# ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

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

#### 70MM – Redevelopment of Queen Mary Hospital, phase 1

Members are invited to recommend to the Finance Committee –

- (a) the upgrading of part of **70MM**, entitled "Redevelopment of Queen Mary Hospital, phase 1 - preparatory works", to Category A at an estimated cost of \$1,592.8 million in moneyof-the-day prices; and
- (b) the retention of the remainder of **70MM** in Category B.

#### PROBLEM

The existing capacity of Queen Mary Hospital (QMH) is inadequate to meet the increasing demand and requirements for healthcare services in Hong Kong West (HKW) Cluster of the Hospital Authority (HA).

#### PROPOSAL

2. The Secretary for Food and Health proposes to upgrade part of **70MM** to Category A at an estimated cost of \$1,592.8 million in money-of-theday (MOD) prices for the preparatory works for the redevelopment of QMH, phase 1.

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## PROJECT SCOPE AND NATURE

3. The part of **70MM** which we propose to upgrade to Category A (i.e. the preparatory works) comprises –

- (a) site investigations, minor studies and surveys, as well as pre-contract consultancy for the main works;
- (b) decanting works including conversion of Senior Staff Quarters (SSQ) into clinical pathology laboratories, staff accommodation, teaching facilities and car parking facilities for the temporary decanting of the existing facilities and equipment in the Clinical Pathology Block (CPB), University Pathology Block (UPB) and Housemen Ouarters (HO)with of access road adjacent to the improvements Administration Building leading to the SSQ site;
- (c) alterations to Block K to accommodate Haematology Department relocated from CPB and a new temporary body store;
- (d) improvement works to Block K and Block J to facilitate the main works; and
- (e) consultancy services for contract administration and site supervision of the decanting works.

4. Subject to funding approval of the Finance Committee (FC), we plan to commence the preparatory works in May 2014 for completion in September 2017.

5. We will retain the remainder of **70MM** (i.e. the main works) in Category B. The main works, which are planned to commence in 2017 for completion in 2023, comprises –

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- (a) demolition of CPB, UPB and HQ for the construction of a new hospital block to accommodate
  - (i) Accident and Emergency (A&E) Department;
  - (ii) A&E Observation Ward;
  - (iii) Emergency Medicine Wards;
  - (iv) Diagnostic Radiology Department;
  - (v) Peri-operative Centre;
  - (vi) Cardiac Catheterization Laboratories;
  - (vii) Endoscopy Unit;
  - (viii) Electro-diagnostic Unit;
  - (ix) Intensive Care Unit (ICU)/Critical Care Unit/ Paediatric ICU;
  - (x) In-patient Wards;
  - (xi) Clinical Pathology Departments (including Mortuary);
  - (xii) University Pathology Departments;
  - (xiii) a roof helipad; and
- (b) provision of a new access point from Pok Fu Lam Road to the new hospital block.
- The site plan showing the location of decanting works at QMH is at Enclosure 1. The floor plans, sections and a perspective view (artist's impression) of the converted SSQ are at Enclosures 2 to 8. Funding for the main works will be sought separately to dovetail with the implementation programme of the project.

### /JUSTIFICATION .....

#### JUSTIFICATION

6. Established in 1937, QMH is a major acute hospital in the HKW Cluster of HA with around 1 700 beds, serving a population of over 531 000 in the Central and Western District and the Southern District as well as treating many patients of other districts in Hong Kong. It provides a full range of acute and tertiary services, including 24-hour A&E services, in-patient service, ambulatory care and rehabilitation services, as well as specialist services covering a wide range of specialties and sub-specialties.

7. As the teaching hospital of the Li Ka Shing Faculty of Medicine of The University of Hong Kong, QMH is providing professional clinical training, pioneering innovative technology and conducting clinical trials for new treatment modalities. In addition, QMH serves as a tertiary and quaternary referral centre for many complex and advanced services such as organ transplant, neonatal intensive care, coronary care, burns and reconstructive surgery and neurosurgery for the entire territory. Since 2003, QMH has become the only designated liver transplant centre in Hong Kong to provide world-class standard liver transplant service. The A&E Department of QMH has been designated as one of the five trauma centres in the territory.

