

**For discussion
on 12 March 2012**

**Legislative Council Panel on Health Services
Centre of Excellence in Paediatrics**

PURPOSE

This paper briefs Members on the proposed development of a Centre of Excellence in Paediatrics (CEP) for Hong Kong.

BACKGROUND

2. Ageing population, technology advancement and rising public expectations are factors contributing to an increasing demand for tertiary and specialised medical services. At present, tertiary and specialised medical services in Hong Kong are mainly provided by the public sector and concentrated in specific designated public hospitals including the two teaching hospitals and other major acute hospitals. Building on our current strengths in tertiary and specialised services, the Government has been studying the feasibility of setting up multi-partite medical centres of excellence in specific specialties, as part of the development of the overall healthcare system and infrastructure in Hong Kong.

3. The objective of setting up a medical centre of excellence is to promote multi-partite participation by putting clinical services, medical research, and professional training together; and concentrating medical expertise, advanced technology and cases of complex illnesses in one place. By doing so, the centre will facilitate cross-fertilisation of expertise, attract both local and overseas talents, serve as teaching platform for local universities, provide valuable training opportunities for healthcare professionals in both the public and private sectors, enhance professional standards and quality of care, and provide enhanced tertiary and specialized medical services to the public. Against this background, the Government announced the initiative to explore the establishment of centres of excellence in the specialties of paediatrics and neuroscience in the 2007-08 Policy Address.

Centre of Excellence in Paediatrics

4. To take forward the policy initiative to establish a centre of excellence in the paediatrics specialty with a view to upgrading the medical care for the children in Hong Kong, the Food and Health Bureau (FHB) has set up a Steering Committee since 2008 comprising renowned medical and healthcare professionals from the public and private sectors, academics, patient groups and non-government and charitable organizations (NGOs) to examine the scope of services, the operational model and the physical infrastructure of the CEP project.

5. Having reviewed the existing delivery arrangements of paediatric services¹, the existing service level in paediatrics, the estimated needs of the current and projected demographics, the Steering Committee concludes that the development of a custom-built centre of excellence dedicated to the paediatrics specialty focusing on tertiary and specialized services interfaced with existing paediatrics services is essential to further enhance the quality of medical services for the children in Hong Kong. Based on the recommendation of the Steering Committee, FHB together with the Hospital Authority (HA) and the Architectural Services Department (ArchSD) have formulated the blueprints for the establishment of the CEP. These are set out in the following sections.

JUSTIFICATIONS

6. In paediatrics, there are many uncommon yet serious conditions that require special treatment skills which could only be acquired through clinical experiences. Great dexterity is required to perform cardiac operations, transplants, neonatal surgery and other complex and uncommon procedures in children including infants. Besides, complicated conditions of children often need multiple sub-specialty support. There is great advantage if such conditions in children are concentrated in a tertiary service centre in paediatrics such as a children hospital where all subspecialties are available. Concentration of patients and expertise will also facilitate training and research, which are important for the health and welfare of children. Because of this need, many advanced economies have established children hospitals in major cities (some notable examples at *Annex A*).

¹ The Hospital Authority (HA) conducted a comprehensive review of its paediatric services under the guidance of a panel of consultants from UK, Australia and Hong Kong in 2009-2010. A series of consultations and interviews with healthcare professionals and frontline staff had been conducted to solicit views on a wide range of issues including models of care, current service gaps, key service relationships and aspirations for future development. The "Report on Review of Paediatric Services in Hospital Authority" was published in July 2011.

7. At present, a wide range of secondary and tertiary services in paediatrics specialties are being provided in 13 public hospitals in Hong Kong managed by the Hospital Authority (HA) (a summary at *Annex B*). Cases involving complex illnesses are currently referred to designated tertiary referral centres of oncology, cardiology, nephrology and infectious diseases of HA hospitals, caring for all cases including both adults and children. Unlike many other major international cities, Hong Kong, with 7 million population (about 18% of which age under 18), currently does not have a children hospital dedicated to tertiary and specialized paediatric services, concentrating complex cases and co-locating clinical services, research and training.

