For discussion **PWSC(2006-07)16**
on 29 May 2006

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 703 – BUILDINGS
Public Safety – Fire services
127BF – Fire Services Department diving training centre in the Government Dockyard at Stonecutters Island

Members are invited to recommend to Finance Committee the upgrading of **127BF** to Category A at an estimated cost of $144.1 million in money-of-the-day prices for the construction of Fire Services Department diving training centre in the Government Dockyard at Stonecutters Island.

PROBLEM

We do not have appropriate facilities for the officers of Fire Services Department (FSD) to receive diving training for maritime search and rescue diving. We also need a more effective operational base in the Victoria Harbour for launching marine rescue operations.

PROPOSAL

2. The Director of Architectural Services (D Arch S), with the support of the Secretary for Security, proposes to upgrade **127BF** to Category A at an estimated cost of $144.1 million in money-of-the-day (MOD) prices for the construction of a FSD diving training centre with berthing facilities, which will also serve as a base for marine rescue operations, in the Government Dockyard at Stonecutters Island.

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PROJECT SCOPE AND NATURE

3. The project comprises the construction of a four-storey building on a site at the northwest corner of the Government Dockyard at Stonecutters Island. The construction floor area (CFA) of the project is about 5 550 square metres. The scope of the project comprises the construction of –

(a) training facilities for diving training including a diving training pool[1], a lecture room/classroom, a workshop and demonstration room, a diving chamber room with a deep dive simulator[2] and a two-compartment decompression chamber[3], a rapid pool[4], a welding tank[5], an overhead rail and helicopter winch simulator with electric fans[6] and a wave generator[7];

(b) supporting facilities for diving training including a first aid room, and tanks and tank rooms;

(c) berthing facilities for the marine rescue operational base including a crane, a new jetty formed by a pontoon and a mooring dolphin and a floating jetty formed by extension of the existing boat hoist jetty for berthing of a diving support vessel and diving support speedboats;

(d) supporting facilities for the marine rescue operational base including a drill yard[8], an appliance room, dormitories, a recreation room cum canteen with pantry, a kitchen and kitchen store, and a rescue command and control room; and

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1 The diving training pool is of dimensions 25 metre (m) (length) x 11 m (width) x 8 m (depth).

2 The deep dive simulator is a wet chamber used for simulating deep sea diving conditions.

3 The two-compartment decompression chamber is used for aptitude test of diving trainees, and treatment of decompression illness stricken divers.

4 The rapid pool of dimensions 15 m (length) x 5 m (width) x 2.5 m (depth) is used for simulating conditions of whirling and rapid currents for swift water rescue training.

5 The welding tank is used for training divers in operating underwater thermal cutting and welding tools.

6 The overhead rail and helicopter winch simulator with electric fans is used for simulating helicopter winching operation under imitating downwash from a helicopter.

7 The wave generator will be placed in the pool to create big wave.

8 The drill yard is used for parade and operational exercise/drills and for parking of reinforcing fire appliances/ambulances.

(e) supporting facilities for both diving training and the marine rescue operational base including locker and changing rooms, an infirmary, pump rooms, a fire control room, emergency generator rooms, plant rooms, stores, offices, a diving equipment/uniform drying room, two dangerous goods stores, a lift, toilets and ablutions.

A site plan is at Enclosure 1 and a perspective drawing of the centre is at Enclosure 2. We plan to start the construction works in December 2006 for completion in March 2009.

JUSTIFICATION

Diving Training Centre

4. There is a need for FSD's divers to be adequately and appropriately trained to ensure both the efficiency and safety in performing their diving duties. In Hong Kong, maritime and underwater rescue operations are inherently dangerous. Normally, visibility in waters is low due to heavy silt loading which blocks off the sunlight. Rescue operations in typhoon shelters, cargo handling basins and waste water treatment plant are in particular dangerous because in addition to the extremely low visibility, the water can be full of biological and chemical pollutants which impose risk to divers if there is no proper training and protection. The rough sea environment and heavy marine traffic in Hong Kong waters further impose danger on divers.

5. To cope with the challenging work, all FSD's divers must complete two courses, namely an initial diving course and an advanced diving course before they can be deployed as a rescue diver. They should acquire special diving rescue skills, such as decompression, underwater thermal cutting, light salvage and application of underwater rescue tools so as to become a professional diver. Moreover, they are required to undergo regular training to maintain their competency.

