

Flood Prevention Facilities

香港防洪設施





Foreword 前言

Drainage Services Department (DSD) is dedicated to provide world-class stormwater drainage services. To mitigate flooding problems, we implemented a series of flood prevention strategy.

This photobook documents our robust and reliable drainage facilities, infrastructure, river training and river revitalisation projects with a view to mitigate flooding risk and building a flood resilient city.

Enjoy reading!

渠務署致力提供世界級的雨水排放服務。為了紓緩水浸問題，我們實施一系列的防洪策略。

本相冊記錄了我們為緩減水浸風險，在全港建設穩健可靠的各種排水設施、基建、河道治理及活化工程，以建設一個耐洪的城市。

祝您閱讀愉快！

Contents 目錄

P.2

Introduction
介紹

P.4

Drainage Improvement
疏浚

P.14

Stormwater Storage Schemes
蓄洪計劃

P.20

Drainage Tunnels
雨水排放隧道

P.28

Flood Relief Measures
防洪措施

P.30

Looking Forward
展望

Introduction 介紹

In 1980s urban development in Hong Kong has led to the expansion of built-up areas near coastlines and major watercourses. In this process, large areas of natural ground turned into hard-paved area, and watercourses and drainage systems could not cater for the substantially increased surface runoff effectively. As a result, there were increasing flooding risks in various districts of our city.

Drainage Services Department (DSD) has been implementing comprehensive approach and long-term improvement measures to mitigate the flooding risks.

This photobook will offer readers a glimpse of how tunnels intercept and divert stormwater from upland catchment for direct discharge to the sea, and images of stormwater storage schemes, executed to collect excess rainwater, showing how they have reduced hydraulic loads on the downstream drainage system. Readers will also come across some of river training and revitalisation works, which used to be old decrepit nullahs have been transformed to scenic waterways that not only attract the public but also an assortment of wildlife.

After reading this photobook, we hope you will have a better understanding on Hong Kong's flood prevention facilities. While we are facing the frequent extreme weather, we continue to boost our resilience of the city, with a view to creating a more livable environment for the public.

Photos on some past major flooding incidents:
過去一些嚴重水浸事件的相片：



Flooding at the Choi Hung Road (Photo taken in 2015)
彩虹道水浸情況(相片攝於2015年)



Nathan Road in Mong Kok was extensively submerged by flood water during heavy rainstorm (Photo taken in 1997)
旺角彌敦道於暴雨時出現水浸情況(相片攝於1997年)

隨著上世紀80年代城市發展，香港靠近海岸線及主要水道的已建設區不斷擴大，令大量天然土地變成已鋪築地區，水道與排水系統不能有效排走大量增加的地面徑流，導致不同區域面臨更嚴峻的水浸風險。

渠務署一直採取全方位策略及長遠改善措施應對水浸風險。

讀者可藉本相冊對雨水排放隧道如何截取上游集水區的雨水並直接排出大海有初步概念，亦可一覽蓄洪計劃，領略其如何通過收集過量雨水減輕下游排水系統的負荷。本書亦展示多項河道治理及活化工程，曾經破舊的明渠搖身一變為風景秀麗的水道，不僅吸引遊客，亦成為繁多生態的棲息地。

閱畢本相冊後，我們希望大家對香港的防洪設施有更深入認識。面對日益頻繁的極端天氣，我們會不斷加強應對能力，為市民締造更宜居的生活環境。



The water depth at the junction of Wing Lok Street and Hillier Street in Sheung Wan exceeded 1.2 metres under the rainstorm on 7 June 2008
上環永樂街及禧利街交界在2008年6月7日的暴雨中水浸深度逾1.2米

FLOOD PREVENTION STRATEGY FOR URBAN AREA

Hong Kong's low-lying areas are exposed to flooding risks arising from urbanisation, increased surface runoff, reduced flood plains and extreme weather events. DSD has mapped out a three-pronged strategy to mitigate the flooding problems.

1. Drainage improvement

Drainage improvement is to straighten, widen and deepen existing rivers or to build new underground drains. The objective is to improve their flow capacity to enable them to collect and convey stormwater more efficiently.

2. Flood storage

Flood storage tanks have been constructed in appropriate locations to collect and temporarily store stormwater, in order to alleviate the burden imposed on drainage systems.

3. Interception

Drainage tunnels have been built in the mid-levels to intercept and direct stormwater from upland catchment to the sea or downstream drainage system, in order to minimise traffic and public disruptions due to drainage works.

