For discussion **PWSC(2002-03)58**
on 26 June 2002

ITEM FOR PUBLIC WORKS SUBCOMMITTEE OF FINANCE COMMITTEE

HEAD 708 - CAPITAL SUBVENTIONS AND MAJOR SYSTEMS AND EQUIPMENT
Medical Subventions
45MM – Establishment of a Radiotherapy Centre and redevelopment of the Accident and Emergency Department at Princess Margaret Hospital

Members are invited to recommend to Finance Committee the upgrading of **45MM** to Category A at an estimated cost of $564.4 million in money-of-the-day prices for the establishment of a Radiotherapy Centre and the redevelopment of the Accident and Emergency Department at the Princess Margaret Hospital.

PROBLEM

We need to cope with the increasing demand for radiotherapy treatment in the territory and provide timely radiotherapy treatment to cancer patients. The facilities of the existing Accident and Emergency (A&E) Department of the Princess Margaret Hospital (PMH) are outdated. Due to increased patient activities over the years, the A&E Department suffers from space shortage and is extremely congested.

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PROPOSAL

2. The Director of Architectural Services (D Arch S), with the support of the Secretary for Health and Welfare, proposes to upgrade **45MM** to Category A at an estimated cost of $564.4 million in money-of-the-day (MOD) prices for the establishment of a Radiotherapy Centre and the redevelopment of the existing A&E Department at the Princess Margaret Hospital (PMH).

PROJECT SCOPE AND NATURE

3. The project scope of 45MM comprises the following -

(a) demolition of the existing A&E Block of PMH; and

(b) construction of a new building to accommodate a Radiotherapy Centre, an expanded and upgraded A&E Department, and the reprovisioning of other facilities in the existing A&E Block.

A site plan of PMH is at Enclosure 1. We plan to start the construction works in August 2002 for completion by July 2005.

JUSTIFICATION

Radiotherapy Centre

4. Cancer is the number one killer disease in Hong Kong, accounting for one-third of all deaths in 1999. According to the latest statistics of the Hong Kong Cancer Registry, the number of new cancer cases diagnosed rose from 19 344 in 1996 to 20 526 in 1999. As our population ages, the incidence of cancer will continue to be on the rise. The Hospital Authority (HA) projects the number of new cases to further increase to around 22 300 by 2006. Radiotherapy, normally programmed in conjunction with other treatment modalities such as surgery or chemotherapy, offers one of the most effective curative treatments for cancer. At least half of the cancer patients will require radiotherapy treatment in the course of cancer treatment.

5. HA delivers its specialized tertiary oncology service on a territory-wide basis through five radiotherapy centres located at the Queen Mary Hospital (QMH), Pamela Youde Nethersole Eastern Hospital, Queen Elizabeth Hospital (QEH), Prince of Wales Hospital (PWH) and Tuen Mun Hospital (TMH). These five radiotherapy centres are equipped with a total of 22 linear accelerators (linacs) which are operating at their optimal capacity. The increasing demand for oncology service has resulted in the territory-wide average waiting time for radiotherapy treatment being lengthened from 2.5 weeks to 3 weeks in the past 18 months, and HA estimates that the waiting time will be further lengthened to 3.5 weeks by 2003 and 6.5 weeks by 2006. Cancer treatment is time critical. Provision of timely radiotherapy treatment would improve the outcome of cancer treatment and hence the chance of survival. In this connection, a two-week interval to plan and start curative radiotherapy treatment is considered reasonable by international standard. To meet the increasing demand for radiotherapy treatment and provide timely treatment to cancer patients for enhanced prospects of cure, we propose to establish a sixth radiotherapy centre in Hong Kong.

6. Having regard to the geographical distribution of the five existing radiotherapy centres as well as their respective coverage, HA proposes to set up a radiotherapy centre at PMH to enhance the accessibility of oncology service to the population of 1.2 million in the New Territories South (NTS) cluster. At present, about two-thirds of the cancer patients in the NTS cluster are treated at QEH, while the rest have to receive treatment at the TMH, PWH or QMH. The waiting time for radiotherapy treatment at the radiotherapy centre in QEH is about four weeks on average, and is the longest among all the existing radiotherapy centres. As NTS patients account for about a quarter of the patient load of the QEH Centre, the establishment of a radiotherapy centre in the NTS cluster would improve the waiting time for treatment at the QEH Centre.

