



# First Stage of Desalination Plant at Tseung Kwan O

## Industry Briefing

23 May 2017



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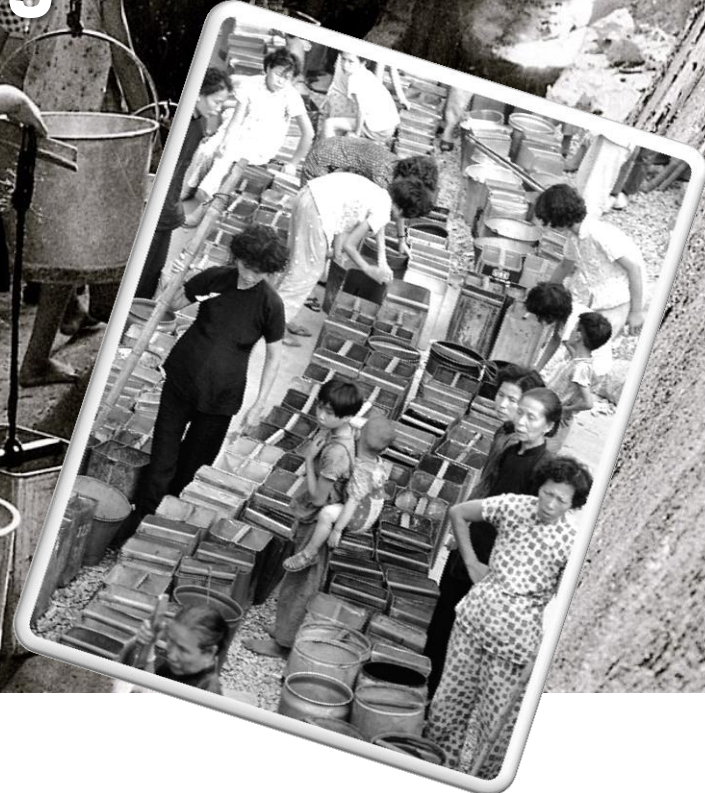
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# Agenda

- Introduction
- Project Overview
- Project Risks and Constraints
- Procurement Method
- Tendering
- Questions & Answers (45 minutes)

Is  
Hong Kong a  
**WATER-SCARCE**  
city?

Water Rationing in the 1960s



## Section 1: Introduction



# Diversification of Water Sources

## 現行三個水源 (3 Current Taps)



本地水源  
Local Yield



沖廁海水  
Seawater  
for Flushing



東江水  
Dongjiang  
Water



## 將來三個新水源 (Additional Three Future Taps)



海水化淡  
Desalinated  
Water



再造水  
Reclaimed  
Water



洗盥水/  
集蓄雨水  
Recycled Grey  
Water &  
Harvested  
Rainwater



## Section 2: Project Overview



# Roles of TKO Desalination Plant

## Primary role

- A climate-proof strategic facility to augment fresh water supply in the event of drought

## Secondary roles

- Enhance system-level resilience
- Augment fresh water supply in the event of short-term emergencies

