Appendix K

Construction and Demolition Material Management Plan (C&D MMP) for Secondary Drainage Channel KT13

APPENDIX K

CONSTRUCTION AND DEMOLITION MATERIAL MANAGEMENT PLAN (C&DMMP) FOR SECONDARY DRAINAGE CHANNEL KT13

K1 PURPOSE OF C&DMMP

K1.1 This Demolition Material Management Plan (C&DMMP) for the secondary drainage channel KT13 has been prepared according to the guidelines and requirements under Environment, Transport and Works Bureau Technical Circular (Works) (ETWBTC(W)) No. 33/2002 – Management of Construction and Demolition Material Including Rock.

K1.2 The purposes for preparing a C&DMMP for this project include:

- To encourage the reduction, re-use and recycling of construction and demolition material as far as practicable;
- To clarify the waste management requirements specified under the Environmental Impact Assessment for this Project; and
- To facilitate the preparation of an Environmental Management Plan by contractor.

K2 BACKGROUND

K2.1 The Territorial Land Drainage and Flood Control Strategy Study – Phase II (TELAFLOCOSS 2), completed in August 1993, recommended as part of its findings that detailed studies were required to resolve secondary and local stormwater drainage problems in five drainage basins in the North and North West New Territories. Accordingly, DSD commissioned the Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai Drainage Master Plan (YLDMP) Study to investigate two of the five basins, namely the Yuen Long, Kam Tin and Ngau Tam Mei Basin and the Tin Shui Wai Basin.

K2.2 The YLDMP has identified problems in the existing drainage systems in the study area and has recommend drainage improvement proposals under a two-stage implementation programme. Black and Veatch Hong Kong Ltd. (Formerly Binnie Black and Veatch Hong Kong Ltd.) was commissioned on 26 July 1999 to carry out the design and construction supervision of the stage 1 works entitled "Yuen Long, Kam Tin, Ngau Tam Mei and Tin Shui Wai Drainage Improvement Stage 1" to mitigate major flooding problems that required immediate attention. The stage 2 works will depend on the future development and has no definite programme for implementation.

K2.3 The stage 1 works are further divided into two phases. Phase 1 works consist of the upgrading works of the urban drainage system in Yuen Long town while Phase 2 works include the construction of 10 secondary drainage channels in Kam Tin and Ngau Tam Mei area. Among the 10 drainage channels, three channels are classified as designated projects under the EIA Ordinance. This Section covers the secondary drainage channel KT13 which is one of the channels classified as designated projects under the EIA Ordinance. The C&DMMP for other channels will be covered by other separate submissions.

K3 RELEVANT LEGISLATION AND GUIDELINES

K3.1 Upon appointment, the main contractor of each construction contract should submit an Environmental Management Plan (EMP) which shall describe among others the arrangements for avoidance, reuse, recovery and recycling, storage, collection, treatment and disposal of different categories of waste to be generated from the construction activities and shall take into account the recommended mitigation measures in the EIA report. Such a management plan shall incorporate site specific factors, such as the designation of areas for segregation and temporary storage of reusable and recyclable materials. The Contractor shall refer to this Construction and Demolition Material Management Plan (C&D MMP) in formulating the EMP.

K3.2 Training should be provided to workers about the concepts of site cleanliness and appropriate waste management procedure, including waste reduction, reuse and recycling. Requirements for staff training should be included in the Contractor's EMP.

K3.3 When handling the waste material the Contractor shall follow and comply with the following legislation and guidelines:

(i) The Contractor shall be aware of, and comply with, the *Waste Disposal Ordinance*, the *Public Health and Municipal Services Ordinances*, the *Water Pollution Control Ordinance* and the *Waste Disposal (Chemical Waste) (General Regulation)*.

(ii) The Contractor's attention is drawn to *A Guide to the Chemical Waste Control Scheme*; *A Guide to the Registration of Chemical Waste Producers*; and the *Code of Practice on the Packing, Labelling and Storage of Chemical Wastes*.

(iii) The Contractor shall comply with and complete the procedures in the following Works Branch Technical Circular (WBTC) and ETWB TCW:

- WBTC No. 2/93 – Public Dumps
- WBTC No. 2/93B – Public Filling Facilities
- WBTC No. 16/96 – Wet soil in Public Dumps
- WBTC No. 4/98) Use of Public Fill in Reclamation
  4/98A) and Earth Filling Projects
- WBTC No. 25/99) Incorporation of Information on
  25/99A) Construction and Demolition
  25/99C) Material Management in PWSC Papers
- WBTC No. 12/2000 – Fill Management
- WBTC No. 19/2001 Metallic Site Hoardings and Signboards
- WBTC No. 12/2002 – Specification Facilitating the Use of Recycled Aggregates
- ETWB TCW No. 33/2002 Management of Construction and Demolition Material including Rock.
- ETWB TCW No. 34/2002 – Management of Dredged/Excavated Sediment.
- ETWB TCW No. 31/2004 – Trip-ticket System for Disposal of Construction and Demolition Material
- ETWB TCW No. 19/2005 – Environmental Management on Construction Sites.