#### Need for the Redevelopment of QMH

#### Insufficient Clinical Space

8. Many buildings of QMH are over 40 years old, with limited space provisions. Currently, the space provision of QMH is around 77 square metres  $(m^2)$  Gross Floor Area (GFA) per bed excluding teaching facilities and staff quarters. By way of comparison, the space provision of Prince of Wales Hospital (PWH), the other teaching hospital in Hong Kong, is around 140  $m^2$  per bed. Besides, the operational space in the A&E Department, including areas for clinical treatment and supporting services, observation beds, patient waiting area, as well as the specially designed cubicle for patients with suspected infectious diseases are all accommodated in an extremely small area. The GFA of the A&E Department of QMH is  $1050 \text{ m}^2$  as compared with that of the PWH which is over 4 000 m<sup>2</sup>. Given the limited space, the existing A&E Department can only accommodate one major trauma room, one resuscitation cubicle, one treatment cubicle and nine consultation/examination rooms. Such facilities and space provision cannot meet the modern standard in emergency medicine practice and are insufficient to cope with the increasing service demand.

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## Unsatisfactory Services Zoning

9. Apart from space limitations, the unfavourable topography of QMH does not facilitate clinical convenience. Incremental growth and piecemeal developments over the years have resulted in a lack of proper services zoning. Related or even the same services are scattered over different locations in the hospital. This has made alignment of functional relationships amongst departments or service units difficult and has lengthened travelling time. Currently, the operating theatres (OTs) are located in two separate buildings, with 14 OTs scattered on six different floors in the Main Block and four other OTs on alternate floors in Block K. Likewise, the ICUs are spread on two different floor levels and hospital wings of the Main Block. Such arrangement does not facilitate sharing of manpower and equipment among OTs and is also not ideal for patient safety as help from other OTs may be remote in case an emergency occurs during operations. Commuting among the various hospital blocks and floors in QMH has also caused much inconvenience to patients, staff and the public.

## Outdated Design and Facilities

10. Having established for over 75 years, the design of QMH has become outdated and no longer meets the service requirements and workflow logistics of a modern tertiary acute hospital. For example, nurse stations in wards are cramped and at locations not convenient for close observation of patients. The clinical pathology laboratories are housed in a building almost 40 years old, which cannot provide the physical environment conducive to efficient workflows. With many of the buildings having been in use for over four decades, their structural conditions and designed capacity have limited QMH to embrace the latest technological advancements, as installation of new medical equipment is often not feasible. Building services provisions at QMH are also inadequate. In particular, the lift service is slow and insufficient which has resulted in long waiting time during peak hours or when the lifts are used for the transport of materials.

### Limited Accessibility

11. QMH is served only by one access road, winding up from Pok Fu Lam Road at the Sassoon Road junction. However, its A&E Department in Block J is located at the far end of the QMH site which can only be accessed through this narrow two-lane carriageway. Ambulances have to share this single

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access road with public transport, which is susceptible to blockage by minor incidents such as car accidents or fallen trees. Traffic congestion along the access road delays the transfer of patients to the A&E Department which is highly undesirable as timely treatment is critical to the clinical outcome of patients with major trauma or other life-threatening conditions.

12. In summary, the design of existing facilities in QMH is outdated and cannot meet the service requirements of a modern tertiary acute hospital. In addition to insufficient clinical space, the existing buildings are set within a difficult topography and do not facilitate clinical convenience. The site has only one major access point and a single, narrow two-lane road. This single access point and narrow road are shared by ambulances, services traffic and public transport. The redevelopment of QMH is therefore imperative.

