

NECSO Entrecanales Cubiertas, S.A.

WASTE MANAGEMENT PLAN

REFERENCE LCK/WMP/01

Waste Management Plan

for

Route 8 (formerly Route 9) - Lai Chi Kok Viaduct

for

Highways Department

Contract No. HY/2003/01

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3.0 BACKGROUND

3.1. Project Description

The Highways Department is implementing the project "Route 9 – Lai Chi Kok Viaduct" (hereinafter called the Project). A site layout plan for the Project is provided in Appendix F. The scope of the Project works comprises the following major items:

- (a) Construction of the 1.4km long Lai Chi Kok Viaduct (LCKV) from Lai Wan Interchange to Butterfly Valley;
- (b) Construction of the elevated slip roads associated with LCKV including Slip Roads A and B at Lai wan Interchange and Slip Roads C and D at Ching Cheung Road;
- (c) Realignment of Lai Po Road (Road D3) and modification of connection with Link Road G being constructed under Contract No. WK/29 by TDD;
- (d) Realignment of Butterfly Valley Road and the modification to Kom Tsuen Street bus terminus;
- (e) Construction of Lai Wan Road Overpass and its integration with the existing bridge and the associated widening of the section of Ching Cheung Road;
- (f) Modification to Butterfly Valley Interchange including the demolition of the existing bridge carrying Ching Cheung Road over Castle Peak Road for the construction of Slip Road C;
- (g) Construction of noise barriers, noise semi and full enclosures on Lai Chi Kok Viaduct and its associated slip roads, and at the tunnel approach road within the site of Contract HY/2003/02;
- (h) Construction of Lai Po Road and Wai Man Tsuen F.H. Pump House;
- (i) Construction of Lai Wan Road Overpass Irrigation Pump Room;
- (j) Slope works and retaining wall construction along Ching Cheung Road, Castle Peak Road and Lai Po Road;
- (k) Associated drainage and sewerage works;
- (l) Associated landscape works;
- (m) Associated waterworks;
- (n) Associated E&M works including road lighting etc;
- (o) Associated civil engineering works for subsequent E&M and TCSS works to be carried out by others;
- (p) Provision of necessary assistance to and coordination of Environmental Monitoring and Audit (EM&A) works to be undertaken by others throughout the contract period; and
- (q) Other works which are shown on the Drawings or specified or which may be ordered in accordance with the conditions of Contract.

The Works comprises a Designated Project as defined by the Environmental Impact Assessment Ordinance (EIAO – Cap 499). Under the requirements of the EIAO, Environmental Impact Assessment (EIA) Reports were prepared under Agreement No. CE 42/96, Route 16 Investigation Assignment from West Kowloon to Sha Tin in 1998 and 1999. The Final EIA Report (hereinafter referred to as the EIA Final Report), which incorporated the final alternative alignment of Route 16, and the associated Environmental Monitoring and Audit (EM&A) Manual have been approved under the EIAO procedures. The Environmental Permit No. EP-103/2001 (hereinafter called the "EP") was subsequently issued by the Environmental Protection Department (EPD) for the construction and operation of the Project.

3.2. Requirements for an Waste Management Plan (WMP)

This Waste Management Plan (WMP) is prepared to present how NECSO will implement the waste management for the Project.

3.3. Objectives of the WMP

The purpose of the WMP is to ensure proper management of construction and demolition materials generated in the execution of the Works.

This WMP will cover the following:

- Identification and classification of the construction and demolition materials generated in the execution of the Works.
- Submission of proposals for disposal, re-cycle/reuse of and minimization of the construction and demolition materials.
- The manner by which such proposal will be implemented and monitored.

4.0 WASTE MANAGEMENT ORGANIZATION STRUCTURE

Several parties are involved in the environmental management of the Project. The Project Team organization structure for environmental matters that involves the Engineer's Representative (ER), Environmental Protection Department (EPD), Independent Environmental Checker (IEC), the Environmental Team (ET), NECSO's Environmental Team and its sub-contractors are presented in the Environmental Management Plan. The roles and responsibilities of NECSO and key personnel are detailed in the following sections.

Main Contractor (NECSO)

- will work within the scope of the construction contract and other tender documents;
- will participate in the waste management site inspections undertaken by the Environmental Team as required and undertake any corrective actions instructed by the ER; and
- will take responsibility and strictly adhere to the provisions of the WMP and Contract.

Several key personnel within the NECSO's organization will be responsible for environmental matters. Roles and responsibilities of these key personnel are as follows:

Project Director

- will maintain the overall control of the Contract and oversee the implementation of the Waste management plan;
- will be responsible to ensure adequate resources are provided for the efficient implementation of Waste Management Plan; and
- will report to Senior Management of NECSO on all environmental matters whenever necessary.

Construction Manager

- will be responsible for the day-to day overview of site practices in relation to waste management on site;
- will be responsible for applying all necessary licenses in relation to waste management; and
- will report to the Project Manager.

General Foreman

- will assist the Construction Manager in all aspects of required waste management on site;
- will supervise and monitors the works of workers including subcontractors in relation to waste management; and
- will ensure all waste containers and storage areas are properly labeled.

