2-4 Background of the Request

2-4-1 Background of the Request

The current statistics in Egypt indicate an undersupply of nurses compared with the number of physicians which is posing difficulties in the operation of medical facilities. The mediocre standard of nursing skills and the inadequate system for training them is another urgent issue of national importance that remains to be solved in the area of health care and medical education and administration.

Under these circumstances, Japan has been implementing nurse training programs in Egypt in response to requests for cooperation, initially through the Nursing Education and Research Project (1978 - 1983) focusing on primary health care and subsequently through the Cairo University Pediatric Hospital Project (1983 - 1989) focusing on technical transfer in the area of clinical nursing.

The Egyptian side highly evaluated the efforts made by Japan on these projects and requested the government of Japan to construct facilities of the High Institute of Nursing of Cairo University under grant aid and to provide the institute with technical cooperation of a Project. The Project is anticipated to contribute to the qualitative and quantitative improvement of leaders engaged in nursing education in Egypt which will, in turn, enable Egypt to play the role of leader in this field among neighboring countries.

In response to this request, the government of Japan dispatched to Egypt a Preliminary Study Team from September 1 through 8, 1989, and a Basic Design Study Team headed by Ms. Junko Kondo, professor of St. Luke's College of Nursing for 22 days from December 8, 1989 for the purpose of investigating the adequacy of the project and the contents of the cooperation to be provided.

2-4-2 Contents of the Request

The contents of request have been gradually modified with the progress of stages from the initial request, preliminary survey and basic design study, and the outline of the facilities ultimately requested are as described below.

Provision of school facilities composed of four departments was requested - educational, administration, common and dormitory. Facilities for the Educational Dept. include classrooms, nursing skill laboratories, library, auditorium, A/V room, meeting rooms, primary health care laboratory, etc. Facilities for the Administration Dept. include research centers for each specialized area of nursing, Director's office, administrative office, storage for supplies, warehouse etc. In the Common Dept., provision of a gymnasium, auditorium, conference room, cafeteria, and a dormitory for 500 students and parking lot etc. was requested.

The equipment requested for the Project can be roughly divided into ① office equipment and ② equipment to be used in various laboratories. The detailed breakdown is given in attached APPENDIX 4. The main items are office supplies, printing equipment, beds for nursing laboratories, human body models for anatomical and physiological studies, measuring instruments for physics laboratory, microscopes for biology laboratory, autoclaves for parasite study laboratory, centrifuge for chemical laboratory, AV devices for Audiovisual Production Room and beds for the Student Dormitory. A majority of the equipment are movable types. The quantity of the equipment required has not been specified in the request.

The modifications that have been made from the initial request to the request made at the time of the preliminary survey are indicated in the following pages. Mainly due to the increase of common use facilities such as the auditorium and gymnasium, and the increased area required for parking lot, the total area of the Project was expanded from 15,900 m^2 as initially planned to 22,820 m^2.

Further expansion was also requested at the time of the basic design study: the request was for a total increase of 33,000 m^2 (which means a further increse of 10,180 m^2) consisting of 18,000 m^2 (15 m^2 per student) for the Educational, Administration and Common departments, and 15,000 m^2 for the Student Dormitory (for 500) and Parking Lot (facility of 6,500 m^2). There were additional requests regarding the number of classrooms in the Educational Dept.

Fig. 2.4.2

Department	Original Request (Feb., 1989)		Original Request Prior to Preliminary Survey (Sep., 1989)		Request at the time of Basic Design Survey (Dec., 1989)
	No.	Floor Area	No.	Floor Area	No.
(1) Educational Dept.					
Auditorium	2	760 m²	1	500 m²	4
Meeting Room	2	200 m²	4	400 m²	0
Classroom (50)	14	1,050 m²	2	150 m²	2
Classroom (100)	2	300 m²	10	1,500 m²	4
Classroom (30)	5	250 m²	4	250 m²	4
Classroom (12)	14	280 m²	15	300 m²	18
Laboratory	3	360 m²	4	480 m²	2
Nurse Research	1	160 m²	0	0 m²	4
Language Laboratory	1	60 m²	1	70 m²	1
Library	1	250 m²	2	500 m²	1
Copy Room	1	50 m²	1	100 m²	1
Dark Room	1	20 m²	1	20 m²	1
Control Room	1	20 m²	0	0 m²	0
Document Storage	1	30 m²	4	120 m²	4
Guard Room	2	60 m²	4	120 m²	4
Workshop	1	100 m²	0		—
Auxiliary Facilities (Corridors, stairs)	1	1,150 m²	1	(1,150)m²	---
AV Production Room	0	0 m²	1	100 m²	1
Student Lounge	0	0 m²	1	200 m²	1
PHC Room	0	0 m²	1	400 m²	1
Changing Room	0	0 m²	5	500 m²	1
Sub Total		5,100 m²		6,860 m²	

Fig. 2.4.2

Department	Original Request (Feb., 1989)		Original Request Prior to Preliminary Survey (Sep., 1989)		Request at the time of Basic Design Survey (Dec., 1989)
	No.	Floor Area	No.	Floor Area	No.
(2) Administration Dept.					
Director's Office	1	70 m²	1	70 m²	1
Deputy Director's Office	2	80 m²	2	80 m²	2
High Studies Affair	7	875 m²	7	875 m²	7
Common Room	3	70 m²	0	0 m²	0
Secretary Room	1	105 m²	1	105 m²	1
Student Education (undergraduate)	1	100 m²	1	100 m²	1
Student Education (graduate school)	1	130 m²	1	100 m²	1
Student Care	1	100 m²		110 m²	1
Financial Affairs	1	60 m²	1	100 m²	1
Storage	1	290 m²	1	290 m²	1
Administration Office	1	190 m²	1	190 m²	1
Auxiliary Facilities	1	530 m²	1	530 m²	1
Meeting Room	0	0	4	100 m²	4
Lounge for Teaching Staff	0	0	1	100 m²	1
Lounge for Office Staff	0	0	1	50 m²	1
Printing Room	0	0	1	50 m²	1
Guard Room	0	0	2	60 m²	2
Sub Total		2,600 m²		2,910 m²	

Fig. 2.4.2

Department	Original Request (Feb., 1989)		Original Request Prior to Preliminary Survey (Sep., 1989)		Request at the time of Basic Design Survey (Dec., 1989)
	No.	Floor Area	No.	Floor Area	No.
(3) Common Dept.					
Resting Room for Teaching Staff	1	80 m²	0	0	0
Resting Room for Students	1	80 m²	0	0	0
Cafeteria	1	120 m²	1	400 m²	1
Changing Room	1	80 m²	0	0	0
Waiting Room for Visitors	1	50 m²	0	0	0
General Purpose Hall	1	1,300 m²	0	0	0
PHC Room	1	200 m²	0	0	0
Washing Room	1	80 m²	0	0	0
Workshop for Parking Lot	1	50 m²	0	0	0
Praying Room	1	60 m²	1	50 m²	0
Auxiliary Facilities	1	600 m²	1	600 m²	1
Meeting Room	0		4	400 m²	4
Gymnasium	0		1	1,000 m²	1
Auditorium	0		1	800 m²	1
Exhibition Hall	0		1	200 m²	1
Outdoor Sport Ground	0		1	1,000 m²	1
Sub Total		2,700 m²		4,450 m²	

Fig. 2.4.2

Department	Original Request (Feb., 1989)		Original Request Prior to Preliminary Survey (Sep., 1989)		Request at the time of Basic Design Survey (Dec., 1989)
	No.	Floor Area	No.	Floor Area	No.
(4) Dormitory					
Student Dormitory	300 beds	4,800 m²	500 beds	3,000 m²	500 beds
Day Care Room	30 beds	400 m²	0	0 m²	0
Dormitory for Visitors	20 beds	300 m²	0	0 m²	0
Kitchen, Washing Room	0	0 m²	1	200 m²	2
Lounge	0	0 m²	1	400 m²	1
Parking Lot (Basement Type)	0	0 m²	1	5,000 m²	1
Sub Total		5,500 m²		8,600 m²	
Grand Total		15,900 m²		22,820 m²	

CHAPTER 3 OUTLINE OF THE PROJECT

Chapter 3: Contents of Project

3-1 Objective

In Egypt, the number of nurses is small in proportion to that of physicians, interfering with the smooth implementation of medical treatment. The level of nursing care and skill remains rather low because education facilities for nurses are not yet well developed. This is a national problem to which a solution is urgently required from the perspective of health and medical administration and health and medical education. The High Institute of Nursing, Cairo University is at present planning to improve its facilities and accept more students, with the primary emphasis on the enhancement of nursing services in medical facilities. The Institute also aims to improve nursing education both qualitatively and quantitatively and to educate leaders who will play a significant role in nursing education in neighboring nations. The objective of this project is to set up a suitable environment for education and research to meet the aims of this national plan. The Project will result in the qualitative and quantitative improvement of nurses in Egypt who, in turn, will contribute to upgraded public health and social welfare.

3-2 Review of Facilities Requested

3-2-1 Need for the Project

The Project is thought to be suitable for grant aid from Japan for the following reasons:

(1) The number of nurses must be increased in the future in order to establish a more comprehensive nursing system. The ratio of nurses to population (roughly 120/100,000) is on a par with that of nations at the level of mid-development, but still lags far behind that of the advanced nations (in Japan, for example, the ratio is about 500/100,000).

(2) As the number of graduates from the university's Faculty of Medicine decreases gradually, and there are more students at the High Institute of Nursing, the balance between doctors and graduate nurses is improving slowly, but still the ratio remains at 12:1. As the national development plan aims to improve this figure to 5:1 by the year 2,000, some early measures to realize this still have to be taken.

(3) To increase the nurse population, it is necessary to educate those who are to teach in the nursing institute later. An increase in the number of graduates from the Institute at a university level and also in the number of those engaged in education will contribute to a future increase in the number of nurses.

(4) The construction of large hospitals has been booming in recent years, and these hospitals are in need of many graduate nurses to play leadership roles.

(5) Egypt is now accepting a lot of foreign students from African and Arab nations, and is positioned as a technical leader in that part of the world. It is necessary, consequently, to improve its educational facilities not only for the sake of Egypt itself but also for those neighboring nations.

(6) The High Institute of Cairo University and Alexandria University are both top educational establishments for the training of nurses. In Cairo University, however, the nursing unit's own facilities had to be demolished several years ago to make way for hospital expansion. At present the Institute does not have a suitable environment for education since it must share some of the facilities of the Faculty of Medicine. The early establishment of its own facilities is therefore absolutely necessary for the nursing institute of Cairo University.

3-2-2 Implementation/Management Plan

(1) Planned student increase

Cairo University's High Institute of Nursing managed to increase its number of students between 1985 and 1989 at an annual average growth rate of 16.8%. This is slightly lower than the 21.5% annual average growth rate of high institutes of nursing throughout Egypt (actual figures between 1983 and 1987).

	1983	1984	1985	1986	1987	1983~1987	Annual average growth rate
No. of students at high institutes of nursing	1,266	1,447	1,742	2,295	2,353	85.9%	21.5%

	1985	1986	1987	1988	1989	1985~1989	Annual average growth rate
No. of students of the High Institute of Nursing, Cairo Univ.	249	304	326	387	416	67%	16.8%

As Table 4.2.1. shows, the student quota of the Institute is scheduled to keep growing until it reaches 800 in the year 2000. Student quotas for internships, master's and doctor's degrees are also expected to reach 200, 100 and 100, respectively, by 2000 and the proposed total number of students in that year will be 1,200.

A similar plan to sharply increase student numbers has already been implemented by Alexandria University, which now accept 350 freshmen each year. Cairo University is

similarly expected to increase its student intake in parallel with improvements to its facilities.

No. of Students, High Institute of Nursing, Alexandria Univ.

	Freshman	Sophomore	Junior	Senior	Internship	Master	Doctor	Total
1988	260	230	180	180	180	20	7	1,057
1989	352	214	155	200	165	20	10	1,116

In view of the actual annual growth rate of 19 to 16.7%, the expansion to 200 freshmen a year is considered appropriate. However, the dropout rates over the ensuing six years are as listed below.

	Entrance in 1985		Entrance in 1986		Entrance in 1987		Entrance in 1988			
	Actual No.	Index	Actual No.	Index	Actual No.	Index	Actual No.	Index	Average Index	Alexandria Univ.
Freshman	79	100	134	100	134	100	169	100	100	100
Sophomore	55	69	86	64	90	67	101	60	65	82.3
Junior	51	64	82	61	88	66	90	53	61	70.8
Senior	46	58	87	65	80	60	85	50	85	78.6
Internship	36	46	80	60	75	56	80	47	53	72

The statistics covering the past six years indicate that an initial 100 freshmen was reduced to 65 or less on average in the ensuing years between sophomore and graduation. If this project successfully improves educational methods and reduces the dropout rate to the level of that of Alexandria University, it appears realistic to establish a median student quota for this Project between past results and Egypt's proposed plan as shown below.

	Freshman	Sophomore	Junior	Senior	Internship	Total Students
① Proposed by Egypt	200	200	200	200	200	1,000
② Average index in the past	200	130	122	116	106	674
③ Median of ① and ②	200	165	161	158	153	837
Student quota established for this Project	200	170	160	160	160	850
Student quota at Alexandria Univ.	200	165	140	160	150	815

In spite of an increase in the number of undergraduate students, the student quotas for post-graduate master's and doctor's degrees have not been increased at all over the last 5 years. In view of the fact that the current number of undergraduate students, 416, will be doubled to 850, the Egyptian expansion program for graduates will have to be considered to some extent.

	① Annual average between 1985 and 1989	② Quota proposed by Egypt	③ Median	④ ① × 2	⑤ Average of ③ and ④
Master's Degree	26	100	63	52	60
Doctor's Degree	52	100	76	104	90
	78	200	139	158	150

In view of these considerations, it is proposed that student quotas be established as follows.

