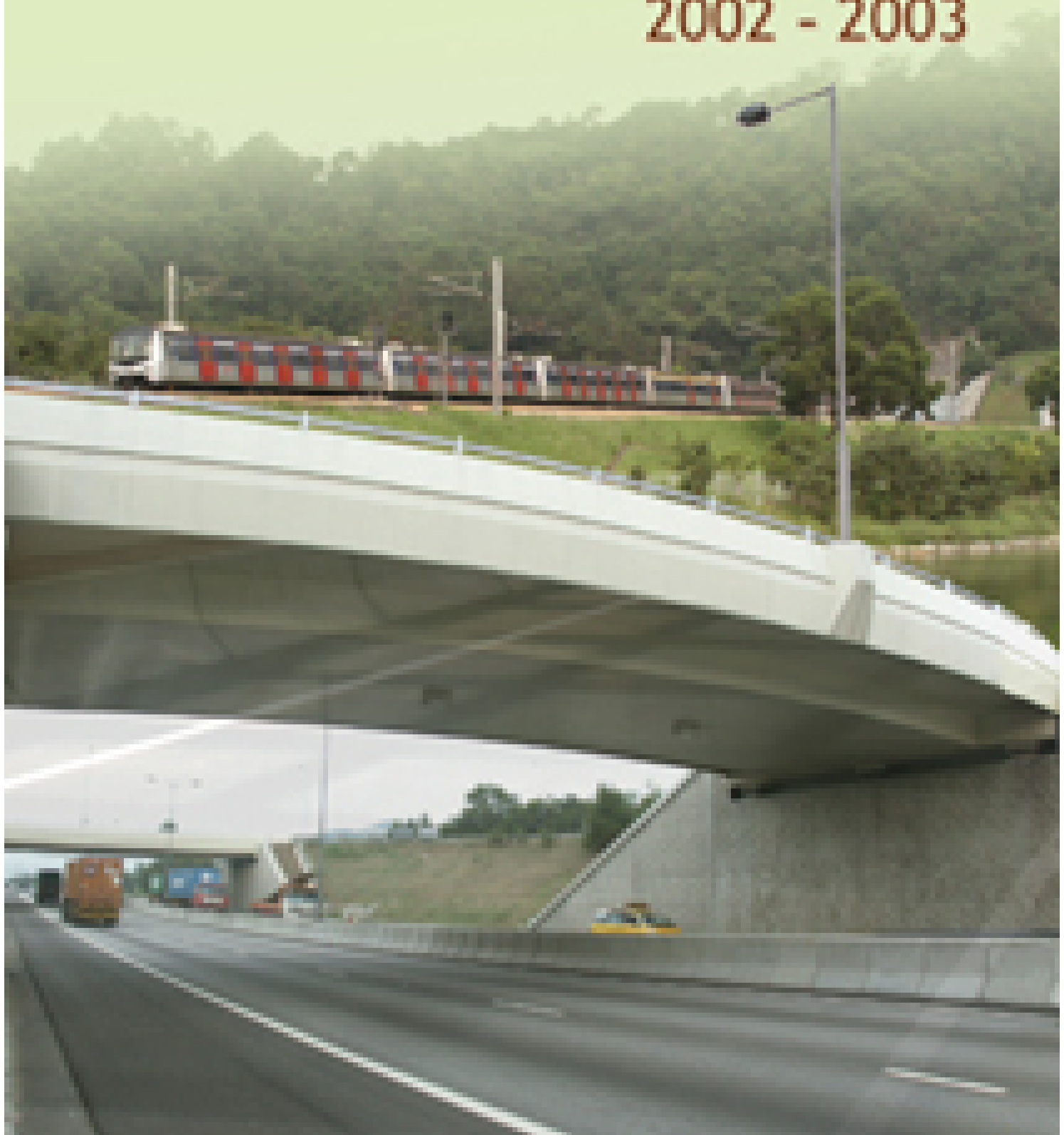


Highways Department

# ENVIRONMENTAL REPORT

2002 - 2003



# Contents

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## **Director's Message**

## **Introduction**

## **Environmental Policy**

## **Procedures**

- Environmental Management System to ISO 14001
- Environmental Consideration for Capital Works Projects
- Noise Barriers – Assessment and Design
- Road Opening Control

## **Materials**

- Recycled Pavement Materials
  - Sub-base
  - Reclaimed Asphalt Pavement
  - Block Paver
- Low Noise Surfacing
- Metal Hoarding and Formwork

## **Technology**

- Common Utility Enclosure
- Energy Saving for Public Lighting
- Energy Saving for Public Transport Interchange Ventilation
- Tunnel Engineering
- Bridge Engineering

## **Greening and Landscape Enhancement**

- Greening Our Environment
- Pedestrian Schemes
- Streetscape Enhancement
- Greening of Slopes
- Ecological Mitigation - Wetland Creation
- Green Awards

## **Green Office Management**

- Paper Saving
- Energy Saving
- Waste collection for Recycling

## **Looking Ahead**

## Director's Message



It is my pleasure to present our Environmental Report which covers the period from April 2002 to December 2003. This report summarises our efforts to protect the environment when developing and upkeeping our highway and railway networks in the Hong Kong Special Administrative Region.

During this period, all our staff tried their best to ensure that our work and practices are in line with environmental legislations, and are of good quality. In 2003, we further enhanced our management practices through the implementation of an environmental management system to ISO 14001 standard across the Department. We have made use of this tool to systematically evaluate, manage and minimise the environmental impacts of our activities. We have also strived for continual improvement in environmental performance in every aspect of our operations.

In this report, we highlighted our endeavours in protecting the environment which are reflected in our attention to environmental procedures, materials and technologies adopted, and new initiatives in delivering and maintaining our road infrastructures. We shall continue to provide an environmentally friendly surroundings to the public through our work.

I hope you will find the report interesting and informative.

A handwritten signature in black ink, appearing to read 'Mak Chai-kwong'. The signature is stylized and fluid.

MAK Chai-kwong  
Director of Highways  
April 2004

# Introduction

Highways Department is responsible for developing and upkeeping the road network as well as planning for and monitoring railway development in the Hong Kong SAR. We have a staff establishment of over 400 professionals and nearly 1,600 other staff in different grades.

In planning and implementing our road projects, we carry out environmental impact assessments and monitoring to ensure that highway infrastructures are built with the least disturbance to the surroundings. In designing new roads, we adopt road layouts that will give the quietest arrangement. Noise barriers and low noise road surfacing are mitigation measures we use to strive for quieter environment in our densely developed city. We also implement pedestrian schemes, streetscape enhancement, slope greening, decorative lighting, enhancement of bridge aesthetics and landscape designs, all aimed at providing a more pleasing city outlook and enhanced living environment.

