Operation Approach of Construction Waste Management

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Waste Disposal Ordinance

- Provides a comprehensive framework for managing waste from the point of production to the point of final disposal

- Waste should be disposed of in an environmentally acceptable manner

Legislation on Construction Site Waste Management

- Waste Disposal Ordinance (Cap. 354) 1980
- Waste Disposal (Amendment) Ordinance 1991
- Waste Disposal (Amendment) Ordinance 1997
- Waste Disposal (Chemical Waste) (General) Regulation 1992
- Waste Disposal (Permits, Authorisations and Licences) (Fees) Regulation 1992
- Waste Disposal (Appeal Board) Regulation 1992
- Waste Disposal (Charges for Disposal of Chemical Waste) Regulation 1995
- Waste Disposal (Designated Waste Disposal Facility) Regulation 1997
- Waste Disposal (Charges for Disposal of Construction Waste) Regulation 2004
- Foreshores and Sea Bed (Reclamations) Ordinance (Cap.127) 1985
- Public Health and Municipal Services Ordinance (Cap.132) 1960
- Land (Miscellaneous Provisions) Ordinance (Cap. 28) 1972Dumping at Sea Ordinance (Cap. 466) 1997

Construction Waste Disposal Charging Scheme

Contractual Requirements for Housing Authority's Contracts

- ISO 14001
- Trip Ticket System, incl. use of Construction and Demolition Material Disposal Delivery Form

- Minimize use of timber in temp. works and prohibit use of tropical hardwood in construction works
- "Waste Flow Table"
- Keep accurate records on waste movement on and off the site
- Containers and storage areas for C&D materials are properly labelled

Contractual Requirements for Housing Authority's Contracts

- Potential buyers or collectors for reuse or recycling of materials
- A system for on site sorting of C&D materials
- Environmental management plan
- Environmental management training for workers
- Use of prefabricated building elements (e.g. precast facades and staircases) when applicable

Construction & Demolition (C&D) Material

- C&D Waste: bamboo, timber, vegetation, packing waste, other organic materials, etc.

- Inert C&D Material: rubble, boulder, concrete, bricks, asphalt, tile, masonry, earth/soil/sand , and rock etc.

