

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 709 – WATERWORKS

Water Supplies – Salt water supplies

43WS – Uprating of Wan Chai salt water supply system

Members are invited to recommend to Finance Committee the upgrading of **43WS**, entitled “Uprating of Wan Chai salt water supply system”, to Category A at an estimated cost of \$271.1 million in money-of-the-day prices.

PROBLEM

At present, the existing supply system cannot meet the demand on salt water for flushing in Wan Chai and mid-level areas, Central. The shortfall in salt water supply is being met by fresh water as a temporary measure.

PROPOSAL

2. The Director of Water Supplies, with the support of the Secretary for Development, proposes to upgrade **43WS** to Category A at an estimated cost of \$271.1 million in money-of-the-day (MOD) prices to enhance the existing salt water supply system for Wan Chai, Causeway Bay and Happy Valley, and to extend the system to provide salt water to Bowen Road areas in mid-levels, Central for flushing.

PROJECT SCOPE AND NATURE

3. The scope of works under **43WS** comprises –
- (a) laying of approximately 7 kilometres (km) of salt water mains of sizes from 80 millimetres (mm) to 800 mm in diameter;
 - (b) provision of a roof cover to the existing Bowen Drive salt water service reservoir (SWSR);
 - (c) construction of a salt water pumping station (SWPS) at Bowen Drive with a pumping capacity of 7 200 cubic metres (m³) per day; and
 - (d) construction of a SWSR with a capacity of 2 400 m³ at Magazine Gap Road (with a proposed access road) and demolition of a decommissioned fresh water service reservoir at the same location.

————— 4. A site plan showing the proposed works is at Enclosure 1. Photomontages showing the proposed roof cover to the existing Bowen Drive SWSR, the Magazine Gap Road SWSR and the Bowen Drive SWPS are at
————— Enclosure 2.

5. We plan to implement the proposed works in two stages. The first stage, planned to start in November 2009, is for the laying of the proposed salt water mains. The second stage comprising construction of the remaining works is planned to start in early 2010. All the proposed works are scheduled for completion in December 2014.

JUSTIFICATION

6. At present, the salt water supply to Wan Chai, Causeway Bay and Happy Valley is drawn from the Wan Chai seafront by the existing Wan Chai SWPS and then conveyed to the Bowen Drive SWSR while supplying salt water to users en route. The areas supplied by this system are shown as Area 1 in Enclosure 1. The current demand in these areas is about 38 900 m³ per day and

is anticipated to increase to 42 300 m³ per day upon completion of planned developments in the areas. On the other hand, the capacity of the existing supply system is only about 33 000 m³ per day. The current shortfall of 5 900 m³ salt water supply is being met by fresh water as a temporary measure. Such shortfall will increase to 9 300 m³ should no improvement works are to be implemented. From cost and water conservation considerations, there is a need to increase the capacity of the existing salt water supply system by 25 000 m³ to 58 000 m³ by uprating the existing Wan Chai SWPS and laying additional salt water mains in the areas.

7. As the existing Wan Chai SWPS will need to be relocated to facilitate construction of the Wan Chai Development Phase II (WDII) project, the proposed SWPS uprating works, together with part of the mainlaying works which falls within WDII project boundary, will be constructed under the WDII project to avoid construction interfaces. Funding for these SWPS uprating and mainlaying works is separately sought by the Civil Engineering and Development Department as part of the WDII project (vide PWSC(2009-10)53). The remaining part of the mainlaying works outside the WDII project boundary is included under **43WS** to allow construction to proceed in parallel with the waterworks facilities to be implemented under WDII project.

8. Besides, the existing Bowen Drive SWSR which was built in 1987 is not provided with a roof cover. Though the reservoir is fenced off at present, there are occasional trespassers. For safety reason, we propose to provide a roof cover to the reservoir.

9. Separately, there is at present no salt water supply to Bowen Road areas in mid-levels, Central (Area 2 in Enclosure 1) and fresh water is being used there for flushing. In order to save fresh water, we propose the Wan Chai salt water supply system be extended by providing a new SWPS at Bowen Drive of a capacity of 7 200 m³ adjacent to the existing Bowen Drive SWSR, a new SWSR at Magazine Gap Road and laying the associated salt water mains in the area. Upon completion of the proposed works, the new Bowen Drive SWPS will draw water from the existing Bowen Drive SWSR for delivery to the proposed Magazine Gap Road SWSR while supplying salt water to users en route. This extended system will also help augment the inadequate salt water supply to the nearby area west of Garden Road between Conduit Road and Caine Road. The total estimated demand for salt water in these areas is about 6 000 m³ per day.