We maintain about 1,930km of roads. We ensure that any defects are timely repaired; that road lighting, road furniture and structures are properly functioned; and that our roads are always kept in a safe and clean condition for the road users.

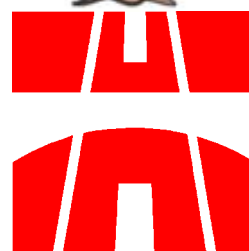
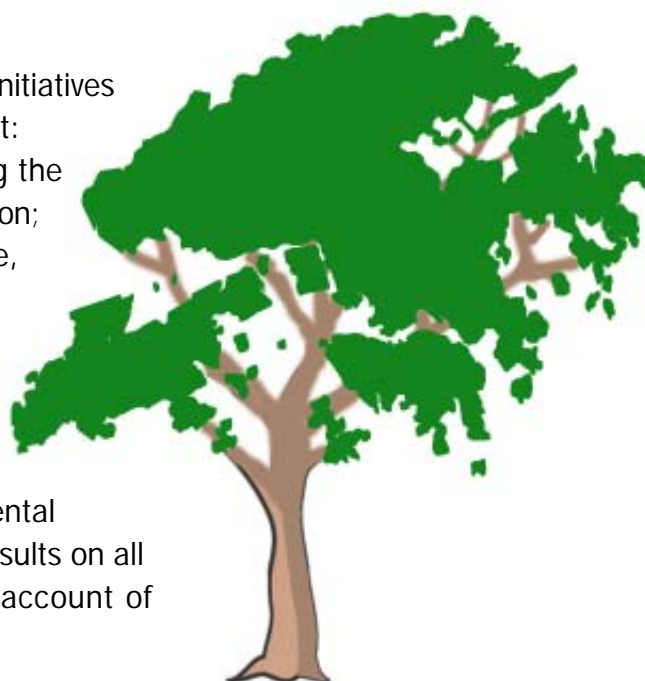
Railways are the most environmentally friendly and efficient mass carriers in Hong Kong, carrying more than 30% of our public transport passengers. Environmental considerations are always taken account of in our planning for railway development.

The Department continues to work on the following initiatives to achieve a more sustainable form of development:

- waste minimisation and its recycling including the use of recycled pavement materials in construction;
- modern technology on common utility enclosure, energy saving for public lighting, tunnel engineering and bridge engineering;
- retrofitting of greenery in urban area; and
- ecological preservation and mitigation.

The Department is now implementing an Environmental Management System to ensure that the intended results on all the measures and techniques employed to take account of environmental protection are achieved consistently.

This report describes the Department's effort towards protecting the environment. The content is grouped under 5 headings, viz., Procedures, Materials, Technology, Greening and Landscape Enhancement, and Green Office Management. Our pledge for the coming year is in the final chapter.





## Environmental Policy

An enhanced policy on protection of the environment has been included as an important part in the Department's management policy since we implemented the Environmental Management System (EMS) in 2003. Our Quality Management System has now fully integrated with the EMS to meet both requirements of the International Standards ISO 14001 and ISO 9001. In implementing this system, we place emphasis on both environmental and quality considerations in all stages of our work. To achieve our goals we are committed to -

- providing high quality services to our clients;
- identifying environmental aspects in all stages of our work, controlling their impacts and preventing pollution as far as practicable;
- monitoring the performance of our contractors to ensure good quality of works and prevention or mitigation of potential environmental impacts arising from our projects;
- complying with relevant legal and administrative requirements for environmental protection; and
- using resources efficiently and minimizing waste generated from our projects.



# Procedures

## ■ Environmental Management System to ISO 14001



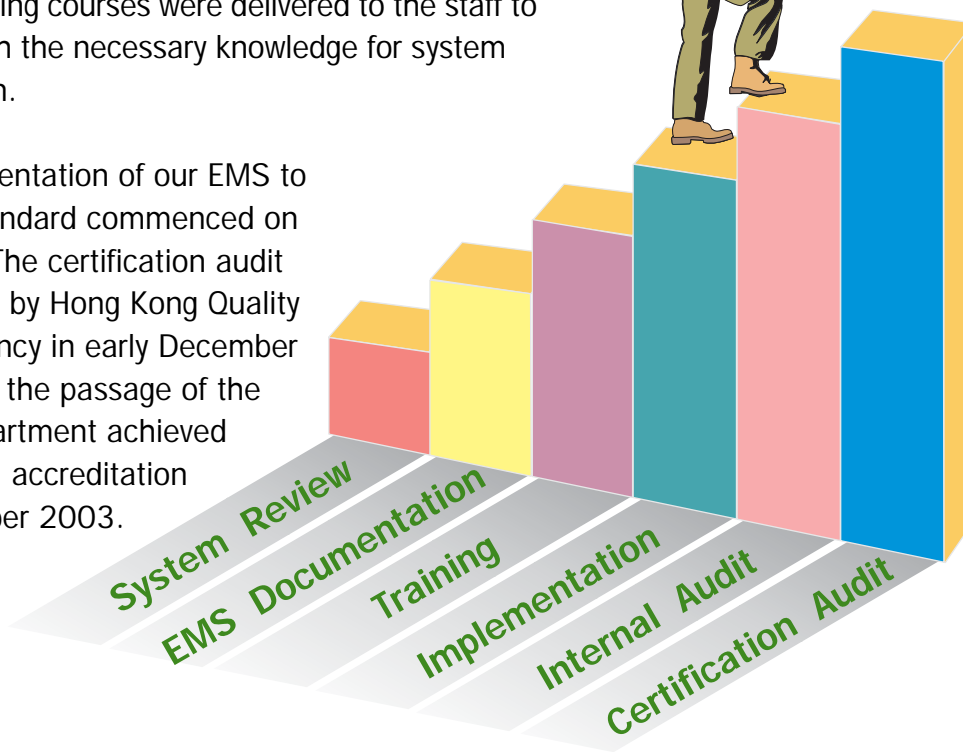
ISO 14001 : 1996  
Certificate No : CC2634

International standard ISO 14001 specifies requirements for an Environmental Management System (EMS) to enable an organization to formulate policy and objectives taking into account legislative requirements and information about significant environmental impacts.

Having decided in 2002 to implement an EMS to ISO 14001 standard in the Department, we commissioned Hong Kong Productivity Council in June 2002 to assist us to implement the EMS and to integrate the EMS with our quality management system. Documentation of EMS began after completing a review of our existing quality management system. Working groups were set up to formulate additional procedures required under the integrated system. With much debate on how to achieve the EMS objectives without losing sight of practicality, the Department deliberated on the detailed procedures to be adopted for the integrated system. Following the formulation of the integrated QMS and EMS, a series of training courses were delivered to the staff to equip them with the necessary knowledge for system implementation.



