



渠務署

Drainage Services Department

Blue-Green / Sponge City Concept: Adapting to Climate Change

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Drainage Services Department

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Harbourfront Commission

海濱事務委員會



Blue-Green / Sponge City Concept: Adapting to Climate Change

(1) INTRODUCTION

(2) BLUE-GREEN / SPONGE CITY CONCEPT

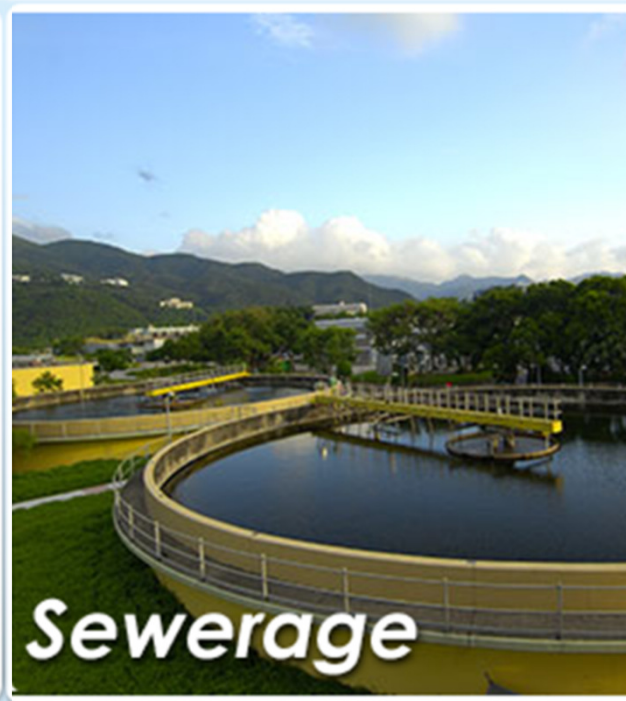
(3) OVERSEAS' EXPERIENCE

(4) WAY FORWARD

Drainage Services Department

DSD Vision

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



Flood Prevention Assets

Total Project Cost

~ **HK\$25 billion**



- ~2400 km Drains
- ~360 km River Channels
- ~ 21 km Drainage Tunnels (4 nos.)
- 3 nos. Stormwater Storage Tanks
- 27 nos. Village Polder Schemes