K4 SCOPE OF PROJECT

Location of Designated Project and Existing Environment

K4.1 Secondary drainage channel KT13 is in the vicinity of a recognized egretry, the Ho Pui Egretry. The site is located between two villages, Ma On Kong and Ho Pui in southern Kam Tin in Northwest New Territories of Hong Kong. It is approximately 1 km northeast of the portal of the Route 3 Tai Lam Tunnel less than 300 m from West Rail alignment and depot and immediately north of Tai Lam Country Park. Figure K1 shows the location of KT13 in relation to the main water catchments in the Northwest New Territories.

Secondary Drainage Channel KT13

K4.2 Secondary drainage channel KT13 has been proposed in the YLDMP to drain the areas in Ma On Kong where the existing streamcourse is insufficient, to deal with catchwater overflows for Ho Pui Reservoir to the south and to provide infrastructure for future development.

K4.3 In order to improve the hydraulic performance of the streamcourse, the downstream section (Section A) of the streamcourse is widened and deepened to a trapezoidal channel with 5 m wide gabion base and banks, depth of 3 m. The upstream section (Section B) is also trained to a trapezoidal channel with 5 m wide gabion base and banks with a constant depth of 2 m.

K4.4 A concrete bypass culvert will be built for the middle section of Ma On Kong streamcourse with the maintenance access to be formed above the bypass culvert. The alignment of the proposed bypass culvert, the associated ramps, access road, gates are shown on Figure K2a and b. The bypass culvert is a twin cell box culvert. With the bypass culvert, the flow in the middle section of Ma On Kong streamcourse can be controlled so that there will be no overbank flow during a 1 in 50 years storm, while maintaining dry weather flow similar to existing condition in the unmodified existing middle section of the KT13 stream to ensure protection of egretry and associated habitat.

K4.5 With the widening and deepening of both the upstream and downstream sections and a bypass culvert for the middle section, the Ma On Kong streamcourse will have adequate flow capacities to convey the maximum predicted flows within bank.

K5 IMPLEMENTATION PROGRAMME

Design and Construction Programme

K5.1 The construction of the secondary drainage channel KT13 is scheduled to commence in mid 2007, and is expected to be completed by mid 2010. The construction contract is programmed to be approximately 36 months.

K5.2 The endorsed environmental mitigation measures of the EIA will be incorporated in the detailed design of the channel.

K6 DEVELOPMENT CONSTRAINTS

Alternative Alignment

K6.1 The secondary drainage channel KT13 requires channelization of a stream which supports ecological habitats with conservation value (Ho Pui Egretry). When planning this DP, the benefits from optimizing hydraulic performance of the proposed channel design, material and alignment, and those from the preservation of natural stream habitats and the Ho Pui Egretry for education and enjoyment were both recognized and weighed.

K6.2 The design of the culvert was initiated by the requirement to avoid modification of the middle section of the stream for the preservation of Ho Pui Egretry and the associated habitats. This bypass culvert is necessary to provide sufficient hydraulic capacity to prevent over bank flow at this middle section during storm conditions.

K6.3 The alignment selection process is evaluated in detail in the EIA.

Channel Lining Options

K6.4 Options for channel lining for banks and floor include natural bed (gravel or mud), gabions, concrete or grasscrete. While the hydraulic performance of concrete and grasscrete lined channels are best for smooth flow and easy maintenance, they will remove the ecological values of the land on which they occupy. Also, the rate of transport of sediments downstream, whether clean or contaminated, will also increase, resulting in increase in suspended solids and biological oxygen demand (BOD) in water.

K6.5 Gabions and natural stream beds offer surfaces for retaining sediments and establishment of vegetation on banks. This would also reduce the rate of sediment loss from the catchment and enter into Deep Bay. Nevertheless they are more expensive to maintain as they are often displaced or damaged after heavy storms. Annual trimming of bank side vegetation and removal of excess sediments will be required to ensure sufficient hydraulic capacity is retained. Natural banks are especially prone to erosion and subject to scour especially if there are bends in the channel alignment. To retain sufficient hydraulic capacity for flood prevention and cost effectiveness in maintenance, it is considered not viable to adopt natural stream bank and bed for this Project.

K6.6 After due consideration of the ecological value of the two sections of stream to be channelized in terms of their proximity to the unmodified section for the preservation for Ho Pui egretry, a balance was drawn to adopt a gabion design for the existing stream sections to be channelized, while the bypass culvert is of a twin box concrete design.

K7 BREAKDOWN OF C&D MATERIAL QUANTITY

K7.1 An estimate of the maximum material volumes involved during construction and potential for re-use of excavated material is shown in Tables K1a and K1c. The method and the programme of the disposal of the C&D materials are shown in Table K1b.