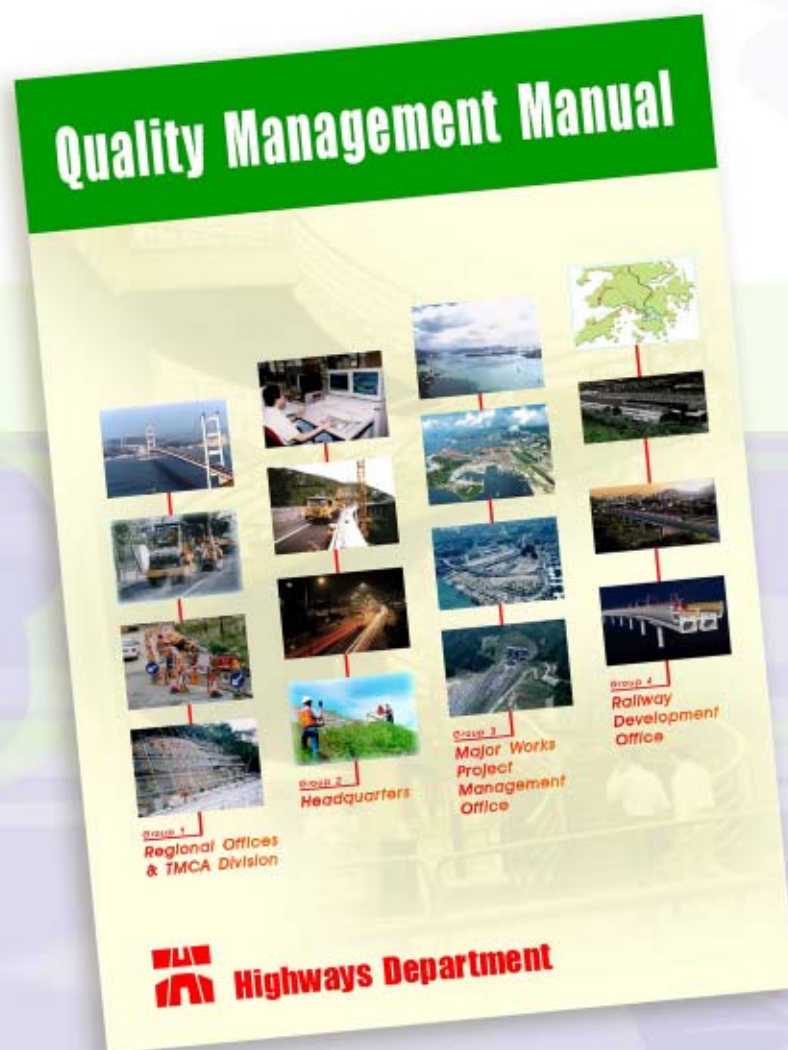
Official implementation of our EMS to ISO 14001 standard commenced on 2 July 2003. The certification audit was conducted by Hong Kong Quality Assurance Agency in early December of 2003. With the passage of the audit, the Department achieved the ISO 14001 accreditation in late December 2003.



Our management policy depicted in the Quality Management Manual is set for quality services as well as for environmental protection in accordance with the requirements of the ISO 9001 and ISO 14001 standards.

Under the new management system, we identify and evaluate those aspects of works arising from our projects that could have a significant impact on the environment. We set operational control requirements on these significant aspects for inclusion into the projects. We have compiled a register of legal and administrative requirements concerning the environment that are applicable to our activities to facilitate our staff and our consultants and contractors. During construction, the contractors' environmental performance can be checked and monitored regularly for compliance with the environmental contract clauses. This provides a systematic way for early identification of non-compliance so that preventive and/or corrective action can be devised timely.

Under this system, we are also required to formulate environmental objectives and targets for continual improvement at the beginning of each financial year.



## ■ Environmental Consideration for Capital Works Projects

In delivering a new road or railway project, we go through the environmental impact assessment (EIA) process so as to protect residents and other sensitive receivers from adverse environmental impacts that might arise from the proposed works. We ensure that all our works will comply with the requirements in the Technical Memorandum under the Environmental Impact Assessment Ordinance.

The EIA process covers a wide range of environmental issues; such as noise, air and water quality, landscape and visual aspects, cultural heritage and archaeological sites, as well as ecological and hazardous impacts during construction, and after the project is in operation. It identifies the impact sources, the elements of the community and the environment likely to be affected, and determines the severity of the impacts. If adverse impacts are found, we provide measures to avoid or to mitigate the impact and reduce them to acceptable levels. Moreover, we implement the environmental monitoring and auditing procedures to ensure the effectiveness of the measures and compliance with regulatory requirements and policies.

We pay particular attention to tree preservation by minimizing tree removal. Where mature trees are to be affected, they are transplanted as far as possible. Compensatory planting is normally included in the proposed landscape design. We discuss with the relevant authorities on the proposed treatment of any rare or protected species that may have ecological, amenity, aesthetic or heritage value.

The Landscape Unit of the Department is tasked to examine the landscape and visual aspects of a project. The environmental findings and necessary mitigation measures proposed are sent to the Planning Department, the Agriculture, Fisheries and Conservation Department and the Environmental Protection Department for vetting and agreement. If required, we also consult and seek approvals from the Advisory Council on the Environment and the Advisory Committee on the Appearance of Bridges and Associated Structures.





## ■ Noise Barriers - Assessment and Design

The most effective way to tackle traffic noise is by means of good integration of transport and land use planning. In designing a new highway project, we assess alternative alignments and the provision of buffer distance to minimize any adverse impact. When these are not feasible, we will consider the installation of noise barriers/enclosures and low noise surfacing as possible options to mitigate noise impacts.

For noise barriers, we pay special attention to their aesthetic design so that they would enhance the landscape and visual quality and the proposed barriers would be compatible with the vicinity. Due considerations are given to architectural harmony, outlook on both sides, and planting to soften the visual impact.

In response to the policy to redress the noise impact of existing roads, we examine the engineering feasibility of retrofitting noise barriers on those roads with excessive traffic noise impact on surrounding residential premises. The new structures should not interfere with emergency access, fire fighting, road safety, commercial or social activities. There must be adequate road space and the highway structure has the capability for retrofitting. Priority is given to road sections having higher noise exposure and a greater number of affected residents. The first two retrofit projects at Fanling Highway will commence in 2004.

