

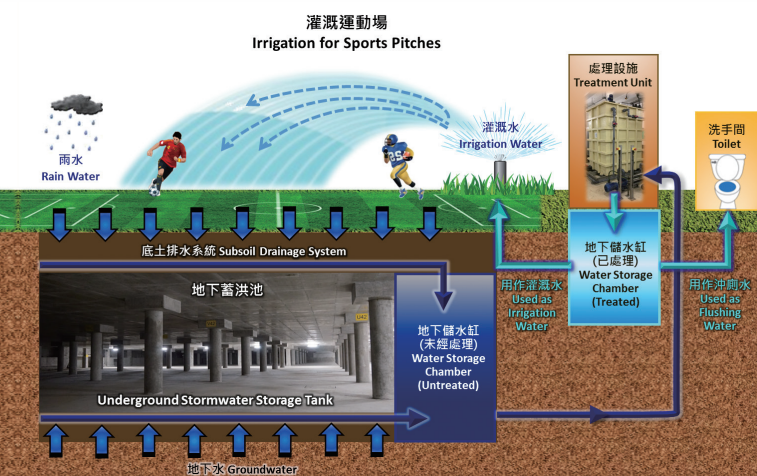
水資源採集及回用系統 Water Harvesting System

跑馬地地下蓄洪計劃的設計
具備可持續發展水資源的意念：
The HVUOSS project fosters the development of
sustainable sources of water supply:

收集蓄洪池下的地下水及
運動場的灌溉水和雨水
Collection of groundwater under the
storage tank, and irrigation water and
rainwater beneath sport pitches

經由地下排水管道輸
送到淨化系統作適當處理
Conveyance through underground
pipes to treatment unit for suitable
treatment

重用於澆灌蓄洪池上的
跑馬地運動場及場內沖廁系統
Reuse as irrigation water at sport
pitches and flushing water in
toilets in the Happy Valley Recreation Ground



新工程合約 New Engineering Contract (NEC)

跑馬地地下蓄洪計劃建造過程採用「新工程合約」模式，
在此模式下，工程管理部门和承建商會在互助互信的基
礎上，以伙伴關係合作，共同推動工程進展，及早預視
與解決可能發生的問題，從而減少或避免不必要的工程
糾紛和延誤，並更有效控制工程成本。

The construction of HVUOSS adopts the "New
Engineering Contract" (NEC) form of contract. Under
the NEC, the project management office and the
contractor foster a partnering relationship through
mutual trust and co-operation. On this basis, the
parties collaborate closely to foresee and early
resolve potential problems, thereby minimize or avoid
unnecessary disputes and delay, and effectively
control the project cost.

跑馬地地下蓄洪計劃應用「新工程合約」的成果： The benefits of adopting NEC in HVUOSS:

- 主體工程提早 14 個月完成
- 工程成本節省約 9,000 萬元
- Completion of main works advanced for 14 months
- Construction cost saved about \$90 million



社區參與 Public Engagement



持份者工作坊 Stakeholders workshop



舉辦嘉年華
Organizing carnival



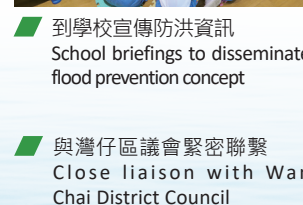
參與展覽
Participation in exhibitions



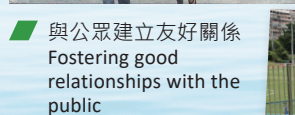
接待到訪團體及傳媒
Receiving various organizations
and media



執波服務
Football retrieval service



到學校宣傳防洪資訊
School briefings to disseminate
flood prevention concept



與公眾建立友好關係
Fostering good
relationships with the
public



獎項 Awards

2017

- 2017 年優質公務員獎勵計劃
Civil Service Outstanding Service Award Scheme 2017
隊伍獎 (專門服務) – 金獎
Team Award (Specialised Service) – Gold
部門合作獎 – 優異獎 Partnership Award – Meritorious
- 英國新工程合約用戶組織 UK NEC Users' Group
創新合約條款組別大獎
Contract Innovation Through
Additional Clauses Category - Winner Award