Table K1a
Breakdown of Surplus Material Types and Volumes Likely to Arise during Construction of KT13

Location	Inert Excavated Material (not contaminated) including Rock (Grade III or below) (m^3)	Sediments (m^3)	C&D Waste (m^3)
KT13 Section A (CH0 – CH401) Trapezoidal, gabion	26,540	8,218	44
KT13 Bypass Culvert (CH0 – CH400) Twin box, concrete	17,690	800	45
KT13 Section B (CH0 – CH301) Trapezoidal, gabion	21,500	5,421	35
Total	65,730	14,439	124

Table K1b
Method and Programme of the Disposal of Construction and Demolition Materials (m^3)

	KT13 Section A (CH0 – CH401)	KT13 Bypass Culvert (CH0 – CH400)	KT13 Section B (CH0 – CH301)
2007			
Reuse on site	957	652	774
Reuse at other projects or to public filling facilities	4,624	3,149	3,741
Disposal to East Sha Chau facility	2,876	800	1,897
Disposal to NENT landfill	10	10	7
Imported fill	142	97	116
2008			
Reuse on site	1,149	783	929
Reuse at other projects or to public filling facilities	9,522	6,292	7,718
Disposal to East Sha Chau facility	3,287	0	2,168
Disposal to NENT landfill	17	18	14
Imported fill	171	116	138

	KT13 Section A (CH0 – CH401)	KT13 Bypass Culvert (CH0 – CH400)	KT13 Section B (CH0 – CH301)
2009			
Reuse on site	766	522	620
Reuse at other projects or to public filling facilities	9,522	6,292	7,718
Disposal to East Sha Chau facility	2,055	0	1,356
Disposal to NENT landfill	17	17	14
Imported fill	114	77	19

Remark:
1. The exact programme and quantities of the disposal and filling works will depend on the contractor's programme after the contract is awarded.
2. C&D materials should be disposed of at designated public filling facilities or landfills. Disposal of the materials for use at other construction projects is subject to the approval of the Engineer and/or relevant authorities, such as LandsD, PlanD, etc. Furthermore, unauthorized disposal of C&D materials in particular on private agricultural land is prohibited and may be subject to relevant enforcement and regulating actions. The Contractor shall refer and strictly follow the requirements stipulated in the ETWB TCW No. 31/2004 – Trip Ticket System for Disposal of Construction & Demolition Materials.

Table K1c
Summary of Estimated Quantity of Construction and Demolition Materials (m^3) Arising from this Designated Project

	KT13 Section A (CH0–CH401)	KT13 Bypass Culvert (CH0 – CH400)	KT13 Section B (CH0–CH301)	Total
C&DM to be reused on site	2,872	1,957	2,323	7,152
C&DM to be reused on other projects or delivered to public filling facilities	23,668	15,733	19,177	58,578
Sediments for marine disposal	8,218	800	5,421	14,439
C&D waste to be disposed of at NENT landfill	44	45	35	124
Total	34,802	18,535	26,956	80,293

Remark:
1. The exact programme and quantities of the disposal and filling works will depend on the contractor's programme after the contract is awarded.
2. C&D materials should be disposed of at designated public filling facilities or landfills. Disposal of the materials for use at other construction projects is subject to the approval of the Engineer and/or relevant authorities, such as LandsD, PlanD, etc. Furthermore, unauthorized disposal of C&D materials in particular on private agricultural land is prohibited and may be subject to relevant enforcement and regulating actions. The Contractor shall refer and strictly follow the requirements stipulated in the ETWB TCW No. 31/2004 – Trip Ticket System for Disposal of Construction & Demolition Materials.

K7.2 It is estimated that the quantity of C&D material to be transported off site is 73,141m³. The amount of fill need to be imported is 990m³. The amount of material reused on site is 7,152m³. Amount of material required to be reused at other public works project (subject to approval by relevant authorities as stipulated in ETWB TCW No. 31/2004) or disposed of to designated public filling facilities amounts to 58,578m³. Worst case estimate of sediments quantity is 14,439m³ (may be contaminated to different level). Approximately 12,062m^3 and 2,377m^3 of sediment will require Type 1 – open sea disposal and Type 2 – confined marine disposal respectively. Amount of C&D waste to be disposed to landfill is 124m³. The designated landfill to accept C&D waste generated from this Project will be the NENT Landfill. The designated public filling facility to dispose the public fill generated from this Project will be the Public Filling Facility at Tuen Mun Area 38. The locations of disposal of the sediment were obtained from the Marine Fill Committee. Type 1 – open sea disposal will be Pit IVa / Pit IVb of the East Sha Chau facility as capping material while for Type 2 – confined marine disposal will be Pit IVc of the East Sha Chau facility.

K8 METHODS TO MINIMIZE C&D WASTE

Waste Concrete

K8.1 Dry concrete waste will be sorted out from the other wastes and recycled at recycling plant at Tuen Mun Area 38 to form aggregates for road sub-base.

Wooden Material

K8.2 All wooden material used on site should be kept separate from other wastes. Wooden boards will be reused on site several times until the quality of the boards is no longer suitable for re-use. Boards used should be capable of being reused at least five times, thus keeping the wastage rate down to around 20%. Timber which cannot be reused again should be sorted and stored separately from all inert waste before being disposed of to landfill. On-site incineration of wooden waste is prohibited under the Air Pollution Control Ordinance, Open Burning Regulation. It is an offence under law to burn construction waste in open space. On completion of construction phase, remaining reusable wooden material shall be sorted and used at other construction sites by the same contractor or sold to other construction sites.

K8.3 Steel and concrete panels shall be used as a preferred alternative to formwork, falsework, and site fencing where possible.