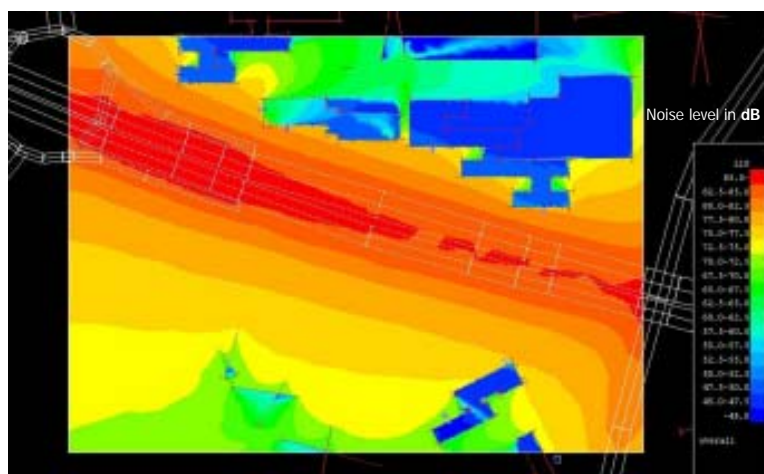
The Department has recently set up a dedicated team to coordinate the design of noise barriers. This is to ensure that effective and consistent noise barrier schemes are adopted. We have procured a traffic noise modelling software to conduct noise assessments. This computer model can generate a graphic distribution of noise contribution, which facilitates an optimization of the noise barrier design.



Hiram's Highway near Ho Chung New Village



Kam Tin Road near the junction to Tsing Long Highway, Yuen Long



Noise map of Fanling Highway near Choi Yuen Estate showing noise distribution in various areas due to road traffic

To gain further insight into noise barrier design and the choice of noise barrier materials in various situations, we have gathered overseas experience such as specifications of noise barrier materials in North America, Europe and East Asia. We shall continue with more research to look for economical, aesthetically pleasing and effective materials for noise barriers.

## ■ Road Opening Control

The Department has adopted a permit system to control road opening and excavation on public roads. Permit conditions are imposed to mitigate the impact of the works to the public. In processing permit applications, we coordinate all proposed works in the vicinity through our computerized Utility Management System (UMS) with the objective to reduce or shorten the road opening period. About 28,000 excavation permits were issued in 2003. Audit inspections have been carried out to record non-compliance with permit conditions. Experience on improvement proposals are shared at various forums among the senior management of Government departments and utility undertakings. On 23 May 2003, the Land (Miscellaneous Provisions)(Amendment) Ordinance [LMPAO] was enacted. Under the new Ordinance, a fee charging system on excavation permits and delays to works on carriageways will be implemented. The objective of the new system is to encourage better planning and to strengthen the control of road opening. The new system also requires Government departments to obtain excavation permits for carrying out road opening works. We anticipate that the total number of excavation permits will increase to about 51,000 per year. Through reorganization and restructuring, the Department has redeployed staff to take up the new duties in the processing and auditing of road excavation permits as well as the enforcement of the Ordinance. We have carried out trials on the detailed procedures under the new system and conducted briefings and training to parties affected so that all concerned will follow the new system under LMPAO, which has become effective since 1 April 2004.



# Materials

## ■ Recycled Pavement Materials

Hong Kong is facing a challenge to handle more than 14 million tonnes of construction and demolition (C&D) waste materials generated from the local construction activities each year. To prevent waste accumulation from becoming a long-term environmental problem, the Government is trying to find ways to reuse and recycle the C&D waste material.

Highways Department is keen to promote the use of recycled construction materials in lieu of their disposal. In 2002 to 2003, we have been investigating the use of recycled aggregates for road sub-base, and precast block pavers, and also the use of asphalt milled off from routine road maintenance works.

### Sub-base

In 2001, we started a two-year trial at Tolo Highway on the use of aggregates recycled from C&D waste materials in the sub-base layer for the carriageway. In 2002, based on the preliminary results which were satisfactory, we prepared a set of specifications on the use of recycled aggregate in the construction of road sub-base. The trial at Tolo Highway was completed successfully in mid-2003 and the results showed that the performance of the recycled sub-base was comparable to conventional virgin granular material. We are now conducting further trial at Fo Tan Road where the use of the recycled aggregates was extended to the sub-base for footpaths. We are refining the specifications of recycled sub-base for carriageways.



Laying recycled aggregate as road sub-base

## Reclaimed Asphalt Pavement

Hong Kong produces about 1 million tonnes of asphalt materials each year for paving our road network. At the same time, owing to wear and tear, about 0.2 million tonne of asphalt pavement is scarified and removed from our pavement. We are researching into recycling the reclaimed asphalt pavement (RAP) back into new asphalt material production. Our initial findings indicate a promising approach through the Hot-in-Plant process by remixing RAP into asphalt production at the batching plant.

In September 2003, we promulgated a specification allowing the use of up to 15% of RAP in new asphalt mixes for road base. We are continuing our research with a view to introducing the use of RAP into asphalt mixes for other pavement layers.



## Block Paver



In the past few years, precast block pavers have replaced in-situ concrete as the preferred paving material for public footpaths. They are more environmentally friendly than in-situ concrete, tiles and other fixed materials. Block pavers of different colours and sizes can be arranged in a variety of patterns to enhance the aesthetics of our streets and to blend harmoniously with the surrounding environment. With block paver, we no longer require to use noisy jackhammers during excavation of footpaths to access underground utilities. This also reduces inconvenience to the public since only pavers at the affected area need to be lifted up. Moreover, the removed pavers can be re-used in the footpath reinstatement works and the quantity of construction waste is significantly reduced. The use of block pavers are more economical in the long run since the higher material cost is offset by savings in long term maintenance and reinstatement. Approximately 550,000 square metres of public footpaths were paved with precast paving blocks during 2002 and 2003.



Reinstating the original block pavers after completion of utility work

Trial of recycled aggregate block pavers at Cheung Sha Wan Road in Lai Chi Kok



In April 2003, we introduced a specification for the block pavers that allow the use of aggregates recycled from C&D waste materials. We facilitated the Hong Kong Polytechnic University to conduct a field trial with their recycled block pavers. The trial proved to be successful and we are working with the Environment, Transport and Works Bureau to allow the general use of recycled aggregate pavers in public works contracts.

## ■ Low Noise Surfacing

In the past, we have been using friction course as a standard surfacing material for high speed roads in Hong Kong. Apart from providing better skid resistance and faster drainage of rain water from the road surface, the friction course also helps to reduce traffic noise. Up to 98% of our expressways are already paved with friction course.



Monitoring traffic noise of low noise surfacing material

In early 2003, we started to extend the use of low noise surfacing to low speed roads. We are now implementing a programme to resurface more than 70 low speed road sections with low noise surfacing. The works will be completed by 2006. The problem with such application is the need for frequent maintenance due to the low speed traffic. We will start research into the development of a more durable low noise surfacing material in early 2004.