6. Training for diving rescue operations is itself inherently risky. To reduce such risk, trainees should learn the basic skills, and undergo drills and exercises in controlled environments. They should have acquired the necessary techniques and sufficient experience before being trained in the open sea to gain practical experience. Due to the lack of suitable training facilities in Hong Kong, the present arrangements for training FSD's divers are far from satisfactory. In

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respect of the initial training course, divers are trained to perform diving rescue operations at a depth of up to 20 metres. On completion of the advanced training course, divers are capable of performing diving rescue operations at a depth of up to 42 metres. Hong Kong does not have any swimming pool deep enough for the diving training. With the exception of the beginning of the initial course which must be conducted in a swimming pool for safety reasons, FSD always has to conduct initial and advanced diving training in the open sea. The unfavourable sea conditions in Hong Kong are undesirable for diving training, particularly for initial training. The rough sea environment and the heavy marine traffic adversely affect the teaching of diving and rescue techniques, and impose danger on the diving trainees. The limited underwater visibility also makes it difficult for instructors to observe and monitor the trainees' performance. In addition, FSD's fireboats usually have to sail for more than an hour to reach suitable sites in the open sea for divers to receive initial and advanced diving training. Training sessions are often interrupted or even cancelled when the fireboats have to respond to emergencies or when the weather is inclement. The proposed diving training centre will enable diving training, including training for divers to cope with rough sea condition with big waves, whirling and rapid currents, diving at deep sea, etc. to be safely and efficiently conducted under controlled environments.

7. Hong Kong does not have the training facilities for conducting training courses on the special diving rescue skills mentioned in paragraph 5 above, and FSD has to rely on overseas training to provide such training to its divers. Due to financial and manpower constraints, only a few divers have received such overseas diving training. With the training facilities of the proposed centre, all divers can readily acquire the special diving rescue skills in Hong Kong. This will not only enhance the overall capability of divers in performing rescue operations, but also provide much needed flexibility in the deployment of divers for responding to such operations.

8. Apart from FSD, other Government departments also have diving training needs but do not have any similar training facilities . FSD has assisted the Hong Kong Police Force and the Customs and Excise Department in training their divers. The proposed diving training centre can therefore provide better training facilities for other departments to meet their training needs.

A Base for Marine Rescue Operations

9. The proposed diving training centre with berthing facilities will also serve as a base for marine rescue operations. Statistics of the past four years

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indicate that about 50% of the marine incidents in local waters occurred in the Victoria Harbour. The Government Dockyard at Stonecutters Island is centrally located in Hong Kong waters and right next to the major fairways. There are also existing facilities for refuelling, boat hoisting and landing within the Government Dockyard. To take advantage of the strategic location and the existing facilities of the Government Dockyard, we plan to provide permanent accommodation for a diving tender, a diving support vessel and two speedboats, which are temporarily accommodated at Tsim Sha Tsui Fire Station, Tung Lo Wan Fireboat Station and Eastern Sea Rescue Berth of Chek Lap Kok Airport respectively. By consolidating the above rescue resources at the proposed marine rescue operational base, some 10 minutes will be saved for divers to respond to marine incidents occurring at the heart of the Harbour. Moreover, the Diving Unit head office currently at Tsim Sha Tsui Fire Station will also be re-provisioned to the proposed training centre to closely monitor diving training programmes at the centre and to provide support to diving operations.

10. Besides, with the commissioning of the proposed diving training centre, divers will still need to undergo training in the open sea to gain practical experience. To achieve efficiency in conveying divers to undergo such training the proposed berthing facilities will also facilitate divers to board the diving vessels there for travelling to suitable sites in the open sea for training, without the need to travel to other fireboat stations to board the vessels.

FINANCIAL IMPLICATIONS

11. We estimate the capital cost of the project to be $144.1 million in MOD prices (see paragraph 12 below), made up as follows –

		$ million
(a)	Site works	0.8
(b)	Marine works[9]	8.4
(c)	Piling	14.5

(d) .....

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9 The works include demolition of one existing boat hoist jetty, extension of the remaining boat hoist jetty to form a larger floating jetty, and construction of a new jetty making up by a mooring dolphin and a new pontoon.

