LEIGHTON 禮頓

LNS

禮頓 - 利安聯營

Harbour Area Treatment Scheme

Contract No. DC/2007/24

Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from Aberdeen to Sai Ying Pun

Waste Management Plan

DRAINAGE SERVICES DEPARTMENT
HARBOUR AREA TREATMENT SCHEME DIVISION

About this Document

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The Environmental Officer is responsible for updating and maintaining this plan. The original hard-copy of the document should be approved and signed by Contractor's Agent to indicate approval and filed in the project filing system.

If you have any enquiry relating to this plan, please contact the Environmental Officer or authorized delegate in the first instance.

Revision History and Plan Approval

Revision	Date	Section/Description	Prepared by Environmental Officer	Reviewed by Environmental Manager	Approved by the Contractor's Agent
00	2010-11-17	First Issue for Construction	Lighting Chan	-	Argot Ansons
01	2010-12-16	Second Issue for Construction	Lighting Chan	-	Argot Ansons

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Section 1 – Waste Management

1.0 Description of Works

1.0.1 Nature of Work

The Harbour Area Treatment Scheme (HATS, formerly known as Strategic Sewage Disposal Scheme) comprises two stages. The Stage 1 of HATS, which was commissioned in December 2001, involved the construction of a chemically enhanced primary treatment works at Stonecutters Island, the building of a deep tunnel system to convey sewage from the Kowloon Peninsula, Tseung Kwan O, Kwai Tsing and Hong Kong Island East to the new treatment plant, and the construction of a tunnel outfall in the western harbour. The Stage 2 aims at intercepting and treating the sewage generated from the populated areas in the northern and southwestern parts of Hong Kong Island, increasing the treatment capacity to cope with the anticipated population and economic activity growth in the harbour area, and providing a higher level of treatment for all HATS flows to fully meet the water quality objectives set for the Victoria Harbour in the long run. It is Government's current plan to implement HATS Stage 2 in two phases, Stage 2A and Stage 2B. Government is now planning to implement HATS Stage 2A with the scope describe in the next section.

1.0.2 Scope of Work

The scope of Contract DC/2007/24 is as follows:

The Works to be executed under this Contract include, but not exclusively, the following major items:

(a) construction of sewage conveyance system from Aberdeen Preliminary Treatment Works to Sai Ying Pun via Wah Fu Preliminary Treatment Works, Cyberport Sewage Treatment Works and Sandy Bay Preliminary Treatment Works;
(b) construction of drop shafts at Aberdeen Preliminary Treatment Works, Wah Fu Preliminary Treatment Works, Cyberport Sewage Treatment Works and Sandy Bay Preliminary Treatment Works;
(c) construction of temporary production shafts at Aberdeen, Sandy Bay and Sai Ying Pun to provide access for the construction;
(d) construction of connection channels, pipes and chambers connecting the proposed drop shafts to the facilities of the preliminary treatment works / sewage treatment works;
(e) carrying out survey of existing buildings, taking over of existing and installation of new piezometers and ground settlement markers and subsequent monitoring thereof and vibration monitoring along the alignment of the sewage conveyance system;
(f) miscellaneous civil and electrical and mechanical works as shown on the Drawings and specified in the Specification, and
(g) landscape works, which include the landscaping, tree transplanting and preservation works.

1.0.3 Responsibility and Level of Authority of Joint-venture Management and Supervisory Personnel for Waste Management

The responsibilities and authorities of staff with respect to Waste Management are set out in the following subsections. For details of responsibilities refer to the Project Management Plan.

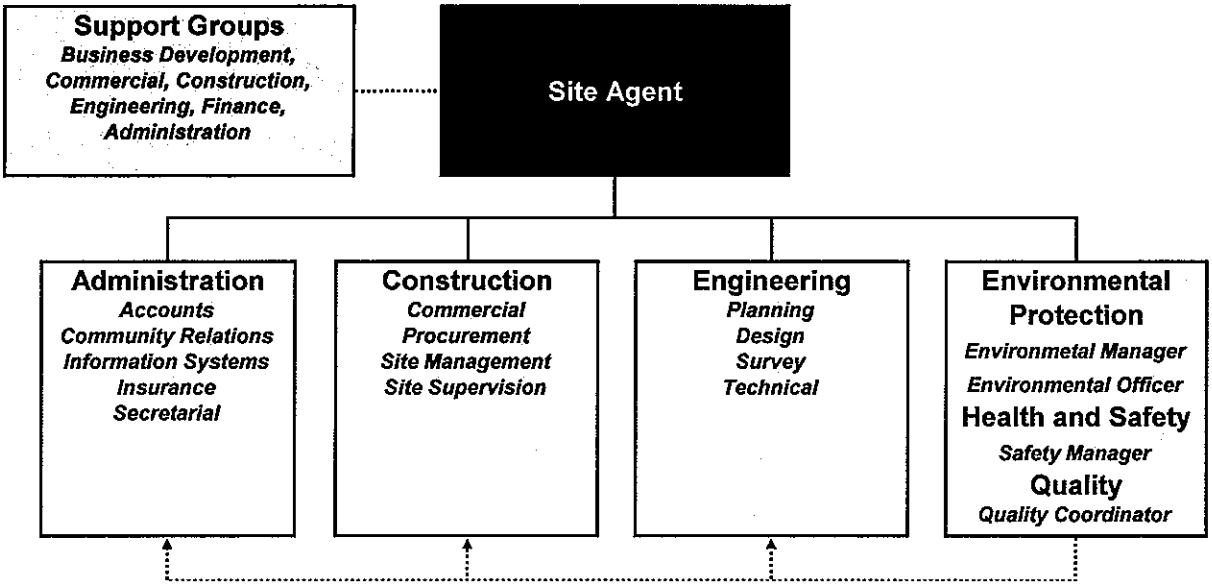


Figure 1.0.1: Project Organigram

1.0.3.1 Site agent (Project Director)

The site agent shall report to the Leighton – LNS Joint Venture's Supervisory Board through the project manager and be responsible for the overall management of the project. He shall have responsibility for making sure that sufficient resources are made available for implementing this Waste Management Plan. He shall have day-to-day authority and responsibility for time, cost and safety, environmental and quality management. The site agent shall:

- determine staffing requirements and allocate clear responsibilities for waste management.
- determine and actively support the Leighton – LNS Joint Venture's policy regarding waste management for the project;
- determine and actively promote the waste management for the project;
- approve the Waste Management Plan and associated documentation for issue;
- liaise with the Engineer, Engineer's Representatives, Drainage Services Department and the Environmental Protection Department regarding overall waste management performance;
- make sure that the Leighton – LNS Joint Venture's activities comply with all statutory and contractual waste management requirements;
- make sure that subcontractors are made aware of their waste management obligations, and
- provide the necessary resources for effective waste management.

1.0.3.2 Environmental Officer

The specified position requirements for the Environmental Officer are set out in Particular Specification Clause 25.36. The main duties of the Environmental Officer are:

Authority:

- the Environmental Officer has the specific authority to implement the approved Waste Management Plan.

Accountability:

- the Environmental Officer is directly accountable to the Quality and Environmental Manager and Environmental Manager for the implementation and maintenance of the Waste Management Plan and for overseeing the monitoring of environmental performance and waste management.

Responsibilities:

- initiating and coordinating the initial planning, documentation and maintenance of the Waste Management Plan and maintaining and updating that plan during the project;
- making sure that all Waste Management Plan requirements are communicated to Leighton – LNS Joint Venture staff, subcontractors and the workforce;
- advising on measures to be taken in the interest of Waste Management, and implementing such measures;
- liaising with the Leighton – LNS Joint Venture's staff, Environmental Team Leader and Environmental Team as appropriate to make sure that the Waste Management Plan is implemented;
- liaising with the Engineer and site supervision staff, environmental staff and representatives of the Environmental Protection Department on Waste Management issues;
- liaising on all matters relating to Waste Management, as necessary;
- making sure that procedures set out in the Waste Management Plan are fully implemented;
- providing or arranging technical support and assistance to Leighton – LNS Joint Venture project staff relating to Waste Management issues;
- monitoring licence and permit applications and their issue to make sure that they are prepared and received in a timely manner to prevent delays to the works;
- monitoring of the environmental system on a day-to-day basis to make sure that the requirements of the Waste Management Plan are operational and effective;
- monitoring environmental performance in accordance with the Waste Management Plan;
- attending waste management-related meetings;
- advising the Leighton – LNS Joint Venture's management and supervision staff on the implementation of the Environmental Management System.

1.0.3.3 Environmental Supervisor

The environmental supervisor shall:

- assist the Environmental Officer in carrying out his duties, including preparation of the Waste Management Plan.
- assist the Environmental Officer in the implementation of the Waste Management Plan;
- monitor and control the works, including those of subcontractors, to make sure that the works are in compliance with contractual and statutory requirements for Waste Management;
- carry out tool-box talks (as assigned by the site agent or Environmental Officer) for Waste Management, and
- implement the project environmental policy and participate and contribute towards the achievement of the Leighton – LNS Joint Venture's environmental objectives and targets.

1.0.3.4 Construction Manager

The construction managers shall:

- make sure that planned mitigation measures for each activity are implemented and that working practices of subcontractors and site personnel do not cause adverse waste impacts;
- report adverse waste impacts and incidents to the Environmental Officer for investigation and corrective action;
- make sure that relevant waste aspects are considered during production, and
- implement the project environmental policy and participate and contribute towards the achievement of the Leighton – LNS Joint Venture's environmental objectives.

1.0.3.5 Tunnel/Shaft Team Leader

The Tunnel/Shaft Team Leader shall:

- make sure that all method statements take account of the constraints imposed by local Waste issues and permit and licensing requirements;
- make sure that planning activities take due account of constraints imposed by waste issues and permit and licensing requirements;
- make sure that all relevant waste aspects are considered during design works, and
- implement the project environmental policy and participate and contribute towards the achievement of the Leighton – LNS Joint Venture's environmental objectives.

1.0.3.6 Commercial Manager

The commercial manager shall:

- coordinate with the Environmental Officer to make sure that all appropriate waste issues, including waste management, are included in subcontracts and purchase orders;
- make sure that waste requirements are fully addressed in procurement documentation, including the requirements of relevant environmental licences and permits;
- make sure that prospective subcontractors are made aware of all the waste issues relating to the project during negotiations prior to subcontract award, and
- implement the project environmental policy and participate and contribute towards achievement of the Leighton – LNS Joint Venture's environmental objectives and targets.

1.0.3.7 Design Manager

The design manager shall:

- coordinate with the Environmental Officer to make sure that all appropriate waste requirements from the contract documents are included in the design;
- consider the method of construction and temporary works proposals to maximize re-use of material when technically acceptable, for example the re-use of formwork and falsework.

1.0.3.8 Programme Manager

The Programme Manager shall:

- coordinate with the Environmental Officer to make sure that the implementation of all appropriate waste mitigation measures are included in the programme, and
- coordinate with the Environmental Officer to make sure that all environmental licences and permit applications are identified and allowed for in programming of the works.

1.0.3.9 Site Agents

The site agents shall:

- make sure that planned mitigation measures for each activity under their specific responsibility are implemented and that working practices of personnel do not cause adverse impacts;
- carry out any necessary remedial work to correct deficiencies identified during weekly inspections, and
- implement the project environmental policy and participate and contribute towards the achievement of the Leighton – LNS Joint Venture's environmental objectives and targets.

1.0.3.10 Senior Engineer/Engineer

The senior engineer/engineer shall:

- make sure that the planned methodology adopted for each activity is fully implemented and that working practices of personnel do not cause adverse impacts;
- make sure that any relevant waste issue is fully considered in preparing work method statements;
- carry out any necessary remedial work to correct deficiencies identified during weekly inspections, and
- implement the project environmental policy and participate and contribute towards the achievement of the Leighton – LNS Joint Venture's environmental objectives and targets.

1.03.11 Senior Foreman/Foreman

The senior foreman/foreman shall:

- make sure that planned mitigation measures for each activity are implemented and that working practices of personnel do not cause adverse impacts;
- be responsible for the day-to-day supervision of the works and make sure that activities are carried out in accordance with environmental control plans;
- monitor rectification of any identified deficiencies and make sure that they are progressed expeditiously, and
- implement the project environmental policy and participate and contribute towards the achievement of the Leighton – LNS Joint Venture's environmental objectives and targets.

1.03.12 Contractor's Organization Chart

The contractor's organization chart for management is shown in figure 1.0.2, and the organization chart of the Environmental Division for waste management is shown in figure 1.03.

Figure 1.0.2 – Organization chart for Management

LEIGHTON / LNS JOINT VENTURE
ORGANISATION CHART (TOP 3 SITE LEVELS)
DECEMBER 2010

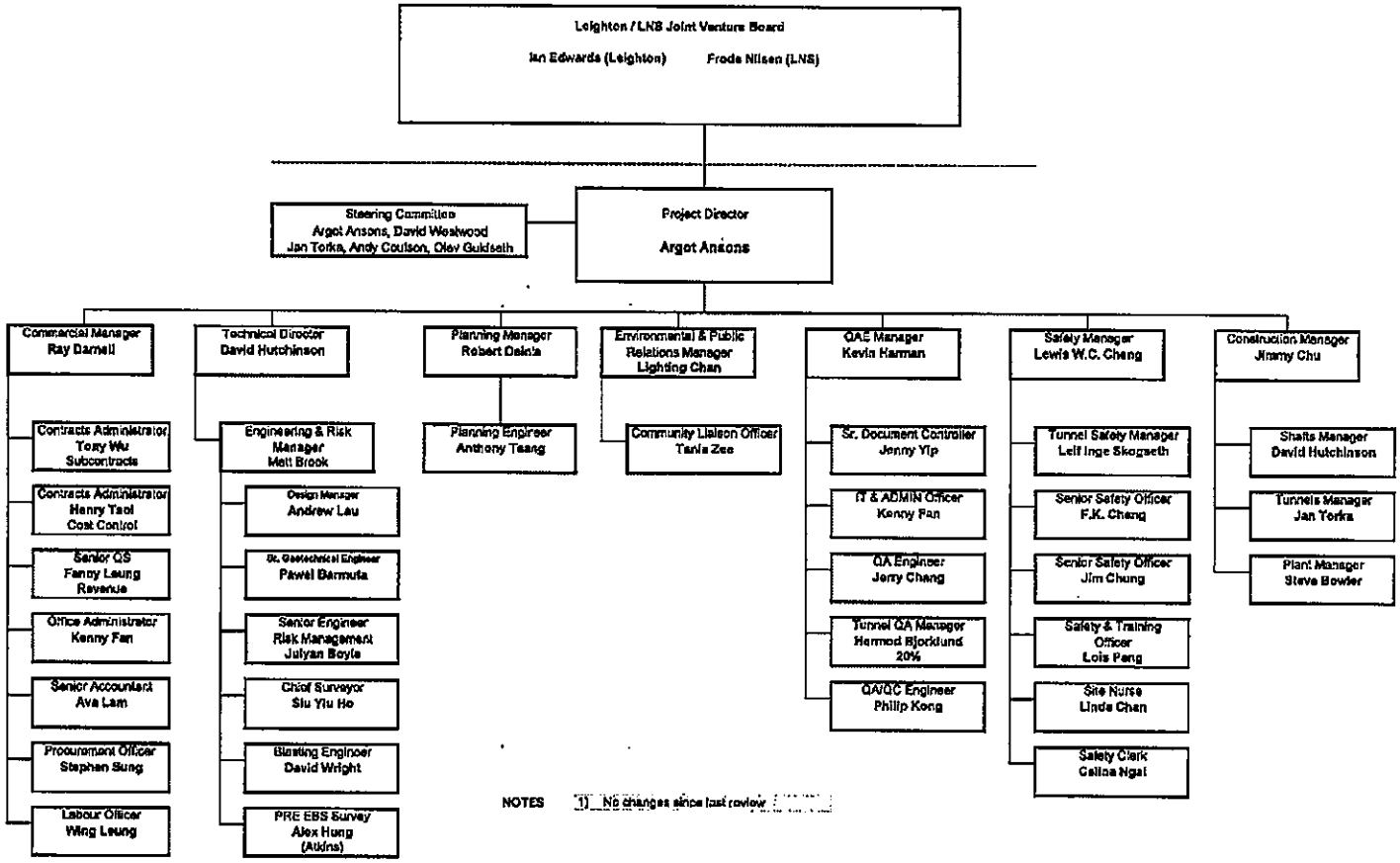
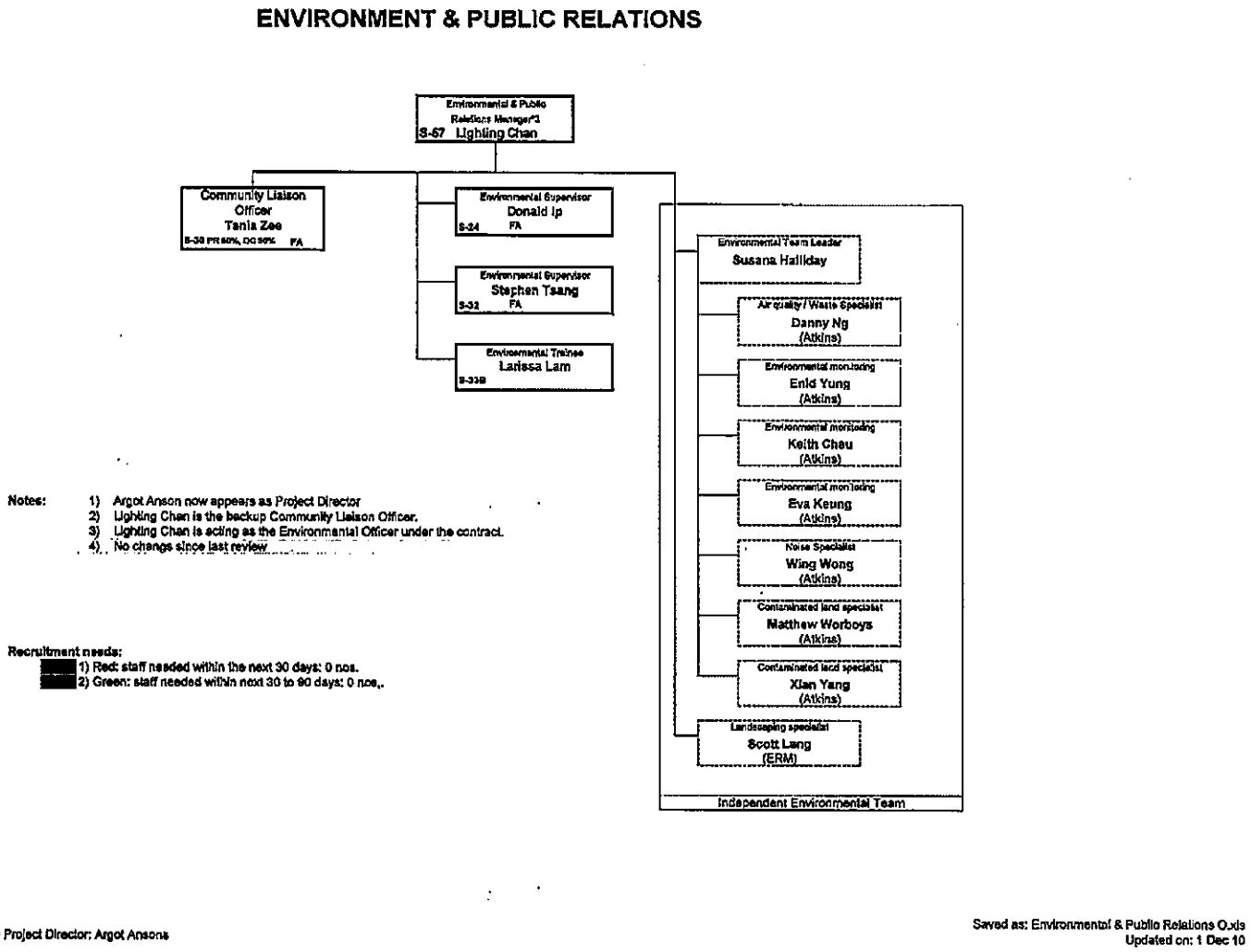


Figure 1.0.2 – Organization chart Environmental Division in Waste Management



1.1 Waste Management Strategy

The Leighton – LNS Joint Venture shall adopt an "inverted cone" waste management strategy, as illustrated in Figure 1.1 to minimize waste generation. That strategy shall also be communicated through the Leighton – LNS Joint Venture's internal training to staff and the workforce.

