

THE HONG KONG HOUSING AUTHORITY

Memorandum for the Housing Authority

Housing Department's Initiatives on Environmental Conservation

PURPOSE

This paper serves to inform Members of Housing Department's work in environmental conservation.

BACKGROUND

2. The Department is an active supporter of environmental conservation. Many green initiatives have been introduced in all areas of its work. The Department has the following specific agencies embedded in its structure to implement and monitor its activities in environmental conservation -

(a) Green Manager

In his 1992 policy address to the Legislative Council, the Governor committed the government to setting a good green example for the private sector. The Green Manager Scheme came into effect in January 1994. Under the scheme, a Green Manager was appointed in each branch/department to help ensure that environmental considerations were taken into account during the formulation of policies and implementation of programmes. In Housing Department, Assistant Director/Administration (AD/A) is appointed as the departmental Green Manager to provide a focal point for introducing and reviewing initiatives to improve environmental performance. As the Department has more than 400 outstation offices, nine Assistant Green Managers are appointed to assist the Green Manager. Quarterly reports on the departmental efforts on environmental conservation and actions on green management are submitted to Planning, Environment and Lands Branch (PELB).

(b) Co-ordinating Committee on Environmental Performance of Housing Department

A Co-ordinating Committee was set up in 1994 to co-ordinate all departmental initiatives on environmental performance and green housekeeping measures. The Committee is chaired by AD/A with representatives from the various Branches. Its terms of reference and composition of the Committee are at **Annexes A** and **B** respectively.

(c) Other Committees

In addition, there are a number of committees formed in the Department with responsibilities for handling specific environmental issues. A list is at **Annex C**. The Department also has representatives on a number of external environmental committees such as the Steering Committee on Waste Reduction Plan, the Housing Department-Environmental Protection Department Liaison Meeting on Environmental Affairs and Energy Efficiency and the Conservation Sub-committee of Energy Advisory Committee.

At estate level, the Estate Management Advisory Committee (EMAC) has played an active role on environmental improvement and conservation programmes by consultation, gaining support from public housing estate tenants and the involvement of residents' participation through various community activities.

DEPARTMENTAL EFFORTS ON ENVIRONMENTAL CONSERVATION

3. A summary of the departmental efforts on environmental conservation, broadly classified into Work efforts and Housekeeping efforts are at **Annex 痲**. Some of these efforts and achievements are highlighted below -

(a) Waste Reduction and Recycling

- The following materials were collected for recycling purpose in 1996-

- 61,355 kg of paper from the Housing Authority Headquarters Building.
- 20,367,000 kg of paper from the housing estates/THAs
- 440,000 kg of aluminum, 1,573,000 kg of plastic and 5,308,000 kg of iron from housing estates/THAs.
- 1,200 laser printer empty toner cartridges

(b) Energy Saving

- Low bay floodlight fitting with SON lamp has been used in the design of lighting system for carpark buildings as a general design practice to save energy.
- Minimum luminous outputs for fluorescent lamps and compact fluorescent lamps have been specified in all new projects to make good use of electricity supply.
- Both automatic timer control and manual override control have been incorporated into circuit control of lighting in communal areas to save energy.
- Those less energy efficient lift drive systems have been removed from our lift installation specification and replaced with more energy efficient drive systems.

(c) Noise Control

- A Noise Control Team has been established to ensure that building services systems installed in Housing Authority buildings comply with the Noise Control Ordinance.
- Measures have been incorporated in standard design to reduce noise emission and vibration from pump rooms.
- External chiller plants are normally provided with acoustic enclosures to eliminate the noise level.

(d) Reduction in Use of Timber

- The standardisation of flat designs allows contractors to use the same formwork on a number of repetitive projects.
- Metal hoarding is now used instead of hardwood.

