete	7 days	2011/10/3	2011/10/11	1176	
1600	Excavation and Formation	35 days	2011/10/8	2011/11/17	1599SS+4 days	
1601	**Base Slab Construction Bay 1+2 (RHS)**	**10 days**	**2011/10/18**	**2011/10/28**		
1602	Formwork and rebar fixing	8 days	2011/10/18	2011/10/26	1600SS+10 edays	
1603	Concreting	1 day	2011/10/27	2011/10/27	1602	
1604	Stripping off formwork	1 day	2011/10/28	2011/10/28	1603	
1605	**Wall Stem Construction Bay 1+2 (RHS)**	**13 days**	**2011/10/29**	**2011/11/12**		
1606	Formwork and rebar fixing	6 days	2011/10/29	2011/11/4	1604	
1607	Concreting	1 day	2011/11/5	2011/11/5	1606	
1608	Stripping off formwork	2 days	2011/11/7	2011/11/8	1607	
1609	Backfill	4 days	2011/11/9	2011/11/12	1608	
1610	**Base Slab Construction Bay 2 (RHS) del**	**0 days**	**2011/10/28**	**2011/10/28**		
1614	**Wall Stem Construction Bay 2 (RHS) del**	**0 days**	**2011/10/28**	**2011/10/28**		
1619	**Base Slab Construction Bay 3 (RHS)**	**10 days**	**2011/10/29**	**2011/11/9**		
1620	Formwork and rebar fixing	8 days	2011/10/29	2011/11/7	1604	
1621	Concreting	1 day	2011/11/8	2011/11/8	1620	
1622	Stripping off formwork	1 day	2011/11/9	2011/11/9	1621	
1623	**Wall Stem Construction Bay 3 (RHS)**	**13 days**	**2011/11/10**	**2011/11/24**		
1624	Formwork and rebar fixing	6 days	2011/11/10	2011/11/16	1622	
1625	Concreting	1 day	2011/11/17	2011/11/17	1624	
1626	Stripping off formwork	2 days	2011/11/18	2011/11/19	1625	
1627	Backfill	4 days	2011/11/21	2011/11/24	1626	
1628	**Base Slab Construction Bay 4 (incl. Step 6)(RHS)**	**10 days**	**2011/10/20**	**2011/10/31**		
1629	Formwork and rebar fixing	8 days	2011/10/20	2011/10/28	1602SS+2 days	
1630	Concreting	1 day	2011/10/29	2011/10/29	1629	
1631	Stripping off formwork	1 day	2011/10/31	2011/10/31	1630	
1632	**Wall Stem Construction Bay 4 (RHS)**	**13 days**	**2011/11/1**	**2011/11/15**		
1633	Formwork and rebar fixing	6 days	2011/11/1	2011/11/7	1631	
1634	Concreting	1 day	2011/11/8	2011/11/8	1633	
1635	Stripping off formwork	2 days	2011/11/9	2011/11/10	1634	
1636	Backfill	4 days	2011/11/11	2011/11/15	1635	
1637	**Base Slab Construction Bay 5 (incl. Step 6) (RHS)**	**13 days**	**2011/11/1**	**2011/11/15**		
1638	Formwork and rebar fixing	8 days	2011/11/1	2011/11/9	1631	
1639	Concreting	1 day	2011/11/10	2011/11/10	1638	



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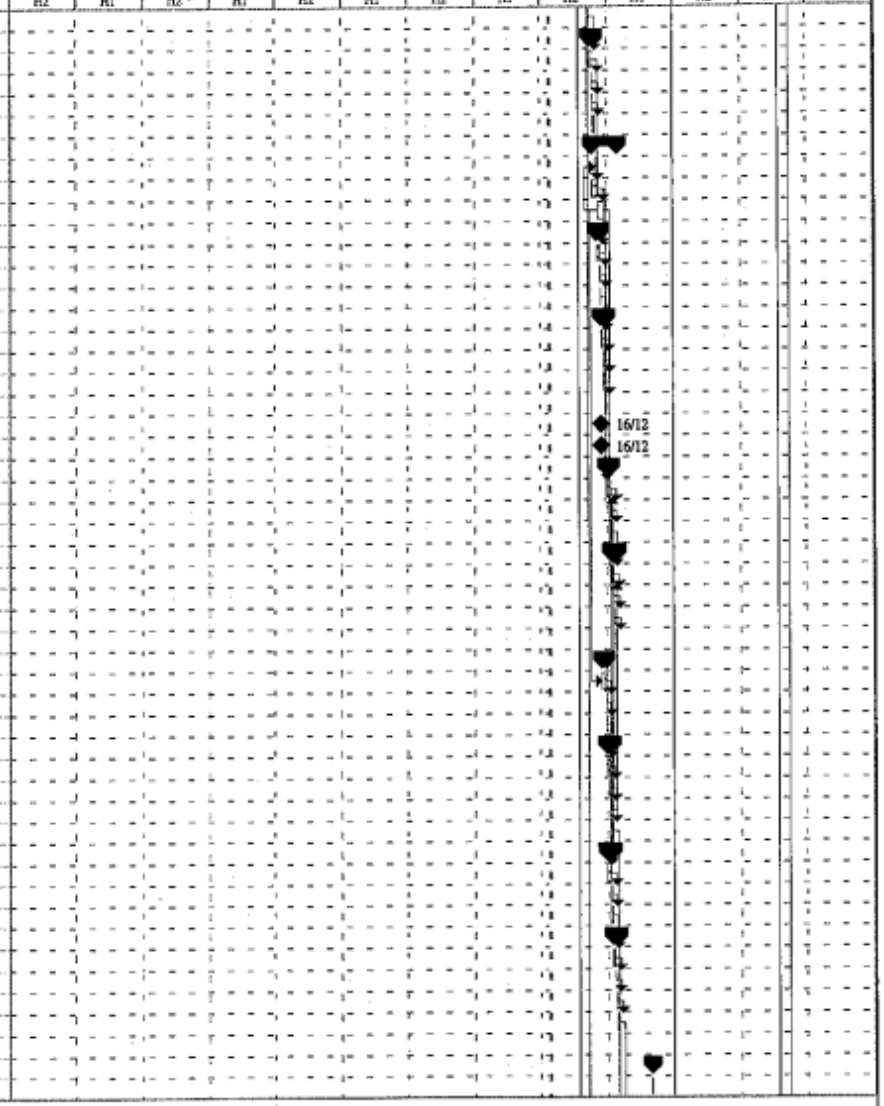
1640	Stripping off formwork	4 days	2011/11/11	2011/11/15	1639	
1641	**Wall Stem Construction Bay 5 (RRS)**	**13 days**	**2011/11/16**	**2011/11/30**		
1642	Formwork and rebar fixing	6 days	2011/11/16	2011/11/22	1640	
1643	Concreting	1 day	2011/11/23	2011/11/23	1642	
1644	Stripping off formwork	2 days	2011/11/24	2011/11/25	1643	
1645	Backfill	4 days	2011/11/26	2011/11/30	1644	
1646	**Retaining Wall (ch 450-500) TR2 (LHS)**	**54 days**	**2011/11/23**	**2012/1/31**		TP4
1647	Demolition of House 2 Sha Po Tsai	7 days	2011/12/2	2011/12/9	1649SS-7 edays	
1648	Excavation and Formation for TR2 Bay 1 to Bay 3	14 days	2011/11/23	2011/12/6	1642	
1649	Excavation and Formation for TR2 Bay 4 to Bay 5	14 days	2011/12/9	2011/12/24	1648	
1650	**Base Slab Construction Bay 1+2 (LHS)**	**10 days**	**2011/12/6**	**2011/12/16**		
1651	Formwork and rebar fixing (with DWP)	8 days	2011/12/6	2011/12/14	1648FS-3 days	
1652	Concreting	1 day	2011/12/15	2011/12/15	1651	
1653	Stripping off formwork	1 day	2011/12/16	2011/12/16	1652	
1654	**Wall Stem Construction Bay 1+2 (LHS)**	**11 days**	**2011/12/17**	**2011/12/31**		
1655	Formwork and rebar fixing	5 days	2011/12/17	2011/12/22	1653	
1656	Concreting	1 day	2011/12/23	2011/12/23	1655	
1657	Stripping off formwork	1 day	2011/12/24	2011/12/24	1656	
1658	Backfill	4 days	2011/12/28	2011/12/31	1657	
1659	**Base Slab Construction Bay 2 (LHS) del**	**0 days**	**2011/12/16**	**2011/12/16**		
1663	**Wall Stem Construction Bay 2 (LHS) del**	**0 days**	**2011/12/16**	**2011/12/16**		
1666	**Base Slab Construction Bay 3 (LHS)**	**10 days**	**2011/12/31**	**2012/1/12**		
1669	Formwork and rebar fixing (with DWP)	8 days	2011/12/31	2012/1/10	1648,1660	
1670	Concreting	1 day	2012/1/11	2012/1/11	1669	
1671	Stripping off formwork	1 day	2012/1/12	2012/1/12	1670	
1672	**Wall Stem Construction Bay 3 (LHS)**	**11 days**	**2012/1/13**	**2012/1/28**		
1673	Formwork and rebar fixing	5 days	2012/1/13	2012/1/18	1671,1684	
1674	Concreting	1 day	2012/1/19	2012/1/19	1673	
1675	Stripping off formwork	1 day	2012/1/20	2012/1/20	1674	
1676	Backfill	4 days	2012/1/21	2012/1/28	1675	
1677	**Base Slab Construction Bay 4 (incl. Step 6)(LHS)**	**10 days**	**2011/12/17**	**2011/12/30**		
1678	Formwork and rebar fixing (with DWP)	8 days	2011/12/17	2011/12/28	1649SS+7 days	
1679	Concreting	1 day	2011/12/29	2011/12/29	1678	
1680	Stripping off formwork	1 day	2011/12/30	2011/12/30	1679	
1681	**Wall Stem Construction Bay 4 (LHS)**	**11 days**	**2011/12/31**	**2012/1/13**		
1682	Formwork and rebar fixing	5 days	2011/12/31	2012/1/6	1680	
1683	Concreting	1 day	2012/1/7	2012/1/7	1682	
1684	Stripping off formwork	1 day	2012/1/9	2012/1/9	1683	
1685	Backfill	4 days	2012/1/10	2012/1/13	1684	
1686	**Base Slab Construction Bay 5 (incl. Step 6) (LHS)**	**12 days**	**2011/12/31**	**2012/1/14**		
1687	Formwork and rebar fixing (with DWP)	7 days	2011/12/31	2012/1/9	1649,1680	
1688	Concreting	1 day	2012/1/10	2012/1/10	1687	
1689	Stripping off formwork	4 days	2012/1/11	2012/1/14	1688	
1690	**Wall Stem Construction Bay 5 (LHS)**	**11 days**	**2012/1/16**	**2012/1/31**		
1691	Formwork and rebar fixing	5 days	2012/1/16	2012/1/20	1689	
1692	Concreting	1 day	2012/1/21	2012/1/21	1691	
1693	Stripping off formwork	1 day	2012/1/26	2012/1/26	1692	
1694	Backfill	4 days	2012/1/27	2012/1/31	1693	
1695						
1696	**Drainage & Footpath (Ch 450-490 RRS)**	**1 day**	**2012/5/2**	**2012/5/3**		
1697	Construction of drainage & footpath	1 day	2012/5/2	2012/5/2		



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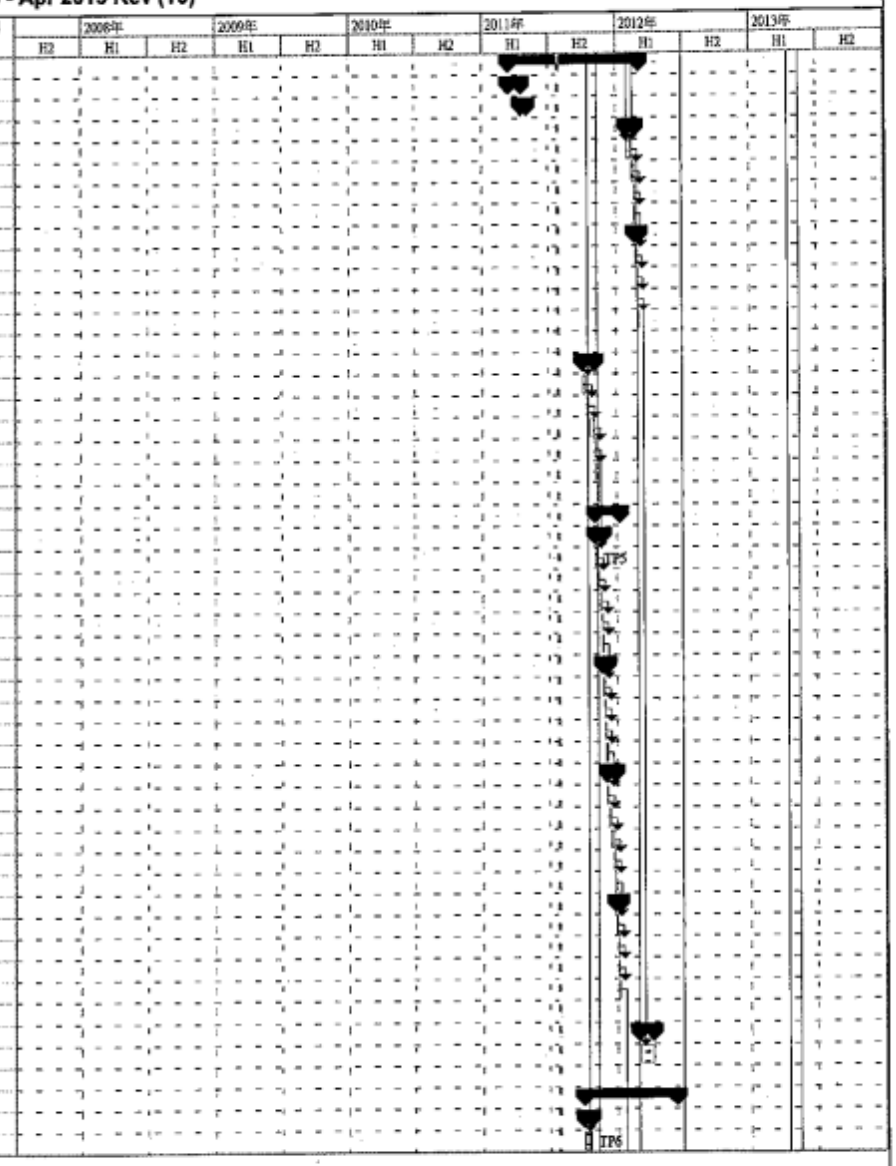
1698	**Retaining Wall (Ch 500-530) TR3 (RHS)**	**290 days**	**2011/3/16**	**2012/3/6**		
1699	***Base Slab Construction Bay 1 (incl. Step 7) (RHS)***	***28 days***	***2011/5/16***	***2011/6/18***		
1704	***Wall Stem Construction Bay 1 (RHS)***	***10 days***	***2011/6/19***	***2011/6/3***		
1709	**Base Slab Construction Bay 2 (incl. Step 7)(RHS)**	**20 days**	**2012/2/1**	**2012/2/23**		TP4
1710	Excavation and Formation	12 days	2012/2/1	2012/2/14	1694,1685	
1711	Formwork and rebar fixing	6 days	2012/2/15	2012/2/21	1710	
1712	Concreting	1 day	2012/2/22	2012/2/22	1711	
1713	Stripping off formwork	1 day	2012/2/23	2012/2/23	1712	
1714	**Wall Stem Construction Bay 2 (RHS)**	**10 days**	**2012/2/24**	**2012/3/6**		
1715	Formwork and rebar fixing	4 days	2012/2/24	2012/2/28	1713	
1716	Concreting	1 day	2012/2/29	2012/2/29	1715	
1717	Stripping off formwork	1 day	2012/3/1	2012/3/1	1716	
1718	Backfill	4 days	2012/3/2	2012/3/6	1717	
1719						
1720	**Cascades (Ch 500 LHS)**	**28 days**	**2011/10/3**	**2011/11/4**		TP5
1721	Water Diversion	7 days	2011/10/3	2011/10/9	1176	
1722	Excavation	7 days	2011/10/12	2011/10/19	1721	
1723	Formwork and rebar fixing	12 days	2011/10/20	2011/11/2	1722	
1724	Concreting	1 day	2011/11/3	2011/11/3	1723	
1725	Stripping off formwork	1 day	2011/11/4	2011/11/4	1724	
1726						
1727	**Retaining Wall (Ch 500-530) TR3 (LHS)**	**55 days**	**2011/11/4**	**2012/1/10**		
1728	**Base Slab Construction Bay 1 (incl. Step 7)(LHS)**	**18 days**	**2011/11/4**	**2011/11/24**		
1729	Remove Concrete Block and shotcrete	4 days	2011/11/4	2011/11/9	1724	TP5
1730	Excavation & blinding	6 days	2011/11/8	2011/11/14	1729FS-2 days	
1731	Formwork and rebar fixing (with DWF)	7 days	2011/11/15	2011/11/22	1730	
1732	Concreting	1 day	2011/11/23	2011/11/23	1731	
1733	Stripping off formwork	1 day	2011/11/24	2011/11/24	1732	
1734	**Wall Stem Construction Bay 1 (LHS)**	**10 days**	**2011/11/25**	**2011/12/6**		
1735	Formwork and rebar fixing	4 days	2011/11/25	2011/11/29	1733	
1736	Concreting	1 day	2011/11/30	2011/11/30	1735	
1737	Stripping off formwork	1 day	2011/12/1	2011/12/1	1736	
1738	Backfill	4 days	2011/12/2	2011/12/6	1737	
1739	**Base Slab Construction Bay 2 (incl. Step 7)(LHS)**	**19 days**	**2011/12/5**	**2011/12/28**		
1740	Remove Concrete Block and shotcrete	4 days	2011/12/5	2011/12/8	1738FS-2 days	
1741	Excavation & blinding	6 days	2011/12/9	2011/12/15	1740	
1742	Formwork and rebar fixing (with DWF)	7 days	2011/12/16	2011/12/23	1741	
1743	Concreting	1 day	2011/12/24	2011/12/24	1742	
1744	Stripping off formwork	1 day	2011/12/28	2011/12/28	1743	
1745	**Wall Stem Construction Bay 2 (LHS)**	**10 days**	**2011/12/29**	**2012/1/10**		
1746	Formwork and rebar fixing	4 days	2011/12/29	2012/1/3	1744	
1747	Concreting	1 day	2012/1/4	2012/1/4	1746	
1748	Stripping off formwork	1 day	2012/1/5	2012/1/5	1747	
1749	Backfill	4 days	2012/1/6	2012/1/10	1748	
1750						
1751	**Drainage & Footpath (Ch 490-525 RHS)**	**30 days**	**2012/3/2**	**2012/4/10**		
1752	Construction of drainage & footpath	30 days	2012/3/2	2012/4/10	1717	
1753						
1754	**Footbridge TB07 (Ch 525)**	**205 days**	**2011/10/3**	**2012/6/12**		TP6
1755	**Temporary Pedestrian Division**	**15 days**	**2011/10/3**	**2011/10/20**		
1756	Temporary Pedestrain Division (at grade)	14 days	2011/10/3	2011/10/20	1176	TP6



