

## ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

### HEAD 708 – CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT

#### Medical Subventions

#### 3MR – Expansion of Tseung Kwan O Hospital

Members are invited to recommend to Finance Committee the upgrading of **3MR** to Category A at an estimated cost of \$1,944.9 million in money-of-the-day prices for the expansion of Tseung Kwan O Hospital.

### PROBLEM

The existing facilities in Tseung Kwan O Hospital (TKOH) are inadequate in terms of space and capacity to meet the future service requirements and service demand in Kowloon East.

### PROPOSAL

2. The Director of Architectural Services, with the support of the Secretary for Food and Health, proposes to upgrade **3MR** to Category A at an estimated cost of \$1,944.9 million in money-of-the-day (MOD) prices for the expansion of TKOH.

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**PROJECT SCOPE AND NATURE**

3. The scope of **3MR** comprises –
- (a) the construction of a new ambulatory block on part of the existing car parking area of TKOH to accommodate the following non-in-patient services and supporting facilities decanted from the existing hospital main block -
    - (i) an expanded specialist out-patient department (with 70 consultation rooms for different clinical specialties and other ancillary facilities such as clinic administration office, waiting area, toilets, treatment and procedure rooms, patient counselling and education rooms, special diagnostic facilities, etc.) and a traditional Chinese Medicine clinic with five consultation rooms;
    - (ii) a Day Psychiatric Centre, a Day Geriatric Centre, a Day Medical Centre and an Ambulatory Surgery Centre;
    - (iii) a Health Resource Centre with patient activities rooms, part of the Integrated Rehabilitation Services (IRS), the hospital administration department, lecture theatre, staff parking spaces and overnight rooms; and
    - (iv) other ancillary facilities including shroff, enquiry and information counter, registration and appointment-booking office, blood-taking room for laboratory tests and staff changing rooms, etc.;
  - (b) the conversion / renovation of the spaces vacated by the services and supporting facilities in the hospital main block as mentioned in sub-paragraph (a) above to accommodate –
    - (i) three additional acute in-patient wards with a total of 112 beds, a new emergency care ward with 30 beds and a new isolation ward with 12 isolation rooms and ante rooms that meet the prevailing standard for infection control;

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- (ii) an expanded capacity for intensive and high dependency care services by up to 16 beds;
  - (iii) necessary facilities for the development of obstetric and neo-natal services, including one neo-natal intensive care unit (NICU) with eight cots;
  - (iv) an expanded clinical pathology department, mortuary, pharmacy, IRS and central sterile supplies department;
  - (v) reprovisioning of psychosocial and spiritual support services, store rooms, community nursing service and workshops / offices for the electrical and mechanical services department; and
  - (vi) additional offices and reprovisioning of call rooms for medical staff and tuck shop;
- (c) construction of a link bridge connecting the new ambulatory block and the hospital main block; and
- (d) enhancement of equipment and facility provisions by -
- (i) installing additional medical equipment items;
  - (ii) expanding digital radiography (DR) systems for Accident and Emergency department and outpatient clinics;
  - (iii) upgrading the picture archiving and communication system (PACS); and
  - (iv) equipping one of the operating rooms with negative pressure.

4. A site plan of the proposed new ambulatory block and conversion / renovation works in the hospital main block is at Enclosure 1. We plan to start part of the conversion works that will not affect existing services in July 2008. We plan to start the construction of the new ambulatory block in April 2009 for completion in January 2012. The remaining part of conversion works will be carried out upon completion of the ambulatory block. The whole project is targeted for completion in March 2013.

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## JUSTIFICATION

5. The construction of TKOH was approved in 1995 and the original design of the hospital at that time was to provide acute and general hospital services to the 300 000 planned population of Tseung Kwan O (TKO) district. The construction works were completed in mid-1999 and TKOH commenced operation in December 1999 by phases. TKOH is currently providing inpatient, 24-hour accident and emergency service, day care and specialist outpatient services.