(e) Use of Precasting

- There is a programme for extending the use of precast elements such as windows sills and staircases to improve quality, reduce labour and reduce wastage on sites. Facade panels on standard blocks all now have mandatory precast facades. Since 1996, all Harmony Blocks tendered out adopt precast facade panels.

THE WAY AHEAD

4. The Department will continue to take up additional environmental initiatives and explore further ways to achieve a greener office environment. The focus for the year ahead is on the following two aspects -

(a) Waste Reduction Plan

In order to tackle the problems of escalating wastes generation in Hong Kong, the Government is planning to formulate a territory-wide waste reduction plan. A Steering Group on Waste Reduction Plan (WRPSG) under the chairmanship of Deputy Secretary (Environmental) was set up in September 1996. Its function is to advise PELB on the formulating of the Draft Waste Reduction Plan (DWRP) which will be issued for public consultation in May 1997 before it is finalised for implementation.

It is proposed in the Plan that the Housing Authority, being the landlord of half of the residential population in Hong Kong, should take a proactive approach in participating in the plan. Currently, the Department is working with the Environmental Protection Department to determine the institutional arrangement for setting waste reduction targets for our housing estates.

(b) Environmental Audit

In order to improve environmental management within the Department, the Department is conducting an environmental audit in two estate offices, one district maintenance office and two site construction offices with the assistance of a consultant. The objectives and scope of the audit are at
_____ **Annex**

The audit work is expected to be completed in May 1997. The result of the environmental audit will be used for considering actions to improve the environmental performance of outstation offices. It will also be used as basis for developing policies, objectives, targets and an environmental management system of the Department.

INFORMATION

5. This paper is presented for Members' information.

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**Co-ordinating Committee on
Environmental Performance in Housing Department**

Terms of Reference

1. To co-ordinate all initiatives related to the environment from various Branches/Divisions/Sections/Offices.
2. To introduce measures to increase staff consciousness and involvement in relation to environmental issues.
3. To determine a programme of green housekeeping measures.
4. To formulate actions plans and record achievements.

**Composition of Co-ordinating Committee
on Environmental Performance in Housing Department**

Chairman: Assistant Director/Administration (Green Manager)

Members: Business Director/Commercial and Services
Assistant Director/Central Services & Management Policy
Chief Building Services Engineer/South
Chief Building Services Engineer/2
Chief Architect/Design & Standards
Senior Housing Manager/Tsz Wan Shan & North Point
Chief Executive Officer/Administration

Secretary: Executive Officer/General(1)

**Committees formed in Housing Department
for handling environmental related issues**

1. The Energy Management Co-ordination Committee
2. Working Group on Abestos
3. Working Group on Automatic Refuse Collection System
4. The Noise Control Team
5. Working Group on Waste Reduction in Housing Estates

HOUSING DEPARTMENT

SUMMARY OF DEPARTMENTAL EFFORTS ON ENVIRONMENTAL PROTECTION

(April 1997)

CONTENTS

WORK EFFORTS (non-office-related)

1. Asbestos Abatement
2. Air Quality
3. Energy Efficiency
4. Noise control
5. Use of Chlorofluorocarbons (CFCs),
Hydrochlorofluorocarbons (HCFCs) and Halons
6. Construction and the Environment
7. Water Supply
8. Waste Disposal
9. Radon

HOUSEKEEPING EFFORTS (Office-related)

1. Energy Efficiency
2. Waste minimisation and recycling

WORK EFFORTS (Non-office-Related)