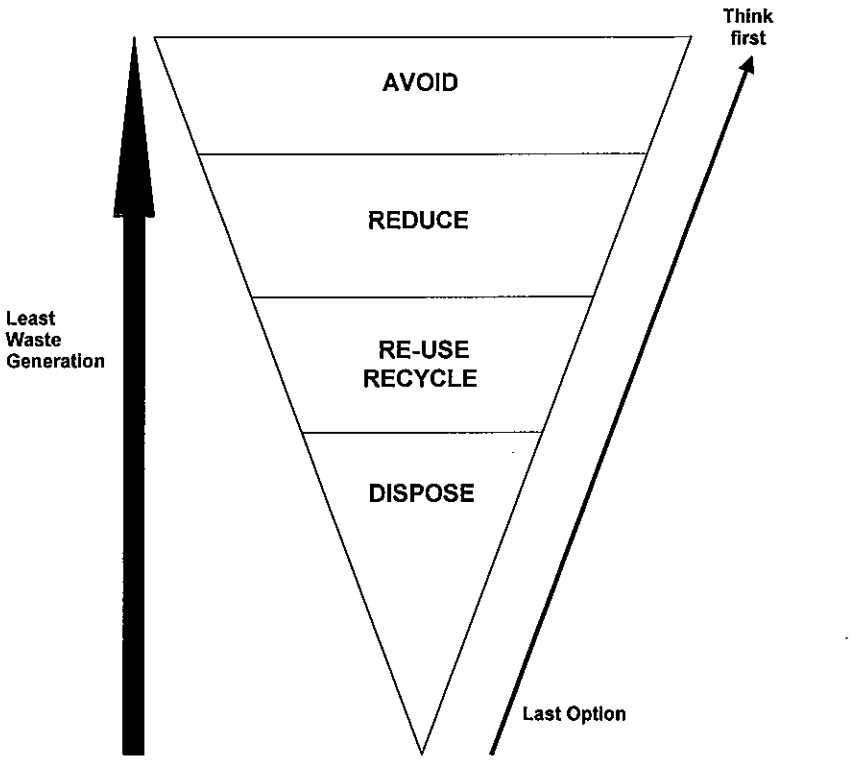


Figure 1.1: Waste-management Strategy

The Leighton – LNS Joint Venture's strategy for waste management shall be to minimize the quantity of material disposed to either the public fill bank or landfill by maximizing reduction and recycling efforts. Disposal of waste shall only be adopted as the last resort. The most significant waste aspect will result from the excavated material arising from the tunnel work and shaft construction. As opportunities for the avoidance or reduction of waste from those activities will be limited, the waste-management strategy shall be to maximize the re-use and recycling of that surplus material.

We will handle C&D Materials in accordance with the requirements of the Particular Specification Clause 6.19A and take the different types of material to the designated disposal locations. Opportunities to improve the environmental outcome for Hong Kong by reusing and recycling at other approved outlets will be continually sought throughout the period of the works as the specific needs of other construction sites and outlets become known.

Rock will be graded/processed to allow reuse or transfer to the Public Fill Bank as appropriate.

In order to maximize the quantity of potential construction and demolition waste that can be re-used or recycled, each type of material shall be carefully segregated and sorted to

avoid cross-contamination and to maintain the quality of the product. Segregation and sorting area shall be assigned as far as practicable to facilitate segregation and sorting process.

Arrangements shall be made with recycling contractors so that recyclable material sorted from the waste stream is collected with reasonable care. The general foremen and engineering supervisors shall be responsible for making sure that suitable temporary storage is available to maintain the quality of the recyclable material such as providing tarpaulin over packaging material to keep it dry. The quantities of recyclable material shall be recorded by the Environmental Officer or nominee before removal off-site by the designated recycling contractor and details shall be included in the waste flow table and in the Leighton – LNS Joint Venture's Monthly Environmental Report.

Opportunities to use recycled material in the permanent and temporary works such as aggregates in low-grade concrete (refer Works Bureau Technical Circular 12/2002, Specifications Facilitating the Use of Recycled Aggregates) is being explored by our designers.

Proposed waste mitigation opportunities based on our overall waste management strategy are summarized in Table 1-1 below:

Table 1-1: Waste Generation: Proposed Mitigation

Strategy	Waste Mitigation Measures
Avoid	Avoid overbreak in tunnel excavation by adequate design of drill hole pattern Plan carefully to make sure material is not over ordered Avoid use of timber in temporary works construction by adopting alternative material, such as steel formwork and pre-cast concrete elements Avoid use of bamboo scaffolding by adopting metal scaffolding solutions
Reduce	Plan construction activities carefully to make sure that resources are used efficiently Optimize design as far as technically feasible to minimize construction and demolition waste (ie, tunnel diameter) Design works to optimize material use and reduce construction and demolition waste Use pre-cast elements to minimize concrete wastage from in-situ works Minimize off-cuts from reinforcing steel bars by careful design and use of bar-bending schedules Encourage use of re-usable/recyclable packaging materials (eg,. plastic pallets) by suppliers
Recycle and Re-use	Re-use suitable material from excavation works for backfilling temporary production shaft Re-use suitable excavated rock (Grade I and II Granite) Seek agreement with suppliers to take back timber pallets (when used) and other packaging Design formwork to maximize use of standard panels to increase re-use Sort material at source or provide temporary storage and sorting area Protect recyclable material when necessary to keep it in usable condition Provide recycle bins to increase worker and staff awareness for general refuse items such as aluminium cans, plastic bottles and paper to facilitate segregation of waste streams and maximize recovery Engage recycling contractors for collection of recyclable material

Strategy	Waste Mitigation Measures
Dispose	Collect and store material in manner that avoids cross-contamination so that it can be disposed of at public-fill facility or other approved waste-disposal outlet without rejection Comply with Waste Disposal (Charges for Disposal of Construction Waste) Regulation for disposing material at public-fill reception facilities, sorting facilities, and landfills/outlying islands transfer facilities Remove disposed material from the site promptly to minimize temporary stockpiling on site and any potential odour impacts Engage licensed chemical waste contractor to collect and dispose of chemical waste Make sure that trucks transporting waste are not overloaded

1.2 Identification, Estimating and Tracking of Waste Generation

1.2.1 Identification of Potential Waste

The waste types described in Table 1-2 may be generated from the various activities carried out on Contract DC/2007/24. The identification of those work processes and activities enables potential waste reduction, re-use and recycling opportunities to be identified and maximized. Improper handling and disposal of those wastes may cause secondary adverse impacts from pollution and nuisance.

Table 1-2: Summary of Activities Producing Surplus Material

Work Process/Activity	Waste Types												
	Natural Excavated Material	Other Inert Material (eg concrete)	Plastic	Packaging	Paper	Timber	Bamboo Scaffolding	General Refuse	Vegetation and Trees	Metals	Chemical Waste		
Site clearance	✓	✓						✓	✓				
Demolition	✓	✓	✓			✓	✓	✓		✓			
Earthworks	✓												
Maintenance of plant and equipment											✓		
Underground drainage	✓	✓	✓							✓			
Formwork			✓			✓				✓			
Falsework						✓	✓			✓			
Concrete works	✓	✓				✓							
Pre-cast concrete		✓	✓			✓				✓			
Piling and foundations	✓	✓					✓						
Tunnelling	✓	✓											
Blasting	✓												
Non-blasting methods	✓												
Road works	✓	✓											
Hard landscape	✓	✓											
Soft landscape	✓								✓				
Finishing works			✓	✓		✓	✓	✓		✓	✓		
Mechanical-ventilation and air-conditioning			✓	✓		✓				✓	✓		
Electrical works			✓	✓		✓				✓	✓		
Material handling and storage	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		
Repair and rework	✓	✓	✓	✓		✓	✓	✓	✓	✓	✓		
General welfare								✓					
Office activities			✓	✓	✓					✓			

1.2.2 Estimated Quantities of Potential Waste by Type

The Leighton – LNS Joint Venture shall maintain a detailed Waste Flow Table to monitor waste-management performance. The Environmental Officer or nominee shall be responsible for maintaining the data in that table. Table 1-3 shows the different categories and types of material that we envisage will be produced during the contracts. We will estimate the quantities of each type when further details of the design and construction method are available.

The actual quantities of material and waste are to be confirmed, estimates are included in individual method statements when possible and will be consolidated here prior to the issue of the Environmental Management Plan to the Engineer's Representative. The

disposal locations shall be reconfirmed during the Contract if circumstances change. Opportunities to improve disposal options in line with our overall strategy will be sought at all times.

Table 1-3: Estimated Waste Generation

Material Category	Waste Type	Quantity	Disposal Location	Generation Period
Inert construction and demolition waste to be re-used	**Natural excavated material (rock in Grade II or above from tunnel and shafts)**	**430830.95 tonnes**	**Re-use on site for backfilling temporary production shaft** **Reuse at Lam Tei Quarry** **Re-use in other contracts as advised by the Engineer**	**December 2010 to March 2012**
	Natural excavated material (Soft)	**38150 tonnes**	**Re-use on site for fill, landscaping and finishing works** **Re-use in other contracts as advised by the Engineer**	**December 2010 to March 2012**
	Concrete and paving from demolition works	**None**	**Re-use on site for temporary works**	**None**
	Structural units	**None**	**Re-use on site or at approved external user**	**None**
Non-inert construction and demolition material to be re-used	**Timber/plastic pallets (or similar) for material deliveries (eg, pre-cast units)**	**None**	**Return to supplier for re-use**	**None**
General waste to be re-used	**Tyres (from plant and equipment)**	**None**	**Man Lee Hang Tyre and Battery Co Ltd**	**None**
Inert construction and demolition waste to be recycled	**Natural excavated material (Grade I & II granite)**	**None**	**Lam Tei Quarry**	**None**
	Natural excavated material (Grade I & II volcanic rock, Grade III rock)	**None**	**Public Fill Bank or approved quarries**	**None**
	Natural excavated material (soft)	**None**	**Public Fill Bank**	**None**
	Concrete (eg. from drainage channel demolition), stone, paving material	**None**	**Public Fill Bank (for reworking and recycling)**	**None**
Non-inert construction and demolition	**Metal (eg, reinforcing steel and pile off cuts)**	**20 tonnes**	**Wai Hung Metals Ltd**	**September 2009 to September 2013**

Material Category	Waste Type	Quantity	Disposal Location	Generation Period
material to be recycled	**Timber**	**[To be confirmed**	**[To be confirmed]**	**To be confirmed**
	Cardboard and plastic packaging (eg, from materials for the works)	**2 tonnes**	**[To be confirmed]**	**September 2009 to September 2013**
General waste to be recycled	**Aluminium cans**	**1000kg**	**Chan Kee Reclamation Co Ltd**	**September 2009 to September 2013**
	Plastic bottles	**1000kg**	**[To be confirmed]**	**September 2009 to September 2013**
	Newspapers	**1000kg**	**Confidential Materials Destruction Service Ltd**	**September 2009 to September 2013**
	Packaging material (plastic)	**100kg**	**Confidential Materials Destruction Service Ltd**	**September 2009 to September 2013**
Office papers to be recycled	**Paper**	**8000kg**	**Confidential Materials Destruction Service Ltd**	**September 2009 to September 2013**
Non-inert construction and demolition waste to be disposed	**Site-clearance material that cannot be reused or recycled (eg, trees and vegetation)**	**20 tonne**	**Landfill**	**September 2009 to January 2010**
	Unsuitable packaging, plastic, timber that cannot be recycled or reused	**5 tonne**	**Landfill**	**September 2009 to September 2013**
General refuse to be disposed	**General refuse (organic waste)**	**None**	**Landfill**	**None**
Special waste to be disposed by licensed collector (including Chemical Waste)	**Liquid chemical waste (spent lubricant oil and others)**	**200 Drums**	**Tsing Yi Chemical Waste Treatment Centre**	**September 2009 to September 2013**
	Solid chemical waste (contaminated soil from spillages)	**50 Drums**	**Dunwell Environmental Management Co Ltd**	**September 2009 to September 2013**
	Used batteries (6 V for flashing light)	**20 Drums**	**Man Lee Hang Tyre and Battery Co Ltd**	**September 2009 to September 2013**
	Holding tank waste	**10 Drums**	**Dunwell Environmental Management Co Ltd**	**September 2009 to September 2013**

Material Category	Waste Type	Quantity	Disposal Location	Generation Period
	Used oil filter, used batteries (for vehicles), oily rags, etc	**1500kg**	**Kam Ming EP Eng Co Ltd**	**September 2009 to September 2013**
Marine Deposit (Sandy Bay)	**Category 1 Marine sediment dredged out from shaft**	**541 m3**	**(Cat 1) South Cheung Chau Open Sea Sediment Disposal area (MP21)**	**3 Nov 2010 to 6 Nov 2010**
Marine Deposit (Sai Ying Pun)	**Category 1, 2,3 Marine sediment dredged out from shaft**	**900m3 (Cat 1)** **1200m3 (Cat 2)** **250m3 (Cat 3)**	**(Cat 1) South Cheung Chau Open Sea Sediment Disposal Area (HATS2A)** **(Cat 2) Sha Chau (PIT IVc)** **(Cat 3) SENT Landfill**	**February 2011**

1.2.3 Monthly Waste Flow

The quantities of construction and demolition material generated each month shall be recorded using the Monthly Summary Waste Flow Table as Appendix 17 in EMP and (Appendix A) in this submission. That table shall be completed by the Environmental Officer and submitted to the Drainage Services Department's Representative together with the updated sections of the Environmental Management Plan (if any). It shall also be submitted to the manager, Group Systems, at Leighton Contractors (Asia) Limited's head office by the seventh day of each month as part of the Monthly Environmental Report. The latest estimate of total quantities of construction and demolition material that is expected to be generated by the works together with a breakdown of the nature of material will be submitted with the monthly 'Waste Flow Table'. The reported figures shall be reconciled against the data held in the Civil Engineering and Development Department's and Environmental Protection Department's websites for the various disposal locations.

541m^3

1.3 Waste Mitigation Measures and Controls

Our construction activities shall be conducted in accordance with all relevant legislation and associated regulations, including the Air Pollution Control (Construction Dust) Regulation, Waste Disposal Ordinance, Land (Miscellaneous Provisions) Ordinance, Public Health and Municipal Services Ordinance, and Waste Disposal (Chemical Waste) (General) Regulation.

The proposed mitigation measures to avoid or minimize the quantity of construction and demolition material and other general waste generated during the project are described in this subsection.

Details of the Leighton – LNS Joint Venture's proposed mitigation measures and operating controls with respect to waste management derived from the Leighton – LNS Joint Venture's environmental aspects database are provided in the Waste Management

Environmental Control Plan included as **Appendix 10** in EMP and (Appendix B in this submission).

1.3.1 Waste Avoidance

1.3.1.1 Best Practice

Best construction management practice shall be implemented throughout the Contract to avoid waste, including:

- careful take-off and ordering of materials such as concrete to avoid waste;
- maintaining proper storage areas and facilities for material and products and protecting material to avoid potential damage, and
- forward planning of the works to avoid waste.
- avoid over-break by properly control excavation and drilling

1.3.1.2 Design

The Leighton – LNS Joint Venture shall consider waste issues in designing the works to optimize structures from an environmental protection and waste viewpoint. Opportunities to re-use material in the temporary and permanent works shall continue to be sought.

1.3.1.3 Demolition Material

Opportunities to retain existing structural elements to minimize demolition material generated shall continue to be explored.

1.3.1.4 Timber

The use of timber formwork shall be avoided when practicable and alternatives such as steel formwork shall be considered and used to increase the potential for re-use. Timber hoarding shall not be used; metal or plastic hoarding panels shall be used instead. Instead of wooden pallets for material delivery, the use of plastic re-usable pallets shall be encouraged by the Leighton – LNS Joint Venture in its discussions with suppliers.

Alternatives to timber packaging shall be explored for precast-concrete segments, although selection of any alternatives shall take into account any potential risk of damage of the permanent-works material. When timber is required for the works, it shall be selected whenever practicable from managed sources.

1.3.1.5 Bamboo Scaffolding

The use of bamboo shall be avoided for all significant temporary-access requirements. Metal scaffold shall be used instead. The use of bamboo for minor access solutions shall only be used when permitted by the site agent.

1.3.2 Waste Reduction

1.3.2.1 Demolition Material

The scope of demolition works shall be reduced as far as practicable.