10. The site proposed for the Magazine Gap Road SWSR is currently occupied by a fresh water service reservoir which was already decommissioned in 1997 due to ageing and leakage problems. We propose to demolish it to make way for the construction of the new SWSR.

11. The proposed works described above is in line with our Total Water Management (TWM) strategy, one of the key elements of which is the extension of the use of salt water for flushing to achieve the objective of water conservation. Upon completion of the proposed works, about a total of 15 300 m³ of fresh water can be saved per day through conversion of fresh water flushing to salt water flushing.

FINANCIAL IMPLICATIONS

12. We estimate the capital cost of the proposed works to be \$271.1 million in MOD prices (see paragraph 13 below), made up as follows –

	\$ million
(a) Bowen Drive salt water pumping station	41.5
(i) civil works	18.2
(ii) electrical and mechanical works	23.3
(b) Demolition of Magazine Gap Road fresh water service reservoir	6.3
(c) Construction of Magazine Gap Road salt water service reservoir	31.4
(d) Roof cover to Bowen Drive salt water service reservoir	14.4
(e) Mainlaying	117.4
(i) 540 m with diameter 800 mm	22.1

/(ii)

	\$ million	
(ii) 510 m with diameter 600 mm	14.0	
(iii) 2 310 m with diameter 450 mm	43.6	
(iv) 3 640 m with diameter 300 mm or below	37.7	
(f) Greening works	0.6	
(g) Environmental mitigation measures	7.7	
(h) Contingencies	21.7	
Sub-total	241.0	(in September 2008 prices)
(i) Provision for price adjustment	30.1	
Total	271.1	(in MOD prices)

13. Subject to approval, we will phase the expenditure as follows –

Year	\$ million (Sept 2008)	Price adjustment factor	\$ million (MOD)
2009 – 2010	0.4	1.03500	0.4
2010 – 2011	12.6	1.05570	13.3
2011 – 2012	29.0	1.07681	31.2
2012 – 2013	49.7	1.09835	54.6
2013 – 2014	61.8	1.12032	69.2
2014 – 2015	50.0	1.15113	57.6
2015– 2016	26.5	1.18566	31.4
2016– 2017	11.0	1.22123	13.4
	241.0		271.1

14. We have derived the MOD estimates on the basis of the Government's latest forecast of trend rate of change in the prices of public sector building and construction output for the period 2009 to 2017. We will tender the proposed work items 3(b) to 3(d) on a remeasurement basis because of the extensive underground works which are subject to variation during construction. We will adopt a design-and-build (D&B) form of contract on a lump sum basis for the proposed work item 3(a) in view of the fact that the contractor can have more flexibilities to tackle traffic, utilities and other constraints during the mainlaying process in the urban areas. The contracts will provide for price adjustments.

15. We estimate the annual recurrent expenditure arising from this project to be \$6.0 million.

16. The project by itself will lead to an increase in production cost of water by 0.24% in real terms by 2014¹.

PUBLIC CONSULTATION

17. We consulted the Wan Chai District Council (WCDC) on 17 March 2009. Members agreed to the need of the proposed works and had no objection for the works to proceed. The Water Supplies Department would further consult WCDC when details of the construction arrangements are available.

18. We consulted the Traffic and Transport Committee of the Central and Western District Council on 16 April 2009. Members had no objection to the proposed works. The Water Supplies Department undertook to liaise with the Committee on the traffic arrangements during construction of the proposed works.

19. We consulted the Legislative Council Panel on Development on the proposed works by circulation of an information paper on 20 May 2009. Members raised no objection to the submission of the funding proposal to Public Works Subcommittee.

/ENVIRONMENTAL

¹ The increase in production cost of water is calculated at the present price level and on the assumption that the water demand remains static during the period from 2009 to 2014.

ENVIRONMENTAL IMPLICATIONS

20. This is not a designated project under the Environmental Impact Assessment Ordinance (Cap 499). We carried out a Preliminary Environmental Review (PER) in March 2009. The PER concluded that the project would not have any long-term environmental impacts. We will incorporate the implementation of standard pollution measures to mitigate short-term construction impacts in the works contracts.