8. The proposed CEP will concentrate the caseload of complex, serious and rare diseases among children, pool the skills and expertise in paediatrics from public, private and academic sectors both within and outside Hong Kong, deliver high quality care for children through advanced facilities and trans-disciplinary teamwork, and provide a platform for collaboration in clinical services, medical research and professional training. The experiences of children hospitals in other international cities indicated that the merits of concentrating the caseload of rare paediatric diseases in such a centre are manifold, including but not limited to the following:

- Concentrating children with highly specialized medical problems for focused medical attention and cross-disciplinary care produces better clinical outcomes.
- A paediatric medical centre's child friendly and family-centred environment can reduce the children's emotional and psychological problems resulting from severe illnesses.
- A centre of excellence dedicated to tertiary and specialized paediatric services will assist in developing and retaining high quality clinical staff and expertise.
- The centre of excellence can become a focal point of the tripartite mission of achieving excellence in service, research and education, leading to improved treatment and care.
- Creation of a centre of excellence will provide a stimulus to re-organize and integrate child health services and in turn achieve greater innovation and efficiency.
- Medical research to improve patient care will be facilitated by the

concentrated clinical cases and co-located research facilities, as well as the availability of relevant expertise.

- Of particular importance will be research into environmental health, epidemiology and genetic susceptibility, not only to rare inherited disorders, but also to common chronic diseases manifest in adults.

Proposals for the CEP

9. The CEP is proposed to be established with the aim to raise professional standards and quality of clinical services to children patients suffering from complex and serious illnesses, and to enhance the standards of research and training through cross-fertilisation of expertise in the specialty of paediatrics. To contribute to the long-term development of the specialty, the CEP will bring together medical professionals in the public, private and academic sectors from both within and outside Hong Kong, and partner with major international medical centres in professional collaborations, research and training. To this end, the CEP will serve three key functions, namely, clinical services, medical research and professional training -

- (a) **Clinical services:** a major function of the CEP will be to provide tertiary and specialised clinical services in paediatrics in Hong Kong, especially complex and serious cases, supporting the paediatrics services in public hospitals and private sector.
- (b) **Medical research:** with concentrated caseload, pooled expertise and advanced facilities, the CEP will provide essential support for driving high quality medical research in paediatrics, in collaboration with the local medical schools and universities.
- (c) **Professional training:** tapping the caseload and expertise, the CEP will also provide the platform for professional training and education in paediatrics medicine, and facilitate sharing and cross-fertilization of the latest technology and experience.

Clinical Services

10. The CEP will be a **public tertiary specialist hospital in paediatrics** with clinical services as the core, to provide family- and child-centric tertiary care to all children under the age of 18 with complex and

serious illnesses² throughout the territory, combined with teaching/training and research functions. Clinical services and facilities will be provided at the CEP with a child-friendly and age-appropriate environment that will encourage parental support and participation. These clinical services will interface with existing paediatrics services in public hospitals managed by HA, with particular emphasis on **partnerships between the CEP and regional public hospitals**. Through concentration of dedicated experts, advanced medical facilities and complex cases, the CEP will be able to provide better treatment for children.

11. In practical terms, paediatric services in public hospitals will be re-organized with tertiary and specialized services and facilities concentrated more at the CEP, while regional public hospitals retaining secondary services and essential facilities in paediatrics in support of their operations. The CEP will serve as the tertiary referral centre for complex and serious cases for all children under the age of 18 in Hong Kong territory-wide by referrals from regional public hospitals with reference to set clinical criteria. The existing regional public hospitals with paediatric departments will continue to provide consultation services to other specialties, emergency and ambulatory care, secondary services, community paediatric care and step-down care for patients returned from the CEP under their respective catchment areas. The CEP will thus relieve regional public hospitals of caseload and service pressure in paediatrics, and allow them room for enhancing their general paediatric services through, for instance, strengthening community paediatrics in various districts and service clusters.

12. The CEP will also cater for children under the care of medical practitioners and institutions outside the public healthcare system, by making its specialized paediatric services accessible to them. This is necessary to ensure continuity of care and make available the expertise and facilities at CEP to children of Hong Kong families who have been seeking private paediatric care.