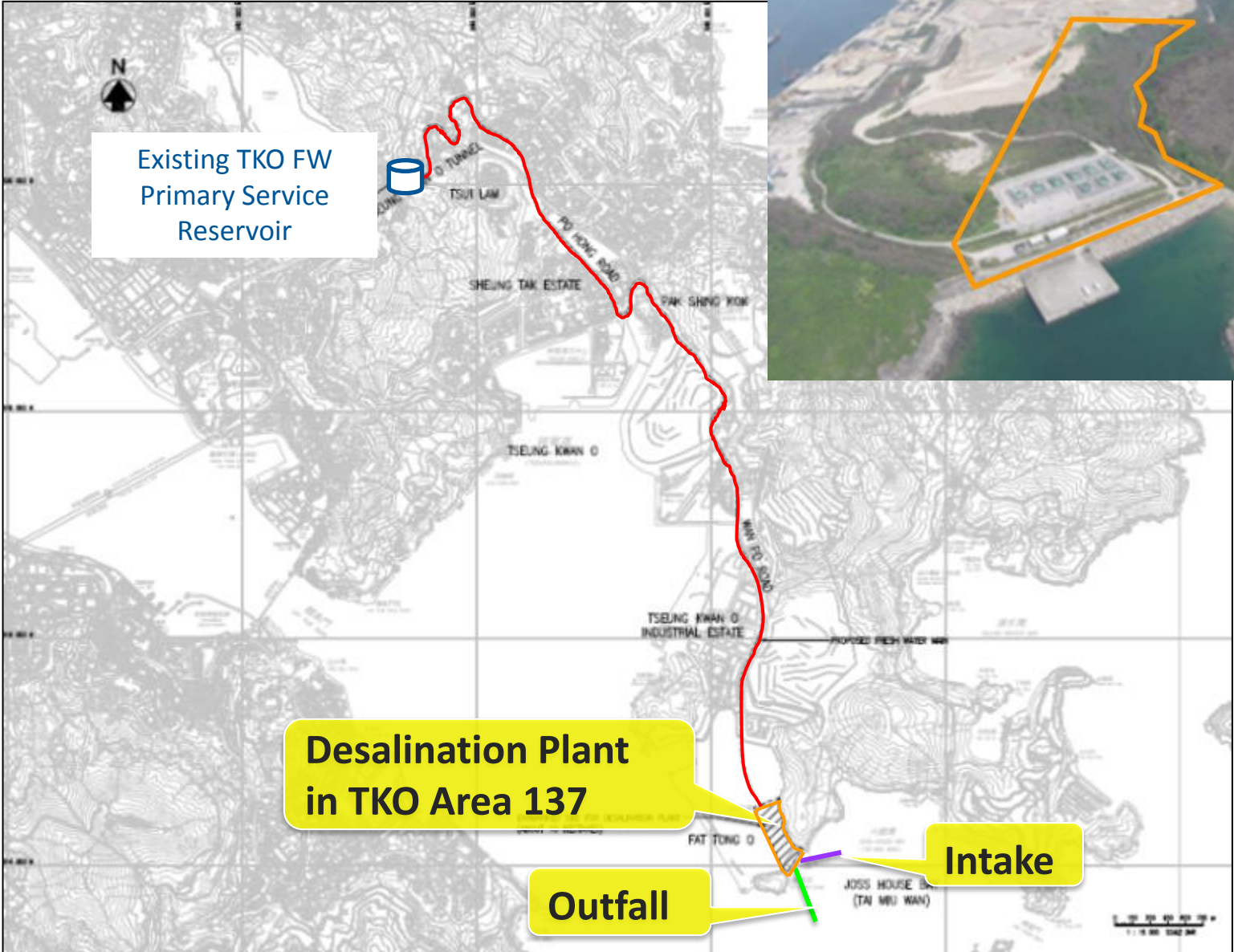


# Operating Mode & Plant Output

- **Operational flexibility to meet varying outputs**
  - Ability to ramp up production to design capacity within a short period (e.g., 24 hours)
- **Periodic testing**
  - At least once every year to confirm readiness for operating at full capacity



# Overall Scheme



**Legend:**

 Current Project Scope

 New Freshwater Main (by others)

# Project Information

- **Core Technology**
  - Reverse Osmosis
- **Phased Development**
  - Stage 1: 135MLD (The Project)
  - Ultimate: 270MLD Total (in future)
- **Both stages to be built within a 8ha site**
- **Stage 1 tentatively scheduled for commissioning by end of 2021**