Drainage Tunnels



Underground Storage Tanks

Tai Hang Tung
100,000 m³



Sheung Wan
9,400 m³



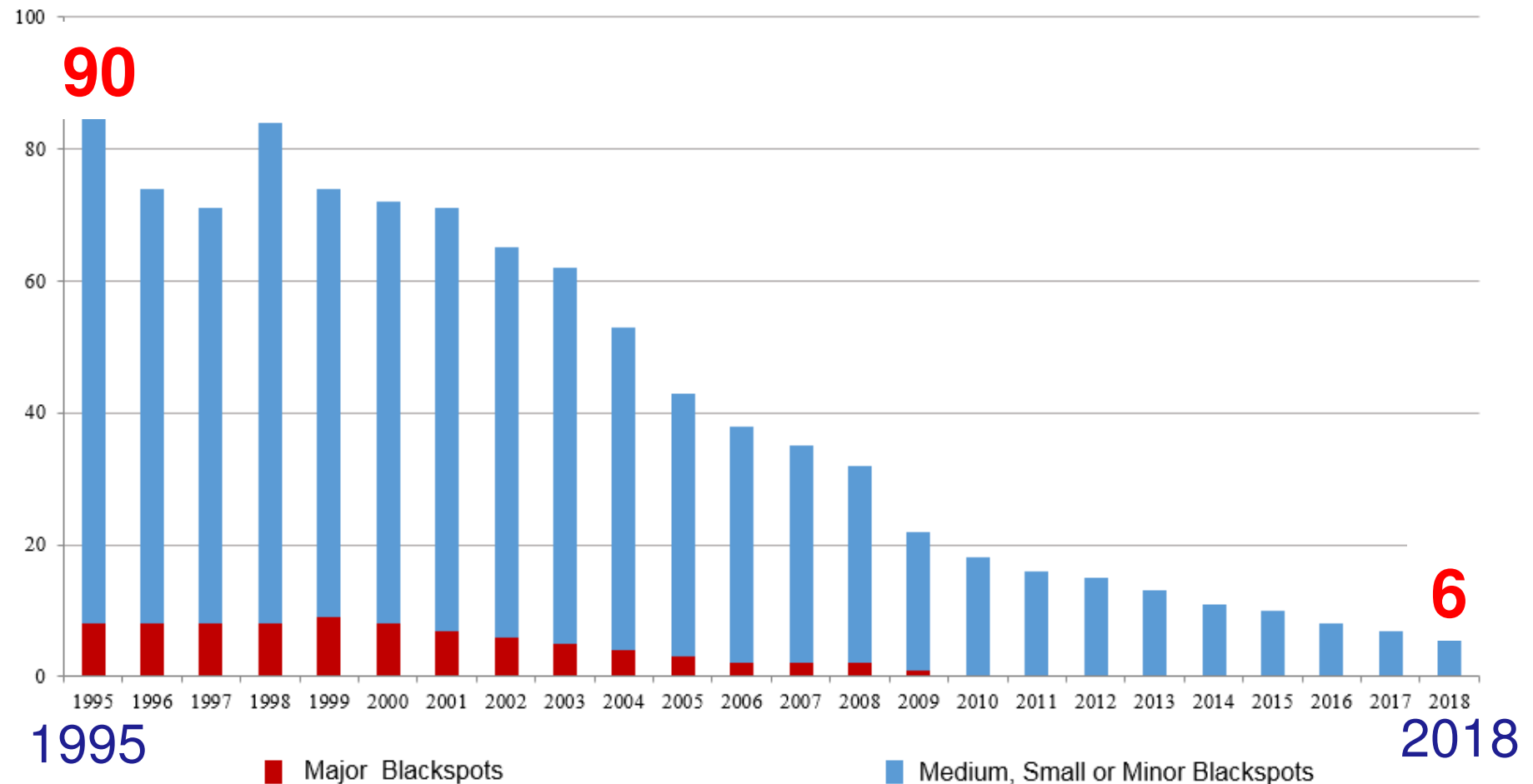
Happy Valley
60,000 m³



Flooding Blackspots (1995-2018)



Total Number of Flooding Blackspots



Annual Rainfall across Pacific Region



Climate is changing ?