2016

- 香港綠色企業大獎 Hong Kong Green Awards
優越環保管理獎 - 項目管理 - 大型企業 – 白金獎
Green Management Awards –
Project Management – Large Corporation - Platinum
- 公德地盤嘉許計劃
Considerate Contractors Site Award Scheme
傑出環境管理獎 – 金獎
Outstanding Environmental Management & Performance Awards – Gold

2015

- 英國新工程合約用戶組織 UK NEC Users' Group
大型工程項目 - 高度讚揚獎
Large Project of the Year – Highly Commended Award
- 公德地盤嘉許計劃
Considerate Contractors Site Award Scheme
傑出環境管理獎 – 金獎
Outstanding Environmental Management & Performance Awards - Gold

2014

- 香港綠色建築議會 Hong Kong Green Building Council
綠建環評新建建築暫定白金級認證
Provisional Platinum Rating under BEAM Plus Assessment for New Buildings
- 公德地盤嘉許計劃 Considerate Contractors Site Award Scheme
公德地盤獎 – 金獎
Considerate Contractors Site Awards - Gold

2013

- 香港工程師學會 Hong Kong Institution of Engineers
工程創意大獎 - 優異獎
The Innovation Award for Engineering Industry – Merit

2012

- 國際水協會項目創新大獎
International Water Association Project Innovation Awards
東亞地區 (規劃組別) 大獎
East Asia Regional Awards in the Planning Category

大家好，我是跑馬地地下蓄洪計劃的吉祥物「海綿仔」。蓄洪計劃除了把雨水暫存在蓄洪池外，計劃更利用綠化天台及滲透地磚，讓雨水滲透地下，同時將收集得來的地下水、灌溉水及雨水回用作灌溉及沖廁之用，真正實行了「海綿城市」的理念。歡迎大家到跑馬地地下蓄洪池找我呀！

Hello! I am Sponge Kid, the mascot of HVUOSS. The HVUOSS embraces the concept of "Sponge City" by not only temporarily storing the stormwater in the storage tank, but also adopting green roofs design and using permeable paving blocks for rainwater infiltration and at the same time reusing the collected groundwater, irrigation water and rainwater for irrigation and toilet flushing.



You are welcome to visit me at Happy Valley Underground Stormwater Storage Tank.

公眾參觀 Public Visits

跑馬地地下蓄洪池現已接受團體預約參觀。參觀者更可透過導賞團以互動形式了解更多有關渠務署的防洪工作。Happy Valley Underground Stormwater Storage Tank is now open for group visits via prior application. Visitors can know more about flood prevention works of DSD by joining the guided tour.

如欲得到更多跑馬地地下蓄洪計劃的資料，請瀏覽本署網頁：
You may visit DSD website for more information about the HVUOSS:



跑馬地

地下蓄洪計劃

Happy Valley Underground Stormwater Storage Scheme



渠務署
Drainage Services Department

渠務署一般查詢 DSD General Enquiries: 2877 0660
電郵 Email: enquiry@dsd.gov.hk 網頁 Website: www.dsd.gov.hk
二零一八年一月印製 Printed in January 2018

工程背景 Project Background

在 2000 年 8 月、2006 年 4 月和 2008 年 6 月，灣仔及跑馬地一帶區域，曾在暴雨時出現嚴重水浸。

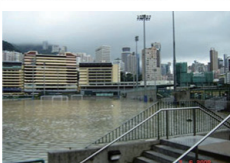
In August 2000, April 2006 and June 2008, severe flooding occurred during heavy rainstorms in Wan Chai, Happy Valley and the adjacent areas.