QA & E Manager

- will provide advice on waste management issues;
- will conduct waste management site inspections and investigate and inspect NECSO's equipment and work methodologies with respect to waste management mitigation stipulated in the WMP, and to anticipate waste management issues that may require mitigation before the problem arises;
- will report the status of the implementation of waste management mitigation measures resulting from site inspections; and
- will follow the procedures stipulated in the Event Contingency Plan in the event of non-compliance or complaint.

Project Environmental Officer (EO)

- will be responsible for technical output and communication with the ER, Government Departments and public where necessary
- will co-ordinate waste management on site, gather data about waste and keep up-dated record of waste movement on and off site;
- will obtain a list of potential buyers or collectors of waste to be reused or recycled; and
- will investigate potential re-use and recycle opportunities of waste.
- will review the programme of works, in order to anticipate any potential waste impacts before they arise;
- will revise any part of the WMP as necessary.

Sub-Contractors

- will implement the mitigation measures in the WMP, which is relevant to the works in their sub-contracts, as required by NECSO; and
- will co-ordinate with the Site Agent.

Staff Training

Training on waste management will be provided to the staff within the NECSO's organization. The EO is responsible for providing the required training as outlined in Table 4.1.

Table 4.1 Outline Training Requirements

Staff	Training Needs	When
QA & E Manager	distribution of Waste Management Plan	beginning of works
Relevant Site Supervisors /Foremen identified by Site Engineer	waste management procedures specific to their scope of work	before the staff commences the particular work
All site workers	general waste management procedures, including site cleanliness, waste reduction, reuse and recycling	induction training for the workers

5.0 WASTE REGULATIONS AND GUIDELINES

Various types of wastes will be generated from the Project works and each waste type will require different approach for management and disposal as stipulated in the waste legislation and guidelines. The relevant statutory and non-statutory requirements regarding waste management are summarised in the sections below.

Statutory Requirements

The following legislation relates to the handling, treatment and disposal of wastes in Hong Kong, and shall be observed with regard to all wastes generated and requiring disposal, where applicable:

- *Water Pollution Control Ordinance (WPCO) (Cap 358)*;
- *Waste Disposal Ordinance (Cap 354)*;
- *Waste Disposal (Chemical Waste) (General) Regulation (Cap 354)*;
- *Land (Miscellaneous Provisions) Ordinance (Cap 28)*;
- *Public Health and Municipal Services Ordinance (Cap 132) - Public Cleansing and Prevention of Nuisances (Urban Council) and (Regional Council) By-Laws*;
- *Summary Offences Ordinance (Cap 228)*;
- *Dangerous Goods Ordinance (Cap 295)*; and
- Other relevant regulations

The *Waste Disposal Ordinance (WDO)* prohibits the unauthorized disposal of wastes. Construction waste is not directly defined in the WDO, but is considered to fall within the category of "trade waste". Under the WDO, wastes can only be disposed of at sites licensed by EPD.

Under the *Waste Disposal (Chemical Waste) (General) Regulation* all producers of chemical wastes (including asbestos) must register with EPD and treat their wastes either utilizing on-site plant licensed by EPD, or arranging for a licensed collector to take the wastes to a licensed facility. The regulation also prescribes the storage facilities to be provided on site, including labeling and warning signs, and requires the preparation of written procedures and training to deal with emergencies such as spillages, leakages or accidents arising from the storage of chemical wastes.

Construction wastes that are wholly inert may be taken to public dumps. Public dumps usually form part of land reclamation schemes operated by the Civil Engineering Department (CED). The *Land (Miscellaneous Provisions) Ordinance* requires that individuals or companies who deliver suitable construction wastes to public dumps obtain dumping licenses. CED issues the licenses under delegated powers from the Director of Lands.

NECSO will obtain all necessary permits and licenses under these ordinances including, but not limited to:

- Chemical waste permits/licenses under the *Waste Disposal Ordinance (Cap 354)*;
- Public Dumping License under the *Land (Miscellaneous Provisions) Ordinance (Cap 28)*;
- Wastewater discharge license under the *Water Pollution Control Ordinance*; and
- License for the storage of dangerous goods under *Dangerous Goods Ordinance (Cap. 297)*.

Non-Statutory Requirements

The following documents and guidelines related to waste management and disposal will be adhered to during the construction:

- *Waste Disposal Plan for Hong Kong (December 1989)*, Planning, Environment and Lands Branch Government Secretariat;
- *Environmental Guidelines for Planning in Hong Kong (1990)*, Hong Kong Planning Standards and Guidelines (1990), Hong Kong Government;
- *New Disposal Arrangements for Construction Waste(1992)*, Environmental Protection Department (EPD) and Civil Engineering Department (CED);
- *Code of Practice on the Packaging, Labeling and Storage of Chemical Wastes*. EPD(1992);
- *Code of Practice on the Handling, Transportation and Disposal of Asbestos Waste*, EPD;
- *Works Branch Technical Circular, 32/92, The Use of Tropical Hard Wood on Construction Site*; Works Branch, Hong Kong Government;
- *Works Branch Technical Circular No. 2/93B, Public Dump*, Works Bureau, Hong Kong Government;
- *Works Branch Technical Circular No. 16/96, Wet Soil in Public Dumps*, Works Bureau, Hong Kong Government;
- *Works Bureau Technical Circular No. 4/98A, Use of Public Fill in Reclamation and Earth Filling Projects*; Works Bureau, Hong Kong SAR Government;
- *Waste Reduction Framework Plan, 1998 to 2007*, Planning, Environment and Lands Bureau, Government Secretariat, 5 November 1998;
- *Works Bureau Technical Circular No 25/99C, Incorporation of Information on Construction and Demolition Material Management in Public Works Sub-committee Papers*; Works Bureau, Hong Kong SAR Government;
- *Works Bureau Technical Circular No. 12/2000 "Fill Management"*; Works Branch, Hong Kong SAR Government;
- *Works Bureau Technical Circular No. 19/2001, Metallic Site Hoardings and Signboards*; Works Branch, Hong Kong SAR Government;
- *Works Bureau Technical Circular No. 12/2002, Specifications Facilitating the Use of Recycled Aggregates*; Works Branch, Hong Kong SAR Government;
- *Works Bureau Technical Circular No 21/2002, Trip-ticket System for Disposal of Construction and Demolition Material*; Works Bureau, HK SAR Government;
- *Environment, Transport and Works Bureau Technical Circular No.15/2003, Waste Management on Construction Sites*.
- *Environment, Transport and Works Bureau Technical Circular No.33/2002, Management of Construction and Demolition Material Including Rock..*
- *A Guide to the Registration of Chemical Waste Producers*; and
- *A Guide to the Chemical Waste Control Scheme*.

6.0 CLASSIFICATION / ANALYSIS OF C&D MATERIAL

Wastes will be generated from the construction activities is Construction and Demolition (C&D) materials – excavated materials not used as filling material or not suitable as filling material under the Contract’s requirements; which consists of “inert” (Public Fill) and “non-inert” (C&D Waste):

- Inert portion C&D materials (Public Fill)
 - Public fill that can be reused and/or recycled in order to enable it to be reused in the Contract;
 - Surplus excavated rock material of Grade III or IV granite to be delivered to the designated stockpile area at Tsing Yi.
 - Surplus public fill other than Grade III or IV granite to be delivered to Tuen Mun Area 38.
- Non-inert portion of C&D materials (C&D Waste), including general refuse
 - Chemical waste – from maintenance of construction plant;
 - C&D waste to be recycled;
 - C&D waste to be re-used;
 - C&D waste to be returned; and
 - C&D waste which cannot be reused or recycled and has to be disposal of at WENT or NENT.

The estimated amounts of different types of waste and their generation schedule are shown in Table 6.1.

Table 6.1 Estimated Amounts of Waste

Waste Type	Examples	Estimated Amount ⁽¹⁾	Generation Period
<i>Inert Portion of C&D Materials (Public Fill)</i>			
Public fill that can be reused and/or recycled in order to enable it to be reused in site area	Rock, concrete, brick, soil, bituminous materials	42,400 m ³	15 th Dec 2003 – 4 th Nov 2007
Surplus public fill to be delivered to public filling facilities	Rock, concrete, brick, soil, bituminous materials	77,600 m ³	15 th Dec 2003 – 4 th Nov 2007
<i>Non-inert Portion of C&D Materials (C&D Waste), including General Refuse</i>			
Chemical waste ⁽¹⁾	Used oil, spent solvent	A couple of hundred litres per month	15 th Dec 2003 – 4 th Nov 2007
C&D waste to be recycled	Office waste, can, XPM mesh and steel	720 m ³	15 th Dec 2003 – 4 th Nov 2007
C&D waste to be re-used	Wood, bamboo	360 m ³	15 th Dec 2003 – 4 th Nov 2007
C&D waste to be returned	Over ordering materials	0 m ³	15 th Dec 2003 – 4 th Nov 2007
C&D waste which cannot be reused or recycled and has to be disposal of at landfill sites	Plastic, vegetation, refuse on land	6,120 m ³	15 th Dec 2003 – 4 th Nov 2007

(1) Chemical waste is defined under *Schedule 1 of the Waste Disposal (Chemical Waste) Regulation*.

7.0 AVOIDANCE / MINIMIZATION OF C&D MATERIAL

The key waste management issue is to reduce the amount of waste generated from the works sites. The waste management options will be exercised in according to the hierarchy described below:

- Avoidance and Minimization, to avoid and minimize waste through careful planning and design works; good site management to minimize over ordering and cross contamination; and improving site practice;
- Reuse of materials, to reuse construction waste such as excavated materials, used wooden planks and metal formwork;
- Recovery and Recycling, to undertake on-site or off-site waste recycling;
- Treatment and Disposal, to properly treat or dispose of waste materials in accordance with legislative requirements, guidelines and good practices.

Wastes arising will be collected on an on-going basis and sorting will be carried out as classification including the separation of C&D materials into public fill, C&D waste for proper disposal, as well as the sorting of C&D material by category to facilitate reuse/recycling/return. Those able to be reused on site will be segregated and temporarily stored on site for reuse.

Reuse and Recycling

Reuse and recycling could divert C&D material from waste stream back to the construction cycle. This can be achieved through balancing cut and fill, reusing items such as hoardings, formworks and scaffoldings and recycling materials such as metals, concrete and asphalt. Demolition waste can also be reused and recycled on-site in new construction.