## ■ Metal Hoarding and Formwork

As part of the effort to reduce C&D waste, we have adopted metal instead of hardwood for site hoardings and signboards. Where appropriate, metal is also used for concrete formwork. Metal hoarding and formwork can be reused a number of times and hence the generation of used timber works as C&D waste could be greatly reduced.

# Technology

Highways Department continues to adopt modern technology in the implementation of our projects with the objective to mitigate the environmental impacts during construction and subsequent operation. The following are a few examples that we are actively pursuing.

## ■ Common Utility Enclosure

With a view to reducing the number of road excavations in Hong Kong so as to minimizing nuisance to the public, we started in 2002 to investigate into the feasibility of Common Utility Enclosure (CUE) in both new developments and built-up areas in Hong Kong. CUE are underground structures that provide a common passage for utility services. With CUE, the need for road excavations during installation and maintenance of utilities will be greatly reduced. The study on CUE has been substantially completed. Based on the study findings, we are considering the various recommended forms and are planning for some trials at road crossings in the near future.



Common utility enclosure

## ■ Energy Saving for Public Lighting



Highways Department is responsible for provision of the public lighting system to illuminate all public roads, bridges, underpasses, footbridges, subways and public transport interchanges. In view of the significant electricity consumption, we have carried out research to save energy. We have adopted the following measures to save energy consumption in the period of this Report :



We replaced 3,200 nos. of less efficient lamps (e.g. mercury lamp) and the associated obsolete lanterns with lower wattage energy efficient lamps (e.g. SON-T lamp) and modern lanterns. The annual saving of electricity was about 1,500,000 kWh.



We replaced 8,100 nos. of electromagnetic ballasts by electronic ballasts at footbridges and subways to reduce energy loss. The annual saving of electricity was about 380,000 kWh.



Where daylight penetration is available, the operation of the booster lighting of noise enclosures and underpasses can be adjusted so that they are only switched on when necessary. Five noise enclosure/underpass lighting systems had been so adjusted with an estimated total annual electricity saving of about 320,000 kWh.





## ■ Energy Saving for Public Transport Interchange Ventilation

Many covered Public Transport Interchanges (PTIs) in Hong Kong have been built in conjunction with building development. Mechanical ventilation systems are required for keeping the air quality in the PTI to acceptable standards. Electricity consumption for ventilation systems in these PTIs maintained by the Government amounts to \$54 million a year. The consumption is expected to grow further as more and more PTIs come into operation in the coming years. There is a need to critically review the ventilation systems to ensure that they are operated in a cost effective manner.



Ventilation system in PTI

We conduct annual air quality measurements in selected PTIs to decide on the need to upgrade the ventilation systems. Through the analysis of these measurements, we have found that there exists considerable margin for adjusting the ventilation systems. The criterion is to ensure that by suitably adjusting down the ventilation systems in the PTI's, the air quality is not lower than current Environmental Protection Department standards. A pilot exercise is being conducted at a few selected PTIs. The result of the exercise is expected to be available in early 2004. If successful the exercise will be extended to all suitable PTIs of Hong Kong to save energy.

## ■ Tunnel Engineering

During construction of our Route 8 Nam Wan Tunnel, which commenced in April 2003, the spoil materials are separated into 3 types. The hard rock spoil is transported to a quarry for processing into aggregates. The soft rock spoil is processed into rockfill for re-use in other projects. The soft spoil material will be reused for embankment construction in the same project or for general filling in other Government projects.



Rock processing and reuse

Many environmentally friendly measures are also adopted during construction of the Nam Wan Tunnel to minimize air, water and noise impacts on the surrounding areas. Examples are chemical treatment of the effluents before discharging into existing storm drains, erection of 7.5m high noise barriers with thick acoustic mat around site construction facilities, erection of acoustic blast door at tunnel portal and monitoring of air qualities to detect explosive or noxious gases.

In 2003, the Department commenced two other tunnel projects, viz the Eagle's Nest Tunnel and the Sha Tin Height Tunnel. The ventilation systems of all three tunnels have been designed to cater for all circumstances including normal and congested traffic conditions and during fire emergencies. Both the ventilation equipment and lighting luminaries are specified to be energy efficient.

## ■ Bridge Engineering

The Department has been responsible for major bridge works. We are now implementing the Stonecutters Bridge and the HK-Shenzhen Western Corridor. For the Stonecutters Bridge, our Department organized an international design competition to procure the best conceptual design from top bridge designers/architects around the world. A key criterion of the bridge design was its ability to harmonise with the surrounding environment.

Environmental considerations are always important factors in our design and construction of bridges. An example is the use of precast segmental method in the construction of the Lai Chi Kok Viaduct, which commenced in September 2003. This construction method will avoid the use of large quantities of timber formwork and environmental nuisances arising from insitu concreting.

During construction of the Hong Kong-Shenzhen Western Corridor, which commenced in August 2003, the impact on water quality is mitigated by maximizing bridge spans and adopting submerged pile caps. The impacts on ecology are also mitigated by minimizing the numbers of bridge piers to reduce the seabed habitat loss. Additionally, the cable-stayed bridge will be directly lit to improve visibility for birds and no cable will be installed in the inter-tidal zone to avoid birds hitting the cables. As the bridge foundations would be constructed in Deep Bay, they will be excavated by using closed grabs within cofferdams to prevent the escape of sediment plumes. The cofferdams will be enclosed by silt-curtains as a secondary mitigation measure. We will also construct a temporary access bridge for foundation and pier construction at shallow waters to minimize the disturbance to the intertidal mudflat.



Stonecutters Bridge (Artist Impression)



Segmental construction method (Diagrammatic)



Hong Kong Shenzhen Western Corridor (Artist Impression)

# Greening and Landscape Enhancement

## ■ Greening Our Environment

The Department has incorporated landscaping works in both road and railway projects at every opportunity to enhance the environment. The planting works and architectural designs completed during the past two years have improved the aesthetic appearance and quality of the flyovers, slopes, retaining walls, tunnels, subways, pavements and footbridges in our road and railway corridors.



Island Eastern Corridor



Tolo Highway



Subway near Aldrich Garden Shau Kei Wan



Tsing Yi North Coastal Road



Kam Tin Road widening

During the reporting period, we spent about \$79 million in planting over 2 million trees, shrubs, climbers and groundcover plants to green the environment under various road and rail projects and in our maintenance work. Apart from compensatory planting to mitigate the ecological and visual impacts to the environment, we have also striven to preserve and transplant existing trees, maximize landscaping as well as to enhance the local ecology. Our efforts have created a green environment along transport corridors, giving real pleasure in both commuting and walking.