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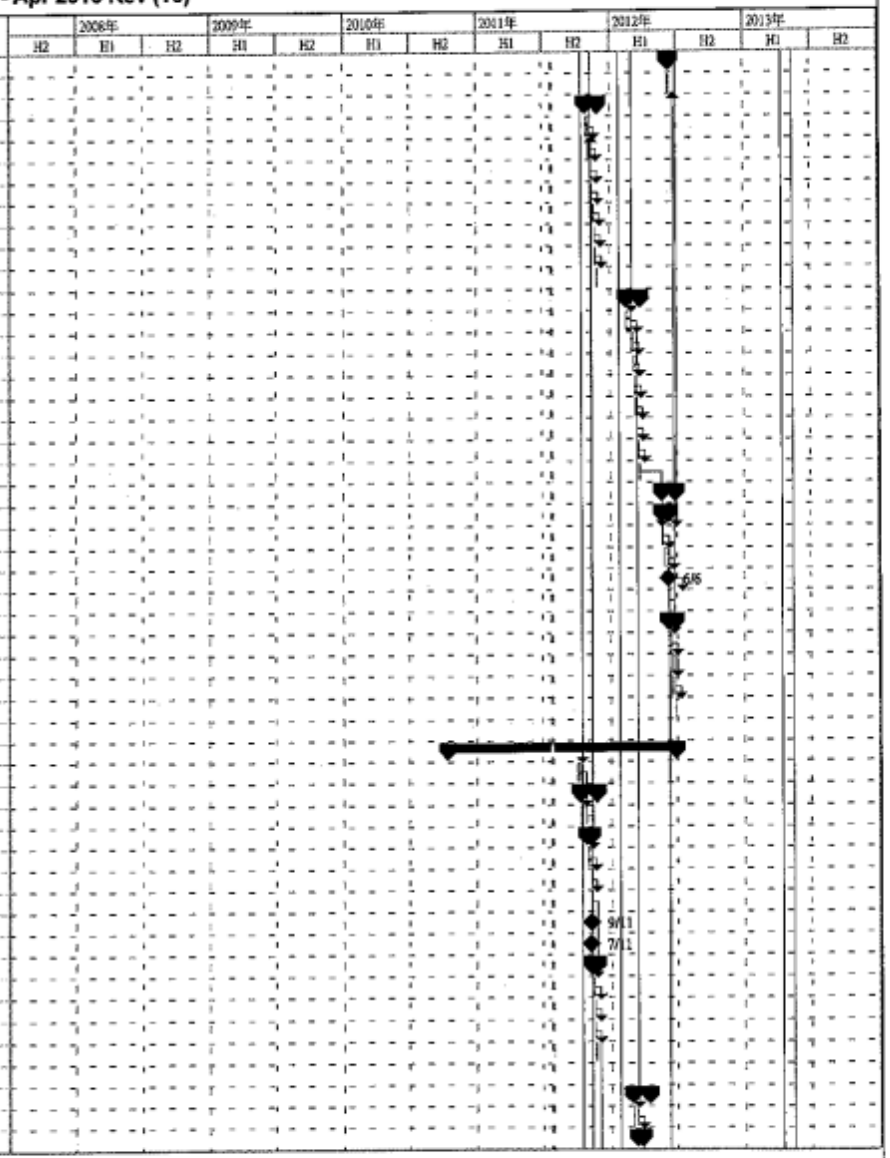
1757	**Demolition of existing Footbridge TB-D (Ch 525)**	**3 days**	**2012/6/9**	**2012/6/12**		
1758	Remove concrete pipes and demolition works	3 days	2012/6/9	2012/6/12	1782	
1759	**Construction of Abutment A**	**28 days**	**2011/10/28**	**2011/11/29**		
1760	Excavation and Blinding	7 days	2011/10/28	2011/11/4	1792	
1761	Formwork and rebar fixing for base slab	5 days	2011/11/5	2011/11/10	1760	
1762	Concreting of base slab	1 day	2011/11/11	2011/11/11	1761	
1763	Stripping off formwork	3 days	2011/11/12	2011/11/15	1762	
1764	Rebar fixing and shuttering formwork for column	4 days	2011/11/16	2011/11/19	1763	
1765	Concreting	1 day	2011/11/21	2011/11/21	1764	
1766	Stripping off formwork	3 days	2011/11/22	2011/11/24	1765	
1767	Backfill	4 days	2011/11/25	2011/11/29	1766	
1768	**Construction of Abutment B**	**33 days**	**2012/2/15**	**2012/3/23**		
1769	Excavation and Blinding	12 days	2012/2/15	2012/2/28	1710	
1770	Formwork and rebar fixing for base slab	5 days	2012/2/29	2012/3/5	1769	
1771	Concreting of base slab	1 day	2012/3/6	2012/3/6	1770	
1772	Stripping off formwork	3 days	2012/3/7	2012/3/9	1771	
1773	Rebar fixing and shuttering formwork for column	4 days	2012/3/10	2012/3/14	1772	
1774	Concreting	1 day	2012/3/15	2012/3/15	1773	
1775	Stripping off formwork	3 days	2012/3/16	2012/3/19	1774	
1776	Backfill	4 days	2012/3/20	2012/3/23	1775	
1777	**Footbridge TB07 (Ch 525)**	**31 days**	**2012/5/22**	**2012/6/27**		
1778	**Construction of decking**	**16 days**	**2012/5/22**	**2012/6/8**		
1779	Insertion of steel [illegible]	4 days	2012/5/22	2012/5/25	1778,1675	
1780	Deck [illegible]	10 days	2012/5/28	2012/6/8	1779	
1781	[illegible]	0 days	2012/6/8	2012/6/8	1780	
1782	[illegible]	2 days	2012/6/7	2012/6/8	1781	
1783	**Footbridge TB07 Lighting**	**15 days**	**2012/6/9**	**2012/6/27**		
1784	Construction of Draw pits / Ducting	7 days	2012/6/9	2012/6/16	1782	
1785	Public lighting Installation (CE2328)	6 days	2012/6/18	2012/6/25	1784	
1786	Public lighting Installation (CE2329)	6 days	2012/6/18	2012/6/25	1784	
1787	T&C	2 days	2012/6/26	2012/6/27	1786	
1788						
1789	**Ch 525-615**	**526 days**	**2010/10/15**	**2012/6/27**		
1790	River Diversion & Remove Conc Block	7 days	2011/10/3	2011/10/11	1736	
1791	**Retaining Wall (Ch 535-546) TR4 (LHS)**	**37 days**	**2011/10/12**	**2011/11/23**		
1792	Excavation and Formation	14 days	2011/10/12	2011/10/27	1790	
1793	**Base Slab Construction Bay 1&2 (LHS)**	**11 days**	**2011/10/28**	**2011/11/9**		
1794	Formwork and rebar fixing	8 days	2011/10/28	2011/11/5	1792	
1795	Concreting	1 day	2011/11/7	2011/11/7	1794	
1796	Stripping off formwork	2 days	2011/11/8	2011/11/9	1795	
1797	**Wall Stem Construction Bay 1 (LHS) delete**	**0 days**	**2011/11/9**	**2011/11/9**		
1802	**Base Slab Construction Bay 2 (LHS) del**	**0 days**	**2011/11/7**	**2011/11/7**		
1806	**Wall Stem Construction Bay 1&2 (LHS)**	**12 days**	**2011/11/10**	**2011/11/23**		
1807	Formwork and rebar fixing	6 days	2011/11/10	2011/11/16	1796	
1808	Concreting	1 day	2011/11/17	2011/11/17	1807	
1809	Stripping off formwork	1 day	2011/11/18	2011/11/18	1808	
1810	Backfill	4 days	2011/11/19	2011/11/23	1809	
1811						
1812	**Retaining Wall (Ch 535-546) TR4 (RHS)**	**36 days**	**2012/2/29**	**2012/4/14**		TP6
1813	Excavation and Formation	12 days	2012/2/29	2012/3/13	1769	
1814	**Base Slab Construction Bay 1+2 (RHS)**	**11 days**	**2012/3/14**	**2012/3/26**	**1813**	



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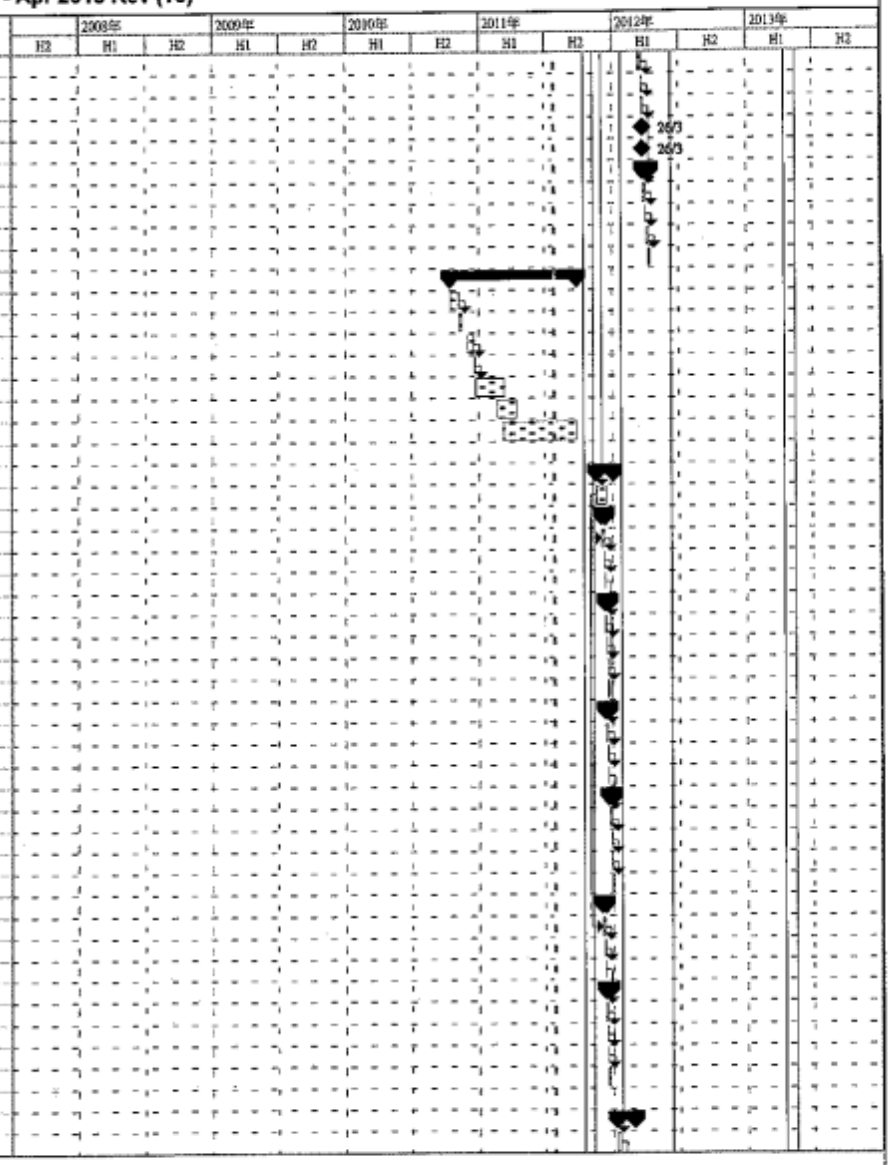
1815	Formwork and rebar fixing (with D/WF)	8 days	2012/3/14	2012/3/22	1813	
1816	Concreting	1 day	2012/3/23	2012/3/23	1815	
1817	Stripping off formwork	2 days	2012/3/24	2012/3/25	1816	
1818	**Wall Stem Construction Bay 1 (RHS) del**	**0 days**	**2012/3/26**	**2012/3/26**	**1817**	
1823	**Base Slab Construction Bay 2 (RHS) del**	**0 days**	**2012/3/26**	**2012/3/26**	**1821**	
1827	**Wall Stem Construction Bay 1+2 (RHS)**	**13 days**	**2012/3/27**	**2012/4/14**	**1826**	
1828	Formwork and rebar fixing	6 days	2012/3/27	2012/4/2	1817	
1829	Concreting	1 day	2012/4/3	2012/4/3	1828	
1830	Stripping off formwork	2 days	2012/4/5	2012/4/10	1829	
1831	Backfill	4 days	2012/4/11	2012/4/14	1830	
1832	**Retaining Wall TR5 Ch (546-596 RHS) TR5 (AD)**	**306 days**	**2010/10/15**	**2011/8/27**		
1833	*Construction of temp haul road*	*25 days*	*2010/10/15*	*2010/11/18*		
1834	*Demolition of Existing structure at slope crest*	*8 days*	*2010/11/19*	*2010/11/26*	1833	
1835	*Suspension of Work due to villagers rally*	*17 days*	*2010/12/2*	*2010/12/18*		
1836	*Construction of temporary ground beam*	*5 days*	*2010/12/19*	*2010/12/23*	1835	
1837	*Trimming of rock slope (from downstream to upstream)*	*73 days*	*2010/12/24*	*2011/3/11*	1836	
1838	*Install rock dowel*	*45 days*	*2011/2/22*	*2011/4/14*		
1839	Construction of skin wall (from DS to US, from toe to crest)	165 days	2011/3/10	2011/8/27		
1840						
1841	**Retaining Wall TR5A CH546-585 LHS**	**37 days**	**2011/11/19**	**2012/1/4**		TP7
1842	River diversion, Excavation and Formation	24 days	2011/11/19	2011/12/16	1809	
1843	**Base Slab Construction TR5A Bay 1 LHS**	**8 days**	**2011/12/3**	**2011/12/12**		
1844	Formwork and rebar fixing	6 days	2011/12/3	2011/12/9	1842SS+14 edays	
1845	Concreting	1 day	2011/12/10	2011/12/10	1844	
1846	Stripping off formwork	1 day	2011/12/12	2011/12/12	1845	
1847	**Wall Stem Construction TR5A Bay 1 LHS**	**9 days**	**2011/12/13**	**2011/12/22**		
1848	Formwork and rebar fixing	4 days	2011/12/13	2011/12/16	1846	
1849	Concreting	1 day	2011/12/17	2011/12/17	1848	
1850	Stripping off formwork	1 day	2011/12/19	2011/12/19	1849	
1851	Backfill	3 days	2011/12/20	2011/12/22	1850	
1852	**Base Slab Construction TR5A Bay 2 LHS**	**8 days**	**2011/12/13**	**2011/12/21**		
1853	Formwork and rebar fixing	6 days	2011/12/13	2011/12/19	1846	
1854	Concreting	1 day	2011/12/20	2011/12/20	1853	
1855	Stripping off formwork	1 day	2011/12/21	2011/12/21	1854	
1856	**Wall Stem Construction TR5A Bay 2 LHS**	**9 days**	**2011/12/22**	**2012/1/4**		
1857	Formwork and rebar fixing	4 days	2011/12/22	2011/12/28	1855	
1858	Concreting	1 day	2011/12/29	2011/12/29	1857	
1859	Stripping off formwork	1 day	2011/12/30	2011/12/30	1858	
1860	Backfill	3 days	2011/12/31	2012/1/4	1859	
1861	**Base Slab Construction TR5A Bay 3 LHS**	**8 days**	**2011/12/3**	**2011/12/13**		
1862	Formwork and rebar fixing	6 days	2011/12/3	2011/12/9	1844SS	
1863	Concreting	1 day	2011/12/10	2011/12/10	1862	
1864	Stripping off formwork	1 day	2011/12/12	2011/12/12	1863	
1865	**Wall Stem Construction TR5A Bay 3 LHS**	**10 days**	**2011/12/13**	**2011/12/23**		
1866	Formwork and rebar fixing	4 days	2011/12/13	2011/12/16	1864	
1867	Concreting	1 day	2011/12/17	2011/12/17	1866	
1868	Stripping off formwork	1 day	2011/12/19	2011/12/19	1867	
1869	Backfill	4 days	2011/12/20	2011/12/23	1868	
1870						
1871	**Box Culvert T802 (ch 580)**	**39 days**	**2012/1/11**	**2012/2/28**		
1872	Haul Road Diversion to TR3 Bay 3, River diversion, Excavation and Blinding	10 days	2012/1/11	2012/1/21	1749	