1. Asbestos Abatement

- 1.1 A Working Group on Asbestos (AWG) has been set up to coordinate and monitor the asbestos abatement work within the Department.
- 1.2 The EHS Consultant Ltd. was appointed in October 1988 to provide consultancy in asbestos abatement work and related activities. Four phases of consultancy work ranging from response to emergency cases in the beginning to the formulation of abatement policies and production of asbestos manual etc. have been completed. Consultants will be employed on a project basis in future, if required.
- 1.3 The general specification for building services installations was revised in 1985 to prohibit the use of asbestos containing materials. The revised specification is currently being used for all projects in HA properties.
- 1.4 Removal of lagging on generator flues containing asbestos at various sites was completed in December 1994.
- 1.5 It has been specified in all new projects that all materials used shall not contain asbestos in any form.
- 1.6 The Asbestos Management Manual and the Asbestos Technical Guidelines were issued in April 1996.
- 1.7 About 68% of the asbestos containing materials (ACM) in the housing stock have been removed or encapsulated. There are 37 scheduled jobs and 5 unplanned jobs for 1996/97.
- 1.8 A new legislation will come into effect in mid-1997 which requires that all unexempted ACMs to be monitored by Registered Consultants and all ACMs to be handled by Registered Contractors. Negotiation with EPD for more exemption is in progress.

2. Air Quality

- 2.1 To improve the air quality of the environment that will be affected by the exhaust system of emergency generator, the emergency generators have been relocated to the roof of all standard Harmony Blocks.

3. Energy Efficiency

3.1 The Energy Management Co-ordination Committee (EMCC) was set up in 1984 to develop programmes which are to improve the efficiency and management control of the building services installations, thus offering a large scope for electrical energy savings. Under the direction of the EMCC, energy management studies in the following areas were conducted in 1991/92 :

- Housing Authority Headquarters Building
- commercial complexes with central air-conditioning plant
- typical block type for rental estates

Most of the recommendations made by the committee have already been implemented.

3.2 Energy efficient designs has been adopted in rental blocks and commercial complexes.

3.3 Electronic control gear for fluorescent light has been treated as design option for the purpose of energy saving.

3.4 Decision has been made to use low bay floodlight fittings with SON lamp in the design of lighting system for carpark buildings as a general design practice to save energy.

3.5 Minimum luminous outputs for fluorescent lamps and compact fluorescent lamps have been specified in all new projects to make good use of electricity supply.

3.6 Both automatic timer control and manual override control have been incorporated into circuit control of lighting in communal areas as design practice for new projects to save energy and facilitate operational purposes.

3.7 Those less energy efficient lift drive systems have been removed from our lift installation specification and replaced with more energy efficient drive systems.

3.8 Means for optimizing energy saving in air conditioning installation have been adopted such as direct, digital control, free cooling and variable air volume system etc., as far as applicable.

- 3.9 It has been specified in all new projects that water pumps shall be so selected that the operating points are located near the best efficiency points.
- 3.10 Lok Fu I Commercial Complex, in which the chillers has been retrofitted with environmentally friendly refrigerant, has been preliminary selected for the installation of a Building Automation System for the evaluation of its energy saving effects.
- 3.11 Housing construction as environmental friendly building :-
- (a) Low Energy Material
 - timber from tropical rainforest replaced by substitute material in design of hoarding formwork and landscape features
 - Pulverized Fly Ash (PFA) as cement substitute material
 - non ferrous material for water supply pipe to avoid health hazard
 - (b) Low Energy Component/Construction
 - Tailor-made steel fabric to optimise structural design/reduce wastage
 - Drywall construction
 - large panel formwork
 - off-site fabrication to reduce wastage on site
 - (c) Low Energy Design
 - Overall Thermal Transfer Value (OTTV) as thermal control on the design of building envelope
 - Automated Refuse Collection System
 - Energy efficiency design adopted in Harmony Block
- 3.12 The Manuals have been updated to require project staff to calculate Overall Thermal Transfer Values (OTTV) for new projects with commercial buildings at scheme design and detailed design stages.
- 3.13 Housing Department is represented on the Energy Efficiency and Conservation Sub-committee of Energy Advisory Committee convened

by the Secretary for Planning, Environment and Lands.

- 3.14 To keep abreast of the development of the Building (Energy Efficiency) Regulations, comments on draft Lighting Codes and AC Codes are given to EMSD as and when necessary.