13. Our overall objective is to ensure that the CEP, the regional public hospitals, the private medical sector, and community-based services will work together to provide patients with the appropriate level of care at different stages of their diseases. Triage and referral protocols will be drawn up by the Expert Group of the Steering Committee in consultation with HA and the relevant professional organizations and stakeholders at a later stage, to be applied by CEP. These guidelines will be made known to both public and private healthcare professionals as well as the general public when available.

² These illnesses may include, for examples, ambiguous genitalia, biliary atresia, brain tumour, diaphragmatic hernia, chronic kidney disease, Crohn's disease, liver failure, renal failure and tube defects.

Referral and admission to all services at CEP will be based on clinical criteria and protocol to ensure that the tertiary and specialized services of CEP are provided to those who genuinely need them.

14. The CEP also aims to facilitate partnership in the provision of tertiary and specialized services, alongside research and training. This will not only allow the CEP to make the best use of the expertise and skills in the public, private and academic sectors, but also enable cross-fertilization of ideas and experience among healthcare professionals, which is an essential success factor of the CEP. To this end, external specialists and experts, local and overseas, can be engaged to practise on a short-term or part-time basis at the CEP, modelling on the existing arrangements for university teaching staff to provide clinical services at teaching hospitals and for outside doctors to be engaged as HA contract staff to provide clinical services. Detailed arrangements for such will be formulated in due course having regard to the experience of existing partnerships in public hospital services and the mode of operation of the CEP.

Services and Facilities at CEP

15. Clinical and other supporting facilities will be provided at the CEP to create an uplifting and learning experiences for patients, their family members and the staff. The scope and scale of services and facilities to be provided by the CEP have been formulated by drawing reference to the scope of other renowned children hospitals around the world and taking into account our local population and demographic changes, and the anticipated need for paediatric services. Specifically, the current plan for CEP includes the following clinical services and facilities –

- (a) in-patient and day-patient services with 468 beds, including general wards, neo-natal intensive care unit, paediatric intensive care unit, special care baby unit, day beds for general surgeries/procedures, and a private ward;
- (b) ambulatory care services including specialist outpatient clinics, ambulatory surgery/day procedure centre, integrated rehabilitation centre and child development assessment service;
- (c) community care services, including patient education and resource centre, and community health education, and medical social service;
- (d) supporting diagnostic and treatment facilities, including radiology

(with magnetic resonance imaging, computed tomography scanner, angiography, interventional radiology, fluoroscopy and ultrasonography) electro-diagnostic studies laboratories, operating theatres and clinical pathology laboratories;

- (e) support facilities and services to cater for the special needs of children and their families such as children recreation areas, play therapy, classrooms, family rest area and parent's support facilities; and
- (f) other general support and administrative services and facilities such as admission, medical records, pharmacy, hospital data centre, food services, café/restaurant, transportation, and staff accommodation, etc.

Medical Research

16. Medical research is part and parcel to the development of high quality medical services, and is essential in striving for clinical excellence and medical advancement in any healthcare system. Currently basic, translational and clinical research is primarily conducted by the medical schools of The University of Hong Kong (HKU) and the Chinese University of Hong Kong (CUHK), and also in science faculties of other tertiary institutions. Over the years, Hong Kong has built up a base of scientists and researchers who have produced high quality clinical research internationally recognized. The rapid advances in research and technology in turn bring about new and better treatments and enhance the quality of care available to patients. Support for medical research in paediatrics will thus be made a crucial function of the CEP, leveraging on its unique advantages, towards the advancement of child health and their well-being.

17. To this end, the CEP will double as a teaching and research hospital supporting clinical research activities, similar to the existing teaching hospitals which provide specific support for teaching and research activities by the universities. Moreover, the plan for CEP has included advanced facilities to support basic medical, epidemiological and clinical research in paediatrics. These include for instance medical bioinformatics, research laboratories to support top-tier biomedical research, clinical trial ward and dry laboratory, etc. The CEP will also provide space for pursuing top-tier basic and translational research in paediatrics, including theme-based research laboratories, core facilities, and office facilities. These facilities will support a wide range of research topics to be carried out at CEP, including clinical and molecular

genetics, metabolic diseases and inborn errors of metabolism, development biology and management of congenital disorders, public health and preventive medicine in childhood, and study of childhood origins of disease in adults.