	Freshman	Sophomore	Junior	Senior	Internship	Master	Doctor	Student Total
Quota in this project	200	170	160	160	160	60	90	1,000

Enrollment Increase Plan

High Institute of Nursing, Cairo University

	1985	'86	'87	'88	'89	'90	'91	'92	'93	'94	'95	'96	'97	'98	'99	2000
1st year	79	134	134	169	140	150	200	200	200	200	200	200	200	200	200	200
2nd year	69	55	86	90	101	110	140	190	190	190	200	200	200	200	200	200
3rd year	59	61	51	82	88	90	100	130	180	180	190	200	200	200	200	200
4th year	42	54	55	46	87	80	85	95	120	170	180	190	200	200	200	200
1~4th year total	249	304	326	387	416	430	525	615	690	740	770	790	800	800	800	800
Internship	33	38	52	51	36	80	75	80	90	110	170	180	190	200	200	200
1st to 5th year	25	25	26	25	25	30	35	40	45	50	60	70	80	90	100	100
Master 1st year	14	8	12	9	12	15	15	15	15	15	20	20	20	20	20	20
1st to 6th year	50	50	53	53	54	60	65	70	75	80	85	90	95	100	100	100
Doctorate 1st year	6	6	3	5	4	15	15	15	15	15	20	20	20	20	20	20
Subtotal	108	113	131	129	115	170	175	190	210	240	315	340	365	390	400	400
Total enrollment	357	417	457	516	531	600	605	805	900	980	1085	1130	1165	1190	1200	1200

(Source: High Institute of Nursing, Cairo University)

Data 3-2-2

(2) Personnel Plan

To meet the increasing number of students, the teaching staff is already scheduled to be increased from 57 in 1987 to 88 in fiscal 1989 and 110 in fiscal 1993. Not only is the number rising, but many assistant professors will be promoted in fiscal 1993 and there will then be 11 full professors.

According to Japanese standards of university education, a student quota of 200/grade requires 28 full-time teachers, more than half of whom should be professors. If the assistant professors and professors in this institute equated with professors in Japan, the University would have more than 20 such teachers in 1993 and the ratio could be considered equivalent to that of Japan. In Egypt, however, lecturers and up all have a doctorate so, academically speaking, they are above the Japanese level.

While the ratio of students to teaching staff was 5.7:1 in fiscal 1987, it improved to 4.7:1 in fiscal 1989 and will drop back to 6.2:1 in fiscal 1993 and 6.7:1 in fiscal 1995. In fiscal 1987, Alexandria University actually had 1,057 students and 160 teachers, a ratio of 6.6:1 and Cairo University has not yet improved to that level. Cairo University is preparing to employ additional external lecturers and increase its own demonstrators but, needless to say, it is much more desirable to have more full-time teaching staffers than having to depend on outside lecturers and demonstrators.

The number of clerical/administrative staff increased nominally from 46 to 48 between fiscal 1987 and 1989, but it will be further expanded by 43% to 69 by fiscal 1991 to meet the demands of the expanded facilities. Because the number of students will eventually be doubled, a further reinforcement of administrative/clerical staff is called for until the standard of Alexandria University (130) is achieved.

Personnel Plan: Higher Institute of Nursing, Cairo University

Teaching Staff	1987	1988	1989	1990	1991	1992	1993	1994	1995
Professor	1	2	2	2	2	2	11	12	12
Assistant Prof.	2	9	10	14	14	14	10	11	13
Lecturer	20	24	29	30	20	26	20	25	30
Assistant Lecturer	16	19	17	20	28	35	35	35	35
Demonstrator	18	18	30	37	35	32	34	27	24
Total	57	72	88	103	109	109	110	110	114

Administrative/Clerical Staff	1987	1988	1989	1990	1991	1992	1993	1994	1995
Dean's Sec.	1	1	1	1	2	2	2	2	2
Vice Dean's Sec.	1	1	1	1	1	2	2	2	2
Student Care	5	5	5	5	8	8	8	8	8
Education Aids	8	8	8	8	12	12	12	12	12
High Studies Affairs	3	3	3	3	6	6	6	6	6
Type/Printing	4	4	6	6	10	10	10	10	10
Library	8	8	8	8	8	10	10	14	14
Administrative	10	10	10	10	12	12	12	12	12
Financial	6	6	6	6	10	10	10	10	10
Total	46	46	48	48	69	72	72	76	76

Total Staff	103	118	136	151	178	181	182	186	190
No. of Undergraduates	326	387	416	430	525	614	690	740	770
Interns and Post-Graduate Students	131	129	115	170	175	190	210	240	315
Total Students	457	516	531	600	605	805	900	980	1085

Fig. 3.2.2

(3) Curriculum

The academic term commences in October every year and terminates in June the following year. The first semester (15 weeks) is scheduled between November and February and the second (15 weeks) between March and June.

The first-year curriculum consists of 500 hours of lectures and 312 hours of practical work. As all lectures are given in English, the first 6 weeks are devoted to English studies.
Also in the 1st year, 36 hours are allocated to anatomy classes which will give students an understanding of the body's structure through use of anatomical models, and pathological models.

From the second year onward, the curriculum consists of in-school lectures of 450 hours, and out-of-school practice of 540 hours. Lectures in each of the years average 15 hours a week and 3 hours a day. Officially, six days a week are timetabled for education, but actually five days a week is the norm as every Thursday or Friday is off. Practice is so designed that one lecturer and one demonstrator instruct the students. It is said that a lecturer can instruct up to 6 students at best.

Students in each grade are divided into 2 classes and study the curricula alternately in the first and second semester, an arrangement that facilitates the schedule for the practical exercises, according to the institute. Therefore, if one grade consists of 200 students, then they are divided into 2 classes of 100 each and each class is further divided into 8 groups, so practice is by units of 12 students.

The Egyptian side has recently introduced a requirement for 30 hours a year of English conversation lessons in each grade, which appears to be in anticipation of the new classrooms. English conversation lessons in LL classrooms are currently given only in the Faculty of Literature. However, if this Project can be planned to include such a facility for English conversation, educational efficiency will improve because all nursing lectures are given in English. The English conversation lessons, including those in the LL, will be given by the staff of the Faculty of Literature.

The students are expected to master such skills as bedside care of hospitalized patients, first-aid care, pre-surgery hand washing, giving patients baths, nurse station requirements, blood pressure measurement, various types of injection and use of the artificial ureter and this training will progress best if lessons can be given in nursing care practice laboratories.

In the 4th year, 60 hours of lectures and 270 hours of practical work a year will be given over to community health care. At present, students are sent out to local communities but they cannot be sent on a large number because local communities are distant and each community center is small. Therefore, it is considered adequate to establish a primary health care laboratory as a part of this Project as a place for students to practice.

Also in the 4th year, numerical analysis takes up 30 hours to allow the students to master computers. At present, post-graduates have to visit the computer center of the pharmaceutical department because the High Institute of Nursing has no computer. Installation of computers has been requested for this Project so that computer training may be given to undergraduates. Expertise with sophisticated medical equipment and statistics in reserach is necessary for today's medical profession. It is expected that the introduction of computers will make the nursing education more flexible to cope with the above-mentioned objectives.

In the post-graduate master's course, first-graders have two seminars a week, but this is reduced to one in the second grade when they go out to practice twice a week. Since many of these students work part-time, they attend school only once or twice a week on average. As nearly all students studying for a doctorate have jobs, and as it takes roughly 5 years to finish the doctoral thesis, they seldom come into school unless there are special assignments or seminars. In both cases, school attendance is 10 to 15% on average.

(4) Budget Scheme

With respect to the budget allocation by the Egyptian government for this Project, 5 million Egyptian pounds (Approximately ¥300 million) has been approved already by the Planning Ministry for non-residential buildings covered by the 5-year plan (1987/88 to 1991/92). This budget is capable of covering the entire scope of work which the Egyptian side is required to implement in this Project.

To itemize this figure, the 1989/90 budget includes the demolition of existing buildings on the project site (£E450,000) and demolition of the structural framework for foundations (£E230,000). The labor costs of the Project (£E30,000), bank commissions (£E160,000) and infrastructure construction costs (£E55,000) are to be met by the 1990/91 to 1992 budget.

In addition, it has been approved by the government that £E510,000 is to be appropriated as part of the national budget after completion of the facilities as shown below.

1)	Running cost (Operation & Maintenance)			
	a) Operation			
	- Electricity	£E 18,000		
	- City water	£E 2,800		
	- Gas	£E 1,500	Sub total :	£E 35,000
	- Telephone	£E 3,700		
	- Oil	£E 9,000		
	b) Maintenance			£E 10,000
2)	Salary of staff of HIN			£E 450,000
3)	Purchase of stationery, expendables, etc.			£E 15,000
			Total	£E 510,000

In addition, the following are the costs of work to be covered by the Egyptian side as confirmed in the Minutes of Discussions of the Survey for the Draft Final Report:

Cost for excavation of the site	£E	900,000
Cost for finish work on the parking lot	£E	1,500,000
Cost for furniture for the Educational Dept.	£E	180,000
Cost for furniture for the Administration Dept.	£E	150,000
Cost for furniture for the Student Dormitory	£E	300,000
Cost for exterior work	£E	250,000
Miscellaneous Costs	£E	100,000
Total	£E	3,280,000

By adding to the amount shown above the budget for the Project appropriated by the Egyptian side, £E 925,000, the total amount reaches £E 4,205,000, which is smaller than £E 5,000,000, the overall budget drawn up by the government of Egypt. Consequently, the budgeting plan of Egypt is deemed adequate.

Compared with current actual personnel costs of £E260,000 and maintenance and control costs of £E20,000, the costs of management and control will nearly double, but further assessment of this subject will be made in this report under the item Operation and Maintenance Plan.

Even if a sufficient amount of money is allowed for a budgetary plan, there may be cases in which payment is delayed. Consideration should therefore be given to ensure that the plan is carried out on schedule by Cairo University.

Annual Expenditure at the High Institute of Nursing, Cairo University Fig. 3.2.2- (3)

	1983/84	1984/85	1987/88	1988/89
Car maintenance and Spare parts	1,000	112	951	230
Supplies	1,222	1,426	2,240	2,100
Advertisement	120	410	-	-
Office supplies	400	465	1,000	1,493
Electricity	440	700	-	-
Train tickets	112	25	190	90
Transport (public)	106	92	250	200
Telephone	615	592	140	100
Postage	20	25	50	175
Building repair	581	1,000	20,000	10,000
Gifts (prize)	300	60	888	1,308
Apparatus	1,933	1,475	2,850	-
Maintenance (cleaning)	70	995	555	412
Car repair	140	32	-	-
Research	1,000	-	-	1,000
Books	-	-	4,188	3,000
Total	£E 8,059	£E 7,409	£E 29,114	£E 20,108

Total Budget (1988/89)

(1) Teaching staff £E 197,559

(2) Employees £E 62,316

3-2-3 Review of Relationship/Duplication with Similar Assistance Programs

(1) Relationship with Other Japanese Cooperation Projects

Major nursing projects operated in Egypt by Japan are listed below.

(a) Nursing Education and Research Project; Technical Cooperation, April 1978-March 1981-March 1983

(b) Cairo University Pediatric Hospital Project; Technical Cooperation, July 1, 1983--June 30, 1988
Cairo University Pediatric Hospital Project (Follow up); July 1, 1988--June 30, 1989

(c) Nursing Education of Trainees from Third Nations; Technical Cooperation, 1985--1989

In Cairo University's Pediatric Hospital, students at the High Institute of Nursing practice clinical nursing of children and learn nursing techniques for psychiatric outpatients while interns master ICU/surgery nursing skills. To graduate (master's/doctor's course) students, it serves as a research facility in the field of children's nursing.

The Pediatric Hospital of Cairo University has already introduced highly advanced medical equipment and these equipment help to improve the educational level at the university together with the theoretical study.

The Nursing Training Center (Manpower Development Section, Research and Study Division, Ministry of Health), which has carried out a nursing education/research project, has a training course for graduate nurses, and educators at the High Institute of Nursing, Cairo University, are their main teachers.

(2) Summary of Third-Nation Cooperation

(a) WHO Assistance

Soon after establishment around 1964 graduate courses were annexed to the medical department under the assistance of WHO. In September 1968, a senior advisor arrived and graduates of Alexandria University were allocated to found the High Institute of Nursing, Cairo University. Assistance from WHO lasted 11 years from that time and was terminated in 1975. The assistance consisted of curricula development, education of teachers, and upgrading of educational equipment, books in particular.
Alexandria University is training seven students from Yemen who are subsidized by WHO. Cairo University has trained approximately 30 students from Palestine, Somalia, Ethiopia, Yemen and other Middle Eastern and African countries for the last five years. Currently, the university has four students from Palestine and Somalia.

(b) Technical Cooperation from Project HOPE (HOPE - Help Overseas Project Everywhere, an American non-governmental organization) (1975-1980)

Technical instruction was provided chiefly by American nursing experts.

3-2-4 Review of Project Components

The Egyptian request can be roughly divided into the areas of facilities and equipment. However, as found by the preliminary survey team, the Project consists of the ① Educational Department, ② Administrative Department, ③ Common Department and ④ Dormitory, with priority in this order. The Educational and Administrative departments are essential for the education of students and for generating professional on-site nursing instructors, teachers and researchers from the pool of post-graduate students. The Common Department is a necessary component, providing facilities for extra-curricular training where teachers and researchers can exchange views. The Dormitory is indispensable for the education of students from local communities, etc.

