渠務署
Drainage Services Department

DSD Overview

Our Vision:
To provide world-class wastewater and stormwater drainage services enabling the sustainable development of Hong Kong.

Drainage Services Department

Established in 1989, the Drainage Services Department (DSD) is one of the Works Departments under the Development Bureau of the Government of the Hong Kong Special Administrative Region. Its vision is to provide world-class wastewater and stormwater drainage services enabling the sustainable development of Hong Kong.

The department is headed by a Director with the assistance of a Deputy Director and four Assistant Directors. The four Assistant Directors respectively head the four branches within the department, namely the Sewage Services Branch, the Operations and Maintenance Branch, the Projects and Development Branch and the Electrical and Mechanical Branch. Besides, there are individual sections at the headquarters rendering technical, accounting and administrative supports.

Sewage Services Branch

The Sewage Services Branch is responsible for the implementation of Harbour Area Treatment Scheme project and collection of sewage charges.

Harbour Area Treatment Scheme (HATS)

Under HATS, sewage from the catchment areas on both sides of the Victoria Harbour, after being collected and screened at local screening plants, is conveyed via deep tunnels to the Stonecutters Island Sewage Treatment Works (SCISTW) for chemically-enhanced primary treatment before disposal. The project is implemented in two stages. Stage 1 of the project covers the catchment areas in urban Kowloon and north-eastern part of Hong Kong Island. Its commissioning in December 2001 has brought about significant improvement to the water quality of the Harbour. Stage 2A is being implemented for completion in 2014. It will collect and treat the sewage from the remaining catchment areas along the northern and southwestern parts of Hong Kong Island and provide disinfection to all HATS flows for further improving the harbour water quality. Stage 2B will provide biological treatment in order to sustain the benefits of Stage 2A. The timing of implementing Stage 2B will depend on a review of population growth, sewage flow build-up and harbour water quality trends to be conducted in 2010-11.

Sewage Services Charging Scheme

The sewage services charging scheme, introduced on April 1, 1995 under the Sewage Services Ordinance based on the "Polluter Pays Principle", requires a discharger to pay for the cost of sewage services provided according to the quantity and pollution strength of the wastewater discharged. To maintain a modest charging level, the scheme only aims at recovering the operating and maintenance costs of public sewage handling facilities. The construction cost of these facilities remains to be funded from public funds.

Sewage services charges have two components: the Sewage Charge (SC) and the Trade Effluent Surcharge (TES). The SC, levied in accordance with the Sewage Services (Sewage Charge) Regulation, aims at recovering the cost of collecting and treating wastewater at or below domestic strength. The TES aims at recovering the additional cost of treating trade effluent with pollution strength exceeding that of domestic sewage and is only levied on trades listed in the Sewage Services (Trade Effluent Surcharge) Regulation.

Operations and Maintenance Branch

The Operations and Maintenance Branch is responsible for the operation and maintenance of the drainage and sewerage systems in the territory. It has three district divisions, the Hong Kong and Islands, Mainland South and Mainland North Divisions, respectively taking care of the drainage and sewerage matters in their areas. The fourth division, the Land Drainage Division, responsible for flood control, planning of drainage and sewerage systems, and the management and maintenance of natural watercourses.

Management of a Labyrinth of Drains and Sewers

Since the establishment of the department, the approach to operation and maintenance of the public drainage systems has progressively been shifted from corrective maintenance to preventive maintenance. Over 4 000 kilometres of public drains, sewers, channels and nullahs are regularly inspected and maintained to ensure their proper functioning. For stormwater drains, in addition to thorough cleansing before the rainy season, regular cleansing is carried out during the rainy season to ensure that the systems are free from any blockages. About 275 000 cubic metres of silt is removed from the systems annually.

Drainage plans and proposals submitted by private and public developers are scrutinised and processed. A large number of enquiries and comments on services, mainly requests to clear blocked drains and sewers, are handled on a daily basis.

An Emergency and Storm Damage Organisation (ESDO) is set up to deal with flooding and damaged or blocked drains and sewers during emergency and rainstorm. This ESDO is attended by staff based on a duty roster and is supported by the department's direct labour force and contractors.