### Need for expansion

6. Over the years, the population in TKO and Sai Kung has increased rapidly, from 287 135 in 1999 to 412 600 in 2007. It is projected that by 2015, the population will reach about 483 850, exerting pressure on the healthcare services to be provided by TKOH.

7. At present, the Hospital Authority (HA) provides medical services for Kwun Tong and TKO districts through its Kowloon East (KE) cluster, which comprises TKOH, United Christian Hospital (UCH) and Haven of Hope Hospital. It is projected that the population in KE cluster will increase from 935 500 in 2007 to around 1 060 800 in 2015, representing a 13.4% rise. With a provision of 2.2 general beds per 1 000 population in KE cluster as compared to an average of 2.9 general beds per 1 000 population of all seven clusters of HA, public hospital services in the KE cluster are insufficient to meet the increasing needs arising from population growth. Furthermore, the aging population and enhanced health awareness of the public also contribute to the increasing demand for health care. The existing facilities in TKOH are inadequate in terms of space and capacity to cope with the future service requirements and service demand. We propose to expand the capacity of TKOH by providing up to 178 additional in-patient beds, giving an eventual bed complement of 636 in-patient beds and 140 day beds/places upon completion.

8. Over the years, the demand for specialist out-patient (SOP) consultation services in the KE cluster has grown tremendously. The number of SOP attendances in KE cluster increased from 484 860 in 2000-01 to 639 990 in 2007-08, representing a 32% rise. The projected population will exert further pressure on the service provisions by TKOH. We propose to increase the number of consultation rooms in the SOP department from 48 to 70. The capacity of SOP attendances is expected to increase from 171 430 to 250 000 per year. As for the traditional Chinese Medicine clinic, the capacity of attendances

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is expected to be 30 000 annually. Other expanded services and facilities are also proposed to cope with the requirement of the additional beds and ambulatory care services. We expect that the proposed expansion project will be able to meet the future demand generated by the projected population.

9. Expanding the space and services of TKOH will also help to address the need to -

- (a) enhance ambulatory care services as a result of the shifting of focus on treatment from in-patient services to ambulatory and community-based care; and
- (b) comply with the prevailing infection control standards in modern healthcare settings, such as maintaining adequate space between patient beds to prevent cross infection.

#### **Enhancement of facility provisions**

10. Additional medical equipment items will be installed to support the delivery of enhanced clinical services. For example, the installation of a new x-ray controlled three-dimensional orthopaedic surgical navigation system will facilitate image-guided navigation surgery to be performed with smaller operative wound exposures but higher surgical accuracy. The new equipment can save operation time and cause less post-operative pains and complications. More surgeries can thus be performed on day basis, achieving shorter lengths of hospital stay and higher patient satisfaction as a result.

11. One of the existing operating theatres will be converted to be negative-pressured such that surgical procedures on patients with air-borne infectious diseases may be performed in an isolation environment.

12. To ensure sufficient manpower supply for carrying out HA services, HA will have additional intakes for the three-year Registered Nurse (RN) High Diploma Programme and two-year Enrolled Nurse (EN) Programme starting from 2008-09. It is expected that the number of EN graduates per year will increase by around 280 starting from 2010-11 and the number of RN graduates by 200 starting from 2011-12. The total number of nurse graduates from HA nursing training programmes will reach 580 in 2011-12.

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13. We expect that the steady local supply of allied health professionals in HA will also be able to cope with the expanded services upon completion of the project in 2013.

## FINANCIAL IMPLICATIONS

14. We estimate the capital cost of the project to be \$1,944.9 million in MOD prices (see paragraph 17 below), made up as follows –

		\$ million		
		Ambulatory Block (1)	Hospital Main Block (2)	Total (3)
(a)	Site works	9.9	4.1	14.0
(b)	Piling	108.6	0.0	108.6
(c)	Building	411.6	207.1	618.7
(d)	Building services	315.0	142.3	457.3
(e)	Drainage	4.8	2.6	7.4
(f)	External works	18.6	10.2	28.8
(g)	Link bridge	29.6	0.0	29.6
(h)	Geotechnical works	8.0	0.0	8.0
(i)	Additional Energy Conservation Measures	18.7	0.0	18.7
(j)	Furniture and equipment (F&E) <sup>1</sup>	120.0	80.0	200.0
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<sup>1</sup> Based on an indicative list of furniture and equipment items and their estimated prices.