3-2-5 Review of Facilities and Equipment Requested

(1) The Educational Department comprises classrooms, special rooms, and practice rooms that correspond to curriculum needs. There are to be classrooms with seating capacities of 200, 100, 50, 25 and 12, and which are for lectures to undergraduate and post-graduate students. The special rooms include a skill lab for nursing practice, an anatomy practice room, a nursing research lab, LL room, AV production room, and PHC room. Others include a library, changing room, etc. Though physiology/chemistry labs and a biology/parasitology lab were part of the original request, they were dropped from the current project on the grounds that these subjects have been taught in high school already. The number and size of educational division requirements are determined by the curriculum and the division of classroom units. According to the curriculum of the High Institute of Nursing, 51% of annual study time is spent outside the classroom in practical exercises. Interns spend 100% of their time doing practical work outside the classroom. In the case of post-graduate students, only 10 to 15% of them use the school's facilities.

(2) The Administrative Department consists of teachers' offices and research labs. The size of these facilities, and details of the design, depend on the teacher personnel plan.

(3) The Common Department comprises extra-curricular facilities for the training and implement of graduates, nurses, and senior nurses plus social facilities for undergraduates including a cafeteria. Though a gymnasium has been requested as one of the social amenities for undergraduates, a simple sports hall is proposed instead, because physical education is not part of the curriculum. A special curriculum has been developed for an auditorium which is to be used 70 days a year, and it is proposed that an auditorium be included in this Project. The annual use breaks down to 20 days for training of graduate/senior nurses, 10 days for the training of Cairo University's teachers, 5 days for medical education such as 5 days for society meetings of Arab

nations, 4 days for school graduation/entrance ceremonies, etc., and 26 days for extra-curricular activities.

(4) The dormitory will accommodate students from outside communities and foreign students. According to current information, 20 to 30% of undergraduates will want to live in the dormitory. It is therefore proposed that a dormitory be built to accommodate 200 students, approximately 25% of the expected total under-graduates student population.

Cairo University's High Institute of Nursing

Dormitory Residents	1987	1988	1989
Giza & Pyramids	34	35	53
Greater Cairo	35	44	26
Upper Egypt	3	3	5
Lower Egypt	17	5	47
Total	89	87	131
Total Students Number	326	387	416
Students %	27.3	27.4	31.4

* Students from Upper Egypt & Lower Egypt must live in the Hostel.

(5) In addition, an underground parking lot has been planned to overcome the shortage of parking space in Cairo University's Faculty of Medicine and to improve the environment around the campus, but this is conditional on the Egyptian government paying for it. After demolition of the existing buildings, a semi-underground area will remain and the proposed parking area will make good use of this underground space. The Japanese side will bear the cost for the foundations and skeletal structure of the new buildings, while the Egyptian side will bear the cost for the finishing.

(6) At the time of presentation of the Draft Final Report, the Egyptian side expressed its desire to construct dormitory facilities for another 100 students above the Dormitory to be provided in this Project, concurrently with the execution of the Japanese grant aid construction.
This request was, however, rejected for the following reasons:

1) No specific plan for increasing the students quota has yet been drawn up.

2) Budgetary measures are unclear.

3) Although the scope of work to be covered by the Egyptian side and the Japanese side, in technical aspects including design and construction, should be clearly divided, it would in practice be difficult to do so.

As there is a possibility that this item will come up again during the detailed design stage, thorough attention should be paid to it in the implementation of the Project.

(7) Review of Equipment Requested

1) Details of Equipment Requested

Of the laboratories related to nursing education and practice which were requested by the Egyptian side, the "Physiology Lab," "Chemistry Lab," and "Biology Lab./Parasitology Lab." were dropped from the list on the grounds that these subjects have already been covered in high school. The facilities and equipment for laboratories and other rooms in the equipment plan are as follows.

① Anatomy & Physiology Lab.
The major equipment includes the various models such as anatomical models of the human body, models of the human skeleton, models of human muscles and various models of internal organs, plus the model of an impregnated womb and models showing the growth of an embryo, in addition to pathological models, a slide projector and an overhead projector.

② Nursing Skill Lab.
Typical equipment includes patient's beds, bedside cabinets, overbed tables, infant incubators, all-purpose practice models, dummy patients, blood sampling/intravenous injection simulators, sterilizers, scrub sink, stainless steel utensils, surgical instruments and dressing carts, etc.

③ Primary Health Care Unit Lab
The equipment in the unit is related to the nursing and care of patients receiving treatment and, in the case of an examination room for example, the equipment consists of very basic instruments such as microscopes, blood sugar analyzer, blood sedimentation racks, and hemoglobin meter. In classrooms a slide projector, overhead projector, and other equipment is planned so that general lectures related to primary health may be given.

④ Nursing Research Lab.
Nine personal computers and 3 printers will be installed so that, seniors and post-graduate students may prepare nursing statistics, analyze data, and make use of files.

⑤ Language Lab.
The LL classroom is designed to improve language education.

⑥ Library
In addition to normal library facilities (bookshelves, reading tables, chairs, etc.), typewriters, and copy machines will be provided.

⑦ Printing/Copying Room
Stencil machine to print student tests, and copy machines will be provided.

⑧ Darkroom
This is equipped with the photo equipment necessary for development of photographs and slides used in student education and for their enlargement and printing.

⑨ AV Production Room
Equipment needed to edit video tapes and make simple productions related to nursing education.

2) Review of equipment requests

The above list of equipment indicates the equipment and instruments requested for ① the Anatomy & Physiology Lab., ② Skills Lab., ③ Primary Health Care Unit ④ Nursing Research Lab., ⑤ Language Lab., ⑥ Library, ⑦ Printing/Copying Room and ⑧ Darkroom and the basic necessities of nursing education. The maintenance and operation of this equipment should pose no problems. Easy maintenance and management shall be the criteria for (4) introduction of PCs for the Nursing Research Lab, (5) contents of equipment for the LL and (9) grade and scale of equipment for the AV production room.

3-2-6 Improvement of School Administration Based on Japanese Experience

The government of Egypt requested the government of Japan to provide project-based technical cooperation in addition to the grant aid. In response to this request, the government of Japan conducted a preliminary survey for such technical cooperation in September 1989, which is the same time when the preliminary survey for the grant aid program was carried out, for the purpose of investigating the necessity as well as the contents of the technical cooperation to be provided.

It is absolutely necessary that facilities and equipment be procured under the grant aid in carrying out this program. It cannot be said, however, that this program has attained the initial objectives unless educational practices and studies operated smoothly. The High Institute of Nursing, Cairo University has been engaged in nursing research and education for many years. Because of inadequate facilities and equipment and the shortage of human resources, the Institute cannot cope with various subjects and problems that it faces. In order to have a variety of activities be conducted within the facilities which will be constructed under the grant aid, it is necessary that technology and experience be transferred from developed countries. Japan is one of the leading countries in the world which having advanced technology as well as accumulated experience in the field of health and medical treatment. Japan also has experience in cooperating with Egypt in the field of nursing education by dispatching specialists, including technical transfer to the High Institute of

Nursing at Cairo University. With these facts taken into consideration, it seems appropriate for Japan to provide technical cooperation on a project basis in connection with the grant aid. Such technical cooperation eventually will help promote an effective and adequate use of the facilities and equipment to be provided under the grant aid.

(1) Objectives of the Technical Cooperation Request

Egypt's main aims in requesting Japanese for technical cooperation are as explained below.

① To strengthen the cooperative relationship between Japan and Egypt brought about through technical cooperation for nursing carried out between the two nations in the construction of Cairo University's Pediatric Hospital.

② To include nursing education within hospital instruction through practical exercises and curriculum innovation.

③ The training of teachers and post-graduate students involved in nursing education.

④ Education of nursing leaders from third nations in Africa, ect., under the auspices of the Ministry of Health and through technical cooperation from Japan.

⑤ Improvement of faculty administration based on Japanese experience and cooperation.

⑥ To strengthen of educational media and equipment for education and practice.

(2) Details of Technical Cooperation

① Long-term dispatch of specialists from Japan
One specialist in each area of the nursing education including clinical nursing, primary health care, and educational media areas.

② Technical training of Egyptian teachers in Japan
Training of a teacher in each of the nursing education, primary health care, Pediatrics ICU, and obstetrical/gynecological nursing fields, 4 in total.

③ Provision of hospital equipment and instruments for High Institute of Nursing and hospital where the training will take place.

④ Reorganization of the current system for training students from third nations in Africa by reassessing the contributions from the Ministry of Health, Cairo University, and Japan.

3-2-7 Basic Cooperation Policy

The execution of this Project is judged suitable for funding by Japanese grant aid because its viability and workability have been confirmed in the foregoing review and because the aims of the Project match the objectives of the Japanese government grant aid system. On condition that a Japanese government grant becomes available, a basic design will be implemented as a study of the summary of this Project as given below. However, if review of the Project indicates that it is appropriate to revise part of the request, modifications may be made as already stated under the item Review of Facilities and Equipment Requested.

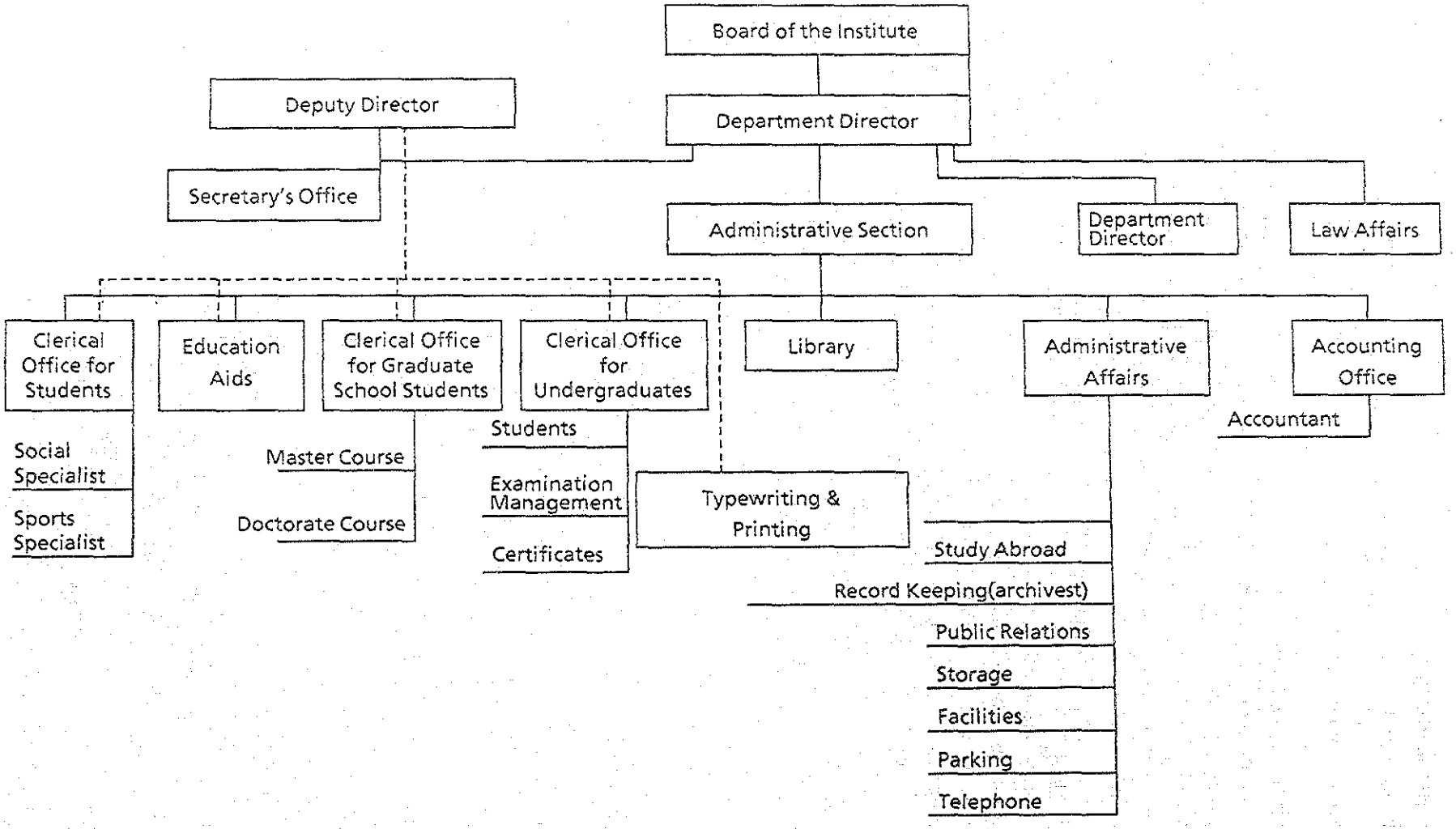
3-3 Project Description

3-3-1 Executing Agency and Operational Structure

After the completion of the Project, the facilities will be operated by the High Institute of Nursing of Cairo University. The Institute now drafts and executes its educational plan and administrates its budgetary plan and the matters related to personnel affairs on its own. Although the Institute is operated like a subdivision of the Faculty of Medicine, it holds an autonomous system in the administration of nursing studies and related educational programs.

As compared with the Faculty of Medicine, the High Institute of Nursing is relatively new and professor-class teaching staff are few. However, there are many middle-class teaching staff and they will be promoted to be professor-class teaching staff soon after they achieve a number of successful results in educational activities and related studies,. When the above-mentioned condition is combined with the progress of the proposed project, the High Institute of Nursing will be designated both in name and reality as the Faculty of Nursing.

Fig. 3.3.1: Organization of the High Institute of Nursing in Cairo University



3-3-2 Educational Programs

The following is a summary of the educational aims of the High Institute of Nursing.

(1) Education of students in the bachelor's degree programme

(2) Education of professional nursing leaders through the master's course of the graduate school and education of teachers and researchers in the doctor's course of the graduate school

(3) Study and research in seven (7) fields of nursing education

(4) Assistance in other educational institutes

Provision of guidance and assistances in setting up new nursing departments

Provision of guidance and assistance to the Ministry of Health, and with courses for post-graduate and executive nurses

Provision of guidance and assistance to WHO, UNICEF, and with nursing courses in third countries

Provision of guidance and assistance to all Cairo universities and teacher training institutions

Provision of guidance and assistance to medical education courses

Acceptance of trainees from Arab nations with the support of WHO.

