

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 704 – DRAINAGE

Environmental Protection – Sewerage and sewage treatment

379DS – Feasibility study on relocation of Sha Tin sewage treatment works to caverns

Members are invited to recommend to Finance Committee the upgrading of **379DS** to Category A at an estimated cost of \$57.9 million in money-of-the-day prices for carrying out a feasibility study on the relocation of Sha Tin sewage treatment works to caverns.

PROBLEM

We need to ascertain whether it is technically feasible and financially viable to relocate Sha Tin sewage treatment works (STSTW) to caverns in order to release the existing site for housing or other uses to meet the long term social and economic needs of Hong Kong.

PROPOSAL

2. The Director of Drainage Services, with the support of the Secretary for Development, proposes to upgrade **379DS** to Category A at an estimated cost of \$57.9 million in money-of-the-day (MOD) prices for carrying out a feasibility study on relocation of STSTW to caverns (the proposed Study).

/PROJECT

PROJECT SCOPE AND NATURE

3. The scope of **379DS** comprises –
- (a) detailed engineering feasibility study on relocation of STSTW to caverns and associated works¹, including relevant preliminary technical and impact assessments², preparation of outline design for the engineering works and formulation of implementation strategies and programmes;
 - (b) planning review with broad technical assessment of the future land use of the existing STSTW site for the purpose of establishing a business case for relocating STSTW to caverns;
 - (c) public engagement and consultation exercises with relevant stakeholders; and
 - (d) associated ground investigation works and site supervision.

— A plan showing the study area for the relocated STSTW is at Enclosure 1.

4. Subject to the funding approval of the Finance Committee (FC), we plan to commence the proposed Study in June 2012 for completion in June 2014.

/JUSTIFICATION

¹ The associated works include –

- (a) rehabilitation, modification and improvement of the upstream sewerage and the Tolo Harbour Effluent Export Scheme system (an existing effluent disposal system) in relation to relocation of STSTW to caverns;
- (b) rehabilitation, modification and improvement of the existing emergency submarine outfall or construction of a new outfall for connecting with the relocated STSTW;
- (c) decommissioning of the existing STSTW; and
- (d) ancillary works.

² The preliminary technical and impact assessments cover sewage and sludge treatments, sewerage, geotechnical, environmental, drainage, traffic, waterworks, utilities, land requirement and land use aspects.

JUSTIFICATION

5. Land is a scarce resource in Hong Kong. To support Hong Kong's social and economic development, there is a pressing need to adopt sustainable and innovative approaches to increase land supply. One possible approach is rock cavern development.

6. Cavern construction is an established technology that has seen continual improvement in its application. Many cavern schemes for various uses have been successfully adopted around the world with notable examples in Canada, China, Finland, Japan, Korea, Norway, Singapore, Sweden and the USA.

7. The benefits of rock cavern development are manifold. Systematic relocation of suitable existing government facilities to rock caverns could release surface sites for other developments and allow future expansion of the facilities underground. Also, placing NIMBY ("not-in-my-backyard") facilities in caverns could minimise any adverse impact on the environment and remove incompatible land uses. In fact, there have been successful local examples of accommodating facilities in rock caverns, including the Stanley sewage treatment works completed in 1995, as well as Island West refuse transfer station and Kau Shat Wan explosives depot both completed in 1997. Also, in 2009, the University of Hong Kong reprovisioned the western salt-water service reservoirs in rock caverns to release the site for its Centennial Campus development. These projects have demonstrated that rock caverns are valuable resources, while providing added environmental, safety and security benefits for many applications.

8. According to the findings of the study on "Enhanced Use of Underground Space in Hong Kong" completed by the Civil Engineering and Development Department (CEDD) in March 2011, Hong Kong is particularly suitable for developing rock caverns from the geological perspective. The study has broadly demonstrated from technical and financial viability standpoints that cavern scheme could be implemented to house STSTW, which is the largest secondary sewage treatment works in Hong Kong with a designed sewage treatment capacity of 340 000 m³ per day, thereby releasing about 28 hectares of land for other beneficial and compatible land uses. The study has also recommended a further detailed feasibility study to identify and address the issues associated with relocation of STSTW to caverns.

9. CEDD's study also recommended some key initiatives for further study regarding cavern development in Hong Kong. A separate funding application will be made for the study on long-term strategy for cavern development in Hong Kong (PWSC(2012-13)8).