7. HA has explored whether there is further room for rationalisation in the provision of existing radiotherapy services through extending the operating hours of the five radiotherapy centres, instead of constructing a new one. The output of all linacs in the existing radiotherapy centres has already reached their optimal level. In this connection, HA estimates that an additional three linacs will be required by 2006 to cope with the increasing service demand. Extending operating hours of linacs may result in more frequent machine breakdowns which would work against the objective of increasing throughput and will be to the detriment of patients in need of treatment. To run an additional session for radiotherapy treatment will mean extending the treatment sessions into the late

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evening. As cancer treatment is very demanding on the patient, cancer patients should not be requested to attend radiotherapy treatment sessions at odd hours. HA has also explored the possibility of increasing the linac provision in some of the existing radiotherapy centres, namely the QEH Centre and the TMH Centre which together serve about 80% of the cancer patients in the NTS cluster. This is however not feasible as the provision of cancer treatment has to be backed up by a full range of facilities, including in-patient beds, computed tomography (CT) and magnetic resonance imaging (MRI) scanners. The utilisation of such facilities in the radiotherapy centres in question is already over-stretched. In the circumstances, we consider that as a long-term solution, it is necessary to establish a sixth radiotherapy centre in Hong Kong to meet the increasing needs for radiotherapy treatment in the territory.

Accident and Emergency Department

8. The existing A&E Department of PMH has been set up for almost 30 years and requires upgrading to meet the prevailing standards of a modern A&E Department. The A&E Department has one major trauma room, one resuscitation cubicle, nine treatment cubicles, and two consultation/examination rooms. There is no proper partition between the treatment cubicles to ensure patient privacy. Nor are there designated consultation rooms for handling the critically ill or mentally disturbed patients. There are no isolating facilities for managing patients with infectious diseases although PMH is the only infectious disease centre in the territory. The A&E Department also suffers from severe space shortage and has become extremely congested due to increased patient activities over the years. Annual A&E attendance rose by 15% from 130 100 in 1997 to 150 200 in 2001, and is expected to rise to 200 000 by 2010. With the opening of the Hong Kong International Airport at Chek Lap Kok and the associated developments in North Lantau, the A&E department of PMH has been designated as the trauma centre in the NTS cluster, and there is a need to enhance its capacity for handling major civil disasters. We therefore propose to reprovision the A&E Department in new and expanded facilities to cope with service demand, improve A&E services to patients, and further enhance its capacity as a trauma centre.

Redevelopment of the A&E Block

9. The three-storey A&E Block of PMH was constructed almost 30 years ago. It houses the A&E department, the CT Scanner suite, the MRI suite, the mammography room, stores, as well as offices and workshops of the Electrical

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and Mechanical Services Department. Its central location within the PMH compound is an ideal site for both the proposed Radiotherapy Centre and the expanded A&E Department in terms of functional proximity to other operationally-related departments of the hospital. We therefore propose to redevelop the aged A&E Block of PMH for the combined development of the proposed Radiotherapy Centre and the expanded A&E Department, as well as the reprovisioning of the remaining facilities of the A&E Block. Apart from optimizing site utilisation, combined development will also offer enhanced operational efficiency and convenience. Both the proposed Radiotherapy Centre and the expanded A&E Department will be supported by a full range of facilities such as CT and MRI scanners located in the same building. Also, the new building will link up with the adjoining Main Block where facilities such as operating theatres, the Intensive Care Unit, and in-patient wards are located.

10. Upon completion of the project, the new building will accommodate under one roof the following -

(a) a Radiotherapy Centre offering comprehensive oncology services, including -

(i) a Radiotherapy Department equipped with three linacs for treating 1 050 cancer cases annually;

(ii) a Specialist Out-patient Department with seven consultation rooms to cater for an annual attendance of around 40 000;

(iii) a centralized aseptic dispensing area for sterile solution and cytotoxic drug preparation;

(iv) upgraded facilities for the reprovisioned Nuclear Medicine Department currently located on Level LG3 of Block F; and

(v) two in-patient wards with 68 beds reprovisioned from the Main Block;

(b) an upgraded and expanded A&E Department with three trauma rooms, nine partitioned treatment cubicles, five consultation / examination rooms, four consultation

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rooms designated for the critically ill, mentally disturbed and infectious disease patients, one minor operating theatre and designated offices for patient and bereavement counselling;

(c) a reprovisioned Diagnostic Radiology Department with upgraded facilities, including a CT scanner suite, an MRI suite, a mammography section, a fluoroscopy section with paediatric facilities, and a dual energy x-ray absorptiometry section; and

(d) other reprovisioned ancillary facilities, including a pharmacy store, workshops, offices and storage areas.