4. Noise Control

- 4.1 A Noise Control Team has been established to ensure that building services systems installed in Housing Authority buildings comply with the Noise Control Ordinance.
- 4.2 Studies have been completed and measures have been incorporated in standard designs to reduce noise emission and vibration from pump rooms.
- 4.3 Studies on the improvement of emergency generator facilities have been completed and measures been incorporated in standard designs to reduce both noise emission and to simplify exhaust arrangements.
- 4.4 Specification for pump motors was revised in June 1994 to limit the mean sound pressure level emitted by the motor to 70dB(A) measured at one metre. The revised specification has been used for all fresh and flush water pumps in HA properties.
- 4.5 Smaller pumps are being installed in estates for night operation to reduced pump noise when required.
- 4.6 Silencers are being installed to attenuate the noise emitted from central air-conditioning plants when required.
- 4.7 Low noise motors for fresh and flush water pumps running at a speed of not exceeding 1500 r.p.m. are being used to limit the airborne noise to a level below 70 dBA measured in accordance with BS7458:Part 1.
- 4.8 Decision has been made to improve the noise abatement for ground floor pump rooms of New Cruciform Blocks and Harmony Blocks to be completed after 30.6.97 and 1.9.97 respectively by providing the following measures :
- Fully isolated slab for ground floor pump room;
 - Pressure reducing valves with acoustic enclosures at pipe inlets to fresh and flush water sump tanks;

- Modulating ball valves for fresh and flush water sump tanks;
 - Pipe mounting brackets with vibration isolators; and
 - Anti-turbulence pipes in water tanks.
- 4.9 External chiller plants are normally provided with acoustic enclosures to eliminate the noise level.
- 4.10 A noise level measuring group has been formed to carry out necessary noise level measurement for building services installations.

5. Use of Chlorofluorocarbons (CFCs), Hydrochlorofluorocarbons (HCFCs) and Halons

- 5.1 We have stopped using ozone depleting refrigerants such as CFC-11, CFC-12 and HCFC-22 for air conditioning installation.
- 5.2 Carbon dioxide or HFC-227 ea are used as fire extinguishing agent instead of halons which are ozone depleting for portable fire extinguishers.
- 5.3 The following actions have been taken place to improve the environmental friendliness of existing chillers/fire-fighting applications in HA buildings -

<u>Existing installations in HA Buildings</u>	<u>Action</u>
- 2 chillers with CFC11	already replaced by R134a
- 23 chillers with CFC12	16 have been retrofitted with R134a, 7 will be retrofitted within 1997.
- 4,000 room coolers/62 chillers with HCFC22	all are being replaced with environmental friendly refrigerants available in the market
- 10 Halon 1301 total flooding system	retrofitting work entrusted to EMSD
- 3,000 Halon 1211 portable fire extinguishers	replacement to use HFC-227ea/CO ₂ will be completed by July 1997

6. Construction and the Environment

6.1 Standardisation of Designs

- a) The Harmony Block range is based upon standard modular flat plans that are repeated through all block types.
- b) The flats all employ standard components such as door sets, collapsible gates, cooking and sink benches, windows, all of which assist in reduction of waste. All components are factory produced off site.

6.2 Drywall/Panel Wall Construction

Bathroom and Kitchen walls are built using a dry construction of modular wall panels. These again reduce waste and at the same time reduce wet trades in the building.

6.3 Reduction in the Use of Timber

- a) The standardisation of flat designs has meant that contractors can employ the same formwork on a number of repetitive projects and Harmony building types.
- b) Large Panel formwork is a contractual requirement and the drive for an improved standard of finish with reduced joints has led to the adoption of steel formwork as the norm. Consequently the amount of timber used in temporary works is dramatically reduced with additional benefits for site "housekeeping" and safety.
- c) Metal hoarding has been used instead of hardwood.

6.4 Reduction in Window Sizes

Facades of Harmony Blocks have been redesigned to reduce window areas as a result of thermal efficiency studies.