3-3-3 Location and Ground Conditions of the Project Site

(1) Natural conditions of the project site

The site fronts the River Roda, a tributary of the Nile, and the sub-surface water level is about 3.5m below ground level. A solid layer of N-value-50 rock also appears about 5m below ground level.

The temperature, humidity and precipitation in the city of Cairo are as follows:

Temperature °C

	Maximum Temperature	Minimum Temperature	Humidity %	Precipitation mm
Winter (Nov. through Apr.)	18.2	3.8	54%	1.9mm
Summer (May through Oct.)	33.3	20.5	55%	0

It is dry throughout the year. Nights are cold in winter, but daytime temperatures are comfortable. The summer season extends from May until October. The period between June and September is extremely hot and the maximum daytime temperature sometimes reaches 45°C. The period requiring heating over the winter is said to be from December to February. It rains once or twice a year, when pools form here and there.

(2) Summary of the infrastructure

1. Electricity

The electrical room is to be placed facing the road. Main cables of sufficient capacity will be furnished up to the site by the Egyptian side (11kV, 3φ, 3W + one neutral line, 50Hz).

The electrical engineers with whom discussions were held are Eng. Maher Matta, Director, and Eng. Saad El Melegy, Chief of the Design Department.

2. Water supply

A new trunk water supply system runs below the central corridor of the University Hospital from a pumping station in a corner of the site occupied by the Faculty of Medicine of Cairo University. Water is supplied to the HIN site via a branch from that trunk system. Other supplies come from two old trunk water supply pipes which are drawn onto the HIN site, but their reliability is low.

3. Sewer system

The trunk sewer is connected to the HIN site via the road in front of the out-patient ward. The discharge sewer from HIN connects into this trunk system, and no treatment is needed before discharge.

4. Telephones

One telephone in HIN is at present connected to the hospital exchange via the exchange in the Faculty of Medicine, but this is now out of order. For the new HIN, a new telephone line shall be laid by the Egyptian side.

5. City gas

The site does not have a city gas supply system, but there is now a propane gas supply system, which is used to boil water in the dormitory. Since it is not very reliable, kerosene is used in the kitchen. The trend in Cairo, however, is to cook with electricity.

3-3-4 Outline of Facilities and Equipment

Facility planning

1. Building for High Institute of Nursing

Reinforced concrete building, four floors above ground	About	9,000 m²
Terrace and plaza	About	2,700 m²

2. Student dormitory

Reinforced concrete building, 5 floors above ground	About 3,200 m²

3. Semi-basement

Parking lot for about 170 vehicles (work by the Egyptian side)	About 6,600 m²
Grand total :	About 21,500 m²

Equipment and materials planning

1. Laboratory equipment and materials for anatomy and physiology
2. Laboratory equipment and materials for nursing skill laboratory
3. Equipment and materials for primary health care unit laboratory
4. Equipment and materials for nursing research laboratory
5. Language laboratory equipment and materials
6. Equipment and materials for the library
7. Equipment and materials for the copy room
8. Equipment and materials for the dark room
9. Equipment and materials for the audio-visual educational aids preparation room

(1) Outline of facilities

Taking into consideration the curricula and function, the number of people to be accommodated, and the usage rate of rooms, etc., the required floor area for each department and for each room was examined, and the results are given below. In

calculating these areas, reference was made to the Japanese facility standards though with reference to international standards, too (Neufert Architect's Data).

The calculations indicated that the Educational Department should be 4,570m^2, the Administration Department 2,000m^2, and the Common Department 2,271m^2, amounting to a total of 8,841m^2, plus 3,200m^2 for the Student Dormitory and 2,700 m^2 for the Terrace and Plaza and 6,600m^2 for the Basement Parking Lot.

The minimum numbers of classrooms required are calculated on the basis of a usage ratio of 50% and above. The conference rooms and the auditorium in the Common Department will be utilized as classrooms, and will be operated flexibly with the classrooms in the Educational Department. The followings are the total number of classrooms.

		Requested (Dept.)	Educational	Common
Auditorium	(500 persons)	1 (Common)		1
Large Classroom	(200 persons)	4 (Educational)	2	0
Middle Classroom	(100 persons)	4 (Educational)	3	1
Small Classroom	(50 persons)	2 (Educational)	2	1
Classroom	(25 persons)	4 (Educational)	2	2
Senior room	(12 persons)	18 (Educational)	10	

Educational Department

Type of room	Function	No. of rooms	Total floor area required
Large classroom (for 200 students)	A classroom for lectures to the whole of a grade in general subjects such as pathology, physiology, psychology, pharmacy, surgery, etc. Usage rate of this room: 43%	2 (4)	320m²
Medium classroom (for 100 students)	To be used for lectures by dividing a grade into two groups for bacteriology, parasitology, and pharmacology classes, etc. Usage rate of this room: 73%, 100 students × 1.2m². 120m² × 3 rooms	3 (4)	360m²
Small classroom (for 50 students)	To be used for lectures by dividing a grade into three groups for English and sociology classes, etc. Usage rate of this room: 80%, 50 students × 1.2m², 65m² × 2 rooms	2 (2)	130m²
Small conference room (for 25 students)	To be used for lectures by joining two groups of 12 student nurses. Usage rate of this room: 70%, 25 students × 2m², 50m² × 2 rooms	2 (4)	100m²
Seminar room (for 12 students)	To be used by a group of student nurses. To be used for meetings, etc., after returning from out-of-school practice. Usage rate of this room: 52%, 12 students × 2.5m², 35m² × 10 rooms	10 (18)	350m²
Nursing skill laboratory (with beds)	To be used for learning the bedside care of patients in a ward, first-aid nursing techniques, etc., by students, using simulators for various types of nursing techniques. A group of 6 students with 12 beds, for 72 students	1 (2)	140m²
Nursing skill laboratory utility	To learn such lessons as pre-surgery hand washing techniques, bathing techniques, etc., using simulation facilities including a toilet, refuse system, nurse station, storage, and washing area.	1 (1)	75m²
Nursing skill laboratory (without beds)	To learn such techniques as measuring, blood pressure, administering injections into various parts of the body, draining urine, etc. Storage: For 30 students	2 (2)	115m²

( ) Requested number

Type of room	Function	No. of rooms	Total floor area required
Anatomy laboratory	A classroom for teaching a variety of physical structures by using a variety of anatomic models. 36 people × 2.2m² + 30m² for storage	1 (1)	110m²
Nurse research laboratory	A laboratory designed for nursing statistics, and to carry out research using the data. For the use of 4th grade and graduate school students. Usage rate of this room: 60%. Space for nine personal computers, 3 printers and 30 students	1 (1)	55m²
LL classroom	Included to encourrage the learning of English skills by each grade. Usage rate of this room: 80% 25 consoles 250 seats × 2m² + 5m² for the stage	1 (1)	55m²
Audio-visual teaching materials room	This room is for the editing and production of video tapes for nursing education, and it will include a darkroom. The learning materials room is 55m² and the darkroom 10m².	1 (1)	65m²
PHC (primary health care) room	To be equipped with the standard contents of primary health care centers which exist around the country, allowing students after graduation to obtain actual practice of clinical methods without awkwardness. It consists of a waiting room, an inspection room, a toilet, a classroom, and a preparation room, etc.	1 (1)	135m²
Library	The library for the exclusive use of the nursing department, presently in the medical department, will be transferred here. The library contains 10,000 books, and has 100 seats, for 10% of the total number of students. The libray will also have reference and copying sections.	1 (1)	370m²
Changing room	A room in which students can change their clothes before going to practice. 850 people	1 (1)	160m²
Utility	Storage areas for cleaning instruments, one required per floor. 10 m² × 4	4 (4)	40m²

( ) Requested number

Type of room	Function	No. of rooms	Total floor area
Toilets	For students, 35m² × 5 locations	5 (5)	165m²
(Proportion of net area)	60%		(2,760m²)
Corridors and others	40%		1,810m²
Subtotal	100%		4,570m²

( ) Requested number

Administration Department:

Type of room	Function	No. of rooms	Total floor area
Department director's office	An office for the department director of the same area as the existing facility.	1 (1)	55m²
Deputy directors' office	A room housing the two deputy directors of the department.	1 (1)	55m²
Secretary's office	For four secretaries — two for the department director and one each for the deputy directors — plus space for a waiting area, etc., in the future. 3 people × 10m² = 30m²	1 (1)	30m²
Teaching Faculty Rooms	The seven departments shall each have their own classrooms of 7 to 10 desks for lecturers. 10 people × 5.0m² = 50m², 50m² × 7 rooms	7 (7)	350m²
Clerical Office for undergraduates	An office for 8 departmental clerks , with plans for 10 clerks in the future 10 people × 7m² = 70m² (plus 10 m²)	1 (1)	80m²
Clerical office for graduate school students	An office for 3 clerks to serve the graduate school students, with plans for 6 clerks in the future. 6 people × 7m² = 42m²	1 (1)	40m²
Clerical office for students	Five clerks for the health and welfare of students, with plans for 8 clerks in the future. 8 people × 7m² = 56m²	1 (1)	60m²
Accounting office	Six accounts staff with plans for 10 in the future, of whom two are cashiers handling cash and requiring space for accounting documents 10 × 7m², 70m² + 15m² for others	1 (1)	85m²
Administration office	Ten clerks, with plans for 12 in the future 12 × 7m² = 84m²	1 (1)	85m²
Examination management office	Housing three or four people who will prepare entrance examinations, etc. 4 people × 7m² = 28m²	1 (1)	25m²

( ) Requested number

Type of room	Function	No. of rooms	Total floor area
Meeting room	Meetings for all concerned with management 15 people × 1.6m² = 24m², 24m² × 2 rooms	2(2)	50m²
Teaching staff room	Room for the use of assistant lecturers, and other assistant teachers, etc. 30 people × 1.7m² = 51m²	1 (1)	50m²
Clerical staff room	Room for clerks to use for relaxation. 25 people × 1.7m² = 42m²	1 (1)	40m²
JICA experts' room	For Japanese experts of long-term residence 3-5, with space for equipment, materials, and working . 5 people × 6m² = 30m² + 10m² for equipment and materials + 10m² for working.	1 (1)	50m²
Printing room	To be fitted with photocopiers and stencil duplicator.	1 (1)	25m²
Storage	For archives in the basement	1 (1)	180m²
Utility	Two rooms with a hot water supply are needed, one each for males and females.	2 (2)	20m²
(Proportion of net effective area):	60%		(1,150m²)
Corridors and others	40%		820m²
Total	100%		2,000m²

( ) Requested number

Common Department

Type of room	Function	No. of rooms	Total floor area
Large auditorium (for 500 people)	To be used for ceremonies such as academic gatherings, graduation ceremonies, entrance ceremonies, etc. Also, to be used as an alternative to the large class-room (200 student capacity). The scale which holds 50% of the total no. of students (1,000) is desirable. The standard of the Ministry of Education of Japan also encourages the provision of an auditorium. 500 people × 0.9m² = 450m² Stonge 100 m²	1 (1)	550m²
Large conference hall (for 100 people)	To be used for seminars such as those for educating nurses after graduation. 100 people × 1.2m²	1 (1)	120m²
Medium-sized conference room (for 50 people)	Ditto 50 people × 1.1m²	1 (1)	55m²
Small conference room (for 25 people)	Ditto 25 people × 1.8m²	2 (2)	90m²
Exhibition room	Exhibition space for educational equipment and materials.	1 (1)	100m²
Entrance hall	300 people × 1.5m², entrance hall	1 (1)	450m²
Cafeteria	1,000 people × 10% × 1.2m² = 120m² 50m² for utilities, recreational facility	1 (1)	170m²
Gymnasium		1 (1)	150m²
Terrace Plaza			2,700m²
(Proportion of net effective area):	60%	4,385m² (Incl. terrace plaza)	(1,685m²)
Corridors and others	40%		586m²
Total	100%	5,271m² (Incl. terrace plaza)	2,271m²

( ) Requested number

Student Dormitory

Type of room	Function		No. of rooms	Total floor area
Bedroom A (double)	2 people × 7.2m² = 14.4m² with beds, desks, and lockers 4.5m × 3.2m for two 70% of total consists of double rooms	(104)	52	749m²
Bedroom B (for four)	4 people × 7.2m² = 28.8m² 30% of total consists of four-person rooms	(96)	24	595m²
Dining hall	For two sittings totalling 200 people, 100 seats 100 seats × 1.4m²		1	140m²
Kitchen	Capacity to cater for 200 people		1	90m²
Lounge	200 people × 10% = 20 people 20 people × 1.5m²		1	30m²
Washing room for students	200 ÷ 12 = 16.7 17 people × 2.5m² = 45m² with ironing boards and drying area		1	45m²
Washing room	3 washing workers with ironing boards and drying area		1	25m²
Shower room	200 / 12 = 16 booths 16 people × 2.5m²		4	40m²
Toilet	200 / 10 = 20 20 units × 2.5m²		5	50m²
Utility	Kitchenette and storage of 10m² on each floor		4	40m²
Entrance hall	Mail handling and key storage room			50m²
Supervisor's room	Supervisor on each floor, 15m² × 6		6	90m²
(Proportion of net effective area):	61%			(1,944m²)
Corridors and others	39%			1,256m²
Total	100%			3,200m²

( ) Requested number

Basement Parking Lot

Type of room	Function	No. of rooms	Total floor area
Parking lot	To afford parking for 165 vehicles under the building. 165 vehicles × 30m² = 4,950m² + 1,210m² for access	1	6,160m²
Storage	Storage for equipment and materials 20m² Office storage = 200m²	1	220m²
Machine Room	Machine Room 70m² Water Tank Room 150m²	1 1	220m²
Total			6,600m²

Subtotal of Use of Each Classroom

Grade: 1st, 2nd, 3rd, 4th, Master's students and Doctorate students

Large classroom (for 200)

8 hrs/week; 8 hrs/w; 8 hrs/w; 8 hrs/w, 2 hrs/w; amounting to 34 hrs/week To be used for 34 hours out of a 40-hour week. 34 hours/week used by 2 classrooms

Usage rate = 43%

Medium classrooms (for 100)

42 hrs/w; 22 hrs/w; 12 hrs/w; 12 hrs/w, amounting to 88 hrs/w. Three classrooms to be used for 88 hours out of a 40-hour week, at 35 hrs per classroom. Total of 88 hours/week

Usage rate = 73%

Small classrooms (for 50)

16 hrs/w; 16 hrs/w; 16 hrs/w; 16 hrs/w, amounting to 64 hrs/w for a 40-hour week. Two classrooms to be used for 34 hours/week.