21. For short term environmental impacts during construction, we will control noise, dust and site run-off within established standards and guidelines through implementation of environmental mitigation measures, such as frequent watering of site, the use of silenced construction plant and the use of movable noise barriers. We have included in paragraph 12(g) above a sum of \$7.7 million (in September 2008 prices) in the project estimate for implementation of these mitigation measures.

22. We have considered the alignment of the water mains, the layout and foundation level of the proposed pumping station and service reservoir in the planning and design stages to reduce the generation of construction waste where possible. In addition, we will require the contractor to reuse inert construction waste (e.g. excavated soil) on site or in other suitable construction sites as far as possible, in order to minimize the disposal of inert construction waste to public fill reception facilities. We will encourage the contractor to maximize the use of recycled or recyclable inert construction waste, as well as the use of non-timber formwork to further minimize the generation of construction waste.

23. We will also require the contractor to submit for approval a plan setting out the waste management measures, which will include appropriate mitigation means to avoid, reduce, reuse and recycle inert construction waste. We will ensure that the day-to-day operations on site comply with the approved plan. We will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. We will control the disposal of inert construction waste and non-inert construction waste to public fill reception facilities and landfills respectively through a trip-ticket system.

24. We estimate that the project will generate in total about 22 100 tonnes of construction waste. Of these, we will reuse about 7 100 tonnes (32.1%) of inert construction waste on site and deliver 14 500 tonnes (65.6%) of inert construction waste to public fill reception facilities² for subsequent reuse. In addition, we will dispose of 500 tonnes (2.3%) of non-inert construction waste at landfills. The total cost for accommodating construction waste at public fill reception facilities and landfill sites is estimated to be \$500,000 for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities and \$125/tonne³ at landfills).

TRAFFIC IMPLICATIONS

25. To minimize possible disruption to traffic during construction, we have completed the traffic impact assessment (TIA) for the proposed works. The TIA has concluded that the proposed works would not cause significant traffic impact. During construction, we will maintain smooth traffic flow through implementation of temporary traffic management measures, and will display notice boards on site to explain the reason of temporary traffic arrangements and the expected completion date of the concerned section of works. In addition, we will set up telephone hotlines for public enquiries or complaints. We will arrange to carry out construction works in busy road sections in non-peak hours. We will employ trenchless methods as far as practicable in particular for mainlaying works crossing the tramway.

26. We will establish a Traffic Management Liaison Group (TMLG) under the works contract to discuss, scrutinize and agree on the proposed temporary traffic management measures. We will invite representatives from Transport Department, Hong Kong Police Force, Highways Department, the relevant District Offices and public transport operators to attend the TMLG before implementing the works. The TMLG will take into account all relevant factors such as site restrictions, existing/future traffic conditions, pedestrian safety, access to buildings/shop fronts, and provision of emergency vehicle access in considering the temporary traffic arrangements.

/HERITAGE

² Public fill reception facilities are specified in Schedule 4 of the Waste Disposal (Charges for Disposal of Construction Waste) Regulation. Disposal of inert construction waste in public fill reception facilities requires a license issued by the Director of Civil Engineering and Development.

³ This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at \$90/m³), nor the cost to provide new landfills (which is likely to be more expensive) when the existing ones are filled.

HERITAGE IMPLICATIONS

27. The proposed works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interests and Government historic sites identified by the Antiquities and Monument Office.

LAND ACQUISITION

28. The project does not require any land acquisition.

BACKGROUND INFORMATION

29. We upgraded **43WS** to Category B in November 2002.

30. We have completed the design of the proposed works to be upgraded to Category A in paragraphs 3(b) to 3(d) above using in-house resources. We will implement the proposed works in paragraph 3(a) above through D&B contract.

31. The proposed works will involve the removal of 41 trees, including 40 trees to be felled and 1 important tree⁴ to be transplanted within the project site. Information of the important tree to be transplanted is provided at Enclosure 3. We will incorporate planting proposals as part of the project, including estimated quantities of 44 trees, 10 shrubs and 300 square metres of grassed area.

