47p.

FINAL REPORT

BASIC HEALTH CENTERS
RURAL COMMUNITY HEALTH PROJECT
OF INTEGRATED SERVICES
IN SILIANA AND SIDI BOU ZID PROVINCES
TUNISIA

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I. PREFACE AND CONTRACT OBJECTIVES

The United States Agency for International Development (USAID) and the Government of Tunisia (GOT) are developing a project to restructure health care in two provinces in Central Tunisia. The overall project involves the program of integrating the health care services into one system, the retaining of personnel by expanding the roles of various health workers, and the facilities to house the newly integrated health care services. The objective of this contract was to advise and assist with the preparation of the designs for the new and renovated facilities in Siliana and Sidi Bou Zid provinces.

Working in conjunction with the appropriate officials in the Ministry of Health (MOH) and the Ministry of Equipment (MOE) and under the guidance of Robert Slusser or Wilbur Wallace of USAID/Tunis, the contractor was to:

A. Review the final report, which was prepared by the contractor in July of 1977, with the MOH and MOE officials, to ascertain areas of agreement or disagreement and to discuss any modifications necessary for a mutually acceptable "service profile"/architectural program for each type of basic health center -- for new and renovated facilities.

B. For the proposed new basic health centers the contractor was to:

1. Review, evaluate and comment on MOH designs for the different types of health centers in terms of function, layout, traffic pattern, equipment placement, lighting, ventilation and other factors influencing the efficient delivery of medical services;

2. Review, evaluate and comment on the MOH designs in terms of local materials, construction methods, contractor capabilities and cost effectiveness. Designs which maximize the utilization of local materials, construction methods and labor and are in keeping with local standards, traditions and culture are encouraged;

3. Advise and assist the MOH architect with the preparation of final preliminary drawings and outline specifications which will provide sufficient information for detailed cost estimates;

4. Advise and assist the MOH architect with the preparation of preliminary cost estimates and recommend areas where potential cost savings may be realized.

C. For the renovation of existing facilities, the contractor was to:

1. Review, evaluate and comment on available renovation plans in terms of increasing the functional effectiveness and efficiency of the medical facilities;

2. Review, evaluate and comment on designs and specifications for structural adequacy and recommend design modifications when deficiencies are noted;

3. Review cost estimates and recommend areas where potential cost savings may be realized.

NOTE: Item A was accomplished as stated. Items B and C need clarification. After reviewing the architectural program, it was determined that 5 types of facilities were appropriate. In addition, the MOH officially announced that these designs would be a standardized prototype, expandable in phases. For Item B, we actually generated the schematic design for the 5 new buildings governed by the constraints of a prototypical, standardized design. No schematic design work for the renovations had been accomplished prior to June 19. These findings were communicated to AID/Tunis shortly after the contractor's arrival.

II. INTRODUCTION

A. PROJECT SUMMARY, OVERVIEW AND BACKGROUND

The contractor began work on June 19, 1978, with Dr. Habib Rejeb, the MOH project director and Tahar Ghedira, the MOH architect. All of the contractor's activities were in conjunction with these two individuals. All of the work was executed in Tunis, 6 days/week, through 19 July 1978. In addition to Dr. Rejeb and Mr. Ghedira, the contractor met with the following people:

Dr. Ben Hamida, the Minister of Health
Mr. Raouf Pacha, MOH, Chief of the Cabinet
Dr. Taoufik Nacef, MOH, Director of Preventive Medicire
Dr. Amor Daly, Medical Director in Gafsaa
Mr. Mezri Chekir, Director of the National Office of Family Planning
Mr. Mongi Ghachem of the National Office of Family Planning
Mr. Hamed Achour, MOH, Director of Buildings and Equipment
Mr. Tahar Ben Youssef, MOH, Attaché for the Cabinet
Ms. Rafia Belhabib, MOH

Mr. Yassine Derbal, engineer with A.E.U.D. (Architecture, Engineering, Urban Design and Decoration) -- the consulting firm for the cost estimates
Various specialty engineers with A.E.U.D.
Wassim Ben Mahmoud, architect in Tunis

Mr. Herman S. Davis, Director, AID/Tunis
Mr. Herman Marshall, Deputy Director, AID/Tunis
Mr. Robert Slusser, Capital Development, AID/Tunis
Mr. Wilbur Wallace, Health and Family Planning, AID/Tunis
Mr. Charles Sadler, Program Director, AID/Tunis
Mr. Anwar Bach Baouab, AID/Tunis
Mr. Mohamed Ali Hessairi, AID/Tunis
Mr. John Neave, AID Regional Engineer
Ms. Joyce Jett, AID/Tunis
Dr. Oliver M.R. Harper, visiting consultant for AID/Tunis