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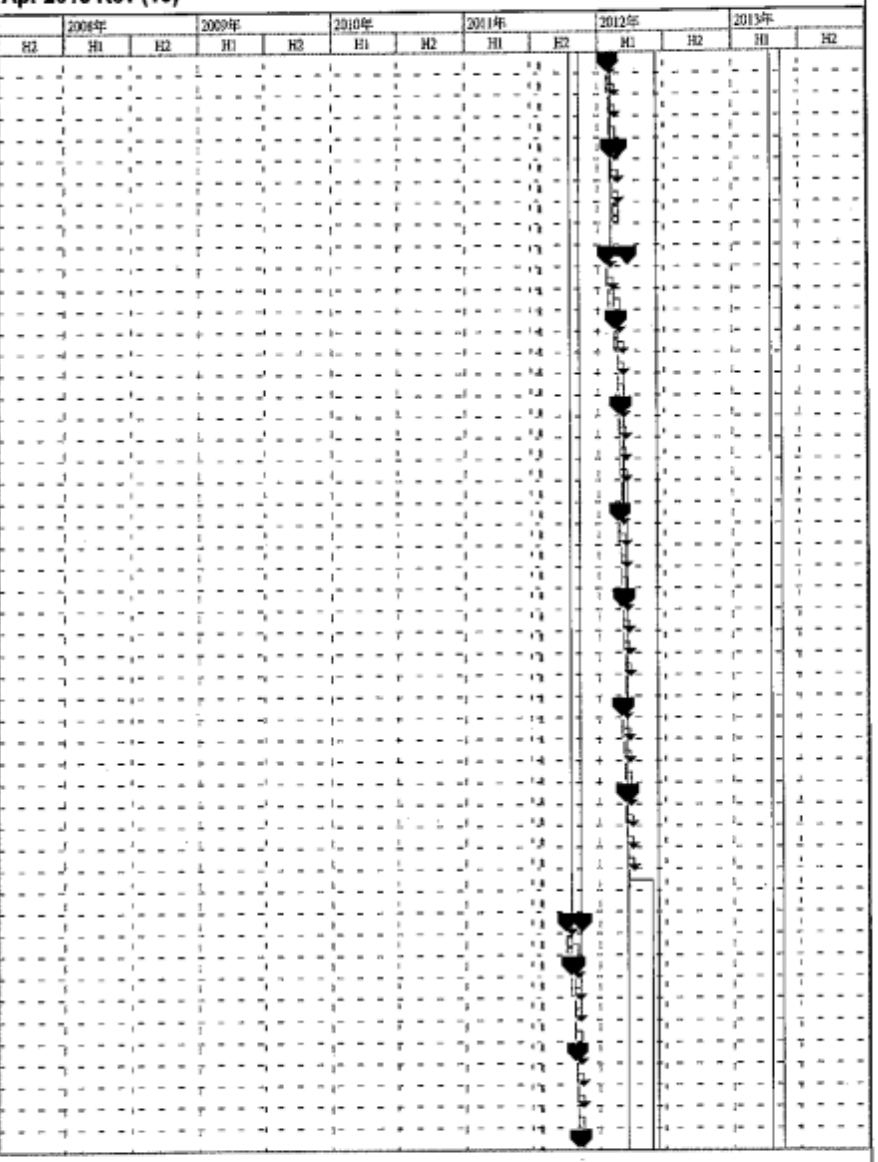
1873	**Construction of Base Slab**	**8 days**	**2012/1/26**	**2012/2/3**		
1874	Formwork and rebar fixing	6 days	2012/1/26	2012/2/1	1872	
1875	Concreting	1 day	2012/2/2	2012/2/2	1874	
1876	Stripping off formwork	1 day	2012/2/3	2012/2/3	1875	
1877	**Construction of Wall Stem and Top Slab**	**21 days**	**2012/2/4**	**2012/2/28**		
1878	Formwork and rebar fixing	6 days	2012/2/4	2012/2/10	1876	
1879	Concreting	1 day	2012/2/11	2012/2/11	1878	
1880	Stripping off formwork	14 days	2012/2/13	2012/2/28	1879	
1881						
1882	**Retaining Wall TR5A & TR6 CH585-595 LHS**	**50 days**	**2012/1/26**	**2012/3/23**		
1883	River/Haul Road Diversion (to TR3 and TR5 RHS)	3 days	2012/1/26	2012/1/28	1872	
1884	Excavation and Blinding	14 days	2012/1/30	2012/2/14	1883	
1885	**Base Slab Construction TR6 Bay 1 LHS**	**10 days**	**2012/2/15**	**2012/2/25**		
1886	Formwork and rebar fixing	8 days	2012/2/15	2012/2/23	1884	
1887	Concreting	1 day	2012/2/24	2012/2/24	1886	
1888	Stripping off formwork	1 day	2012/2/25	2012/2/25	1887	
1889	**Wall Stem Construction TR6 Bay 1 LHS**	**10 days**	**2012/2/27**	**2012/3/8**		
1890	Formwork and rebar fixing	4 days	2012/2/27	2012/3/1	1888	
1891	Concreting	1 day	2012/3/2	2012/3/2	1890	
1892	Stripping off formwork	1 day	2012/3/3	2012/3/3	1891	
1893	Backfill	4 days	2012/3/5	2012/3/8	1892	
1894	**Base Slab Construction TR5A Bay 4 LHS**	**8 days**	**2012/2/25**	**2012/3/5**		
1895	Formwork and rebar fixing	6 days	2012/2/25	2012/3/2	1887	
1896	Concreting	1 day	2012/3/3	2012/3/3	1895	
1897	Stripping off formwork	1 day	2012/3/5	2012/3/5	1896	
1898	**Wall Stem Construction TR5A Bay 4 LHS**	**10 days**	**2012/3/6**	**2012/3/16**		
1899	Formwork and rebar fixing	4 days	2012/3/6	2012/3/9	1897	
1900	Concreting	1 day	2012/3/10	2012/3/10	1899	
1901	Stripping off formwork	1 day	2012/3/12	2012/3/12	1900	
1902	Backfill	4 days	2012/3/13	2012/3/16	1901	
1903	**Base Slab Construction TR5A Bay 5 LHS**	**8 days**	**2012/3/3**	**2012/3/12**		
1904	Formwork and rebar fixing	6 days	2012/3/3	2012/3/9	1895	
1905	Concreting	1 day	2012/3/10	2012/3/10	1904	
1906	Stripping off formwork	1 day	2012/3/12	2012/3/12	1905	
1907	**Wall Stem Construction TR5A Bay 5 LHS**	**10 days**	**2012/3/13**	**2012/3/23**		
1908	Formwork and rebar fixing	4 days	2012/3/13	2012/3/16	1906	
1909	Concreting	1 day	2012/3/17	2012/3/17	1908	
1910	Stripping off formwork	1 day	2012/3/19	2012/3/19	1909	
1911	Backfill	4 days	2012/3/20	2012/3/23	1910	
1912						
1913	**Retaining Wall (ch 595-615) TR3 (Bay 3)**	**56 days**	**2011/10/3**	**2011/11/14**		6.1
1914	River diversion, Excavation and Formation	14 days	2011/10/3	2011/10/19	1176	
1915	**Base Slab Construction Bay 3 LHS**	**12 days**	**2011/10/14**	**2011/10/27**		
1916	Formwork and rebar fixing	10 days	2011/10/14	2011/10/25	1914FS-5 days	
1917	Concreting	1 day	2011/10/26	2011/10/26	1916	
1918	Stripping off formwork	1 day	2011/10/27	2011/10/27	1917	
1919	**Wall Stem Construction TR3 Bay 3 RHS**	**6 days**	**2011/10/28**	**2011/11/3**		
1920	Formwork and rebar fixing	4 days	2011/10/28	2011/11/1	1918	
1921	Concreting	1 day	2011/11/2	2011/11/2	1920	
1922	Stripping off formwork	1 day	2011/11/3	2011/11/3	1921	
1923	**Wall Stem Construction TR3 Bay 3 LHS**	**9 days**	**2011/11/4**	**2011/11/14**		



Revised Master Prog (Aug10-Apr13)
日期: 2011/3/26

任務 | 里程碑 | 上關型任務 | 上關型總成 | 外部任務 | 摘要群組
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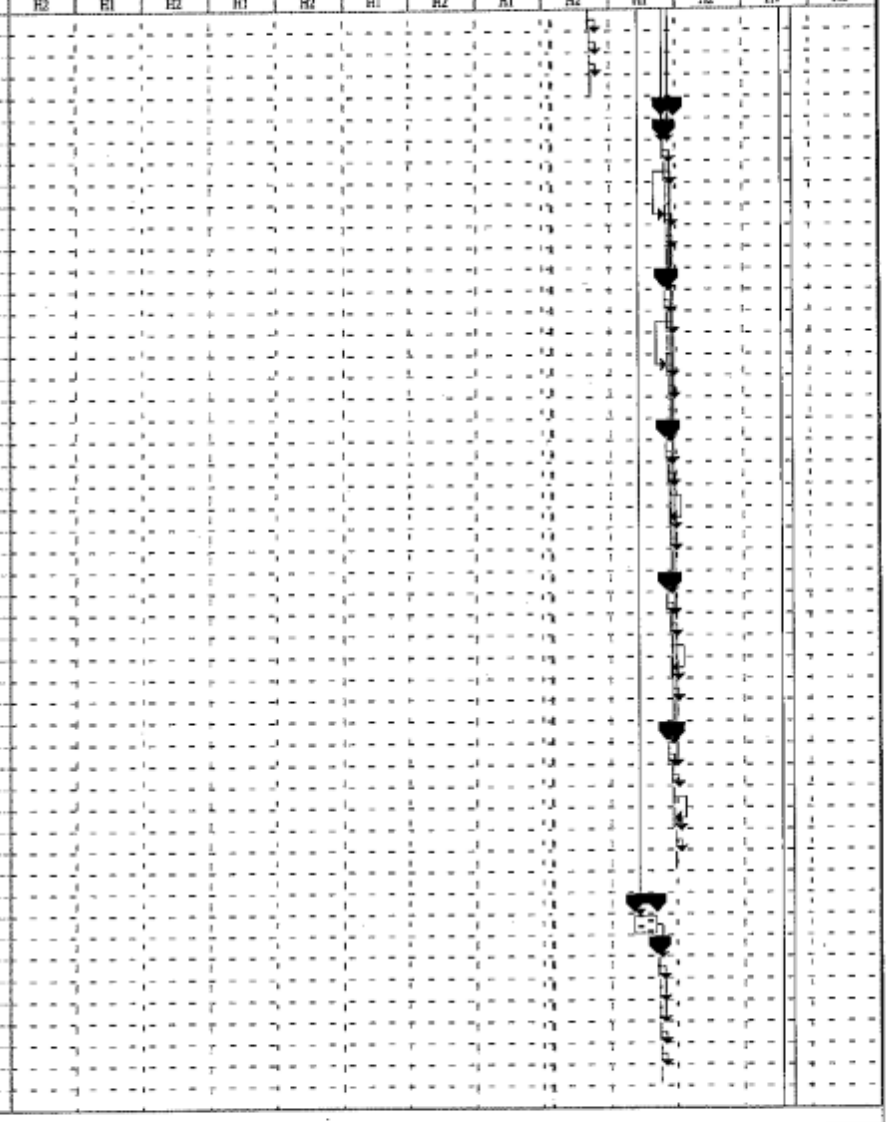
Drainage Services Department

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 (16)