K8.4 The Contractor shall pay attention to WBTC No. 19/2001 - Metallic Site Hoardings and Signboards. This was introduced to reduce the amount of timber used on construction sites.

Chemical Waste

K8.5 Where the construction processes produce chemical waste, the Contractor must register with EPD as a Chemical Waste Producer. Wastes classified as chemical wastes are listed in the Waste Disposal (Chemical Waste) (General) Regulation. EPD requires information on the particulars of the waste generation processes including the types of waste produced, their location, quantities and generation rates. A contact person shall be registered with EPD.

K8.6 Storage, handling, transport and disposal of chemical waste shall be arranged in accordance with the Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes published by EPD. Storage areas for chemical wastes shall have adequate ventilation and be covered to prevent rain entering.

K8.7 The main chemical waste types arising from the construction sites are likely to be engine oils, lubricants, paints and solvents. Oily waste may be in the form of raw waste, or as sundries such as spent oil filters, or materials used to absorb oil leaks. Various storage and disposal measures are recommended in the Code of Practice to minimize impacts from these chemical sources. The expected quantity of such waste is limited.

K8.8 Any construction plant which is likely to leak oil, shall have absorbent inert material e.g. sand, placed beneath it. This material shall be replaced on a regular basis and the contaminated material stored in a designated, secure place. Such relatively inert material is suitable for landfill disposal and can be disposed of via the normal waste stream.

K8.9 Lubricants, waste oil, waste paints and solvents shall be collected by a licensed collector for chemical waste and disposed at the Chemical Waste Treatment Centre, Tsing Yi or other licensed facility.

Wheel Wash Waste

K8.10 All vehicles leaving any of the works areas will pass through a wheelwash at the site access/exit. If, at any time, further entry/exit points are created, they will be provided with similar facilities. The wheelwash will be regularly cleaned to remove sediment, a process which may produce muddy wastewater. These wastewaters shall be directed into settlement ponds. Clarified wheel waste water will be recycled at the wheel wash facility. Settled sediments will be dried and disposed in the same way as inert excavated material. The maintenance of the wheelwash will be the responsibility of the Contractor undertaking the construction works.

Sewage

K8.11 Mobile chemical toilets shall be provided for site staff at locations away from stream sides. The Contractor shall arrange for regular collection of sewage by licenced contractors for disposal to government sewer. There will not be any temporary canteen. It will be the responsibility of the Contractor to ensure that sewage disposal complies with the standards set out in the Technical Memorandum on Effluents Discharged into Drainage and Sewerage Systems, Inland and Coastal Waters.

Municipal/Domestic Wastes

K8.12 Municipal/domestic wastes will be generated by the construction workers during the clearance/construction period. The quantity of municipal waste generated is estimated to be 1.21 kg/employee/day. A temporary refuse collection station shall be set up by the Contractor. Municipal waste shall be collected regularly and delivered to the Northeast New Territories (NENT) Landfill.

K8.13 Provision and collection of skips for different types of recyclable waste is the responsibility of the Contractor. Arrangements shall be made directly with the recycling companies, for example, the paper merchants, to collect the waste as required.

K9 METHODS AND RESPONSIBILITIES TO MAXIMIZE C&D MATERIAL RE-USE AND RECYCLING AND DISPOSAL OPTIONS

K9.1 The potential for re-use, recycling and disposal options for each type of waste is discussed in Table K2.

Table K.2
Recycling or Re-Use Potential and Disposal Options for Different Waste Types

Waste Type	Works Generating Waste	Volumes Lost as Waste	Potential Re-Use or Recycling	Destinations
Inert Fill Material and Topsoil/Pond Material	Excavation works	None	Excess fill material produced during construction can be re-used.	Fill material to be reused on or off-site by Contractor. Excess fill to be sent to C & D Material Recycling Plant at Tuen Mun Area 38 or approved Public Filling areas.

Waste Type	Works Generating Waste	Volumes Lost as Waste	Potential Re-Use or Recycling	Destinations
Stream bed material and material from previously filled ponds	Excavation along channel and along construction spoil in ponds filled by other nearby civil projects	Amount Significant (approximate 50%)	Dried and reusable if clean or considered of an engineering suitable grade. Otherwise to be disposed. Pond bottom deposits not likely to be suitable engineering material. Rubble filled material from previously in-filled ponds will have to be checked to see if it is of a grade suitable for re-use.	Clean deposits and spoil should be sorted and reused within works. Any excess shall be sent to C & D Material Recycling Plant at Tuen Mun Area 38 or to approved Public filling areas.
Concrete	Demolition of current channel sides; Construction of channel	3 – 5%	Needs to be separated; re-useable material needs to be crushed.	To C & D Material Recycling Plant at Tuen Mun Area 38.
Wooden Material	Construction Demolition	20%	Reusable as lower grade shuttering or fencing on-site or other sites.	To NENT landfill (final disposal).
Scrap metals	Construction Demolition	Small amounts	Cannot be reused on site. It will be sold to recycling company.	To NENT landfill only if rejected by recycling companies.
Stream sediments	Excavation	100%	None	Uncontaminated sediment to East Sha Chau facility as capping material. Contaminated sediment to East Sha Chau facility.
Chemical Waste (including waste oil, lubricants, paints and solvent)	General Construction site activities/Cleaning and maintenance of site equipment/ grease traps	Small amounts	Waste oil may be collected by oil companies. For other types of chemical wastes, the recycling potential is low.	To be collected by licensed collectors for disposal at the Tsing Yi Chemical Waste Treatment Facility or other licensed facility.
Wheel Wash Waste	Vehicle use during general works	Total volume when replaced	Settled at sedimentation ponds and recycled.	Settled sediments to be dried and disposed at public filling areas or C&D Material Recycling Plant.
Sewage	Where site workers are present	Small	None.	Chemical toilet waste to be disposed to government sewer by licensed contractor.
Municipal/ Domestic Waste	General site activities	Putrescible waste, wet paper, fabrics	Aluminium cans, dry paper, and clean plastic containers (not used to contain hazardous chemicals)	To NENT landfill after extracting recyclable items from waste stream.