市區防洪策略

城市化、地面徑流增加、洪泛平原減少及極端天氣導致香港低窪地區面臨水浸風險。渠務署已制定三管齊下的策略，緩和水浸問題。

1. 疏浚

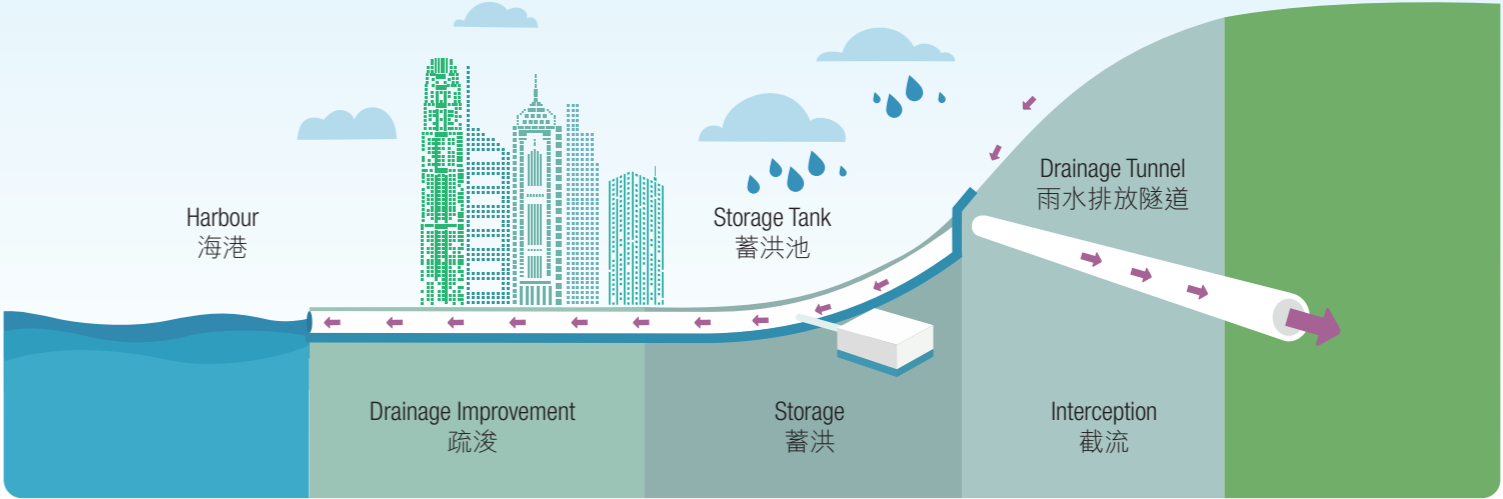
通過拉直、擴闊及挖深現有河道或新建地下渠道疏浚，旨在提高其排水量以促進雨水收集及排放效率。

2. 蓄洪

於合適地點建設蓄洪池以收集及暫存雨水，藉此減輕排水系統的負擔。

3. 截流

於半山興建雨水排放隧道以截取來自上游集水區的雨水並排出大海或下游排水系統，盡可能減少排水工程對交通及公眾造成的干擾。



Drainage Improvement

疏浚

DRAINAGE IMPROVEMENT

Drainage Improvement relates to upgrading the existing drainage system to increase its flow capacity and facilitate more effective discharge of surface runoff. This measure entails widening and deepening of existing river, nullah or constructing new drains to stem flooding risks.

In recent years, greening and ecological elements have been included in the river improvement works to beautify the environment, foster recreational gatherings for the community and provide natural wildlife habitats.

疏浚

疏浚主要是擴建和改善現有排水系統，以增加其排水量及更有效排走地面徑流；當中包括擴闊及挖深現有河道、明渠或建設新排水渠以減低水浸風險。

近年河道改善工程更加入綠化及生態元素，致力美化環境、促進社區共融交流及為繁多生態提供天然棲息地。



Rivers in the City
河畔城市



Lantern Festival at
Jordan Valley Channel and
Kai Tak River
佐敦谷水道及啟德河
中秋綵燈會

Kam Tin River 錦田河



In the past, the meandering, narrow and winding old Kam Tin River was unable to rapidly discharge flood water from torrential rainstorms, and low-lying areas of Kam Tin were inundated. To solve the flooding problem in Kam Tin area, a new channel of 120 metres wide and 3 kilometres long was built at the downstream area of Nam Sang Wai by straightening and widening to increase the drainage capacity of Kam Tin River.

原有的錦田河舊河道是典型的曲流，又窄又迂迴，暴雨時難以迅速排走洪水，導致錦田一帶的低窪地區經常水浸。在下游南生圍進行的河道工程，是藉著拉直及擴闊，闢出一條120米寬，3公里長的人工新河道，以提升錦田河的排水能力，解決錦田區水浸問題。



Since 1980s, area of both sides of Shenzhen River were prone to frequent flooding, causing economic loss. The Governments are determined to regulate the Shenzhen River. A Joint Working Group on Regulation of the Shenzhen River has been set up to oversee the project implementation and worked closely in the planning, design and construction of the river training project. Stage I, II, III and IV works of the Shenzhen River Regulation Project were completed in 1997, 2000, 2006 and 2017 respectively. The flow capacity of Shenzhen River has been significantly increased and, together with other river training works in North New Territories, the regional flooding problem in the areas have basically eliminated.