Potential opportunities for recycling and reuse of C&D materials from the Project will include:

- milling wastes arising from regarding of the existing pavement could be recycled on site and reused as either road-base in the new carriageways or fill for new embankments;
- existing marginal roadside barriers comprise pre-cast units, it may be possible to re-use these following widening works; and
- existing bridge parapets comprise aluminum post and railings, these have a recyclable value and could be sold on for reconditioning or reused for scrap metal.

Material Control and Maintenance

Too early an order or over-ordering together with poor storage and maintenance of raw materials always result in deterioration and damages. To avoid accumulation, the right amount of raw materials will be ordered at the right time with proper control and documentation on material flow. Besides, surplus materials will be returned to stock in centralized area with suitable protective measures.

Material Utilization

Mishandling of raw materials and improper operation procedures are often causes for high raw material wastage. Raw materials will be fully utilized to avoid wastage. As such, current operation procedures will be reviewed to include any waste reduction measure, while raw materials will be carefully used, especially during installation and cutting. Besides, broken items or offcuts will be considered for sections when small lengths are required.

8.0 SORTING FACILITIES

The sorting will be carried out as per the classification and will include the separation of C&D material into public fill, C&D waste for proper disposal, as well as the sorting of C&D materials by category to facilitate re-use/recycling/return. Sorting and temporary storage area of C&D material is provided on site and the location is shown in Appendix G.

NECSO will segregate and sort the waste materials into 3 categories:

- (a) Public Fill (e.g. concrete and rubble) for reuse on-site or disposal at a public filling area;
- (b) Re-use and/or recycling waste (e.g. steel and other materials);
- (c) Waste which cannot be reused and/or recycled (e.g. wood, glass and plastic) for landfill disposal.

NECSO will carefully monitor the sorting processes to avoid missing of the 3 categories. Different types of wastes shall be stockpiled and sorted in different containers to enhance reuse and recycling and their proper disposal.

9.0 PROPOSAL FOR HANDLING, RECYCLING, REUSE AND RETURN OF C&D MATERIAL

C&D materials including:

- Concrete/brick/agggregates/soil/bituminous materials;
- Timber;
- Paper/Cardboard;
- Metal;
- Others (e.g. plastic, foam board etc.)

Handling of C&D Material

These materials will be sorted on site into public fill (inert) and C&D waste (non-inert). Mixed C&D materials will be sorted by separately broken concrete/rock from other non-recycled material such as asphalt brick, tiles and glass at source to reduce the inert content to less than 30% by weight.

The public fill will be temporarily stockpiled on site for reuse on site. Appropriate air quality and water quality (run-off) mitigation measures will be implemented for the storage and handling of public fills. Procedures to be followed during the storage of these materials will include:

- Wetting the surface of stockpiles, particularly during dry periods;
- Minimize disturbance to stockpiles by enclosing and covering, particularly during prolonged wet, dry or windy periods; and
- Separate stockpiles from, and install silt traps into, the surface water drainage system.

Excavated materials will be transported under covered. During loading and waste transportation, consideration will be given to potential environmental impacts caused by fugitive dust emissions.

Reuse of C&D Material

Precast elements will be used whenever practicable so that the amount of waste generated from the construction site can be minimized. Besides, waste reuse and recycling will be highly encouraged at the construction site.

The construction materials that are readily reusable will be first recovered at the site otherwise transported to other construction sites for reuse as far as practicable. Inert materials can be used as fill materials at other construction site and non-inert C&D waste can be first sorted by waste collector who can remove the useful materials from the waste.

Recycling of C&D Material

Metal waste can be recycled by suppliers and C&D material can be recycled by disposed of at Recycling Plant proposed by Necso and endorsed by the Engineer's Representative.

Return of C&D Material

To avoid accumulation, the right amount of raw materials should be ordered at the right time with proper control and documentation material flow. Surplus materials will be returned to stock in centralized area with suitable protective measures.

10.0 EXCAVATED / DREDGED MATERIAL

In general, the excavated materials from the work site will be uncontaminated. Uncontaminated materials to be excavated will be segregated on-site to avoid cross-contamination. The cut and fill of excavated materials will be balanced on-site as far as practicable.

Excavated uncontaminated materials will be sorted on site. The material which is surplus to the requirements of the permanent work will be disposed of by NECSO to Tuen Mun Area 38 or Tsing Yi.

As stockpiling of excavated material may generate dust problems, standard dust suppression measures as specified in the *Air Pollution Control (Construction Dust) Regulations* will be adopted if practicable.

11.0 CHEMICAL WASTE

Chemical waste that is produced, as defined by *Schedule 1 of the Waste Disposal (Chemical Waste) (General) Regulation*, will be handled in accordance with the *Code of Practice on the Packaging, Labelling and Storage of Chemical Wastes* as follows:

Packaging

Chemical waste will be packed and held in containers of suitable design and construction so as to prevent leakage, spillage or escape of the contents under normal conditions of handling, storage and transport.

Containers used for the storage of chemical wastes will:

- be suitable for the substance they are holding, resistant to corrosion, maintained in a good condition, and securely closed;
- have a capacity of less than 450 liters unless the specifications have been approved by the EPD; and
- display a label in English and Chinese in accordance with instructions prescribed in *Schedule 2 of the Regulations*.