### **The Redevelopment Project**

13. HA has formulated the Clinical Services Plan (CSP) for the HKW Cluster to delineate the service delivery model in the Cluster. It involved an analysis of the service needs and a feasibility study on how to maximise the benefits of existing hospital plans to the community which included the development of a concept plan for the redevelopment of QMH. This was a highly intensive and consultative process involving clinicians and key stakeholders of the project. The CSP sets out the clinical strategies, models of care and future service development in the HKW Cluster and guides the planning for the redevelopment of QMH.

### Conceptual Design of QMH

14. Underpinned by the CSP for the HKW Cluster, a Concept Plan for the redevelopment of QMH has been developed, which aims to renew the hospital in phases into a modern health sciences centre and to modernise its facilities to cope with the growing clinical service and teaching demands. The redevelopment plan will provide additional space and maximised floor areas to meet operational needs. It will be adaptable to service development as well as conducive to integrated research and education. The new QMH will adopt a patient-oriented design equipped with state-of-the-art medical equipment, with well-coordinated services and improved accessibility for more cost-effective and efficient operations to meet the long-term needs of the community.

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15. The Concept Plan recommends, as phase 1 of the redevelopment of QMH, the construction of a new hospital block at the north end of the hospital campus that has large floor plates with convenient connections between the A&E Department and "hot floors"<sup>1</sup> so as to strengthen emergency services for critical patients. To minimise disruptions to clinical services during redevelopment, it is necessary to temporarily decant the existing services in the CPB (including mortuary services) and UPB, as well as facilities of the HQ to the vacated SSQ.

### FINANCIAL IMPLICATIONS

16. HA, in consultation with the Director of Architectural Services, estimates the cost of the proposed preparatory works to be \$1,592.8 million in MOD prices (please see paragraph 17 below), broken down as follows –

		<b>\$ million</b>
(a)	Site works and demolition	44.4
(b)	Piling/foundation works	9.6
(c)	Building works <sup>2</sup>	470.3
(d)	Building services works <sup>3</sup>	303.7
(e)	Drainage works	3.3
(f)	Access road improvement	3.7

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<sup>1</sup> "Hot floors" refer to floors where critical services are delivered, e.g. A&E, ICU, OTs and emergency diagnostic facilities.

<sup>&</sup>lt;sup>2</sup> Building works comprise construction of the substructure and superstructure of the building.

<sup>&</sup>lt;sup>3</sup> Building services works comprise electrical installations, ventilation and air-conditioning, fire services installation and lifts and escalators, etc.

		<b>\$</b> 1	million
(g)	External works, link bridge and soft landscaping works		42.2
(h)	Additional energy conservation, green and recycled features		12.5
(i)	Re-provision of Haematology and temporary body store at Block K		25.2
(j)	Furniture and equipment (F&E) <sup>4</sup>		250.0
(k)	Consultants' fees for		25.3
	(i) contract administration	23.3	
	(ii) management of resident site staff	2.0	
(1)	Remuneration of resident site staff		14.0
(m)	Investigations and related services for the main works		13.2
(n)	Improvement works to Block K and Block J to facilitate the main works		17.0

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Based on an indicative list of F&E items at Enclosure 10 and their estimated prices.

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		\$ million	
(0)	Contingencies	118.1	
	Sub-total	1,352. 5	(in September 2013 prices)
(p)	Provision for price adjustment	240.3	
	Total	1,592. 8	(in MOD prices)

Due to insufficient in-house resources, HA will engage consultants to undertake contract administration and construction supervision for the decanting works. A detailed breakdown of the estimate for consultants' fees and resident site staff costs by man-months is at Enclosure 9. The construction floor area (CFA) of this project is about 29 625 m<sup>2</sup>. The estimated construction unit cost, represented by the building and the building services costs, is \$26,126.6 per m<sup>2</sup> of CFA in September 2013 prices. We consider this unit cost reasonable as compared with that of similar projects.