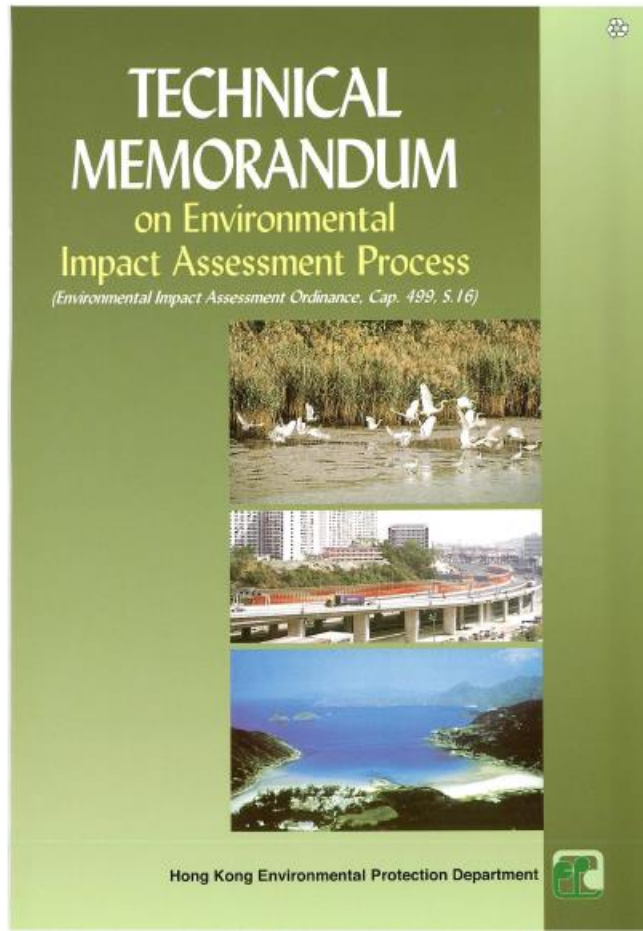




# The Site and Surroundings



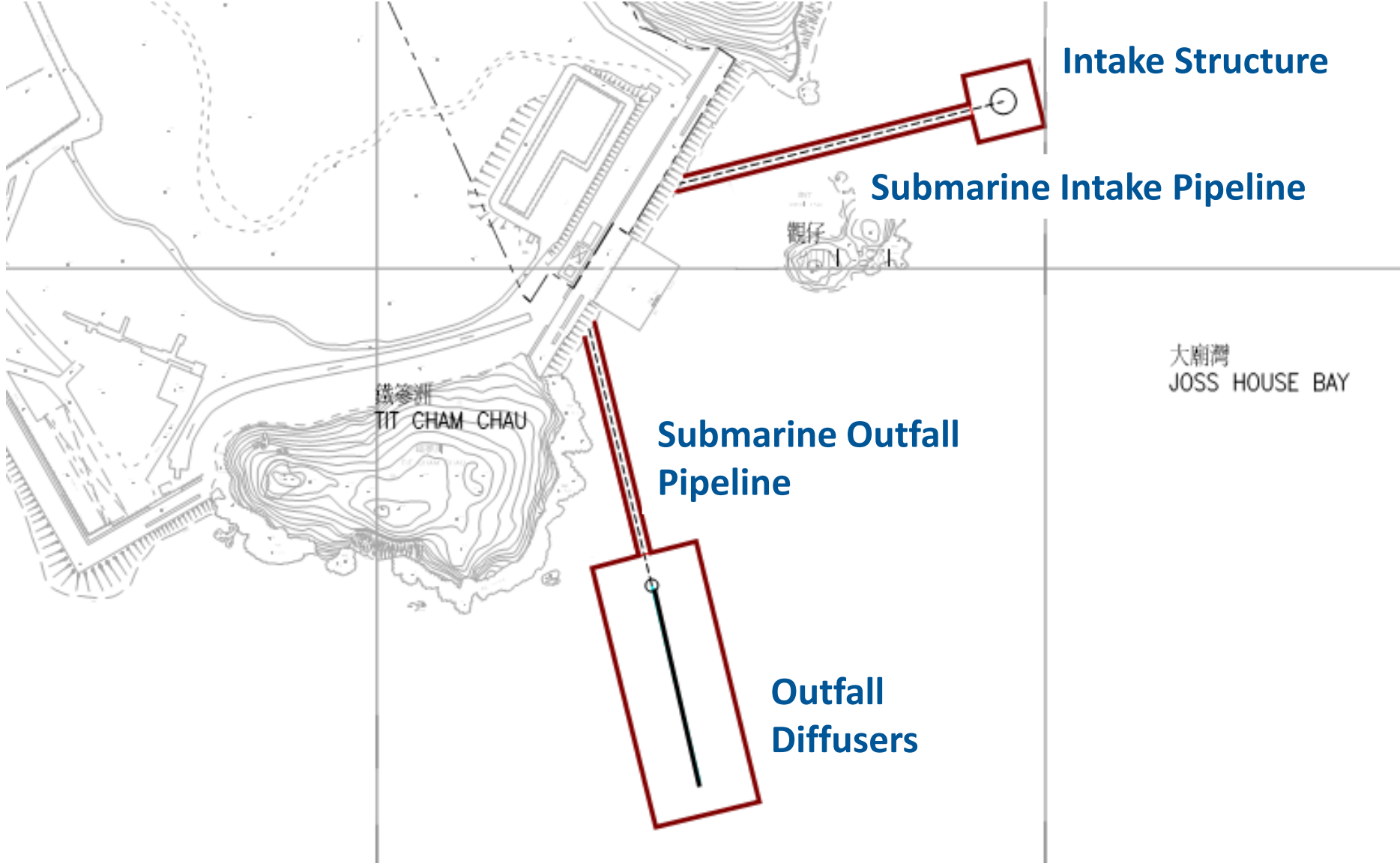
# Environmental Permitting



- Environmental Permit (EP) granted in December 2015
- Approved EIA Report available at:
  - <https://www.tkodesal.hk>
- Approval from the Environmental Protection Department is required for design changes