Typhoon Hato (No. 10)
3 Aug 2017

Sea Flooding occurred in low-lying coastal areas



Tai O



Lei Yue Mun



Heng Fa Chuen

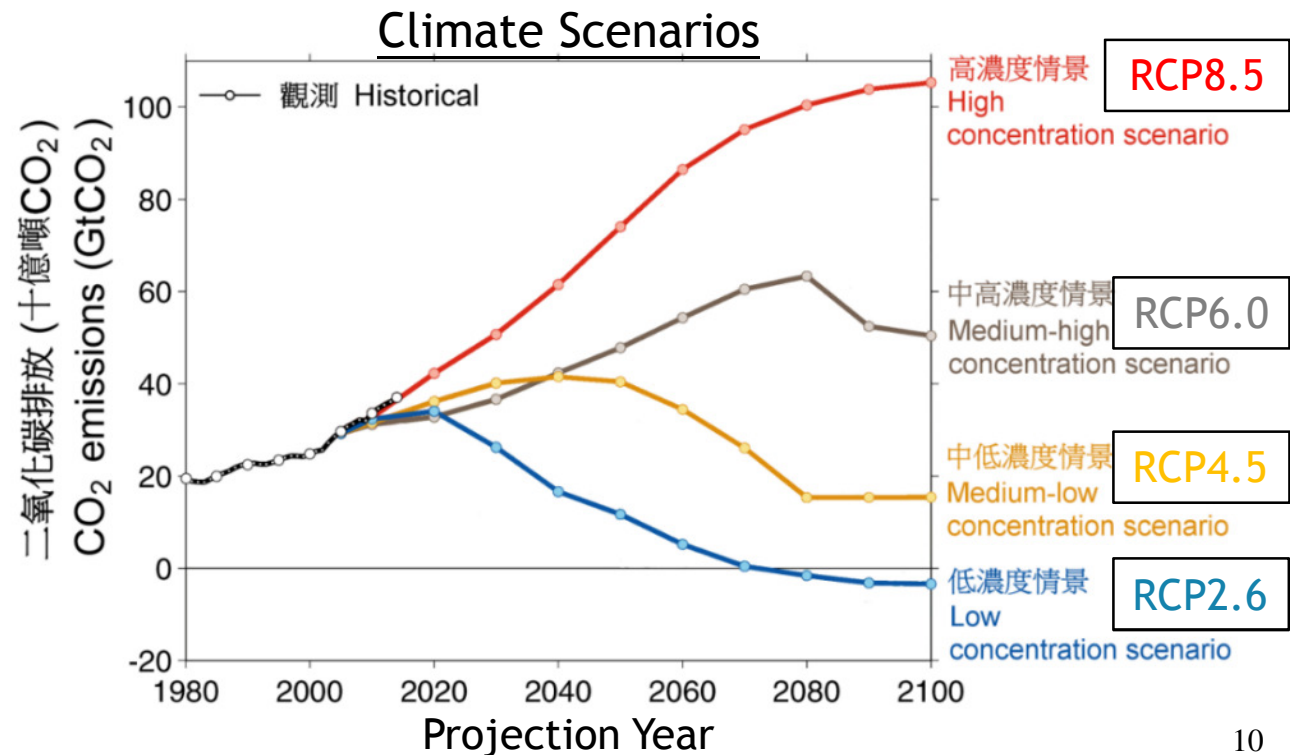
Sources: Social Media, Sing Tao News

Intergovernmental Panel on Climate Change

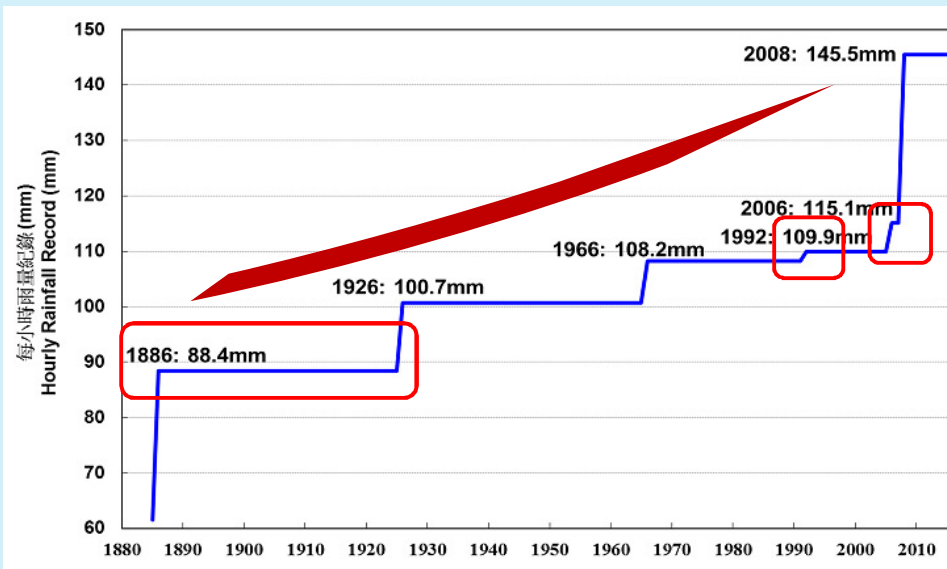


- Established in 1988 under the United Nations
- 195 member states
- Review and assess scientific reports on climate change
- In 2013, IPCC AR5 published 4 pre-determined RCPs scenarios

RCP - Representative Concentration Pathways

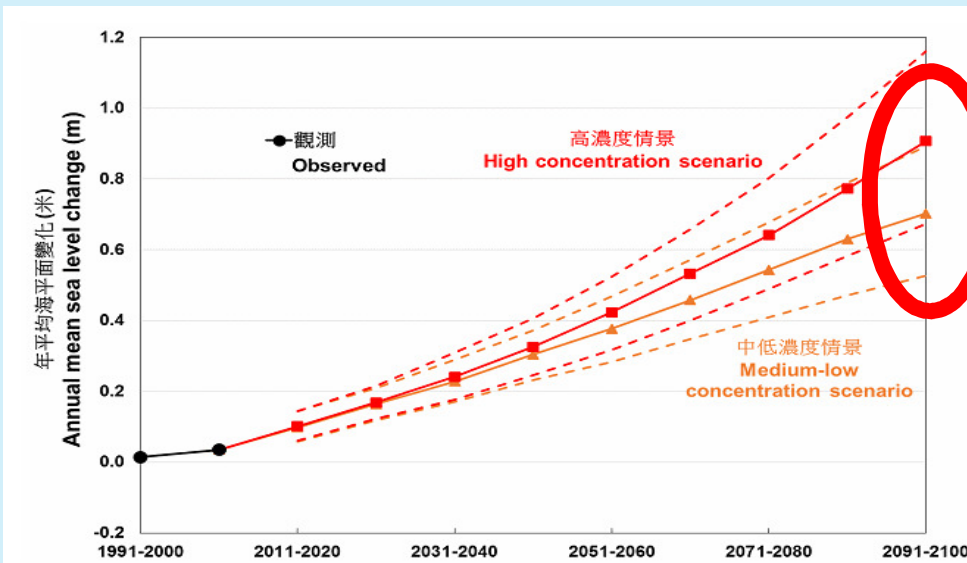


Climate Change Impact



HK Observatory's Record (1885 – 2017)
of Peak Hourly Rainfall Intensity

Record has been
broken frequently in
last few decades



HK Observatory's
Sea Level Rise Projection

700mm-900mm
sea level rise by
year 2100

Source:

Hong Kong Observatory - http://www.hko.gov.hk/climate_change/proj_hk_msl_e.htm



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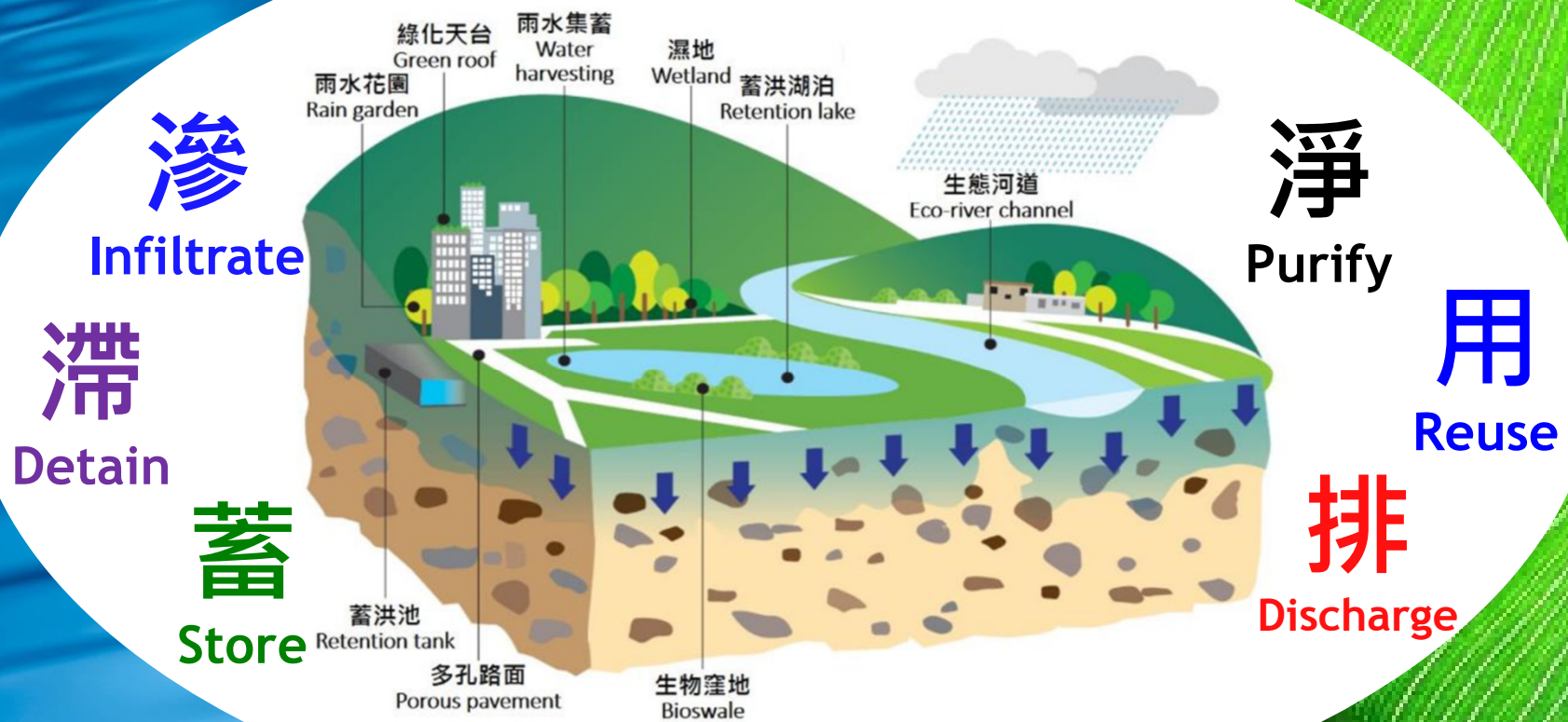
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Blue-Green / Sponge City

BLUE
Rivers and
water bodies

GREEN
Greening and
landscaping



Worldwide Similar Concept

Country	Concept	
Australia 	Water Sensitive Urban Design (WSUD)	
China 	Sponge City (海绵城市)	
Singapore 	Active Beautiful Clean Water (ABC Water)	
UK 	Sustainable Drainage System (SuDS)	
USA 	Low Impact Development (LID) Best Management Practice (BMP)	