11. HA has worked out arrangements for all the existing services in the A&E Block to be decanted prior to its demolition. In order to ensure that the provision of services to the community will not be disrupted, the temporary reprovisioning of the A&E Department and the radio-diagnostic facilities, including the CT Scanner suite, the MRI suite and the mammography room, to the ground floor and Level LG3 of the Main Block respectively are necessary.

FINANCIAL IMPLICATIONS

12. We estimate the capital cost of this project to be $564.4 million in MOD prices, made up as follows -

		$ million
(a)	Site works	10.7
(b)	Demolition / geotechnical works	16.9
(c)	Substructure	15.0
(d)	Building	176.9
(e)	Building services	156.9

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			$ million	
(f)	Drainage and external works		17.9	
(g)	Furniture and equipment[1]		136.0	
(h)	Consultants' fees[2] for		3.8	
	(i) quantity surveying services	3.5		
	(ii) structural detail drawings	0.3		
(i)	Contingencies		39.4	
		Sub-total	573.5	(in September 2001 prices)
(j)	Provision for price adjustment		(9.1)	
		Total	564.4	(in MOD prices)

The construction floor area (CFA) of **45MM** is about 22 883 square metres. The estimated construction unit cost, represented by building and building services costs, is $14,587 per square metre of CFA in September 2001 prices. The unit cost is comparable to that for other similar projects built by the Government.

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

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[1] Based on an indicative list of furniture and equipment items and their estimated prices.

[2] The consultants' fees for post-contract quantity surveying services and structural detail drawings formed an optional part of the lump-sum price quoted by the consultants selected to carry out the tender documentation and structural engineering drafting work mentioned in paragraph 25 of the paper. Subject to Members' approval to upgrade **45MM** to Category A, D Arch S will direct the necessary works to be carried out.

	$ million (Sept 2001)	**Price adjustment factor**	**$ million (MOD)**
2002 – 03	10.0	0.98625	9.9
2003 – 04	120.0	0.98378	118.1
2004 – 05	180.0	0.98378	177.1
2005 – 06	120.0	0.98378	118.1
2006 – 07	100.0	0.98378	98.4
2007 – 08	40.0	0.98378	39.4
2008 – 09	3.5	0.98378	3.4
	573.5		564.4

14. We derived the MOD estimates on the basis of the Government's latest forecast of trend labour and construction prices for the period 2002 to 2009. We will tender the substructure and building works under a lump sum contract with provision for price fluctuation as the contract period will exceed 21 months.

15. HA has assessed the requirements for furniture and equipment (F&E) for this project, and estimates the F&E cost to be $136 million. The proposed F&E percentage, which represents 38.7% of the total construction cost[3] of the project, is higher than the F&E percentage of capital projects in general. This is because equipment to be procured for the Radiotherapy Centre is expensive. For instance, a high-energy linac costs $18.75 million, a low-energy linac costs $9 million, an integrated high dose rate brachytherapy machine costs $7 million and a radiotherapy simulator costs $6.4 million. A list of major F&E items (costing $1 million or above per item) to be procured for the project is at Enclosure 2.

[3] Represented by building, building services, and drainage and external works costs.

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16. We estimate the additional annual recurrent expenditure arising from the project to be $108.0 million. With the implementation of the population-based funding mechanism, the provision of recurrent funding will no longer be facility-based. No separate resources will therefore be provided to HA to cover the recurrent consequences arising from this project.

PUBLIC CONSULTATION

17. HA consulted the Kwai Tsing District Council on 30 April 2002 regarding the proposal. Members of the Council supported the project.

18. We consulted the Legislative Council Panel on Health Services on the proposal on 13 May 2002. Panel members supported the proposed project.

ENVIRONMENTAL IMPLICATIONS

19. We completed a Preliminary Environmental Review (PER) in July 1998. The PER concluded that the project would have no long-term environmental impact. The Director of Environmental Protection agreed that an Environmental Impact Assessment would not be necessary.

20. Before demolition, we will engage a registered asbestos consultant to conduct an investigation for the presence of asbestos-containing material (ACM) and during demolition, we will employ a registered asbestos contractor to remove all the ACM. 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 contract. These include the use of silencers, mufflers, acoustic lining or shields for noisy construction activities, frequent cleaning and watering of the site, and the provision of wheel-washing facilities.

21. At the planning and design stages, we have considered measures to reduce the generation of construction and demolition (C&D) materials. D Arch S has introduced more prefabricated building elements into the project design to reduce temporary formwork and construction waste. These include dry-wall partitioning and proprietary fittings and fixtures. D Arch S will use suitable

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excavated materials for filling within the site to minimise off-site disposal. In addition, D Arch S will require the contractor to use metal site hoardings and signboards so that these materials can be recycled or reused in other projects.