17. Subject to funding approval, HA will phase the expenditure as follows –

Year	\$ million (Sept 2013)	Price adjustment factor	\$ million (MOD)
2014 - 15	199.6	1.05450	210.5
2015 - 16	398.9	1.11777	445.9
2016 - 17	432.0	1.18484	511.9
2017 - 18	130.3	1.25593	163.6
2018 - 19	109.9	1.33128	146.3
2019 - 20	81.8	1.40117	114.6
	1,352.5		1,592.8

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18. HA has derived the MOD estimates 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 2014 to 2020. HA will award the contract on a lump-sum basis for decanting works because the scope of the works can be clearly defined in advance. The contract will provide for price adjustments. For the alteration works to Block K and improvement works to Block K and Block J, HA's term contractor, who is familiar with the operating environment and selected through a competitive bidding process, will be engaged to facilitate early completion of works.

19. HA has assessed the requirements for F&E for this project, and estimates the F&E costs to be \$250 million. The proposed F&E provision represents 30.5% of the total renovation cost of the project<sup>5</sup>. An indicative list of major F&E items (costing \$1 million or above per item) to be procured for the project is at Enclosure 10.

20. We estimate the additional annual recurrent expenditure arising from this preparatory works to be \$20.3 million.

### PUBLIC CONSULTATION

21. We consulted the Culture, Leisure & Social Affairs Committee (CLSAC) of the Central and Western District Council and the Community Affairs and Tourism Development Committee (CATC) of the Southern District Council on the proposed project on 14 and 25 November 2013 respectively. Members of the CLSAC and the CATC supported the proposed project in both consultations.

22. We consulted the Legislative Council Panel on Health Services on 17 February 2014. Members of the Panel supported the project.

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Represented by building, building services, drainage, external works, link bridge and soft landscaping works costs.

#### **ENVIRONMENTAL IMPLICATIONS**

23. The preparatory works is not a designated project under the Environmental Impact Assessment Ordinance (Cap. 499). HA will implement standard pollution control measures during decanting, as promulgated by the Director of Environmental Protection. HA has included in the project estimates the cost to implement suitable mitigation measures to control short-term environmental impacts.

24. During decanting works, HA will control noise, dust and site run-off nuisances to within established standards and guidelines through the implementation of mitigation measures in the relevant contract. These include the use of silencers, mufflers, acoustic lining or shields, and the building of barrier wall for noisy construction activities, frequent cleaning, and the watering of the site.

25. At the planning and design stages, HA has considered measures to reduce the generation of construction waste where possible (e.g. using metal site hoardings and signboards so that these materials can be recycled or reused in other projects). In addition, we will require the contractor to reuse inert construction waste (e.g. use of excavated materials for filling within the site) on site or in other suitable construction sites as far as possible, in order to minimise the disposal of inert construction waste at public fill reception facilities<sup>6</sup>. HA will encourage the contractor to maximise the use of recycled/recyclable inert construction waste, and the use of non-timber formwork to further reduce the generation of construction waste.

26. At the construction stage, HA will 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. HA will ensure that the day-to-day operations on site comply with the approved plan. HA will require the contractor to separate the inert portion from non-inert construction waste on site for disposal at appropriate facilities. HA will control the disposal of inert construction waste and non-inert construction waste at public fill reception facilities and landfills respectively through a tripticket system.

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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.

27. HA estimates that the project will generate in total about 20 160 tonnes of construction waste. Of these, HA will reuse about 3 488 tonnes (17.3%) of inert construction waste on site and deliver 14 112 tonnes (70%) of inert construction waste to public fill reception facilities for subsequent reuse. HA will dispose of the remaining 2 560 tonnes (12.7%) 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 \$0.7 million for this project (based on a unit charge rate of \$27 per tonne for disposal at public fill reception facilities and \$125 per tonne at landfills as stipulated in the Waste Disposal (Charges for Disposal of Construction Waste) Regulation).