Construction Waste

- Landfills: 3 strategic landfills sites managed by EPD

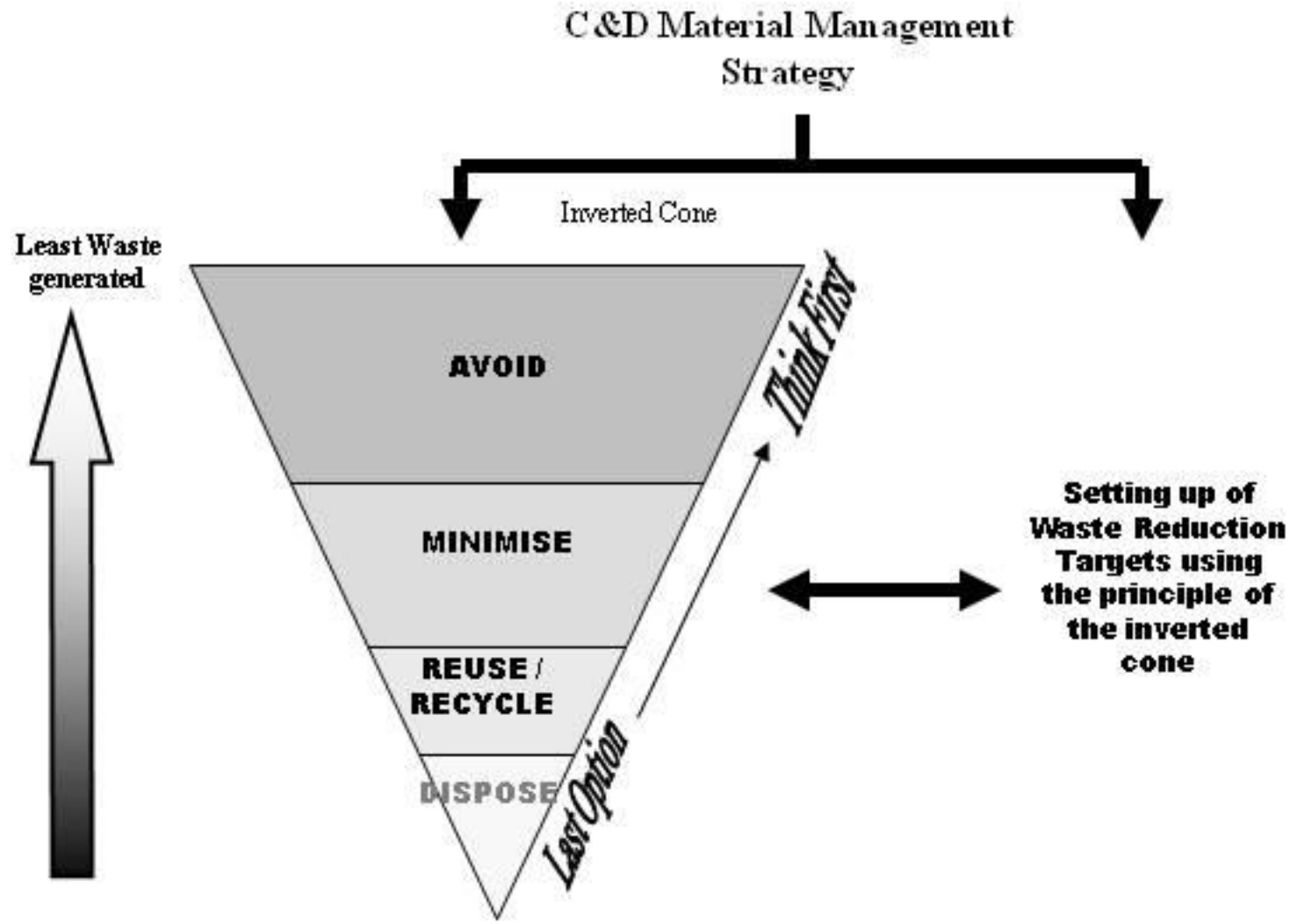
- Public Fill Reception Facilities: managed by CEDD incl. public filling areas, barging points, stockpiling areas , fill banks and C&D recycling facilities

! Running Out of both reclamation sites and landfill space

Waste Management

Options:

- Avoidance
- Minimization
- Recycling
- Treatment
- Disposal



"Waste Hierarchy Principle" can help you to manage so as to minimise waste

Planning for Waste Reduction before Works Commence

- Waste management plan
- Waste reduction targets and programme
- On site sorting and proper waste disposal
- Good housekeeping practice
- Waste management monitoring and audit programme

Waste Management Plan

- Provides an overall framework for waste management and reduction

- Identifies major waste types and defines ways for waste reduction

Waste Management Plan

Contents:

- Nominate a person (e.g. site manager) - responsible for good site practices, collection and effective disposal of all wastes generated at the site to an appropriate facility
- Training of site personnel in proper waste management and chemical waste handling procedures
- Provide toolbox talks for on-site sorting of C&D materials for workers

Waste Management Plan

Contents:

- Provide sufficient waste disposal points and regular collection of waste

- Implement a regular cleaning and maintenance programme for drainage systems, sumps and oil interceptors

Waste Management Plan

Contents:

- Sort C&D waste from demolition of existing facilities to recover recyclable portions e.g. metals

Waste Management Plan

Contents:

- Segregate and sort different types of waste into different containers, skips or stockpiles

- Encourage collection of aluminium cans, plastic bottles and paper by providing separate labelled bins

Waste Management Plan

Contents:

- Ensure proper storage and site practices to minimise the potential for damage or contamination of construction materials

- Recycling unused chemicals
- Routine inspection and reporting system

Waste Reduction Targets

- Set waste reduction targets for each identified waste stream in terms of %, qty. reduced or recycling rates

Examples:

- Concrete wastage to the total amount of concrete used
- Reuse ?% inert construction and demolition material as public fill
- Wastage of steel bars
- Collect ?% waste steel bars for recycling
- Return at least ?% wooden pallets for reuse
- Collect ? no. safety helmets for recycling
- Collect ? toner/ink-jet cartridges for recycling
- Collect at least ?kg/year of waste office paper for recycling
- Use recycled paper for at least ?% of the total paper consumption

Waste Reduction Programme

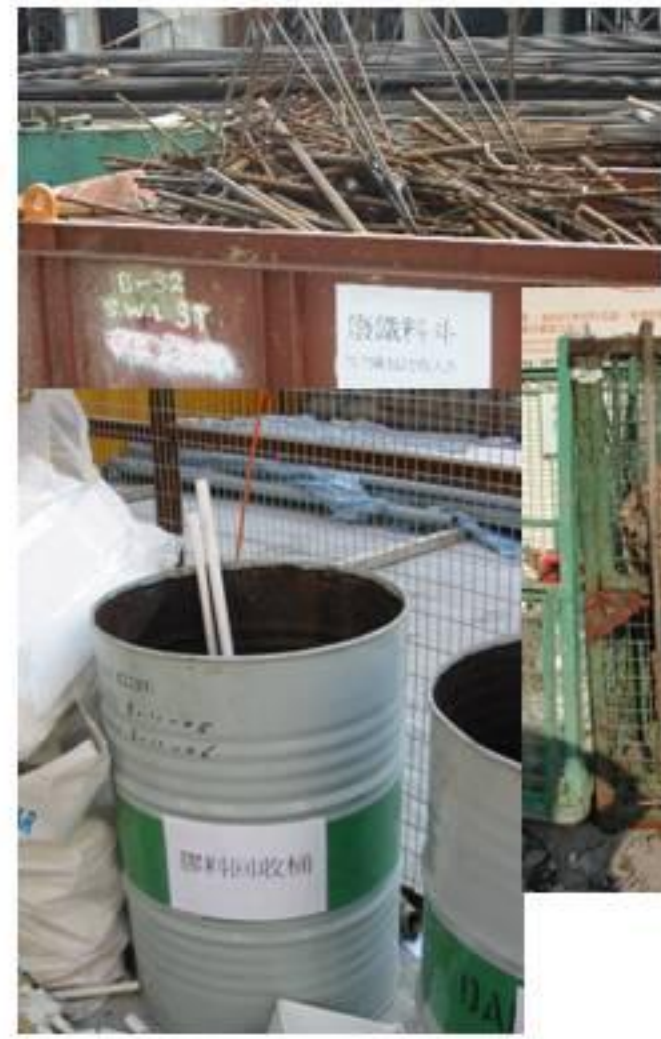
- Sets out actions required for waste reduction for each identified waste type in the form of waste reduction programmes, procedures and guidelines.

On Site Sorting

- Identify designated areas for on-site sorting of waste for reuse and recycle

On Site Sorting

- Provide suitable containers to temporarily store sorted materials e.g. metals, concrete, timber, packaging and plastics



On Site Sorting

- Sorting and segregation at the works location (i.e. at source) can achieve higher recovery effectiveness

Recycle collection bin and plastic refuse chutes at working Floors

Proper Waste Disposal

- Define waste disposal procedure for each waste type and arrange disposal

To Public Fill Reception Facilities

To Recycler

To Landfills

Good Housekeeping Practice

- Avoid accumulation of material
- Provide good storage and maintenance for raw materials
- Return surplus material to a centralized storage area with suitable protection measures

Good Housekeeping Practice

- Concrete paved access road

Monitoring and Audit

Set up a team to:

- Record the qty. of waste generated, reduced, recycled and disposed
- Monitor the effectiveness of the waste management programme
- Recommend improvement or corrective measures when necessary

Mixed waste skip needs emptying – make sure there is a monitoring regime for best practice

Waste Reduction Guidelines

- Lean Construction Design

  To adopt "lean construction" techniques to minimize the qty of raw materials - reduce waste

Examples:

- Use thinner internal wall and floor slabs
- Reduce foundation size
- Adopt modular building designs and precast or prefabricate building components such as facades, staircases and semi-precast floor slabs.