		<b>\$ million</b>		
		Ambulatory Block (1)	Hospital Main Block (2)	Total (3)
(k)	Consultants' fees for	7.0	11.0	18.0
	(i) quantity surveying (QS) services	6.0	10.0	
	(ii) risk management	1.0	1.0	
(l)	Contingencies	92.5	36.6	129.1
	Sub-total	1,144.3	493.9	1,638.2
				(in September 2007 prices)
(m)	Provision for price adjustment			306.7
	Total			1,944.9
				(in MOD prices)

15. Item (b)(1) above is for piling works in connection with the construction of the new ambulatory block, including construction of rock socketed steel H-piles. Item (c)(1) above is for building works in connection with the construction of the new ambulatory block, including provision of superstructure construction, plumbing / drainage installations, provision of finishes / fittings / fixtures, landscaping and other associated works (including all necessary temporary works). Item (c)(2) above is for building works in connection with the conversion / renovation works in the hospital main block, including alteration of internal layout, plumbing / drainage installations, provision of finishes / fittings / fixtures and other associated works (including all necessary temporary works). Item (d)(1) above is for building services works in connection with the new ambulatory block, including provision of electrical installation, air-conditioning / mechanical ventilation systems, fire services installations, emergency generator sets, hot water supply systems, lifts, medical gas installations and other associated works. Item (d)(2) above is for building services works in connection with the conversion / renovation works in the hospital main block, including provision / upgrading / alteration of electrical installation, air-conditioning / mechanical ventilation systems, fire services installations, emergency generator sets, medical gas installations and other associated works.

16. We propose to engage consultants to undertake QS services and risk management of the project as stated in Item (k) above. A breakdown of the estimate for consultants' fees by man-months is at Enclosure 2. The construction floor area (CFA) of 3MR is estimated at 56 300 square metres (m<sup>2</sup>), including 36 600 m<sup>2</sup> and 19 700 m<sup>2</sup> for the new ambulatory block and conversion / renovation works in the hospital main block respectively. The estimated construction unit cost for new ambulatory block and conversion / renovation works for the existing main block, represented by building and building services costs, is \$19,852 per m<sup>2</sup> and \$17,736 per m<sup>2</sup> of CFA respectively in September 2007 prices. We consider these unit costs reasonable as compared with other similar hospital projects.

17. Subject to approval, we will phase the expenditure as follows -

<b>Year</b>	<b>\$ million (Sept 2007)</b>	<b>Price Adjustment factor</b>	<b>\$ million (MOD)</b>
2008 – 09	20.0	1.02575	20.5
2009 – 10	100.0	1.06293	106.3
2010 – 11	200.0	1.10545	221.1
2011 – 12	500.0	1.14967	574.8
2012 – 13	350.0	1.19566	418.5
2013 – 14	200.0	1.24348	248.7
2014 – 15	150.0	1.29322	194.0
2015 – 16	80.0	1.34495	107.6
2016 – 17	38.2	1.39875	53.4
	1,638.2		1,944.9

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18. We have derived the MOD estimates on the basis of the Government's latest forecast of the trend of price change of building and construction output in the public sector for the period 2008 to 2017. We will tender the construction of the new ambulatory block as a design-and-build contract. 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 provide for price adjustments as the contract period will exceed 21 months. We will deliver the conversion/renovation works in the hospital main block through re-measurement contracts because the quantity of these works is subject to variation during construction to suit the actual site conditions. The re-measurement contracts will not provide for price adjustment as the contract periods will not exceed 21 months.

19. HA has assessed the requirements for F&E for this project, and estimates the total F&E cost to be \$200.0 million. The proposed F&E provision represents 18.0% of the total construction cost<sup>2</sup> of the project. An indicative list of major F&E items (costing \$1.0 million or above per item) to be procured for the project is at Enclosure 3.