6.5 Use of Precasting

- a) There is a programme for extending the use of precast elements such as window sills and staircases to both improve quality, reduce labour and reduce wastage on sites. Facade panels on standard blocks all now have mandatory precast facades. Since 1996 all Harmony Blocks tendered out adopt precast facade panels.

- b) Precast staircases and sills are standard in all Harmony Block contracts.
- c) Studies are underway on the possible extension of use of precast elements into floor slab construction.

6.6 Reducing wastes generated from replacing finishes/fittings of new flats

- (a) In 1995 a survey identified the extent and reasons behind occupants of new flats replacing finishes and fittings. In 1996 standard designs were amended to more closely meet occupants' required standards in order to reduce the wastage on initial occupation.
- (b) A pilot project offering home owners some choice of colours for kitchen and bathroom fittings has been initiated to reduce wastage through the replacement on unwanted fittings..

6.7 Temporary Housing Buildings

Consideration is being given to replace temporary housing units, which have a high material wastage factor, with permanent interim housing blocks.

7. Water Supply

7.1 According to the 1996/97 to 1998/99 Master Replumbing Programme, 426 rental blocks have been scheduled for replumbing within the coming three years at an estimated total cost of \$684M, of which 300 blocks will be supervised by in-house staff whereas the remaining 126 blocks will be handled by consultants. So far water pipes in 40 blocks have been replaced with non-ferrous materials and the replumbing of 8 other blocks are in progress. The main replumbing materials being used are copper pipes, uPVC-lined steel pipes and cement-lined ductile iron pipes.

7.2 To improve the quality of water supply, galvanized steel with internal uPVC lining pipes are used in new projects.

8. Waste Reduction

8.1 Housing department has organised various activities with other government departments and local organisations on waste paper recycling to promote civil education on environmental protection.

- 8.2 55 estates/HOS courts are provided with tree-shaped or other types of waste paper collection bins provided by Housing Department or other sponsors.
- 8.3 During the period from 1.1.96 to 31.12.96, a total weight of 20,367 tonnes of waste paper was collected from 182 Estates/THAs by the cleansing contractors for recycling purpose.
- 8.4 440 tonnes of aluminium, 1,573 tonnes of plastic and 5308 tonnes of iron were collected by cleansing contractors in 1996 for recycling purpose.
- 8.5 A salvaging operative is provided in every cleansing contract for estates with 3,000 units or above to separate and recover salvageable waste.
- 8.6 A “Elastic Bag Reduction in Market Campaign” was organised jointly by Consumer Council, Environmental Protection Department, Housing Society and the Municipal Departments in four housing estates and other UC/RC markets from July to September 96.
- 8.7 Sorting of refuse at source is being carried out in Wah Sum and Shek Yam (East) Estates.
- 8.8 A “Second-hand book market” was jointly organised by us and the World Vision Hong Kong, Jusco Company, Environmental Protection Campaign Committee in 1996 -

<u>Date</u>	<u>Venue</u>	<u>Activity</u>
21.7.96 (11:00a.m. - 5:00p.m.)	LFSC (I) podium	Collecting old books
22.7.96 - 8.8.96	LFSC-Jusco Co, Customer Services Counter	Collection of old books
9.8.96 - 15.8.96	LFSC (II) Lobby	Sale of old books

9. Waste Disposal

- 9.1 Automated refuse collection systems have been installed in two pilot projects with an intention to improve the municipal condition of PHEs. Their performance is being monitored.

10. Radon

- 10.1 The EHS Consultants Limited was appointed to carry out a territory-wide pilot study on indoor radon levels of 48 estates in September 1993 (BC paper no. 90/93). It is confirmed that radon does exist in HA estates but at very low concentration levels. Therefore, it does not constitute any cause for concern.