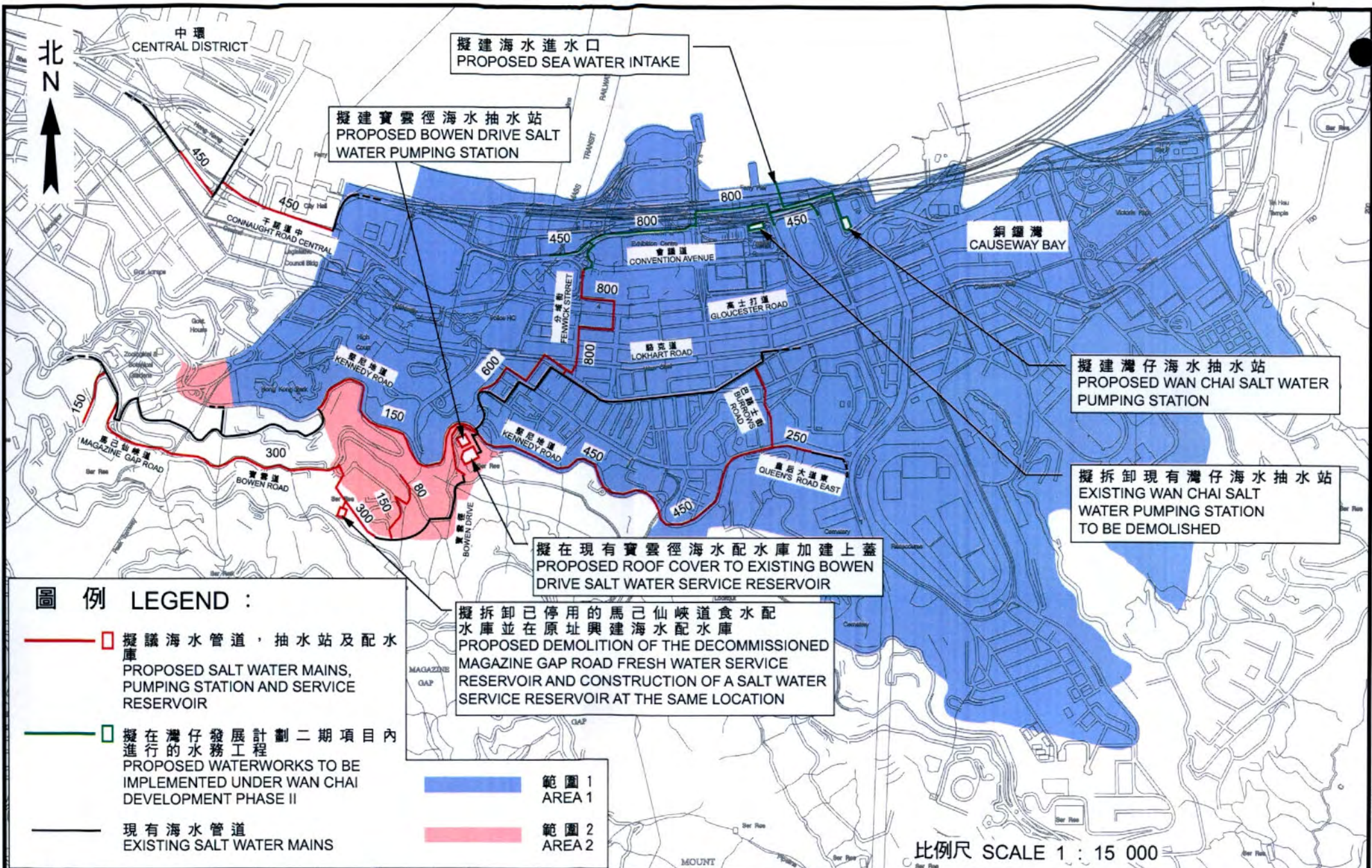
/32.

⁴ An "important tree" refers to trees on the Register of Old and Valuable Trees, and any other trees that meet one or more of the following criteria:

- (a) trees of 100 years old or above;
- (b) trees of cultural, historical or memorable significance e.g. Fung Shui trees, trees as landmark of monastery or heritage monument, and trees in memory of important persons or events;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall trees sizes, shape and any special features), e.g. trees with curtain like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 m (measured at 1.3 m above ground level), or with height/canopy spread equal or exceeding 25 m.

32. We estimate that the proposed works will create about 108 jobs (94 for labourers and another 14 for professional/technical staff) providing a total employment of 4 546 man-months.