1.3.2.2 Vegetation

Vegetation and organic matter will be generated during site clearance. The existing trees and vegetation nearby the works shall be carefully protected and maintained thus minimizing vegetation that requires to be disposed to landfill. Site clearance material

shall be segregated to reduce the quantity of waste taken to landfill.

1.3.2.3 Concrete and Other Cementitious Material

To minimize waste arising from the use of concrete and other cementitious material, construction activities shall be carefully planned to make sure that resources are used efficiently and that material is not over ordered. Pre-cast elements shall be considered to minimize concrete wastage. When practicable, alternative uses for excess concrete shall also be identified beforehand, such as for slope protection or hard areas. A "wash-out" bin for concrete will be provided to segregate the small quantity of inert construction and demolition waste remaining.

1.3.2.4 Steel Reinforcement

Reinforcing steel shall be cut and bent to the approved bar-bending schedules. Every effort shall be made to use the complete 12-metre length of reinforcing steel bar to minimize off-cuts. Checks shall be made to make sure that the reinforcing steel is cut and bent correctly to prevent errors and the need to scrap incorrectly-bent steel. Appropriately-sized off-cuts of steel reinforcement shall be used to support rebar cages when necessary.

1.3.2.5 Cardboard Packaging Material

The methods of packaging goods and material shall be examined with suppliers when placing orders to minimize potential future waste.

1.3.2.6 Timber

The use of timber in temporary works shall be reduced or minimized as far as practicable; for example by the use of pre-cast concrete elements or steel formwork which will reduce the quantity of timber required for formwork. Timber pallets when delivered to site shall be carefully handled so that they may be re-used.

1.3.2.7 Chemical waste

Regular maintenance of plant and equipment shall be provided to keep them in good condition, prevent leakage and so that they use fuels efficiently. That will reduce the quantity of chemical waste (eg, contaminated soil and residues from drip trays). Whenever practicable, the warning lights for temporary traffic-management schemes shall be powered by electricity supply instead of batteries, thus reducing battery waste.

1.3.3 Waste Re-use and Recycling

1.3.3.1 Demolition Material

Demolition material will be produced during site-clearance and removal of existing structures that cannot be retained. Whenever practicable, demolition material shall be segregated at source to maximize possible re-use and recycling. Inert material shall preferably be re-used on site or, alternatively, taken to the Public Fill Bank or other approved outlets. Other demolition material, such as steel, shall be segregated and recycled as far as is practicable.

1.3.3.2 Excavated Material

It is envisaged that hard and soft excavated material will arise from construction of tunnels and shafts associated with Contract DC/2007/24.

The excavated material shall be segregated from other material at source to avoid possible contamination, thereby allowing re-use at other sites/outlets that can use the material. Grade I and II granite from excavated material shall be taken to Lam Tei Quarry for reuse.

Opportunities shall be identified to re-use suitable material such as for backfilling the temporary production shaft during the design process to minimize material leaving the site and dispose of to public fill. Other potential quarries shall also be examined for receiving suitable excavated rock for re-use.

1.3.3.3 Steel and Other Metal Waste

All steel deliveries shall be offloaded using a crane truck. Steel material shall be lifted correctly, stored on timbers and stacked to prevent damage. Steel and metal items shall be re-used as much as practicable and, when not in use, shall be stored neatly on timber to prevent damage. All steel and other metal waste shall, once identified, be segregated and stored in a dedicated skip. Recycling companies shall be engaged and records of quantity of steel recycled maintained within the waste flow table.

Steel drums used for storing fuels and chemicals shall be re-used before recycling. For example, empty drums can be repainted and used for protection purposes adjacent to roads (the recessed tops of drums shall be filled to prevent mosquito breeding).

1.3.3.4 Timber

The design of formwork shall maximize the use of standard panels so that high re-use levels can be achieved. Timber formwork shall be carefully dismantled to prevent damage. The timber shall be de-nailed, cleaned and stacked neatly for re-use. Wooden pallets for material delivery may be returned to the supplier for re-use.

1.3.3.5 Packaging Material and Other Plastics

Packaging material may be returned to the supplier when that service is offered. Alternatively, efforts shall be made to identify and utilize companies that are prepared to accept packaging material of the quality and quantity produced by the site for recycling purposes. That material shall be segregated, kept dry and removed from site regularly to avoid any fire risk.

Separate segregation bins shall be used for smaller items of plastic waste. Empty plastic drink bottles shall be placed into the appropriate bins and collected regularly for recycling purposes by the site amah. Plastic wrapping of material such as pallets of blocks or precast units shall be collected, stored and recycled.

1.3.3.6 General Refuse

General refuse generated on-site shall be stored in bins or skips separate from construction and chemical wastes. Separate bins shall be provided for aluminium cans, plastic bottles and paper to facilitate segregation of those waste streams for recycling. A reputable waste collector shall be engaged to remove general refuse from the site separately from inert construction and demolition material and chemical waste.

1.3.4 Handling of Waste Material

Good housekeeping measures shall be adopted on site to minimize the quantity of waste that requires disposal. Those measures shall include the allocation of designated storage areas and making sure that material is handled carefully by operatives to

prevent damage.

The general foremen and supervisors will arrange on-site sorting to sort the construction and demolition waste into different streams such as inert material, timber, metal, plastic and packaging. An area shall be allocated for sorting and segregating construction and demolition material by type when there is sufficient space. Alternatively, where space is at a premium, material shall be sorted at source. Subcontracts shall include requirements for sorting and segregating material. Material shall be carefully stacked and stored to make sure that the site is kept tidy and that such material does not deteriorate.
Concrete for temporary and permanent works shall be delivered to the site in mixer trucks. Depending on access arrangements, the concrete shall either be discharged directly from the truck chute or by pump/crane and skip. Concrete delivery shall be controlled to prevent spillage of the concrete. Cleaning out of the truck chute shall be into a designated waste skip or onto plastic sheeting. Washing out of the mixer drum shall be prohibited on the site – water shall be added to the mixer and the truck shall be driven back to the batching plant for final wash out. Waste concrete shall be allowed to harden and then shall be removed from the site.

General refuse shall be removed frequently to minimize odour, pest and litter impacts and shall be disposed to public landfill. Refuse shall not be burned on site.

1.3.5 Site Tidiness

Sites shall be kept in a tidy manner at all times. Site establishment shall be planned with areas allocated for containers, plant, storage of material and waste skips. Direct and subcontract labour shall be responsible for making sure that the site is kept in a tidy manner. All labour involved on the site shall be responsible for making sure that tools are cleaned and put away, equipment is stored away after use, and un-used material is neatly stacked or stored in areas provided. All areas of the site shall be kept clean and tidy, access/egress points shall be swept, and passageways shall be kept free from material and plant or equipment. Waste material shall be stored in the receptacles provided, which shall be emptied regularly.

Site tidiness shall be one of the areas to be inspected and checked as part of the safety walk.

1.3.6 Records for Use of Timber in Temporary Works

The Leighton – LNS Joint Venture's strategy is to avoid, reduce or minimize the use of timber in temporary works as far as practicable. When timber has to be used for temporary-works construction, its method statement shall include the justification for and the measures taken to minimize the use of timber in the said temporary works. In addition, a summary table shall be provided containing the description, justification and the estimated quantity for every work process/activity requiring the use of timber for temporary-works construction irrespective of the quantity of timber used.

The summary table on the use of timber for temporary-works construction shall be updated and submitted to the Engineer together with the monthly summary Waste Flow Table for monitoring and review by not later than the fifteenth day of each month or, if it is a General Holiday, the day following the General Holiday. A Summary Table for using timber in temporary works and the quantities are shown in Appendix A

1.3.7 Marine Deposits

Marine sediment, which is the seabed deposit, is mainly generated from excavated/dredging of sediment/mud. It could be classified as category 1, 2 and 3 based on its contamination level with reference to Chemical Exceeedance Level (CEL) laid down in Appendix A of Environment, Transport *and Works Bureau Technical Circular (Works) No 34/2002, management of Dredged/Excavated Sediment, Environment,* Transport and Works Bureau. Significant quantities of marine sediment will be excavated and disposed during the Shaft Excavation works at Sandy Bay and Sai Ying Pun Shaft. The detailed information for the quantities of marine deposit and dumping location is listed in Table 1.3

1.4 Waste Performance and Incentives

1.4.1 Waste Performance Targets

To facilitate assessment of the effectiveness of the waste-management measures, the following performance targets shall be adopted in addition to the Leighton – LNS Joint Venture's targets set out in 2.2 of Part A in EMP: (which can be seen in Appendix C of this submission)

- all excavated material shall be sorted to recover inert portions (eg, soil and broken rock) for re-use on site or re-use and recycling at designated outlets;
- all metal shall be recovered on site for collection by a recycling contractor;
- all cardboard and paper packaging, if any, (for plant, equipment and material) shall be recovered on site, properly stockpiled in dry conditions and covered to prevent cross contamination by other construction and demolition material;
- all chemical waste to be collected and properly disposed of by collectors licensed by the Environmental Protection Department,
- all demolition debris to be sorted to recover broken concrete, reinforcement bars, as well as other fittings or material that have established recycling outlets.

1.4.2 Promotion of Good Waste Management Practice

The waste performance and waste targets shall be posted on the bulletin boards at the site. Waste management posters shall be placed at public areas to increase the awareness of the Leighton – LNS Joint Venture's waste performance and included in training programmes.

Other promotion initiatives shall include rewards for good environmental Management performance for individuals and subcontractors.

1.4.3 Waste management training and tool box

As part of Leighton Contractors (Asia) Limited's Environmental Management System, training to address waste-management issues shall be conducted for all Leighton Contractors (Asia) Limited staff, subcontractors and the general workforce. That training may take the form of environmental induction training, tool-box meetings or similar and shall be carried out in accordance with the requirements of the Environmental Management Plan. In addition, waste-management coordination meetings shall be held as necessary. The

environmental training programme of waste management for DC/2007/24 is shown below in table 1.3.1. Arrangement shall be made for the project director, and other key site personnel to attend training on Environmental Management if they have not previously attended similar courses.

Table 1.3.1 Environmental Training Programme

Details of Training	Training Recipients	Trainer / Presenter	Frequency
General Environmental Awareness Training, including the project's significant Environmental Aspects	All Project Staff	Environmental Officer / Environmental Supervisor	Periodic as needs dictate
Specific training in the operation of the Environmental Management Plan and Waste Management and Environmental Mitigation Controls	Appropriate Staff	Environmental Officer / Environmental Supervisor	Dependent on identified training needs
Induction to environmental issues relevant to the workforce	All Project Staff and Workers	Environmental Officer / Environmental Supervisor	Once before the commencement of work and re-induction for every half a year
Tool-box talks introducing environmental issues	Workforce	Environmental Officer / Environmental Supervisor	Bi weekly basis

1.4.4 Waste management audit proposal

The Environmental Management System is subject to regular audits by the manager, group systems. The results of those audits are reported to directors and senior management via regular environmental management committee meetings.

The project shall also be subject to third-party audits carried out by the Hong Kong Quality Assurance Agency to check compliance with the ISO 14001 standard.

1.5 On Site Sorting and Segregation

An area of the project site shall be allocated as far as practicable for storing, sorting and segregating purposes. At sites where space is very limited, construction and demolition waste shall be segregated and sorted at source prior to loading on to trucks.

The segregation and sorting areas shall be clearly defined on site-layout plan and shall be regularly reviewed and amended to suit site constraints as work proceeds. The space provided shall be commensurate with the estimated quantity for each type of material generated on site, as indicated in the waste flow table. The physical location of each segregation and sorting area shall be clearly marked on site by signs, barriers or similar such that they are easily identified.

Table 1-4 shows the Leighton – LNS Joint Venture's initial overall strategy for sorting and segregation of construction and demolition material, which includes the material type, approximate relative quantities, responsibility for initial sorting and the Leighton –

LNS Joint Venture's supervision responsibilities.

Table 1-4: Segregation and Sorting of Waste

Material Type	**Relative Quantity**	**Methods (see main sections for further details)**	**Responsible Company or Person**	**Joint-venture Responsible Staff**
Rock	High	Re-use on or off site Recycle on or off site	Subcontractor/ Leighton – LNS Joint Venture foreman	Superintendent
Vegetation	Low	Direct segregation from soil and disposal to landfill	Subcontractor/ Leighton – LNS Joint Venture foreman	Superintendent
Soft excavated material	Medium	Direct segregation from work face and removal to public fill Quantities shall be maximized to retain on site for ongoing works when timing is appropriate	Subcontractor/ Leighton – LNS Joint Venture foreman	Superintendent
Marine deposits	Low	Dispose to approved dumping location	Subcontractor/ Leighton – LNS Joint Venture foreman	Superintendent
Broken concrete	Medium	On-site segregation Re-use as hardcore	Subcontractor/ Leighton – LNS Joint Venture foreman	Superintendent
Metal	Low to medium	Segregate and recycle	Subcontractor/ Leighton – LNS Joint Venture foreman	Superintendent
Paper	Low	Separate bins for reuse and disposal	Secretary/staff/ subcontractors	Secretary
Plastic – bottles	Low	Separate bins	Subcontractors/ Amah	Environmental supervisor
Plastic - general	Low	Separate bins/cages	Subcontractor and Leighton – LNS Joint Venture labour	Environmental supervisor
Aluminium cans	Low	Separate bins	Amah	Foreman/ environmental supervisor
Timber	Low	Separate bins/cages/open storage	Subcontractor	Foreman/ environmental supervisor
Chemical waste	Medium	Collect and place in chemical waste store	Mechanic/ foreman	Foreman/ Environmental Officer
Chemical-waste containers	Low	Segregate and collect in separate bin/containers	Mechanic	Foreman/ Environmental Officer
Packaging material	Low	Covered segregated area	All	Foreman/ environmental supervisor

Surplus construction-and-demolition material shall be sorted on site into inert and non-inert material. Inert construction-and-demolition material shall be sorted further, when necessary, by the use of plant into hard and soft material and other re-usable components. Those separate material streams shall be taken to the most-appropriate outlet for re-use as necessary.

As far as practicable, general refuse shall be segregated at source by the use of bins for different types of material.

1.6 Chemical Waste

Moderate quantities of the following types of chemical waste may be produced during the construction works:

- spent solvent and lubricating oil from the workshop;
- rags contaminated with solvent and lubricants from the workshop;
- sawdust/sandbags used to soak up engine oil/solvent/lubricants from accidental spillage/leakage, and
- spent batteries (from temporary traffic-management schemes).

All chemical wastes generated by the construction works shall be properly labelled, packaged, and temporarily stored at a designated chemical waste storage area within the construction site. The chemical waste handling and storage requirements shall be in accordance with the Environmental Protection Department's Code of Practice on the Packaging, Handling and Storage of Chemical Waste. A licensed chemical waste contractor shall be employed by the Leighton – LNS Joint Venture to collect and dispose of the chemical wastes as necessary.

Containers used for the storage of chemical wastes shall be resistant to the contents, in good condition, and securely closed. Their sizes and types shall be in accordance with Environmental Protection Department's Code of Practice. Labels showing the nature of chemical waste in traditional-character Chinese and in English and shall be properly displayed on the containers.

Storage areas shall be clearly labelled as chemical waste storage area in traditional-character Chinese and in English and should be used solely for the storage of chemical wastes. Those storage areas shall be enclosed on at least three sides; adequately ventilated; adequately covered to prevent rainfall entering; be designed to allow for proper separation of incompatible materials; and shall have impermeable floor and bunding of sufficient capacity to accommodate 110 per cent of the volume of the largest container or 20 per cent of the total volume of waste stored in the area, whichever is the greater.

Only compatible chemical wastes shall be stored together. Reference shall be made to the Hazardous Waste Compatibility Chart from the Code of Practice.

Chemical waste disposal shall be via licensed waste collectors to licensed chemical waste disposal facilities either:

- a facility licensed to receive chemical waste, or
- a company re-using the waste, under approval from the Environmental Protection Department.

Waste Producer's copies of trip tickets for collection/disposal shall be retained by the Environmental Officer and maintained in the project system.

1.7 Disposal of Waste

1.7.1 Designated Waste Outlets

The designated disposal outlets and identified recycling companies for Contract DC/2007/24 are detailed in Table 1-5.

Table 1-5: Designated Disposal/Re-use/Recycling Outlets

Waste Stream	Details of Outlet	Contact Telephone	Contact Name	Disposal/ Recycle/ Re-use
Public fill (inert construction waste)	Chai Wan Barging Point (CWBP) Tseung Kwan O Area 137 Fill Bank (TKO 137)	2562-8787 2623-9269	Not available Not Available	Recycle/ re-use
Landfill (construction waste)	South East New Territories landfill	2706-8800	Not available	Disposal
Temporary construction-waste sorting facility	Not available	Not available	Not available	Recycling - (Not generally used material sorted/ segregated on site)
Liquid chemical waste	Tsing Yi Chemical Waste Treatment Centre	To be confirmed	Not available	Disposal
Solid chemical waste	Dunwell Environmental Management Co Ltd	2391-0371	Not available	Disposal
Rock	Lam Tei Quarry and other potential quarries to be confirmed	To be confirmed	To be determined	Re-use
Metal	Wai Hung Metals Ltd	2349-0301	Mr Kwan	Recycle
Waste tyres	Man Lee Hang Tyre and Battery Co Ltd	2477-1579	Mr Man	Recycle
Packaging material	To be confirmed	To be confirmed	To be confirmed	Recycle
Used batteries (6 V for flashing light)	Man Lee Hang Tyre and Battery Co Ltd	2477-1579	Mr Man	Recycle
Holding tank waste	Dunwell Environmental Management Co Ltd	2391-0371	Not available	Disposal

Waste Stream	Details of Outlet	Contact Telephone	Contact Name	Disposal/ Recycle/ Re-use
Used oil filter, used batteries (for vehicles), oily rags, etc	Kam Ming EP Eng Co Ltd	2407-3377	Miss Chan	Disposal
Confidential papers	Confidential Materials Destruction Service Ltd	2676-8800	To be confirmed	Recycle
Timber, paper, plastic and aluminium cans	Chan Kee Reclamation Co Ltd	2623-9688, 2719-1103 (fax)	Kit Lam	Recycle

1.7.2 Disposal of Public Fill

Inert portion of construction and demolition material (public fill) shall be managed in the following order:

1. Surplus public fill shall be re-used on-site such as for backfilling the temporary production shaft.
2. Surplus public fill shall be delivered and re-used at the Leighton – LNS Joint Venture's own outlets.
3. Public fill that can be re-used and/or recycled shall be re-used at location outlets to be agreed with the Engineer.
4. Surplus public fill that cannot be re-used and recycled on other projects, such as unsuitable material, shall be delivered to the public-fill bank.