Usage rate = 80%

Small conference rooms (for 25)

8 hrs/w; 8 hrs/w; 6 hrs/w; 6 hrs/w; 20 hrs/w; 6 hrs/w, amounting to 56 hrs/w. Two rooms to be used for 56 hours out of a 40-hour week, or 28 hrs/w each.

Usage rate = 70%

Seminar rooms (for 12 people)

34 hrs/w; 34 hrs/w; 34 hrs/w; 34 hrs/w; 48 hrs/w; 24 hrs/w, amounting to 200/12 = 16.6

To be used for 24 hrs/w by 17 groups, for 208 hours out of a 40-hour week, and 20.8 hrs/w for 10 classrooms.

Usage rate = 52%

Nursing skill laboratory (6 beds)

16 hrs/w, 36 people + 36 people = 72 people to use two rooms in three shifts 16 ÷ 40 = 0.40

Usage rate = 40%

Anatomy laboratory

7 hrs/w, 200 ÷ 30 = 7, to use this in seven groups of 30 people 7 ÷ 40 = 0.175

Usage rate = 17.5%

Nursing research laboratory

8 hrs/w; 8 hrs/w; 8 hrs/w = 124 hrs/w

To be used for 24 hours out of a 40-hour week

Usage rate = 60%

LL classroom

8 hrs/w; 8 hrs/w; 8 hrs/w; 8 hrs/w = 32 hrs/w. Total of 32 hrs/week. To be used for 32 hours out of a 40-hour week.

Usage rate = 80%

3-3-5 Operation and Maintenance Plan

(1) Planning of operation and management

Cairo University will plan the security personnel, organizational and financial resources for the purpose of this Project.

After completing construction of the facility and handing the equipment to the government of Egypt, the High Institute of Nursing of Cairo University becomes responsible for operations and management. The maintenance and control of this entire installation shall, in principle, be carried out by the facility control department of Cairo University's Faculty of Medicine. Such facilities as the electrical equipment, air conditioning, sanitation and other special equipment will require two resident engineers and two resident operators expert in the relevent fields.

(2) Planning of facility maintenance and control

1) Buildings

In maintaining and controlling the buildings, the primary concern is in three areas: daily cleaning; repair of any wear, damage and deterioration; and security for the purposes of safety and prevention of crime.

Daily cleaning has a positive effect on the attitude of users, resulting in more careful handling of the facilities, too. Further, it is important to maintain cleanliness in research facilities, and this also enables any damage or failures to be more easily found. Early repair will then extend the service life of the installed research equipment and materials.

In the area of repairs, maintaining the interior and exterior finish to protect the structures is the main aim. Further, the need for repairs and renovations due to changes in the type of activity, increased staff numbers, etc., can be expected within a decade, if past experience in Japan is taken as a guideline. The particulars of regular inspections and repairs which affect the life of the buildings shall be submitted in the form of a maintenance manual upon handing over the facilities, but a summary follows.

Summary of Regular Building Inspections

(Exterior)	
1. Repair and repainting of the exterior walls	(Once every 5 years)
2. Inspection and repair of the roof waterproofing	(Annual inspection and as necessary)
3. Regular cleaning of gutters and drains	(Monthly)
4. Inspection and repair of the seals around exterior fixtures	(Annually)
5. Repainting of exterior fixtures	(Once every 5 years)
6. Regular inspection and cleaning of ditches, manholes, etc.	(Monthly)
7. Repainting of exterior fences	(Once every 5 years)
8. Regular maintenance of gardens and landscaping	(As necessary)
(Interior)	
1. Modifying the interior	(As necessary)
2. Repair and repainting of interior walls	(As necessary)
3. Replacement of interior ceiling materials	(As necessary)
4. Adjustment of fixture closures and replacement of fittings	(Annually and as necessary)

For security reasons, it is essential to check every user in and out of the facilities. Further, it is also important to establish a security system which will prevent any experimental equipment or materials from being stolen.

2) Building service equipment

It is necessary to maintain and control the equipment and to repair and replace failed parts, etc., in addition to carrying out daily control and regular inspections. The service life of installed equipment will be extended by ensuring normal operation, daily inspections, lubrication, adjustments, cleaning, and early repairs. It is also necessary to undertake preventive maintenance to avoid the bad effects on the buildings of a breakdown, and to make efforts to maintain the facilities in a safe condition. In regular inspections, disassembly, repair, or replacement of expendable parts are carried out in accordance with the maintenance manual.

The supervisors should be conversant with the system components, capacities, etc, in the design. For this purpose, it is necessary to assign, as maintenance personnel, resident engineers with knowledge of each electrical, air conditioning and

ventilation, water supply, drainage and sanitation system, and a further engineer who understands any special equipment. Further, it is essential for these maintenance personnel to receive on-site training at every stage from installation to adjustment. Operation and maintenance manuals shall be submitted upon facility hand-over. The durability of major items of equipment is given below:

Lifetime of Systems and Equipment

(Electrical)	
1. Power generation panel	10 - 15 years
2. Distribution switchboard	10 - 20 years
3. Fluorescent tubes	2,500 to 5,000 hours
4. Incandescent lamps	750 - 1,000 hours
5. Telephone exchange	30 years
6. Public announcement equipment	10 - 15 years
7. Elevator	15 years
(Water Supply and Drainage Systems)	
1. Pumps, pipes, valves	10 years
2. Tanks	10 - 15 years
3. Sanitation hardware	20 years
4. Fire extinguishing equipment	10 - 15 years
5. Gas appliances	5 years
6. Sewer equipment	5 years
(Air Conditioning System)	
1. Pipe work	10 - 15 years
2. Air blowers	10 - 15 years
3. Air conditioning units	5 - 10 years

(3) Estimated Costs for Maintenance and Management

Calculation was made on the costs for maintenance and management to be covered by the Egyptian side after the facilities have been completed and handed over. The items of expenditure are classified into personnel costs, expenses for operation of the facilities, maintenance costs for the facilities and utility devices, costs for expendables, and costs for other activities.

1) Personnel Costs

Based on the recruitment plan of the Egyptian side, the personnel costs at the time of opening of the facilities (1993) were calculated. Data supplied from the Egyptian side were referred to for the annual income of staffers.

teaching staff	110 persons	£E	26,000
administration staff	72 persons	£E	14,400
total	182 persons	£E	41,000

£E 41,000/month × 12 months = £E 492,000

2) Expenses for Operation of the Facilities

① Electricity

1,000 KW × 0.5 × 7 hrs × 20 days = 70,000 KWH/month
70,000 KWH × £E 0.0567 = £E 3,969/month
3,969 × 12 months = £E 47,628/year

② City Water

17,000 m^3 / year × £E 0.1 = £E 1,700/year

③ Telephone

Local calls within Cairo costs 20 piasters per call.
Assuming approximately £E 320/month, the annual amount would be:
320 × 12 = 3,840 £E 3,840/year

④ Gas

There is no gas supply system in the facilities.

⑤ Petroleum

Consumption of petroleum for generators, etc., amounts to 1,000litres /month.

1,000 × 12 months × £E 0.1 = £E 1,200/year

3) Maintenance Costs for the Facilities and Utility Devices

① Maintenance Costs for Facilities

Building repair costs can vary largely depending on the age of the building. Assuming the average annual building repair cost per m^2 of floor area to be £E 0.5/m^2 on a 30-year span basis, the following calculation can be made:

£E 0.5/m^2 × 21,500 = £E 10,750/year

② Maintenance Costs for Utility Devices

Repair costs for utility devices are relatively small up to about 5 years after completion of facilities. In subsequent years, however, there will be mounting demand for exchanging parts and devices. Assuming the average annual utility devices repair costs to be approximately 0.2% of the price of

these devices on a 10 year span basis, the following calculation can be made:

£E 27,000,000 × 0.002/year = £E 54,000

③ Maintenance Costs for Equipment

Regarding maintenance costs for equipment, approximately 30% of the equipment will require tmaintenance and 2% of the purchase amount is deemed appropriate as maintenance and management costs. Hence,

¥ 70,000,000 × 0.3 × 0.02 = ¥ 420,000/year

4) Costs for Expendables and Spare Parts

£E 1,200 × 12 months = £E 14,400/year

5) Total Estimated Costs

①	Personnel Costs	£E 492,000
②	Costs for Operation of the Facilities	£E 54,368
③	Maintenance Costs for Facilities and Utility Devices	£E 84,750
④	Costs for Expendables and Spare Parts	£E 14,450
	(subtotal)	£E 625,568 (¥ 34,406,240)
⑤	Maintenance Costs for Equipment	¥ 420,000
	Grand Total	¥ 34,826,240

The total estimated costs amount to ¥ 35,000,000, which is somewhat larger than the amount planned to be covered by the Egyptian side, £E 510,000/year (approx. ¥ 26,050,000). However, the Egyptian side has promised to increase their budget.

(4) Plan for Maintenance and Management of Equipment

For the equipment for nursing education to be provided at the High Institute of Nursing of Cairo University, it is necessary to set up systems not only for day-to-day maintenance and management to ensure that their functions will be preserved, but also for speedy repair in case of breakdowns, and the uninterrupted supply of spare parts.

1) System for Maintenance and Management of Equipment

* A majority of the equipment for nursing education to be introduced through implementation of this Project are not manufactured in Egypt and therefore need to be imported from Japan. Under the present conditions in Egypt where there are few manufacturers of medical and educational equipment, or even a sufficient number of agents for those equipment, after-sales service including repair by the manufacturers, etc., cannot be expected. Egypt as a whole is short of manpower and facilities for maintenance and repair of equipment of this sort. Consequently, providing an efficient repair and maintenance system in a single facility will not solve the problem. What needs to be done is to promote an improved maintenance and management system for equipment for nursing education (medical equipment) on a nationwide basis.

* In cases where the teaching staff or operators are not accustomed to operating the equipment for nursing education (medical equipment), initial troubles, defined as troubles occurring due to incorrect operations within one year after the start of use, tend to happen much more frequently than in Japan. Troubles can also be triggered by invisible damages due to long-distance transportation, as well as the natural conditions of Egypt. Since most of these failures can be corrected by such simple measures as exchanging of spare parts at an early stage, it is important for the management/maintenance division of the High Institute of Nursing to start its operations concurrently with the opening of the Institute itself to counter troubles in the initial stages.

* Sufficient knowledge on operation of the equipment and thorough execution of day-to-day maintenance and management.

Day-to-day maintenance and management of the equipment must be conducted not only by those who are assigned to undertake the task but also by the teaching staff and operators who actually use the equipment. In order to prevent misuses which are the most common cause of the breakdown of equipment, and also to ensure adequate maintenance and management closely following the usage manuals, it is crucial that appropriate technical guidance be provided by the Japanese side to those people in charge.
In conclusion, the guidance described below should be provided by the Japanese side at the time of installation of the equipment so that the maintenance and management of the equipment for nursing education will be undertaken correctly:

-1. The methods for storing and managing the supplied spare parts and expendables will be introduced to the Egyptian side.

-2. Clear-cut and accurate manuals for repairing the equipment are to be prepared and guidance on how to utilize and preserve them will be provided

to the Egyptian side.

-3. Methods for operating and repairing the equipment will be explained by Japanese engineers who have both the expertise and linguistic ability to do so.

2) Procurement of Expendables

Components that constitute equipment are divided into Expendables (packings, filters, electrodes, ink ribbons, etc.) which must be exchanged regularly with the progress of use of the equipment, and repair components that are required at the time of failures (IC base plates, sensors, motors, etc.). The repair parts to be used for the initial year that accompany the equipment when it is procured do not necessarily contain everything that is required at the time of a breakdown. Hence, expendables and missing components must be purchased by Cairo University. However strongly the personnel system for maintenance and management may be reinforced, maintenance and management will be impossible without repair parts. As a result, Cairo University must reserve a foreign currency budget for the purchase of the repair parts.

Costs related to procurement of expendables and spare parts essential for the operation of nursing education equipment tend to vary depending on the frequency of usage of the equipment. Consequently, trials and experience of some sort are required for determining the adequate amount required when procuring them.

It is generally acknowledged that approximately 15% of the price of the equipment itself should be reserved as budget for expendables and spare parts for nursing education equipment. Expenses of the same level should also be secured as annual maintenance costs for office equipment (copy machine, typewriter, etc.)

As a result, approximately 2% of the total price of the equipment should be allocated as annual maintenance/management costs for the equipment to be provided for the Project.

3-4 Technical cooperation

In the area of technical cooperation, the minutes submitted by a prior mission have already discussed the following policy regarding the scope and details of the cooperation.

3-4-1 Objectives

(1) To offer education and training to teachers in the field of nursing education, as well as to nurses.

(2) To improve teaching methodology, developing curricula, and producing teaching materials.

(3) To introduce the concept of primary health care (PHC) by spreading it throughout the system of nursing education.