# Intake & Outfall



Marine works authorised under the Foreshore and Sea-bed (Reclamations) Ordinance

# Mandatory Requirements

## Fresh Water Quality

- Boron  $\leq 1.0$  mg/L
- Bromide  $\leq 0.2$  mg/L
- TDS  $< 250$ mg/L

## On-site Generation of Chlorine Gas for Final Disinfection

- Chlor-alkali process
- High-purity grade salt as feedstock

## Operation & Maintenance Skill Transfer

- Through a structured secondment programme

## BEAM Plus

- Minimum Gold Rating





## Other Requirements

### Architectural Treatment

- Must “blend in” with country park and future developments in TKO Area 137

### Use of Renewable Energy

- Solar
- Landfill Gas





## Section 3: Risks and Constraints

# Seawater Quality

## Seawater quality parameters for which the plant must be able to operate to meet full performance requirements

Parameter	Value
Temperature	15 to 30 °C
Total Suspended Solids	≤ 30 mg/L
Total Dissolved Solids	≤ 38,740 mg/L
Bromide	≤ 80 mg/L
Boron	≤ 5.3 mg/L

Red tide events could occur occasionally; plant output may be relaxed during such periods



# Site Apportionment and Hand Over



Access Road

Stage 2 site  
(Handover  
within 2<sup>nd</sup> year )

Stage 1 site  
(Handover  
within 1<sup>st</sup> year)

Stage 1 site  
(Handover upon  
commencement)

# Construction Access

Shared Access with the Existing Pier Operations (explosive handling by Mines Division of CEDD )

Desalination Contractor shall not hinder CEDD/Mines explosive transport





# Co-Use of Pier during Construction and Operation



***Influence Zone*** wrt loading  
***/unloading of explosives by***  
***Mines Division***

- Use of pier subject to conditions imposed by CEDD/Mines
  - No activities at pier between 11am and 1pm each day
  - 3 days advanced notice on scheduled use of pier
  - No stockpiling of plant and materials at the pier



# Key Statutory Approvals



環境保護署  
Environmental Protection Department

- **Environmental Impact Assessment Ordinance (EIAO)**
  - Compliance with EP requirements
  - Variations to Environmental Permit (VEP) for non-material changes
  - Supplementary EIA for “material” changes



Fire Services Department  
The Government of the Hong Kong Special Administrative Region

- **Compliance with Fire Services Department’s**
  - Codes of Practice for “Minimum Fire Service Installations and Equipment” and “Inspection, Testing and Maintenance of Installations and Equipment”

# Other Risks and Constraints

- Stringent requirements on importation of skilled labour
- Presence of plant species of conservation interest in the Clear Water Bay Country Park
- Presence of coral communities and fisheries resources
- Working in and around an operating “fill bank”
- Requirements on CO2 storage area
- Requirements on the footprint, location and construction programme of CLP (power supply company) substation