Transplanting the Date Palm in Hung Shui Kiu



Sha Tin Road (before improvement)



Sha Tin Road (after improvement)



Photomontage of proposed landscape treatment of the Rumsey Street flyover, Sheung Wan

Although most landscaping opportunities are in large road/rail projects in the New Territories or new development areas, we have not forgotten the developed urban districts of Hong Kong. The retrofitting of greenery in the urban districts, such as in Sheung Wan, Causeway Bay, Mong Kok and Kwun Tong is planned for 2004.

## ■ Pedestrian Schemes

Apart from developing the transport infrastructure, Highways Department is also keen to promote walking as an environmentally friendly mode of transport. In 2002 and 2003 we continued to implement pedestrian schemes throughout the territory to improve air quality and the walking environment of pedestrians.



Great George Street, Pedestrian Schemes in Causeway Bay

Implementation of schemes in Causeway Bay, Tsim Sha Tsui and Mong Kok continued whilst new pedestrian schemes commenced in Central, Wan Chai, Jordan, Sham Shui Po, Stanley and Sheung Shui districts.

The schemes have reduced the average air pollution levels in the pedestrianised streets by about 10%. Although space is restricted, the pedestrian schemes have also provided opportunities for urban greening.



Canton Road, Tsim Sha Tsui



Hankow Road, Tsim Sha Tsui



Yun Ping Road, Causeway Bay



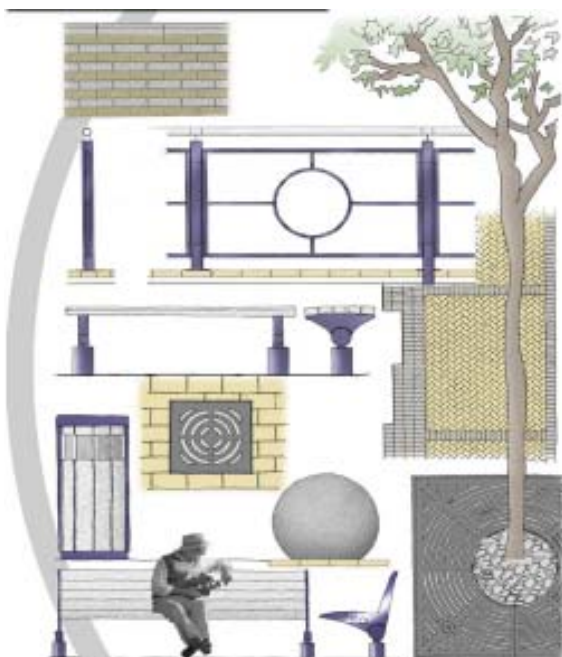
San Hong Street, Shek Wu Hui

## Streetscape Enhancement

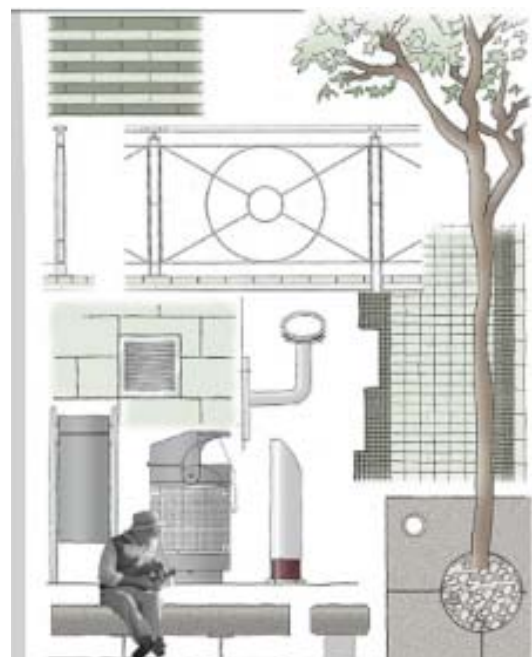


"Rustic" style street furniture

With experience from pedestrian schemes, we carried out a Streetscape Enhancement Study in 2002. The Study developed 3 sets of improved street furniture namely "Polished" style, "Subtle" style and "Rustic" style for use in various areas to enhance the street environment, to allow flexibly for re-use of components, and to facilitate efficient maintenance. Street nameplates incorporating building numbers are planned to be introduced in 2004, which will help both pedestrians and drivers to find their destination faster and with ease.



"Subtle" style street furniture



"Polished" style street furniture

## ■ Greening of Slopes

We are responsible for the upkeep of over 10,000 roadside slopes. These slopes contribute a major part of our maintenance schedule.

Many of the slopes were protected with sprayed concrete (shotcrete) to reduce surface erosion and to prevent landslides. In the past few years, we had provided vegetation on existing shotcreted slopes using various proprietary systems. These systems include geo-synthetic mats, cellular confinement, reinforced soil and bio-engineering techniques. During the reporting period, we spent some \$70 million on the greening of about 170 shotcreted slopes. The performance of these new vegetation systems is being monitored and reviewed.



Slope at Tai Hang Road after greening by cellular confinement system



Slope at Tai Hang Road before greening



Slope at Wong Nai Chung Gap Road after greening by geo-synthetic mat system



Slope at Wong Nai Chung Gap Road before greening



Before greening



2.5 months after greening



5 months after greening

Greening of slope at Lion Rock Tunnel Road by bio-engineering technique



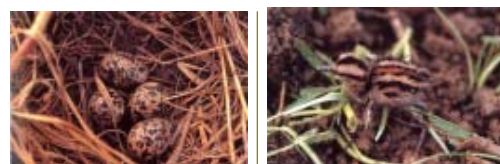
## ■ Ecological Mitigation - Wetland Creation



Kam Tin Bypass recreated wetland

Many of our new cross-boundary transport infrastructure links in the New Territories are located in areas where the bulk of Hong Kong's wetland habitats exist. In situations where ecological impacts cannot be avoided, comprehensive ecological mitigation measures such as wetland creation are adopted.

The Kam Tin Bypass project has taken up about 0.8 hectares of marshland, used by the Painted Snipe for roosting and breeding. In order to compensate the habitat loss and to minimize disturbance to this rare bird, we recreated 1.3 hectares of freshwater marshland in an ecological corridor alongside the new road. The habitat has been created in shallow ponds lined with clay material so that they retain the water. Topsoil and carefully selected vegetation were planted to mimic the original living environment and an automatic fresh water irrigation system was installed to maintain a shallow, marshy conditions. As well as being attractive to the Painted Snipe, this habitat is suitable for other wildlife, such as dragonflies, frogs and other types of birds.



