

**LegCo Panel on Health Services
Meeting to be held on 14 June 2004**

Prince of Wales Hospital – Current Condition and Way Forward

Purpose

This paper briefs members on the current condition of the Prince of Wales Hospital (PWH) and the Government and Hospital Authority (HA)'s plans on the way forward.

Background of PWH

2. PWH was completed and put into operation in 1984 and its design was undertaken in the late 1970s. It is a tertiary level acute hospital serving population of NT East, as well as the teaching hospital for the Medical Faculty of the Chinese University of Hong Kong (CUHK). The services provided include:

- Inpatient service in 16 clinical specialties, with 1400 beds;
- Ambulatory services including 24-hour A&E, 9 specialist out-patient clinics with an annual attendance of over 500,000; and
- Clinical support services, including operating theatre, clinical pathology and laboratory service, rehabilitation services, diagnostic radiology, pharmacy.

A layout plan of PWH is at Annex.

3. All public hospitals are subject to a regular maintenance programme. Day to day minor maintenance, redecoration, replacement and repairs are carried out on cyclical basis. Major replacement and repair works completed in the past three years for Prince of Wales Hospital include renewal of roof waterproofing, replacement of sewage pipes, pneumatic air compressors, some switchboards and miniature circuit

breaker boards, some fan coil units, some air-handling units, and some water pumps. Because of high demand, occupancy and usage of clinical areas that make decanting of patients impossible, it is often not possible to adhere strictly to the maintenance programmes scheduled, especially preventive maintenance programmes.

Current condition and problems faced by PWH

Space Constraint

4. The mode of hospital operation has undergone a lot of changes since the completion of PWH. Space provision in PWH is inadequate to meet service needs with increase in the population of the NTE cluster, demographic changes and the emergence of new medical technologies and modes of care. Originally, the hospital had a total space provision of around 92,000m² in gross floor area (GFA) for hospital operations and another 63,000m² GFA for staff accommodation and training. Over the years, PWH has undergone a number of addition, alteration and improvement works to meet the ever-increasing demand for medical services. These works led to a total increase in GFA of around 33,000m². Nevertheless, PWH is still severely under-provided in space as demonstrated by the fact that its 90m² GFA per bed provision for hospital operations is only about 80% of the 110m² GFA per bed provision of a modern secondary acute general hospital like the North District Hospital (NDH). The in-patient wards are small and heavily congested, with space between beds less than desirable. In addition, there are only 10 operating theatres in PWH. In comparison, Queen Mary Hospital, the other teaching hospital of Hong Kong and a tertiary acute general hospital with 1,440 beds, has 18 operating theatres.

5. According to the latest projections of the Census and Statistics Department, the population of the NTE cluster would increase by 4.8% and 9.1% by 2008 and 2011 respectively. The HA has critically reviewed the space requirements of PWH and considers that a total space provision of around 200 000m² GFA would be required to meet its service needs. Such a provision would be equivalent to 140 m² GFA per bed and is adequate for PWH to meet its service requirements as a

teaching hospital as well as a major tertiary acute general hospital.

Limitations imposed by the existing structural frame

6. The problem of space constraint could be resolved by constructing other extension blocks while retaining the current buildings and spacing out the currently crowded beds and facilities. However, the structural frame of the existing buildings has imposed limitations on their potential to be upgraded to meet present-day standards and future demands. For example, the structural headroom of 3.5m is insufficient to allow for installation of service trunkings to support the necessary engineering services, hospital operational systems and the information technology infrastructure. As an example for comparison, the structural headroom of the North District Hospital is 4.5m.

Undesirable locations of services

7. The addition and alteration works conducted in PWH over the years to meet service needs have resulted in related or even the same services being scattered over different locations in the hospital. The present distribution of hospital services does not induce an efficient patient and functional flow, has increased the transit time of staff, patients as well as materials, and heightened the risk of cross infection. Improvement on the functional relationships of the hospital services is limited by the physical constraints. For example, patients in Ward Blocks E and F (Special Block) in need of an operation have to be transported to 2/F, along the covered walkway to the Main Block, up to 3/F of the Main Block and along the ward corridor to operating theatres located on 3/F of the Clinical Science Building. The journey normally takes about 20 minutes. Comprehensive re-planning and rationalization of the realignment of existing hospital services is theoretically feasible but the refurbishment space or modified layout would still be constrained by the limitations imposed by the existing structural frame, with building services installations exposed and resultant headrooms being undesirably low etc.