Responsibilities for Construction Waste Management

K9.2 Appropriate waste management measures should be incorporated as part of the Environmental Management Plan (EMP) to be prepared and implemented by the Contractor. This EMP should include all factors dependent on individual works sites including designation of areas for the segregation and temporary storage of materials for future use or recycling. Contractors shall follow the recommendations of ETWB TCW No. 19/2005 for environmental management on construction site.

K9.3 The Public Fill Committee (PFC), review and co-ordinate the provision and operation of land based public filling facilities, whilst the Marine fill Committee (MFC) co-ordinates marine based facilities. Responsibilities for recycling, re-use or disposal of waste materials will be the Contractors generating the waste.

K9.4 The Contractor is responsible for re-use, recycle and dispose the construction waste according to the methods detailed in Table K.2. A summary of the responsibilities of the Contractor is provided in Table K.3.

Table K.3
Responsibilities for Waste Collection, Recycling and Disposal during the Construction Phase

Waste Type	Responsibility for Collection of Waste	Responsibility for Transport of Waste Off-Site	Responsibility for Recycling	Responsibility for Disposal
Excavated Material	Contractor	Contractor	Contractor, for the portion of fill re-used on site. For surplus fill, CEDD (Port Works) defines sites that require fill.	Contractor
Concrete	Contractor	Contractor	CEDD (Port Works) defines sites which require fill.	Contractor
Wooden Material	Contractor	Contractor	Contractor	Contractor
Scrap Metals	Contractor	Contractor	Contractor	Contractor
Municipal / domestic waste	Contractor to arrange licensed contractors	Licensed contractors	Not applicable	Contractor
Wheel Wash Waste	Contractor	Contractor (settled material)	Contractor	Contractor
Sewage	Contractor to arrange licensed contractors	Licensed contractors	Not applicable	Licensed contractors to sewage treatment works operated by DSD

Waste Type	Responsibility for Collection of Waste	Responsibility for Transport of Waste Off-Site	Responsibility for Recycling	Responsibility for Disposal
Sediments	Contractor	Contractor	Not applicable	Contractor to location approved by Marine Fill Committee (MFC).
Chemical Waste (including waste oil, lubricants, paints and solvents)	Contractor to arrange licensed collectors	Licensed collectors	Not applicable	Licensed collectors of chemical wastes to Chemical Waste Treatment Facility at Tsing Yi or other licensed facility.

K10 DISPOSAL PROGRAMME FOR EACH TYPE OF SURPLUS C&D MATERIAL

K10.1 Table K4 shows the disposal programme for the different types of surplus construction wastes.