Blue-green Infrastructure



River Revitalization



Flood Retention Lake



Underground Storage Tank



Green Roof



Porous Pavement

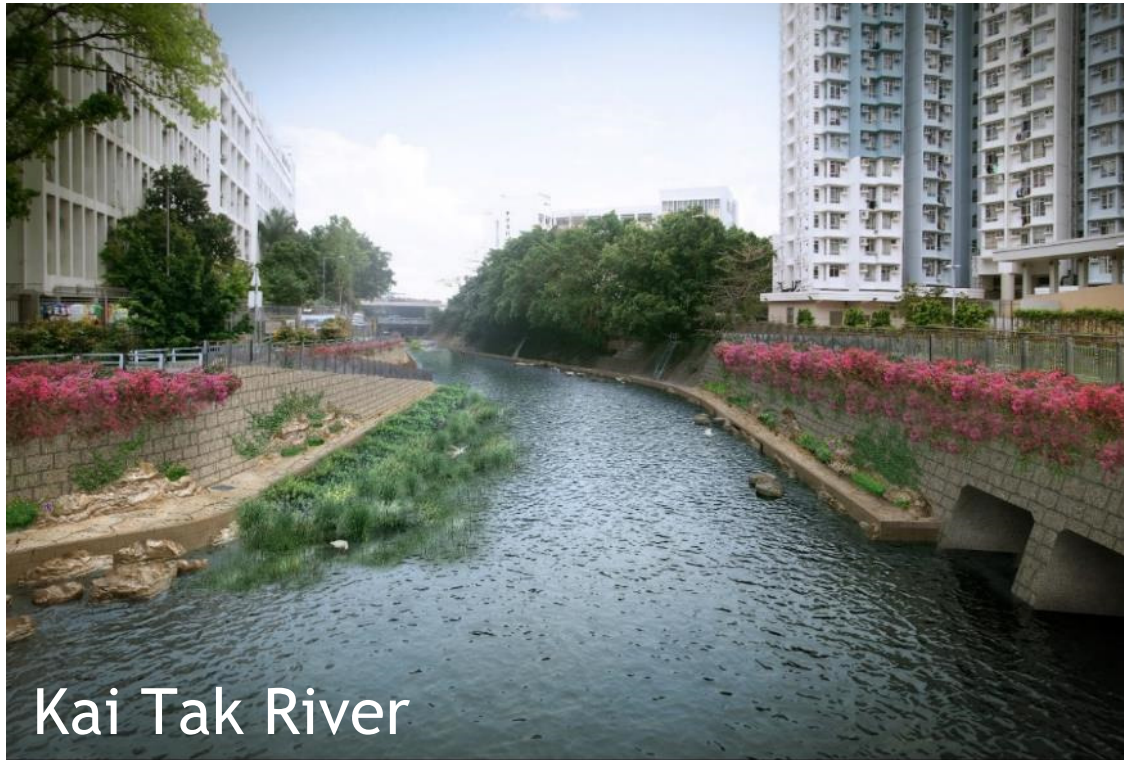


Water Harvesting



Bioswale

River Revitalisation



Kai Tak River



Upper Lam Tsuen River

Flood Retention Lake



Shenzhen
River Stage IV

Green Roof



- Installed green roof in 70 facilities
- Total green roof & surface area constructed: ~30,000 m²
- Annual increase: ~4,000 m²/yr