18. By providing co-located facilities and a collaborative environment for research, the research component of the CEP aims to serve as an anchor point for collaboration of clinical and research teams from both the academia and the profession, and for international linkage and co-operation. In particular, multi-centred research and large-scale surveys will be encouraged at CEP to leverage on its scale and expertise advantage, which will help to capture the disease patterns and evaluate treatment outcomes. This will facilitate the development of knowledge regarding the management of complex and rare diseases; support for multidisciplinary research efforts and ideas into the study of the nature and health outcomes of important childhood illnesses; and the development of innovative treatment interventions and technologies as well as their translation into state-of-the-art clinical care practices for Hong Kong. This will also speed up the process of translational research from the laboratory to the patient, and from the patient to the community.

Professional Training

19. Public hospitals are currently the main base of clinical training: clinical training for medical students of HKU and CUHK is currently provided at the two teaching hospitals, and specialist training for paediatrics is mainly provided in the paediatrics departments of various public hospitals. To strengthen professional training and facilitate professional development in the areas of paediatrics, the CEP will serve as a training ground for future generation of specialists in paediatrics and for carrying out public education on issues related to paediatric health.

20. Professional training at the CEP will cover doctors, nurses and other allied health professionals at all levels including undergraduates, postgraduates, specialist training, in-service/continuing education, and research training. Emphasis will be placed on interdisciplinary training and sharing, with participation of local and overseas experts. The ultimate aim is to train up a strong team of experts in the field of paediatrics with advanced knowledge of the physical and psycho-social needs of children and adolescents to raise the overall professional standards and quality of clinical services to the young patients in Hong Kong.

MANPOWER REQUIREMENTS

21. To better understand and address the training and manpower needs, HA has conducted a workforce planning for its 13 paediatrics departments and the CEP. A high-level working group with wide representation from clinicians of different paediatric and paediatric-related subspecialties across HA and universities has been established by HA to examine the manpower and training issues with a view to developing a comprehensive manpower and training plan for implementation at an early stage. Subject to service needs, local and overseas experts from various sectors will also be recruited to pool the necessary expertise together for delivering high quality tertiary paediatric services in Hong Kong. The Steering Committee will consider the report from the working group to determine the manpower need of the CEP at a later stage.

PHYSICAL LOCATION AND CONCEPTUAL DESIGN

22. As the CEP will provide tertiary paediatric services for all children under the age of 18 with complex and serious illnesses territory-wide, and is intended to be a collaborative focal point for research and training in paediatrics, it is essential that the CEP is centrally and conveniently located within Hong Kong for easy access by patients and their families, by healthcare workers, as well as by research and teaching staff. The CEP is also planned to be located close to an acute general hospital for operational support. After taking into consideration various relevant factors, the Government has identified a vacant site with an area of about 2.17 hectares in the South Apron of the Kai Tak Development, shown as Site C at *Annex C*, for the construction of the CEP.

23. The proposed site is currently zoned for “Government/Institution Community” (“G/IC”) use in the Outline Zoning Plan and is readily available for establishment of the CEP. The site is centrally located adjacent to a major trunk highway, and is relatively accessible from various parts of the territory including Hong Kong Island, East Kowloon, West Kowloon and the New Territories, and from the major acute hospitals.

24. The overall design objective of the CEP is to create a non-institutional, home-like, child-friendly, comfortable and cozy environment that provides the best clinical practice under a patient-centered approach, facilitates multi-disciplinary and cross-specialty collaboration, and allows efficient and flexible use of facilities and resources with appropriate sharing. Taking into account the guiding principles, the operational needs of the CEP,

the planning parameters as well as the urban design concept for the Kai Tak Development, the Government has formulated a conceptual design of the CEP, with the following key features (various diagrams illustrating the conceptual design are included at *Annex C*) -