Development Bureau
June 2009




圖例 LEGEND :

- 擬議海水管道，抽水站及配水庫
PROPOSED SALT WATER MAINS, PUMPING STATION AND SERVICE RESERVOIR
- 擬在灣仔發展計劃二期項目內進行的水務工程
PROPOSED WATERWORKS TO BE IMPLEMENTED UNDER WAN CHAI DEVELOPMENT PHASE II
- 現有海水管道
EXISTING SALT WATER MAINS

擬拆卸已停用的馬己仙峽道食水配水庫並在原址興建海水配水庫
PROPOSED DEMOLITION OF THE DECOMMISSIONED MAGAZINE GAP ROAD FRESH WATER SERVICE RESERVOIR AND CONSTRUCTION OF A SALT WATER SERVICE RESERVOIR AT THE SAME LOCATION


- 範圍 1
AREA 1
- 範圍 2
AREA 2

比例尺 SCALE 1 : 15 000

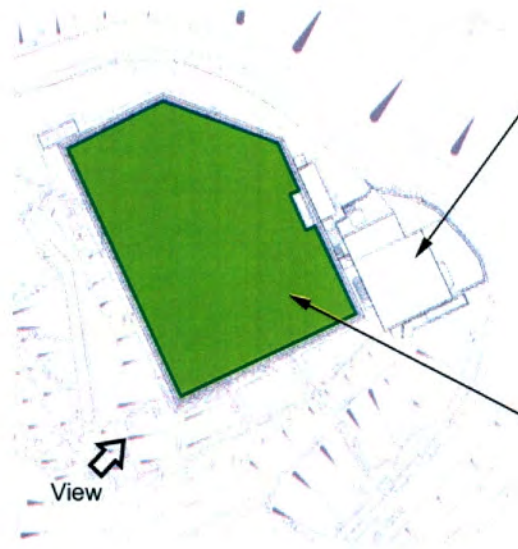
核准 APPROVED

 總工程師/設計 CE / Des
 8/15 / 2009

工務計劃項目 43WS ----- 灣仔海水供應系統提升工程

(甲級工程) P.W.P. Item No. 43WS — Upgrading of Wan Chai salt water supply system
 (CAT 'A' Submission)

 水務署
 WATER SUPPLIES DEPT.
 草圖編號 SK 62008 / 207 / 001
 SKETCH NO.

附件一 Enclosure 1



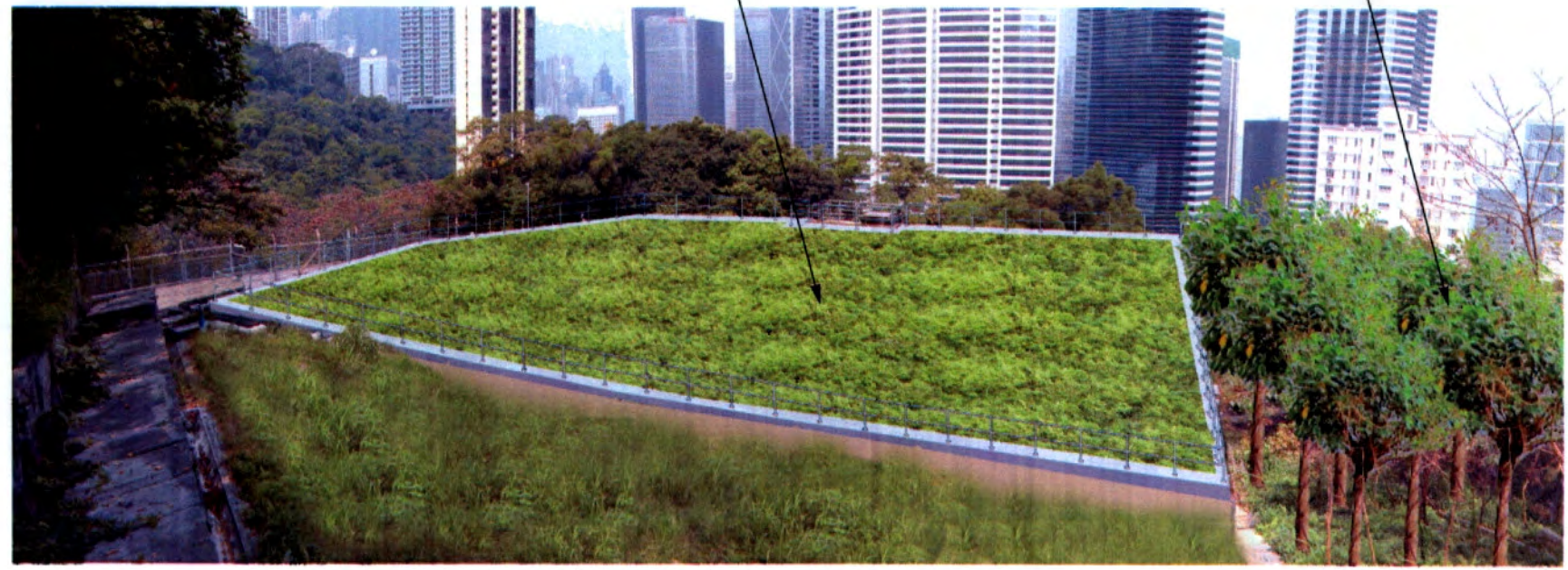
擬建的寶雲徑海水抽水站
PROPOSED BOWEN DRIVE
SALT WATER PUMPING STATION