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
1924	Formwork and rebar fixing	4 days	2011/11/4	2011/11/8	1922	
1925	Concreting	1 day	2011/11/9	2011/11/9	1924	
1926	Stripping off formwork	1 day	2011/11/10	2011/11/10	1925	
1927	back fill & diversion	3 days	2011/11/11	2011/11/14	1926	
1928	**Concrete Slab (Ch546 - Ch596) LHS**	**27 days**	**2012/5/26**	**2012/6/27**		
1929	**Bay 1**	**11 days**	**2012/5/26**	**2012/6/7**		
1930	Excavation/Blinding	3 days	2012/5/26	2012/5/29	1911,1779	
1931	Formwork and rebar fixing for DWF	4 days	2012/5/30	2012/6/2	1930	
1932	Concreting of DWF	1 day	2012/6/4	2012/6/4	1931	
1933	Formwork and rebar fixing for slab	4 days	2012/6/1	2012/6/5	1931SS+2 days	
1934	Concreting of slab	1 day	2012/6/6	2012/6/6	1933	
1935	Stripping off formwork	1 day	2012/6/7	2012/6/7	1934	
1936	**Bay 2**	**12 days**	**2012/5/30**	**2012/6/12**		
1937	Excavation/Blinding	2 days	2012/5/30	2012/5/31	1930	
1938	Formwork and rebar fixing for DWF	4 days	2012/6/4	2012/6/7	1937,1931	
1939	Concreting of DWF	1 day	2012/6/8	2012/6/8	1938	
1940	Formwork and rebar fixing for slab	4 days	2012/6/6	2012/6/9	1938SS+2 days	
1941	Concreting of slab	1 day	2012/6/11	2012/6/11	1940	
1942	Stripping off formwork	1 day	2012/6/12	2012/6/12	1941	
1943	**Bay 3**	**14 days**	**2012/6/1**	**2012/6/16**		
1944	Excavation/Blinding	2 days	2012/6/1	2012/6/2	1937	
1945	Formwork and rebar fixing for DWF	4 days	2012/6/7	2012/6/11	1944,1934	
1946	Concreting of DWF	1 day	2012/6/12	2012/6/12	1945,1938	
1947	Formwork and rebar fixing for slab	4 days	2012/6/11	2012/6/14	1946FF+2 days	
1948	Concreting of slab	1 day	2012/6/15	2012/6/15	1947	
1949	Stripping off formwork	1 day	2012/6/16	2012/6/16	1948	
1950	**Bay 4**	**16 days**	**2012/6/4**	**2012/6/21**		
1951	Excavation/Blinding	2 days	2012/6/4	2012/6/5	1944	
1952	Formwork and rebar fixing for DWF	4 days	2012/6/12	2012/6/15	1951,1945	
1953	Concreting of DWF	1 day	2012/6/16	2012/6/16	1952	
1954	Formwork and rebar fixing for slab	4 days	2012/6/15	2012/6/19	1953FF+2 days	
1955	Concreting of slab	1 day	2012/6/20	2012/6/20	1954	
1956	Stripping off formwork	1 day	2012/6/21	2012/6/21	1955	
1957	**Bay 5**	**18 days**	**2012/6/5**	**2012/6/27**		
1958	Excavation/Blinding	2 days	2012/6/6	2012/6/7	1951	
1959	Formwork and rebar fixing for DWF	4 days	2012/6/16	2012/6/20	1958,1952	
1960	Concreting of DWF	1 day	2012/6/21	2012/6/21	1959	
1961	Formwork and rebar fixing for slab	4 days	2012/6/20	2012/6/25	1960FF+2 days	
1962	Concreting of slab	1 day	2012/6/26	2012/6/26	1961	
1963	Stripping off formwork	1 day	2012/6/27	2012/6/27	1962	
1964						
1965	**Drainage and Footpath (Ch525-615 LHS & RHS)**	**48 days**	**2012/3/5**	**2012/5/5**		
1966	Construction of footpath & drainage works	48 days	2012/3/5	2012/5/5	1892	
1967	**Lighting at CH 550-610**	**10 days**	**2012/5/7**	**2012/5/17**		
1968	Construction of Drawpits / Ducting	6 days	2012/5/7	2012/5/12	1966	
1969	Public lighting Installation (CE2325)	2 days	2012/5/14	2012/5/15	1968	
1970	Public lighting Installation (CE2326)	2 days	2012/5/14	2012/5/15	1968	
1971	Public lighting Installation (CE2327)	2 days	2012/5/14	2012/5/15	1968	
1972	T&C	1 day	2012/5/16	2012/5/16	1971	
1973	Removal of existing lighting (CE1600-B2)	1 day	2012/5/17	2012/5/17	1972	
1974						



Revised Master Prog (Aug10-Apr1
日期: 2011/7/26

任務 里程碑 上層型任務 上層摘要 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

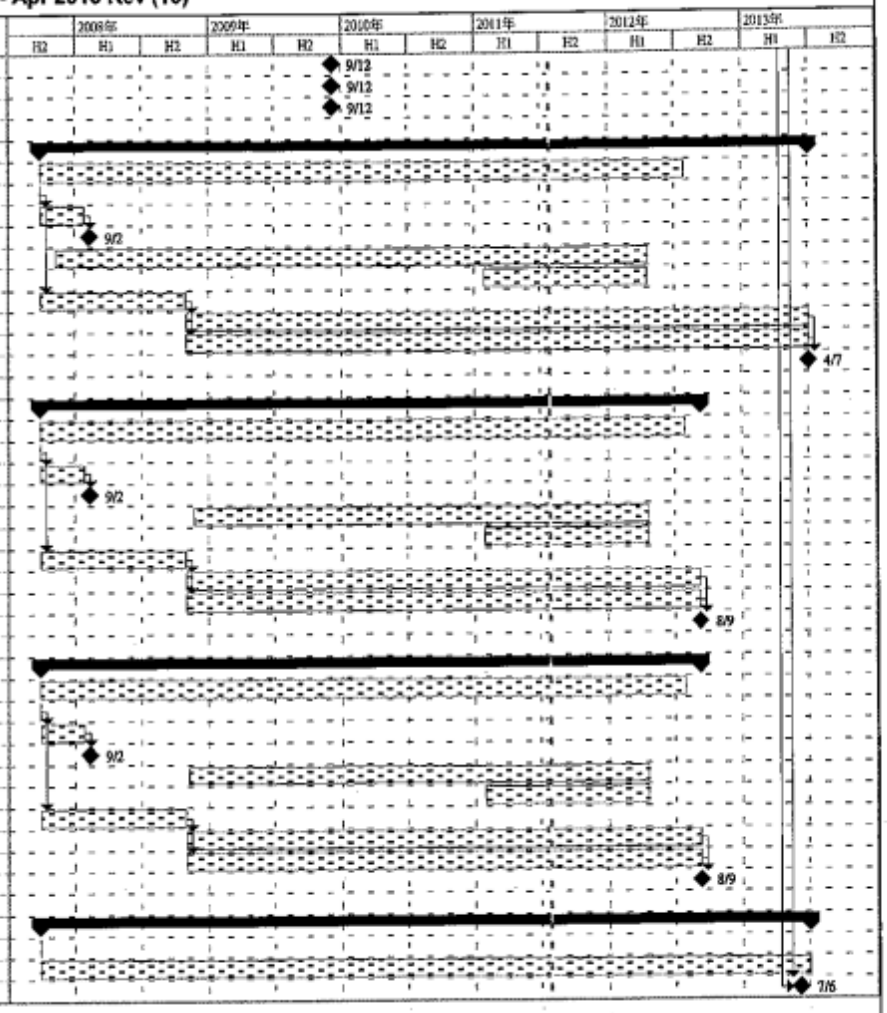
Drainage Services Department

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 (16)

識別號	任務名稱	工期	開始時間	完成時間	前置任務	資源名稱
1975	*Section 4 - Box Culvert at Ping Long*	*0 days*	*2009/12/9*	*2009/12/9*		
1976	*Section 4 - Box Culvert (Area A)*	*0 days*	*2009/12/9*	*2009/12/9*		
1977	*Completion of Work at Section 4*	*0 days*	*2009/12/9*	*2009/12/9*		
1978						
1979	Section 5 - Landscape Establishemnt Works (Portion B, C, D, E, F, (	1951 days?	2007/9/28	2013/7/4		
1980	Section 5 Landscape Works	1665 days	2007/9/28	2012/7/28		
1981	Commencement of Works	1 day	2007/9/28	2007/9/28		
1982	Material Submission	120 days	2007/9/29	2008/1/26	1981	
1983	Submission Approval	0 days	2008/2/9	2008/2/9	1982FS+14 days	
1984	Landscaping Hardworks	1541 days?	2007/11/9	2012/4/19		
1985	Landscaping Softworks	365 days	2011/1/28	2012/4/18		
1986	Submission of Tree Survey	400 days	2007/9/29	2008/11/1	1981	
1987	Preservation and Protection of Preserved Trees	1550 days	2008/11/2	2013/7/4	1986	
1988	Landscape Establishment Works	1550 days	2008/11/2	2013/7/4	1986	
1989	Completion of Works	0 days	2013/7/4	2013/7/4	1987,1988	
1990						
1991	Section 6 - Landscape Establishemnt Works (Portion J, K & M)	1701 days?	2007/9/28	2012/9/8		
1992	Section 6 Landscape Works	1665 days	2007/9/28	2012/7/28		
1993	Commencement of Works	1 day	2007/9/28	2007/9/28		
1994	Material Submission	120 days	2007/9/29	2008/1/26	1993	
1995	Submission Approval	0 days	2008/2/9	2008/2/9	1994FS+14 days	
1996	Landscaping Hardworks	1161 days?	2008/11/23	2012/4/19		
1997	Landscaping Softworks	365 days	2011/1/29	2012/4/19		
1998	Submission of Tree Survey	400 days	2007/9/29	2008/11/1	1993	
1999	Preservation and Protection of Preserved Trees	1300 days	2008/11/2	2012/9/8	1998	
2000	Landscape Establishment Works	1300 days	2008/11/2	2012/9/8	1998	
2001	Completion of Works	0 days	2012/9/8	2012/9/8	1999,2000	
2002						
2003	Section 7 - Landscape Establishemnt Works (Portion L, N & P)	1701 days?	2007/9/28	2012/9/8		
2004	Section 7 Landscape Works	1665 days	2007/9/28	2012/7/28		
2005	Commencement of Works	1 day	2007/9/28	2007/9/28		
2006	Material Submission	120 days	2007/9/29	2008/1/26	2005	
2007	Submission Approval	0 days	2008/2/9	2008/2/9	2006FS+14 days	
2008	Landscaping Hardworks	1176 days?	2008/11/8	2012/4/19		
2009	Landscaping Softworks	365 days	2011/1/29	2012/4/19		
2010	Submission of Tree Survey	400 days	2007/9/29	2008/11/1	2005	
2011	Preservation and Protection of Preserved Trees	1300 days	2008/11/2	2012/9/8	2010	
2012	Landscape Establishment Works	1300 days	2008/11/2	2012/9/8	2010	
2013	Completion of Works	0 days	2012/9/8	2012/9/8	2011,2012	
2014						
2015	Section 8 - All Remaining Work at All Portions	1950 days	2007/9/28	2013/7/3		
2016	Commencement of Works	1 day	2007/9/28	2007/9/28		
2017	All remaining works at all Area	1950 days	2007/9/28	2013/7/3		
2018	Completion of Works	0 days	2013/6/7	2013/6/7	2,555,1174,1177	



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任務 里程碑 上期型任務 上期型進度 外部任務 摘要群組
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Appendix J: Complaint Investigation Reports and Log

Environmental Pioneers & Solutions Ltd
大成環境科技拓展有限公司
豐盛創建機電集團附屬公司 *Subsidiary of FSE Engg Group*
豐盛創建企業成員 *Member of Fung Seng Enterprises*

Our ref. no.: DC0706-CL-111027(EPD)

3rd November 2011

To: Distribution List

Dear Sirs or Madams,

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

Complaint Investigation Report and Log

Based on the complaint incident received from EPD with details of:

EPD complaint ref.:	EP3/N05/RN/00021938-11
Date received:	27th October 2011
Incident location:	Upper Tai Po River (UTPR), nearby Sheung Wun Yiu
Description:	Two Complaints were referred by EPD regarding the observation of muddy water due to construction works along Upper Tai Po River.

Enclosed please find the complaint investigation report and log sheets of the incident as for your record.

Yours faithfully,

Goldie Fung
ET leader

Environmental Pioneers and Solutions Limited

c.c. SRE/AECOM (Mr. Colin Cheng)
RE/AECOM (Mr. Adrian Ng)
IEC/ERM (Ms. Winnie Ko)
Chiu Hing Project Manager (Mr. Alvin Ma)
Chiu Hing Site Agent (Mr. Gary Chan)
Chiu Hing Environmental Officer (Ms. Macy Fung)

Flat A, 19/F Chai Wan Industrial Centre, 20 Lee Chung Street, Chai Wan, Hong Kong
香港柴灣利眾街 20 號柴灣工業中心 19 字樓 A 座
Tel: (852) 2556 9172 Fax: (852) 2856 2010 http://www.epsl.com.hk

DSD Project – River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River

Report for Complaint/ Concern
Our Ref.: DC0706-CL-111027(EPD)
EPD complaint ref.: EP3/N05/RN/00021938-11

RECIPIENT

Name: Chiu Hing Construction & Transportation Co., Ltd,
Details: Two complaints, one from the public and the other one from the EPD monitoring team, were referred by EPD regarding on the observation of muddy water due to construction works at Upper Tai Po River (UTPR), nearby Sheung Wun Yiu.

Received Date: 27th October 2011 Received Time: N/A

COMPLAINANT / Concern

Name: N/A Tel: N/A
Address: N/A

COMPLAINT

☐Noise ☐Air quality/Dust ☑Water ☐Odour ☐Environment ☐Traffic/Pedestrian ☐Safety ☐Others

Event Date and Time: 27th October 2011

Location: Upper Tai Po River (UTPR), nearby Sheung Wun Yiu.

INVESTIGATION RESULTS, RECOMMENDATIONS & MITIGATION MEASURES

1. Two complaints, one from the public on 25th October 2011 and the other one from the EPD monitoring team on 27th October 2011, were recorded regarding the observation of muddy water due to construction works along Upper Tai Po River (UTPR). Environmental Team (ET) was informed by email on 27th October 2011 by the Residential Engineer (RE).

2. A routine site inspection covering site area at UTPR was carried out on 26th October 2011 with representatives from RE, ET, Contractor and Independent Environmental Checker. During the inspection, muddy surface runoff, site water seepage and soil erosion were observed to be causing water quality impact to the downstream area at excavated site at approximate ch.200 & 500 (Fig.2.1 & 2.2). As such, Contractor was requested to implement immediate corrective actions to stop further deterioration of water quality.

3. As reported by Contractor, the following immediate mitigation measures were implemented:
   i. Geo-textile earth bund was provided to avoid site water seeping into river channel.
   ii. Site water arisen from construction activities was diverted to sedimentation tank for de-silting before discharge.
   iii. A chemically enhanced sedimentation tank was provided at ch.400 for more effective water treatment.

4. ET has conducted a site investigation on 29th October 2011 with representatives from Contractor to resolve the concern. During the investigation, it was observed that diversion of the river channel was being carried out at ch.50 – ch300. Muddy water was generated from construction activities and soil erosion of the exposed riverbanks which caused adverse impact to the downstream area (Fig.4.1 to 4.2). As reported by Contractor, the purpose of the aforesaid works was to avoid the direct contamination of the river from the construction activities. Contractor was seriously requested to implement immediate corrective measures including covering the exposed

riverbank, provision of sandbag barriers and bund wall to avoid surface runoff and site water seepage from entering into river channel, and provision of de-silting facility for treating site water before discharge.

5. As a follow up investigation, second site inspection was carried out on 2nd November 2011 to check if proper follow up mitigation measures were implemented. During the investigation, geo-textile coving was provided at ch.50 to avoid soil erosion. However, muddy water was still observed from ch.500 which caused by surface runoff generated from overflowing of wheel washing bay at ch.600 and seepage of underground water and domestic waste water (Fig.5.1 to 5.3). Contractor was requested to implement immediate corrective actions to stop further deterioration of water quality.

6. As reported by Contractor on 3rd November 2011, immediate corrective actions were implemented to stop muddy water generation, including:
   - Provision of earth bunds to avoid leakage of muddy runoff entering into the river at ch.500.
   - Provision of de-silting facility for the wheel washing bay at ch.600

   After the mitigation measures implemented by Contractor, no further contaminated water discharged into the river and the river quality was acceptable (Fig.6.1 & 6.2).

7. Contractor was seriously recommended to review their site conditions and implement necessary water quality mitigation measures to avoid further deterioration of river water quality, which should at least include:
   - Proper temporary drainage system should be provided on site for site water diversion as to avoid surface runoff and site water seepage from entering into river channel.
   - Haul access and excavated area should be enclosed with proper bund walls.
   - Riverbanks, soil slopes and earth bunds should be covered with geo-textile materials to avoid erosion by water.
   - Any site water, wastewater, underground water and runoff arisen from construction activities should be diverted to proper site water treatment system before discharge; sedimentation tank using chemicals to enhance its treatment effectiveness should be adopted for silty water whenever it is necessary.
   - Site water treatment facilities should be regularly checked and maintained as to ensure those are in good condition and functional.
   - Excessive storage of earth materials should be prevented on site; earthy materials should not be stockpiled next to the river channel as to avoid soil runoff.

8. To meet relevant environmental ordinance such as Environmental Impact Assessment Ordinance (EIAO) and Water Pollution Control Ordinance (WPCO), Contractor was seriously reminded that direct discharge of site water is not allowed and site water seepage to the river should be prevented.

Signature:

Goldie Fung, ET Leader

Date: 3-11-2011

Fig.2.1 –The river banks were barely exposed which caused soil erosion.

Fig.2.2 –Seepage of untreated site water directly into the river.