自80年代，深圳河兩岸地區經常氾濫，造成經濟損失。兩地政府決心整治深圳河，成立了聯合治理深圳河工作小組，負責監督河道治理項目的實施情況，並在工程規劃、設計及施工方面保持緊密合作。第一、二、三及四期治理工程先後於1997年、2000年、2006年和2017年竣工，大大提高了深圳河的防洪能力，並配合了新界北區其他河道治理項目，基本消除了該區的水浸威脅。



Shenzhen River 深圳河

Sheung Yue River, Ng Tung River and Yuen Long Bypass Floodway

雙魚河、梧桐河及元朗排水繞道



Sheung Yue River and Ng Tung River

The training works of Sheung Yue River and Ng Tung River were completed in 2002 and 2003 respectively. Both the rivers have been trained by straightening, widening, deepening and provision of grass linings to increase their capacity to cope with severe runoff brought by extreme weather.

Yuen Long Bypass Floodway

Constructed to mitigate flooding in Yuen Long Town and the peripheral village areas, Yuen Long Bypass Flooding is a 3.8 kilometres long large drainage channel that intercepts around 40% of the runoff in the Yuen Long catchment and diverted to Kam Tin River, then discharged to Deep Bay.

雙魚河及梧桐河

雙魚河及梧桐河的治理工程先後於2002年及2003年完成。我們採取拉直、擴闊、挖深及設置草坡襯層的治河方式，力求提高這兩條河道應對極端天氣所引發嚴重洪水的能力。

元朗排水繞道

元朗排水繞道是一條長達3.8公里的大型排水道，截取元朗集水區約四成雨水並引導至錦田河再排出后海灣，為減輕元朗市及周邊鄉村地區的水浸風險而設。



Ho Chung River 蠔涌河



Approximately 650 metres of Ho Chung River underwent drainage improvement. Along the enhanced river section, the existing riverbed and substrates have been retained to protect natural habitat.

蠔涌河其中約650米進行了疏浚工程。改善的河段保留現有河床及河底，保護自然棲息地。



Drainage improvement works were conducted at Upper Lam Tsuen River to alleviate flooding risks. 2.6 kilometres of the river were straightened, widened and deepened at upstream. A series of conservation measures were integrated into the design, construction and post-construction phases to protect the river's biodiversity.

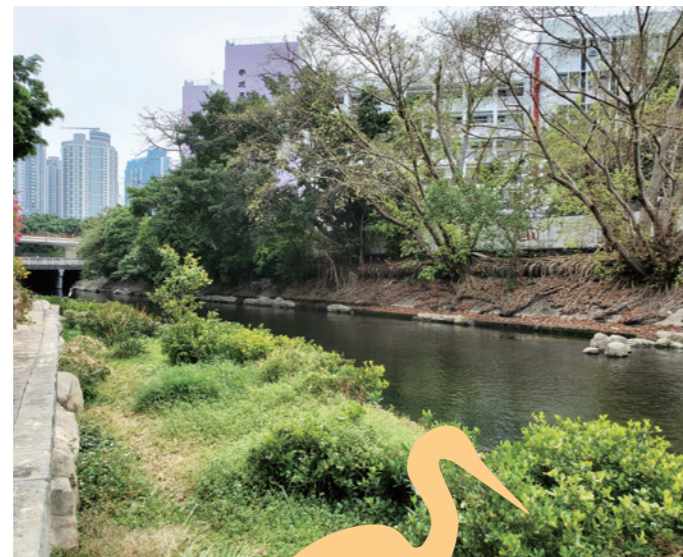
在上林村河實施疏浚工程以減輕水浸風險。上游長達2.6公里的河道被拉直、擴闊及挖深。設計、建設及建成階段融入一系列保育措施以保護河流的生物多樣性。

Upper Lam Tsuen River 上林村河

Kai Tak River 啟德河

Upon completion of improvement works, the drainage capacity of Kai Tak Nullah was able to reach current flood protection standards and mitigate flooding risks along Choi Hung Road. With the injection of various greening and ecological elements, it has been revitalised as Hong Kong's first urban green river corridor.

改善工程竣工後，啟德明渠的排洪能力已達致現行防洪標準並緩解彩虹道一帶的水浸風險。啟德河融入各種綠化及生態元素，活化成香港首條市區綠化河道走廊。



Jordan Valley Channel

Commissioned in April 2022, the Jordan Valley Channel has transformed into a river oasis through revitalisation works under the "Rivers in the City" concept incorporating greening, ecological and sustainability elements.

佐敦谷水道

佐敦谷水道於2022年4月開放，是踐行「河畔城市」概念的活化工程，將綠化、生態和可持續發展元素融入其中，令水道變成一片河流綠洲。



Jordan Valley Channel 佐敦谷水道

Stormwater Storage Schemes

蓄洪計劃

Hong Kong experiences heavy rainstorms during the rainy season each year. To combat severe flooding, DSD has constructed stormwater storage tanks to temporarily retain a part of runoff during peak flow, while allowing a limited flow to the downstream, ensuring that the flow rate is controlled within the capacity of the drainage system.