20. We estimate the additional annual recurrent expenditure arising from the project to be \$371.0 million.

## **PUBLIC CONSULTATION**

21. The HA has consulted the Sai Kung District Council (SKDC) on 4 March 2008 on the proposed project. Members of the SKDC supported the proposed project.

22. We consulted the Legislative Council Panel on Health Services (the Panel) on 19 May 2008. Members of the Panel supported the project.

## **ENVIRONMENTAL IMPLICATION**

23. The project is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). The project will not cause any long-term environmental impact.

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<sup>2</sup> Represented by building, building services, drainage and external works costs for this project.

24. 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 sites, and the provision of wheel-washing facilities.

25. We have considered measures in the planning and design stages to reduce the generation of construction waste where possible. These include using demountable partitions and unitised window wall system to reduce temporary formwork and construction waste. In addition, we will require the contractor to reuse inert construction waste, e.g. the use of excavated materials for filling within the site, the use of metal hoardings and signboards so that these materials can be recycled or reused 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<sup>3</sup>. 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.

26. 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.

27. We estimate that the project will generate in total about 61 200 tonnes of construction waste. Of these, we will reuse about 5 400 tonnes (8.8%) of inert construction waste on site, deliver 49 900 tonnes (81.5%) of inert construction waste to public fill reception facilities for subsequent reuse. In addition, we will dispose of 5 900 tonnes (9.7%) 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 \$2.1 million for this project (based on a unit cost of \$27/tonne for disposal at public fill reception facilities

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<sup>3</sup> 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 licence issued by the Director of Civil Engineering and Development.

and \$125/tonne<sup>4</sup> at landfills).

## ENERGY CONSERVATION MEASURES

28. This project has adopted various forms of energy efficient features, including -

- (a) T5 energy efficient fluorescent tubes with electronic ballast and lighting control by occupancy sensors and daylight sensors;
- (b) light-emitting diode (LED) type exit signs;
- (c) high efficiency air-cooled chillers with heat recovery function;
- (d) demand control of fresh air supply with carbon dioxide sensors;
- (e) heat wheel/heat pipe for heat energy reclaim of exhaust air;
- (f) automatic on/off switching of lighting and ventilation fans inside the lifts;
- (g) service-on-demand control for escalators; and
- (h) building energy management system for large installation.

29. For renewable energy technologies, we will use solar hot water heating and will use photovoltaic panels to provide renewable energy for environmental benefits.

30. For green features, we will provide landscape in the appropriate areas on main roof, terraces and courtyard for environmental and amenity benefits.

31. The total estimated additional cost for adoption of the above features in the new ambulatory block is around \$18.7 million. There will be about 11.0% energy savings in the annual energy consumption.

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<sup>4</sup> 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<sup>3</sup>), nor the cost to provide new landfills, (which is likely to be more expensive) when the existing ones are filled.

## HERITAGE IMPLICATIONS

32. The project 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

33. This project does not require land acquisition.

## BACKGROUND INFORMATION

34. We upgraded **3MR** to Category B in October 2007. We have engaged consultants to carry out minor site investigation works including topographical survey, utility mapping, geotechnical assessment, traffic impact assessment (TIA), drainage impact assessment (DIA), sewerage impact assessment (SIA) and pre-contract QS services. We have also employed a term contractor to carry out ground investigation works. The total cost of these consultancy services and works is about \$8.7 million. We have charged this amount to block allocation **Subhead 8100MX** "Hospital Authority – improvement works, feasibility studies, investigations and pre-contract consultancy services for building projects". The consultants have completed the topographical survey, utility mapping, geotechnical assessment, TIA, SIA and DIA, and the term contractor has completed the ground investigation works. The QS consultant is carrying out the pre-contract QS services. We are concluding the project requirements with in-house staff resources and the QS consultant is also finalizing the tender documents of the project.

35. The proposed works will involve the removal of 75 trees including two trees to be felled, 73 trees to be transplanted within TKOH compound. All trees to be removed are not important trees<sup>5</sup>. We will incorporate planting proposals as part of the project, including estimated quantities of 80 trees/palms and 10 000 shrubs / groundcovers / climbers.