3-4-2 Details of cooperation

(1) Nursing education

(2) Primary health care (PHC)

(3) Nursing of children

(4) Maternal Infant nursing

(5) Producing teaching materials

The numbers of professionals and trainees to be accepted, and for what period, will be examined in the future. The outline of the technical cooperation considered by the Japanese counterparts at present is as described below. As to the means of technical transfer, the High Institute of Nursing has already established a curriculum as previously mentioned that should result in an improved quality of nursing education there. This was done by reviewing the curricula, teaching materials drafts, and teaching methods proposed by each department.

Long-term Experts				Short-term Experts	
1.	Team leader	5 years	1		
2.	Coordinator	Ditto	1		
3.	Fundermentals of nursing	Ditto	1-2	3-months × twice	2
4.	Medical and surgical nursing	3 years	1 - 2	Ditto	
5.	Maternity nursing	Ditto	1 - 2	Ditto	
6.	Pediatric nursing	Ditto	1 - 2	Ditto	
7.	Primary health care nursing	5 years	1-2		
8.	Psychiatric nursing	2 - 3 years	1 - 2	Ditto	

Counterparts:

Nursing education	1 for ICU,	2 (for infants and adults)
Fundamentals of Nursing	1 for CCU,	1
Medical surgical nursing	2	
Maternity nursing	3	
Pediatrics nursing	2	
Primary health care	2	
Nursing management	1	

3-4-3 Operation Committee

For implementation of this project-type technical cooperation, it will be necessary to organize a Project Operation Committee consisting of related personnel in Egypt (Director of High Institute of Nursing, Cairo University, etc). The main role of this committee will be to review the curricula and improve the teaching material.

CHAPTER 4 BASIC DESIGN

Chapter 4: Basic Design

4-1 Design Principles

The following are the fundamental policies adopted for drawing up the basic design of the facilities and equipment:

(1) To achieve a design that will be accepted and appreciated locally, meeting the various needs of users.

(2) To design facilities that are easy to use, easy to maintain, and conform to the cultural and natural environment of Egypt.

(3) To design facilities that are technologically effective, efficient and safe.

(4) To design facilities that are flexible for future changes including expansion for accommodating the increased number of students expected in the future.

(5) To draw up a design that takes fully into account the local construction techniques, methods and standards and also uses locally procured materials and equipment wherever possible.

(6) To select systems and equipment that are easy to maintain and manage when drawing up the utility design.

(7) To also select systems and equipment that are easy to maintain and manage when drawing up the equipment plan.

In addition to these, the following policies are also taken into consideration in carrying out a basic design so that it will follow the planned details of the Project.

1) Policies for Coping with the Natural Conditions

The local meteorological conditions of the construction site are a critical factor for determining details of the architectural design including establishment of living space and shape of buildings.
The site for the Project, at approximately 30°N, 31°E, is located in the central plains of Egypt, about 150 km to the south of Alexandria. The climate of the region is dry, with average annual rainfall of only 23.8 mm. The average annual temperature and humidity are 21.5°C and 10.5%, respectively.
It is therefore necessary to establish an appropriate standard for indoor temperature and humidity, and also provide protection and insulation against sunlight and heat. These natural conditions are vital factors for drawing up an architectural design that ensures the comfort, economy, safety and functionalism of the indoor space.

- Countermeasures against heat and humidity
  The temperature of this region is more or less stable throughout the year at 15°C - 30°C. May to September is the particularly hot season when the temperature can exceed 35°C. The average temperature for December, January and February is about 15°C. However, the remaining period of the year tends to be hot, and an effective heat insulation system and air conditioning system are indispensable for maintaining a comfortable living space. The average annual humidity is 10.5%, so it does not cause discomfort as long as one remains in the shade.

- Countermeasures against the wind
  The wind of the region is characterized by a gentle breeze with annual average wind force of only 6.3 knots (2.8 m/sec.). The maximum instantaneous wind force is about 15 m/sec. which is not strong enough to affect buildings. The facilities shall be high in air-tightness to guard against the sandstorms of May and June that speckle the exteriors with sand.

- Countermeasures against rainfall
  With an annual rainfall of only 23.8 mm, it seldom rains in the region. Drainage pipes for rainwater and waterproofed roofs are required, however, because the region is not totally free from rainfall.

- Countermeasures against exposure to sunlight
  Because of its location close to the 30° N line, the site is exposed to strong sunlight. As result, adjustment of intake of sunlight through appropriate positioning of canopies, eaves and louvers and selection of insulating materials for external walls and roofs are a critical part of the building design. The amount of sunlight on the western and eastern walls are constant in the morning to afternoon, but the sun rays from the west in the afternoon coincide with the peak increase of temperature, so the amount of heat absorbed by the western walls, in particular, should be kept down to a minimum. Insulation should be provided in areas with wide openings.

2) Policies for Coping with the Social Conditions

Buildings styled after a courtyard are popularly adopted for mosques and housing in Egypt, as a means of securing comfortable space that is free from the sandstorms and little affected by the hot, dry climate of Egypt.
The external appearance of the facilities was planned on the understanding that the facilities would serve as a symbol of nursing education in Egypt and the neighboring Arab nations. An overall setback was adopted so that the buildings will not look too overwhelming. A plaza was provided, and the use of curves in the design was encouraged to add a soft touch to the buildings. As a result, the facilities for the High Institute of Nursing are equipped with unique features that distinguish them from the buildings of the Faculty of Medicine.

3) Policies on the Local Construction Circumstances

Since the facilities will be constructed under grant aid from the government of Japan, they will be exempted from the procedure of applying for a building permit which is commonly required of general facilities of private companies. Consequently, the facilities are also free from the procedures for obtaining authorized signatures for detail design documents prepared by local consultants which is obligatory in some nations at the time of applying for confirmation of a grant aid project. However, the design of facilities and selection of equipment should conform to regulations on urban design, the building standard act, safety codes and other local laws and provisions.

4) Policies on Utilization of Local Subcontractors and Local Materials

Although the main contractor for the construction work for the facilities is officially a Japanese corporation, the Project will rely a great deal on Egyptian firms for subcontractor work.

The level of skills maintained by local construction companies in Egypt is not so high, and they cannot be regarded as having sufficient expertise. Egypt is generally rich in labor force, but there is a shortage of skilled workers. Almost all types of construction materials and equipment, excluding steel frames and some of the utility-related devices, are locally available. Consequently, from the aspect of efficient management and maintenance after completion of the facilities, local products should be utilized wherever possible. It is also important to adopt a construction method which can be sufficiently covered by the technical standard of local subcontractors, in order to achieve a design that can contribute to the upgrading of the construction industry of Egypt.

5) Policies for Coping with the Managerial and Maintenance Abilities of the Executing Agency

The facilities consist of 3 departments: Educational, Administration and Common, as well as the accommodation and dining facilities, etc. Each department is further divided by functions and arranged in such a way around the Entrance Hall as to maintain good communications among themselves. This leads to a facility design which is both easy to use and easy to maintain. In particular, the Common Department, which attracts a large number of visitors from the outside, should be based on a design that can smoothly cope with the flow of these people. A clearly defined traffic line that enables efficient and functional activities of a large number of people shall therefore be adopted. As a result, the compositions of each division will be easy to understand and the convenience of the facilities themselves will be enhanced.

The composition of the facilities should also be sufficiently flexible to accommodate possible extensions in the future in preparation for expanded activities within the facilities and an increased number of staffers.

The facility design should also be one that requires minimum maintenance costs. Natural ventilation and lighting shall be adopted wherever possible.

The design should place importance on energy saving measures that avoid dependency on mechanical systems while ensuring simplification of utility systems and durability of materials and equipment. Materials and construction methods that are both durable and impose few problems in terms of maintenance and management should be taken into account in the selection of building materials.

4-2 Review of the Design Conditions

(1) Applicable Codes and Standards

The codes and standards of the Arab Republic of Egypt shall be applied in principle. In cases where there are no relevant codes or standards, or the existing ones are deemed insufficient, the standards and provisions of Japan or other foreign countries may be applied on a case-by-case basis. The following shows the major codes and standards to be applied for the architectural, structural, utility and equipment design of the Project:

- Architectural Design
  1) A.R.E. Building and Housing Laws
  2) A.R.E. Building Code, Municipal Laws
  3) A.R.E. New Laws for the Basics of Design and Execution of Building Works
  4) Egyptian Standard Specifications (ESS)
  5) Japanese Industrial Standard (JIS)

- Structural Design
  1) Concrete: A.R.E. Code of Practice (Reinforced Concrete)
     American Concrete Institute (ACI)
  2) Egyptian Standard Specifications (ESS)

- Utility/Equipment Design
  1) A.R.E. Building Code (Service)
  2) Japanese Industrial Standard (JIS)
  3) Japanese Electrotechnical Committee's Standards (JEC)
  4) Standards for the Japan Electrical Manufacturer's Association (JEM)
  5) Japanese Elevator Association Standard (JEAS)
  6) Japanese Heating, Airconditioning and Sanitary Standard (HASS)

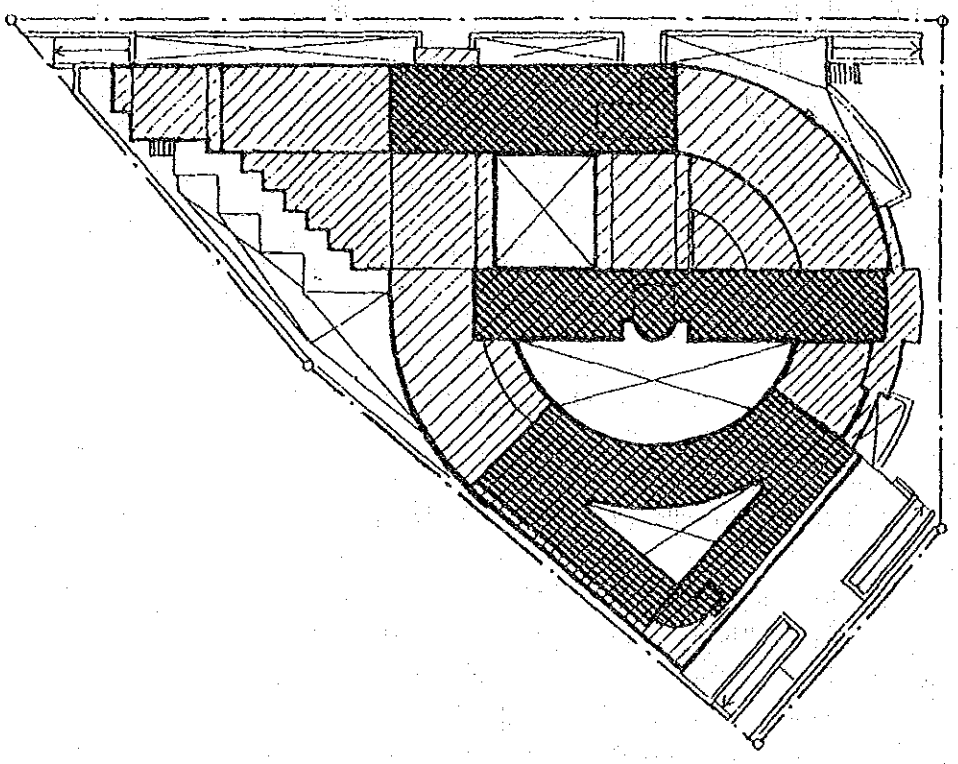
(2) Establishment of the Grade of Buildings

In consideration of the fact that the Project provides facilities for both the undergraduate level and graduate school level of university education, it was decided that a grade close to the Japanese or international standard be adopted for the laboratories of the Education Dept. The classrooms, which are required to be functional, adopts a grade close to the standard level in Egypt. The same grade as those of other universities in Egypt is adopted for the Administration Dept. The Auditorium, which will also serve as a venue for international conferences attended by people not only from Egypt but also from neighboring nations in the future, shall be of a grade that allows the installation of simultaneous interpretation facilities. A grade close to the standard level in Egypt is adopted for the Student Dormitory.

(3) Future Plan

Similar facilities in adjacent areas, including the educational hospital constructed with funds borrowed from the government of France, have an eaves height of approx. 30 m. For the sake of efficient site utilization, the nearby facilities are expected to be more or less uniform in height in the distant future, thereby achieving an integrated skyline. Since the site for the Project is located in a first-class region of the city of Cairo, consideration should be given to allowing the facilities to expand to the height of 30 m or so when the necessity arises in the future. The same applies to the Student Dormitory: when it is expanded to a height of 30 m, it will have sufficient space to accommodate the 500 students projected by the Egyptian side.

For the reasons given above, the structural design shall be drawn up to allow room for expansion of the facilities - to 3 stories for the School Building and to 5 stories for the Student Dormitory. With consideration on the impact on cost and impact on the surrounding environment, the limit for expansion shall be established as shown below.