Deterioration of building services and facilities

8. PWH has faced extremely heavy service demand since its completion. The table below shows the population figures of PWH's catchment area and those of two other tertiary acute hospitals:-

Catchment Area	mid-year 1992	mid-year 2002	Percentage change
PWH (NTE) ¹	1,093,400	1,340,824	+ 22.6%
QMH ²	503,600	539,965	+ 7.2%
QEH ³	518,800	490,128	- 5.5%

As can be seen in the above table, whilst the population of PWH's catchment area has grown by 22.6% between 1992 and 2002 and stood at 1.34 million in mid 2002, the population in the catchment areas of QMH and QEH is not only smaller by half but is also either growing at a slower rate or decreasing. Particularly heavy usage of the hospital in the past 20 years has accelerated the deterioration of finishes, fixtures and other installations and shortened their life span. Some of the building services installations, including the air-conditioning system, are approaching the end of their serviceable life and beyond economical repair. There are also problems normally faced by aging buildings such as spalling concrete and water seepage. Although the buildings' condition is generally satisfactory with maintenance services in place, the hospital is due for major refurbishment which should include replacement of major building services and facilities such as air-conditioning and fire services installations to meet present-day requirements and standards. Other major acute hospitals have also undergone major refurbishment after having been put into use for a considerable number of years. For example, the Princess Margaret Hospital was refurbished in 1993 when the hospital had operated for 18 years.

Sub-standard building services installations

9. At the commissioning of PWH, the hospital was able to meet the standards prevailing at the time. However, as standards evolved over the years, some building services installations do not meet the latest statutory requirements and clinical standards. For examples, installations of the operating theatre are extremely aged and out-moded to

¹ Figures of 1992 cover Tai Po, Sai Kung (including Tseung Kwan O), Sha Tin and New Territories North; figures of 2002 cover Tai Po, Sai Kung (excluding Tseung Kwan O), Sha Tin and North District

² Queen Mary Hospital

³ Queen Elizabeth Hospital

meet present-day clinical standards; provision of medical gas outlets in wards is inadequate to meet the requirement of modern acute care services; some building services installations like the nurse call system and automatic fire alarm system, have become so outdated that their spare parts are no longer available in the market and that renders repairs extremely difficult. It is very difficult to bring these building services systems up to the current standards in a cost-effective manner due to physical constraints and the need to avoid major disruptions to the hospital services resulted from continuous decanting exercises.

Refurbishment and redevelopment options

10. We have considered the options of refurbishment and redevelopment. There are various disadvantages of the refurbishment option that renders it not cost-effective. These are outlined in the following paragraphs.

Difficulty in suspending services and decanting for the purpose of refurbishment

11. All major refurbishment programmes of acute hospitals require service suspension and substantial decanting arrangements. In PWH's case, the service demand has made it difficult even for regular maintenance, which generates far less disruption to the hospital's operation, to be carried out in the past. With the increase in population of the NTE cluster, continuous heavy usage will make it impossible for the hospital to suspend some of the services and close down part of the hospital for a major refurbishment programme. Suspension of service would also affect the teaching of the Medical Faculty of CUHK. There would also be considerable environmental nuisance during the refurbishment period for the parts of the hospital that are still functioning. The quality of care would be adversely affected. The refurbishment approach would seriously affect the extent to which the hospital can operate. The main hospital block consists of four wings (A, B, C and D), which are linked up by a small circulation area. Closing down of these must be done in pair, ie either Wing A and B or C and D. As they are in very close proximity, closing down of either one would cause great disruption to the other, given the noise, dust, and other nuisances as a result of the site work. In our analysis of the refurbishment approach, the option that would cause the least disruption to service would still require the suspension of service of 450-500 beds at any one phase, and the estimated timing required for completion of refurbishment is 72 months.

It would be extremely difficult for other hospitals in the NTE cluster to share the workload for such a long period. It would also mean that six years of medical students of CUHK would have a less-than-desirable learning environment, some for the whole of their five-year undergraduate study.

Limitation on the improvement that can be brought about by refurbishment

12. There are various inherent problems that cannot be resolved by the refurbishment approach. Besides the examples quoted above, spatial configurations, existing horizontal and vertical circulation patterns, structural loading capacity and headroom limitations would mean that the hospital would not be able to achieve the most efficient layout and to harness the latest technology to suit today's demand and operation of a modern hospital. As a result, the renovated/refurbished hospital would not be flexible enough to meet future needs and would be outdated quickly. The maintenance cost for new buildings are also much lower than aged buildings.

The Redevelopment option

13. Although refurbishment is possible, the conclusion of our preliminary analysis is that it is not cost-effective compared to the redevelopment approach which allows the hospital to continue to operate while construction works are going on. The project is preliminarily envisaged to be carried out in two phases. Part of the existing staff quarters will be demolished in each of the phases for construction of two new blocks to house the clinical facilities, supporting facilities and ancillary facilities. This approach would not require service suspension and would not affect teaching. The environmental nuisance caused would be much less since the construction would take place in sites outside the existing hospital buildings. Upon redevelopment, there will be adequate clinical space and facility provisions for the hospital to meet present-day standards and future needs. The new development would help to create a patient oriented hospital setting, which can accommodate satisfactory functional efficiency, can improve patient comfort, and can meet clinical and technological advances. We have therefore agreed in-principle to this redevelopment approach in the interest of meeting the needs of future decades and providing uninterrupted service to the public of the NTE cluster as well as uninterrupted teaching for CUHK's Medical Faculty.