Labelling

Every container of chemical waste will bear an appropriate label which will contain the particulars details. The waste producer will ensure that the information contained on the label is accurate and sufficient so as to enable proper and safe handling, storage and transport of the chemical waste.

Storage

A proposed area for temporary storage of chemical waste is identified in Appendix E. The storage area will be specially constructed and bunded, and located close to the source of waste generation.

The storage area for chemical wastes will:

- be clearly labeled and used solely for the storage of chemical waste;
- be enclosed on at least 3 sides;
- have an impermeable floor and bunding of sufficient capacity to accommodate 110% of the volume of the largest container or 20% of the total volume of waste stored in that area, whichever is the greatest;
- have adequate ventilation;
- be covered to prevent rainfall entering (water collected with the bund must be tested and disposed of as chemical waste); and
- be arranged so that incompatible materials are adequately separated.

Transportation and Disposal

Under the *Waste Disposal (Chemical Waste) (General) Regulation*, chemical wastes will be transported by a licensed waste collector, after the chemical wastes have been packed, labeled, and stored. The chemical wastes will be disposed at appropriate waste disposal sites mentioned in Table 13.1 of this WMP.

12.0 GENERAL REFUSE

General refuse generated on-site will be stored in enclosed bins separate from construction and chemical wastes. A waste collector will be employed to remove general refuse from the site, separately from construction and chemical wastes, on regular basis to minimize odor, pest and litter impacts. The burning of refuse on construction sites is prohibited by law and will not be undertaken.

Office wastes can be reduced through the recycling of paper if volumes are large enough to warrant collection. Waste paper can be stored separately from the general refuse to facilitate recycling. Participation in a local collection scheme should be considered if one is available. In addition, waste separation facilities for paper, aluminum cans, plastic bottles etc., should be provided.

13.0 DISPOSAL OF SURPLUS C&D MATERIAL

The inert materials will be delivered to other reclamation sites or public filling areas while waste containing putrescible and non-inert materials will be disposed of at landfills.

Waste Disposal Sites

The disposal sites for different types of wastes are shown in Table 13.1.

Table 13.1 Waste Disposal Sites

Waste Type	Disposal Site
<i>Inert Portion of C&D Materials (Public Fill)</i>	
Public fill that can be reused and/or recycled in order to enable it to be reused in site area	-
Surplus public fill to be delivered to public filling facilities	Any public filling facilities as approved by ER.
<i>Non-inert Portion of C&D Materials (C&D Waste), including General Refuse</i>	
Chemical waste	Chemical Waste Treatment Facility at Tsing Yi; or Other facilities approved by EPD
C&D waste to be recycled	-
C&D waste to be re-used	-
C&D waste to be returned	-
C&D waste which cannot be reused or recycled and has to be disposal of at landfill sites	WENT, SENT or NENT Landfills or at any other landfills as approved by the ER.

Surplus public fill and non-inert C&D waste such as bamboo, metal and timber will be disposed of at public filling facilities, landfills, or any other locations within the Territory of the Hong Kong Special Administrative Region in accordance with the acceptance criteria laid down by the operators of the corresponding public filling facilities or landfills. A copy of the acceptance criteria for Tuen Mun Area 38 Public Filling Area and WENT, SENT or NENT landfills is shown in Appendix C. The C&D waste delivered for landfill disposal will contain no free water and the liquid content will not exceed 70% by weight.

Permitted and licensed waste collectors will be employed to collect and transport waste to appropriate disposal points. The following measures will be adopted:

- (a) Handle and store waste in a manner which ensures that it is held securely without leakage.
- (b) Use authorized or licensed waste collectors to collect specific category of wastes.
- (c) Remove waste in a timely manner.
- (d) Maintain and clean waste storage areas regularly.
- (e) Minimize windblown litter and dust during transportation by either covering the trucks or transporting waste in enclosed containers.
- (f) Obtain necessary waste permits from the relevant authorities or agencies.
- (g) Dispose waste at licensed sites.
- (h) Develop trip-ticket system in accordance with Works Bureau Technical Circular No. 21/2002 to facilitate tracking of loads and ensure that illegal disposal of waste does not occur.

- (i) Maintain records of quantities of wastes generated, recycled and disposed off-site for each category of waste.

The trip-ticket system will be established to monitor the disposal of public fill, excavated materials and solid wastes at public filling facilities and landfills. NECSO will produce a Construction and Demolition Material Disposal Delivery Form (the Form), which is attached in Appendix D, for each and every vehicular trip transporting C&D materials.

Prior to the vehicle leaving the Site, NECSO will present to the site supervisory staff the completed Form. The site supervisory staff will insert the Time of Departure and stamp the Form. The site supervisory staff will retain a copy of the Form and return the original to NECSO. The Form will be carried on board the vehicle at all times throughout the vehicular trip.

For each vehicular trip, NECSO will present to the operator of the Designated Public Filling Facility or Landfill the stamped Form prior to the disposal of C&D material. The Operator will stamp and return the Form to NECSO together with a computer print-out receipt to acknowledge the disposal of public fill or C&D waste. NECSO will submit the stamped Form and the computer print-out receipt to ER by fax within 2 working days and followed by submission of the originals by post within 2 weeks after the vehicular trip.