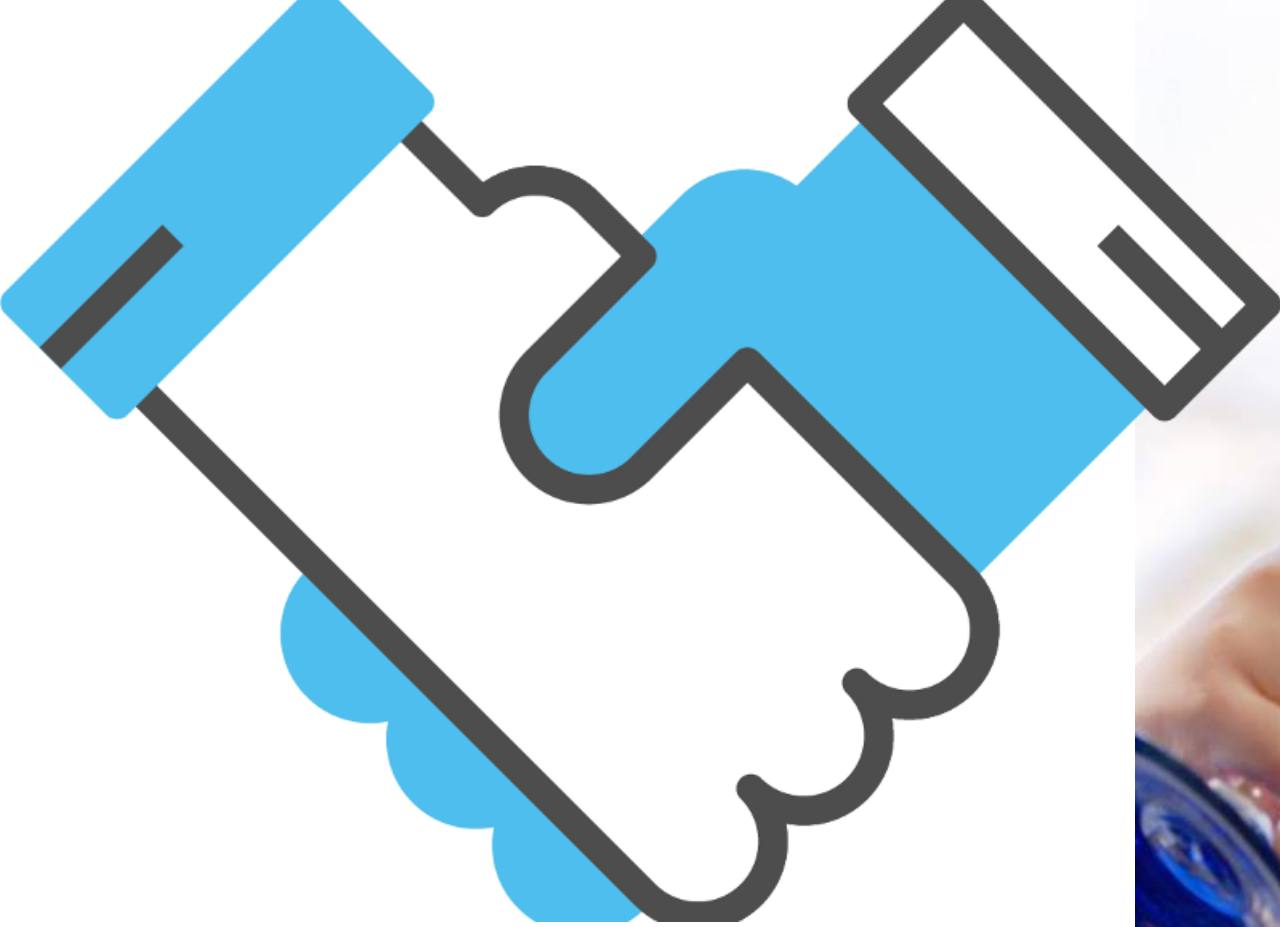
**Slope mitigation measures to follow detailed design provided by the Employer**

- Flexible barrier
- Rock dowels
- Boulder removal

## **Other Requirements**

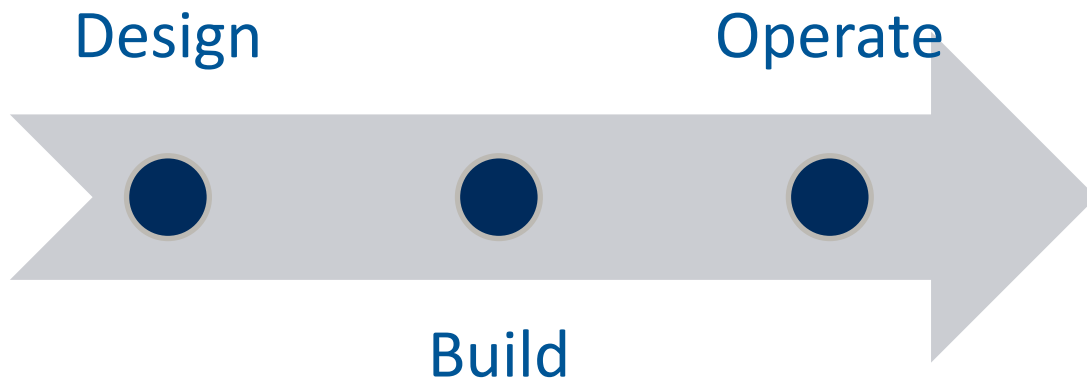
- Natural terrain hazards mitigation measures approved by GEO
- Building height limitation per Environmental Permit
- 90-day chemical storage for stage 1 plant
- Sizing of chlorine contact tank(s) per WSD requirements
- BIM with asset management





## Section 4: Procurement Method

# Proposed Project Delivery Model



- **Time for Completion of Design/Build Phase**
  - 28 months + allowance for inclement weather
- **Operations Term:**
  - 10 years (base)
  - Additional optional extension of 5 years (at WSD's sole discretion)