The four stormwater storage schemes currently operated by DSD are located in Tai Hang Tung, Sheung Wan, Happy Valley and On Sau Road. Under the "single site, multiple use" concept, the underground is used for stormwater storage, while the land on top of the tank can be used by public.

每年雨季，香港往往經歷連場暴雨。為應對嚴重水浸，渠務署已建設蓄洪池，於洪峰期間，臨時貯存部份雨水，並限制流向下游流量，確保流量控制在排水系統的容量以內。

渠務署現時運作的四個蓄洪計劃位於大坑東、上環、跑馬地及安秀道，利用一地兩用的概念，地下蓄洪，地面空間可供市民使用。



Happy Valley Underground
Stormwater Storage Scheme
跑馬地地下蓄洪計劃

Tai Hang Tung Stormwater Storage Scheme 大坑東蓄洪計劃



The Tai Hang Tung stormwater storage tank was designed to reduce flooding risk in Mongkok area. It was built under the existing rugby and football pitches. Designed to handle rainfall up to 100 millimetres per hour, it has a capacity of 100,000 cubic metres and is the city's first large-scale underground storage tank.

大坑東蓄洪池的設計，旨在減低旺角一帶的水浸風險。蓄洪池興建於現有欖球場及足球場下方。其容量高達100,000立方米，可處理每小時高達100毫米雨量，是香港首個大型地下蓄洪池。



"After the Deluge" staged inside the Tai Hang Tung Stormwater Storage Tank
大坑東蓄洪池舉行《大禹之後》媒體藝術展覽



Commissioned in 2009, the Sheung Wan Stormwater Storage Scheme comprises an underground storage tank of 9,000 cubic metres and a pumping station. Greening was implemented on top of the underground storage tank, a waterfront promenade, a plaza and a pet garden were constructed with trees and shrubs planted. The design was supported and welcomed by the public.

上環蓄洪計劃在2009年完成，包括一個9,000立方米的地下蓄洪池及泵房。地下蓄洪池上蓋進行綠化，建造海濱長廊，廣場和寵物公園等設施，廣泛栽種樹木及灌木，設計深受市民歡迎。

Sheung Wan Stormwater Storage Scheme 上環蓄洪計劃

Happy Valley Underground Stormwater Storage Scheme, Anderson Road Quarry Stormwater Storage Scheme and Polder Schemes in New Territories

跑馬地地下蓄洪計劃、安達臣道石礦場蓄洪計劃及在新界的蓄洪池計劃



A storage tank with a capacity of 60,000 cubic metres, about the same as 24 full-size swimming pools, has been built under the Happy Valley recreational ground. The scheme had its first test during the black rainstorm in October 2016 when neither the recreational ground nor Happy Valley Racecourse were flooded.

蓄洪池的容量為60,000立方米，約相當於24個標準游泳池，建於跑馬地遊樂場地底。該計劃於2016年10月黑色暴雨期間受到首次考驗，遊樂場及跑馬地馬場也沒有受水浸影響。



Movable Weir in Happy Valley Underground Stormwater Storage Tank
位於跑馬地地下蓄洪池的可調式溢流堰



Happy Valley Underground Stormwater Storage Tank
跑馬地地下蓄洪池



Anderson Road Quarry Stormwater Storage Tank
安達臣道石礦場蓄洪池



POLDER CONSTRUCTION 建設蓄洪池

Village flood protection scheme involves the construction of a polder for temporary flood storage and an embankment surrounding it to keep external runoff out. Flood water stored in the polder is later pumping out to nearby river channel. To date, 27 flood protection schemes have been constructed and have proven to work well.

鄉村防洪計劃包括建設用於臨時蓄洪的蓄洪池及其周圍的防洪堤以防外部徑流流入。蓄洪池內貯存的雨水隨後用泵排出附近河道。截至目前為止已完成27個防洪計劃，且運作良好暢順。



Drainage Tunnels

雨水排放隧道

Since 2004, DSD has built four drainage tunnels total 21 kilometres long to intercept and divert rainwater directly to the sea or downstream drainage system, reducing the loading on those drainage facilities with insufficient capacity. Therefore, the flooding risk could be curbed without resorting to extensive drainage upgrading works that would cause traffic impact and public disturbance.