像灣仔這樣人口稠密的地區，要以傳統方案改善防洪能力，需大規模加建或擴大地下排水渠，當中會涉及大量開路工程，對公眾及商業活動造成滋擾，而密集的地下公用設施亦會影響傳統方案的可行性。

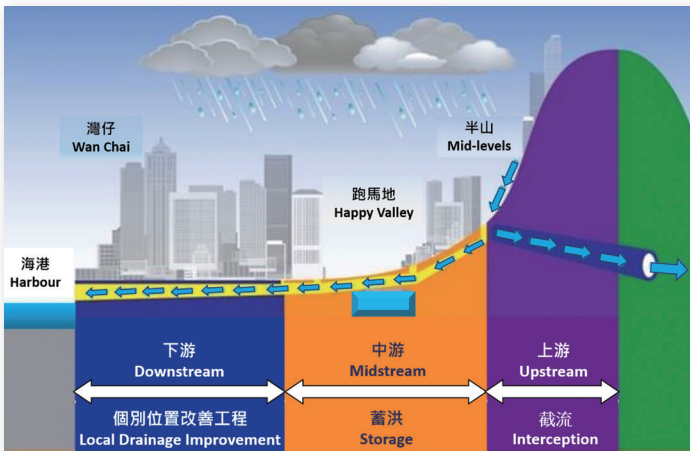
In such densely populated areas as Wan Chai, conventional drainage improvement schemes would require extensive upsizing of existing drains or laying of new drains, which would involve extensive road opening works, leading to disruption to the public and commercial activities. Congested underground utilities will also jeopardize the viability of the conventional schemes.

除此之外，為應對極端降雨，海平面上升及徑流因城市發展而增加等對現有排水系統負荷的挑戰，我們需要一個完善的方案以增強地區的防洪能力。

Besides, to solve the increased loading to existing drainage networks brought by extreme torrential rains, rising sea level and increased overland flow due to urbanization, a comprehensive solution to enhance the regional flood prevention capacity is needed.



防洪三招 Three-pronged Approach in Flood Protection



於跑馬地興建地下蓄洪池可暫存暴雨期間流進上游排水系統的部分雨水，從而減低洪峰流量。

By constructing an underground flood storage tank in Happy Valley, it will serve to temporarily store part of the stormwater entering the upstream drainage system for attenuating the peak flow.

工程範圍 Project Scope

- **地下蓄洪池 Underground Stormwater Storage Tank**
容量 6 萬立方米，相等於 24 個標準游泳池
Capacity of 60,000m³, equivalent to 24 standard swimming pools
- **泵房 Pump House**
最高排洪量每秒 1.5 立方米
Peak discharge capacity 1.5 m³/s
- **雙管道箱形暗渠 Twin-cell Box Culvert**
長約 650 米，每管道內枉高 2 米、闊 4 米
Approximately 650m long, with internal cell dimensions 2m(H) x 4m(W)
- **球場草坪復修及園藝工程 Re-provision of the Sport Pitches and Landscaping**

- 核准工程預算 Approved Project Estimate
10 億 6,580 萬元 \$1,065.8 million
- 開展日期 Commencement Date: 2012
- 啟用日期 Commission Date: 2017

工程效益 Project Benefits

- 蓄洪池自啟用後已多次於暴雨及颱風中發揮作用，保護跑馬地及鄰近地區免受水浸影響。

The storage tank has played a vital role in several severe rainstorm and typhoon events since its commissioning to protect Happy Valley and its adjacent areas from flood threat.

- 透過把一地多用、海綿城市及可持續發展的概念充分應用到工程設計上，令工程在防洪以外亦為社區及市民提供一個更宜居的公共空間。

By adopting the concepts of "co-use of land", "sponge city" and "sustainable development" to the design, the project not only achieves flood prevention, but also provides a more livable public space to the community.