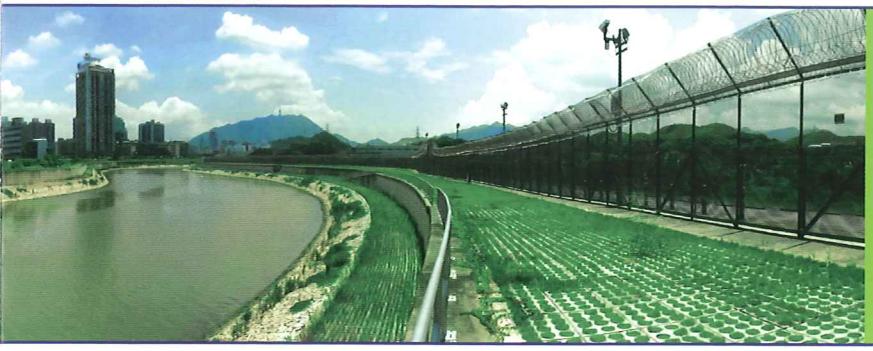
Flood Prevention Strategy and Drainage Master Plans (DMPs)

A consultancy study - "Territorial Land Drainage and Flood Control Strategy Study-Phase I" completed in 1990 developed an overall strategy of flood control for the whole territory. The study identified the need for major river training schemes and the introduction of legislation and management measures.

Based on the recommendation of Phase I Study, DSD completed the Phase II Study in 1993 and drew up drainage basin management plans for the five most flood prone basins in the Northern and North-western New Territories. They provided a framework for the necessary river training works and village flood protection schemes to alleviate flooding. In parallel, the Land Drainage Ordinance was enacted in 1994 to strengthen the protection and maintenance of designated major watercourses.

Following the Phase II Study, eight DMP Studies were conducted to comprehensively examine the condition and adequacy of the drainage systems, and to develop short to long term improvement measures so as to meet the current standards and future needs. In the course of the DMP Studies, a number of drainage improvement options had been identified and these include flood storage, tunneling, pumping, expanding the existing systems and village flood pumping schemes.

The first DMP covering the Yuen Long areas was completed in 1998 and the last on the Southern Hong Kong Island was completed in 2004. The recommended drainage improvement measures are in various stages of implementation. To ensure that the DMP Studies match with the latest development in the districts, it is planned to review the DMPs in the near future.



Projects and Development Branch

The Projects and Development Branch, consisting of the Consultants Management, Project Management, Sewerage Projects and Drainage Projects Divisions, is responsible for the implementation of capital works projects. These include the design and construction of drains, flood control and relief works, sewerage systems and sewage treatment plants.

Under the Public Works Programme, DSD is committed to upgrade the drainage and sewerage systems to protect Hong Kong from flooding and water pollution. Projects valued at some $13.7 billion are now under construction and a further $20.6 billion worth of projects are at various stages of planning and design.

Flood Prevention in New Territories (NT)

In NT, 41 major flood prevention projects, among which 12 are in Northern New Territories (NNT) and 25 in the Northwestern New Territories (NWNT), have been completed since 1997. Flood risk in the NT has since been substantially reduced with no more major flooding reported as from 2002 in known flooding black spots like Tin Ping Shan and Ho Sheung Heung in NNT, and Kam Tin and Ngau Tam Mei in NWNT. The flood risk in Ta Kwu Ling, North District, has also been alleviated upon completion of Stage 3 of the Shenzhen River Regulation Project in 2006. Since 1997, about 73 kilometres of rivers in NNT have been trained and 27 village flood pumping schemes have been put into operation, bringing relief to the flooding situation in NNT and NWNT. With the completion of Yuen Long Bypass Floodway in 2006, the flood risk of Yuen Long Town has also been substantially relieved.

In the NWNT, DSD commissioned a consultancy study to examine the feasibility of various options and proposals to improve the environmental conditions and the general appearance of the Yuen Long Town Nullah. The study is near completion and will identify feasible options for improving and beautifying the Nullah.

Flood Prevention in the Urban Areas

In West Kowloon, all three stages of the drainage improvement works which include the laying of 44 kilometres of stormwater drains were completed. The flood risk has been further reduced after the completion of Tai Hang Tung Storage Tank and the Kai Tak Transfer Tunnel in 2004.

Drainage Tunnels

The Kai Tak Transfer Tunnel is the first drainage tunnel completed in Hong Kong in 2004. Currently there are three other drainage tunnels being implemented. The Hong Kong West drainage tunnel and the Tsuen Wan drainage tunnel have commenced works in 2007 and the Lai Chi Kok Transfer Scheme in late 2008.

Reduce Flooding Blackspots

All flooding blackspots identified are under close monitoring and improvement measures are taken to lower the flood risk. With the progressive completion of major flood prevention projects, flooding situation at the associated flooding blackspots and flood-prone areas has been significantly improved. Since 1995, 109 flooding blackspots from both the urban and rural areas have been removed. DSD will continue to improve the drainage systems of the remaining 22 flooding blackspots.

Nullah Decking/Improvement

In 2005, the Government announced a plan to deck 16 sections of nullahs in the urban areas to improve their surrounding environment. The works are being implemented in three packages. Package A consisting of eight sections was completed following the completion of the decking of the Lung Chu Street Nullah in October 2007. Package B consisting of four nullahs has commenced work in 2008. The remaining four nullahs under Package C are in design stage. All the nullah decking/improvement works are scheduled to be completed progressively by 2014.