#### ENERGY CONSERVATION, GREEN AND RECYCLED FEATURES

28. This project will adopt various forms of energy efficient features and renewable energy technologies, in particular –

- (a) high efficiency air-cooled chiller with variable speed drive;
- (b) automatic demand control of chilled water circulation system;
- (c) automatic demand control of supply air;
- (d) demand control of fresh air supply with carbon dioxide sensors;
- (e) heat wheels for heat reclaim of exhaust air;
- (f) automatic demand control for ventilation fans in car park; and
- (g) photovoltaic panels on roof top.

29. For greening features, HA will provide vertical greening on the appropriate facades of the building for environmental and amenity benefits.

30. For recycled features, HA will provide rainwater recycling system for irrigation purpose.

31. The total estimated additional cost for adoption of the above features is around \$12.5 million (including \$6.35 million for energy efficient features), which has been included in the cost estimate of this project. The energy efficient features will achieve 6.9% energy savings in the annual energy consumption with a payback period of about 7.6 years.

## HERITAGE IMPLICATIONS

32. Three historic buildings/structures, namely Pok Fu Lam Conduit (Grade 2), No. 128 Pok Fu Lam Road which is also known as "Jessville" (Grade 3), and Nurses' Quarters Block "A" of QMH (Grade 2) are located in the vicinity of the project site. HA has consulted the Antiquities and Monuments Office (AMO), who advised that Heritage Impact Assessment is not required. However, the works shall be carried out with care with precautionary measures and photo records to be submitted to AMO. HA will ensure that adequate protection measures will be implemented to avoid any adverse impact of the project to these historical structures.

## LAND ACQUISITION

33. This project does not require any land acquisition.

## **BACKGROUND INFORMATION**

34. We upgraded **70MM** to Category B in October 2013.

35. HA engaged consultants to carry out traffic impact assessment, utility, topographical, tree and building survey, ground investigation works, asbestos survey, heritage survey and tree felling and compensation proposals. HA also appointed a quantity surveying consultant to prepare tender document. The total cost of the above-mentioned services is about \$26.4 million. HA has charged this amount to block allocation **Subhead 8100MX** "Hospital Authority – improvement works, feasibility studies, investigations and pre-contract consultancy services for building projects". All the above consultancy services and site investigation works have been completed.

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36. Of the 24 trees within the project site boundary of the link bridge and access road, the project will involve felling of seven trees and pruning of one tree. All trees to be felled or pruned are not important trees<sup>7</sup>. Compensation of 12 new trees will be incorporated into planting proposals as part of the project.

37. We estimate that the proposed preparatory works will create about 360 jobs (282 for labourers and another 78 for professional/technical staff) providing a total employment of 12 970 man-months.

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Food and Health Bureau April 2014

- (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 curtail like aerial roots, trees growing in unusual habitat; or
- (e) trees with trunk diameter equal or exceeding 1.0 metre (m) (measured at 1.3m above ground level), or with height/canopy spread equal or exceeding 25 m.

<sup>&</sup>lt;sup>7</sup> An "important tree" refers to trees in the Register of Old and Valuable trees, or any trees that meet one or more of the following criteria—

<sup>(</sup>a) trees of 100 years old or above;

<sup>(</sup>b) trees of cultural, historical or memorable significance, e.g. Fung Shui tree, tree as landmark of monastery or heritage monument, and trees in memory of an important person or event;

#### 附件1 Enclosure1



70MM - Redevelopment of Queen Mary Hospital, phase 1 瑪麗醫院重建工程第一期

Site Plan (Not to Scale) 工地平面圖 (不按比例)

附件 2 Enclosure 2









#### 附件 6 Enclosure 6







70MM - Redevelopment of Queen Mary Hospital, phase 1 瑪麗醫院重建工程第一期 Perspective view of the converted Senior Staff Quarters from Pok Fu Lam Road 面向薄扶林道改建後的高級職員宿舍構思透視圖