14.0 DISCHARGE OF WASTE WATER

Construction Run-Off

Exposed soil areas will be minimised to reduce the potential for increased siltation, contamination of runoff, and erosion. Construction runoff can be readily controlled through the use of appropriate mitigation measures, which include:

- Use of a sedimentation tank prior to discharge;
- Regular (weekly) cleaning of the sedimentation tank; and
- Adequate maintenance of drainage systems to prevent flooding and overflow.

Open stockpiles of construction materials (eg. Aggregates, sand and fill material) of more than 50 m³ will be covered with tarpaulin or similar fabric during rainstorms. Necessary measures will be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.

Manholes (including newly constructed ones) will always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris being washed into the drainage system and storm runoff being directed into foul sewers.

Precautions to be taken at any time of year when rainstorms are likely, actions to be taken when a rainstorm is imminent or forecast, and actions to be taken before rainstorms are summarised in ProPECC PN/94. Particular attention will be paid to the control of silty surface runoff during storm events, especially for areas located near steep slopes.

All vehicles and plant will be cleaned before leaving a construction site to ensure no earth, mud, debris and the like is deposited by them on roads. An adequately designed and located wheel washing bay is to be provided by NECSO.

Drainage

All temporary drainage pipes and culverts provided to facilitate runoff discharge will be adequately designed for the controlled release of storm flows. All sediment control measures will be regularly inspected by environmental team and maintained by site staff to ensure proper and efficient operation at all times and particularly following rain storms.

Sewage Effluent

Construction work force sewage on site is discharged to septic tanks or potable chemical toilet installed on site. NECSO will be responsible for collection of sewage by licensed subcontractor.

15.0 SITE CLEANLINESS

In order to keep the site clean, following measures will be adopted on site:

- Waste will be removed on a regular basis to avoid potential hazardous and visual impact from waste build up on site;
- Rubbish bins will be provided for storage of general refuse so as to separate refuse from construction and chemical wastes;
- Formal instruction will be issued to all staff members and sub-contractors to prohibit general littering on site; and
- Debris before dumped into a debris chute will be sprayed with water to minimize dust generation.
- Wheel washing facilities at site accesses will be provided and cleaned up in a regular basis or as required.

Daily Cleaning

A Daily Cleaning Checklist (shown in Appendix A) is prepared to facilitate ER to check NECSO's compliance in keeping the Site in a clean and tidy condition. EO or his delegate will complete the inspection checklist, record down the areas requiring improvements, and take photographs of areas where cleaning and tidying up works have been done and where improvement actions are required.

NECSO will submit, in the morning of the day (which is not a General Holiday) following a Cleaning Day, the inspection checklist, records and photographs to ER for checking and recording.

Weekly Tidying

A Weekly Tidying Checklist (shown in Appendix A) is prepared to facilitate ER to check NECSO's compliance in keeping the Site in a clean and tidy condition. EO or his delegate will complete the inspection checklist, record down the areas requiring improvements, and take photographs of areas where cleaning and tidying up works have been done and where improvement actions are required.

NECSO will submit, in the morning of the day (which is not a General Holiday) following a Cleaning Week Day, the inspection checklist, records and photographs to ER for checking and recording.

16.0 MONITORING AND AUDIT PROPOSAL

The aims of the waste audit are:

- To ensure proper arrangements/procedures to avoid/minimize the waste generated from construction activities;
- To ensure that the waste arising from works are handled, stored, collected, transferred and disposed of in an environmentally acceptable manner;
- To ensure that the handling, storage, collection and disposal of waste arising from the demolition works comply with the relevant requirements under the *Waste Disposal Ordinance* and its regulations;
- To encourage the reuse and recycling of materials; and
- To facilitate the ER to audit NECSO's performance in implementing the WMP.

The EO will audit the waste management practices with reference to Table 16.1. The audit frequency will be at least once every week. In the event of any identified non-compliance against the provisions of this WMP, actions should be taken in according to the Event Contingency Plan for non-compliance and complaint as shown in Table 16.2.

Table 16.1 Waste Management Checklist

Activities	When	If non-compliance, Correction Required
All necessary waste disposal permits or licenses have been obtained.	Before the commencement of demolition works	Apply for the necessary permits/licenses prior to disposal of the waste.
Only waste hauliers are used for waste collection.	Throughout the works	Waste collection of that particular waste should be temporarily suspended until a licensed waste haulier is used.
Wastes are removed from site in a timely manner. General refuse is collected regularly.	Throughout the works	Remove the waste accordingly.
Waste storage areas are properly cleaned and do not cause windblown litter and dust nuisance.	Throughout the works	Clean the storage area and/or cover the waste.
Different types of waste are segregated in different containers or skip to enhance recycling of material and proper disposal of waste.	Throughout the works	Provide separate skips/containers and ensure the workers place the waste in the appropriate containers.
Chemical wastes are stored, handled and disposed of in accordance with the <i>Code of Practice on the Packaging, Handling and Storage of Chemical Wastes</i> , published by the EPD.	Throughout the works	Rectify the problems immediately.
Wastes are stored properly to minimise dust and water quality	Throughout the works	Carry out mitigation measures immediately.