Table K4
Disposal Programme for Different Types of Surplus Construction Wastes

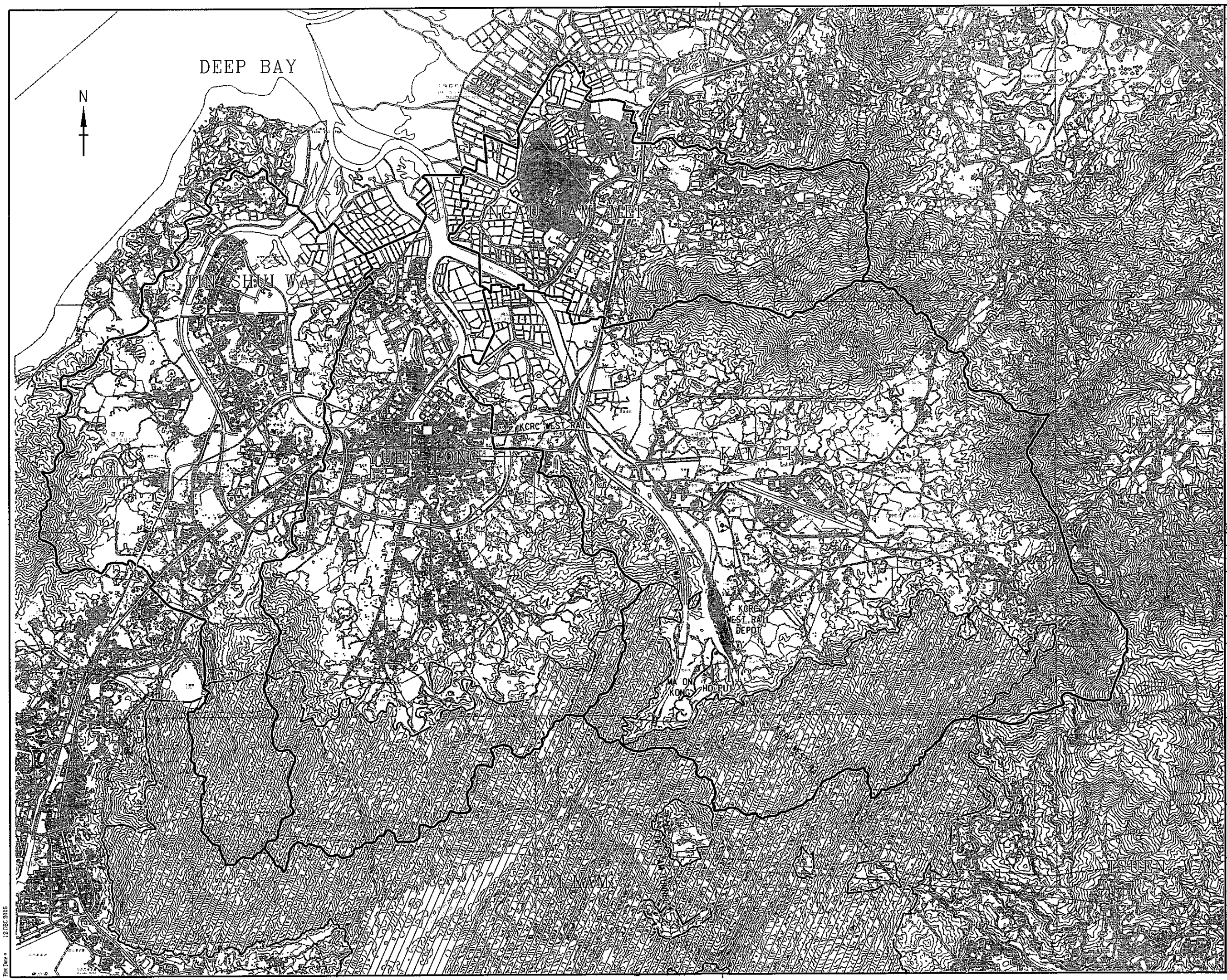
Area	Major Activities	Waste Type	Disposal
All	Site clearance	Vegetation Topsoil	NENT Landfill To be used for landscaping
All	Demolition	Concrete Bricks/Tiles Scrap metals Wood and other non-inert waste	Reuse on site/Public Filling Facility at Tuen Mun Area 38 Recycle Recycle/Reuse/NENT Landfill
All	Excavation	Assorted spoil including rocks of various size and soil. Not suitable for re-use on site or other projects. Non-inert material Contaminated sediments	Public Filling Facility at Tuen Mun Area 38 Recycle/NENT Landfill East Sha Chau facility
All	General site Activities	Sewage Municipal Wastes Packaging Materials Chemical wastes	Collected by licenced contractor NENT Landfill Recycle/NENT Landfill Chemical Waste Treatment Facility

K11 CONCLUSIONS

K11.1 This C&DMMP summarizes the expected quantities of gross and surplus wastes likely to arise from the implementation of the KT13 project and feasible ways to minimize, re-use, recycle and appropriately dispose surplus C & D wastes. It is recognized there are a number of constraints inherent to reducing surplus material for this particular project but nevertheless many practical measures had been suggested to achieve the purposes of this Plan.

K12 RECOMMENDATIONS

K12.1 The Contractor is required to prepare an Environmental Management Plan as required under ETWB TCW No. 19/2005 by referring to the information listed in this C&DMMP, and should try to adhere to the principles of waste reduction, reuse and recycling when deriving his construction methods and programme to facilitate and if possible surpass the expected performance listed in this C&DMMP.



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LEGEND

- CATCHMENT BOUNDARY
- MA ON KONG CHANNEL (KT13)
- TAI LAM COUNTRY PARK BOUNDARY

Revision	Date	Description		Initial
	Designed	Checked	Drawn	Checked
Initial	MC	KIL	YLL	KIL
Date	09/05	09/05	09/05	09/05

Approved

AGREEMENT NO. CE 67/98

Contract title

YUEN LONG, KAM TIN,
NGAU TAM MEI AND TIN SHUI WAI
DRAINAGE IMPROVEMENT, STAGE 1,
PHASE 2B - KAM TIN

Drawing title

KT13 AND ITS RELATION WITH
CATCHMENTS IN
NORTHWEST NEW TERRITORIES

Drawing no.