Painted Snipe

Other projects currently under construction also include ecological mitigation measures. Extensive woodland planting will be undertaken throughout the Route 8 project between Tsing Yi and Sha Tin. Special measures will be undertaken during the construction of the Hong Kong to Shenzhen Western Corridor over Deep Bay, including restoring the mudflat profile, replanting mangroves and the relocation of sea grass on the mudflats affected by the construction of bridge piers.



Shenzhen Western Corridor - Waders in Deep Bay



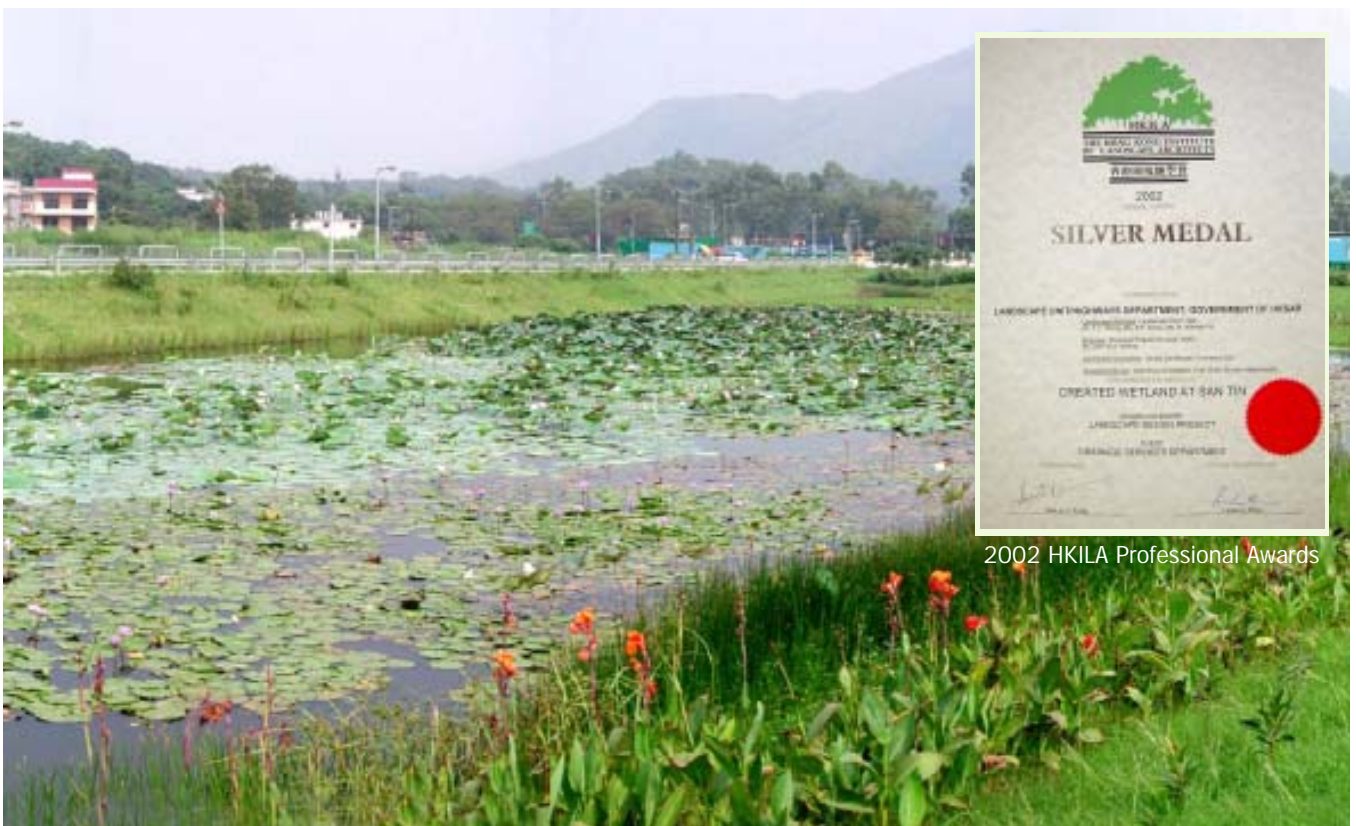
Proposed re-created stream in Butterfly Valley, Route 8

## Green Awards

Our Landscape Unit provides in-house expertise on wetland creation. The Unit has created a natural style wetland at San Tin from an abandoned and filled fishpond in order to alleviate the adverse environmental impacts generated by the flood mitigation works at the San Tin Villages. Besides testing the feasibility of constructing wetland habitats, this wetland creation project also investigated various wetland plant species for their growth adaptation, regeneration ability and ecological contribution. Based on the results of observation and monitoring, the Unit has produced a report for reference in future wetland construction works. The San Tin Wetland project has earned a 2002 Outstanding Greening Project Award and a Silver Medal of the 2002 Professional Awards from the Hong Kong Institute of Landscape Architects.



2002 Outstanding Project Greening Award



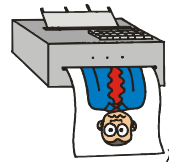
2002 HKILA Professional Awards

Created wetland at San Tin

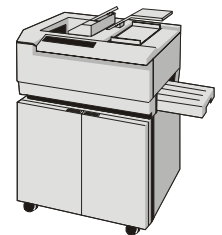
# Green Office Management

The Highways Department Green Committee was first formed in 1994 to develop, implement and monitor green office practices. Various green measures in housekeeping have been adopted in 2002 and 2003 to economize the use of natural resources. The main features are summarised as follows:

## ■ Paper Saving



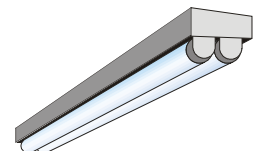
- ✿ Minimize photocopying paper consumption
- ✿ Use both sides of paper for printing and photocopying
- ✿ Use blank side of used paper for drafting/photocopying for internal reference
- ✿ Use electronic means extensively for communication, including the sending of electronic files instead of hard copies
- ✿ Reuse envelopes and file covers



## ■ Energy Saving

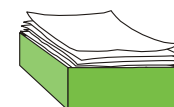


- ✿ Maintain air-conditioning not lower than 24 °C in summer
- ✿ Switch off lights during lunch or when away for long hours
- ✿ Switch off computer equipment and electric appliances not in use
- ✿ Increase the use of energy efficient fluorescent tubes for lighting
- ✿ Review lighting level arising from change of room use
- ✿ Monitor electricity consumption
- ✿ Encourage use of staircase for interfloor traffic
- ✿ Use timer water taps in toilets