		$ million	
(d)	Building	50.1	
(e)	Building services	19.4	
(f)	Drainage works	0.6	
(g)	External works	8.1	
(h)	Specialised diving training installations[10]	6.9	
(i)	Furniture and equipment[11]	17.5	
(j)	Consultants' fees for contract administration	2.4	
(k)	Contingencies	9.0	
	Sub-total	137.7	(in September 2005 prices)
(l)	Provisions for price adjustment	6.4	
	Total	144.1	(in MOD prices)

D Arch S proposes to engage consultants to undertake contract administration for the project. A breakdown of the estimate for consultants' fees by man-months is at Enclosure 3. The CFA of **127BF** is about 5 550 m^2. The estimated construction unit cost, represented by the building and building services costs, is $12,523 per m^2 of CFA in September 2005 prices. We consider this unit cost reasonable by reference to other comparable projects undertaken by the Government, taking into account the specialist nature of the proposed diving centre.

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[10] The specialised diving training installations include building integrated electrical and mechanical installations such as an overhead rail, electric fans, rapid current making devices and a welding tank for diving training.

[11] The estimated cost of furniture and equipment is based on an indicative list of items required for the diving training centre including telephone system, public address/call-out system, medical equipment for infirmary, standard furniture and equipment, closed-circuit surveillance system, high pressure compressor system, a two-compartment chamber, a deep dive simulator, a helicopter winch simulator, a five-tonne crane, a wave ball and jetfloat units.

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

Year	$ million (Sept 2005)	Price adjustment factor	$ million (MOD)
2006 – 07	4.0	1.01500	4.1
2007 – 08	30.0	1.03023	30.9
2008 – 09	70.0	1.04568	73.2
2009 – 10	23.0	1.06136	24.4
2010 – 11	10.7	1.07728	11.5
	137.7		144.1

13. 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 2006 to 2011. We intend to award the contract on a lump-sum basis because we can clearly define the scope of the works in advance. The contract will not provide for price adjustment because the contract period will not exceed 21 months.

14. We estimate the annual recurrent expenditure of the project to be about $3.7 million.

PUBLIC CONSULTATION

15. We consulted the Community Affairs Committee of the Sham Shui Po District Council on our proposal in January 1999 and June 2002. The Committee members have no objection to the proposal.

16. In respect of the provision of berthing facilities at the diving training centre, we consulted the Environment and Food Committee of the Sham Shui Po District Council in March 2005. The Committee members raised no

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objection to the provision of berthing facilities and offered their support to the project. The proposed berthing facilities are gazetted under the Foreshore and Sea-bed (Reclamations) Ordinance (Cap. 127) on 6 and 13 January 2006. No objection to the proposal was received.

17. We consulted the Legislative Council Panel on Security on the proposal on 2 May 2006. At the meeting, Members raised questions on the breakdown of the types of diving operations, the working conditions of FSD's divers after training, the expected utilisation of the proposed diving training centre, the justification for the proposed canteen facilities, and the cost of sending FSD's divers abroad to receive diving training. We addressed these questions during the meeting and through a written reply on 18 May 2006.

ENVIRONMENTAL IMPLICATIONS

18. The project is not a designated project under the Environmental Impact Assessment (EIA) Ordinance (Cap. 499). We completed a Preliminary Environmental Review (PER) for this project in February 1998. The PER concluded that the project would have no long term environmental impact. The Director of Environmental Protection vetted the PER and agreed that an Environmental Impact Assessment would not be necessary.

19. During construction, we will control noise, dust and site run-off nuisances to within established standards and guidelines through the implementation of mitigation measures in the relevant contracts. These include the use of silencers, mufflers, acoustic lining or shields for noisy construction activities, frequent cleaning and watering of the site, and the provision of wheel-washing facilities.

20. At the planning stage, we have considered measures to reduce the generation of construction and demolition (C&D) materials. We will encourage the contractor to maximise the use of recycled or recyclable C&D materials, as well as the use of non-timber formwork to further minimise the generation of construction waste. We will use suitable excavated materials for filling within the site or in other suitable construction sites as far as possible, in order to minimise the disposal of C&D materials to public fill reception facilities. In addition, we will require the contractor to use metal hoardings and signboards so that these materials can be recycled or reused in other projects.