# Proposed Commercial Model



**Contract  
Payments**

**Design Build  
Phase**

**Lump Sum,  
milestones**

**Operations  
Phase**

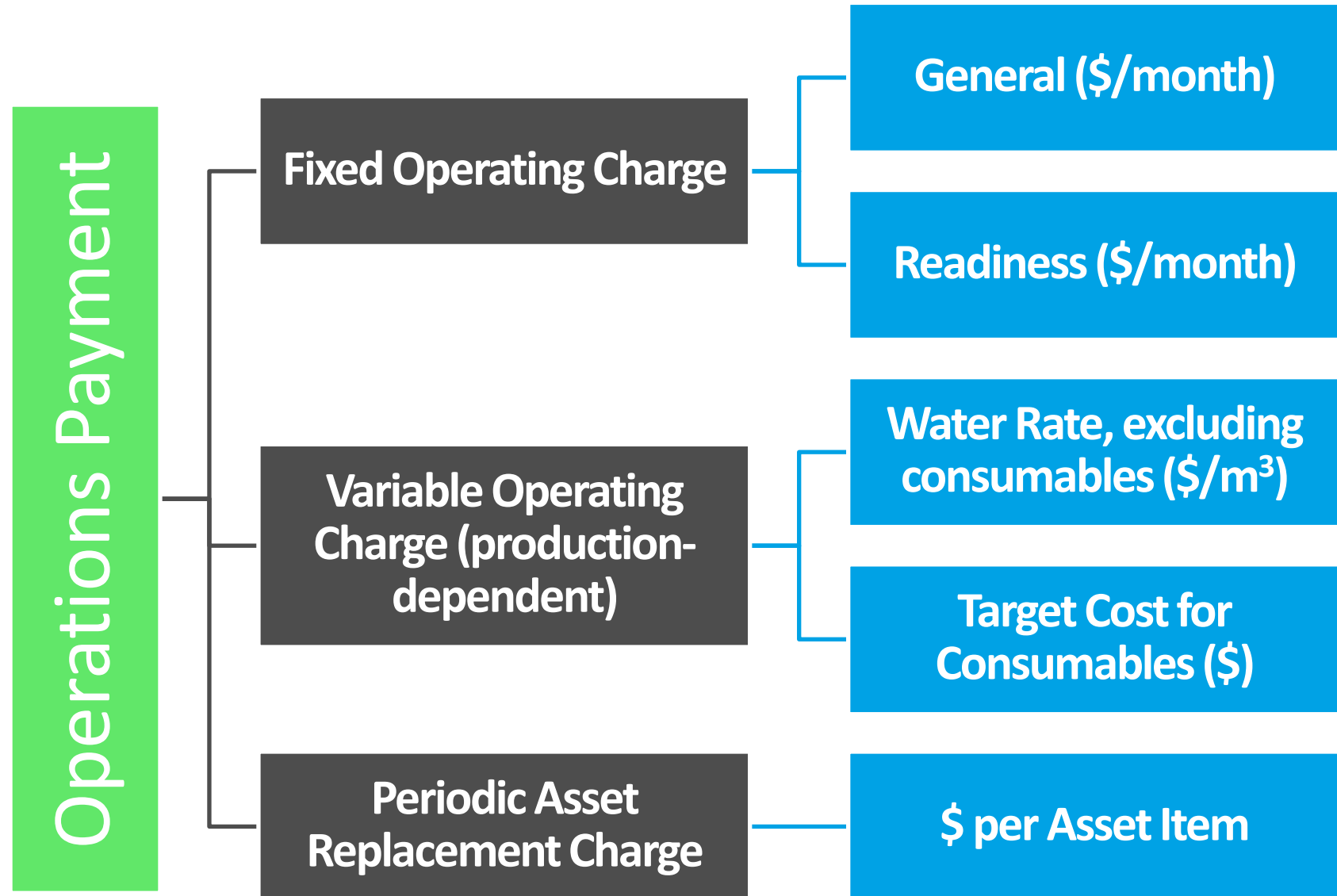
**Fixed  
Operating Costs**

**Variable  
Operating Costs**

**Asset  
Replacement**



# Proposed Hybrid Operations Payment Model





## Section 5: Tendering

# Tender Process and Tentative Timeline

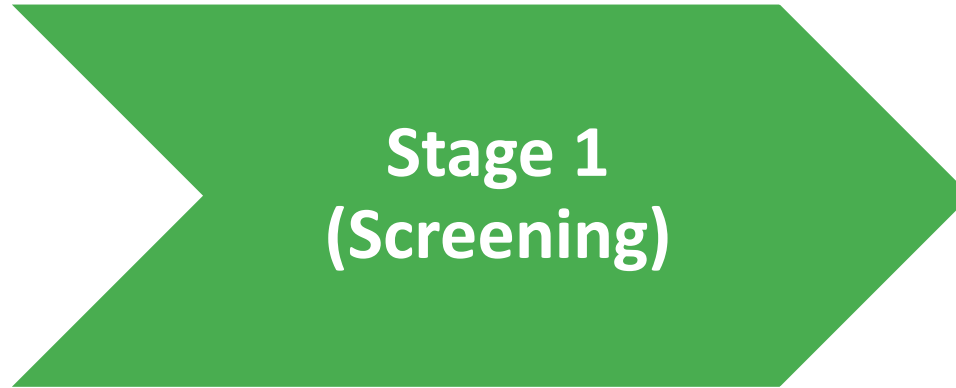


\* Date is tentative and if everything is smooth and is subject to relevant approval

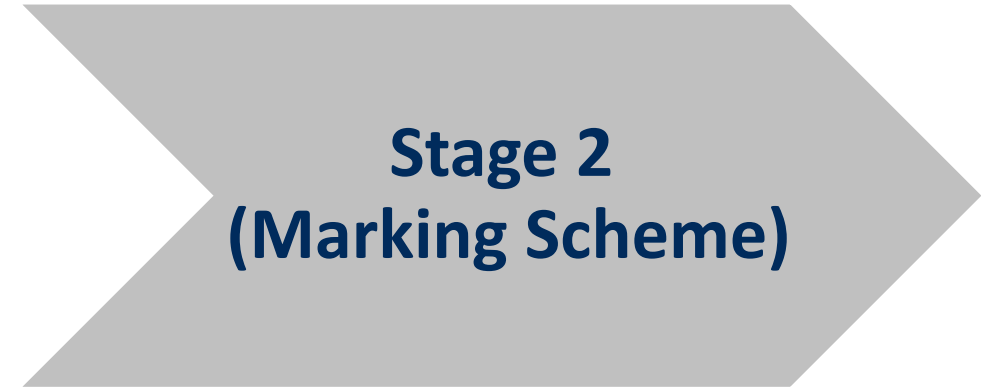




## Prequalification Process



- Yes/No questions
- Minimum experience requirements of applicants
- Applicants not passing the screening criteria will not be further assessed



- Project experience
- Work methodology
- Proposed resources
- Past performance in local projects
- Top 4 applicants will be shortlisted

# Screening Criterion 1

*(tentative, subject to change)*

- One or more “equivalent relevant” contract for **design and construction** of SWRO desalination facility(ies)
  - Design capacity  $\geq$  50 MLD; **AND**
  - Design and construction part of the contract completed within the past 10 years from PQ closing date or is currently being undertaken
- **No. of past contracts will be discounted**
  - % financial participation in referenced contract, if undertaken as part of a JV
  - % financial participation, if applicant is part of a JV for TKO

## Screening Criterion 2

*(tentative, subject to change)*

- **One or more equivalent relevant contract for operation and maintenance of SWRO desalination facility(ies)**
  - Design capacity  $\geq$  50 MLD; **AND**
  - Operation and maintenance part of the contract has a continuous period  $\geq$  2 years carried out within the past 10 years from PQ closing date or is currently being undertaken
- **No. of past contracts**
  - Will not be counted if applicant has  $<$  25% of financial participation in the claimed contract experience
  - Will be discounted according to % financial participation if applicant is part of a JV proposed for TKO