Activities	When	If non-compliance, Correction Required
impacts.		

Table 16.2 Event Contingency Plan for Non-compliance and Complaint

Step	Day	Action	NECSO	ER	IEC	ET
1.	1	Create a new non-compliance /complaint record within 1 working day after making an observation during a site audit by EO or his delegate. EO sends a Notice of Non-Compliance/Complaint (NNC) to ER. The NNC will include the observations and the reasons for non-compliance/complaint.	■			
2.	2	Propose corrective actions within 1 working day after the receipt of the NNC.	■	□	□	□
3.	2	Review and agree with the proposed corrective actions and make additional recommendations as required.	■	■ □	□	■ □
4.	2	Implement the proposed corrective actions once they have been agreed.	■			
5.	-	Check the implementation of the corrective actions at the next site audit. Close the non-compliance /complaint record if the implementation of the corrective actions is satisfactory.	■	■ □	□	■ □
6.	-	Propose preventive actions within 3 working days after the closure of the non-compliance /complaint record.	■	□	□	□

- action party
- comments on the non-compliance record where applicable.
- IEC – Independent Environmental Checker
- ET – Environmental Team

17.0 RECORDS

The EO will be responsible for keeping waste management records on site. These records will include, but not limited to, the following:

- relevant licences and permits, including dumping licences and registration as chemical waste producer
- records of quantities of waste generated, recycled and disposed of (including the disposal sites)
- trip tickets for chemical waste disposal / Collection of Recycled Coarse Aggregates
- any waste management training record
- photograph

Adequate and proper calendar month records (such as delivery docket, photographs and measurement records) relating to the implementation of the WMP will be submitted to ER within the first week of the following calendar month.

18.0 REPORT

A report on the implementation of the WMP in a form to be agreed by ER after the completion of the Contract will be submitted by NECSO.

The report will include the following information and as required by ER:

- the quantities of different types of C&D material as estimated at the commencement of the Contract;
- a statistics on the monthly quantities of different types of C&D material generated and their disposal method; and
- reasons for any significant difference between the estimated quantities at (a) and the actual quantities at (b).

APPENDIX A

**ROUTE 9 – LAI CHI KOK VIADUCT
 Daily Cleaning Checklist**

Ref no.: _____ Portion: _____ Date: _____ (:)

Description of Works Being Undertaken: _____

Item	Descriptions	N/A	Yes	No	Photo/Remarks
1	Are passageways, common accesses and public areas free of obstructions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	Are materials properly stored and stacked?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Are tools and equipment properly placed and stored after work?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Are waste materials proper sorted, stored and/or disposed of in accordance with the Waste Management Plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	Are hoarding, barriers, guarding, lighting and signing of works properly secured?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Are water ponds and flooding prevented/ removed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7	Are stockpiling and wastes arising from the works cleared?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8	Is chemical waste/waste oil stored properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9	Are the conditions of the site, including Public Cleaning Areas in the perspective of the general public clean and tidy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Checked by: _____

ROUTE 9 – LAI CHI KOK VIADUCT

Weekly Tidying Checklist

Ref no. : _____

Date : _____ (:)

Item	Descriptions	N/A	Yes	No	Photo/Remarks
1	Are passageways, common accesses and public areas thoroughly cleansed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
2	If appropriate, are storage materials re-organized for better utilization of storage spaces and safe stacking?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
3	Are tools and equipment properly maintained and re-conditioned?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
4	Are external covers for plant and equipment cleansed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
5	Are collection and removal of disposed waste materials off site in accordance with the Waste Management Plan?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
6	Are hoarding, barriers, guarding, lighting, and signage of works cleansed, re-conditioned and/or replaced to good working condition?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
7	Are drains and channels cleared to prevent flooding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
8	Is chemical waste/waste oil stored properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
9	Are the conditions of the site, including Public Cleaning Areas in the perspective of the general public clean and tidy?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Checked by: _____

APPENDIX B

ROUTE 9 – LAI CHI KOK VIADUCT

Waste Management Checklist

Ref no. : _____
Date : _____ (:)

		N/A	Yes	No	Photo/Remarks
General refuse	Is accumulation avoided?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is receptacles (e.g. rubbish bins) available?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is there regular and proper disposal?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Construction waste	Is there avoidance or minimization of construction waste general (e.g. use of precast material)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is there on site segregation as far as practicable for reuse and recycle?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is construction waste reused where practicable?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is construction waste disposed at public dumping area or public landfill?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Are trip tickets available for inspection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Chemical waste/waste oil	Is there designated storage area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is chemical waste/waste oil stored properly?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is there proper disposal?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Are disposal delivery forms available for inspection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Excavated material	Is chemical waste license available for inspection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is excavated material properly covered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is excavated material reused on site?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
Chemical/fuel	Are disposal delivery forms available for inspection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is chemical/fuel stored in spill tray or bounded area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Is bund capacity adequate (>110% of the largest tank)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	
	Are storage areas provided with locks and located on sealed area?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	

Checked by: _____

APPENDIX C – ACCEPTANCE CRITERIA FOR DISPOSAL AT LANDFILLS

Acceptance Criteria for WENT, SENT and NENT Landfills

- 1 The EPD Serial No. for this Contract for the purpose of disposal of Construction and Demolition (C&D) material is EP/20/03/432/0117/2000.
- 2 Mixed C&D materials shall be sorted at source to reduce the inert content to less than 30% by weight as far as practicable before they are delivered to landfills.
- 3 The C&D Waste delivered for landfill disposal shall contain no free water and the liquid content shall not exceed 70% by weight.
- 4 NECSO is required to submit ER within 14 days of the date of the Employer's letter of acceptance of the Tender a disposal programme regarding the disposal of construction and demolition waste and to inform the ER any changes of such disposal programme.
- 5 NECSO is also required to inform ER two weeks before starting to deliver the construction and demolition waste to the landfills.