Fig.4.1 – River bank was barely exposed without proper protective measures.

Fig.4.2 – Muddy water was generated from river diversion work.

Fig.5.1 – Geo-textile covering was provided to prevent soil erosion.

Fig.5.2 – Muddy surface runoff caused by seeping of underground water and domestic waste water.

Fig.5.3 – Leakage of contaminated water from the overflowed wheel washing bay.

Fig.6.1 – Earth bunds was provided to avoid leakage of muddy runoff entering into the river (photo provided by Contractor).

Fig.6.2 – The river quality was acceptable with no muddy water observed (photo provided by Contractor).

COMPLAINT / CONCERN LOG

Ref: DC0706-CL-111027(EPD)

Log Ref	Event Date/Location	Complainant/ Date of Contact	Details of Complaint	Investigation/Mitigation Action	File Closed
Our REF: DC0706-CL-111027(EPD) EPD complaint ref.: EP3/N05/RN/00021938-11	27th October 2011, Project site at Upper Tai Po River (UTPR), nearby Sheung Wun Yiu	Two Complaints were referred by EPD on 27th October 2011	Two complaints, one from the public and the other one from the EPD monitoring team, were referred by EPD regarding on the observation of muddy water due to construction works at Upper Tai Po River (UTPR), nearby Sheung Wun Yiu.	1. Two complaints, one from the public on 25th October 2011 and the other one from the EPD monitoring team on 27th October 2011, were recorded regarding the observation of muddy water due to construction works along Upper Tai Po River (UTPR). Environmental Team (ET) was informed by email on 27th October 2011 by the Residential Engineer (RE). 2. A routine site inspection covering site area at UTPR was carried out on 26th October 2011 with representatives from RE, ET, Contractor and Independent Environmental Checker. During the inspection, muddy surface runoff, site water seepage and soil erosion were observed to be causing water quality impact to the downstream area at excavated site at approximate ch.200 & 500 (Fig.2.1 & 2.2). As such, Contractor was requested to implement immediate corrective actions to stop further deterioration of water quality. 3. As reported by Contractor, the following immediate mitigation measures were implemented: i. Geo-textile earth bund was provided to avoid site water seeping into river channel. ii. Site water arisen from construction activities was diverted to sedimentation tank for de-silting before discharge. iii. A chemically enhanced sedimentation tank was provided at ch.400 for more effective water treatment.	Yes

				4. ET has conducted a site investigation on 29th October 2011 with representatives from Contractor to resolve the concern. During the investigation, it was observed that diversion of the river channel was being carried out at ch.50 – ch300. Muddy water was generated from construction activities and soil erosion of the exposed riverbanks which caused adverse impact to the downstream area (Fig.4.1 to 4.2). As reported by Contractor, the purpose of the aforesaid works was to avoid the direct contamination of the river from the construction activities. Contractor was seriously requested to implement immediate corrective measures including covering the exposed riverbank, provision of sandbag barriers and bund wall to avoid surface runoff and site water seepage from entering into river channel, and provision of de-silting facility for treating site water before discharge. 5. As a follow up investigation, second site inspection was carried out on 2nd November 2011 to check if proper follow up mitigation measures were implemented. During the investigation, geo-textile coving was provided at ch.50 to avoid soil erosion. However, muddy water was still observed from ch.500 which caused by surface runoff generated from overflowing of wheel washing bay at ch.600 and seepage of underground water and domestic waste water (Fig.5.1 to 5.3). Contractor was requested to implement immediate corrective actions to stop further deterioration of water quality. 6. As reported by Contractor on 3rd November 2011, immediate corrective actions were implemented to stop muddy water generation, including: iv. Provision of earth bunds to avoid leakage of muddy runoff entering into the river at ch.500. v. Provision of de-silting facility for the wheel	

				washing bay at ch.600 After the mitigation measures implemented by Contractor, no further contaminated water discharged into the river and the river quality was acceptable (Fig.6.1 & 6.2). 7. Contractor was seriously recommended to review their site conditions and implement necessary water quality mitigation measures to avoid further deterioration of river water quality, which should at least include: vi. Proper temporary drainage system should be provided on site for site water diversion as to avoid surface runoff and site water seepage from entering into river channel. vii. Haul access and excavated area should be enclosed with proper bund walls. viii. Riverbanks, soil slopes and earth bunds should be covered with geo-textile materials to avoid erosion by water. ix. Any site water, wastewater, underground water and runoff arisen from construction activities should be diverted to proper site water treatment system before discharge; sedimentation tank using chemicals to enhance its treatment effectiveness should be adopted for silty water whenever it is necessary. x. Site water treatment facilities should be regularly checked and maintained as to ensure those are in good condition and functional. xi. Excessive storage of earth materials should be prevented on site; earthy materials should not be stockpiled next to the river channel as to avoid soil runoff. 8. To meet relevant environmental ordinance such as Environmental Impact Assessment Ordinance (EIAO) and Water Pollution Control Ordinance	

				(WPCO), Contractor was seriously reminded that direct discharge of site water is not allowed and site water seepage to the river should be prevented.	

Filed by Environmental Team Leader: _____

Date: 3rd November 2011

Appendix K: Ecological Impact Monitoring Report for Upper Tai Po River

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

Ecological Impact Monitoring Report (No. 6)
Upper Tai Po River

(Revised report)

September 2011

River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River

Contract No. DC/2007/06

Ecological Impact Monitoring Report (No. 6) Upper Tai Po River

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1 Introduction

1.1 The project of Drainage Improvement Works in Upper Tai Po River requires to carry out an ecological impact monitoring programme when the project commenced. The collected data was used to assess ecological impact during construction period.

1.2 Scope of ecological impact monitoring was detailed in the Particular Specification (PS) and EM & A Manual of the project. In brief, the survey need to collect data on abiotic such as water quality, substratum characteristics, water flow, and biotic data of flora and fauna.

1.3 China-Hong Kong Ecology Consultants was committed by Chiu Hing Construction and Transportation Co. Limited to undertake the ecological baseline survey in Oct 2007 and impact monitoring tasks for the project starting from January 2009.

1.4 This is the number 6 ecological impact monitoring report for the project conducted in July 2011. It contents the following subsections:

- Summary of major points
- Summary of the construction activities for the month
- Monitoring Methods and Results
- Audit/review of monitoring results
- Remedial measures adopted to restore the adverse condition
- Record of complaints and remedial measures
- Forecast of works programme and monitoring requirements; and
- Comments and conclusions

2 Summary of Major Points

- Field ecological monitoring was undertaken on 21st July 2011;
- Stream habitat at most sections of Upper Tai Po River (Photo 1,2) was changed due to drainage works; and
- During the impact monitoring, the man power deployed and survey duration was the same as pervious monitoring events. (i.e. 3 field workers from China-Hong Kong Ecology Consultant and 2 environmental assistant from Chiu Hing Construction & Transportation Co. Ltd).
- The number of target stream fauna (i.e., fish, *Parazacco spilurus*) recorded in July 2011 was lower than those recorded during baseline monitoring (before fish capture/relocation took place). *Parazacco spilurus* was only recorded from the reference site adjacent to the project site at upper stream. Low fish population of *Parazacco spilurus* was river bed modification. The other target species including fish (*Pseudobagrus trilineatus*) and Hong Kong Newt (*Paramesotriton hongkongensis*) were not found within works area during both baseline and impact monitoring.

3 Summary of The Construction Activities

3.1 Major construction activities carried out by the contractor from December 2010 (last reporting time) to July 2011.

- Construction of gabion wall
- Construction of retain wall
- Construction of footbridge
- Construction of concrete block.

4 Monitoring Methodology

4.1 Avifauna

Avifauna survey was conducted during the impact monitoring period. Special attention was given to those stream channel area where birds used as feeding and foraging habitat. In general, avifauna survey was taken in the morning or late afternoon when birds are more active (feeding and foraging). Numerical abundance was recorded at fixed count points within a fixed radium, e.g. 30-50m according to landscape feature and visual penetration extent. Duration of the point count of birds was standardised for 10 minutes at each location in order to collect comparable data. Transect count will also be used for the avifauna survey aimed to collect qualitative data. Binoculars and digital camera was the main instrument to be used. Nomenclature and protection status of the species followed those documented in the AFCD website (www.hkbiddiversity.net) and Carey et al (2001).
The point count was conducted at two locations with one located at the lower portion of the river channel ant the other located at the upper section of the river.

4.2 Fish and Newt Population

Fish community including target species (Three-lined Chinese Stream Catfish and Predaceous Chub) and Hong Kong Newt population at the specified river channel was monitored by live trapping, hand nets and direct observation methods. Active searching at night for *Pseudobagrus trilineatus* has also been carried out. Sampling was conducted at two proposed sampling locations, i.e. upper and lower sections of the river and covered major type of stream habitats, e.g. stream pool and riffle. The number of the captured or observed fish was estimated and recorded. Nomenclature and protection status of the species followed those documented in the AFCD website (www.hkbiddiversity.net) and Virginia et al (2004).

4.3 Aquatic Macro-invertebrates

Macro-invertebrates in the likely affected streams was surveyed. Two sampling sites within the affected stream sites was designed to collect necessary macroinvertebrate fauna for ecological impact monitoring information. Three replicates was taken at each sampling point and pool together for further sample process. Kick sampling (photo 4) and hand netting was the main survey methodologies for stream organisms. Dissection microscope, digital camera was used to aid identification and enumeration. Numerical abundance, species identity was recorded. Nomenclature and protection status of the species will follow those documented in the AFCD website (www.hkbiddiversity.net) and other literatures such as Dudgeon (1999)

4.4 Adult Odonate Survey

Adult Odonate survey was conducted within the monitoring area. Transect count was used for the survey. Binoculars, digital camera and hand net was utilized to aid identification. In general, all captured fauna was released immediately after on-site identification or taking photo. Numerical abundance, species identity and other notable behaviour was recorded. Nomenclature and protection status of the species followed those documented in the AFCD website (www.hkbiddiversity.net) and Keith (2003). Adult Odonate survey was conducted along line transects in parallel with river channel within works area where access was permitted

4.5 Riparian Vegetation

Riparian vegetation including aquatic and emergent was sampled by line a belt transects along the affected stream channel and riparian habitat. Species, relative abundance, average heights were recorded. Vegetation survey was conducted at two selected belt transects with one located at the lower portion of the river channel and the other at the upper section of the river respectively. The belt transects was run across the river channel and is aimed to collect quantitative data of vegetation. Similarly, qualitative data of plants was collected by recording plant species along line transect. Nomenclature and protection status of the species followed those documented in the AFCD website (www.hkbiddiversity.net) and Hong Kong Herbarium (2004).

4.6 Abiotic Data Collection

Water quality monitoring

Dissolved oxygen level, pH value, conductivity, salinity, BOD and nutrient level (nitrate and ammonium) was sampled and analyzed by conventional methods in situ or send to laboratory.

Sediment Characteristics

Sediment/substrate characteristics was recorded of sediment cover in percentage e.g. mud, sand, rock, boulder and cemented bottom in the stream bed at sampling sites.

Water flow

Water flow rates in river channel were measured by record of travel time of a floating material (e.g. floating ball) in a measured distance.

5 Monitoring Results

5.1 Vegetation

Vegetation growing along the affected stream was surveyed at Upper Tai Po River. About 10 flora species was recorded within the survey transects along the affected stream courses. All recorded floras were common species. Compared with the baseline result, the number of flora species was reduced from 38 to 10 flora species. Most vegetation along the stream section was cleared in order to construct temporal assess road and new embankment. Moreover, previous heavy rainfall has also washed out most vegetation along channel. Despite that, the vegetation was predicted to be re-colonized along the river channel after finished the construction work. Generally, the height of the dominated riparian grass and herb species were in a range from 0.2m to 1.5m. No rare or protected flora species was recorded. Results of vegetation survey and belt transect survey were given in **Table 5-1** and **Table 5-2**. Figure 1-1 to 1-3 shows the transect line for the flora surveys.

5.2 Fauna

5.2.1 Avifauna

Avifauna survey was undertaken along survey transects and at two selected point count locations. In total, 20 species of birds were recorded during bird surveys within project area which was comparatively less than the baseline result of 24 avifauna species on

October 2007. The project site was utilised by avifauna as foraging/ roosting area only. No breeding site was found within project site during baseline survey. Thus, it was predicted that adverse impact on avifauna species will be temporal during construction period. Transect and Point Count locations were shown on **Figure 1-1 to 1-3**. Result of bird survey was presented in the table 5-3

5.2.2 Adult Odonate Survey

Odonate survey was performed and species recorded at Upper Tai Po River were listed in **Table 5-4**. 5 species of dragonfly species were recorded during the surveys in current hot and wet season which was similar to the baseline result of 4 odonate species recorded in October 2007. *Pantala flavescens* was the dominated species along the river channel. All recorded species was generally common and abundant in Hong Kong (Keith, 2003). Sampling location was shown on **Figure 1-1 to 1-3**.

5.2.3 *Hong Kong Newt*

Survey of Hong Kong Newt was conducted at Upper Tai Po River. No Hong Kong Newt species was recorded.

5.2.4 Aquatic Macro-invertebrates

Upper Tai Po River was flowing with constant water during survey. Aquatic-net and kick sampling was performed at the stream.

The stream benthos fauna collected was mainly comprised of insects, mollusks and as well as small fish. The mollusk fauna of the stream was dominated by snail species of *Physella acuta* at the river channel. Compared with the baseline result, the number of species was reduced from 10 to 7 for stream benthos. Apparently, stream benthic fauna was temporally de-faunated as a result of engineering works and heavy rainfall last year. Despite that, the aquatic macro-invertebrates was predicted to be re-colonized along the river channel after finished the construction work. Details of recorded of stream benthic fauna refers to **Table 5-5.** Sampling location was shown on **Figure 1-1 to 1-3**.

5.2.5 *Stream Fish Fauna*

Fish surveys were performed at Upper Tai Po River during surveys. In total, 8 species freshwater fish were recorded within project area. Fish density was low along river channel. Compared with the baseline result, the number of fish species was reduced from 10 to 8 species. The pelagic fish, *Parazacco spilurus* which have conservation interest, was restricted in the upper section of the surveyed river outside the works boundary where the water was not affected by construction works. Small number of *Parazacco spilurus* (Photo 3) was recorded from the reference site adjacent to the project site at upper stream section. No record of *Parazacco spilurus* and reduced population of the fish was observed within project site. That would likely be due to the habitat change caused by river bed modification, which was stated in Project profile.

Generally, most of the recorded fish fauna are common species in Hong Kong. *Parazacco spilurus* is a common freshwater fish species in Hong Kong but it was listed as vulnerable in China Red Data Book (hkbiodiversity website) and some of them were captures and released to an undisturbed upper stream habitat before construction works with most recently performed on the 15th October 2010. The locally rare fish species of Three-lined Chinese Stream Catfish was not recorded at affected stream section during day and night time surveys (Photo 4) during both baseline and impact monitoring periods. Details of records of fish fauna refers to **Table 5-6.** Sampling location was shown on **Figure 1-1 to 1-3**.

5.3 Abiotic data

Data on water quality and major stream hydrological feature (water flow and substratum) of the stream were collected and given in the Table 5.7.

Generally, the water quality was found polluted at lower stream section mainly due to the domestic sewage discharge (Photo 5) from villages. Concentration of Ammonia (0.20 mg/L) in lower stream section was comparatively higher than that measured at upper stream section. Fish with less tolerance to toxic ammonia would be eliminated from stream water. Currently, the level of ammonia concentration is considered low and it was likely due to dilution of the running water in the stream. Salinity was low, and it was indicated that the stream was not affected by tidal effect. The detailed abiotic information was shown in Table 4-7.

The stream substratum was comprised of over 80% stones or rocks at most of the stream sections with moderate water flow (up to 0.2m/second at pool and 0.6m/second at riffle). Most vegetation was cleared along the river channel and it would be planted or recolozised in late stage of the construction period.