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21. We will also require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. We will ensure that the day-to-day operations on site comply with the approved WMP. We will control the disposal of public fill, C&D materials and C&D waste to public fill reception facilities[12], sorting facilities[12] and landfills respectively through a trip-ticket system. We will require the contractor to separate public fill from C&D waste for disposal at appropriate facilities. We will record the disposal, reuse and recycling of C&D materials for monitoring purposes.

22. We estimate that the project will generate about 7 000 tonnes of C&D materials. Of these, we will reuse about 3 800 tonnes (54.3%) on site, deliver 2 600 tonnes (37.1%) to public fill reception facilities for subsequent reuse, and 100 tonnes (1.4%) to sorting facilities in order to retrieve the inert portion for reuse as public fill. In addition, we will dispose of 500 tonnes (7.2%) at landfills. The total cost for accommodating C&D materials at public fill reception facilities and landfill sites, together with the cost for handling the materials at sorting facilities is estimated to be $142,700 for this project (based on an unit cost of $27/tonne for disposal at public fill reception facilities, $100/tonne at sorting facilities and $125/tonne[13] at landfills).

LAND ACQUISITION

23. The project does not require any land acquisition.

BACKGROUND INFORMATION

24. We upgraded **127BF** to Category B in May 2005.

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12 Sorting facilities and public fill reception facilities are specified in Schedule 3 and Schedule 4 respectively of the Waste Disposal (Charges for Disposal of Construction Waste) Regulations. Disposal of public fill in public fill reception facilities requires a licence issued by the Director of Civil Engineering and Development.

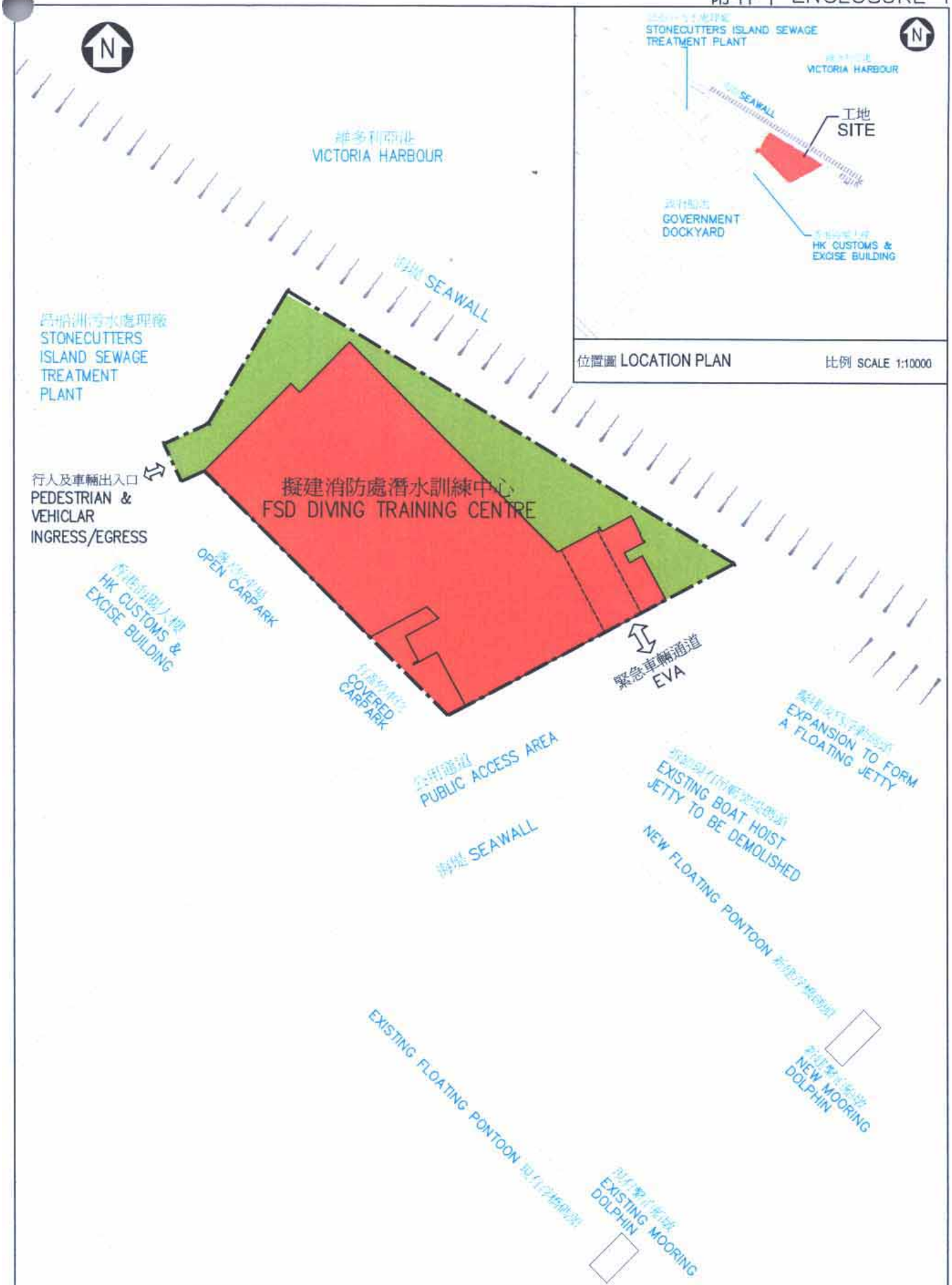
13 This estimate has taken into account the cost for developing, operating and restoring the landfills after they are filled and the aftercare required. It does not include the land opportunity cost for existing landfill sites (which is estimated at $\$90/m^3$), nor the cost to provide new landfills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