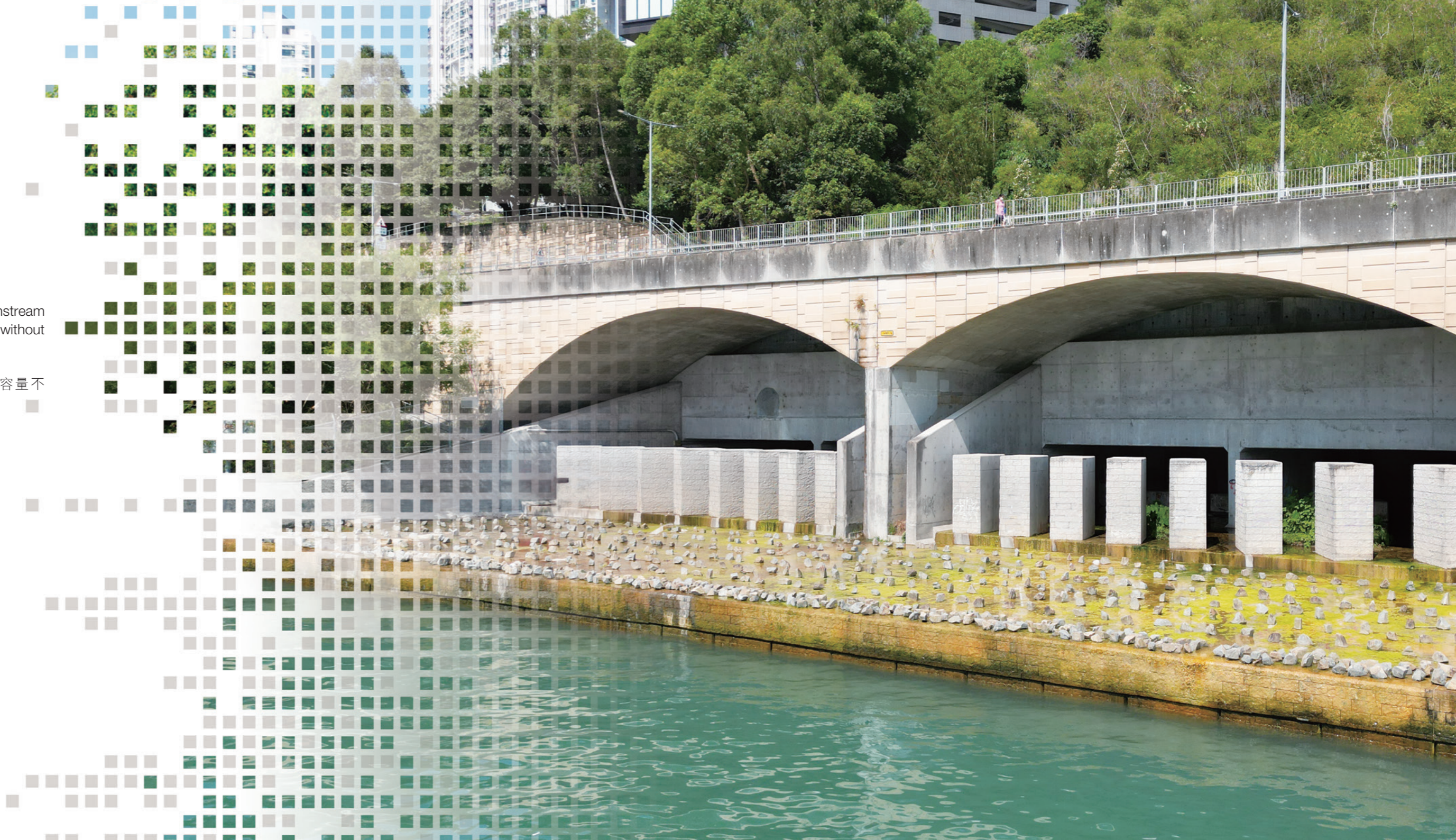
自2004年以來，渠務署興建四條總長度 21 公里的雨水排放隧道，以截取雨水並將之直接排入大海或下游排水系統，藉此減輕容量不足的排水設施的負荷。因此，水浸風險得以降低，而毋須進行影響交通及滋擾公眾的大規模排水改善工程。