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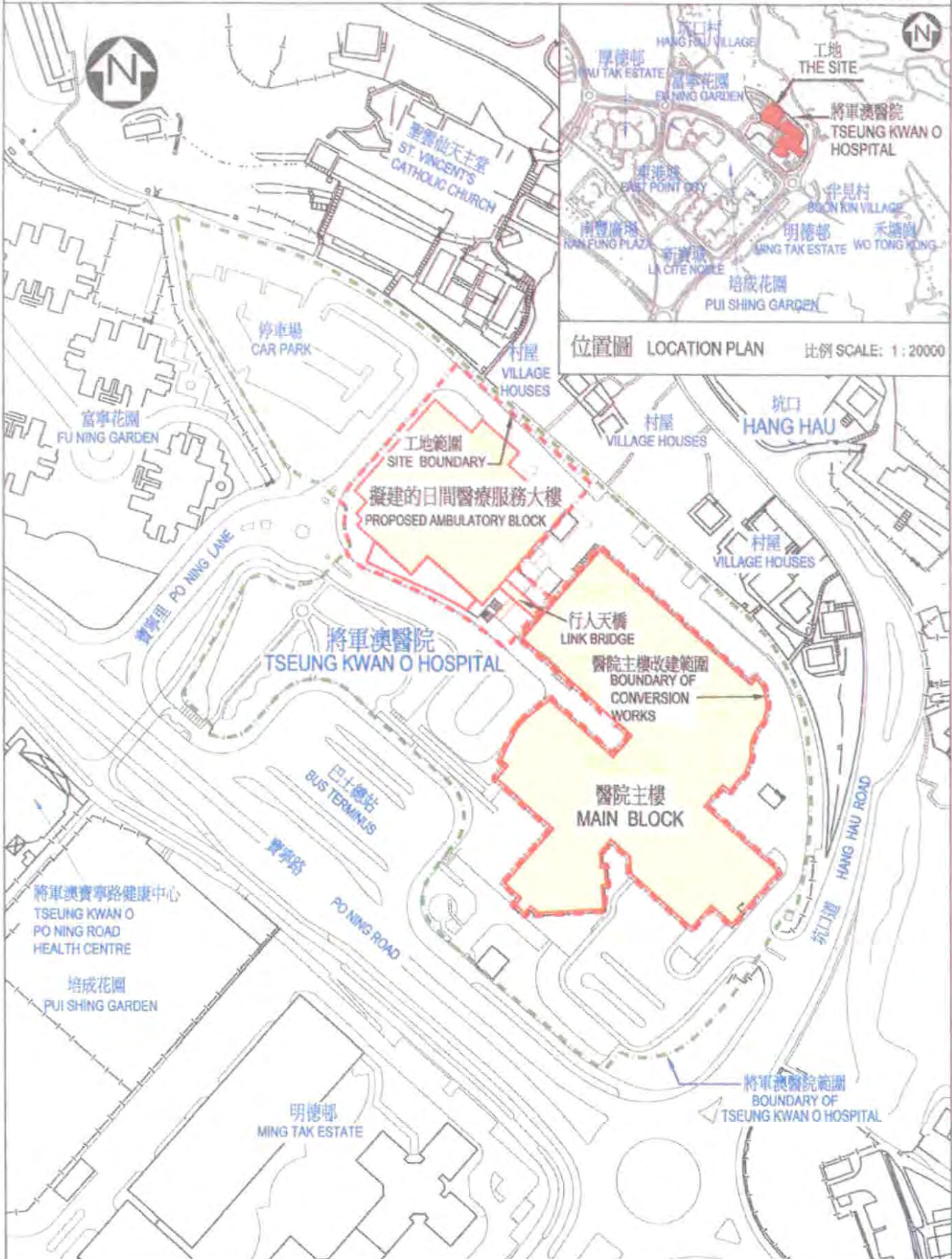
<sup>5</sup> "Important tree" refers to trees in the Register of Old and Valuable Trees, or any other trees that meet one or more of the following criteria –

- (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 an important person or event;
- (c) trees of precious or rare species;
- (d) trees of outstanding form (taking account of overall tree 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 metre (measured at 1.3 metres above ground level), or with height/canopy spread equal or exceeding 25 metres.