22. D Arch S will require the contractor to submit a waste management plan (WMP) for approval. The WMP will include appropriate mitigation measures to avoid, reduce, reuse and recycle C&D materials. D Arch S will ensure that the day-to-day operations on site comply with the approved WMP. D Arch S will control the disposal of public fill and C&D waste to designated public filling facilities and landfills respectively through a trip-ticket system. The contractor will be required to separate public fill from C&D waste for disposal at appropriate facilities. D Arch S will record the disposal, reuse and recycling of C&D materials for monitoring purposes. We estimate that the project will generate about 23 000 cubic metres (m^3) of C&D materials. Of these, we will reuse about 19 320m^3 (84%) as fill in public filling areas[4] and dispose of 3 680m^3 (16%) at landfills. The notional cost of accommodating C&D waste at landfill sites is estimated to be $460,000 for this project (based on a notional unit cost [5] of $125/$m^3$).

LAND ACQUISITION

23. The project does not require land acquisition.

BACKGROUND INFORMATION

24. PMH is an acute general hospital with 1 400 beds. It runs an A&E Department and provides a wide spectrum of inpatient, specialist outpatient and ambulatory care services. Its clinical specialties include medicine, surgery, orthopaedics and traumatology, obstetrics and gynaecology, neurosurgery, paediatrics, neonatology, ophthalmology and intensive / coronary care. It is a

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[4] A public filling area is a designated part of a development project that accepts public fill for reclamation purpose. Disposal of public fill in a public filling area requires a licence issued by the Director of Civil Engineering.

[5] 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 $90 per/$m^3$), nor the cost to provide new landfills (which are likely to be more expensive) when the existing ones are filled. The notional cost estimate is for reference only and does not form part of this project estimate.

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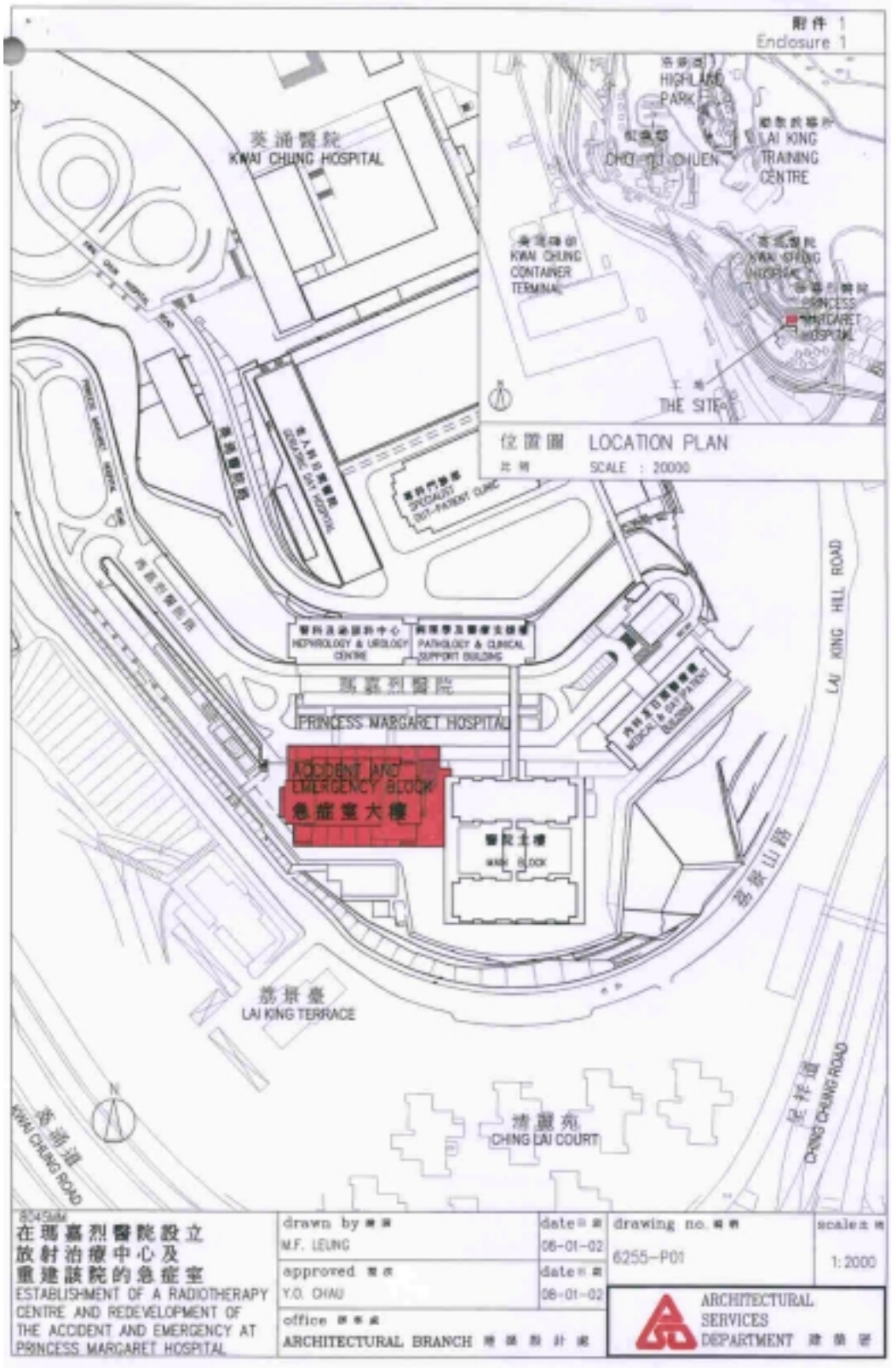
designated specialized service centre for burns, extracorporeal shockwave lithotripsy, paediatric nephrology, paediatric intensive care, virology, clinical toxicology and renal transplant.