The trucks for handling the spoils shall use the approved transport route identified in the Traffic Impact Assessment Report or as directed by the Engineer. The truck loading point at project sites shall be equipped with a water-spray system to suppress dust generation if site constraints allow. Details of the dust mitigation measures are included in Section 13 in EMP, which can be seen in Appendix D in this document.

All reinforced-concrete waste generated from demolition of existing structures shall be inspected to make sure it is properly segregated before removal.

When material has to be transported off-site by road, the scheduling of trips shall be carefully managed. To minimize traffic disturbance during peak-hours, material shall be stockpiled or stored in bins before loading onto trucks and removing off-site at appropriate times. A Disposal Delivery Form and Chit shall be prepared and used for each truckload of material disposed to a public-fill reception facility.

1.7.3 Disposal of Construction and Demolition Waste to Landfill

When construction waste cannot be segregated and sorted for re-use or recycling, such as vegetation, it shall be disposed at a landfill site. The Leighton – LNS Joint Venture target shall be to make sure that all inert material is segregated out of the construction-waste stream to minimize the inert portion so that the remaining construction waste can be disposed directly to landfill and not taken to a sorting facility, thus freeing that facility to other users.

1.7.4 Procedure for Construction Waste Disposal Charging Scheme

The procedure for the Construction Waste Disposal Charging Scheme is:

1. The Leighton – LNS Joint Venture shall apply for and set up an account and obtain Chits (refer to Section 24, Part D, Environmental Management Records, for an example of a Chit of the EMP (which can be seen in Appendix E) from the Environmental Protection Department for the disposal of construction waste at a waste disposal facility. The Leighton – LNS Joint Venture shall complete all relevant details on the Chit.

2. Following checks of the load and prior to the vehicle leaving the site, the Leighton – LNS Joint Venture shall present the completed Chit to the waste haulier and retain Part A of the Chit for record. The Chit (Parts B and C) shall be carried on board the waste-haulier's vehicle at all times throughout the vehicular trip. Each load will be checked for type of material and whether the truck is properly loaded within permitted limits.

3. For each vehicular trip, the waste haulier shall present to the operator of the designated public-fill reception facility/landfill/sorting facility (the operator) the completed Chit prior to the disposal of the construction-and-demolition material. The operator shall scan the barcode on the Chit and return Part B of the Chit to the waste haulier together with a computer print-out receipt to acknowledge the disposal of the construction waste. The Leighton – LNS Joint Venture shall retain the original receipt and the copy of Part A of the Chit, which will be retained for inspection by the Drainage Services Department's Representative, if required.

4. The Leighton – LNS Joint Venture shall check the Environmental Protection Department website on a regular basis to verify that deliveries from the project have been recorded. The return of the Chit and receipt shall be a condition of payment to the subcontractor or company transporting the waste to the waste-disposal facility.

A site management plan for trip ticket implementation shall incorporate any requirements of the General Specification 25.25 (9d, 9e, 9f) (Trip Ticket System), and shall identify and detail the procedures for the issue, retrieval and recording of DDF and CHIT.

A complete set of DDF and Chit Ticket will be issued to the dump truck driver by the site foreman or site supervisory staff to the dump truck driver before the truck is leaving the site. The on site foreman or the supervisory staff for each site will record the DDF and CHIT number, Licence plate, approximate volume and the material type for each truck everyday. Leighton – LNS staff will generate a Daily Record summary for each site everyday which the sample can be seen in table 1-5.1.

Part 1 of the Daily Record Summary will be completed and send to Engineer's Representative 1 day after the CHIT and DDF ticket are used and and the complete Daily Record Summary including Part 2 will be sent to Engineer's Representative 3 days after The CHIT and DDF ticket are used for each site.

Leighton-LNS staff will record the amount of inert and non-inert waste based on the combined record and generate a Monthly Waste Flow Table shown in Appendix A and submitted the table each month that is included in the updated Monthly Environmental Management Plan.

Table 1-5.1 Daily Record Summary

A SAMPLE OF "DAILY RECORD SUMMARY" TO RECORD DAILY DISPOSAL OF CONSTRUCTION & DEMOLITION (C&D) MATERIALS FROM THE SITE

(1) Contract no. & title: _____

(2) Date of disposal: _____

(3) Designated disposal ground(s): (a)
(b)
(c)
others _____

(4) Approved alternative disposal grounds: _____

DDF Serial no.	Vehicle registration no.	Departure time from site	Approx. vol (e.g. Full/Three Quarter/Half/One quarter)	C&D material type (e.g. inert or non-inert)	Actual disposal ground	Arrival time at disposal ground	Remarks

Part 1[1] | Part 2[2]

Submitted by : _____ *[Name of Contractor's Designated Person]*
Signature : _____
Date : _____
Received by : _____ *[Name and signature of the officer]*
Post : _____
Date & Time : _____

Submitted by : _____ *[Name of Contractor's Designated Person]*
Signature : _____
Date : _____
Received by : _____ *[Name and signature of the officer]*
Post : _____
Date & Time : _____

[1] Part 1 - The Contractor shall complete Part 1 and submit it to the Engineer's Representative by 1:00 pm of the following working day of the disposal trip.
[2] Part 2 - The Contractor shall complete Part 2 and submit it to the Engineer's Representative within 3 working days of the disposal trip.

25.31

1.7.5 Measures for prevention of overloading of Dump Trucks

In order to minimize or to prevent the overloading of dump trucks from waste generated from our site to the government dumping facilities. The Leighton – LNS jointed venture have implemented the following conditions to Dump Trucks for avoiding over-load cases.

1. All Dump Truck equipped with pressure Gauge
   All dump trucks working for our Project are equipped with pressure gauge to have a preliminary checking of the truck load before leaving our site.

2. Distribution of the C&D Materials in Skip
   It was found and concluded tht if the materials distributed at the front part of the skip, the error of the gauge will be minimized. Therefore, we have required all the excavator operators to load the materials mainly at the front part of the skip instead of the rear part.

3. Ensure to check the Reading before Leaving
   We have also added additional term on the notice which is attached with the DDF and CHIT to the driver while tickets issuing to remind all dump truck drivers not to overload their truck.

4. Enhancement of the Notice
   We have also added additional term on the notice which is attached with the DDF and CHIT to the driver while tickets issuing to remind all dump truck drivers not to overload their truck.

1.8 Corrective Action

Corrective action arising from an exceedance of prescribed parameters, as detailed in the Environmental Monitoring & Audit Manual, shall be carried out in accordance with the relevant Environmental Monitoring and Audit Event Action Plans.

Corrective action shall be required when a condition has been identified that has caused a non-conforming incident or even, such as an adverse environmental impact or improper working practice. Such conditions may be identified through day-to-day supervision of the works, during formal routine environmental monitoring activities, following audit or via complaints from stakeholders. Ideally, corrective action shall be taken immediately following the identification of a non-conformance. Table 1-6 gives guidance on the types of corrective action to be taken.

Table 1-6: Waste-management Corrective Actions

Non-conformance Identified	**Example Condition**	**Action to be Taken**	**Record (when appropriate)**
During day-to-day supervision activities	Litter found on ground in vicinity of waste bin	If possible, correct condition immediately It is not necessary to formally record action taken. However, Environmental Officer should be advised if this is a repetitive problem	Advise Environmental Officer if necessary
	Insufficient bins for waste segregation	Report condition to production manager/Environmental Officer to investigate and instigate corrective action in accordance with MP-019	Form F003
During formal routine environmental monitoring and inspection	Waste skip found to be full	If possible, correct condition immediately and review collection frequency	Make remark on checklist detailing what action was taken
	Chemical-waste drums not suitable for waste produced	Obtain containers from chemical waste collector, carry out formal corrective action in accordance with MP-019 if necessary	Form F003
Following complaint	Food remnants found on floor	Record in complaints register, correct condition, raise corrective action request if necessary	Entry in complaint register Form F003
During internal audit	Lubricant oil found spilt on the ground	Clean-up and carry out formal corrective action in accordance with procedure MP-020	Audit report/ corrective action plan

1.8.1 Complaint Investigation Procedure for Waste Management

Should a valid complaint be received or non-compliance be identified with regard to waste management affaris, the Event Contingency plan as contained in table 1-6.1 shall be triggered. Non-compliance shall include the following situations:

- Infringement of legal requirements with respect to waste issues.
- Persistent outstanding of control measures stated in the WMP as identified during the site inspection or audit by ET/IEC.

Valid Complaint shall be written complaint regarding to waste issues from either public or government authorities.

Table 1-6.1

Step	Day	Action	Contractor /ET	ER	IEC
1	1	Create a new non-compliance record within 1 working day after making an observation during a site audit accompanied by Environmental Officer / Supervisor or his delegate. ET sends a Notice of Non-Compliance (NNC) to Contractor, ER, and IEC. The NNC would include the observation and the reasons for non-compliance	●		
2	2	Propose corrective actions within 1 working day after the receipt of the NNC	●	○	
3	2	Review and agree with the proposed corrective ations 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 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 record	●	○	

● Action Party

○ Comments on the non-compliance and valid complaint record where applicable

○comments on the non-compliance record where applicable.

ET – Contractor's Environmental Team; IEC – Independent Environmental Checker; ER – Engineer Representative

1.8.2 Emergency procedure for Chemical Drill

Leighton – LNS have prepared an Emergency procedure for Chemical Drill for all the site staff. The Leighton – LNS Joint Venture will prepare an Emergency Drill to different sites once a month. The details of the Emergency Drill is shown below

Pre - Briefing of the Emergency Drill
Before the drill, a notice was given to all the participants for informing the steps of handling the spillage of oil on site. The steps are given in the following information.

環境緊急操練
Environmental Emergency Drill

1. 有工人在工地發現漏油
2. 通知科文
3. 先用沙包把油包圍
4. 用適當布吸收所有油
5. 最後用化油劑清理
6. 所有廢物必須以化學廢料處理
7. 科文通知工地管理人員和環保同事
8. 由環保同事標籤後, 放入化學廢物貯存倉等待處理

1. Oil spillage is observed on site
2. Contact the foreman
3. Use sand to enclose the spillage area
4. Use proper clothing to absorb the spillage oil
5. Use oil dispersant to clean up the contaminated area
6. All the waste must be treated as chemical waste
7. Foreman to inform the site management and Environmental Department
8. The chemical waste will be labelled by the Environmental Department, and the chemical waste will be put into the chemical waste storage.

1.9 Preventive Action

The need for preventive action shall be identified and action determined by using a number of different methods, including risk assessment, day-to-day supervision of the works and formal routine environmental monitoring and audit activities. When a condition has been identified that requires documented preventive action not already covered by the items in Table 1-7 or in the relevant environmental control plan, a formal corrective action request (Form F003) shall be generated and implemented (for preventive actions, impact classification is marked "Not Applicable").

Table 1-7: Waste-management Preventive Action

Item No.	Preventive Action	Method
1	Monitor effectiveness of ongoing mitigation measures identified and check waste-management facilities and general housekeeping	Visual monitoring in accordance with checklist
2	Minimize timber waste by careful design of formwork	Maximize re-use or consider alternative material
3	Minimize paper use and waste	Implement Leighton Asia Document Management System, provide dedicated trays on photocopier for recycled paper
4	Minimize waste sent to landfill	Sort and segregate demolition material into waste streams and recycle when practicable

1.10 Location Plan for Waste Management on site

All the waste including the inert waste (Stockpile), non-inert waste and chemical waste on site will be sorted and piled up in designated location on site. The inert waste (Stock Pile) will be placed in Stock Piling Area, non inert waste will be placed in (Sorting Area) and chemical waste will be placed in (Chemical Waste Storage). The detailed location plan is shown in Appendix F

1.11 Possible Routing

Our inert waste generate from shaft will be sent to CWBP and TKO 137 for dumping. The routing from the following shafts to CWBP and TKO 137 are as follows:

Sai Ying Pun

CWBP	TKO 137	SENT
Fung Mat Road,	Fung Mat Road,	Fung Mat Road,
Connaught Rd W	Connaught Rd W	Connaught Rd W
Route 4.	Route 4.	Route 4.
Shun Tai Rd	Cross Harbour Tunnel	Cross Harbour Tunnel
Sing Tai Rd	Hong Chong Rd	Hong Chong Rd
Shing Man Rd	Route 5	Route 5
Shun Tai Rd	Route 7	Route 7
Wing Tai Rd	Wan Po Rd	Wan Po Rd

Ka Yip St		

Sandy Bay

CWBP	TKO 137	SENT
Sandy Bay Rd	Sandy Bay Rd	Sandy Bay Rd
Victoria Rd	Victoria Rd	Victoria Rd
Consort Rise	Consort Rise	Consort Rise
Pok Fu Lam Rd	Bisney Rd	Bisney Rd
Route 4	Pok Fu Lam Rd	Pokl Fu Lam Rd
Shun Tai Rd	Route 4	Route 4
Sing Tai Rd	Cross Harbour Tunnel	Cross Harbour Tunnel
Shing Man Rd	Hong Chong Rd	Hong Chong Rd
Shun Tai Rd	Route 5	Route 5
Wing Tai Rd	Route 7	Route 7
Ka Yip St	Wan Po Rd	Wan Po Rd

Cyberport

CWBP	TKO 137	SENT
Cyberport Rd	Cyberport Rd	Cyberport Rd
Victoria Rd	Victoria Rd	Victoria Rd
Consort Rise	Consort Rise	Consort Rise
Pok Fu Lam Rd	Bisney Rd	Bisney Rd
Route 4	Pokl Fu Lam Rd	Pokl Fu Lam Rd
Shun Tai Rd	Route 4	Route 4
Sing Tai Rd	Cross Harbour Tunnel	Cross Harbour Tunnel
Shing Man Rd	Hong Chong Rd	Hong Chong Rd
Shun Tai Rd	Route 5	Route 5
Wing Tai Rd	Route 7	Route 7
Ka Yip St	Wan Po Rd	Wan Po Rd

Wah Fu

CWBP	TKO 137	SENT
Waterfall Bay Rd	Waterfall Bay Rd	Waterfall Bay Rd
Pok Fu Lam Rd	Pokl Fu Lam Rd	Pokl Fu Lam Rd
Route 4	Route 4	Route 4
Shun Tai Rd	Cross Harbour Tunnel	Cross Harbour Tunnel
Sing Tai Rd	Hong Chong Rd	Hong Chong Rd
Shing Man Rd	Route 5	Route 5
Shun Tai Rd	Route 7	Route 7

Wing Tai Rd	Wan Po Rd	Wan Po Rd
Ka Yip St		

Aberdeen

CWBP	TKO 137	SENT
Tin Wan Praya Rd	Tin Wan Praya Rd	Waterfall Bay Rd
Shek Pai Wan Rd	Shek Pai Wan Rd	Shek Pai Wan Rd
Route 1	Route 1	Route 1
Route 4	Route 4	Route 4
Shun Tai Rd	Cross Harbour Tunnel	Cross Harbour Tunnel
Sing Tai Rd	Hong Chong Rd	Hong Chong Rd
Shing Man Rd	Route 5	Route 5
Shun Tai Rd	Route 7	Route 7
Wing Tai Rd	Wan Po Rd	Wan Po Rd
Ka Yip St		

1.12 Timing of peak disposal

The predicted timing of peak disposal is shown in table 1-8 below for all the waste that will generate from DC/2007/24 construction site.