## Screening Criterion 3

*(tentative, subject to change)*

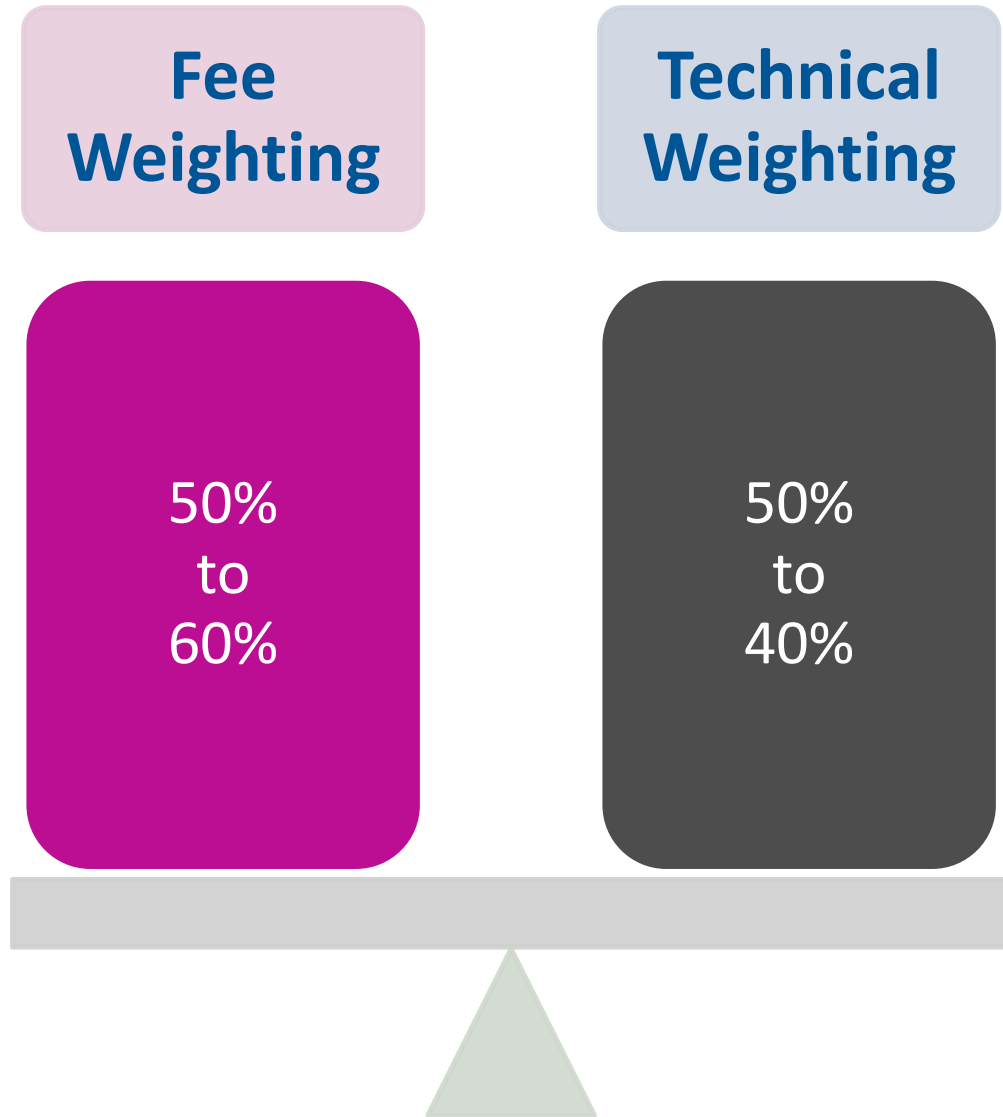
- **One or more equivalent local civil engineering and/or building contract**
  - Awarded contract sum  $\geq$  HK\$500 million
  - Completed within the past 10 years from PQ closing date
- **No. of past contracts to be discounted**
  - % financial participation in the referenced contract, if undertaken as part of a JV
  - % financial participation, if applicant is part of a JV proposed for TKO

## Common Pitfalls

- Misspelling of Contract Names and Personnel
- Inconsistencies in submitted documentations
- Uncertified documents
- Incorrect Dates

**Uncertified documentation will be disregarded  
Inconsistent / insufficient information may be disregarded**

# Tender Evaluation



- **Two-envelope system**
- **Technical Proposal will be evaluated and finalised, prior to reviewing the Fee Proposal**
- **Weighting of Proposals, to be determined**



# Typical Tender Marking Scheme

Assessment Criteria	Sub-criteria	Marks	
		Maximum	Passing
A.	Price (See item 1 of Annex I)		
	1.1 Tender Price	600	--
	<b>Maximum Price Mark</b>	600	

	Assessment Criteria	Marks	
		Maximum	Passing
<b>B.</b>	<b>NON-PRICE</b>		
	1.0 Design and construction of the Works		
	2.0 Operation		
	3.0 Project Management and Human Resources		
	4.0 Environmental Management, Quality, Safety and Health		
	5.0 Past Performance		
	<b>TOTAL</b>		

Refer to “Administrative Procedures 2015 for Use with the Government of the Hong Kong Special Administrative Region General Conditions of Contract for Design and Build Contracts 1999 Edition”

# Tseung Kwan O

## Desalination Plant

### News

02 May 2017

Industry Briefing Session  
to be held on 23 May  
2017

## Section 6: Questions & Answers

# THANK YOU