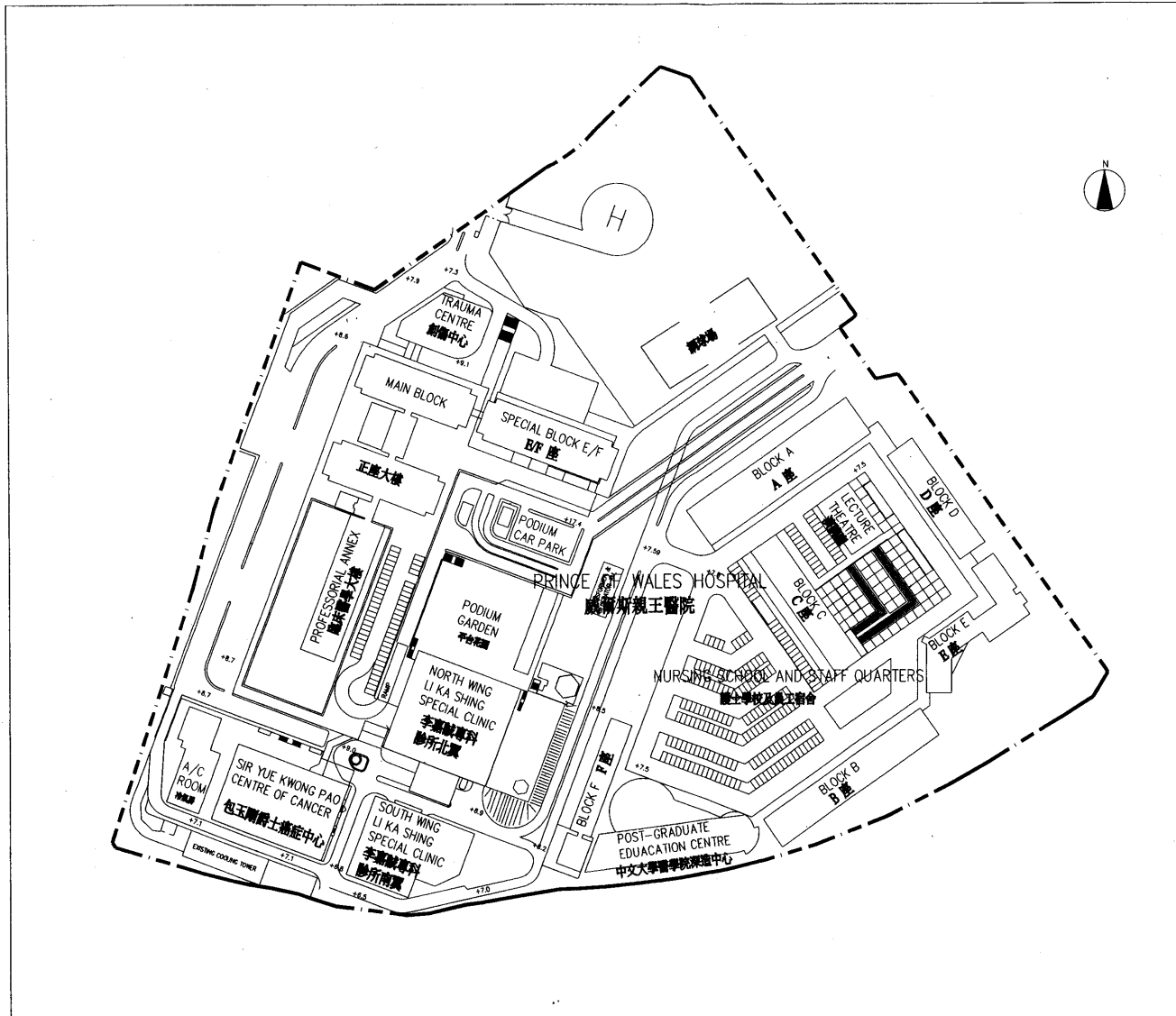
Way forward

14. As announced in the 2003 and 2004 Budget, the Government would explore the possibility of Public/Private Partnership (PPP) for implementing public works projects. In considering how to take forward the PWH project, we will conduct a feasibility study to explore the PPP option to see if there can be enhanced efficiencies. We will also take the opportunity to study the feasibility of taking the PPP approach in refurbishing the hospital with a view to exploring whether the private sector has alternatives to overcome the problems we identified with the refurbishment option. We aim at completing the feasibility study in 12 month's time. We will inform members of the outcome of the feasibility study and will consult the local community on the project before applying to the Finance Committee for the necessary funding.


Advice sought

15. Members are invited to note the contents of this paper.

**Health, Welfare and Food Bureau
Architectural Services Department
Hospital Authority
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NOTES
ANNEX
附件

no.	date	description
REVISION		
drawn	H.S. LEUNG	10.6.04
checked		
approved		
Chief Architect		
Senior Architect		
Project Architect	signed	date
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drawing title	LAYOUT PLAN 平面圖	
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	 ARCHITECTURAL SERVICES DEPARTMENT	

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