36. We estimate that the proposed works will create about 584 jobs (544 for labourers and 40 for professional/technical staff) providing a total employment of 29 400 man-months.

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Food and Health Bureau  
May 2008



位置圖 LOCATION PLAN 比例 SCALE: 1:20000

8003 MR 將軍澳醫院擴建工程 EXPANSION OF TSEUNG KWAN O HOSPITAL	drawn by 繪圖 S.W. CHAN	date 日期 4/08	drawing no. 編號 6931/XA201	scale 比例 1:2000
	approved 覆核 Y.O. CHAU	date 日期 4/08	 ARCHITECTURAL SERVICES DEPARTMENT 建築署	
	office 辦事處 PROJECT MANAGEMENT BRANCH 工程策劃管理處			

## 3MR – Expansion of Tseung Kwan O Hospital

## Breakdown of the estimate for consultant's fees

Consultant's staff cost		Estimated man- months	Average MPS* salary point	Multiplier (Note 1)	Estimated fee (\$million)
Quantity surveying services (Note 2)	Professional	-	-	-	7.5
	Technical	-	-	-	8.5
Risk management consultancy services (Note 3)	Professional	8.8	38	2.0	1.0
	Technical	26.5	14	2.0	1.0
				Total	18.0

\*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 consultant's overheads and profit, as the staff will be employed in the consultant's offices. (As at 1 April 2007, MPS point 38 is \$56,945 per month and MPS point 14 is \$18,840 per month.)
- (2) The consultant's staff cost for quantity surveying services is calculated in accordance with the existing consultancy agreement for the provision of quantity servicing services for 3MR. The assignment will only be executed subject to Finance Committee's approval to upgrade 3MR to Category A.
- (3) We will only know the actual man-months and actual fees after we have selected the consultants through the usual competitive bidding system.

**3MR – Expansion of Tseung Kwan O Hospital**

**Indicative list of furniture and equipment items  
with unit cost of \$1 million or more**

<b>Item description</b>	<b>Quantity</b>	<b>Unit cost (\$ million)</b>	<b>Total cost (\$ million)</b>
Monitoring system, physiologic	1	5.400	5.400
Operating microscope	1	1.200	1.200
X-ray controlled three dimensional orthopedic navigating system	1	2.210	2.210
Sterilizing unit, steam	1	1.131	1.131
Integrated telecommunication system and underground cable	1	3.100	3.100
Integrated public addressing system	1	1.600	1.600
Closed circuit television (CCTV) system	1	2.800	2.800
Card access control system with associated accessories	1	3.300	3.300
Integrated audio visual system for new lecture theatre	1	3.000	3.000
Carbon dioxide laser for ear, nose & throat (ENT) conditions	1	1.500	1.500
Ultrasound scanner	1	1.600	1.600
Physiologic monitoring system & information system	1	5.000	5.000
Echocardiography system	1	1.800	1.800
Electrocardiography (ECG) management system	1	1.500	1.500
Electrical mobile shelving system	1	3.300	3.300



**Enclosure 3 to PWSC(2008-09)23**

<b>Item description</b>	<b>Quantity</b>	<b>Unit cost (\$ million)</b>	<b>Total cost (\$ million)</b>
Laboratory automation system, chemistry	1	15.000	15.000
Analyser, haematology with slide stainer	1	3.000	3.000
Analyser, flow cytometry	1	1.500	1.500
Analyser, molecular	1	1.500	1.500
Mortuary body storage refrigerator	1	6.000	6.000
Magnetic resonance imaging system (MRI)	1	21.500	21.500
Picture archiving & communication system (PACS)	1	13.000	13.000
C-arm mobile radiography and fluoroscopy unit with computer control	1	1.800	1.800
Automatic tablets dispensing & packaging system	1	1.500	1.500