Inter-Reservoirs Transfer Scheme
水塘間轉運隧道計劃



Hong Kong West Drainage Tunnel
港島西雨水排放隧道



Tsuen Wan Drainage Tunnel 荃灣雨水排放隧道



Outfall at Yau Kom Tau
油柑頭的排水口

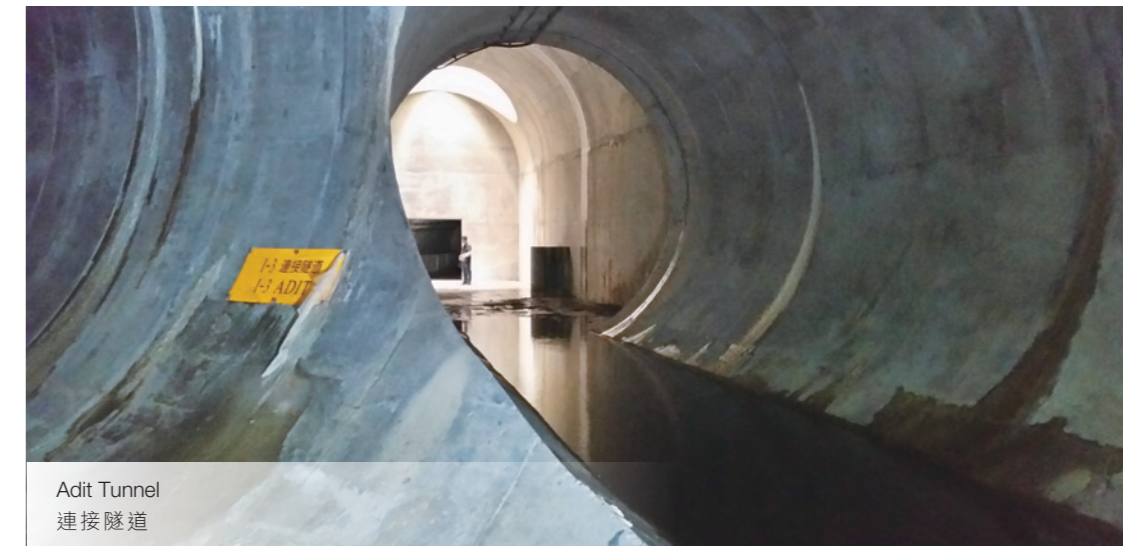


The 5.1 kilometres tunnel extends from Yau Kom Tau in Tsuen Wan to Wo Yi Hop in Kwai Chung. With a design capacity of over 220 cubic metres per second, it intercepts surface runoff from the uphill catchment of Tsuen Wan and Kwai Chung for direct discharge into the sea near Yau Kom Tau, thereby relieving the loading of the existing drainage system in the downstream urban areas.

5.1公里長的隧道由荃灣的油柑頭延伸至葵涌的和宜合，設計容量超過每秒220立方米，截取來自荃灣及葵涌上游集水區的地面徑流以便直接排入油柑頭附近海域，藉此減輕下游市區現有排水系統的負擔。



Intake at Lo Wai
老圍的入水口



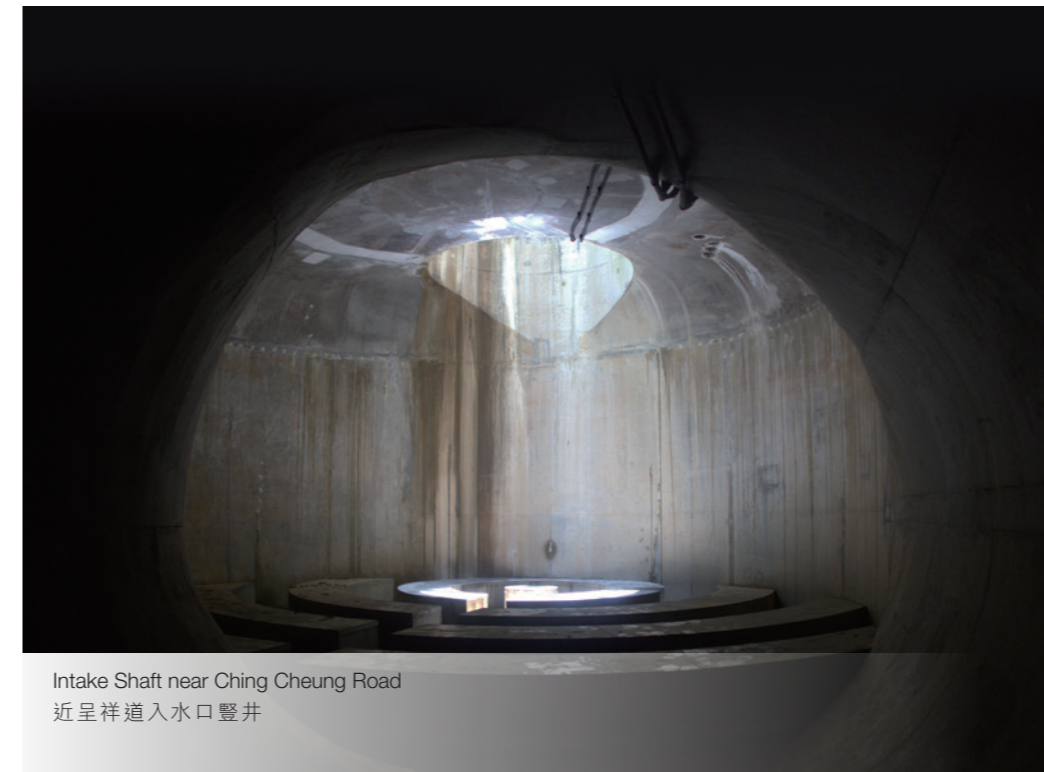
Adit Tunnel
連接隧道

Lai Chi Kok Drainage Tunnel 荔枝角雨水排放隧道



Spanning 3.7 kilometres in total length, the Lai Chi Kok Drainage Tunnel captures rainwater from the upper catchment in West Kowloon and discharges it into Victoria Harbour to reduce flooding risks in Cheung Sha Wan, Lai Chi Kok and Sham Shui Po.