Table 1-8 Timing of Peak disposal

Month Number	Month	Estimation on Generation of C&D Materials & Waste for Disposal				Actual Disposal Record		
		Est. Amount of C&D Materials - Soil, tonne (1)	Est. Amount of C&D Materials - Rock, tonne (2)	Est. Amount of C&D Waste, tonne (3)	Total: (1)+(2)+(3)	Total C&D Materials to Public Fill, tonne	C&D Waste to Landfill, tonne	Total
1	Jul-2009							
2	Aug-2009							
3	Sep-2009	100.00		30.00	130.00	118.82	27.95	146.77
4	Oct-2009	200.00		30.00	230.00	783.69	26.23	809.92
5	Nov-2009	100.00		30.00	130.00	126.75	21.32	148.07
6	Dec-2009	500.00		30.00	530.00	638.81	25.80	664.61
7	Jan-2010	100.00		30.00	130.00	2,635.47	24.86	2,660.33
8	Feb-2010			30.00	30.00	3,640.56	23.58	3,664.14
9	Mar-2010			30.00	30.00	6,699.66	75.39	6,775.05
10	Apr-2010	1,600.00		40.00	1,640.00	3,696.63	60.55	3757.18
11	May-2010			40.00	40.00	1,562.77	96.45	1659.22
12	Jun-2010	9,100.00		40.00	9,140.00			
13	Jul-2010	13,300.00	2,500.00	40.00	15,840.00			
14	Aug-2010		6,200.00	40.00	6,240.00			
15	Sep-2010		11,500.00	40.00	11,540.00			
16	Oct-2010	15,800.00	20,500.00	40.00	36,340.00			
17	Nov-2010	19,000.00	17,500.00	40.00	36,540.00			
18	Dec-2010		31,000.00	40.00	31,040.00			
19	Jan-2011		28,500.00	40.00	28,540.00			
20	Feb-2011		26,000.00	40.00	26,040.00			
21	Mar-2011		23,100.00	40.00	23,140.00			
22	Apr-2011		26,500.00	40.00	26,540.00			
23	May-2011		27,400.00	40.00	27,440.00			
24	Jun-2011		26,500.00	40.00	26,540.00			
25	Jul-2011		25,000.00	40.00	25,040.00			
26	Aug-2011		25,000.00	40.00	25,040.00			
27	Sep-2011		26,000.00	40.00	26,040.00			
28	Oct-2011		28,200.00	40.00	28,240.00			
29	Nov-2011		26,000.00	40.00	26,040.00			
30	Dec-2011	800.00	25,800.00	40.00	26,640.00			

Month Number	Month	Estimation on Generation of C&D Materials & Waste for Disposal				Actual Disposal Record		
		Est. Amount of C&D Materials - Soil, tonne (1)	Est. Amount of C&D Materials - Rock, tonne (2)	Est. Amount of C&D Waste, tonne (3)	Total: (1)+(2)+(3)	Total C&D Materials to Public Fill, tonne	C&D Waste to Landfill, tonne	Total
31	Jan-2012		14,700.00	40.00	14,740.00			
32	Feb-2012		10,900.00	40.00	10,940.00			
33	Mar-2012		1,300.00	40.00	1,340.00			
34	Apr-2012	1,100.00		40.00	1,140.00			
35	May-2012			40.00	40.00			
36	Jun-2012			40.00	40.00			
37	Jul-2012			40.00	40.00			
38	Aug-2012			40.00	40.00			
39	Sep-2012		20,480.95	40.00	20,520.95			
40	Oct-2012			40.00	40.00			
41	Nov-2012	200.00		40.00	240.00			
42	Dec-2012	350.00		40.00	390.00			
43	Jan-2013	250.00		40.00	290.00			
44	Feb-2013	650.00		40.00	690.00			
45	Mar-2013			40.00	40.00			
46	Apr-2013			40.00	40.00			
47	May-2013			40.00	40.00			
48	Jun-2013			40.00	40.00			
49	Jul-2013							
50	Aug-2013							
51	Sep-2013							
52	Oct-2013							
53	Nov-2013							
54	Dec-2013							
55	Jan-2014							
56	Feb-2014							
57	Mar-2014							
58	Apr-2014							
59	May-2014							
60	Jun-2014							

Appendix A

Monthly Summary Waste Flow Table and Work Processes or Activities Requiring Timber for Temporary Work

Contract No. DC/2007/24
Harbour Area Treatment Scheme Stage 2A
Construction of Sewage Conveyance System from Aberdeen to Sai Ying Pun

Monthly Summary Waste Flow Table for 2010 (year)

Month	Actual Quantities of Inert C&D Materials Generated Monthly						Actual Quantities of C&D Wastes Generated Monthly				
	Total Quantity Generated	Broken Concrete (see Note 3)	Reused in the Contract	Reused in other Projects	Disposed as Public Fill	Imported Fill	Metals	Paper/ cardboard packaging	Plastics (see Note 2)	Chemical Waste (see Note 4)	Others, e.g. general refuse
	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000m³)	(in '000 Kg)	(in '000 Kg)	(in '000 Kg)	(in '000 Kg)	(in '000m³)
Jan	1.387	0	0	0	1.387	0	8.190	0.112	0	0	0.016
Feb	1.946	0	0	0	1.946	0	8.510	0.251	0	0	0.015
Mar	3.526	0	0	0	3.526	0	1.440	0.436	0	0.624	0.075
Apr	1.946	0	0	0	1.946	0	0	0.255	0	0	0.038
May	0.823	0	0	0	0.823	0	0.146	0.374	0	0	0.060
Jun	2.261	0	0	0	2.261	0.406	7.336	0.325	0	0	0.196
Sub-total	11.889	0	0	0	11.889	0.406	25.64	1.753	0	0.624	0.400
Jul	2.695	0	0	0	2.695	0	0	0.332	0	0	0.094
Aug	2.276	0	0	0	2.276	0	2.600	0.287	0	0	0.078
Sept	2.053	0	0	0	2.053	0	3.969	0.403	0	0	0.057
Oct	3.171	0	0	0	3.171	0	0	0.280	0	0	0.032
Nov											
Dec											
Total											

Notes:
(1) The waste flow table will also include C&D materials that are specified in the Contract to be imported for use at the Site.
(2) Plastics refer to plastic bottles/containers, plastic sheets/foam from packaging material.
(3) Broken concrete for recycling into aggregates.
(4) Assume general liquid chemical waste on site has a density of 1kg/L

Assumption:
1m³ of Inert C&D Materials weigh 1.9 tonnes
1m³ of C&D Wastes weigh 1.6 tonnes

Contract:	HATS Stage 2A - Construction of Sewage Conveyance System from Aberdeen to Sai Ying Pun From 1-September-09 to 31-October-10	Contract No.	DC/2007/24 (H2488)

Work Processes or Activities Requiring Timber for Temporary Work

Item	Description of Works Process or Activity [see note (a) below]	Justifications for Using Timber in Temporary Construction Works	Estimated Quantities (m^3)	Actual Quantities used (m^3)	Remarks
1	Construction of wheel washing bay at Aberdeen	Not required as quantity < $5m^3$	1.5	1.394	Order on 25 Sep 2009
2	Construction of wheel washing bay at Sandy Bay PTW	Not required as quantity < $5m^3$	1	0.535	Order on 24 Oct 2009
3	Construction of D-wall at Sandy Bay (From Bachy)	Not required as quantity < $5m^3$	2	1.515	Order on 10 Dec 2009
4	TTA for Temporary Pedestrian Passage at Aberdeen and Sandy Bay	Not required as quantity < $5m^3$	2	1.450	Order on 21 Jan 2010
5					
6					
7					
8					
9					
		Total Estimated Quantity of Timber Used (m^3)	10(m^3)	Total Used = 4.894(m^3)	

Notes:
a) Works items requiring timber for use in temporary construction works. Several minor work items can be combined for ease of updating.
b) The summary table shall be submitted monthly to the PM for review and monitoring.

Appendix B
Outline Environmental Control Plan
ECP 9 – Waste Management

Environmental Control Plan				LLNSJV
Contract Name: Harbour Area Treatment Scheme Stage 2A				**Plan No:** ECP 9
Environmental Aspect: Waste Management			**Contract No:** DC/2007/24 (H2494)	
ID No	**Environmental Aspect (and impact where necessary)**	**Actions Required**	**Action By**	**Additional Control/Monitoring and Measurement Procedures/Methods (if necessary)**
1	Production of inert construction-and-demolition material (including residual benitonite slurry) requiring disposal	1 Reduce amount of construction-and-demolition material generated by careful planning and procurement. 2 Properly sort construction-and-demolition material and re-use on-site as backfilling material and for landscaping works as far as practicable. 3 Re-use volcanic rock generated from the tunnelling works for reclamation or rock fill by other projects either in the Hong Kong SAR or elsewhere. 4 Dispose of suitable inert construction-and-demolition material to public-fill facility. 5 Make sure Chit and a trip ticket are prepared for each load taken to public-fill facility. 6 Consider selling demolition material. 7 Implement site management plan for trip tickets. 8 The bentonite shall be reused as far as practicable. 9 The bentonite slurry will be mixed with sand (if necessary) and then disposed to public fill after dry and according to the ProPECC PN1/94 "Construction Site Drainage.	Engineer/superintendent/ supervisor/foremen	Routine Environmental Monitoring Checklist or equivalent Waste Disposal Chit and Disposal Delivery Form endorsed by Contractor and Engineer Database printout of deliveries to facility

Environmental Control Plan				LLNSJV
Contract Name: Harbour Area Treatment Scheme Stage 2A				**Plan No:** ECP 9
Environmental Aspect: Waste Management			**Contract No:** DC/2007/24 (H2494)	
ID No	**Environmental Aspect (and impact where necessary)**	**Actions Required**	**Action By**	**Additional Control/Monitoring and Measurement Procedures/Methods (if necessary)**
2	Inert construction-and-demolition material has contamination (eg, vegetation, rebar, timber or plastic) making it unsuitable for disposal at public fill	1 Sort and segregate material to remove contamination so that it can be accepted as public fill 2 Make sure Chit and a Disposal Delivery Form are prepared for each load taken to appropriate waste-disposal facility. 3 Check that no contamination of chemical waste is present that may cause rejection. 4 Sign Disposal Delivery Form to verify compliance. 5 Security staff at site exit to check load. 6 Implement site management plan for trip tickets.	Engineer/superintendent/ supervisor/foremen/ subcontractor/truck driver	Routine Environmental Monitoring Checklist or equivalent Waste Disposal Chit and Disposal Delivery Form endorsed by Contractor and Engineer Database printout of deliveries to facility
3	Production of construction and demolition material requiring disposal	1 Reduce amount of construction-and-demolition material generated by careful planning and procurement. 2 Properly sort construction-and-demolition material and recycle for use in construction. 3 Dispose of construction-and-demolition waste to landfill 4 Make sure Chit and Disposal Delivery Form are prepared for each load taken to landfill. 5 Consider selling demolition material. 6 Implement site management plan for trip tickets.	Environmental Officer/engineer/ superintendent/supervisor/ foremen	Routine Environmental Monitoring Checklist or equivalent Waste Disposal Chit and Disposal Delivery Form endorsed by Contractor and Engineer Database printout of deliveries to facility
4	Vegetation and organic materials require disposal	Segregate materials from inert materials and dispose to SENT	Environmental Supervisor/ Foremen	DDF and Construction Waste Chit

Environmental Control Plan				LLNSJV
Contract Name: Harbour Area Treatment Scheme Stage 2A				**Plan No:** ECP 9
Environmental Aspect: Waste Management			**Contract No:** DC/2007/24 (H2494)	
ID No	**Environmental Aspect (and impact where necessary)**	**Actions Required**	**Action By**	**Additional Control/Monitoring and Measurement Procedures/Methods (if necessary)**
5	Incorrect disposal of waste fuels, oils and solvents (ie, chemical waste)	1 Register as chemical-waste producer. 2 Incorporate trip-ticket system in Environmental Management Plan. 3 Only engage licensed waste collectors. 4 Establish chemical-waste storage facility on site.	Environmental Officer/superintendent/supervisor/foremen	Routine Environmental Monitoring Checklist or equivalent
6	Accumulation of general refuse causing potential rodent/pest infestation	1 Erect and maintain awareness publications (eg, posters) regarding dangers of allowing pests and breeding. 2 Provide awareness training. 3 Make sure adequate number of waste skips are provided and are changed in timeously.	Safety offices/superintendent/ supervisor/foremen	Routine Environmental Monitoring Checklist or equivalent
7	Poor handling of material causing loss or damage resulting in waste	1 Provide training on material handling. 2 Supervise material handling.	Engineer/superintendent/ supervisor/foremen	Monthly Material Storage Inspection Checklist (F173)
8	Poor storage of material causing loss or damage resulting in waste	1 Make sure material is stored in proper manner (eg, stacked properly to prevent damage). 2 Minimize stockpile on site.	Superintendent/supervisor/ foremen	Routine Environmental Monitoring Checklist or equivalent
9	Poor workmanship causing demolition and rework	Improve awareness of site supervision staff.	Project quality coordinator	None
10	Production of waste: general material and packaging	1 Recycle usable material and packaging (eg, cardboard boxes) 2 Investigate opportunity to return packaging to supplier.	Environmental Officer/purchase officer	Routine Environmental Monitoring Checklist or equivalent
11	Disposal of surplus material as result of over-ordering	1 Make sure estimation is correct during procurement stage. 2 Continue monitoring of quantity of site stockpile.	Quantity surveyor/ engineer/purchase officer	None

Environmental Control Plan				LLNSJV
Contract Name: Harbour Area Treatment Scheme Stage 2A				**Plan No:** ECP 9
Environmental Aspect: Waste Management			**Contract No:** DC/2007/24 (H2494)	
ID No	**Environmental Aspect (and impact where necessary)**	**Actions Required**	**Action By**	**Additional Control/Monitoring and Measurement Procedures/Methods (if necessary)**
12	Disposal of packaging material (eg, cardboard, polystyrene)	Recycle usable material and packaging (eg, cardboard boxes)	Environmental Officer	Routine Environmental Monitoring Checklist or equivalent
13	Disposal of brake linings and oily rags	1 Make sure brake linings containing asbestos are disposed in accordance with Environmental Protection Department's Code of Practice on the handling, transportation and disposal of asbestos waste. 2 Make sure oily rags are collected for proper disposal.	Environmental Officer/superintendent/ supervisor/foremen	None
14	Disposal of spent batteries	1 Use generator/permanent power source, when practicable. 2 Use rechargeable batteries. 3 Use licensed collector. 4 Use trip-ticket system.	Environmental Officer/superintendent/ supervisor/foremen	Trip-ticket System
15	Disposal of unusable tyres	1 Try to source recycling company for tyres. 2 Collect unusable tyres for recycling purposes. 3 Reuse for temporary protection purposes on site.	Environmental Officer/superintendent/ supervisor/foremen	Receipt
16	Paper use and disposal (office)	1 Improve awareness of staff by including procedure to minimize paper usage in environmental induction training. 2 Re-use paper (double-sided printing), recycle disposed material.	Environmental Officer/all staff	Objectives and Targets
17	Mobile-phone batteries	1 Improve awareness of staff by including procedure of recycling mobile phone batteries in environmental induction training. 2 Dispose batteries in government collection bins.	Environmental Officer/all staff	None

Environmental Control Plan				LLNSJV
Contract Name: Harbour Area Treatment Scheme Stage 2A				**Plan No:** ECP 9
Environmental Aspect: Waste Management			**Contract No:** DC/2007/24 (H2494)	
ID No	**Environmental Aspect (and impact where necessary)**	**Actions Required**	**Action By**	**Additional Control/Monitoring and Measurement Procedures/Methods (if necessary)**
18	Concrete spillage during washing out of truck mixer disposed as hardened-concrete waste to public-fill reception facility	1 Make sure all concrete trucks are directed to wash-out area before spraying with water. 2 Reduce magnitude of impact by providing designated wash-out bins/skips. Re-use or dispose of to public-fill reception facility.	Superintendent/supervisor/ foremen	Routine Environmental Monitoring Checklist or equivalent
19	Production and disposal of general refuse causing litter nuisance (includes newspaper, food boxes, cans)	1 Provide separate bins for recycling (eg, paper, aluminium cans, plastic bottles) if in area where recycling is feasible. 2 Include issues in site induction. 3 Provide posters/notices to increase awareness. 4 Store general refuse in enclosed bins or compaction units separate from construction-and-demolition material. 5 Employ a reputable waste collector to remove general refuse from the site, separately from construction-and-demolition material. 6 Provide an enclosed and covered area to reduce the occurrence of 'wind blown' light material.	Environmental Officer/superintendent/ supervisor/foremen	Waste Management Plan
20	Production and disposal of sludge/waste from holding tank or similar	1 Appoint authorized waste collector. 2 Periodically clean holding tank or similar by waste collector.	Purchase officer/foremen	Cleaning Records
21	Loss of semi-liquid/solid waste from vehicles in transit (eg, mud on road, leakage of fluid from tail gate)	1 Make sure vehicles are covered properly before leaving site (e.g. cover skip by tarpaulin). 2 Make sure tail gates are sealed when transporting semi-liquid waste.	Foremen	Routine Environmental Monitoring Checklist or equivalent

Environmental Control Plan				LLNSJV
Contract Name: Harbour Area Treatment Scheme Stage 2A				**Plan No:** ECP 9
Environmental Aspect: Waste Management			**Contract No:** DC/2007/24 (H2494)	
ID No	**Environmental Aspect (and impact where necessary)**	**Actions Required**	**Action By**	**Additional Control/Monitoring and Measurement Procedures/Methods (if necessary)**
22	Use and disposal of plant, site accommodation and other surplus equipment	1 Re-use plant/parts of plant, when practicable. 2 Re-use surplus equipment/parts of surplus equipment, when practicable. 3 Send to Plant Department/storage facilities for storage. 4 Sell to old-parts collectors.	Superintendent/supervisor/ foremen	None
23	Disposal of residual cleaning material from painting (using acrylic, water-based paints)	1 Do not dispose of waste water used for cleaning purposes into surface-water drains. 2 Place any residual material into drum containing sand. When full, place material into chemical waste store. 3 Dispose of via licensed collector.	Environmental Officer/superintendent/ supervisor/foremen	None
24	Controlled disposal of Empty tins that have previously contained chemical material	1 Make sure there is no residue in tin that is potentially reactive. 2 Segregate from main waste skip. 3 Engage chemical-waste collector.	Environmental Officer/superintendent/ supervisor/foremen	None

Environmental Control Plan				LLNSJV
Contract Name: Harbour Area Treatment Scheme Stage 2A				**Plan No:** ECP 9
Environmental Aspect: Waste Management			**Contract No:** DC/2007/24 (H2494)	
ID No	**Environmental Aspect (and impact where necessary)**	**Actions Required**	**Action By**	**Additional Control/Monitoring and Measurement Procedures/Methods (if necessary)**
25	Bad site practices causing waste nuisance	1 Nominate an approved person, such as a site manager to responsible for good site practices, arrangement for collection and effective disposal of all wastes generated at the site to an appropriate facility. 2 Train site personnel in proper waste management and chemical handling procedures. 3 Provide sufficient waste disposal points and regular collection of waste. 4 Cover trucks or transport waste in enclosed containers to minimise windblown litter and dust transportation of waste. 5 Regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors.	Site agent/Environmental Officer/ superintendent/supervisor/ foremen	None

Appendix C
Leighton – LNS Joint Venture's targets

1.1 Environmental Objectives and Targets

Leighton – LNS Joint Venture's environmental objectives and associated performance targets, which are linked to Leighton – LNS Joint Venture Environmental Policy, are shown in Table 1-1.

Those objectives have been prepared taking account of the individual corporate objectives of the participating companies of the Leighton – LNS Joint Venture.

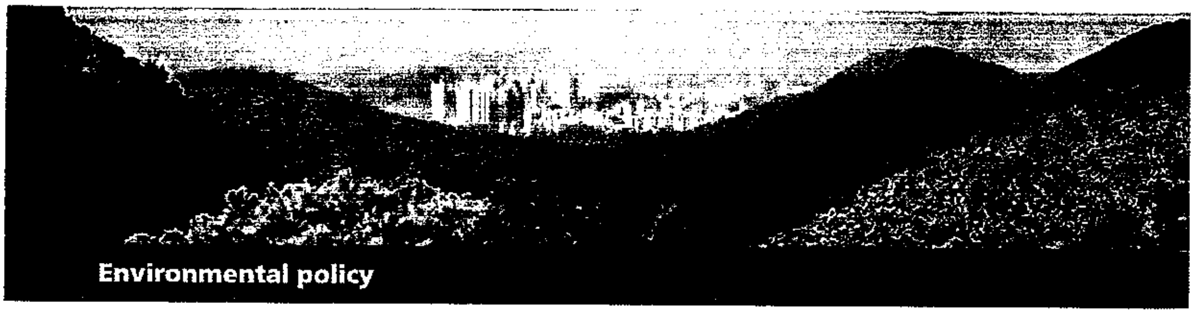
An action plan to achieve those objectives shall be prepared by the Environmental Officer and approved by the site agent following the award of the Contract.