Sewage Collection, Treatment and Disposal

All urban areas and 93 per cent of households are sewered by public sewers. There are currently 66 sewage treatment plants for handling 2.68 million cubic metres of sewage a day. In order to cater for the growing developments, the Sha Tin, Tai Po and Shek Wu Hui Sewage Treatment Works have been undergoing continuous expansion and upgrading. Sha Tin Sewage Treatment Works Extension Phase III will be completed in stages with the final stage targeted for completion in 2010. Tai Po Sewage Treatment Works Extension Phase V is on-going with completion of the final stage scheduled for 2013. Expansion of the Shek Wu Hui Sewage Treatment Works is in full swing and will be completed by 2009. Furthermore, to accord with the expansion of the sewered areas in Port Shelter, Stage 2 upgrading of the Sai Kung Sewage Treatment Works is scheduled to commence in 2010 for completion by 2014.

Sewerage Master Plans (SMPs)

There are a total of 16 SMPs for expansion and upgrading of sewerage systems and sewage treatment facilities in the territory. The recommended works under three SMPs, namely the Hong Kong Island South, Chai Wan/Shau Kei Wan and East Kowloon SMP have been completed. The other 13 SMPs, together with further works identified from SMP Reviews, are under different stages of design and construction.

Village Sewerage Projects

Government has implemented the Village Sewerage Programme to extend the sewer networks to serve unsewered villages. The Programme not only improves the environment and hygiene of the concerned areas, but also contributes to sustainable development and brings enhanced values to village properties. To date, Government has already provided public sewerage to about 100 originally unsewered villages and a further 400 have been included in the Programme for roll out in the coming years.

Electrical and Mechanical Branch

The Electrical and Mechanical Branch, consisting of two Sewage Treatment Divisions and the Electrical and Mechanical Projects Division, is mainly responsible for the operation of sewage treatment and flood protection facilities as well as electrical and mechanical design and installation works in sewerage and drainage projects in DSD.

Sewage Treatment Facilities

The two Sewage Treatment Divisions are responsible for the management, operation and maintenance of sewage treatment and flood protection facilities throughout the territories. There are about 200 sewage pumping stations and around 65 sewage treatment plants of various scales and treatment levels. The treatment levels vary from preliminary (screenings and grit removal), primary (sedimentation), chemically-enhanced primary, secondary, to tertiary treatment. These plants are operated according to the discharge licenses issued by the Environmental Protection Department (EPD) under the Water Pollution Control Ordinance. Effluent disinfection by either ultraviolet light or chlorination is incorporated in some of the plants to meet particular water quality objectives set by the EPD.

Out of the 2.68 million cubic metres sewage treated daily, 30 per cent receives preliminary treatment, 53 per cent receives chemically-enhanced primary treatment and 17 per cent receives secondary treatment. Projects are in hand to give higher level of treatment to preliminary treated effluents.

Chemically-enhanced Primary Treatment (CEPT)

As a crucial part of HATS Stage 1, SCISTW is the biggest sewage treatment plant in Hong Kong treating 1.4 million cubic metres daily, which is about half of the sewage generated. Since its full operation in December 2001, the plant has shown consistently excellent performance results and is acclaimed by local and international experts as one of the world's most efficient CEPT plants. The hydraulic performance of the 23.6 km sewage tunnels, with diameters ranging from 1.2m to 3.5m, is regularly monitored to ensure the satisfactory performance of HATS Stage 1.

Secondary Treatment

To protect different water bodies, major secondary treatment plants are constructed at Sha Tin, Tai Po, Sai Kung, Shek Wu Hui, Yuen Long and Stanley. The secondary treatment works adopt advanced activated sludge process to remove both organic pollutants and nutrients. The Tolo Harbour Effluent Export Scheme at Sha Tin was designed to protect the water quality of Tolo Harbour by exporting treated effluent from both Sha Tin and Tai Po Sewage Treatment Works to Kai Tak Nullah for discharge into the Victoria Harbour. It also helps to flush the Nullah. The Scheme was put into operation in 1995/96. There are also a number of small package plants employing different secondary sewage treatment technologies in isolated areas around the territories.

Tertiary Treatment

Ngong Ping Sewage Treatment Works is the first tertiary treatment plant designed with effluent re-use. The plant was commissioned in March 2006 to treat sewage from the tourists and nearby villages at Ngong Ping. The reclaimed water produced is currently used for toilet flushing in the nearby public toilets and tourist

attractions, and for rearing fishes, irrigation and toilet flushing within the sewage treatment works.