總長3.7公里的荔枝角雨水排放隧道截取來自西九龍上游集水區的雨水並排入維多利亞港，從而舒緩長沙灣、荔枝角及深水埗各區的水浸風險。



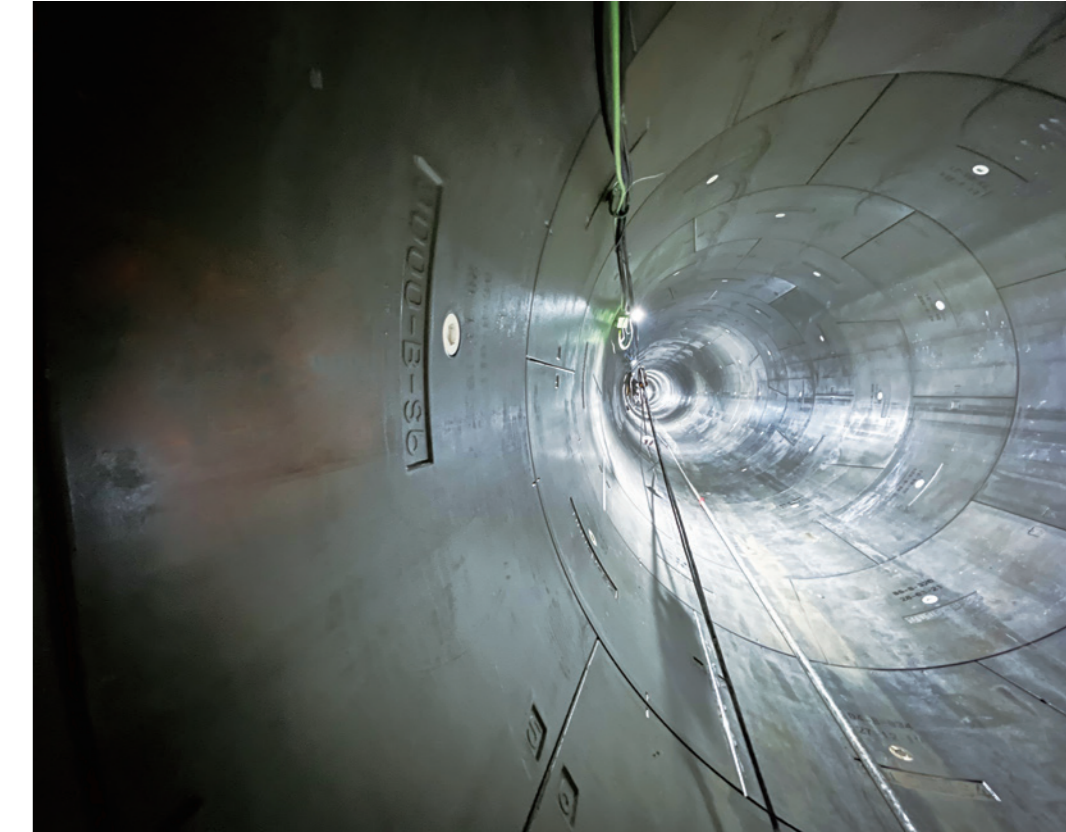
Hong Kong West Drainage Tunnel 港島西雨水排放隧道



The Hong Kong West Drainage Tunnel with a total length of 10.5 kilometres intercepts surface runoff from a catchment area at the mid-level area of Hong Kong Island and discharges up to 240 cubic metres per second. The project's objective is to diminish flooding risk in the urban areas at north-west Hong Kong Island.

港島西雨水排放隧道總長10.5公里，截取來自港島半山集水區的地面雨水徑流，每秒排放量高達240立方米。該項目的目的是減低港島西北部市區的水浸風險。

Inter-Reservoirs Transfer Scheme 水塘間轉運隧道計劃



The Inter-Reservoirs Transfer Scheme project is implemented by DSD with a 2.8 kilometres long water tunnel to divert rainwater collected in Kowloon Byewash Reservoir to Lower Shing Mun Reservoir, so as to reduce overflow from the former and increase the yield of the latter, with the aim of reducing flooding risks in the Lai Chi Kok area.

渠務署推行水塘間轉運隧道計劃，利用一條2.8公里長的輸水管道，將九龍副水塘收集的雨水引至下城門水塘，一方面減少九龍副水塘的溢流，同時增加下城門水塘的集水量，以降低荔枝角地區的水浸風險。

Flood Relief Measures 防洪措施



Flood Barriers in Tai O
大澳擋水設施

DSD has adopted an array of flood relief measures to minimise the potential impact of flooding before they occur. Installation of flood barriers is one of the flood relief measures adopted to protect most-at-risk areas.

When Storm Surge Alert is disseminated by Hong Kong Observatory, DSD will work with other government departments to line up emergent flood relief measures at some low-lying coastal areas that are vulnerable to storm surge.