25. We engaged consultants to carry out a project planning and feasibility study and a PER in September 1997 and employed contractors to carry out a topographical survey and site investigations in December 2000 and June 2001 respectively at a total cost of $1.4 million. We also engaged an architectural consultant and a quantity surveying consultant to undertake the detailed design and preparation of tender document at a total cost of $4.3 million. We charged these to block allocation **Subhead 3100GX** "Project feasibility studies, minor investigations and consultants' fees for items in Category D of the Public Works Programme". The consultant and the contractors have completed the PER, site investigation and topographical survey respectively. The architectural and quantity surveying consultants have completed the detailed design and tender document.

26. The proposed works will not involve any tree removal or planting proposal.

27. We estimate that the proposed works will create about 106 jobs (95 for labourers and another 11 for professional/technical staff) providing a total employment of 2 000 man-months.

Security Bureau
May 2006



127BF 昂船洲政府船塢消防處潛水訓練中心 FSD DIVING TRAINING CENTRE IN THE GOVERNMENT DOCKYARD AT STONECUTTERS ISLAND	drawn by J.L	date 02.06	drawing no. AB/5970/XA101	scale 1:750
	approved T.H	date 02.06		
	office PROJECT MANAGEMENT BRANCH		ARCHITECTURAL SERVICES DEPARTMENT	

消防處潛水訓練中心東北面立面圖(模擬圖)
NORTH-EASTERN ELEVATION OF THE FSD DIVING TRAINING CENTRE (ARTIST'S IMPRESSION)

消防處潛水訓練中心西北面立面圖(模擬圖)
NORTH-WESTERN ELEVATION OF THE FSD DIVING TRAINING CENTRE (ARTIST'S IMPRESSION)

127BF 昂船洲政府船塢消防處 潛水訓練中心 FSD DIVING TRAINING CENTRE IN THE GOVERNMENT DOCKYARD AT STONECUTTERS ISLAND	drawn by C.H	date 02.06	drawing no. AB/5970/XA102	scale N.T.S.
	approved T.H	date 02.06		
	office PROJECT MANAGEMENT BRANCH		ARCHITECTURAL SERVICES DEPARTMENT	

127BF – Fire Services Department diving training centre in the Government Dockyard at Stonecutters Island

Breakdown of estimate for consultants' fees

Consultant's staff costs			Estimated man-months	Average MPS* salary point	Multiplier factor	Estimated fee ($million)
(a)	Contract administration[(Note 1)]	Professional	-	-	-	1.1
		Technical	-	-	-	0.6
(b)	Quantity Surveying Services[(Note 1)]	Professional	-	-	-	0.5
		Technical	-	-	-	0.2
					Total	2.4

* MPS = Master Pay Scale

Notes

(1) The consultants' staff costs are calculated in accordance with the existing consultancy agreement for the design and construction for **127BF**. They will only be executed subject to the Finance Committee's approval to upgrade **127BF** to Category A.