6 Audit/review of monitoring results

Total population was decreased for the concerned Fish (*Parazacco spilurus*) population at river channel within project site in the current monitoring period than those recorded in baseline ecology report. Reduced fish population including *Parazacco spilurus* was likely due to habitat change caused by river bed modification within project site. Habitat change due to river bed modification was stated in Project profile. The project profile also predicted some indirect localized disturbance would occur on aquatic community and direct impact to approx. 0.6km of lowland river habitat within project area during construction period. The decrease of concerned fish (*Parazacco spilurus*) population was caused by river bed change which was a unavoidable as predicted. Project profile stated that the new channel bed would be lined with natural materials such as small cobbles and boulders which are similar to the substratum before the construction work. Thus, it is predicted that the concerned fish (*Parazacco spilurus*) population would be restored after the completion of the construction work.

7 Remedial measures adopted to restore the adverse condition

None

8 Record of complaints and remedial measures

There were some complaints at construction site for the Upper Tai Po river. The complaints were followed up with suitable mitigation measures by contractor. The complaints and remedial measures were shown on Appendix I & II.

9 Forecast of works programme and monitoring requirements

Major Construction activities carried out by the contractor anticipated for the coming month.

- Construction of Retaining wall
- Construction of Gabion wall,
- Removal of shotcrete & concrete blocks for temporary pretection of river banks .

10 Comments and Conclusions

Ecological impact monitoring was carried out during July 2011 and relevant biotic and abiotic data was collected according to the project specification and the EM & A Manual.

One of the three target freshwater fauna species, i.e., fish *Parazacco spilurus,* was recorded at upper stream section adjacent to project boundary. The reduced population of the fish would likely due to the habitat change caused by river bed modification, which was stated in Project profile and such disturbance would be reversible during the operation period.. The fish was commonly seen in more upper stream courses which would be the source for late re-colonization of the newly built river channel. The locally rare fish species of Three-lined Chinese Stream Catfish and the Hong Kong Newt were not recorded at the affected stream section during day and night time surveys conducted for both baseline and impact monitoring.

Most aquatic and riparian vegetation along the stream section was cleared due to construction works. Plant plantation along newly built up river banks would be undertaken at late stage of the project.

The water quality in the surveyed stream was found polluted at lower stream section mainly due to the domestic sewage discharge from villages. No significant change in water quality was detected except the increased sediments in water after comparing the results with baseline monitoring data.

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FIGURE

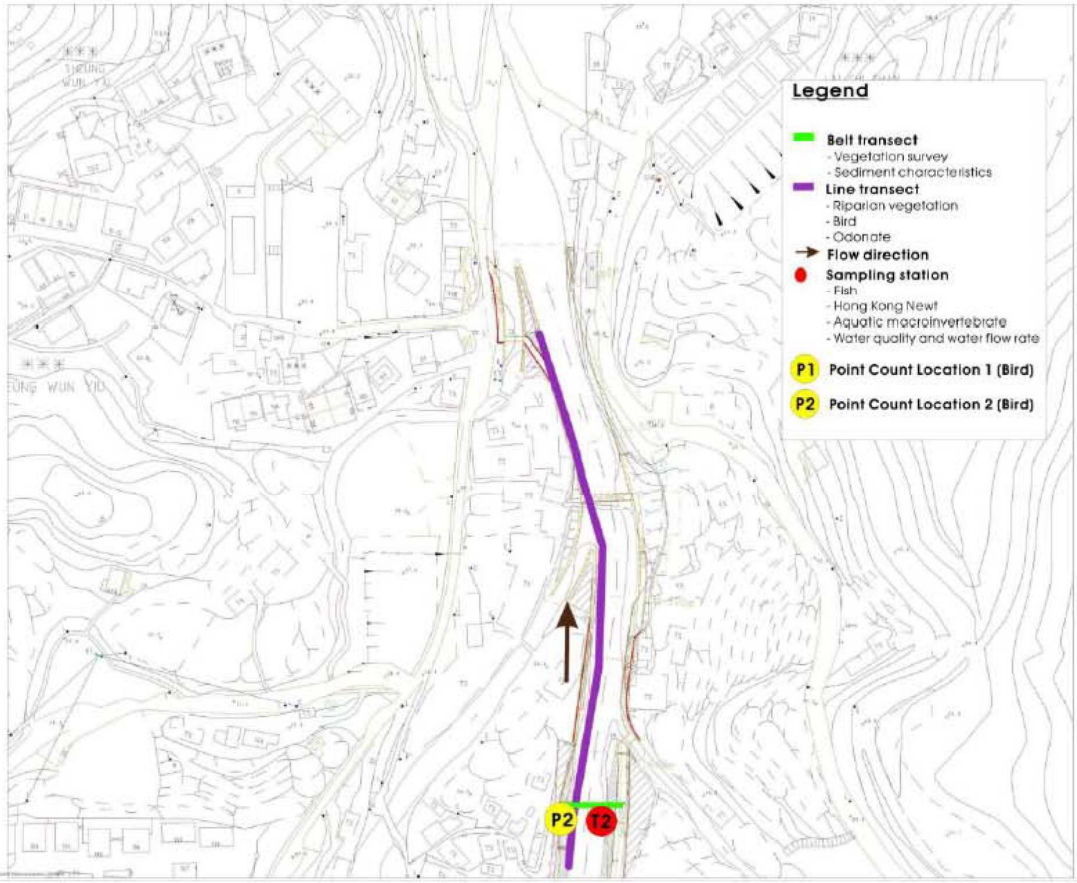

Figure 1-1. Sampling location of impact monitoring at Upper Tai Po River(Lower Section)

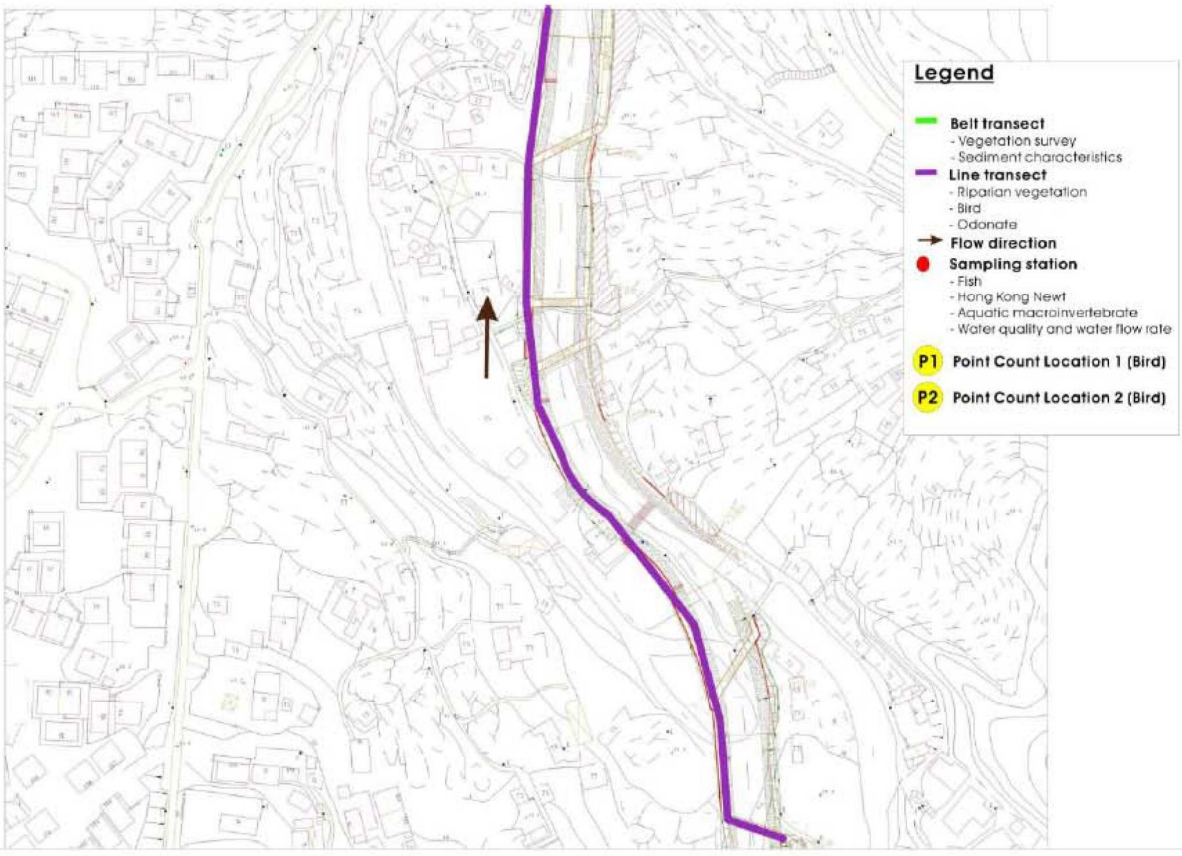

Figure 1-2. Sampling location of impact monitoring at Upper Tai Po River(Middle Section)

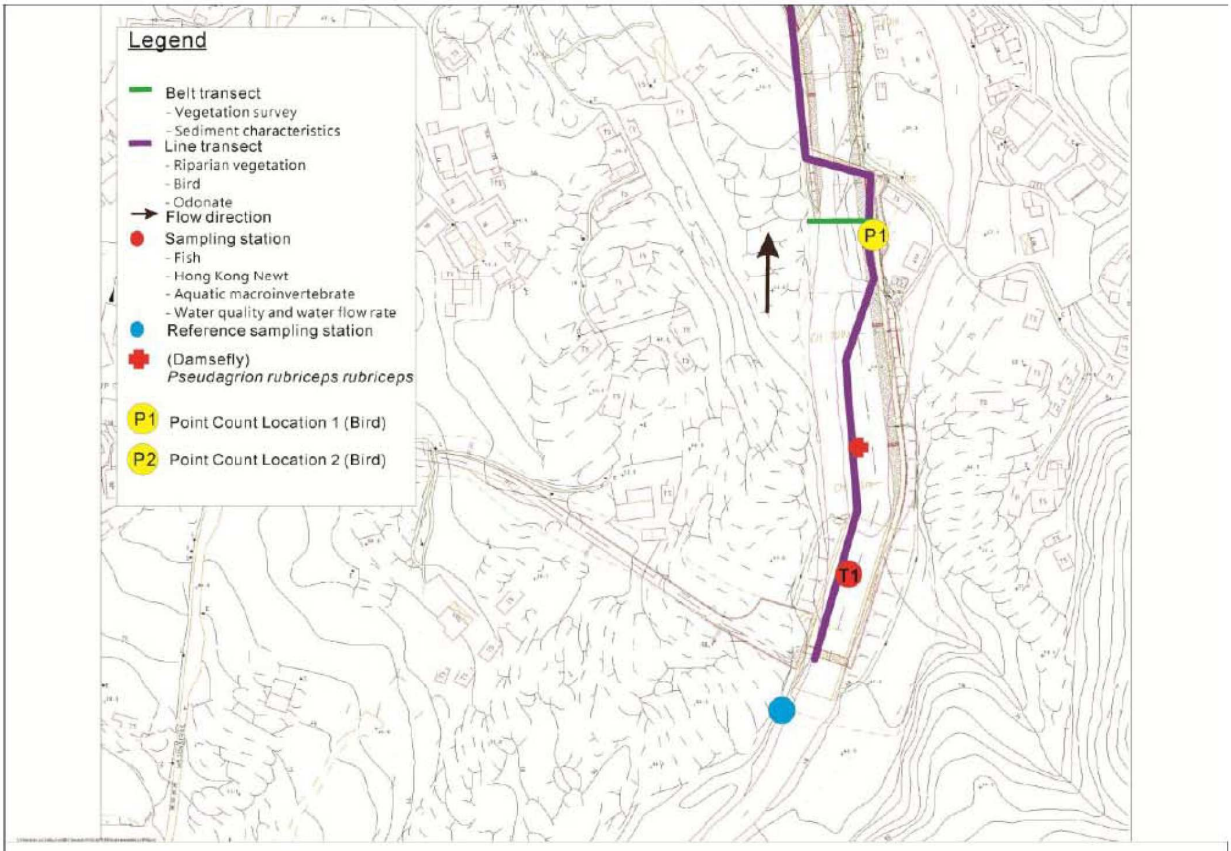

Figure 1-3. Sampling location of Impact monitoring at Upper Tai Po River(Upper Section)

TABLE

Table 5-1. Flora species recorded at the transect along the Upper Tai Po stream including riparian habitat.

Family	Species name	Species name in Chinese	Oct-07	Jan-09	Jul-09	Jan-10	Jul-10	Jan-11	Jul-11
Euphorbiaceae	*Macaranga tanarius*	血桐	+	+	+	+	+	+	
Musaceae	*Musa paradisiaca*	大蕉	+	+	+	+	+		
Commelinaceae	*Commelina communis*	鴨跖草	+	+	+	+	+	+	+
Fabaceae	*Pueraria lobata*	野葛	+	+	+	+	+	+	
Gramineae	*Panicum repens*	枯骨草	+	+	+	+	+	+	+
Asteraceae	*Bidens alba*	白花鬼針草	+	+	+	+	+	+	++
Araceae	*Alocasia odora*	海芋	+	+	+	+	+	+	
Araceae	*Colocasia esculenta*	芋	+	+	+	+	+	+	
Moraceae	*Ficus hispida*	對葉榕	+	+	+	+	+	+	
Ulmaceae	*Celtis sinensis*	朴樹	+	+	+	+	+	+	
Athyriaceae	*Callipteris esculenta*	菜蕨	+	+	+	+	+	+	
Verbenaceae	*Lantana camara*	馬纓丹	+	+	+	+	+	+	
Sapindaceae	*Dimocarpus longan*	龍眼	+	+	+	+	+	+	
Solanaceae	*Solanum torvum*	水茄	+	+	+	+	+	+	
Equisetaceae	*Equisetum debile*	筆管草	+	+	+	+	+		
Thelypteridacea	*Cyclosorus parasiticus*	華南毛蕨	+	+	+	+	+	+	
Bombacaceae	*Bombax ceiba*	木棉	+	+	+	+	+	+	
Lauraceae	*Cinnamomum camphora*	樟樹	+	+	+	+	+	+	
Myrtaceae	*Psidium guajava*	番石榴	+	+	+	+	+	+	
Caprifoliaceae	*Viburnum odoratissimum*	珊瑚樹	+	+	+	+	+		
Sapindaceae	*Litchi chinensis*	荔枝	+	+	+	+	+	+	
Rutaceae	*Clausena lansium*	黃皮	+	+	+	+	+	+	
Lauraceae	*Litsea glutinosa*	潺槁樹	+	+	+	+	+		
Euphorbiaceae	*Glochidion zeylanicum*	香港算盤子	+	+	+	+	+		
Asteraceae	*Ageratum conyzoides*	勝紅薊	+	+	+	+	+	+	+
Urticaceae	*Boehmeria nivea*	苧麻	+	+	+	+	+	+	+
Convolvulaceae	*Ipomoea aquatica*	通菜	+	+	+	+	+		
Gramineae	*Microstegium ciliatum*	剛秀竹	++	+	+	+	+	+	+
Asteraceae	*Mikania micrantha*	薇甘菊	++	+	+	+	+	+	+
Gramineae	*Pennisetum purpureum*	象草	+	+	+	+	+	+	
Convolvulaceae	*Ipomoea cairica*	五爪金龍	+	+	+	+	+	+	+
Asteraceae	*Synedrella nodiflora*	金腰箭	+	+	+	+	+	+	
Gramineae	*Coix lacryma-jobi*	薏苡	+	+	+	+	+	+	
Amaranthaceae	*Alternanthera philoxeroides*	空心蓮子草	+	+	+	+	+	+	
Asteraceae	*Wedelia chinensis*	蟛蜞菊	+	+	+	+	+	+	+
Polygonaceae	*Polygonum barbatum*	毛蓼	+	+	+	+	+	+	
Myrtaceae	*Cleistocalyx operculatus*	水翁	+	+	+	+	+	+	+
Gramineae	*Phragmites karka*	卡開蘆	+	+	+	+	+	+	
Solanaceae	*Solanum nigrum*	龍葵				+	+	+	+
Cucurbitaceae	*Benincasa hispida*	冬瓜						+	

Note:

+, occurred; ++, common; +++, abundant

Table 5-2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

			Baseline survey				Impact monitoring					
		Stream	Oct-07				Jan-09					
		Transect	T1		T2		Reference		T1		T2	
			Height (cm)	%	Height(cm)	%	Height(cm)	%	Height(cm)	%	Height(cm)	%
Family	Species	Chinese name										
Asteraceae	*Mikania micrantha*	薇甘菊	0.4	15	1	40	0.5	5	0.5	5		
Moraceae	*Ficus hispida*	對葉榕	1	2			5	5			2	10
Ulmaceae	*Celtis sinensis*	朴樹	5	2							6	15
Gramineae	*Microstegium ciliatum*	剛秀竹	1.2	45	1.2	30			0.8	10	0.5	12
Euphorbiaceae	*Macaranga tanarius*	血桐	2	2			5	5	3	5	1.5	4
Araceae	*Alocasia odora*	海芋	1.5	23							1.5	25
Araceae	*Colocasia esculenta*	芋	0.3	<1	0.4	<1	0.3	2				
Myrtaceae	*Cleistocalyx operculatus*	水翁					0.4	10	7	5		
Athyriaceae	*Callipteris esculenta*	菜蕨			0.6	1	0.8	10			0.4	10
Gramineae	*Phragmites karka*	卡開蘆					1.5	51				
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨	0.4	10							0.4	10
Equisetaceae	*Equisetum debile*	筆管草			0.6	<1	0.3	2				
Asteraceae	*Ageratum conyzoides*	勝紅薊							0.4	2		
Commelinaceae	*Commelina communis*	鴨跖草										
Solanaceae	*Solanum nigrum*	龍葵										
Euphorbiaceae	*Mallotus paniculatus*	白楸										
Gramineae	*Eleusine indica*	牛筋草										
Gramineae	*Pennisetum purpureum*	象草									3	4
Asteraceae	*Wedelia chinensis*	蟛蜞菊										
Asteraceae	*Bidens alba*	白花鬼針草										
Gramineae	*Panicum repens*	枯骨草										
Cucurbitaceae	*Benincasa hispida*	冬瓜										
Bare Gound								10		73		10

- Reference point was the sampling location outside the works area used to compare with the data within works area.