- (a) The CEP will adopt a podium-free design consists of two separate towers with a site coverage of 65%, building height not exceeding 60mPD and a plot ratio of about 5.5. Each tower will have 11 stories above ground and one basement level, with a floor plate of about 6 500m².
- (b) Tower A of the CEP will primarily house clinical supporting services including the integrated rehabilitation centre, main operating theatres, clinical and research laboratories, the hospital data centre, as well as education and training facilities.
- (c) Tower B of the CEP will be more patient-oriented with the provision of inpatient services and ambulatory care services, and will include various children- and family-friendly design and support facilities alongside the clinical facilities.
- (d) The two towers will be interconnected with one another by three direct link bridges strategically located to facilitate efficient circulation of patients, staff and the general public between the two buildings within the CEP.
- (e) A landscaped courtyard will be featured on the ground level of the CEP between the two towers, with a highly transparent entrance pavilion allowing views through to the landscaped courtyard and the harbour beyond. The courtyard will integrate with the overall architectural settings, the outdoor spaces and the waterfront promenade to make it a prominent gateway of the CEP. The general public is expected to enjoy an uninterrupted view of and access to the waterfront across the landscaped courtyard.
- (f) The CEP will be developed as a sustainable building to meet the greening ratio stipulated for the Kai Tak Development, and comply with the visual permeability standard and air ventilation requirement.

IMPLEMENTATION

25. In view of the significance of the CEP project as first of its kind in Hong Kong and the Administration's experience with other large scale capital projects, the Government has decided to adopt a "Design and Build" model for developing the CEP. Under the "Design and Build" agreement, the Government will enter into a single contractual relationship with the finally selected contractor to design and construct the project in accordance with a set of design requirements and performance specifications prepared by the Government in consultation with the relevant stakeholders. The adoption of such model will facilitate close communication and interaction between the project proponent with the selected contractor throughout the design and construction period. We plan to invite tender in April 2012 and conclude the tender evaluation by first half of 2013. Subject to funding approval, construction works of the CEP will start in 2013 with a target date for completion by 2017. Our target is to commence services at CEP by phases starting from mid 2018.

FINANCIAL IMPLICATIONS

26. Based on the current scope and scale of works and conceptual design, ArchSD has made a preliminary estimate on construction cost involved, and the capital cost of the CEP is estimated to be about \$9.7 billion in September 2011 prices. The actual construction cost of the CEP will only be known upon conclusion of the tender exercise under the "Design and Build" model, which in turn will depend on the detailed design proposed by the contractor. We will seek funding approval from the Finance Committee of the Legislative Council in 2013 after the tender result is available.

PUBLIC CONSULTATION

27. We have consulted the Task Force on Kai Tak Harbourfront Development of the Harbourfront Commission on the proposed development of the CEP on 16 January 2012. We have also consulted the Wong Tai Sin District Council (DC), the Kwun Tong DC as well as the Food, Environment and Health Committee of the Kowloon City DC on 17 January, 2 February and 9 February 2012 respectively. All of them supported the proposed development of the CEP and some members provided useful and constructive advice on the physical layout and conceptual design of the CEP. These comments will be taken into consideration in tendering for the detailed design of the project.

ADVICE SOUGHT

28. Members are invited to note the contents of this paper and provide their views on the proposed development of the CEP at Kai Tak.

**Food and Health Bureau
Hospital Authority
Architectural Services Department
March 2012**

Children Hospitals in Major Cities

USA

- The Children's Hospital of Philadelphia

UK

- Great Ormond Street Hospital For Children, London
- Evelina Children's Hospital, Guy's and St Thomas' NHS Foundation Trust, London

Ireland

- Children's Hospital of Ireland, Dublin

Canada

- The Hospital for Sick Children, Toronto

Australia

- Royal Children's Hospital, Melbourne

Germany

- Children Hospital of Hannover University Hospital

Singapore

- Kandeng Kerbau Women's and Children's Hospital

Information on Paediatric Services in Hong Kong

Paediatric Services in Hospital Authority (HA)