Water Harvesting

LAI CHI KOK DRAINAGE TUNNEL

Irrigation, Toilet Flushing,
Street Cleaning



HAPPY VALLEY UNDERGROUND STORMWATER STORAGE SCHEME

Irrigation, Toilet Flushing



Green Building

Kowloon City No. 1 Sewage Pumping Station



Rainwater Harvesting



Photovoltaic (PV) Panel



PLATINUM
鉑金級 NB 新建建築 V1.2 2017

HKGBC
BEAM Plus
綠建環評



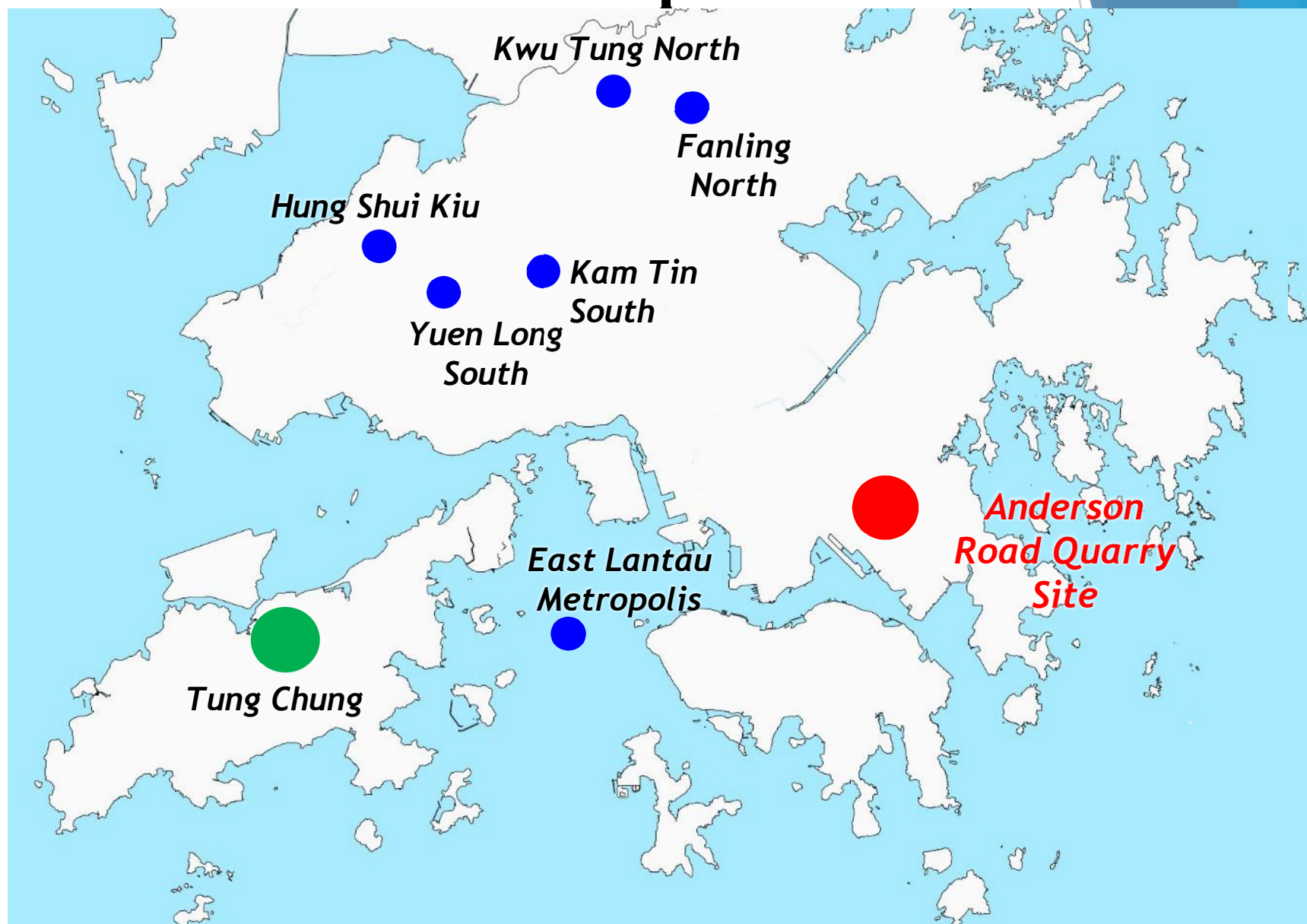
Green Roof



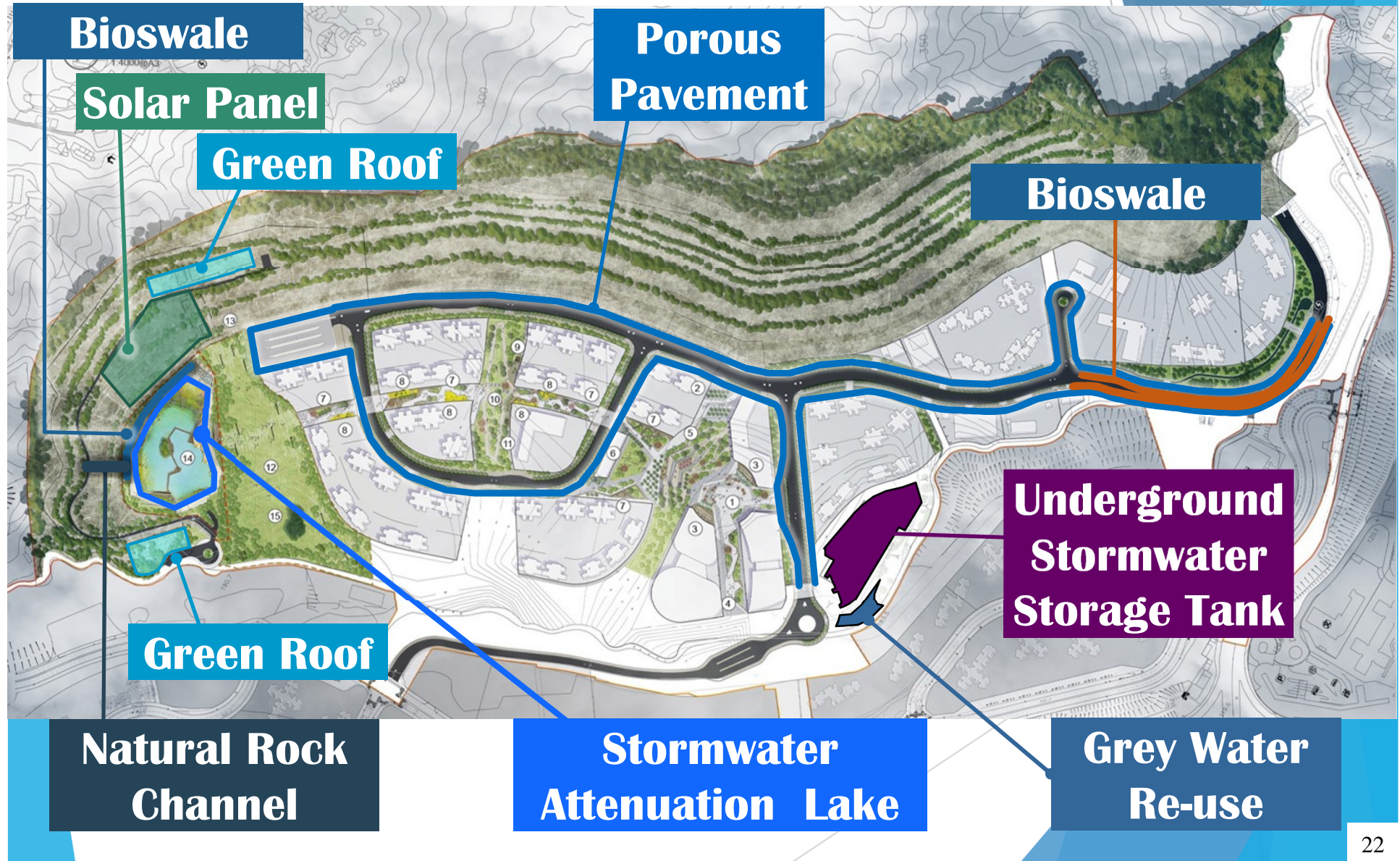
Porous Pavement



Blue-green Opportunities in New Development Areas

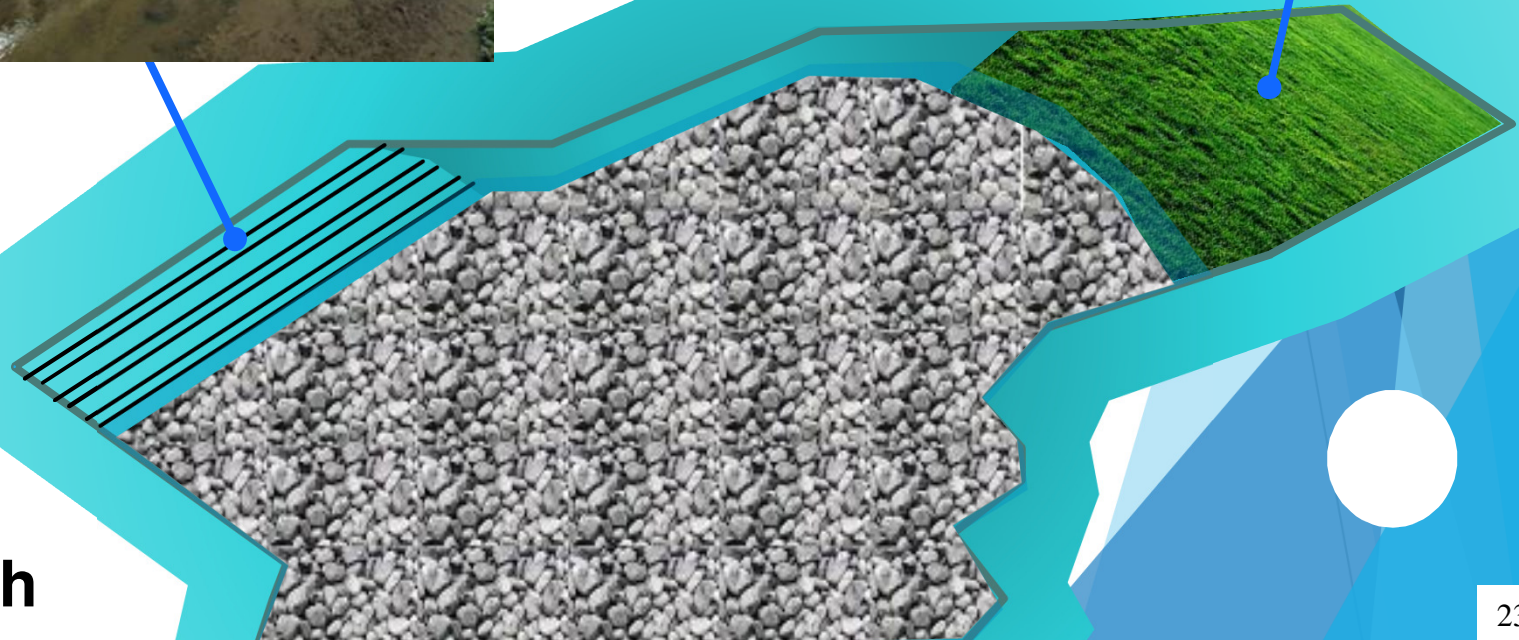
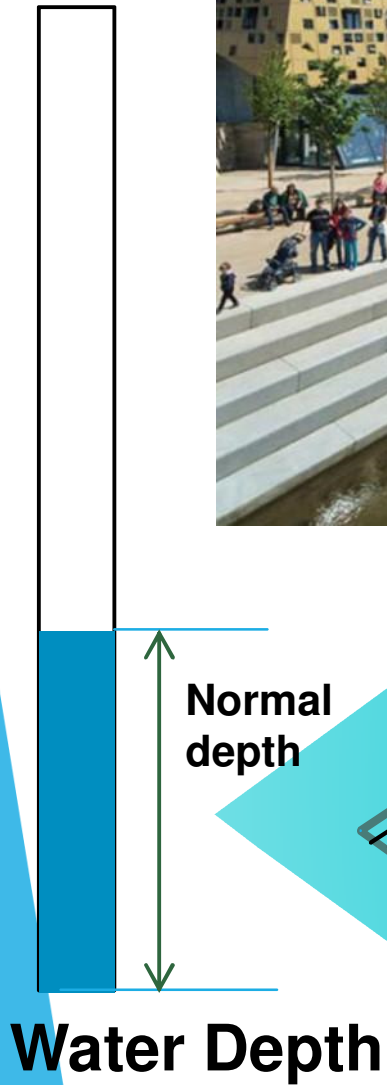