FINANCIAL IMPLICATIONS

10. We estimate the cost of **379DS** to be \$57.9 million in MOD prices (please see paragraph 11 below), broken down as follows –

		\$ million	
(a)	Consultants' fee for	36.0	
	(i) detailed engineering feasibility study on relocation of STSTW to caverns and associated works	27.5	
	(ii) planning review with broad technical assessment of future land use of the existing STSTW site	4.2	
	(iii) public engagement and consultation exercises with relevant stakeholders	3.1	
	(iv) supervision of ground investigation works	1.2	
(b)	Ground investigation works ³	10.0	
(c)	Contingencies	4.6	
	Sub-total	50.6	(in September 2011 prices)
			/(d)

³ The ground investigation works will be carried out under CEDD's existing term contract.

	\$ million	
(d) Provision for price adjustment	7.3	
Total	57.9	(in MOD prices)

Owing to inadequate in-house resources, we propose to engage consultants to conduct the proposed Study and supervise the associated ground investigation works. A breakdown of the estimates for the consultants' fees by man-months is at Enclosure 2.

11. Subject to FC's approval, we will phase the expenditure as follows –

Year	\$ million (Sept 2011)	Price adjustment factor	\$ million (MOD)
2012 – 2013	7.0	1.05325	7.4
2013 – 2014	18.0	1.11118	20.0
2014 – 2015	19.0	1.17229	22.3
2015 – 2016	6.6	1.23677	8.2
	50.6		57.9

12. We have derived the MOD estimate on the basis of the Government's latest set of assumptions on the trend rate of change in the prices of public sector building and construction output for the period from 2012 to 2016. Subject to funding approval, we will engage consultants to undertake the proposed consultancy on a lump sum basis with provision for price adjustments as the duration of the consultancy will exceed 12 months. We will deliver the ground investigation works under a standard re-measurement term contract of the Geotechnical Engineering Office (GEO) of CEDD. The term contract for ground investigation works will provide for price adjustments.

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13. The conduct of the proposed Study and the associated ground investigation works will not give rise to any recurrent expenditure.

PUBLIC CONSULTATION

14. During the course of CEDD's study on "Enhanced Use of Underground Space in Hong Kong", various professional bodies including the Hong Kong Institution of Engineers (HKIE), Hong Kong Institute of Planners (HKIP), Institute of Quarrying, Institute of Materials, Minerals and Mining, and Association of Geotechnical and Geoenvironmental Specialists were consulted. They supported the study to explore the use of underground space including rock cavern development. In the HKIE-HKIP Conference on Planning and Development of Underground Space held in Hong Kong in September 2011, local engineers and planners met and shared experiences with overseas counterparts and the planned development of underground space in Hong Kong was strongly supported.

15. Key findings of the CEDD's study were presented to the Panel on Development of the Legislative Council in May 2011, the Town Planning Board in July 2011, as well as the Land and Development Advisory Committee and its Planning Sub-committee in July and August 2011 respectively. There was also extensive media coverage on the subject. Based on the feedback of Government's consultative bodies and public responses, members of the public are generally supportive of the initiative of relocating suitable government facilities (particularly NIMBY facilities) to rock caverns.

16. A two-stage Public Engagement (PE) exercise on "Enhancing Land Supply Strategy: Reclamation outside Victoria Harbour and Rock Cavern Development" was launched in November 2011 to gauge public views on increasing land supply by new and innovative ways including reclamation outside Victoria Harbour and rock cavern development. Opportunity was also taken to foster public understanding and acceptance of the issue. The Stage 1 PE was completed on 31 March 2012. The initial feedback regarding relocating suitable government facilities to rock caverns to release land for alternative use is generally positive. There were views expressed in respect of some identified sites that capital investment should be weighed against public gains, which shall include intangible benefits such as improvement in environment and releasing sites for housing development and community facilities.

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17. We conducted three briefings on the proposed Study for the residents in the vicinity of the proposed relocation site in February and March 2012. At these briefings, apart from collecting views from the residents on the proposed Study, we also took the opportunity to explain the benefits of relocating STSTW to caverns and to assure them that preliminary impact assessments including environmental and traffic would be conducted and mitigation measures would be recommended in the proposed Study. Please refer to Enclosure 3 for more details.

18. We consulted the Health and Environment Committee (H&EC) of Sha Tin District Council (STDC) on the proposed Study on 8 March 2012. H&EC of STDC supported our proposal to conduct the proposed Study. They requested that the proposed Study should take into account the impact (including environmental, health, hygiene, noise, air quality, traffic and visual impacts) of the relocation proposal on residents in the vicinity. The Administration should also ensure that public consultation would be conducted during the course of the proposed Study and consult STDC on the results of the proposed Study.