FIGURE K1

Scale

1:25000 A1
1:50000 A3

香港特別行政區政府渠務署
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
DRAINAGE SERVICES DEPARTMENT

BLACK & VEATCH HONG KONG LIMITED
柏誠工程顧問有限公司

Plot Date = 12 DEC 2005

CAD Filename = p:\drain-water\drainage\2047\c2b\env study\fig2-1.dgn

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NOTES :

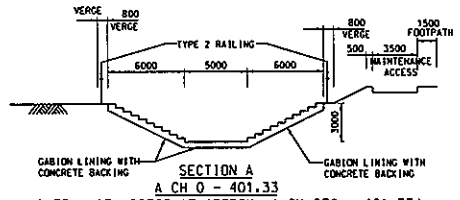
1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
2. GRID LINES ARE HONG KONG METRIC GRID 1980.
3. TYPE 2 RAILING WITH DEBRIS TRAP BAR AND GENERAL MESH FILL SHALL BE PROVIDED AT BOTH SIDES OF THE CHANNEL BANKS

LEGEND :

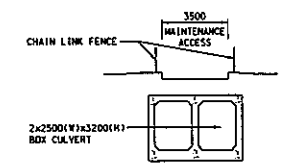
- SITE BOUNDARY
- PROPOSED CHANNEL
- PROPOSED SLOPE
- AREA TO BE FILLED TO ADJACENT GROUND LEVEL
- I.L. INVERT LEVEL

824700 E
824800 E
824900 E
825000 E
825100 E
825200 E
831000 N
830900 N
830800 N
830700 N
830600 N
830500 N

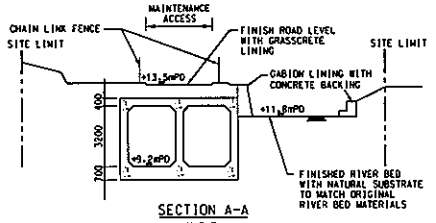
INLET STRUCTURE
EXISTING PEDESTRIAN CROSSING SHALL BE DEMOLISHED
CONNECTION TO MATCH WITH BOX CULVERT No. BC1 (3 CELLS 3500(W) x 2200(H)) CONSTRUCTED BY KCRC - WEST RAIL UNDER CONTRACT CC601
MAIN RIVER CHANNEL CONSTRUCTED BY KCRC - WEST RAIL UNDER CONTRACT CC601
IL 7.46mPD
PEDESTRIAN CROSSING PC13A-1
A CH 100
900mm DIA PIPE CROSSING
THE INLET STRUCTURE CONSTRUCTED UNDER CONTRACT CC601 SHALL BE DEMOLISHED AND MODIFIED
SECTION A 5m BASE WIDTH TRAPEZOIDAL CHANNEL WITH GABION BASE AND BANKS
TWIN 1200mm DIA PIPE CROSSING
A CH 200
TAI KWEK
RAMP NO. 2
LOCKABLE CRASH GATE CG13-2
TURNING AREA
A CH 300
BC CH 0
IL 8.40mPD
VEHICULAR GATE VG13-4
MA ON KONG
VEHICULAR ACCESS
A CH 400
PROPOSED FOOTPATH
BC CH 300
PASSING BAY
TWIN 1050mm DIA PIPE CROSSING
IL 8.5mPD
SECTION BYPASS TWIN-CELL BOX CULVERT
VEHICULAR GATE VG13-3
BC CH 200
MATCH LINE FOR CONTINUATION SEE FIGURE 2.2B
HO PUI
TRAPEZOIDAL CHANNEL 8.0m BASE WIDTH
100 DEPTH



SECTION A
A CH 0 - 401.33
(MAINTENANCE ACCESS AT APPROX. A CH 270 - 401.33)
N.T.S.



TWIN CELL BOX CULVERT
BC CH 127 - 200
N.T.S.



SECTION A-A
N.T.S.

Revision	Date	Description	Initial
C	03/06	AMENDMENT TO BY-PASS CULVERT	KIL
B	10/05	MINOR AMENDMENT TO CHANNEL LAYOUT	KIL
A	05/05	MINOR AMENDMENTS TO SITE BOUNDARY	KIL

	Designed	Checked	Drawn	Verified
Initial	TW	KIL	MK	KIL
Date	04/04	04/04	04/04	04/04

Approved

AGREEMENT NO. CE 67/98

Contract title

YUEN LONG, KAM TIN, NGAU TAM MEI AND TIN SHUI WAI DRAINAGE IMPROVEMENT, STAGE 1, PHASE 2B - KAM TIN

Drawing title

MA ON KONG CHANNEL KT13
PROPOSED LAYOUT PLAN

(SHEET 1 OF 2)