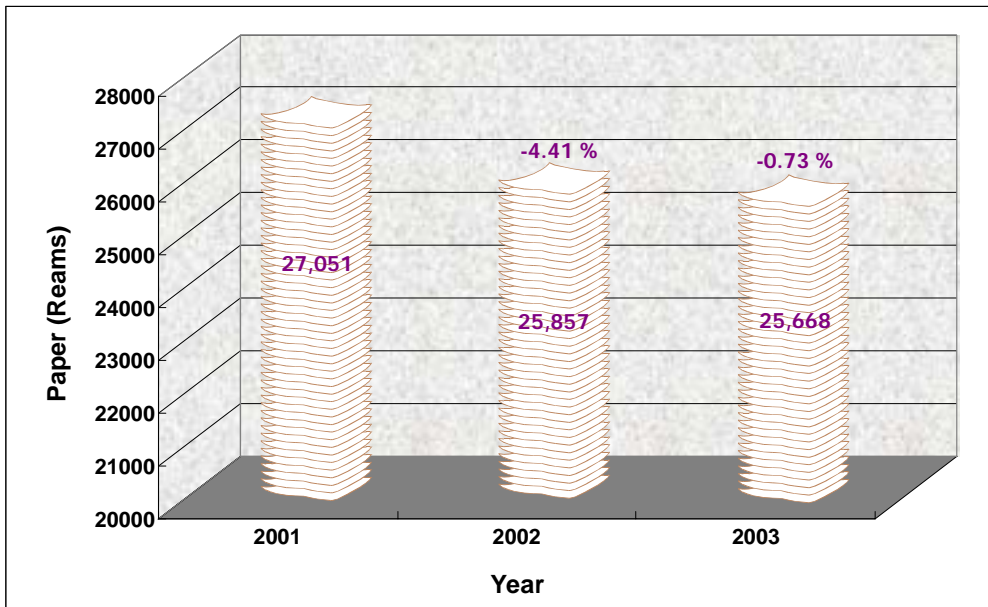


## ■ Waste collection for Recycling

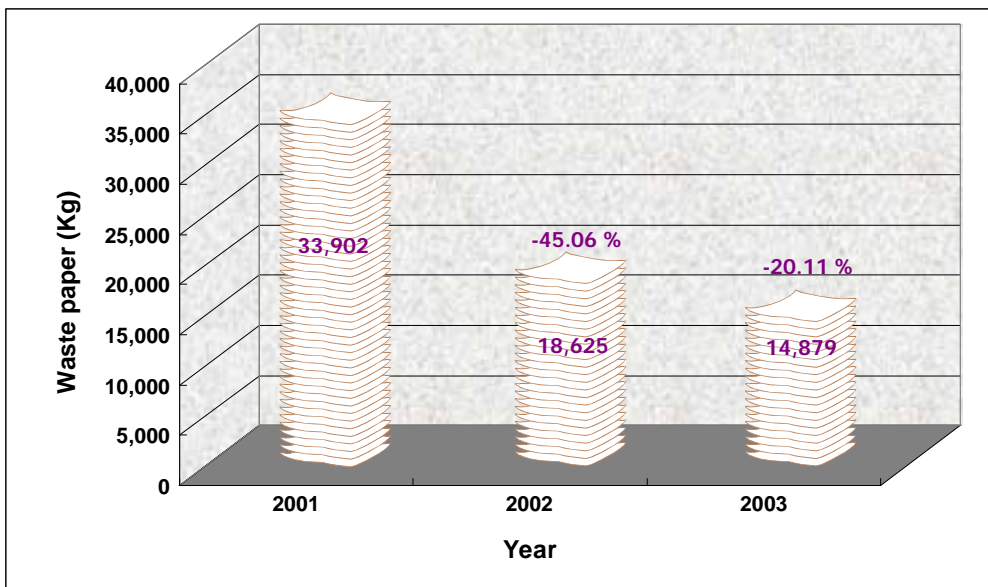
- ✿ Put up green boxes to collect reusable envelopes and papers for reuse
- ✿ Collection of computer printer toner and ink cartridges for refill and recycling
- ✿ Put up recycling boxes to collect paper for recycling



With the concerted efforts of our staff, the Department achieved a saving of 4.41% in paper consumption and a reduction of 45.06% in waste paper production in 2002 when compared with 2001. In 2003 we further achieved a saving of 0.73% in paper consumption and a reduction of 20.11% in waste paper production.



◀ Paper Consumption



◀ Waste Paper Production


To maintain the impetus of the green measures in housekeeping, we have conducted annual environmental audits in all the 12 offices located in different premises. The objectives of conducting the annual environmental audits are:

- (i) to assess compliance with the green housekeeping guidelines;
- (ii) to identify any non-compliances and recommend remedial actions;
- (iii) to promote good environmental management; and
- (iv) to increase staff awareness of the department green management and occupational safety and health initiatives.

## Looking Ahead

We have summarized the work and effort of the Highways Department in 2002 and 2003 towards environmental protection.

We shall continue with the various environmental protection work, research initiatives and greening measures in 2004 which we hope would contribute to a more sustainable form of working. In particular, we aim at achieving the following environmental objectives and targets:



Objectives	Targets
Improve Environmental Performance of term contractors	<ul style="list-style-type: none"> <li>● To incorporate additional environmental requirements in our term contracts commencing in 2004</li> </ul>
Use of recycled materials in road construction	<ul style="list-style-type: none"> <li>● To promulgate the use of recycled asphalt pavement in road construction</li> </ul>
	<ul style="list-style-type: none"> <li>● To study the use of recycled aggregates produced from C&amp;D waste as road sub-base</li> </ul>
Save energy consumption	<ul style="list-style-type: none"> <li>● To maintain the room temperature of offices at an average not lower than 24°C during office hours in summer</li> </ul>
	<ul style="list-style-type: none"> <li>● To increase the office area having energy saving fluorescent tubes installed from 20% in 2002/03 to 25% in 2003/04</li> </ul>
	<ul style="list-style-type: none"> <li>● To explore further electricity consumption reduction measures in public lighting and Public Transport Interchanges (further annual saving of 700,000 kWh)</li> </ul>
Save photocopying paper consumption in the Department	<ul style="list-style-type: none"> <li>● To reduce the consumption of photocopying paper by 1% in 2003/04 comparing with that in 2002/03</li> </ul>
Waste reduction	<ul style="list-style-type: none"> <li>● To incorporate additional environmental requirements into specifications of the capital works contracts</li> </ul>

Highways Department will use its best endeavour to achieve these targets to make Hong Kong a better place to live.

We hope that this publication will provide a glimpse into our environmental protection efforts. We also wish it will promote a green culture among ourselves, our consultants and contractors. If you have any comments or suggestions on our work, we would love to know. Please send us your views through our homepage on the Internet (address : <http://www.hyd.gov.hk>).