渠務署已採取一系列防洪措施，力求將水浸的潛在影響減至最低，防患於未然。其中一項防洪措施是加設擋水設施，保護受影響風險最高的地區。

渠務署亦與其他政府部門合作，每當香港天文台發出風暴潮警報時，本署會在沿岸低窪地方易受風暴潮影響地區，安排應急防洪措施。



Flood barriers in Tai O
大澳擋水設施



Flood barriers in Tai O
大澳擋水設施



Flood barrier in Lei Yue Mun
鯉魚門擋水設施

Looking Forward 展望

DSD has been endeavouring to turn Hong Kong into a climate-ready, flood-resilient city. However, as climate change continues to raise the risk of flooding, the city cannot rest on its laurels but must keep strengthening its defences against and be able to withstand serious flooding.

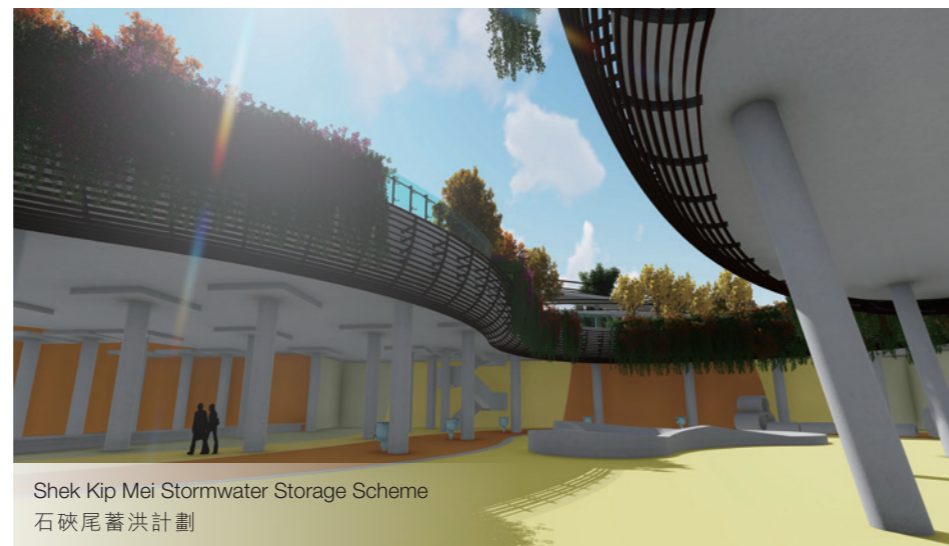
To remain flood ready, Hong Kong must continue the multifaceted approach to controlling floods that has served the city so well over the past decades. On top of a three-pronged strategy — stormwater interception, flood storage and drainage improvement, DSD will continue to explore more opportunities for land co-use concept, for example, to adopt an open tank design and integrate with nearby recreation facilities to provide infinite possibilities for leisure activities.

Moving forward, we came up with a smart-driven solution to alleviate the flooding problem due to high sea level and extreme rainfall in low-lying inland area. It will be a first-ever flood control barrage in Hong Kong with a mega-sized pumping station in Yuen Long, which will greatly reduce the flood risk in the areas. The future will see an unstoppable pipeline of drainage projects being implemented and scheduled for completion.

渠務署一直努力將香港建設成一個能夠適應氣候、耐洪的城市。然而，隨著氣候變化增加水浸風險，本港決不能固步自封，必須不斷加強防範及抵禦更嚴重的水浸。

為求做好防洪準備，香港有必要秉持過去數十年行之有效的全方位抗洪措施。渠務署會繼續貫徹截洪、蓄洪、疏浚的三管齊下策略，探索更多實踐土地共享概念的機會，例如採用開放式蓄洪池設計，與周邊康樂設施互相配合，為休閒活動賦予無限可能。

展望未來，我們構思出一個智能化解決方案，旨在緩解因海平面上升和極端降雨而導致在內陸低窪地區的水浸問題。通過建設全港首個設有巨型泵房的防洪堤壩，可大大減低元朗區的水浸風險。未來，渠務署將繼續推行及落實一系列的排水工程項目。



Looking Forward 展望



Tsui Ping River
翠屏河



Fo Tan Nullah
火炭明渠

Inspired by the “Rivers in the City” concept put forward by the government in 2019, DSD has been implementing river revitalisation projects and introducing, when planning new development areas, waterbody rejuvenation facilities such as artificial flood attenuation lakes and river parks, thereby providing the public with quality river facilities and enhancing the environmental and social values of rivers.

Looking ahead, we are committed to building drainage system for urban areas and enhancing the flood resilience, which serves to enrich ecological values and provide a greener environment as well as to promote water friendliness and improve community engagement for building a liveable city.

秉承政府於2019年提出的「河畔城市」概念，渠務署已推展活化河道項目，並已在規劃新發展區時加入防洪人工湖、河畔公園等活化水體設施，從而為公眾提供優質的河道設施，並提升河道的環境及社會價值。

展望未來，我們致力建設城市排水系統及提升防洪能力，提升生態價值及綠化環境，亦有助促進親水文化及提高社區凝聚力，攜手建設宜居城市。



Middle Tuen Mun River Channel
屯門河中游



Tai Wai Nullah
大圍明渠



渠務署

Drainage Services Department