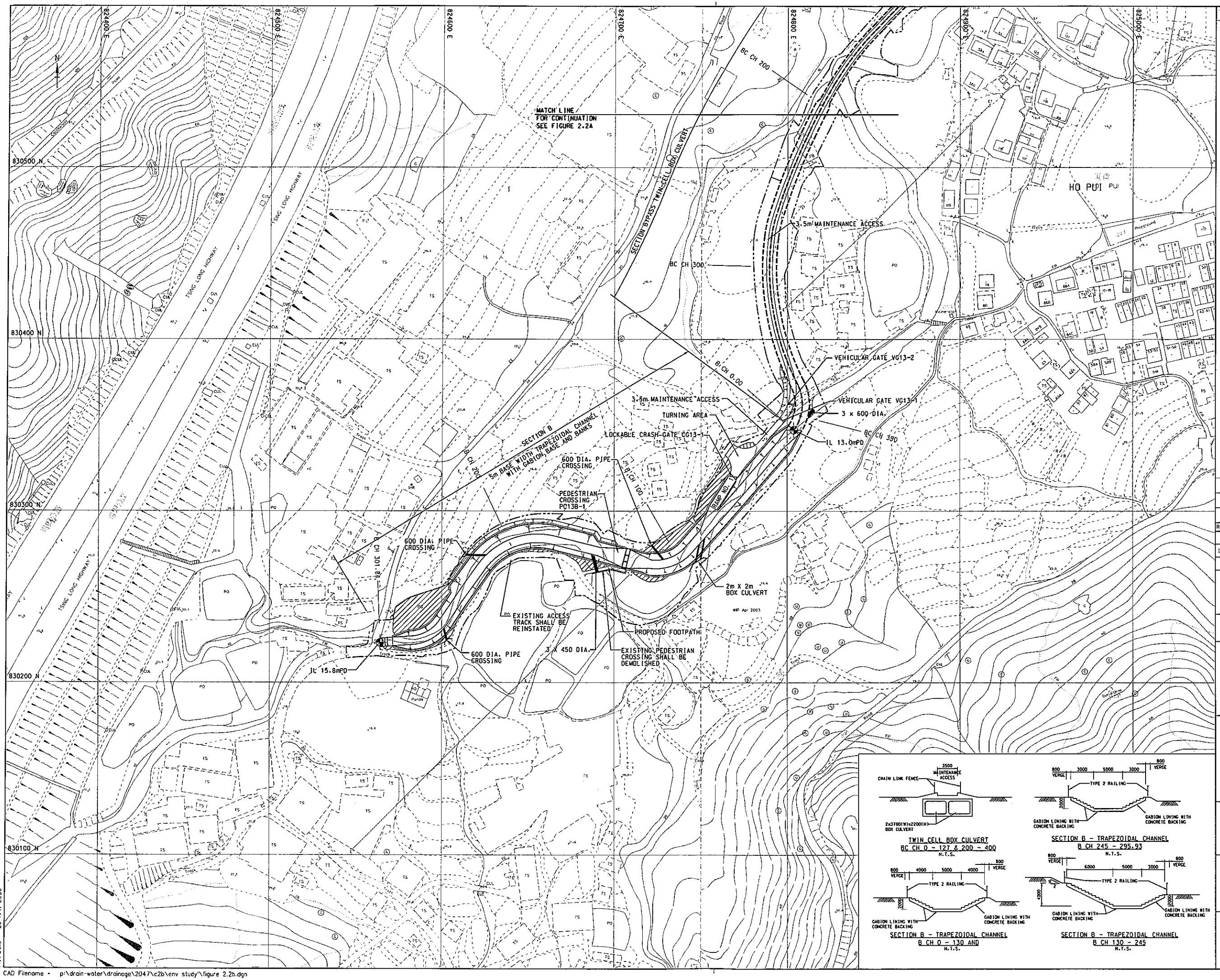
Drawing no.	Scale
FIGURE K2a	1:1000 A1 1:2000 A3

香港特別行政區政府渠務署
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
DRAINAGE SERVICES DEPARTMENT

BLACK & VEATCH HONG KONG LIMITED
博威工程顧問有限公司

Plot Date - 21 APR 2006

CAD Filename - p:\drain-water\drainage\2047\c2b\env study\figure 2.2a.dgn



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NOTES :

1. ALL DIMENSIONS ARE IN MILLIMETRES UNLESS STATED OTHERWISE.
2. GRID LINES ARE HONG KONG METRIC GRID 1980.
3. TYPE 2 RAILING WITH DEBRIS TRAP BAR AND GENERAL MESH FILL SHALL BE PROVIDED AT BOTH SIDES OF THE CHANNEL BANKS

LEGEND :

- SITE BOUNDARY
- PROPOSED CHANNEL
- PROPOSED SLOPE
- AREA TO BE FILLED TO ADJACENT GROUND LEVEL
- I.L. INVERT LEVEL
- PROPOSED RETAINING WALL

Revision	Date	Description	Initial
C	03/06	AMENDMENT TO BY-PASS CULVERT	KIL
B	10/05	MINOR AMENDMENT TO CHANNEL LAYOUT	KIL
A	05/05	MINOR AMENDMENTS TO SITE BOUNDARY	KIL

	Designed	Checked	Drawn	Verified
Initial	TW	KIL	MK	KIL
Date	04/04	04/04	04/04	04/04

Approved

AGREEMENT NO. CE 67/98

Contract title

YUEN LONG, KAM TIN,
NGAU TAM MEI AND TIN SHUI WAI
DRAINAGE IMPROVEMENT, STAGE 1,
PHASE 2B – KAM TIN

Drawing title

MA ON KONG CHANNEL KT13
PROPOSED LAYOUT PLAN
(SHEET 2 OF 2)

Drawing no.	Scale
FIGURE K2b	1:1000 A1 1:2000 A3

香港特別行政區政府渠務署
THE GOVERNMENT OF THE HONG KONG SPECIAL ADMINISTRATIVE REGION
DRAINAGE SERVICES DEPARTMENT

BLACK & VEATCH HONG KONG LIMITED
博威工程顧問有限公司

Plot Date - 26 APR 2006

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