	2008/09	2009/10	2010/11
Total number of beds currently used by HA paediatrics departments	1372 (as at 31 Dec 2009)	1387 (as at 31 Dec 2010)	1389 (as at 31 Dec 2011)
Paediatric Intensive Care Beds (PICU)	45	45	43
Neonatal Intensive Care Beds (NICU)	100	100	100
Other Acute Paediatric & Neonatal Beds	1227	1242	1246
Inpatient services			
No. of discharges & deaths	78,800	82,400	85,900
No. of patient days	360,700	358,900	378,800
Bed occupancy			
- Paed. & adolescent medicine	72%	71%	73%
- Neonatology	92%	89%	97%
Average Length of stay (days)			
- Paed. & adolescent medicine	3.9	3.6	3.6
- Neonatology	5.8	5.7	5.4
Ambulatory & Outpatients			
Day patients			
- No. of discharges & deaths	25,100	27,300	31,500
- % of total discharges & deaths	24%	25%	27%
Outpatients			
- Specialist outpatient attendances	256,800	253,000	255,000
Manpower position	(as at 31 Dec 2009)	(as at 31 Dec 10)	(as at 31 Dec 11)
Number of Paediatric Doctors	315	312	310
Number of Paediatric Nurses #	1,155	1,139	1,207

These figures do not include nurses under “the central pool” who are deployed to the paediatrics specialty.

Sources: *Quarterly Bed Statistics Report, Executive Information System, Integrated Patient Administration System, Enterprise Resources Planning System, Hospital Authority*

Paediatric services are currently provided in the following 13 HA hospitals –

New Territories East Cluster

- Alice Ho Miu Ling Nethersole Hospital
- Prince of Wales Hospital

New Territories West Cluster

- Tuen Mun Hospital

Kowloon West Cluster

- Yan Chai Hospital
- Princess Margaret Hospital
- Caritas Medical Centre
- Kwong Wah Hospital

Kowloon Central Cluster

- Queen Elizabeth Hospital

Kowloon East Cluster

- United Christian Hospital
- Tseung Kwan O Hospital

Hong Kong East Cluster

- Pamela Youde Nethersole Eastern Hospital

Hong Kong West Cluster

- Queen Mary Hospital
- The Duchess of Kent Children's Hospital

Paediatric Specialized Beds in Referral Centres
(as at 31 December 2009)

Centre	Hospital	Number of Beds
Cardiology	Queen Mary Hospital	40
Oncology	Prince of Wales Hospital	28
	Queen Mary Hospital	21
	Princess Margaret Hospital	5
	Queen Elizabeth Hospital	18
	Tuen Mun Hospital	10
Nephrology	Princess Margaret Hospital	20
Total		142

Source: Survey of HA paediatrics departments

No of Registered/Enrolled/Listed Practitioners in Hong Kong
(as at 31 December 2011)

Specialist Registration	Number of Registration
Paediatrics	494
Paediatric Surgery	26
Total	520