25. We upgraded **45MM** to Category B in November 2001. We engaged consultants to carry out pre-contract structural engineering drafting and quantity surveying services in May 2002 and employed term contractors to carry out preparatory works for services diversion and decanting in October 2001 at a total cost of $14.9 million. We 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 substantially completed the drafting work. The term contractors have also substantially completed preparatory works for services diversion and decanting. D Arch S has completed the detailed design of the project and is preparing tender documentation with the consultancy services.

26. We estimate that this project will create some 410 jobs, comprising five professional staff, 15 technical staff and 390 labourers, totalling 7 150 man-months.

Health and Welfare Bureau
June 2002


附件 1
Enclosure 1
英涛醫院
KWAI CHUNG HOSPITAL
HIGHLAND PARK
CHOI HUNG ESTATE
LAI KING TRAINING CENTRE
KWAI CHUNG CONTAINER TERMINAL
KWAI CHUNG HOSPITAL
PRINCESS MARGARET HOSPITAL
THE SITE
位置圖 LOCATION PLAN
比例 SCALE : 20000
SPECIALIST OUT-PATIENT CLINIC
NEPHROLOGY & UROLOGY CENTRE
PATHOLOGY & CLINICAL SUPPORT BUILDING
瑪嘉烈醫院
PRINCESS MARGARET HOSPITAL
ACCIDENT AND EMERGENCY BLOCK
急症室大樓
MAIN BLOCK
LAI KING HILL ROAD
荔景山路
荔景臺
LAI KING TERRACE
清麗苑
CHING LAI COURT
CHING CHUNG ROAD
青松道
CHING CHUNG ROAD
N
8045dtw
在瑪嘉烈醫院設立
放射治療中心及
重建該院的急症室
ESTABLISHMENT OF A RADIOTHERAPY CENTRE AND REDEVELOPMENT OF THE ACCIDENT AND EMERGENCY AT PRINCESS MARGARET HOSPITAL
drawn by 繪圖
M.F. LEUNG
date 日期
06-01-02
drawing no. 圖號
6255-P01
scale 比例
1:2000
approved 核准
Y.O. CHAU
date 日期
06-01-02
office 辦事處
ARCHITECTURAL BRANCH 建築設計處
ARCHITECTURAL SERVICES DEPARTMENT 建築署

Enclosure 2 to PWSC(2002-03)58

45MM - Establishment of a Radiotherapy Centre and redevelopment of the Accident and Emergency Department at Princess Margaret Hospital

Furniture and equipment items with unit cost of $1 million or more

Item description	Qty	Unit cost ($ million)	Total cost ($ million)
Audio-visual system	1	1.780	1.780
Communication and electronic systems	1	3.125	3.125
Computerised tomography simulator	1	7.800	7.800
General X-ray equipment	1	1.500	1.500
High energy linear accelerator	2	18.750	37.500
Image-guided radiology system for conformal therapy	1	4.500	4.500
Integrated high dose rate brachytherapy machine	1	7.000	7.000
Low energy linear accelerator	1	9.000	9.000
Mobile C-arm X-ray equipment	1	2.500	2.500
Radiotherapy simulator	1	6.400	6.400
Treatment plan computer system for radiotherapy	1	6.300	6.300
Ultra-sound scanner with color doppler	1	2.700	2.700