Table 1-1: Environmental Objectives and Targets

Objective	Performance Indicator	Target
1. Legal compliance with environmental legislation	Number of breaches	0
2. No serious environmental incident	Number of Level 1 or 2 incidents and incident frequency rate	0
3. Environmental Induction of workforce	Attendance	100%
4. participate in recognized environmental awards and chive recognition (e.g. HKAEE, considerate contractor)	Number of events	At least one per year
5. Obtain good performance results for environmental protection under CPS	Contractors rating under Environmental Protection	Good or better

Explanatory Notes:

1) Environmental incidents classification:
Level 1, high severity: Pollution or degradation that has or may have irreversible detrimental effects on the environment and/or community;
Level 2, medium severity: Pollution or degradation that has persistent but reversible effects on the environment and/or community, and
Level 3, low severity: Pollution or degradation that has short-term and reversible detrimental effects on the environment and/or community.



LEIGHTON LNS 禮頓-利安聯營 Harbour Area Treatment Scheme

Leighton – LNS Joint Venture is aware of the impact our work can have on the environment. We support the principle of sustainable development and are committed to taking an environmentally responsible approach to all our business activities.

It is our policy to:

- Identify and comply with all relevant environmental laws, regulations and contractual obligations
- Take all practicable steps to prevent pollution in our activities
- Conserve resources through the efficient use of energy and material
- Systematically manage our environmental performance on projects
- Provide appropriate training for our employees, subcontractors and others working on our behalf to improve awareness and knowledge of their environmental obligations
- Set targets and review results on a regular basis with the aim of continually improving our environmental performance
- Provide sufficient resources to enable us to achieve our environmental objectives
- Ensure that our environmental management system is in accordance with ISO 14001:2004

It is a requirement of the Leighton – LNS Joint Venture that each employee is made aware of, promotes and implements this policy. Each employee is expected to extend the understanding and acceptance of this policy to our partners, suppliers, subcontractors, customers and the communities in which we work.

The Project Director is responsible to implement and ensure compliance with this policy.

Ian Edwards
Chairman of the Joint Venture Executive Board

15 October 2009

Appendix D
Details of Dust Mitigation Measures

1.1 Scope

This section relates to the following environmental aspects:

- dust from construction activities;
- air emissions from plant and equipment use, and
- use of chemicals, such as volatile organic compounds, that may give rise to air emissions.

For details of the activities that may cause air pollution, refer to Environmental Aspect in the Environmental Control Plan (ECP1) listed in Appendix 2 in EMP.

1.2 Statutory Requirements

Statutory requirements include:

- Air Pollution Control Ordinance (Cap 311);
- Air Pollution Control (Construction Dust) Regulations;
- Air Pollution Control (Open Burning) Regulations;
- Air Pollution Control (Smoke) Regulations;
- Air Pollution Control (Specified Processes) Regulations, and
- Air Pollution Control (Volatile Organic Compounds) Regulations
- Air Pollution Control (Fuel Restriction) Regulations

For the full version of legislation and regulations, refer to http://www.legislation.gov.hk/index.htm

Other requirements include:

- Environmental Impact Assessment Report.

1.3 Applicable Licence Requirements

The Environmental Officer shall notify the Environmental Protection Department Regional Control Office prior to starting notifiable works at the project site using Form NA or prior to any subsequent changes to programme dates given in Form NA by completing Form NB.

Open burning and fires of any description shall be strictly forbidden on Contract DC/2007/24. That requirement shall be included in induction training for the workforce.

Details of licences, permits and notifications, together with application requirements and validity periods and renewal frequencies are provided in Table 6-2 of the EMP. Once obtained, the licence or permit shall be logged on a register maintained by the Environmental Officer or nominee to make sure that the validity period and expiry date are regularly monitored.

1.4 Air-sensitive Receivers

The locations of potential air-sensitive receivers are listed in Table 1-1. The receivers listed here are the representative air-sensitive receivers from the Environmental Assessment Report. Some of them have been selected as air monitoring station in Environmental Monitoring and Audit Manual, namely The Arcade (Cyberport), Western Wholesale Food Market, Wah Ming House and the Hong Kong Ice and Cold Storage,

showed in Appendix 16 of the EMP. The Environmental Team will commence the impact air monitoring after the completion of baseline air monitoring.

Table 1-1: Air Sensitive Receivers

Reference	Location	Remark	District
ASR1	Block A Kwan Kick Building Phase III	Residential	SYP
ASR2	Western Wholesale Food Market	Commercial	SYP
ASR3	University of Hong Kong Stanley Ho Sports Centre Pitch	Educational	SB
ASR4	Maclehose Medical Rehabilitation Centre	Clinical	SB
ASR5	Chuk Lam Ming Tong Home for the Elderly	Home of elderly	SB
ASR6	The Duchess of Kent Children's Hospital	Clinical	SB
ASR7	Cyber Centre	Commercial	CBP
ASR8	Le Meridien Hotel Cyberport	Hotel	CBP
ASR9	Aegean Terrace	Residential	CBP
ASR10	Block 18, Baguio Villa	Residential	CBP
ASR11	Phase 1&2, Residence Bel-Air	Residential	CBP
ASR12	Wah Yu House, Wah Fu Estate	Residential	WF
ASR13	Wah Ming House, Wah Fu Estate	Residential	WF
ASR14	Waterfall Bay Park	Recreational	WF
ASR15	Wah Lai House, Wah Kwai Estate	Residential	ABD
ASR16	Hing Wai Centre	Industrial	ABD
ASR17	Shek Pai Wan Road Playground	Recreational	ABD
ASR18	Dairy Farm Ice and Cold Storage	Industrial	ABD
ASR19	Ka Chun House, Ka Lung Court	Residential	ABD
ASR20	Ka Sing House, Ka Lung Court	Residential	ABD

1.5 Proposed Mitigation Strategy

The Leighton – LNS Joint Venture shall provide dust and odour suppression measures for all dust generating and odour emission activities on the site, including:

- mechanical and non-blasting methods;
- tunnelling work;
- grouting operations;
- shotcreting operations;
- excavation or spoil moving;
- piling and foundation work;
- road construction, opening or resurfacing work;
- site formation, demolition and clearance;
- slope stabilization work or stockpiling of dusty material,
- waste handling and dust cleaning operations, eg, filters; and
- temporary/permanent deodorization unit.

The mitigation measures for air quality impact are described in the following sections. Environmental Control Plan for air pollution abatement is developed and included in **Appendix 2 of the EMP**. That plan will be reviewed and updated on a regular basis, to

ensure that it meets site requirements.

The effectiveness and efficiency of the air pollution control can be assessed by the result of the air monitoring under Environmental Monitoring and Audit Manual. In additional, the performance of the air mitigation measure can also be monitored and assessed by the Weekly Environmental Walk.

1.5.1 Use of Fixed Water Sprays

Dust-suppression chemicals, such as wetting agents and binders, may be adopted as necessary to prolong the effectiveness of mitigation measures.

A fixed water-spray system shall be installed at the for the conveyor-belt hopper and muck bins. That system shall consist of a central water-storage tank and pump. The water shall be pumped to the spray heads through 50-millimetre diameter unplasticized poly-vinyl-chloride or similar pipes.

The spray heads shall be set out such that their fields of spray overlap. The complete fixed water-spray system shall be constructed of material that makes it easy to dismantle, move and re-erect. When practicable, water used for dust suppression shall be recycled.

Labourers with hoses will be used when access is limited or in areas not covered by the fixed system.

1.5.2 Dust/Smoke Screens

When the public may be directly affected by dust or exhaust fumes from construction plant and equipment or a work activity, such plant or work activity shall be shielded by a screen with a height of at least 1.8 metres. The screen for shielding exhaust fumes shall be incombustible.

Indicative construction details of any required dust/smoke screen to be provided for the works where the public will be affected are shown in Figure 1.1.

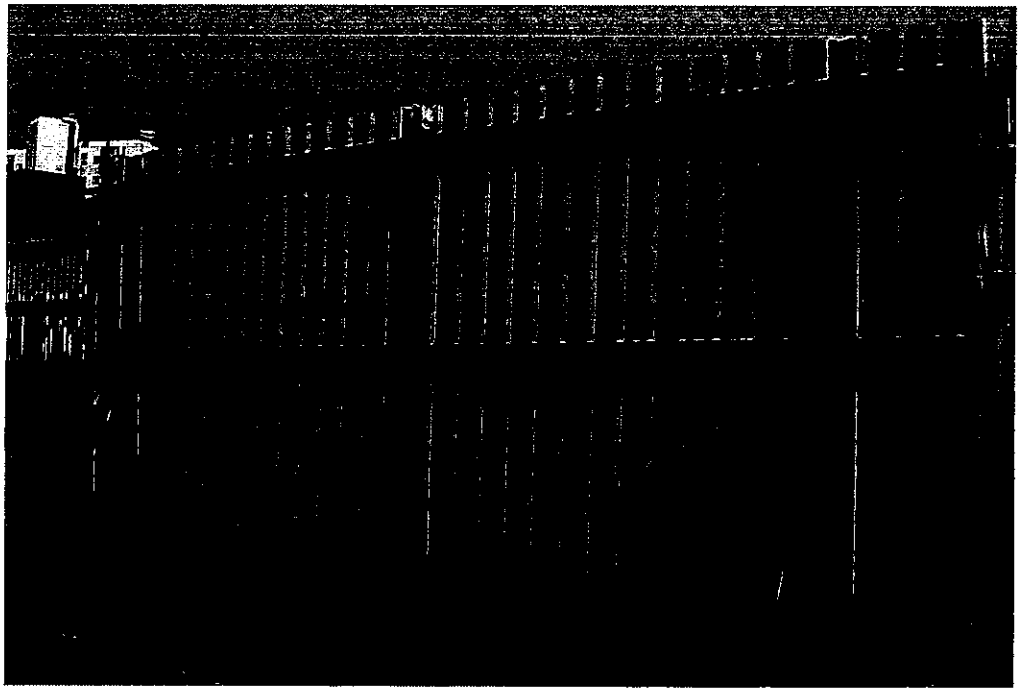


Figure 1.1: Dust/Smoke Screen

1.5.3 Wheel-wash Facility

A wheel-wash facility will be provided at the site exit to make sure that all vehicles' wheels and body are cleaned before leaving the site and driving on public roads. Automated equipment will be used if site constraints allow. The wheel-wash facility will include a water recycling system to minimize water usage. Labourers with hoses will be used for all shaft locations where site limitations may preclude the installation of a wheel-wash facility. The access between the wheel-wash facility and the public road shall be hard paved to avoid re-contamination.

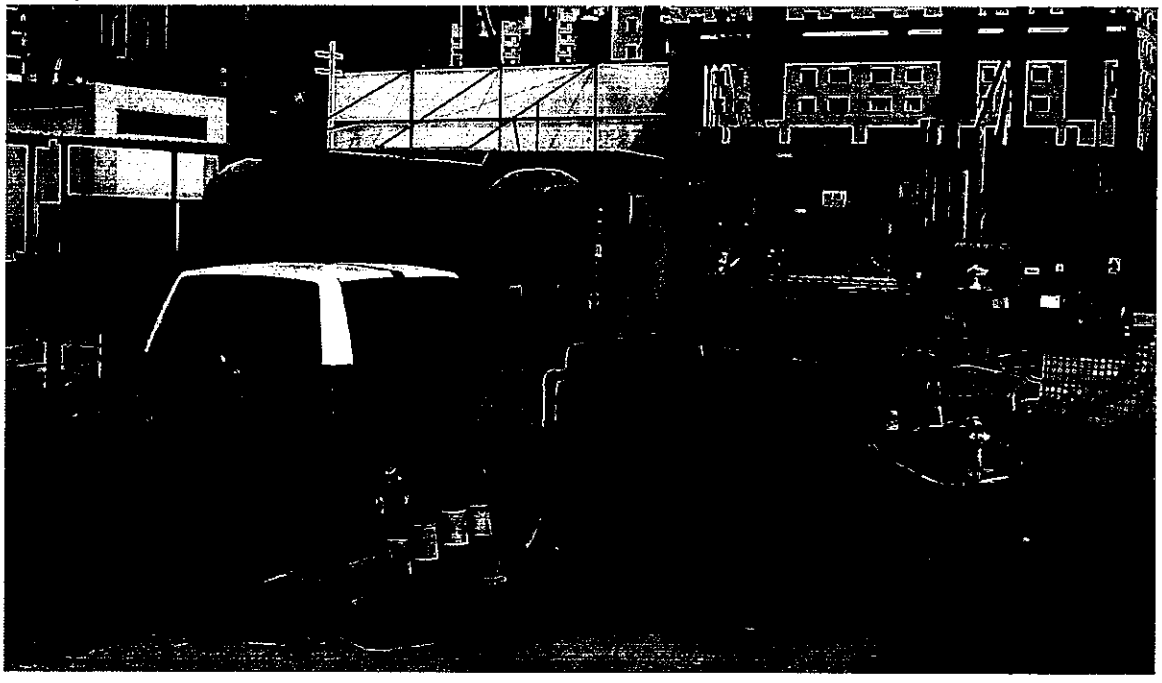


Figure 1.2: Automated Wheel Wash

Dedicated labourer(s) who have received appropriate training shall be allocated by the site foreman to maintain the environmental facilities on the site, including timely removal of resulting spoil from the wheel-wash operation. Spoil shall be allowed to dry out before disposing as public fill off site.

1.5.4 Pre-soaking of Rock

Areas to be broken down during site formation and shaft construction shall be damped down by labourers with hoses or fixed sprays to minimize dust impacts.

1.5.5 Transfer of Spoil Using Belt-conveyor System

When transferring spoil/material using a belt-conveyor system, that system shall incorporate the following features:

- every belt-conveyor used for the transfer of dusty material shall be enclosed on the top and the two sides;
- every transfer point between any two belt conveyors shall be totally enclosed;
- an effective belt scraper or equivalent device shall be installed at the head pulley of every belt conveyor to dislodge fine particles that may adhere to the belt surface and to reduce carry-back of fine particles on the return belt, and the belt scraper or equivalent device shall be equipped with bottom plates or other similar means to prevent falling of material from the return belt;
- every stockpiling belt conveyor shall be provided with a mechanism to adjust its level such that the vertical distance between the belt-conveyor outlet and the material landing point is maintained at not more than 1 metre;
- the area for the unloading of dusty material from a belt-conveyor outlet to any stockpile, storage bin, truck and barge shall be enclosed on the top and three sides with a flexible curtain across the front, and
- exhaust fans shall be provided for any enclosures used.

1.5.6 Temporary Storage of Spoil

Spoil may need to be stored on site for short periods due to constraints in removing spoil during certain times. When that is necessary, spoil shall be stockpiled and covered or contained to prevent dust impacts especially during dry and windy conditions. A water spray shall also be considered to supplement dust-prevention measures. Any spoil that is likely to become odorous (eg, marine deposits) will be transferred off-site promptly.

1.5.7 Preventing Use of Smoky Plant

1.5.7.1 On Arrival

Each item of plant and mechanical equipment shall be checked by the Leighton – LNS Joint Venture prior to its use. That checking procedure shall include a review of registration and statutory certificates required for its use on site by the safety officer. The results of this inspection shall be recorded on the construction plant checklist. If the plant is categorized as "quality powered mechanical equipment" by the Environmental Protection Department, an appropriate Noise Label shall be inspected and recorded on the plant return form.

After the plant is allowed to start, its exhaust emission shall be checked visually for

compliance with specified requirements (good practice guideline GPG 503 provides details of methodology and legal requirements). If the plant exhaust appears to be non-conforming, it shall be checked again using an approved smoke-measurement device, such as a Micro-Ringelmann Chart, to confirm the visual assessment. If the smoke emission from the plant exceeds Shade 1 on the Ringelmann Chart continuously for 30 seconds, appropriate corrective action shall be taken, such as prompt maintenance or removal from site and replacement.

1.5.7.2 Maintenance

Maintenance regimes shall be adopted for all Leighton – LNS Joint Venture-owned plant and equipment. That system is maintained by the Leighton – LNS Joint Venture and makes sure that preventive maintenance takes place in accordance with manufacturers' and Leighton – LNS Joint Venture requirements.

Hired and subcontractor-owned plant shall be continually monitored by supervisory staff and any perceived deterioration in the air quality of the exhaust emission shall be brought to the attention of the owner/operator and the Environmental Officer shall be advised of the situation. Plant performance and maintenance shall be regularly discussed at the weekly Site Safety and Environmental Committee meeting.

1.5.7.3 During Operations

The operation of plant and mechanical equipment shall be continually monitored visually for dark-smoke emissions. A formal inspection shall take place weekly as part of the site walk (see section 8.2 of EMP). If a plant's exhaust appears to be non-conforming, it shall be checked again using an approved smoke-measurement device, such as a Micro Ringelmann Chart, to confirm the initial visual assessment. If the smoke emission from the plant exceeds Shade 1 on the Ringelmann Chart continuously for 30 seconds, appropriate corrective action shall be taken, such as prompt maintenance or removal from site and replacement.

1.5.8 Dump-truck Mechanical Covers

Mechanical covers shall be used for all dump trucks transporting construction and demolition material waste off the site. The details of the mechanical covers shall follow the Particular Specification 1.98. For other types of waste, a properly-fitted tarpaulin shall be provided that fully covers the load and is secured to the dump-truck body.

Each dump truck shall be checked prior to leaving the site as part of the Leighton – LNS Joint Venture's waste-management procedures. That check shall be carried out by authorized personnel, such as security-gate staff, and shall include:

- waste chit and trip ticket (when specified) are completed correctly;
- dump-truck wheels and body are clean to allow it to drive on public roads, and
- the load is properly covered, either with a mechanical cover or fitted tarpaulin.

Once satisfied, the inspecting staff shall record the vehicle registration in the Vehicle Movement Log, which is kept at the security gate, before allowing the vehicle to leave the site.

1.5.9 System for Recording Use of Ultra-low-sulphur Diesel in Construction Plant and Equipment

1.5.9.1 Joint-venture-supplied Ultra-low-sulphur Diesel

Ultra-low-sulphur diesel shall be used for all diesel-operated construction plant on the site. Dockets for each delivery of ultra-low-sulphur diesel shall be maintained by the Purchasing Officer and the cumulative supplies logged in the register used for monitoring energy use by the project (as required by the Leighton – LNS Joint Venture's environmental objectives). An example of the register format is shown in Figure 1.3. Other specified formats shall be adopted when necessary.