Source: The Medical Council of Hong Kong

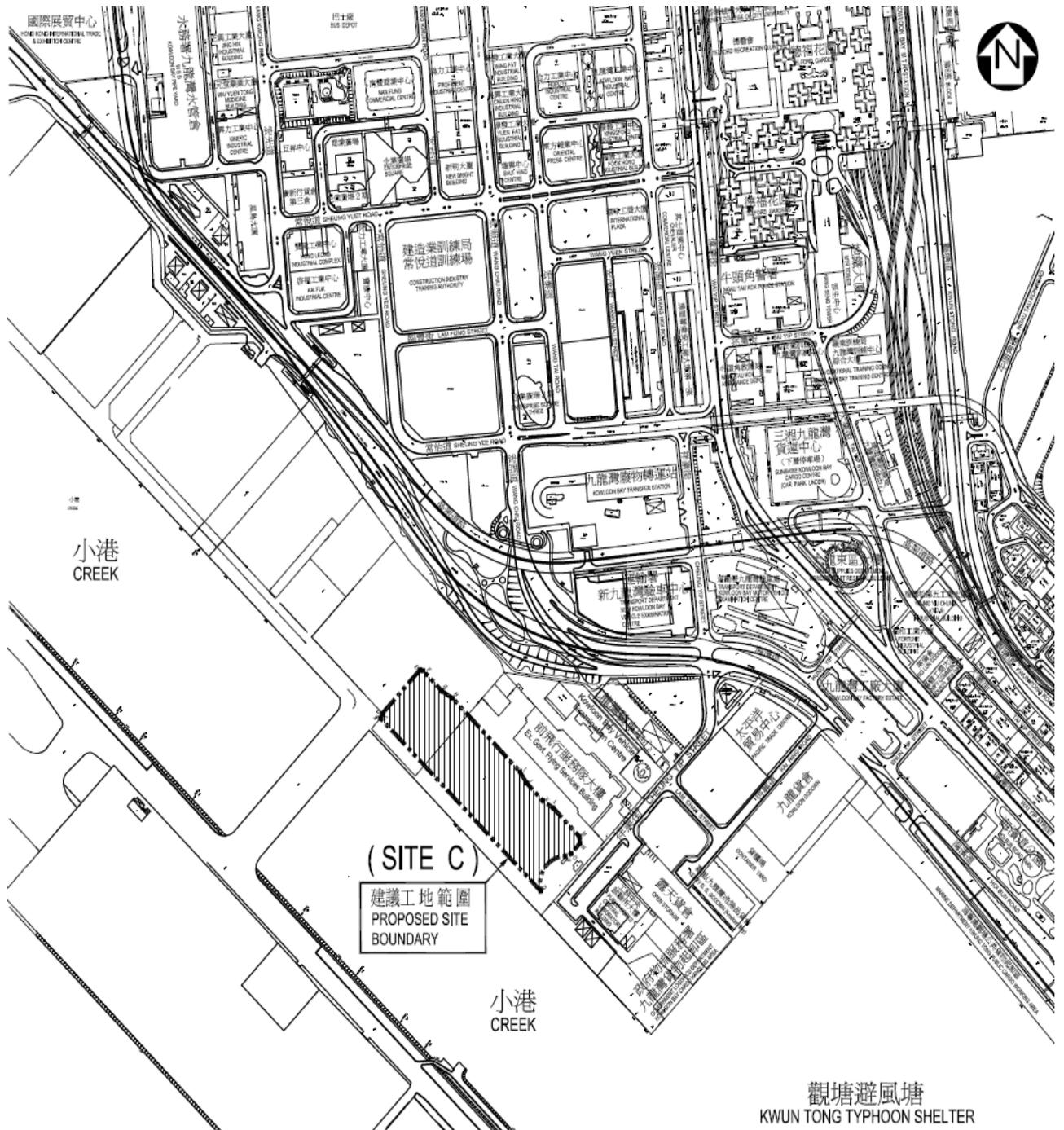
Number of Doctors working in Paediatric Department of
HA Hospitals (as at 31 December 2009)

Types of Staff	Number
Consultant	44.75
Associate Consultant / Senior Medical Officer	80.1
Resident Specialist / Medical Officer	65.5
Resident Trainee / Medical Officer	130.5
House Officer	30
Total	350.85