APPENDIX D

CONTRACT No. HY/2003/01

ROUTE 9 – LAI CHI KOK VIADUCT

**Construction and Demolition Material
Disposal Delivery Form**

Department : _____ Contract No. : _____

Contractor : _____

Contract Title : _____

Location of Site : _____

Location of Public Filling Facility/Landfill * : _____

Vehicle Registration No. : _____ Date : _____

Approximate Load : Full / three quarter / half / one quarter *

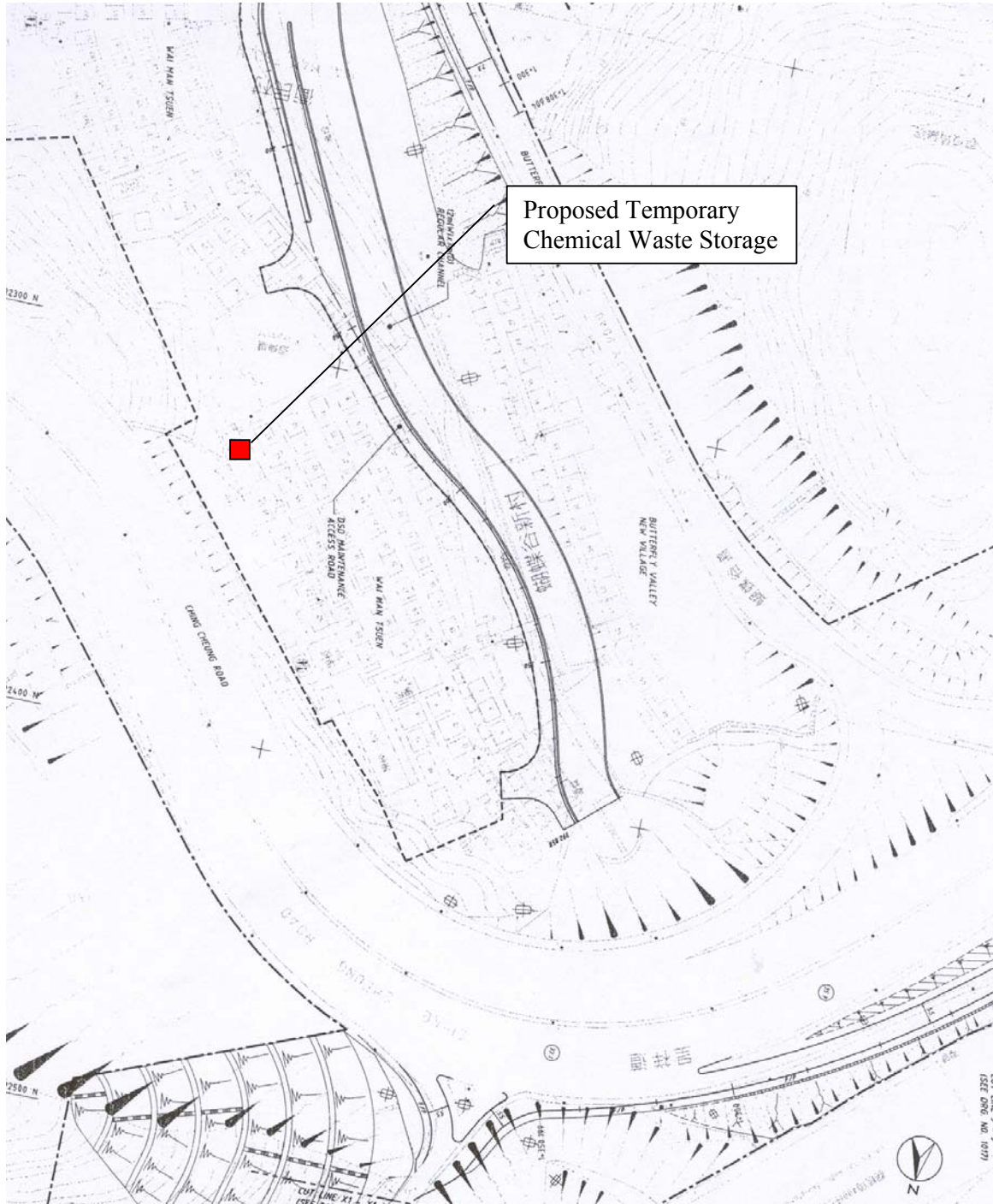
Remark : _____

Time of Departure : _____

Authorized Chop of
Engineer's Representative

* Delete whichever inappropriate

APPENDIX E – Proposed Temporary Chemical Waste Storage



APPENDIX G –Proposed Sorting Area