HOUSEKEEPING EFFORTS (Office-related)

1. Energy Efficiency

1.1 The following measures have been taken in HAHQ building :-

- (a) Tungsten lamps to be replaced by more efficient SL prismatic light fittings.
- (b) Operating time of high bay lighting to be optimised.
- (c) Security guards to switch off lighting in offices not occupied.
- (d) Operating time of main chiller to be shortened by one-and-a-half hours.
- (e) Avoid transient operation of chillers during start up.
- (f) Operating time of air-handling units and fan coil units to be shortened to follow the operating time of chillers. Operating time of ventilation fans to be shortened by five hours.
- (g) Manually controlled fan coil units are to be switched off when not required.
- (h) The operation hours of the passenger and service lifts has been programmed and shortened.

1.2 103 outstation offices have been identified to be without separate energy meters hence separate/check meters are required. 80 of these offices have been installed with a separate/check meter subsequently while the remaining 23 offices will have a meter within 1997.

1.3 A study had been conducted to consider the group switching arrangement to be modified to individual switching. The proposal has been abandoned due to the high cost and unduly long pay-back period.

2. Waste Minimisation and Recycling

2.1 The following measures have been taken :

- (a) Recycle paper has been used for printing of Christmas cards in 1996.
- (b) Green tips are publicized in In-house Newsletters.

- (c) Green boxes have been placed on each floor of the HAHQ Building and in outstation offices.
- (d) Circulars/memos/notices/publicity materials have been distributed to staff/posted up on notice boards.
- (e) Distribution lists were reviewed to minimise the unnecessary numbers of copies.
- (f) Staff are encouraged to print on both sides of the paper and to use blank side of used paper of drafting and printing drafts.
- (g) HP Laserjet empty toner cartridges are collected for recycling.
- (h) All offices, except designated smoking areas, are smoke-free w.e.f. 1.4.96.

HAHQ Building only :

- (i) Waste paper are separated by cleansing contractor for recycling.
- (j) Classified documents are collected CMDS for recycling.
- (k) Staff are encouraged to use their own cups instead of paper cups. The cost of paper cups will be deducted when staff bring their own cups.
- (l) Routine checking to switch off lighting is conducted by security guards.

Environmental Audit for Housing Department

Objectives

- (a) To identify the environmental concerns in the offices;
- (b) To assess the existing environmental performance against ordinances, regulations, departmental polices and other established guidelines, through questionnaires, interviews, site inspection, and documentary and record review, etc. Laboratory testing is not expected unless the consultant proposes otherwise;
- (c) To review the departmental policy towards the environmental performance;
- (d) To determine the adequacy of resources, environmental information and records;
- (e) To identify areas where environmental performance can be improved;
- (f) To identify those areas that require actions and set priority to them;
- (g) To recommend environmental performance indicators, objectives and targets;
- (h) To develop action plans to achieve the objectives;
- (i) To document all the findings and recommendations;
- (j) To prepare an audit manual to be used by the Department and to provide corresponding training for self-audit of other offices; and
- (k) To prepare an environmental manual for the implementation of an environmental management system.

Scope of the Audit

- (a) Assessment, control and prevention of adverse impacts of office activities and practices on the environment;

- (b) Review of practices and procedures relating to environmental protection for compliance with relevant statutory regulations, code of practice, acceptable standards, international protocols, internal rules and guidelines and good management practices
- (c) Review and assessment of the following issues -
 - i. energy management, saving and choice;
 - ii. material management, handling, transportation, storage, possible savings and alternatives;
 - iii. water management and economy of use;
 - iv. waste (including solid, liquid, chemical wastes, etc.) avoidance, recycling, reduction, reuse and disposal;
 - v. evaluation, control and reduction of noise within and outside the office;
 - vi. evaluation, control and improvement of air quality within the office and the emission to the outside of the office;
 - vii. transportation and traveling practices;
 - viii. staff awareness, information, participation and training in environmental issues;
 - ix. publicity of environmental information;
 - x. response to public enquiries and complaints.