擬綠化的配水庫上蓋
PROPOSED GREENING TO THE
ROOF OF THE SERVICE RESERVOIR

擬種植的樹木
PROPOSED TREES

View


平面圖
Plan



核准 APPROVED
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總工程師/設計 CE / Des
r815 / 2009

(甲級工程)
(CAT 'A' Submission)


工務計劃項目 43WS ----- 灣仔海水供應系統提升工程
P.W.P. Item No. 43WS — Upgrading of Wan Chai salt water supply system
擬加建上蓋的寶雲徑海水配水庫
Proposed roof cover to existing Bowen Drive salt water service reservoir

 水務署
WATER SUPPLIES DEPT.
草圖編號
SKETCH NO. SK 62008 / 207 / 002.1

附件二 (三張中的第一張) Enclosure 2 (Sheet 1 of 3)

擬綠化的配水庫上蓋
PROPOSED GREENING TO THE
ROOF OF THE SERVICE RESERVOIR



核准 APPROVED

 總工程師/設計 CE / Des
 8/15 / 2009

工務計劃項目 43WS ----- 灣仔海水供應系統提升工程
 P.W.P. Item No. 43WS — Uprating of Wan Chai salt water supply system
 擬建的馬己仙峽道海水配水庫
 Proposed Magazine Gap Road salt water service reservoir

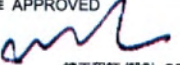
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 WATER SUPPLIES DEPT.
 草圖編號 SK 62008 / 207 / 002.2
 SKETCH NO.



擬種植的攀爬植物
PROPOSED CLIMBER PLANT

綠化屋頂
ROOF GREENING

擬種植的樹木
PROPOSED TREES

核准 APPROVED

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工務計劃項目 43WS ----- 灣仔海水供應系統提升工程
 P.W.P. Item No. 43WS — Uprating of Wan Chai salt water supply system

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8/15 / 2009

(甲級工程)
 (CAT 'A' Submission)

擬建的寶雲徑海水抽水站
 Proposed Bowen Drive salt water pumping station

草圖編號 SK 62008 / 207 / 002.3
 SKETCH NO.

43WS – Uprating of Wan Chai salt water supply system

Information of important tree to be transplanted

Tree ref. no.	Tree species (Botanical name)	Overall height (m)	Trunk diameter ¹ (mm)	Average crown spread (m)	Form ²	Health condition	Amenity value	Survival rate after transplanting	Recommendation (Retain/ Transplant/ Fell)	Remarks (including justification for proposed tree removal/ ecological and historical significance (if any) of affected trees, etc)
T16	Artocarpus hypargyreus	7	150	4	Poor	Fair	Medium	Medium	Transplant	The tree is a rare species under the species list in Rare and Precious Plants of Hong Kong. It stands near the middle of the proposed access road to the Magazine Gap Road SWSR. Due to limited site area, the access road cannot be re-aligned to avoid affecting the tree.

¹ Trunk diameter of a tree refers to its diameter at breast height (i.e. measured at 1.3 m above ground level).

² Form of a tree takes account of the overall tree size, shape, and any special feature.