Table 5-2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

			Impact monitoring						Impact monitoring					
		Stream	Jul-09						Jan-10					
		Transect	Reference		T1		T2		Reference		T1		T2	
			Height(cm)	%	Height(cm)	%	Height(cm)	%	Height(cm)	%	Height(cm)	%	Height(cm)	%
Family	Species	Chinese name												
Asteraceae	*Mikania micrantha*	薇甘菊	0.5	5					0.5	3	0.2	5	0.2	2
Moraceae	*Ficus hispida*	對葉榕	5	5			2	10	5	5				
Ulmaceae	*Celtis sinensis*	朴樹					6	15						
Gramineae	*Microstegium ciliatum*	剛秀竹					0.7	30						
Euphorbiaceae	*Macaranga tanarius*	血桐	5	5	3	5	1.5	5	5	5				
Araceae	*Alocasia odora*	海芋					2	30						
Araceae	*Colocasia esculenta*	芋	0.3	2	0.8	5			0.3	1				
Myrtaceae	*Cleistocalyx operculatus*	水翁	0.4	10	7	5			0.4	10	7	5		
Athyriaceae	*Callipteris esculenta*	菜蕨	0.8	10			0.4	2	0.8	6				
Gramineae	*Phragmites karka*	卡開蘆	1.5	51					1.5	53				
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨					0.4	2						
Equisetaceae	*Equisetum debile*	筆管草	0.3	2					0.3	2				
Asteraceae	*Ageratum conyzoides*	勝紅薊			0.4	2					0.2	2		
Commelinaceae	*Commelina communis*	鴨跖草							0.2	5	0.2	5	0.2	5
Solanaceae	*Solanum nigrum*	龍葵											0.4	5
Euphorbiaceae	*Mallotus paniculatus*	白楸									0.3	5		
Gramineae	*Eleusine indica*	牛筋草			0.5	5						5		
Gramineae	*Pennisetum purpureum*	象草												
Asteraceae	*Wedelia chinensis*	蟛蜞菊												
Asteraceae	*Bidens alba*	白花鬼針草												
Gramineae	*Panicum repens*	枯骨草												
Cucurbitaceae	*Benincasa hispida*	冬瓜												
Bare Gound				10		78		6		10		73		88

- Reference point was the sampling location outside the works area used to compare with the data within works area.

Table 5-2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

			Impact monitoring						Impact monitoring					
		Stream	Jul-10						Jan-11					
		Transect	Reference		T1		T2		Reference		T1		T2	
			Height(cm)	%	Height(cm)	%	Height(cm)	%	Height (cm)	%	Height (cm)	%	Height (cm)	%
Family	Species	Chinese name					0.5	10						
Asteraceae	*Mikania micrantha*	薇甘菊	0.5	20	0.5	60			0.5	10				
Moraceae	*Ficus hispida*	對葉榕	5	5										
Ulmaceae	*Celtis sinensis*	朴樹					4m	5						
Gramineae	*Microstegium ciliatum*	剛秀竹	1	35	1	5	0.5	10	1	15	1	5	0.5	2
Euphorbiaceae	*Macaranga tanarius*	血桐	5	5							4m	5		
Araceae	*Alocasia odora*	海芋					2	10					0.4	3
Araceae	*Colocasia esculenta*	芋												
Myrtaceae	*Cleistocalyx operculatus*	水翁	0.4	10					0.4	5	5m	5		
Athyriaceae	*Callipteris esculenta*	菜蕨	0.8	6										
Gramineae	*Phragmites karka*	卡開蘆	1.5	10					1.5	2				
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨												
Equisetaceae	*Equisetum debile*	筆管草												
Asteraceae	*Ageratum conyzoides*	勝紅薊											0.3	2
Commelinaceae	*Commelina communis*	鴨跖草			0.5	20							0.2	4
Solanaceae	*Solanum nigrum*	龍葵												
Euphorbiaceae	*Mallotus paniculatus*	白楸												
Gramineae	*Eleusine indica*	牛筋草												
Gramineae	*Pennisetum purpureum*	象草												
Asteraceae	*Wedelia chinensis*	蟛蜞菊												
Asteraceae	*Bidens alba*	白花鬼針草									0.5	5		3
Gramineae	*Panicum repens*	枯骨草												
Cucurbitaceae	*Benincasa hispida*	冬瓜											0.2	5
Bare Gound				9		15		65		68		80		89

- Reference point was the sampling location outside the works area used to compare with the data within works area.

Table 5-2. Flora species recorded from belt transect survey at the Upper Tai Po stream (T1- Upper stream sampling site and T2 - Lower stream sampling site)

			Impact monitoring					
		Stream	Jul-11					
		Transect	Reference		T1		T2	
			Height (cm)	%	Height (cm)	%	Height (cm)	%
Family	Species	Chinese name						
Asteraceae	*Mikania micrantha*	薇甘菊	0.5	10				
Moraceae	*Ficus hispida*	對葉榕						
Ulmaceae	*Celtis sinensis*	朴樹						
Gramineae	*Microstegium ciliatum*	剛秀竹	1	2				
Euphorbiaceae	*Macaranga tanarius*	血桐						
Araceae	*Alocasia odora*	海芋						
Araceae	*Colocasia esculenta*	芋						
Myrtaceae	*Cleistocalyx operculatus*	水翁						
Athyriaceae	*Callipteris esculenta*	菜蕨						
Gramineae	*Phragmites karka*	卡開蘆	1.5	2				
Thelypteridaceae	*Cyclosorus parasiticus*	華南毛蕨						
Equisetaceae	*Equisetum debile*	筆管草						
Asteraceae	*Ageratum conyzoides*	勝紅薊	1.2	10				
Commelinaceae	*Commelina communis*	鴨跖草						
Solanaceae	*Solanum nigrum*	龍葵					0.5	4
Euphorbiaceae	*Mallotus paniculatus*	白楸						
Gramineae	*Eleusine indica*	牛筋草					0.3	5
Gramineae	*Pennisetum purpureum*	象草						
Asteraceae	*Wedelia chinensis*	蟛蜞菊						
Asteraceae	*Bidens alba*	白花鬼針草					0.2	2
Gramineae	*Panicum repens*	枯骨草	1.5	5				
Cucurbitaceae	*Benincasa hispida*	冬瓜						
Bare Gound				71		100		89

- Reference point was the sampling location outside the works area used to compare with the data within works area.

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River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River

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Table 5-3 Avifauna recorded along survey transects and at two selected point count locations for Upper Tai Po River. (PC1- Upper stream section and PC2- Lower stream section)

					Baseline survey			Impact monitoring			Impact monitoring			Impact monitoring		
Common Name	**Species name**	**Chinese name**	**Status***	**Rarity***	Oct-07			Jan-09			Jul-09			Jan-10		
					Abundance			Abundance			Abundance			Abundance		
					T	PC1	PC2	T	PC1	PC2	T	PC1	PC2	T	PC1	PC2
Black Kite	*Milvus lineatus*	麻鷹	R,WV	C	+									+		
Black -crown Night Heron	*Nycticorax nyxticorax*	夜鷺	R,WV	C												
Black-collared Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	+	1	1							+		
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵯	R	C	+	3	2	++	5	6	++	4	7	+++	7	6
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R	C	+			++	6	3	+	2	3	++	3	3
Common Kingfisher	*Alcedo atthis*	普通翠鳥	PM, WV	C	+											
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C	+											2
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C	+											
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	+		1	+	1	1	+		1	++		10
Crested Myna	*Acridotheres cristatellus*	八哥	R	C		1										
Domestic pigeon	*Columba sp.*	鴿	--	C		3										
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R	C	+	1										
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C												
Japanese White Eye	*Zosterops japonica*	暗綠繡眼鳥	R	C		2		++	2	3	+	1	4	+++	4	6
Little Egret	*Egretta garzetta*	小白鷺	R	C	+			+	1		+		1	+		1
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C										+	1	
Magpie	*Pica pica*	喜鵲	R	C		1										
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	+	1	1				+	1	3	+	2	1
Olive Backed pipit	*Anthus hodgsoni*	樹鷚	WV	C	+			+	1	3						
Crested bulbul	*Pycnonotus jocosus*	紅耳鵯	R	C	+	2		+++	6	7	++	2	6	+++	4	5
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	+		2	+	1		+	1	3	+	1	2
Scaly-breasted Munia	*Lonchura punctulata*	斑文鳥	R	C												
Eurasian Tree Sparrow	*Passer montanus*	麻雀	R	C	+	3	2							+		
Violet Whistling Thrush	*Myiophoneus caeruleus*	紫嘯鶇	R	C	+											
White Wagtail	*Motacilla alba*	白鶺鴒	WV, R	C	+		1							++	2	3
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C	+									+		1
Yellow Bellid Prinia	*Prinia flaviventris*	灰頭鷦鶯	R	C	+											
Yellow Wagtail	*Motacilla flava*	黃鶺鴒	WV&PM	C		1										
Little Swift	*Apus affinis*	小白腰雨燕	R, SpM	C												
Green Sandpiper	*Tringa ochropus*	白腰草鷸	WV	U												
Barn Swallow	*Hirundo rustica*	家燕	SV, SpM	C												
Great Tit	*Parus major (commixtus)*	大山雀	R	C										+	2	1
Blue Magpie	*Urocissa erythrorhyncha*	紅咀藍鵲	R	C										+		2
Scarlet Minivet	*Pericrocotus flammeus*	赤紅山椒鳥	R	C										+		
Scarlet-backed Flowerpecker	*Dicaeum cruentatum*	朱背啄花鳥	R	C										+		
Common Blackbird	*Turdus merula*	烏鶇	WV, PM	C												
Silver-eared Mesia	*Leiothrix argentauris*	銀耳相思鳥	R	C												
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵯	R	C												
Number of birds									23	23		11	28		26	43

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River Improvement Works in Upper Lam Tsuen River, She Shan River and Upper Tai Po River

Ecological Impact Monitoring Programme

Table 5-3 Avifauna recorded along survey transects and at two selected point count locations for Upper Tai Po River. (PC1- Upper stream section and PC2- Lower stream section)

					Baseline survey			Impact monitoring			Impact monitoring			Impact monitoring		
Common Name	**Species name**	**Chinese name**	**Status***	**Rarity***	Oct-07			Jan-09			Jul-09			Jan-10		
					Abundance			Abundance			Abundance			Abundance		
					T	PC1	PC2	T	PC1	PC2	T	PC1	PC2	T	PC1	PC2
No. of species								8	8	6	8	6	8	18	9	13

Note: R – Resident; WV – Winter visitor; PM – Passage migrant; C – Common; U – Uncommon; SpM – Spring migrant; T – transect count; PC1 – Point count location 1; PC2 – Point count location 2

*Sourced from Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. and Yung, L.. (2001) The Avifauna of Hong Kong. Hong Kong Bird Watching Society.

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River Improvement Works in Upper Lam Tsuen River, She Shan River a

Ecological Impact Monitoring Programme

Table 5-3 Avifauna recorded along survey transects and at two selected point count locations for Upper Tai Po River. (PC1- Upper stream section and PC2- Lower stream section)

					Impact monitoring			Impact monitoring			Impact monitoring		
Common Name	**Species name**	**Chinese name**	**Status***	**Rarity***	Jul-10			Jan-11			Jul-11		
					Abundance			Abundance			Abundance		
					T	PC1	PC2	T	PC1	PC2	T	PC1	PC2
Black Kite	*Milvus lineatus*	麻鷹	R,WV	C				+					
Black -crown Night Heron	*Nycticorax nyxticorax*	夜鷺	R,WV	C	+			+					
Black-collared Starling	*Sturnus nigricollis*	黑領椋鳥	R	C	+		1	+			+		1
Chinese Bulbul	*Pycnonotus sinensis*	白頭鵯	R	C	+++	6	3	+	4	2	+	1	
Chinese Pond Heron	*Ardeola bacchus*	池鷺	R	C	++	2	2	+	1	1	+	1	
Common Kingfisher	*Alcedo atthis*	普通翠鳥	PM, WV	C	+			+					
Common Koel	*Eudynamys scolopacea*	噪鵑	R	C				+			+		
Common Sandpiper	*Actitis hypoleucos*	磯鷸	WV&PM	C				+			+		
Common Tailorbird	*Orthotomus sutorius*	長尾縫葉鶯	R	C	+	1		+		1	+		
Crested Myna	*Acridotheres cristatellus*	八哥	R	C	+			+	2		+		2
Domestic pigeon	*Columba sp.*	鴿	--	C	+						+		
Great Coucal	*Centropus sinensis*	褐翅鴉鵑	R	C	+	1		+			+		
Grey Wagtail	*Motacilla cinerea*	灰鶺鴒	WV	C				+	2	1			
Japanese White Eye	*Zosterops japonica*	暗綠繡眼鳥	R	C	++	3	2	+	5	2	+		
Little Egret	*Egretta garzetta*	小白鷺	R	C	+	1	1		1	1	+		
Rufous-backed Shrike	*Lanius schach*	棕背伯勞	R	C	+	1					+		
Magpie	*Pica pica*	喜鵲	R	C									
Magpie Robin	*Copsychus saularis*	鵲鴝	R	C	+	2	2	+	1	1	+	1	
Olive Backed pipit	*Anthus hodgsoni*	樹鷚	WV	C				+					
Crested bulbul	*Pycnonotus jocosus*	紅耳鵯	R	C	++	3	2	+	2	1	+	1	2
Spotted Dove	*Streptopelia chinensis*	珠頸斑鳩	R	C	+	1	1	+	1	1	+	1	
Scaly-breasted Munia	*Lonchura punctulata*	斑文鳥	R	C									
Eurasian Tree Sparrow	*Passer montanus*	麻雀	R	C	+	4	3	+			+		1
Violet Whistling Thrush	*Myiophoneus caeruleus*	紫嘯鶇	R	C									
White Wagtail	*Motacilla alba*	白鶺鴒	WV, R	C	+	1	1	+	2	2	+		
White-breasted Waterhen	*Amaurornis phoenicurus*	白胸苦惡鳥	R	C	+		1						
Yellow Bellid Prinia	*Prinia flaviventris*	灰頭鷦鶯	R	C				+			+		
Yellow Wagtail	*Motacilla flava*	黃鶺鴒	WV&PM	C									
Little Swift	*Apus affinis*	小白腰雨燕	R, SpM	C									
Green Sandpiper	*Tringa ochropus*	白腰草鷸	WV	U				+					
Barn Swallow	*Hirundo rustica*	家燕	SV, SpM	C							+		
Great Tit	*Parus major (commixtus)*	大山雀	R	C	+	1							
Blue Magpie	*Urocissa erythrorhyncha*	紅嘴藍鵲	R	C									
Scarlet Minivet	*Pericrocotus flammeus*	赤紅山椒鳥	R	C									
Scarlet-backed Flowerpecke	*Dicaeum cruentatum*	朱背啄花鳥	R	C									
Common Blackbird	*Turdus merula*	烏鶇	WV, PM	C				+					
Silver-eared Mesia	*Leiothrix argentauris*	銀耳相思鳥	R	C				+					
Sooty-headed Bulbul	*Pycnonotus aurigaster*	白喉紅臀鵯	R	C							+		1
Number of birds						27	19		21	13		5	7

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Table 5-3 Avifauna recorded along survey transects and at two selected point count locations for Upper Tai Po River. (PC1- Upper stream section and PC2- Lower stream section)

					Impact monitoring			Impact monitoring			Impact monitoring		
Common Name	**Species name**	**Chinese name**	**Status***	**Rarity***	Jul-10			Jan-11			Jul-11		
					Abundance			Abundance			Abundance		
					T	PC1	PC2	T	PC1	PC2	T	PC1	PC2
No. of species					19	13	11	23	10	10	20	5	5

Note: R – Resident; WV – Winter visitor; PM – Passage migrant; C – Common; U – Uncommon; SpM – Spring migrant; T – transect count; PC1 – Point count location 1; PC2 – Point count location 2

*Sourced from Carey, G.J., Chalmers, M.L., Diskin, D.A., Kennerley, P.R., Leader, P.J., Leven, M.R., Lewthwaite, R.W., Melville, D.S., Turnbull, M. and Yung, L.. (2001) The Avifauna of Hong Kong. Hong Kong Bird Watching Society.