 ----- Future Plan

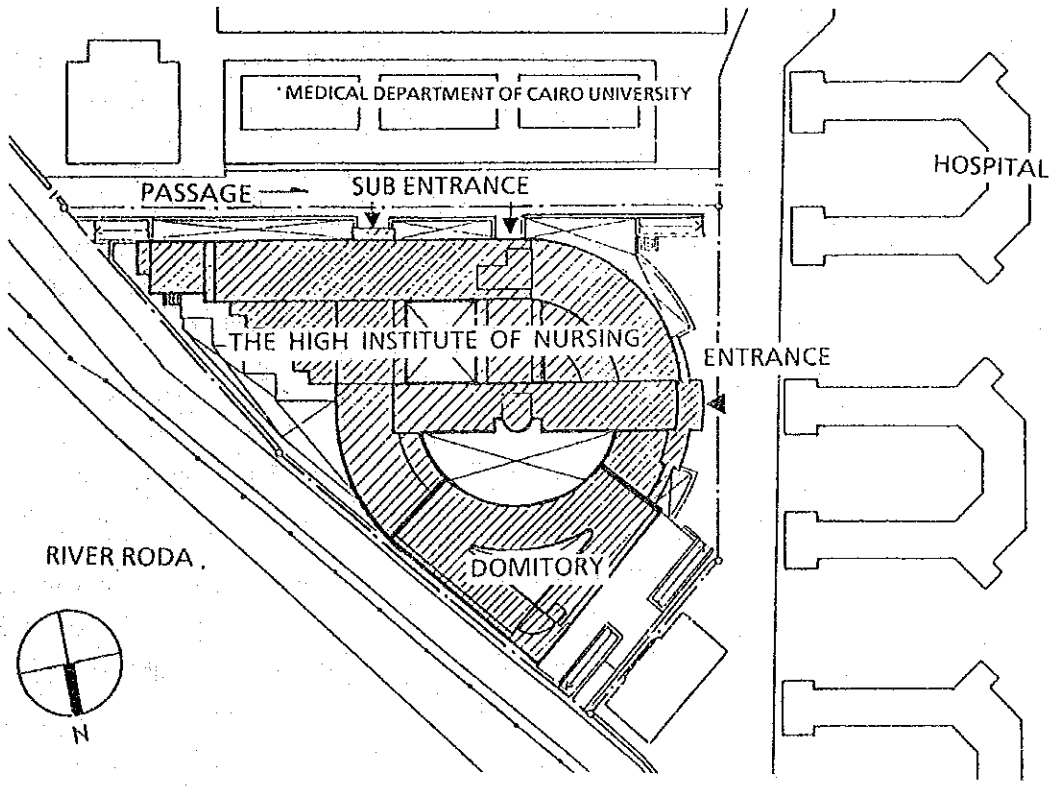
4-3 Basic Plan

4-3-1 Site Location Design

The site borders on the external road facing the River Roda on one side, and is hemmed by internal roads on the southern and eastern sides. The external road is of one-way traffic in a direction opposite to that leading to downtown Cairo, with the result that most of the traffic is concentrated on the internal road on the western side of the site. The passage on the southern side, although almost 12 meters in width, is currently used exclusively as a temporary path for pedestrians.

The scale of the facilities planned for the Project is comparatively large for the area of the site. For this reason, the Egyptian side agreed that the site for the facilities can be stretched to include 5 meters of the area currently serving as the southern path. Consequently, the site area was increased from the initially conceived 6,700 m^2 to 7,470 m^2.

With these preconditions as a base, the Educational Dept. was located near the Surgery Patient Ward on the southern part of the site. The Auditorium and other large spaces were clustered in the common area in the center of the site, with the Administration Dept. located as if to surround the area.
The main entrance for visitors and teaching staff was positioned on the side facing the Faculty of Medicine. The layout plan adopted allows a full view of the facilities to be commanded from the River Roda.



The main entrance for visitors and teaching staff is to be provided on the western side facing the campus of the Faculty of Medicine. The adjacent plaza is to serve as the main entrance (introductory space) for students approaching the school building and Student Dormitory. A side door facing the southern temporary passage is to be provided for general visitors and students. As a result, the traffic line will be separated from that which leads to the laboratories for nursing training. The gateway for cars to and from the basement area will be located on the site bordering on the western internal road in order to prevent any disturbance of the teaching environment. A five-story Student Dormitory will be located on the north of the site facing the River Roda.

4-3-2 Architectural Designs

(1) Ground Plan

Basic Composition of the Facilities

- Highly dense and functional facilities will be composed of the Auditorium, large-and-medium-scale Classrooms and Student Dormitory forming a vast circular arc around the previously-mentioned entrance for students (Multipurpose Plaza) and integrating themselves with the group of Educational/Administration facilities which are lined up to correspond to the east-west axis lines of the nearby school buildings.

- A combination of a corridor-type ground plan surrounding a courtyard and a semi-corridor type ground plan is to be adopted for maximum utilization of natural ventilation and natural lighting.

- A circular arc form was adopted as the basic composition for the facilities of the Project, based on the reasons given below.

1) Spaces for stopping and moving that are an integral part of the design of school facilities are to be provided in the form of the central Plaza, Courtyard and Atrium (with air-well inside). The groups of classrooms surrounding these spaces in a circular arc will bring about an atmosphere of centripetalism and unity.

2) A floor plan with the floor spreading out like a fan from the teacher's stand to the back of the room is ideal for large-scale classrooms including the Auditorium, Large Classroom (200) and Medium Classroom (100). These groups of large fan-shaped facilities will comprise a part of the circular arc.

3) Part of the circular arc will be exposed in the general external appearance of the facilities. This will lead to a compact and human-scale design appropriate for a campus to be used mainly by female students.

(2) Elevation and Sectional Design

Elevation

- In order to prevent the sandstorms and blazing sun of Egypt from directly invading the rooms, the group of classrooms and the dormitory rooms are to be laid out so that their openings will open widely on to the courtyard. On the other hand, the openings on the walls around the circumference of the buildings are to be made as small as possible. Canopies and balconies will also be provided to prevent direct exposure to the sun. As a result, the external appearance of the building will have a strong elevation composition with high contrast between light and shadow.

Sectional Design

- The building shall consist of four stories to allow students to use the stairs for moving inside the building.

- The floor level of the ground floor is to be established at a level of 1.5 m above ground so that a relatively shallow excavation of the ground for the foundation will be sufficient, and also to shorten the time required for the construction of the underground work.

- For functional reasons, the classrooms and laboratories that accommodate a large number of students will need to have high ceilings and vast spaces. They should also match the existing facilities in nearby school buildings. Consequently, a relatively high floor height of 3.8 m for Educational/ Administration buildings and 3.0 m for the Student Dormitory will be adopted.

(3) Structural Design

- Basic Policies

  a. To design structures that are safe and durable.

  b. To design structures that conform to the local environment and site conditions.

  c. To adopt locally available materials and equipment and locally practiced methods wherever possible in order to create economical structures.

- Design Codes and Design Standards

  a. The "Code of Practice for the Use of Reinforced Concrete in Buildings" of the Egyptian Standard Specifications (ESS) shall be followed.

  b. For items that have no particular provisions in the above-mentioned standard, the design standard ACI-318-83 of the American Concrete Institute (A.C.I.) shall be followed.

- Materials to be Used

  Regarding the chief materials for structures, those that meet ESS and the standards of the American Society for Testing and Materials (ASTM) shall be used.

  a. Reinforcing Steel Bars
     Round steel (E.S.S.: Steel 37 or ASTM 615 Grade 40)
     Deformed steel bars (E.S.S.: Steel 52 or ASTM 615 Grade 60)

  b. Concrete
     28-day compressive stress Fc = 245 kg/cm (3,500 psi)
     fc = 80 kg/cm^2
     fs = 8 kg/cm^2

  c. Cement
     Regular portland cement ASTM C150 Type I

  d. Steel frame
     Steel 37
     ft = 1,400 kg/cm^2

  e. Pile
     Cast-in-place reinforced concrete pile (flight auger type)
     Diameter 60 - 80 cm , tip of pile: GL-15 m
     Bearing capacity: 100 t/pile for 600ø

  With reference to the ESS standard, the values given below were established as the allowable unit stress for each material:

- Design Loads

  The following load conditions shall be applied for the structural design:

  a. Fixed Load
     - Reinforced Concrete 2.5 t/m^3
     - Bricks 2.0 t/m^3
     - Steel 7.85 t/m^3
     - Mortar 1.9 t/m^3

  b. Live Load
     - Roof 150 kg/m^2
     - Individual Rooms

c. Wind Load

The equation given below shall be applied, following the standard in Egypt:

$Pw = C \cdot q$ where Pw : wind load (kg/m²) per unit area
C : wind pressure coefficient
q : standard velocity pressure (kg/m²)

The following values apply for standard velocity pressure:

Height from Ground (m)	Standard Velocity Pressure (kg/m²)
0~ 8	50
8~ 20	75
20~ 100	100

The wind pressure coefficient is as shown below:

- Windward walls 0.8 (positive pressure)
- Horizontal roof surface - 0.4 (negative pressure)
- Leeward walls - 0.4 (negative pressure)

- Outline of the Soil of the Site

The surface of the site is covered with river drift sediments, under which lie alluvial deposits and diluvial formations of sand. The current situation of the soil of the site was surveyed by means of three trial borings of 20 meter-deep holes within the site. The results uncovered the following soil conditions:

a. The soil from the ground surface down to 1 m - 3.5 m below G.L. consists of agricultural soil or fill-in soil.

b. Beneath that, from 10 - 13 m below GL, the soil consists of a clay or sand stratum with N value of 5 - 35.

c. Further downward, deeper than 10 - 13 m below GL, the soil is a dense sand stratum with N value exceeding 50 , which can serve as a supporting stratum for heavy buildings.

d. The underground water level is somewhere around 3.8 - 5 m below GL.

The results of the boring survey are given in the solumnar diagram at the end of this report.

- Outline of the Structural Design of the Building

The following structure shall be provided for creating the spaces required for the Project, following the Basic Policies outlined in Section 4 - 1.

a. A structure which provides brick walls within a RC column beam framework shall be adopted.

b. Columns and foundations that allow expansion of the facilities to the scale of 7 stories for school buildings and 10 stories for the dormitory shall be designed, as per the request of the Client.

c. The parking area in the semi-basement and the High Institute of Nursing area above it require structural span divisions of different dimensions. For this reason, the floor beam of Floor 1 which comes between these two areas shall be made particularly strong so that the load from the above can be transferred.

d. The roof of the hall has a large span and shall therefore be made of steel frame or prestressed concrete.

e. Expansion joints shall be installed at adequate intervals as countermeasures against thermal stress.

f. The foundation shall be of the flight auger type cast-in-place P.C. pile commonly used in Egypt.

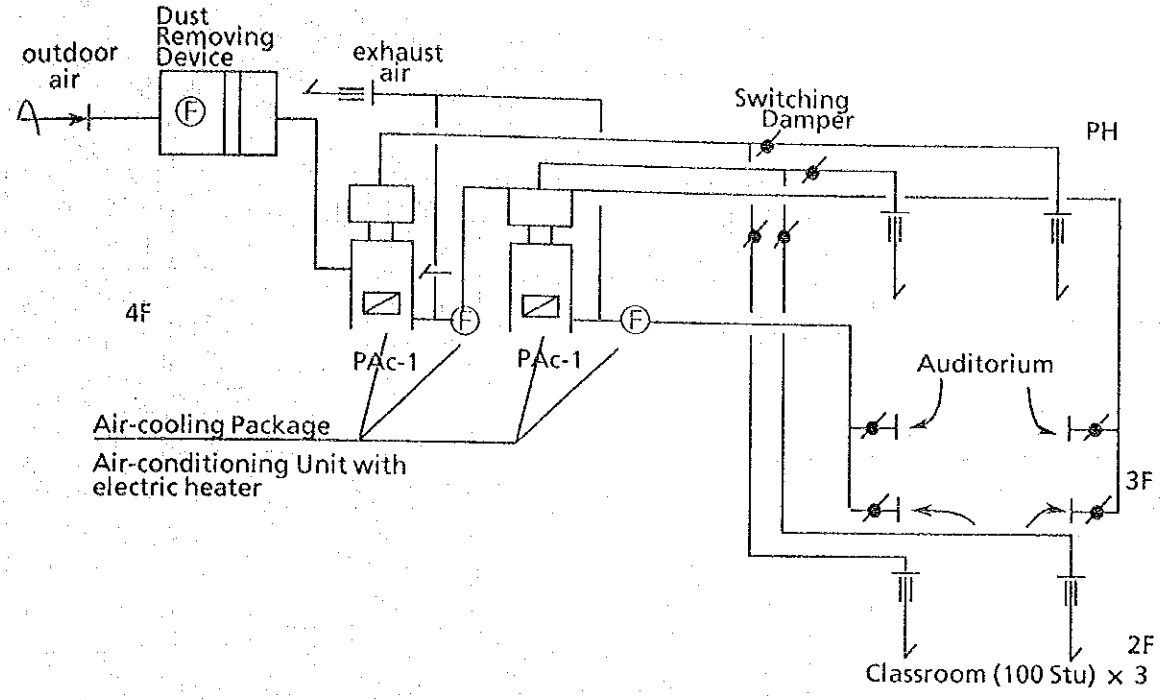
(4) Air Conditioning System Design

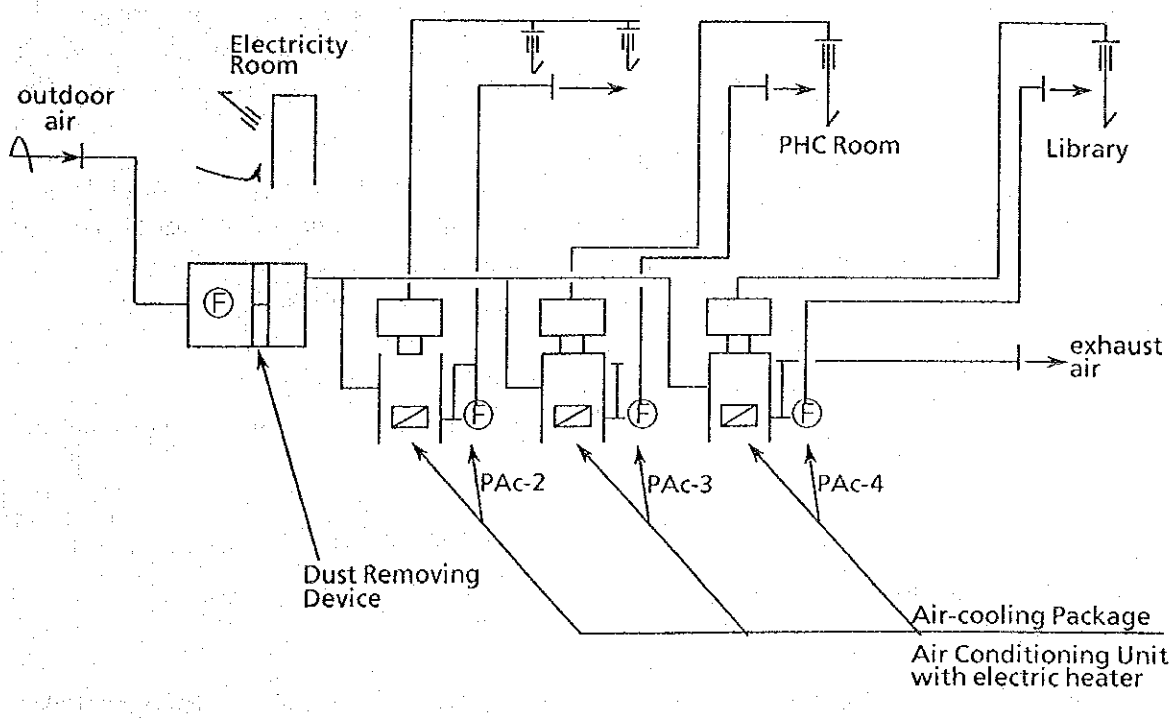
1) Heat Source System

Distributed installation type air-chilling package unit (incorporating an electric heater) or room-type air conditioning units (loading supporting heaters) shall be adopted as systems that ensure easy maintenance and management and also make local air conditioning possible. The following shows the estimated capacity required for each department (1 RT = 3.024 Kcal/H).