Waste Reduction Guidelines

- Assign a Site Waste Officer
- May be an environmental engineer, site agent or other suitable staff
- Drafting the waste management plan
- Identifying waste management procedures and instructions
- Performing a regular site waste audit

Waste Reduction Guidelines

- Materials Utilization
- Avoid poor handling of materials and improper operating procedures
- Broken items or off-cuts to be considered for sections when small lengths are required
- Management system facilitating senior site staffs or headquarter staffs to easy check the usage and waste of materials
- Measure wastage of different materials to identify improvement opportunities

Waste Reduction Guidelines

- Reuse and Recycling - an essential part of waste management to prevent surplus materials from being disposed

Waste Reduction Guidelines

- Reuse Items

Modular Site Office

Metal Hoarding

Metal Formwork

Metal Scaffolding

Waste Reduction Guidelines

- Recycle Materials

How can it be reused or recycled?

Waste Reduction Guidelines

- Concrete

→ Aggregates in new concrete

→ Unbounded aggregate in roads or fill

- Bitumen and Asphalt

→ In bound layer of road

→ As bulk fill

Waste Reduction Guidelines

- Excavation Spoil / Topsoil

→ Landscaping

Waste Reduction Guidelines

- Timber
  - → Reuse for formwork
  - → Noise barriers
  - → Chipboard

- Metals
  - → Reuse and recycle

Waste Reduction Guidelines

- Clay, Concrete, Pipes, Tiles, Blocks and Bricks
  - → Reuse surplus materials such as bricks and tiles
- Packing and Plastics
  - → Reuse or send to recycler

Waste Reduction Guidelines

- Consider an on-site crusher for demolition material into aggregates for reuse

Waste Reduction Guidelines

- Foundation and earthworks projects:
- Design for reusing excavated spoil as backfilling materials to balance cut and fill

- Cut and fill cannot balance – look to other possible sites as alternate disposal ground

Prevention against Fly-tipping Activities

- Preventive measures:
- Waste management plan
- Control and manage chits to dump truck operators
- Install CCTV, photo taking & on-site loading measurement
- Ensure disposal at proper disposal outlets
- Ensure transporter comply with legal requirements
- Prompt report of any suspected noncompliance
- Employ only reliable drivers

Prevention against Fly-tipping Activities

Installation of weigh bridge

Installation of CCTV

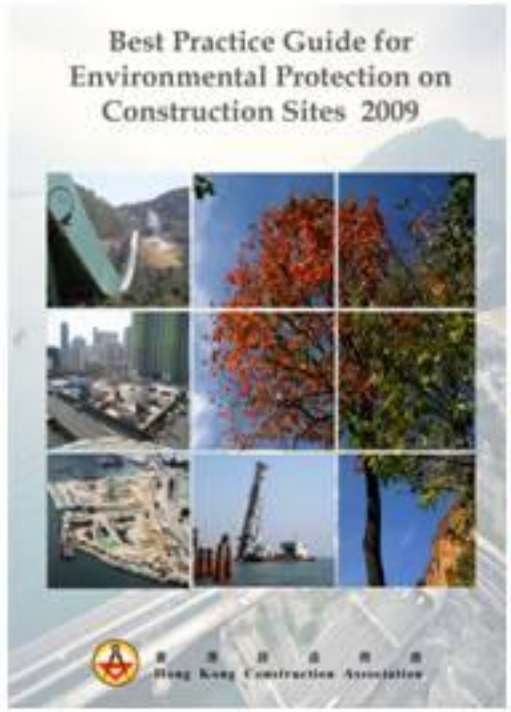
Training

- All staff receive comprehensive HS&E training through:
  - Academy
  - Site-based training and toolbox talks

- Operations supported by qualified HS&E staff

Training

- HKCA's publications
  - Best Practice Guide for Environmental Protection on Construction Sites 2009
  - Environmental Toolbox Training Kit 2008



Thank You