19. We consulted the Legislative Council Panel on Development (the Panel) on the proposed Study on 27 March 2012. Members generally raised no objection to the proposed Study. The concerns expressed by residents of Chevalier Garden adjacent to the proposed relocation site through the Legislative Council Redress System were tabled at the Panel meeting. We explained that the proposed Study would conduct various impact assessments and recommend necessary mitigation measures. We also confirmed that public consultation would be conducted under the proposed Study, and we would further discuss the outcome of the proposed Study with the nearby residents. We would also invite the nearby residents for a site visit to the Stanley sewage treatment works to enhance their understanding of the operation of a sewage treatment facility inside caverns, for which no adverse impact on the surrounding environment has been reported.

ENVIRONMENTAL IMPLICATIONS

20. The proposed Study and the associated ground investigation works are not designated projects under the Environmental Impact Assessment Ordinance (Cap. 499) and will not cause any adverse environmental impact. We will implement suitable mitigation measures to control any short-term environmental impacts arising from the ground investigation works.

21. The proposed ground investigation works will only generate very little construction waste. We will require the consultants to fully consider measures to be implemented in future construction stage to minimise the generation of construction waste and to reuse/recycle construction waste as much as possible.

HERITAGE IMPLICATIONS

22. The proposed Study and the associated ground investigation works will not affect any heritage site, i.e. all declared monuments, proposed monuments, graded historic sites/buildings, sites of archaeological interest and Government historic sites identified by the Antiquities and Monuments Office.

LAND ACQUISITION

23. The proposed Study and the associated ground investigation works will not require any land acquisition.

BACKGROUND INFORMATION

24. We included **379DS** in Category B in September 2011.

25. The proposed Study and the associated ground investigation works will not involve any tree removal or planting proposal.

26. We estimate that the proposed Study and the associated ground investigation works will create about 39 jobs (seven for labourers and another 32 for professional/technical staff) providing a total employment of 750 man-months.



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Breakdown of the estimates for consultants' fees (in September 2011 prices)

Consultants' staff costs (Note 2)			Estimated man-months	Average MPS* salary point	Multiplier (Note 1)	Estimated fees (\$ million)
(a)	Detailed engineering feasibility study on relocation of STSTW to caverns and associated works	Professional	158	38	2.0	19.7
		Technical	183	14	2.0	7.8
(b)	Planning review with broad technical assessment of future land use of the existing STSTW site	Professional	24	38	2.0	3.0
		Technical	28	14	2.0	1.2
(c)	Public engagement and consultation exercises with relevant stakeholders	Professional	18	38	2.0	2.2
		Technical	21	14	2.0	0.9
(d)	Supervision of ground investigation works	Professional	6	38	2.0	0.7
		Technical	12	14	2.0	0.5
Total						36.0

* MPS = Master Pay Scale

Notes

1. A multiplier of 2.0 is applied to the average MPS point to estimate the full staff costs including the consultants' overheads and profit for the staff employed in the consultant's offices. (As at now, MPS salary point 38 = \$62,410 per month and MPS salary point 14 = \$21,175 per month.)
2. The consultants' staff costs given above are only estimates prepared by the Director of Drainage Services. The actual man-months and fees will only be known when we have selected the consultants through the usual competitive fee bid system.

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Consultation for the residents in the vicinity of the proposed relocation site

The first briefing session was conducted on 11 February 2012, attended by about 30 residents from Kam Tai Court, Mountain Shore, Sausalito, La Costa, Ocean View and Oceanaire of Ma On Shan. The residents generally welcomed the feasibility study on relocation of STSTW to caverns. They requested that the proposed Study should take into account impacts on the environment (in particular, odour) and traffic arising from the construction and operation of the relocated STSTW.

The second briefing session was also conducted on 11 February 2012, attended by about 50 residents from the Tai Shui Hang area, mainly from Chevalier Garden of Ma On Shan. The residents expressed similar concerns as set out above.

A further briefing session was conducted on 1 March 2012 specifically for the residents of Chevalier Garden, during which about 200 residents attended. The residents expressed their concerns on environmental and traffic issues. They also raised concerns on the effect of blasting operations on structural safety of nearby buildings.

Relevant information of the proposed Study was circulated to the residents at the briefing sessions to address their concerns. We also assured attendees that provisions had been made in the proposed Study to further consult the public on the outcome of the proposed Study.