The Engineer shall be invited to witness each bulk fuel delivery of ultra-low-sulphur diesel to verify the type of diesel in use.

1.5.9.2 Subcontractor-supplied Ultra-low-sulphur Diesel

Refuelling of a subcontractor's plant and equipment on-site shall use the Leighton – LNS Joint Venture-supplied diesel (see above) Delivery dockets for on-site refuelling shall be verified by the Leighton – LNS Joint Venture and copies retained. The cumulative supply shall be logged in the register used for monitoring energy use by the project.

Energy Usage Register **Period:** Quarter 1 2006
Project:

Conversion factor for electricity:	1kWh =	0.0036 GJ
Conversion factor for gasoline:	1ℓ =	0.0275 GJ
Conversion factor for diesel:	1ℓ =	0.03038 GJ

Description	From (date)	To (date)	Electricity		Gasoline		Diesel				Total (GJ)	Remarks
			kWh	GJ	ℓ	GJ	ℓ	GJ		GJ		
Q1 2006 Total	01-Jan-06	31-Mar-06	57610	207.4	2010	55.3	10000	303.6	0	0.0	566.2	
Electricity bill	11-Jan-06	12-Feb-06	19698	70.9		0.0		0.0			70.9	Site office
ULSD Diesel tank refuelling	01-Jan-06	31-Jan-06		0.0		0.0	3000	91.1			91.1	
Petrol bill from Shell	01-Jan-06	31-Jan-06		0.0	800	22.0		0.0			22.0	plant and equipment operating on-site
Electricity bill	12-Feb-06	15-Mar-06	20343	73.2		0.0		0.0			73.2	Site office
ULSD Diesel tank refuelling	01-Feb-06	28-Feb-06		0.0		0.0	3000	91.1			91.1	plant and equipment operating on-site
Petrol bill from Shell	01-Feb-06	28-Feb-06		0.0	450	12.4		0.0			12.4	Site transport
Electricity bill	15-Mar-06	31-Mar-06	17569	63.2		0.0		0.0			63.2	Site office
ULSD Diesel tank refuelling	01-Mar-06	31-Mar-06		0.0		0.0	4000	121.4			121.4	plant and equipment operating on-site
Petrol bill from Shell	01-Mar-06	31-Mar-06		0.0	760	20.9		0.0			20.9	

Figure 1.3: Energy Use Register

1.6 Corrective Action

Corrective action shall be required when a condition has been identified that has caused a non-conforming incident or event such as an adverse environmental impact or improper working practice. Such conditions may be identified through day-to-day supervision of the works, during formal routine environmental monitoring activities, following audit or via complaints from stakeholders. Ideally, corrective action shall be taken immediately following the identification of a non-conformance. Table 1-2 gives guidance on the types of corrective action to be taken for air pollution.

Table 1-2: Air-pollution Corrective Actions

Non-conformance Identified	Example Condition	Action to be Taken	Record (when appropriate)
During day-to-day supervision activities	Site is dry – solution is to increase frequency of water spraying	If possible, correct condition immediately It is not necessary to formally record action taken for routine issues however Environmental Officer should be advised if there is repetitive problem	Advise Environmental Officer if necessary
	Dark-smoke emission from construction plant	Report condition to production manager/Environmental Officer to investigate and instigate corrective action in accordance with MP-019	Form F003
During formal routine environmental monitoring and inspection	Stockpile uncovered and dry causing dust	If possible, correct condition immediately	Make remark on checklist detailing what action was taken
	Plant emitting dark smoke	Carry out formal corrective action in accordance with MP-019	Form F003
Following complaint	Plant emitting dark smoke	Record in complaints register, correct condition, raise corrective action request if necessary	Entry in complaint register Form F003
During internal audit	-	Carry out formal corrective action in accordance with management procedure MP-020	Audit report and corrective action table

1.7 Preventive Action

The need for preventive action shall be identified and action determined by using a number of different methods, including risk assessment, day-to-day supervision of the works and formal routine environmental monitoring and audit activities. When a condition has been identified that requires documented preventive action not already covered by the items in Table 1-3 or in the relevant environmental control plan, a formal corrective action request (Form F003) shall be generated and implemented (for preventive actions, impact classification is marked NA).

Table 1-3: Air-pollution Preventive Actions

Item No.	Preventive Action	Method
1	Periodically check and monitor condition of plant with respect to exhaust emissions	Visual check (use Micro-Ringelmann Chart where there is a dispute
2	Carry out regular maintenance of plant and equipment	As per plant service and maintenance requirements
3	Monitor effectiveness of mitigation measures and working practices	Visual monitoring in accordance with routine environmental monitoring checklist items (see 3.14.3)
4	Prevent wind-blown dust impacts	Provide covers/tarpaulins for stockpiles

Item No.	Preventive Action	Method
5	Maintain wheel-wash facilities	Check daily and remove silt regularly to optimize operation

Appendix E
Example of a Chit of the EMP

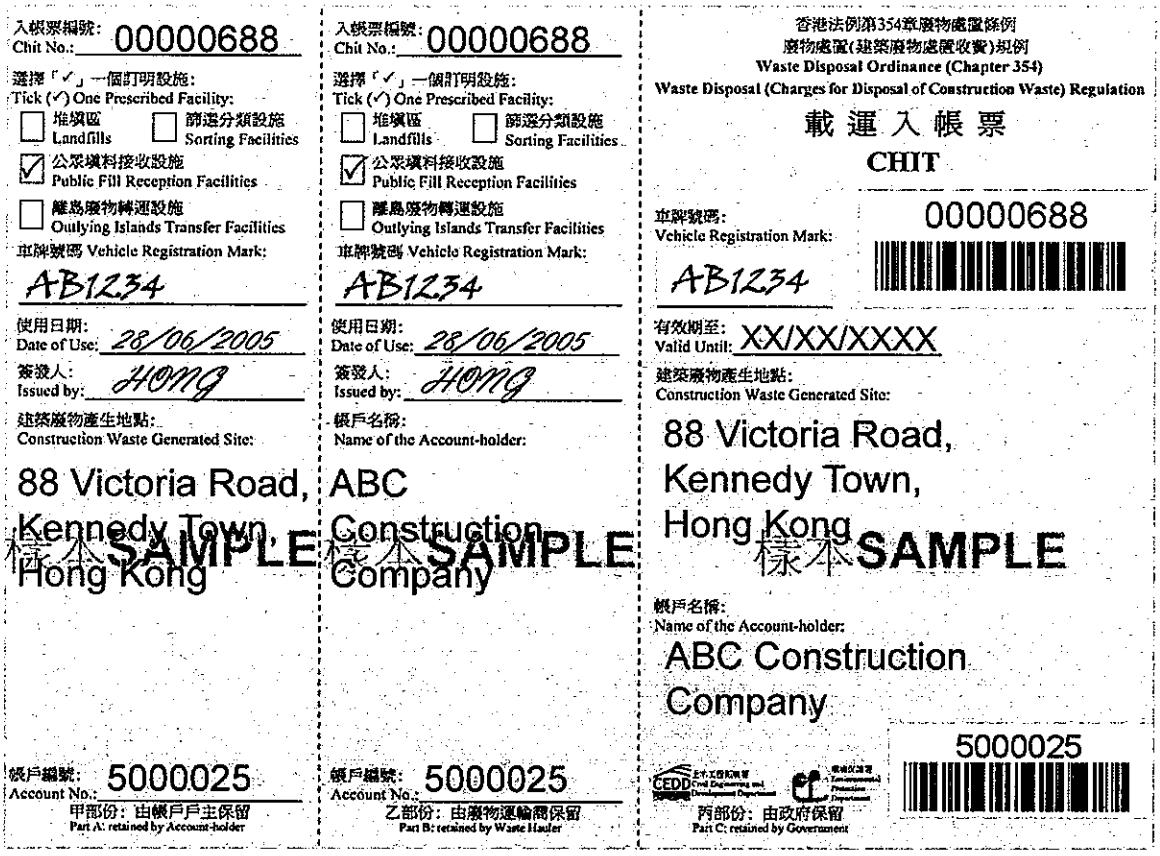
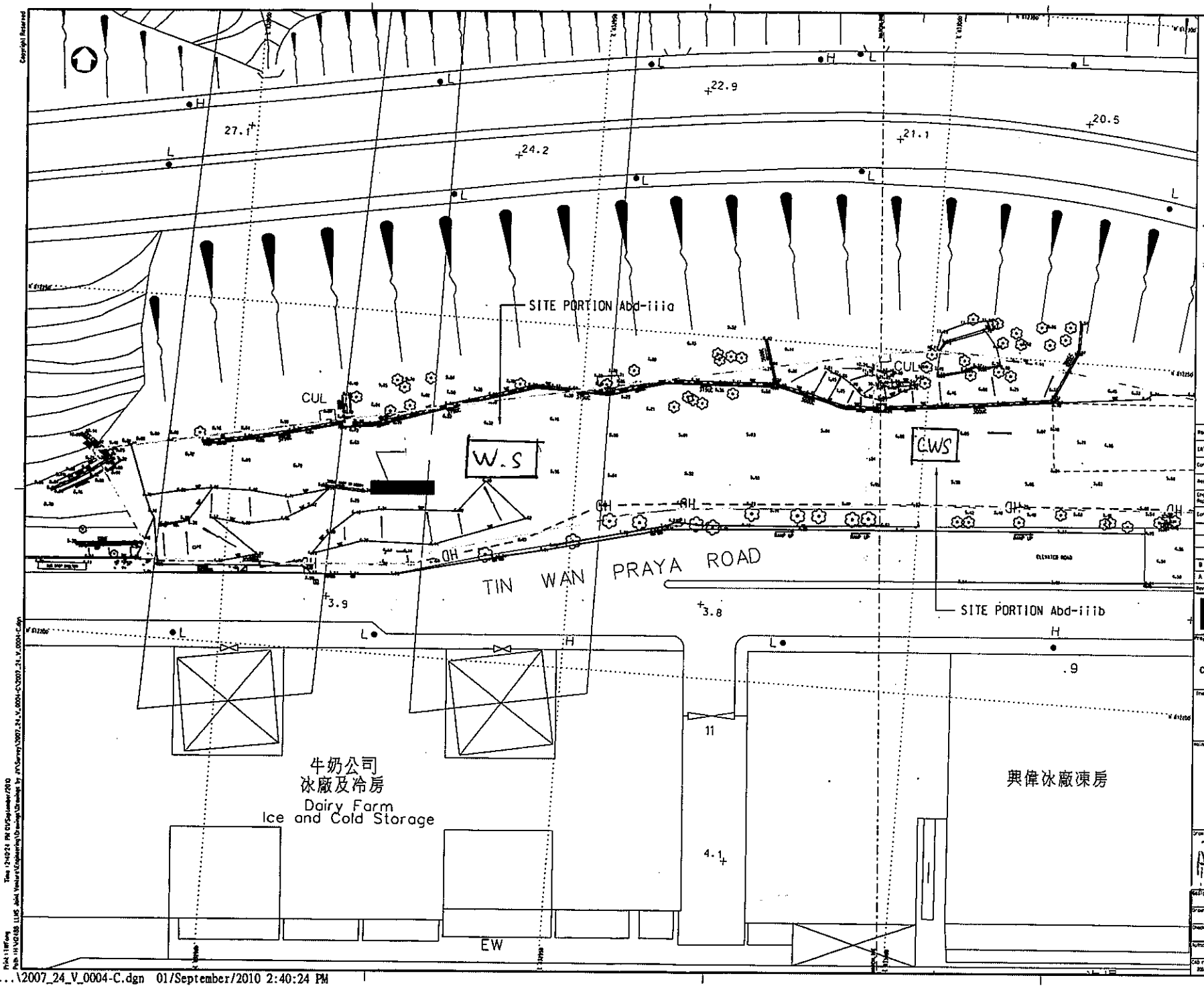


Figure 1.1: Example Chit under Waste Disposal (Charges for Disposal of Construction Waste) Regulation

Appendix F
Location plan of on-site Stockpile, Sorting Area and Chemical Waste



Aberdeen Works Area

CONTRACT NO. DC/2007/24
HARBOUR AREA TREATMENT SCHEME STAGE 2A
CONSTRUCTION OF SEWAGE CONVEYANCE SYSTEM
FROM ABERDEEN TO SAI YING PUN

DRAINAGE SERVICES DEPARTMENT
HARBOUR AREA TREATMENT SCHEME DIVISION

AECOM
Metcalf & Eddy – AECOM Joint Venture

LNS
禮頓 - 利安聯營
Harbour Area Treatment Scheme

Rev	Description	Date	Dsn.	Chk.	Auth.
B	SURVEY UPDATED	28-APR-10	-	-	JN
A	FIRST ISSUE	22-SEP-09	-	-	JN

Drawing No. 2007/24/V/0004 Rev. C

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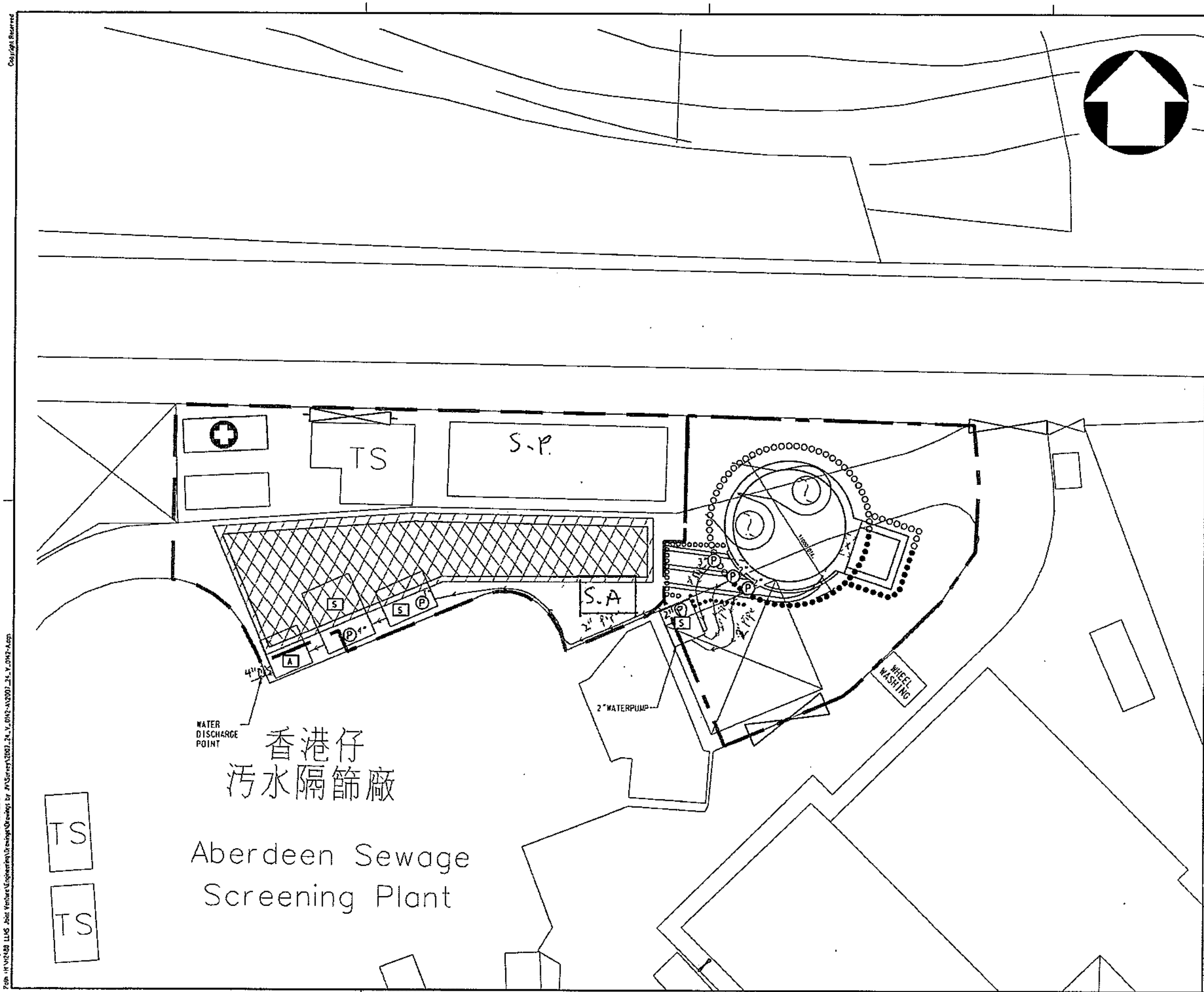

LEGENDS:

S.P → Stock Piling Area

S.A → Sorting Area

Rev	Description	Date	Sgn	Chk	Auth
A	FIRST ISSUE	19/11/2010	ST	LC	AA

渠務署
DRAINAGE SERVICES DEPARTMENT
HARBOUR AREA TREATMENT SCHEME DIVISION

Project title
CONTRACT NO. DC/2007/24
HARBOUR AREA TREATMENT SCHEME STAGE 2A
CONSTRUCTION OF SEWAGE CONVEYANCE SYSTEM
FROM ABERDEEN TO SAI YING PUN