Table 5-4. Odonate species recorded at the Upper Tai Po stream

					Baseline survey	Impact monitoring			
Species	Common name	Chinese name	Status	Commonness	Oct-07	Jan-09	Jul-09	Jan-10	Jul-10
Orthetrum chrysis	Red-faced Skimmer	華麗灰蜻	NP	VC		+	+		+
Crocothemis servilia servilia	Crimson Darter	红蜻	NP	VC	+		+		+
Copera marginipes	Yellow Featherlegs	黃狹扇蟌	NP	VC					
Prodasineura autumnalis	Black Threadtail	烏齒原蟌	NP	VC					
Trithemis festiva	Indigo Dropwing	慶褐蜻	NP	VC					
Neurobasis chinensis	Chinese Greenwing	華艷色蟌	NP	C					+
Rhinocypha perforata	Common Blue Jewel	三斑鼻蟌	NP	VC					+
Pantala flavescens	Wandering Glider	黃蜻	NP	VC	+		+	+	+
Orthetrum glaucum	Common blue skimmer	黑尾灰蜻	NP	VC	+	+	+		
Trithemis Aurora	Crimson dropwing	曉褐蜻	NP	VC	+				+
Urothemis signata signata	Scarlet Basket	赤斑曲鈎脈蜻	NP	C					
Pseudagrion rubriceps rubriceps	Orange-faced Sprite	丹頂斑蟌	NP	C					
Euphaea decorata	Black-banded Gossamerwing	方帶幽蟌	NP	VC					

Note: NP – Not protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the survey site

"++" – Species common in the survey site

"+++" – Species abundance in the survey site

Table 5-4. Odonate species recorded at the Upper Tai Po stream

			Impact monitoring	
Species	Common name	Chinese name	Jan-11	Jul-11
Orthetrum chrysis	Red-faced Skimmer	華麗灰蜻		
Crocothemis servilia servilia	Crimson Darter	红蜻		
Copera marginipes	Yellow Featherlegs	黃狹扇蟌		
Prodasineura autumnalis	Black Threadtail	烏齒原蟌		
Trithemis festiva	Indigo Dropwing	慶褐蜻		+
Neurobasis chinensis	Chinese Greenwing	華艷色蟌		
Rhinocypha perforata	Common Blue Jewel	三斑鼻蟌		
Pantala flavescens	Wandering Glider	黃蜻	+	++
Orthetrum glaucum	Common blue skimmer	黑尾灰蜻		
Trithemis Aurora	Crimson dropwing	曉褐蜻		
Urothemis signata signata	Scarlet Basket	赤斑曲鈎脈蜻		+
Pseudagrion rubriceps rubriceps	Orange-faced Sprite	丹頂斑蟌		+
Euphaea decorata	Black-banded Gossamerwing	方帶幽蟌		+

Note: NP – Not protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the survey site

"++" – Species common in the survey site

"+++" – Species abundance in the survey site

Table 5-5 Aquatic Macro invertebrates recorded at Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

				Baseline survey		Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring		
Species	Chinese name			Oct-07		Jan-09			Jul-09			Jan-10			Jul-10		
Invertebrates		Sampling point		T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Pomacea canaliculata	福壽螺	NP	VC					+	+		++	+		+	+		++
Physella acuta	尖膀胱螺	NP	VC														
Melanoides tuberculata	瘤擬黑螺	NP	VC					+	+	+	+	+		+	+		++
Radix plicatulus	耳白螺	NP	VC		++			+			+		+	+		+	+
Biomphalaria sp.	--	NP	VC		+			+			+		+	+		+	+
Brotia hainanenzis	--	NP	VC	++	+	++			++			++	+		++	+	
Sinotaia quadrata	田螺	NP	VC					++		+	++			++			+++
Indobaetis zp.	--	NP	VC	+		+			+			+	+		+	+	
Baetis sp.	--	NP	VC	+		+			+			+	+		+	+	
Chironomus sp.	螺幼虫	NP	VC	+	+	+			+			+		+	+	+	+
Mnais sp.	--	NP	VC		+	+			+			+	+		+	+	
Orthetrum sp.	--	NP	VC	+	+	+			+			+	+		+	+	
Perla sp	--	NP	VC										+			+	
Aulocodes sp.	--	NP	VC										+			+	
Tipulidae spp.	--	NP	VC										+			+	
Arctopora sp.	--	NP	VC													+	
Anisocentropus sp.	--	NP	VC													+	
Crustacea																	
Macrobrachium hainanense	海南沼蝦	NP	VC			+			+			+	+		+	+	+
Caridina contonensis	廣東米蝦	NP	VC			+			+			+	++		+	++	+
Cryptopotamon anacoluthon	鰓刺溪蟹	*NP*	*C*			+			+			+			+	+	
Fish																	
Gambusia affinis	食蚊魚	NP	VC	+	+			+		+	+		+	++		+	++
Poecilia reticulata	孔雀花魚將	NP	VC	+	+			+			+		+	+++		+	+++
Schistura fasciolata	橫紋南鰍	NP	C			+			+	+		+	+		+	+	
Rhinogobius spp.	鰕虎魚	NP	C			+		+	+		+	+	++		+	++	

Note: NP – Not protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the survey site

"++" – Species common in the survey site

"+++" – Species abundance in the survey site

- Reference point was the sampling location outside the works area used to compare the with the data within works area.

Table 5-5 Aquatic Macro invertebrates r
stream sampling site)

				Impact monitoring			Impact monitoring		
Species	Chinese name			Jan-11			Jul-11		
Invertebrates		Sampling point		Reference	T1	T2	Reference	T1	T2
Pomacea canaliculata	蘋果螺	NP	VC			+	+		+
Physella acuta	尖膀胱螺	NP	VC	+	+	++			
Melanoides tuberculata	瘤擬黑螺	NP	VC	+			+		+
Radix plicatulus	羅白螺	NP	VC				+		+
Biomphalaria sp.	--	NP	VC				+		
Brotia hainanensis	--	NP	VC	+			+	+	
Sinotaia quadrata	田螺	NP	VC				+		
Indobaetis sp.	--	NP	VC	+					
Baetis sp.	--	NP	VC	+					
Chironomus sp.	蠓幼虫	NP	VC	+	+	+	+	+	+
Mnais sp.	--	NP	VC	+	+	+	+	+	
Orthetrum sp.	--	NP	VC	+	+		+		
Perla sp	--	NP	VC						
Aulocodes sp.	--	NP	VC						
Tipulidae spp.	--	NP	VC						
Arctopora sp.	--	NP	VC						
Anisocentropus sp.	--	NP	VC						
Crustacea									
Macrobrachium hainanense	海南沼蝦	NP	VC	+	+		+		
Caridina contonensis	廣東米蝦	NP	VC	+	+	+	+	+	
Cryptopotamon anacoluthon	鰓刺溪蟹	*NP*	*C*				+		
Fish									
Gambusia affinis	食蚊魚	NP	VC		+	+	+		
Poecilia reticulata	孔雀花魚將	NP	VC		+	+	+		
Schistura fasciolata	橫紋南鰍	NP	C	+			+		
Rhinogobius spp.	鰕虎魚	NP	C	+			+		

Note: NP – Not protected in Hong Kong
"VC" – Very Common; "UC" – Uncomr
"+" – Species exists in the survey site
"++" – Species common in the survey si
"+++" – Species abundance in the surve
- Reference point was the sampling locat
area used to compare the with the data

Table 5-6 Fish species recorded at Upper Tai Po River (T1- Upper stream sampling site and T2 - Lower stream sampling site)

				Baseline surve		Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring			Impact monitoring		
				Oct-07		Jan-09			Jul-09			Jan-10			Jul-10			Jan-11			Jul-11		
Species		Status	Commonness	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2	Reference	T1	T2
Xiphophorus hellerii	劍尾魚	NP	C	++		+			+	+	++	+	+	++	+	+	+++	+	+		+		+
Puntius semifasciolatus	七星魚	NP	C	+		+	+		+	+	+	+	+	++	+	+	++	+			+		+
Poecilia reticulata	孔雀花魚將	NP	C	++	+			++			+		+	+++		+	++			+	+		+
Pseudogastromyzon myersi	麥氏擬腹吸鰍	NP	C	+		+			+			+			+	+		++	++		+	+	
Gambusia affinis	食蚊魚	NP	VC	+	++			+		+	+		+	++		+	+++	+	+	+	+	+	+
Xiphophorus variatus	雜色劍尾魚	NP	C	+													++				+		+
Parazacco spilurus	異鱲	V and NP	C	++		+	+		+			+			+	+		+	+		+		
Rhinogobius spp.	鰕虎魚	NP	C	+		+	+		+			+	++	+	+	++	+	+			+		
Schistura fasciolata	橫紋南鰍	NP	C	+		+			+	+		+			+	+		+	+		+		+
Oreochromis niloticus	尼羅口孵非鯽	NP	C	+													+			+	+		+
Misgurnus anguillicaudatus	泥鰍	NP				+			+			+			+			+			+		
Cyprinus carpio var. viridiviolaceus	錦鯉															+							
		2x2m fish number		70	60	15	8	25	10	20	100	10	2	8	10	7	100	10	5	20	6	2	4

Note: NP – Not protected in Hong Kong

"VC" – Very Common; "UC" – Uncommon; "C" - Common

"+" – Species exists in the survey site

"++" – Species common in the survey site

"+++" – Species abundance in the survey site

V – Listed as vulnerable in China Fish Red Data Book

- Reference point was the sampling location outside the works area used to compare with the data within works area.

Table 5-7 Abotic data for Upper Tai Po River (T1- Upper stream sampling site and T2- Lower stream sampling site)

Stream	Oct-07 (baseline	Jan-09		Jul-09		Jan-10		Jul-10		Jan-11		Jul-11	
Replicate	T1	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2	T1	T2
DO (mg/L)	8.2	9	4	6.3	6	9.4	8.8	9	6.5	10.5	9.8	9	8.2
pH	6.9	7.18	6.86	7.28	6.96	8.2	8.5	7.3	7.2	6.9	7.1	7.1	7.3
Nitrate (mg N/L)	0.39	0.1	1.3	0.07	1.32	0.12	0.71	0.1	0.5	0.1	0.5	0.1	0.5
Ammonia (mg/L)	PO4-P (μ g P/L): <100	PO4-P (μ g P/L): <100		0.01	0.22	<0.01	0.2	0.1	0.2	0.01	0.3	0.01	0.2
Salinity (ppt)	<0.1	<0.1	0.1	0	0	0	0	0	0	0	0	0	0
Conductivity (mS/cm)	40	40	190	34	118	42	72	49	43	50	60	50	60
BOD (mg/L)	<2	<2	12	<2	<2	<2	2	<2	2	2	<2	<2	2
Water flow at pool	0.01-0.2	0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2		0.01-0.2	
Water flow at riffle	0.2-0.5	0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5		0.2-0.5	
Sand (%)	15	15		15	25	15	25	15	25	15	25	15	15
Stone (%)	80	80		80	70	80	70	80	70	80	70	80	70
Mud (%)	5	5		5	5	5	5	5	5	5	5	5	5
Concrete(%)	0	0	0	0	0	0	0	0	0	0	0	0	10

PHOTOS

	
Photo 1: General view of the works area	Photo 2: General view of the works area
	
Photo 3: Stream benthos sampling	Photo 4: Night survey for fish survey
	
Photo 5: Sewage discharge pipe	

Appendix I.: Summary of Total Accumulative Complaint Received

Case No.	EPD Complaint Reference	Date Received	Incident Location	Media/ Nature
9(E*)	EP/3/N05/RN/24567-08	05/11/2008	UTPR	Muddy Water
10(E*)	EP/3/N05/RN/24849-08	10/11/2008	UTPR	Muddy Water
12(E*)	EP/3/N05/RN/26619-08	28/11/2008	UTPR, Wilson Trial	Muddy Water
15(P#*)	NA	27/11/2008	UTPR Wilson Drive	Dust Generation
21(E*)	ICC#1-174345035	24/3/2009	UTPR near Sha Po Tsai Village	Noise
25(E*)	ICC#1-219109670	06/02/2010	Tai Po River	Noise generation at night
27(E*)	EP3/N05/RN/00004775-10	12/03/2010	Tai Po River	Muddy Water
28(#)	NA	07/04/2010	Tai Po River	Noise generation
30(E*)	NCF-N05/RN/00007763-10	21/04/2010	Tai Po River	Muddy Water
31(E*)	EP3/N05/RN/00009177-10	10/05/2010	Tai Po River	Muddy Water
34(E*)	EP3/N05/RN/00023471 -10	11/11/2010	Tai Po River	Muddy Water
35(E*)	EP3/N05/RN/00023818 -10	16/11/2010	Tai Po River	Muddy Water
36(E*)	EP3/N05/RN/00003752-11	02/03/2011	Tai Po River	Noise Generation
37(E#)	NA	07/03/2011	Tai Po River	Dust Generation
38(E*)	EP3/N05/RN/00004753-11	16/03/2011	Tai Po River	Muddy Water
39(E*)	EP3/N05/RN/00008234-11	03/05/2011	Tai Po River	Noise generation on Public holiday
40(E*)	ECRS No. 3270	06/05/2011	Tai Po River	Dust Generation
42(E*)	EP3/N05/RN/00009991-11	24/5/2011	Tai Po River	Noise Generation
45(E*)	ECRS No. 5769	21/06/2011	Tai Po River	Stagnant Water generation
46(E*)	EP3/N05/RN/00018630-11	09/09/2011	Tai Po River	Dust and Noise generation
47(E*)	EP3/N05/RN/00018630-11	14/09/2011	Tai Po River	Dust generation

* : transferred from EPD / DSD

Appendix II. The mitigation measure for Upper Tai Po River construction site.

Dust

- Arrange the staff to clean the upper access during the vehicle pass the road.
- The access at downstream would be clean 2 times in one day.
- The wheel washing bay was provided to prevent the dust erosion.
- The wheels of the vehicles are required to be cleaned before leave.

Muddy Water

- The rock has been used to create a river bank to reduce the sand and/or mud is washed into river bank.
- Watering along the access road is carried out every day.
- Sand Bags is provided to prevent the muddy water discharge to the river. The muddy water has been treated by effective Wet Seps to minimize the water penetrate through the soil to river.

Noise

- Work 25mins then take a rest 10mins
- noise barrier
- Machines would not be operated at same time and point besides work far away from Noise sensitive receiver
- Regular maintenance