Sludge Treatment

About 800 tonnes of sludge cakes are disposed of daily to landfills after dewatering to about 30 per cent solids content. Anaerobic sludge digestion is used at Sha Tin, Tai Po, Shek Wu Hui and Yuen Long Sewage Treatment Works for sludge stabilization. Methane gas (also known as "biogas") is produced as a by-product from the digestion process. The biogas is used for heating and/or power generation within the sewage treatment works. To better utilize the biogas, a 330-kW biogas generator was commissioned at Shek Wu Hui Sewage Treatment Works in 2006. Additional biogas generators with combined heat and power system will be installed at Shek Wu Hui and other plants.

Odour Treatment

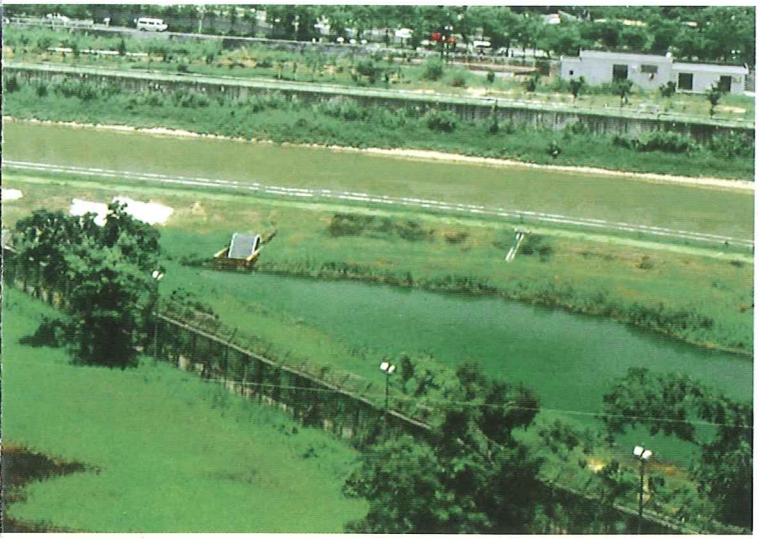
DSD has been taking a proactive approach in mitigating odour impact due to treatment plant operations on its surrounding environment. Various types of odour control systems and measures are installed to control odour in the sewage pumping and treatment facilities. These include chemical dosing such as the use of calcium nitrate and ferric chloride to suppress odour formation, and use of specific types of de-odourisers, such as chemical scrubbers, activated carbon, bio-filters, and bio-trickling filters to remove odour. Odour measurement is also regularly conducted at critical sewage treatment facilities to monitor the odour level and ensure consistent satisfactory performance of the plants.

Flood Protection Facilities

The two Sewage Treatment Divisions also operate and maintain 30 flood protection pumping stations and nine inflatable dams to protect the public against the risk of flooding. While majority of the flood pumping stations are widely scattered in the NNT and NWNT, the Tai Hang Tung Flood Storage Scheme is designed to alleviate flooding in the Mong Kok area. Under the Scheme, a 100,000 cubic metre flood storage tank was constructed under the football pitch at the Tai Hang Tung playground and a pumping station was provided to empty the storage tank within 15 hours. The pumping scheme has been put into operation since November 2004.

Electrical and Mechanical Projects

The Electrical and Mechanical Projects Division is responsible for the design and installation of electrical and mechanical plants and systems, including those major pumping and treatment equipment for sewage and sludge treatment in capital sewerage and drainage works projects. It acts as a functional manager to the project manager on electrical and mechanical engineering works and provides advice on sewage treatment process design to other DSD Divisions and Government departments. The Division also undertakes research and development work for the Electrical and Mechanical Branch on related technology and process development to enhance service delivery. Recent research and development works include: computerized activated sludge modelling, process optimisation and investigation, study of online sensors, odour control and membrane technology application.



Public Education

There are three information centres on sewage treatment respectively at Sha Tin, Stonecutters Island and Ngong Ping Sewage Treatment Works which are opened to visitors. DSD also organizes open day for the general public for learning more about its services to the community. Furthermore, a Flood Preventation Information Centre is also established at San Tin for introducing our flood control work.

Staff

As at January 1, 2009, DSD has 1,994 staff consisting of 1,854 permanent establishment and 140 contract posts. The permanent establishment includes 18 Directorates, 270 Professionals, 784 Technical and Site Supervisory staff, 562 General and Common Grades staff, and 220 Model Scale I staff. The department aspires to train its staff at all levels to enhance their knowledge and increase their capabilities in aspects such as engineering and information technology.

Public Works Expenditure

The expenditure on new capital drainage and sewerage projects by DSD in 2008-09 was about $2.5 billion. Following the commencement of a number of drainage and sewerage projects, the projected expenditure in 2009-10 will increase to about $3.3 billion.

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