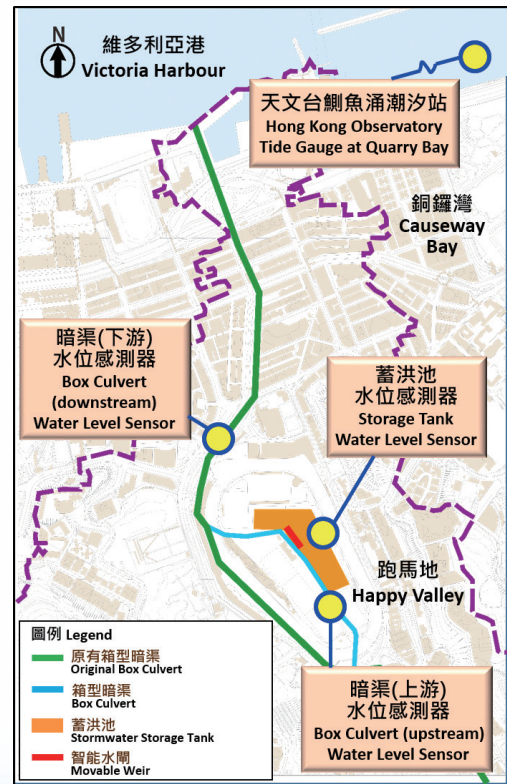
智能水閘 (即可調式溢流堰) Movable Weir

跑馬地地下蓄洪計劃是香港首個結合「智能水閘」及「數據採集與監控」系統的蓄洪設施，其設計可有效降低建築成本和時間，及節省操作耗能，防洪與環保並重。

The HVUSSS is Hong Kong's first storage tank provided with a "Movable Weir" that works in connection with a "Supervisory Control and Data Acquisition" (SCADA) system. This design effectively lowers construction cost and time, as well as operation power consumption, addresses flood prevention and environmental concerns in tandem.

設計及操作 Design and Operation

透過「數據採集與監控」系統實時監察潮水，蓄洪池內及位於其上下游箱形暗渠裏的水位，自動控制溢流堰升降，令蓄洪池能在最適當時間啟動儲存上游集水區的部分雨水。Through the SCADA system, the positioning of the Movable Weir is controlled based on the real-time tidal level, water levels inside the storage tank, and upstream and downstream of water level in the box culvert. This allows overflowing of stormwater from the box culvert to the storage tank to be invoked at the most optimal time.



對比傳統的固定式溢流堰，這個設計可避免暗渠過早或過遲溢流到蓄洪池，確保蓄洪池發揮最大功能，藉此減少蓄洪池所需的設計容量。

Compared to the conventional fixed-weir design, the Movable Weir prevents pre-mature or belated filling of the storage tank, thereby maximizing the effectiveness of the storage tank and reducing the required design tank volume.

微雨/晴天 Light Rain/Sunny Day



暴雨 Heavy Rain



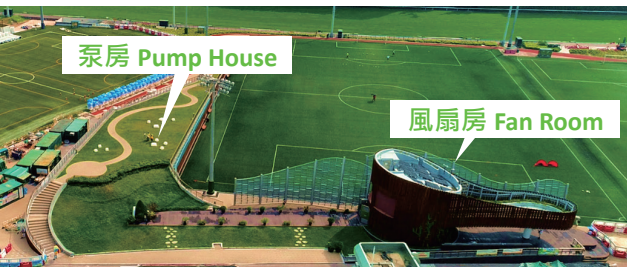
暴雨過後 After Heavy Rain



此外，蓄洪池採用了淺缸設計，隨著暴雨過後下游暗渠水位下降，「智能水閘」可進一步開啟，讓蓄洪池內約三分之一的雨水能以自然回流形式往暗渠排放，減少以水泵抽排的需要。

Furthermore, the storage tank is of a shallow-depth design. After heavy rain, as water level in the downstream box culvert subsides, the Movable Weir can be lowered further to allow about one-third of the stored stormwater to be discharged by gravity back to the box culvert, reducing the need for pumping.

可持續發展的設計 Sustainable Design



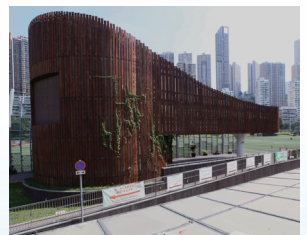
泵房 Pump House

在泵房上鋪設一個小山坡，並蓋以柔軟的真草，既可為泵房隔熱，亦可為公眾提供一個舒適恬靜的休閒空間，及作為欣賞跑馬地運動場內遼闊景觀的瞭望台。

A turfed slope is built on top of the Pump House, which not only helps reducing indoor temperature, but also provides a serene public space as well as an open-air vantage point in the Happy Valley Recreation Ground.



風扇房 Fan Room



風扇房的外牆裝飾木有助增加建築物的美感，旁邊設有休憩用地，供公眾使用。Timber cladding mounts on the Fan Room adds to the building aesthetics. An outdoor sitting area is provided for public use.