#### 70MM (Part) – Redevelopment of Queen Mary Hospital, phase 1

# **Breakdown of the estimates for consultants' fees and resident site staff costs** (in September 2013 prices)

			Estimated man-months	Average MPS <sup>*</sup> salary point	Multiplier (Note 1)	Estimated fee (\$ million)
(a)	Consultant's fees	for Profession	nal 105	38	2.0	14.1
	contract administr (Note 2)	ration Technical	197	14	2.0	9.2
					Sub-total	23.3
(b)	Resident site staff costs (Note 2)	Technical	344	14	2.0	16.0
	Comprising –				Sub-total	16.0
	(i) Consultants fees for managemen resident site	at of e staff			2.0	
	(ii) Remunerative resident site	on of e staff			14.0	
					Total	39.3

\* MPS = Master Pay Scale

#### Notes

- 1. A multiplier of 2.0 is applied to the average MPS point to estimate the full staff cost including the consultants' overheads and profit for staff employed in the consultants' offices. (As at now, MPS salary point 38 = \$67,370 per month and MPS salary point 14 = \$23,285 per month.)
- 2. The actual man-months and actual fees will only be known after completion of the preparatory works.

## Enclosure 10 to PWSC(2014-15)8

# 70MM (Part) – Redevelopment of Queen Mary Hospital, phase 1

## Indicative list of furniture and equipment items with unit cost of \$1 million or above

Item description	Quantity	Unit cost (\$ million)	Total cost (\$ million)
Animal Cage Washer, Hong Kong University (HKU), Microbiology	1	2.000	2.000
Audio Visual System	1	7.949	7.949
Autoclave, HA, Microbiology	3	1.200	3.600
Autoclave, HKU, Microbiology	4	1.500	6.000
Body Storage Fridge for Temporary Body Store, HA, Mortuary	1	1.500	1.500
Centrifuge, Ultra-speed, HKU, Pathology	1	1.422	1.422
Digital Slide Scanner, HKU, Pathology	1	2.876	2.876
Deoxyribonucleic Acid (DNA) Sequencing Machine, HA, Anatomical Pathology	1	1.500	1.500
DNA Sequencing Machine, HA, Haematology	1	1.000	1.000
DNA Sequencing Machine, HKU, Microbiology	1	2.200	2.200
DNA Sequencing Machine, HKU, Pathology	1	2.081	2.081
DNA Sequencing Machine, HA Microbiology	1	2.000	2.000

Item description	Quantity	Unit cost (\$ million)	Total cost (\$ million)
Examination Lamp with Audio and Video System, HA, Mortuary	1	1.500	1.500
Flow Cytometer, Cell Analyser, HKU, Pathology	1	2.527	2.527
Flow Cytometer, Cell Sorter, HA, Microbiology	1	4.000	4.000
Flow Cytometer, Cell Sorter, HKU, Pathology	1	4.655	4.655
Integrated Security System	1	3.000	3.000
Information Technology (IT) Network, HA	1	5.144	5.144
IT Network, HKU	1	9.760	9.760
Microscope System, HKU, Pathology	1	1.149	1.149
Mobile Shelving System	1	11.148	11.148
Next-gen Sequencer, High Throughput and High Quality, HKU, Microbiology	1	1.565	1.565
Next-gen Sequencer, Long Reads of Length, HKU, Microbiology	1	1.274	1.274
Quantitative Polymerase Chain Reaction (PCR) Machine, HA, Microbiology	1	1.501	1.501
Robotic System for Immunohistochemistry (IHC), HKU,	1	1.995	1.995

Pathology

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Item description	Quantity	Unit cost (\$ million)	Total cost (\$ million)
Telephone System, Digital Enhanced Cordless Telecommunications	1	6.999	6.999
(DECT) and Private Automatic Branch Exchange (PABX)			