Blue-green Elements in Anderson Road Quarry (ARQ) Site



Flood Retention Lake

Normal Condition





Flood Retention Lake – Land Co-Use



Normal Condition AECOM



Flood Retention Lake – Land Co-Use



Flooded Condition



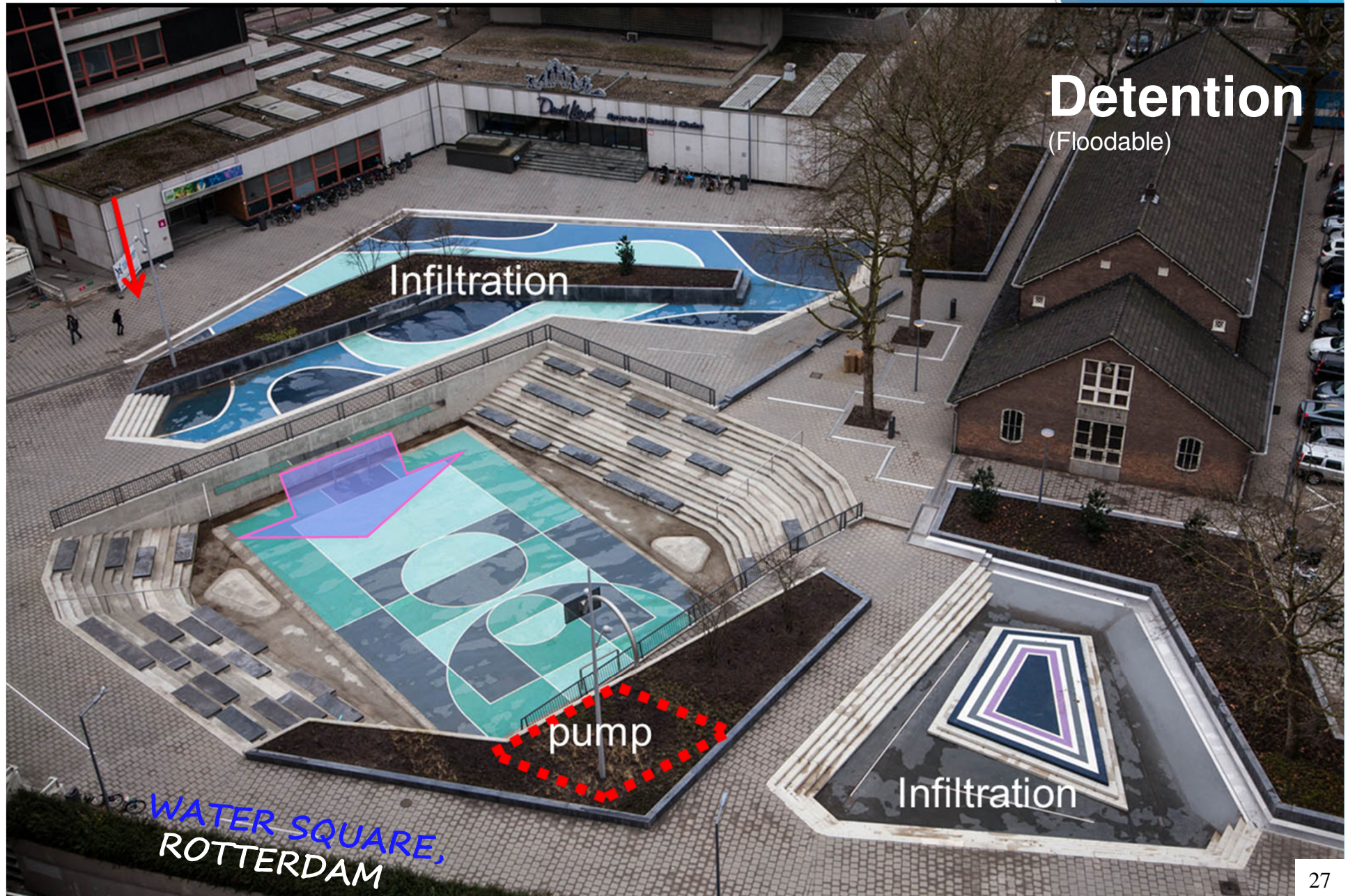
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Overseas Experience



Overseas Experience



Overseas Experience

Biofiltration (central divider)



Sydney

Biofiltration Rain Garden



Brisbane

Overseas Experience

深圳 - 福田河

Shenzhen - Futian River





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Revitalising Tsing Ping River



Existing Nullah



Tung Chung River Park



DSD Research & Development Forum



Academic Gathering



Collaboration with Green Groups



Connecting with Overseas Cities



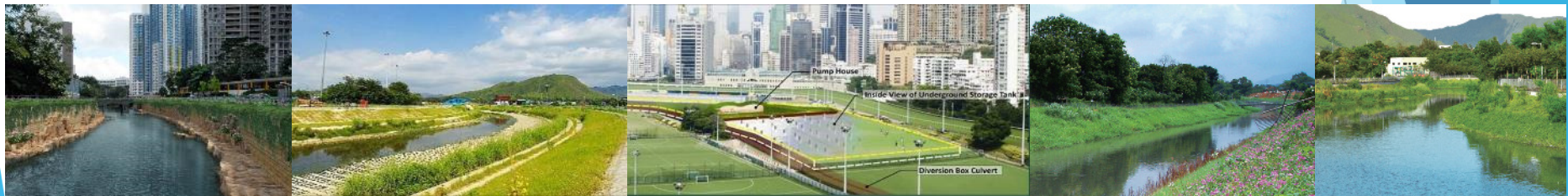
C40 Cities

Connecting Delta Cities





Building Flood Resilience By Blue-Green



Thank You !