◦ Educational Dept.	:	approx.	55 RT
◦ Administration Dept.	:	approx.	40 RT
◦ Common Area	:	approx.	40 RT
◦ Student Dormitory	:	0	
Total		approx.	135 RT

• Air Conditioning Package System





Air Conditioning System

2) Air Conditioning System

a. Indoor Temperature/Humidity

	Summer		Winter	
	Temp.	Humid.	Temp.	Humid.
Skill Lab, PHC Room, Library, Auditorium	25 ± 2°C	no humidity control	25 ± 2°C	no humidity control
Other Rooms	26 ± 1°C	no humidity control	23 ± 2°C	no humidity control

b. Outdoor Air Conditions

	Summer	Winter
Temperature	37.8°C	3.4°C
Humidity	59%*	53%**

* The average humidity for July + 5% is adopted for summer.

** The average humidity for January -5% is adopted for winter.

c. Air Conditioning System

- Single-duct system of air-chilling package units shall be adopted for the Skill Lab., PHC Room, Library and Auditorium for cooling these facilities or heating and humidifying them with electric heaters. A switching damper device shall be added to the air-chilling package unit for the Auditorium to allow the unit to be used for cooling the medium-sized classrooms (120 m^2 × 3) when it is not being used for the Auditorium.
- Cooling and heating of the rooms in the Educational Dept., Administration Dept., etc., shall be conducted by room-type air Conditioning units and electric heaters.

d. Frequency of Ventilation

- Skill Lab., PHC Room about 10~15 times/H
- Other Rooms about 3~5 times/H or use natural ventilation

e. Intake of Fresh Air

- Skill Lab., PHC Room about 2~3 times/H
- Other Rooms Use natural ventilation as a rule

f. Air Conditioning Zone

Table A shows the zoning of the rooms that are to be cooled or heated.

3) Ventilation System

a. Ventilation Method

- The Electricity Room shall be ventilated with air supply fans and exhaust fans.
- Ventilation by exhaust fans shall be conducted for Equipment Storage, Toilets, Shower Rooms, etc.
- The general Classrooms, etc., shall adopt a combination of a mechanical system (consisting of air supply fans, exhaust fans and indoor ceiling propeller fans) and natural ventilation through the windows.
- The Kitchenette of the Student Dormitory, Cafeteria, Entrance Hall, etc., shall adopt air supply ventilation fans or ceiling propeller fans for ventilation.
- Table A gives the zoning of the rooms that are to be ventilated.

4) Countermeasures Against Sand

A dust removing device shall be installed in the air intake area of the air conditioning units for the Skill Lab. and PHC Room in order to increase the life span (no. of usable hours) and reduce the maintenance cost of the medium-quality filters. Cartridge-style dust-proof filters will be mounted on the air intake fans or air intake in the other rooms.

(5) Plumbing System Design

1) Water Supply System

The existing main line for water supply shall be used, and a floor-type water tank (net capacity: 92 m^3) will be installed in the Machine Room in the basement. The water will be pumped up with a water pump to the Elevated Water Tank (net capacity: 15 m^3) to be installed on the rooftop. Thereafter, the water will be supplied to the required locations, as well as to the drinking water chillers on each floor, by the gravity water supply method.

- Usage by Staffers 190 persons *1 × 100ℓ/person · day *2 = 19,000 ℓ/day
- Usage by all Students of High Institute of Nursing 1,000 persons *1 × 40ℓ/person · day *2 = 40,000
- Usage at the Student Dormitory 200 persons *1 × 150ℓ/person · day *2 = 30,000

Total 89,000
→90 m^3/day

*1 The figure that includes the anticipated increased number in the future based on the basic design survey for the Project has been adopted as the figure for the number of persons using water.

*2 The Japanese Standard is adopted for the amount of water used per person per day.

2) Hot Water Supply System

Electric-type water heaters that are relatively easy to use shall be installed for supplying hot water. Hot water for beverages will be supplied from the tank-style electric water heater (temperature of hot water provided: 95° C) in the Hot Water Supply Room and Cafeteria. Hot water for hand washing is to be supplied from the tank-style electric water heater (temperature of hot water provided: 45°C) installed in the Kitchenette, Cafeteria, Washing Rooms, etc. Hot water for the training rooms including the Skill Lab. and showers will be supplied from instantaneous water heaters.

3) Water Drainage System

An indoor combined sewerage (to be used both for waste water and miscellaneous water) shall be connected to the outdoor waste water tank by a gravity system. A forced drainage system will be adopted for the basement Parking Lot, etc. A separate pipe to be connected to the outdoor rainwater tank will be provided for rainwater. No wastewater treatment facilities such as water treatment tanks will be installed within the site.
As a rule, the small quantity of special waste water from the PHC Room, Skill Lab., etc., shall be drained into the general sewerage system after a dilution process. Separate collection by plastic buckets may be conducted as the occasion requires.

4) Sanitary Equipment Design

The following sanitary equipment that are both hygienic and easy to use shall be installed:

a. Toilets

Western style water closet, Turkish style water closet, wall-type urinals, hand washing stand, cleaning sinks, etc.

b. Shower Rooms

Fixed shower heads, combination faucet

c. Washing Room

Washing machine pans

d. Skill Lab. and other training rooms

Experiment water/waste water sinks

5) Kitchen Utensils, Washing Machine

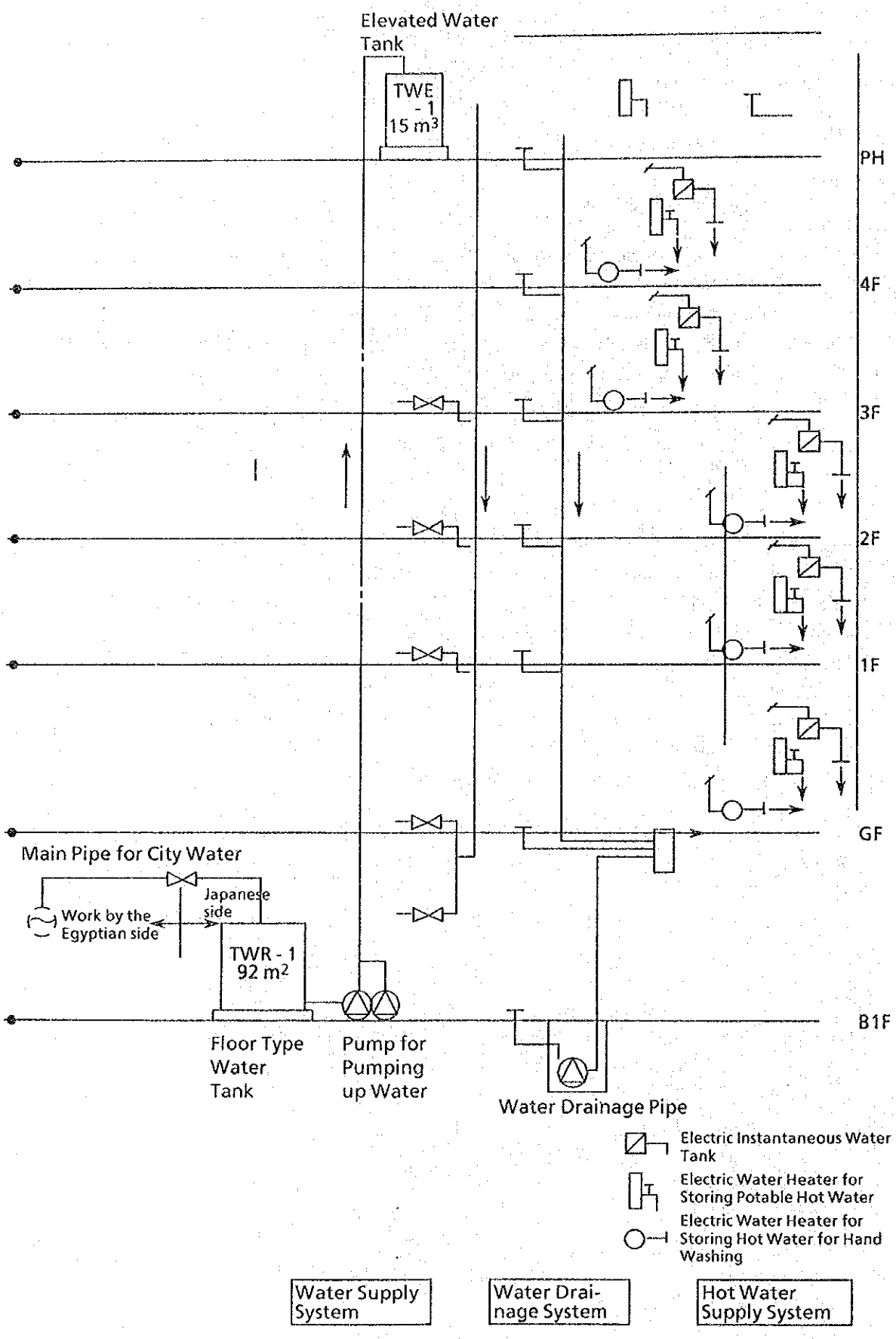
To provide basic installations.

6) Fire Fighting System

a. Indoor hydrant system conforming to the standard in Egypt shall be installed. The hydrants will be provided where necessary, and the hydrant pipes are to be located in the Machine Room of the basement. The concrete double-slab in the basement shall be utilized for providing the water sources.

b. Fires in the Electricity Room and Generator Room shall be fought with a fire extinguisher for exclusive use.

• Systems for Water Supply/Hot Water Supply/Water Drainage



Educational Dept.

Name of Room	V	A	C	H	W	D	HW	Remarks
Classroom (200 Stu.)	○				○	○		
Classroom (100 Stu.)	○	○						
Classroom (50 Stu.)	○							
Meeting Room (25)	○							
Seminar Room (25)	○							
Laboratories w/Bed		○			○	○		
Laboratories Utility		○			○	○	○	
Laboratories wo/Bed		○			○	○		
Anatomical Lab.			○	○	○	○		
Nursing Research Lab.			○	○				
Language Lab.			○	○				
Audio-visual Storage	○							
PHC Room (Primary Health Care Room)		○			○	○	○	
Library		○			○	○		
Changing Room	○							
Utility								
Toilets	○				○	○		

V: Ventilation D: Drainage A: Air Conditioning C: Cooling
HW: Hot Water H: Heating W: Water Supply

Administration Dept.

Name of Room	V	A	C	H	W	D	HW	Remarks
Director's Office	○		○	○				
Deputy Director's Office	○		○	○				
Secretary Room			○	○				
Academic Dept.			○	○				
Student Education			○	○				
High Studies Affair			○	○				
Student Care			○	○				
Financial Affairs			○	○				
Office Staff Room			○	○				
Exam Management Room			○	○				
Meeting Room			○	○				
Lounge for Teaching Staff			○	○				
Lounge for Office Staff			○	○				
Room for JICA Experts			○	○				
Printing Room	○				○	○		
Storage	○							
Utility	○				○	○	○	

V: Ventilation D: Drainage A: Air Conditioning C: Cooling
HW: Hot Water H: Heating W: Water Supply

Student Dormitory

Name of Room	V	A	C	H	W	D	HW	Remarks
Bedroom A (for 2)	○							
Bedroom B (for 4)	○							
Cafeteria	○				○	○		
Kitchen	○				○	○	○	
Lounge	○							
Washing Room for Students	○				○	○	○	
Washing Room	○				○	○	○	
Shower Room	○				○	○	○	
Toilets	○				○	○		
Utility	○				○	○	○	
Exit Hall								
Matron Room	○							

V: Ventilation D: Drainage A: Air Conditioning C: Cooling
HW: Hot Water H: Heating W: Water Supply

Common Dept.

Name of Room	V	A	C	H	W	D	HW	Remarks
Auditorium (500)		○						
Meeting Room (100)			○	○				
Meeting Room (50)			○	○				
Meeting Room (25)			○	○				
Exhibit Room	○							
Entrance Hall								
Cafeteria	○				○	○	○	

V: Ventilation D: Drainage A: Air Conditioning C: Cooling
HW: Hot Water H: Heating W: Water Supply

Basement Parking Area

Name of Room	V	A	C	H	W	D	HW	Remarks
Parking Lot	○				○	○		
Storage	○							

V: Ventilation D: Drainage A: Air Conditioning C: Cooling
HW: Hot Water H: Heating W: Water Supply