The Engineer
AECOM
Metcalf & Eddy - AECOM Joint Venture

Main Contractor
LEIGHTON LNS
禮頓 - 利安聯營
Harbour Area Treatment Scheme

Drawing title
Aberdeen PTW

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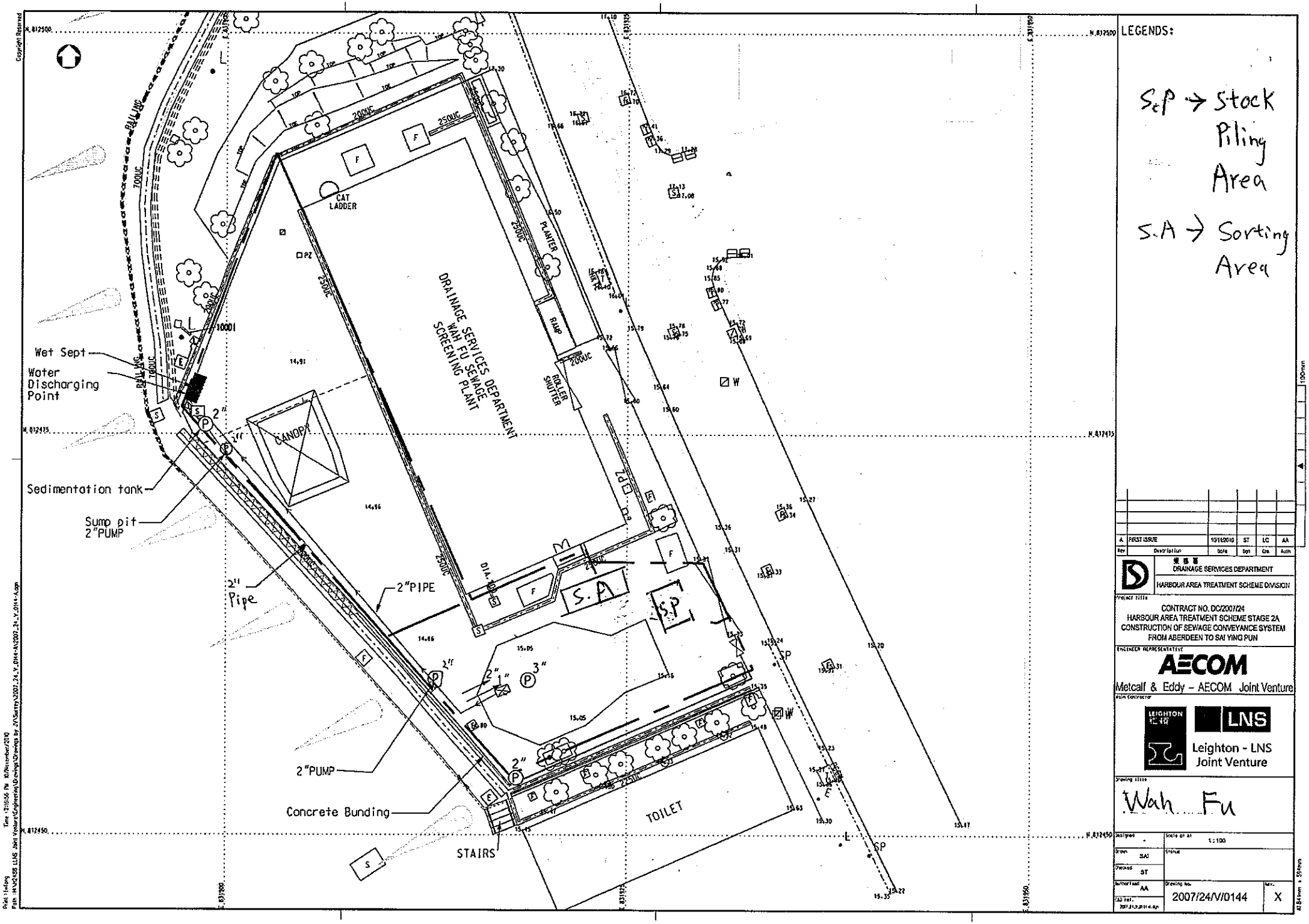
CAD ref.	Rev.: A


LEGENDS:
S.P → Stock Piling Area
S.A → Sorting Area
Wet Sept
Water Discharging Point
Sedimentation tank
Sump pit 2"PUMP
2" Pipe
2"PIPE
2"PUMP
Concrete Bunding
STAIRS
TOILET
CANOPY
CAT LADDER
DRAINAGE SERVICES DEPARTMENT WAH FU SEWAGE SCREENING PLANT
PLANTER
RAMP
ROLLER SHUTTER
S.A
S.P
DRAINAGE SERVICES DEPARTMENT
HARBOUR AREA TREATMENT SCHEME DIVISION
CONTRACT NO. DC/2007/24
HARBOUR AREA TREATMENT SCHEME STAGE 2A
CONSTRUCTION OF SEWAGE CONVEYANCE SYSTEM
FROM ABERDEEN TO SAI YING PUN
AECOM
Metcalf & Eddy – AECOM Joint Venture
Leighton - LNS Joint Venture
Wah Fu
2007/24/V/0144
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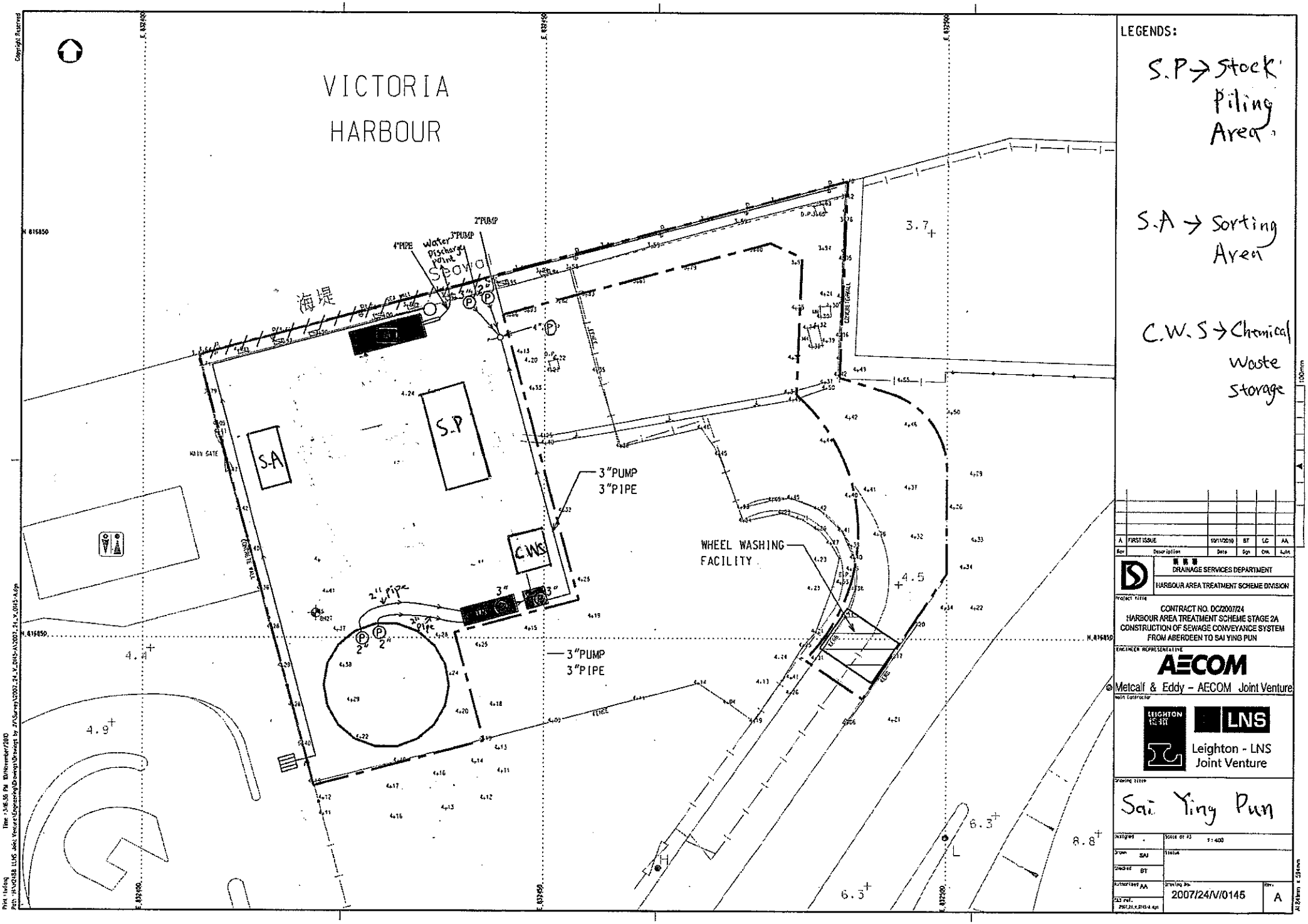
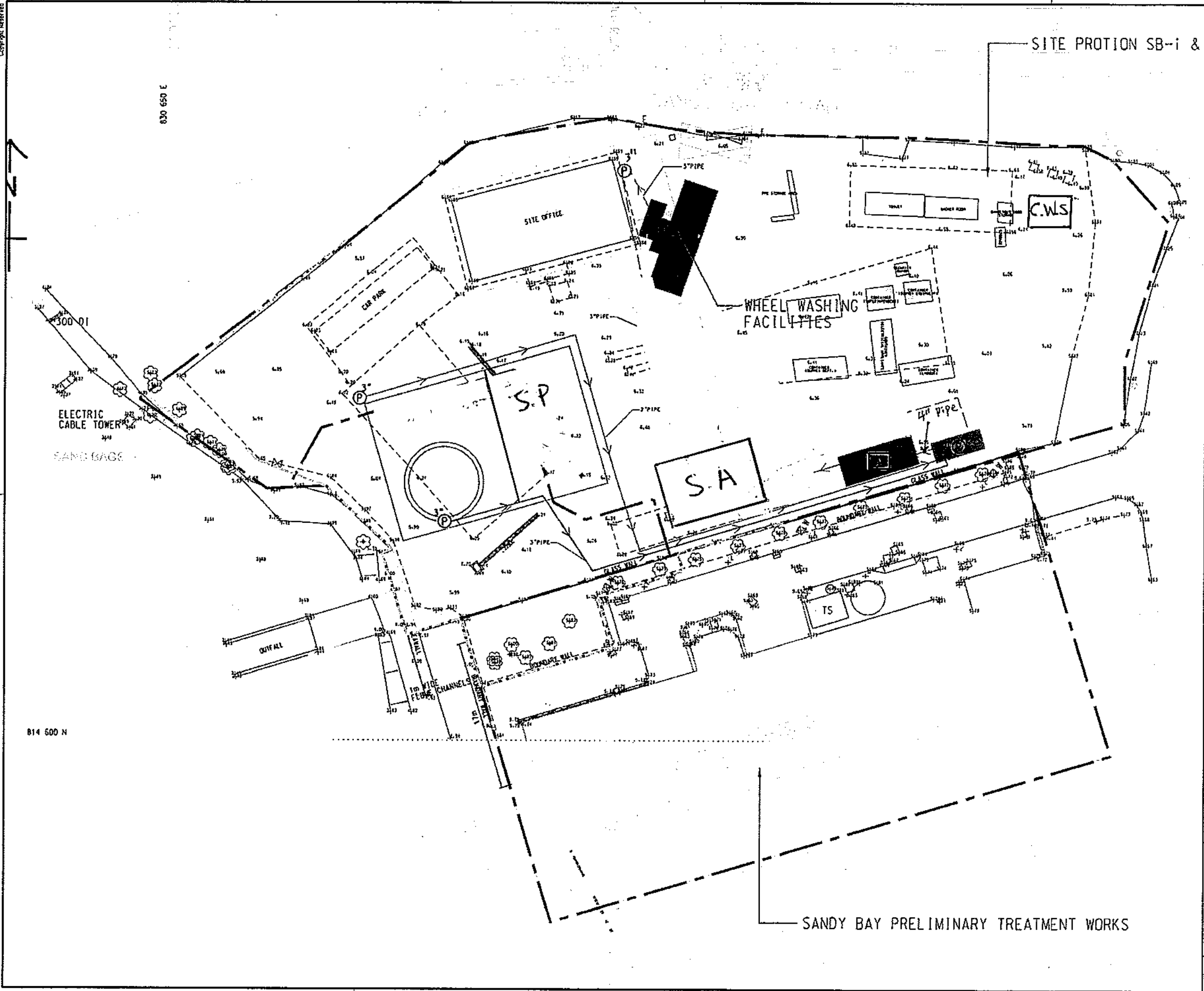

VICTORIA
HARBOUR
海堤
4"PIPE
water discharge point
3"PUMP
2"PUMP
S.A
S.P
C.W.S
3"PUMP
3"PIPE
WHEEL WASHING FACILITY
2" pipe
3"PUMP
3"PIPE
3.7+
4.5
4.3+
4.9+
6.3+
8.8+
6.3+
H
L
LEGENDS:
S.P → Stock Piling Area
S.A → Sorting Area
C.W.S → Chemical Waste Storage
DRAINAGE SERVICES DEPARTMENT
HARBOUR AREA TREATMENT SCHEME DIVISION
CONTRACT NO. DC/2007/24
HARBOUR AREA TREATMENT SCHEME STAGE 2A
CONSTRUCTION OF SEWAGE CONVEYANCE SYSTEM
FROM ABERDEEN TO SAI YING PUN
AECOM
Metcalf & Eddy – AECOM Joint Venture
LEIGHTON
LNS
Leighton - LNS Joint Venture
Sai Ying Pun
2007/24/V/0145
A



LEGENDS:

S.P → Stock Piling Area

-SP is inside the noise enclosure

S.A → Sorting Area

C.W.S → Chemical Waste Storage

Rev	Description	Date	Dgn	Chk	Auth
A	FIRST ISSUE	11/11/2010	BT	LC	AA

渠務署
DRAINAGE SERVICES DEPARTMENT
HARBOUR AREA TREATMENT SCHEME DIVISION

Project Title
CONTRACT NO. DC/2007/24
HARBOUR AREA TREATMENT SCHEME STAGE 2A
CONSTRUCTION OF SEWAGE CONVEYANCE SYSTEM
FROM ABERDEEN TO SAI YING PUN

Engineer Representative
AECOM
AECOM ASIA CO. LTD.

Main Contractor
LEIGHTON
LNS
禮頓 - 利安聯營
Harbour Area
Treatment Scheme

Drawing Title
Sandy Bay

Designed	-	Scale at A1	1:200
Drawn	SAI	Status	-
Checked	ST		
Authorised	AA	Drawing No.	2007/24/V/0146
CAD ref.		Rev.	A

FULL SIZE A1

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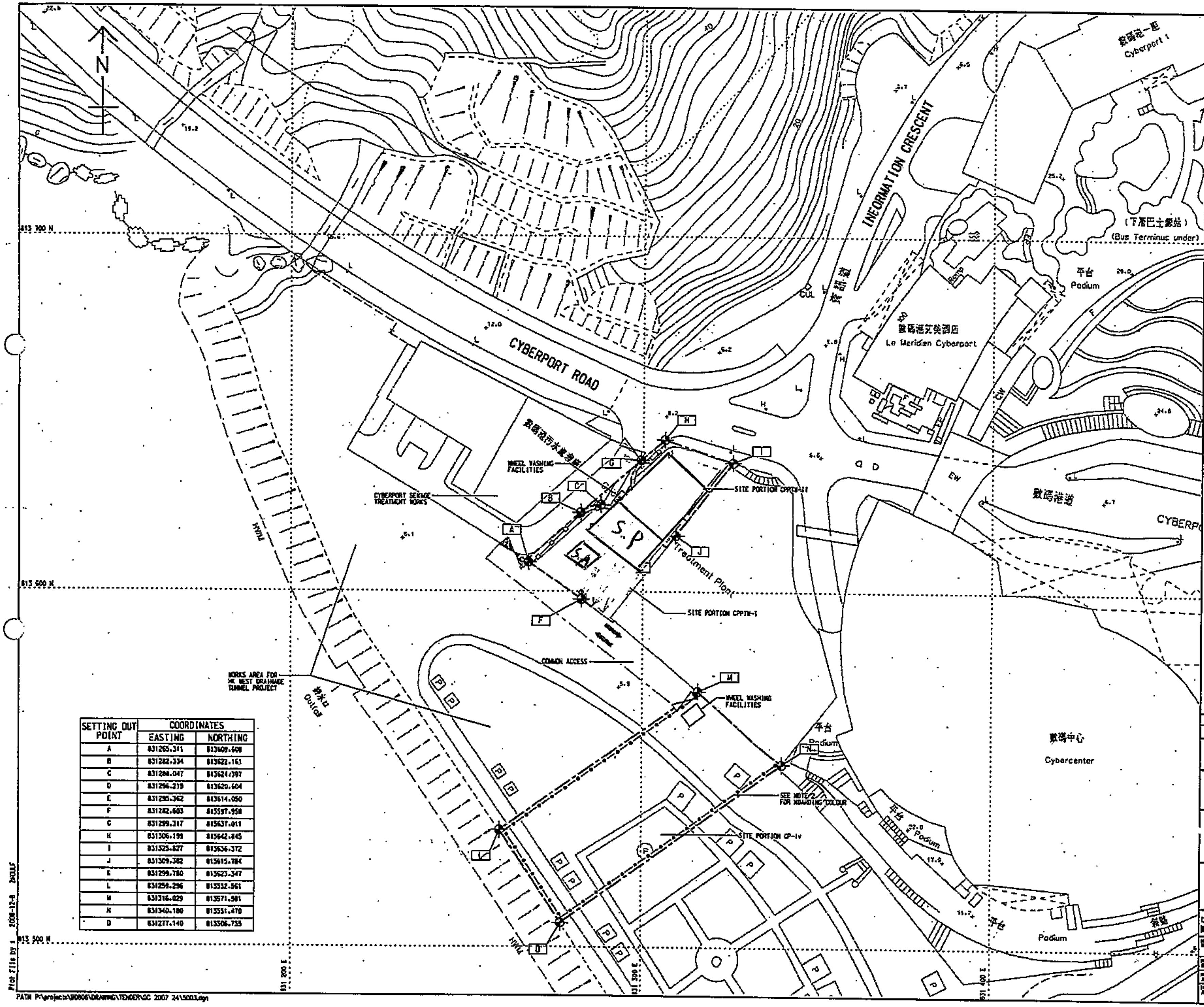

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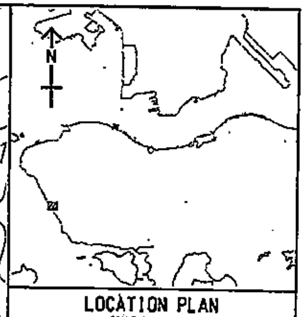

LOCATION PLAN
SCALE 1 : 100000

S.P → Stock Piling Area
-S.P is inside noise enclosure
S.A → Sorting Area

-	TENDER DRAWING

DRAINAGE SERVICES DEPARTMENT
HARBOUR AREA TREATMENT SCHEME DIVISION

CONTRACT NO. DC/2007/24
HARBOUR AREA TREATMENT SCHEME STAGE 2A
CONSTRUCTION OF SEWAGE CONVEYANCE SYSTEM
FROM ABERDEEN TO SAI YING PUN

Cyberport

MAUNSELL | AECOM
Metcalf & Eddy – Maunsell Joint Venture

DRG.NO. 90806/DC 2007 24/5003

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