Source: Survey of HA paediatric departments conducted in December 2009

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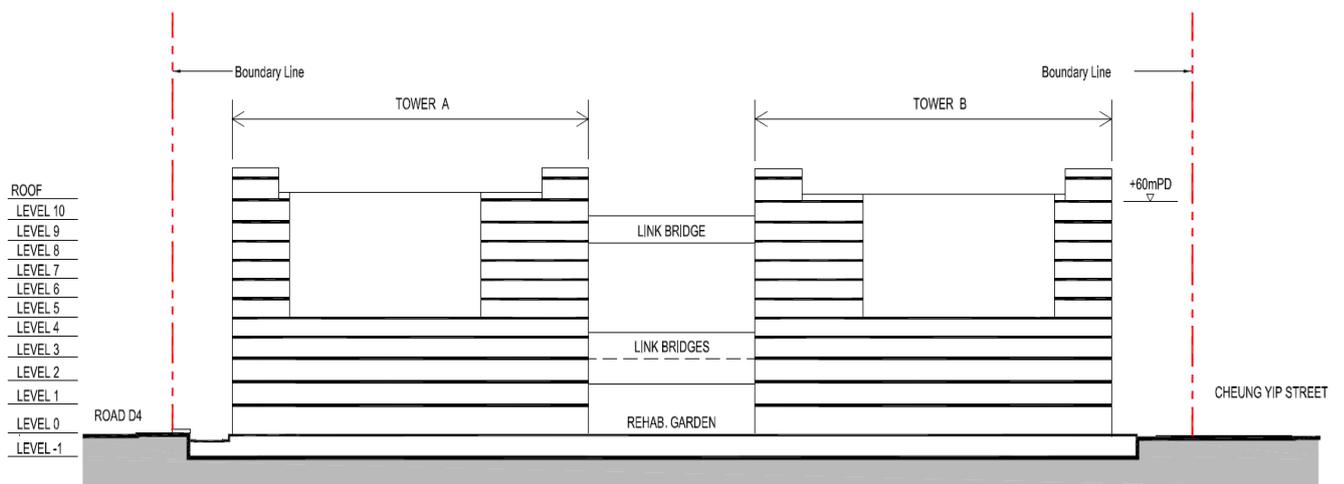
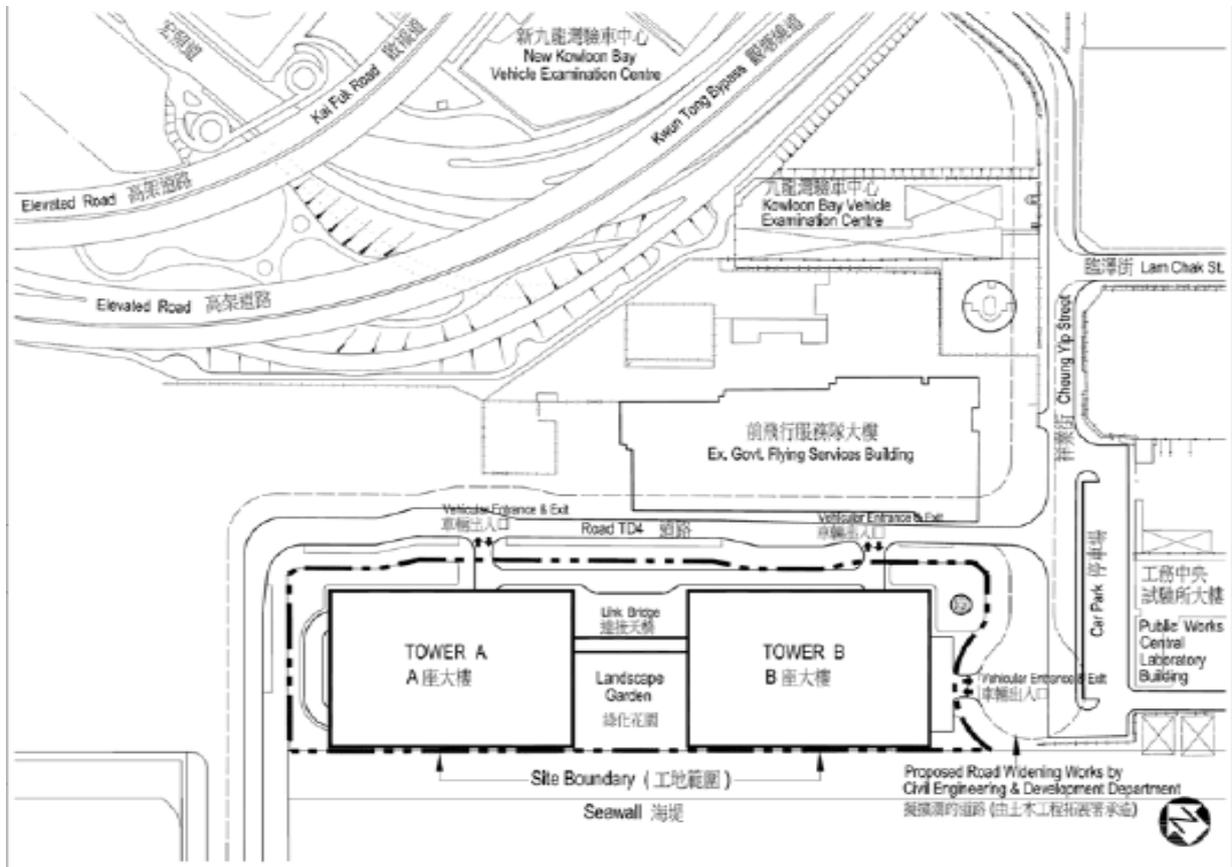
Site Plan



Aerial View of the CEP Site



Conceptual block plans of CEP



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