During the first week (June 19 - 24) Dr. Rejeb, Mr. Ghedira and the contractor thoroughly reviewed the final report of July 1977, to ascertain the modifications and revisions to the architectural program or "service profiles". (These revisions are discussed in Sections III and IV of this report.) In addition, we reviewed and analyzed the MOH drawings prepared by Mr. Ghedira in February of 1978, to determine the assumptions underlying the designs. This was a vehicle for further identifying the revisions to the architectural program. Furthermore, a schedule of activities/tasks was prepared for the duration of the contractor's stay and for the facility development process for new construction and renovation design. The breakdown by weeks with accomplishments is as follows:

WEEK 1 (6/9 - 6/24)

- Review program of services.
- Review and revise architectural program.
- Review MOH drawings of February 1978.
- Determine assumptions for services, staffing, location, and resulting space requirements.
- Determine information available for renovation sites.
- Explore alternatives for the vast amount of architectural work to be accomplished.
- Determine process for cost estimations.

WEEK 2 (6/25 - 7/1)

- Begin preparation of schematics ("esquisse") for the 5 new types of basic health centers. (Designs are standardized, prototypical, expandable.)
- Review and revise schematics.
- Prepare details and critical layout sketches.
- Selection process begins to determine the consulting engineering firm for the cost estimates.

WEEK 3 (7/3 - 7/8)

- Continue schematic design for 5 new buildings, lodging, typical site plan.
- Prepare cost estimate by dinar/square meter for preliminary schematics.
- Prioritize renovations by complexity of design and criticality of health care needs of particular sites.
- Review schematics with consulting engineering firm, assist as required in preparation of information and assumptions for cost estimates.
- Present preliminary assumptions for each section of work so engineering firm can prepare a cost estimate by major categories of construction.

WEEK 4 (7/10 - 7/15)

- Continue schematic design work.
- Continue collaboration with engineering firm.
- Begin schematics on renovation design where sufficient information exists on prioritized sites (2 accomplished).
- Review schematics with MOH officials.

WEEK 5 (7/17 - 7/19)

- Final cost estimates for schematics for new construction.
- Final review and approval of schematic design with MOH.
- Explore information packet/brochure (other than construction documents) that succinctly describes the program of integrated

health services, summarizes the architectural program, defines assumptions behind the designs, shows typical layout of furniture and equipment, patient flow, etc.
- Assess situation and list problems and activities to expedite the facility development process for new construction and renovation design for the basic health centers.

B. FACILITY DEVELOPMENT PROCESS TO DATE

Although the definition of the facility development process is beyond the scope of this contract, it is a significant issue and warrants some discussion. Dr. Rejeb indicated that the MOH has determined the general process for the development of the new and renovated facilities to essentially be that process recommended on pages 12 - 14 of the July 1977 final report. An outline only of the actual process is submitted below. Critical dates and specific future activities and decision points should be determined for the entire project. (Items with an * have already been accomplished. "?" means date unknown.)

JUNE '77 - ? '78 — PLANNING AND PROGRAMMING

- Loan confirmed *
- MOH designation of project coordinator *
- Final review of exact location of sites *
- Obtain clear title, topographic data, plat plans on all sites (in-process)
- Measure existing facilities for renovations and obtain sufficient data for preparation of renovation designs (partially complete)
- Obtain drawings of existing PMIs that may be included in renovation work
- Revise and finalize architectural program *
- Preliminary analysis for renovations *
- Determine consulting engineering firm to prepare cost estimates *
- Determine responsibilities of MOH architect and of alternative architectural and engineering resources being explored by the MOH.

JULY '78 - ? '78 — "ESQUISSE" SCHEMATIC DESIGN PHASE

NEW CONSTRUCTION:

- Prepare schematic design for 5 types of new facilities *
- Prepare cost estimates for new construction *
- Review and approval of schematics at MOH *

RENOVATIONS:

- Prepare schematic design for renovations
- Prepare cost estimates
- Review and approval of schematics for renovations at MOH

JULY '78 - ? '78 — "AVANT PROJECT" DESIGN DEVELOPMENT PHASE

NEW CONSTRUCTION: (4 weeks?)

- Approved schematics developed in greater detail (partially complete)
- Outline specifications prepared by engineers *
- Cost estimate by category of construction for each type of facility, with contingency and escalation rate *
- Design development reviewed and approved at MOH
- Revised cost estimates reviewed and approved

RENOVATIONS:

- Same as for new construction; time component different than for new

EQUIPMENT:

- Lists finalized and cost estimates prepared

AUGUST '78 - ? '78 — "DOSSIER D'APPEL D'OFFRES" CONSTRUCTION DOCUMENTS

NEW CONSTRUCTION: (8 - 10 weeks?)

- Working drawings, specifications, detailed cost estimate, contingency, escalation rate, legal documents, notice - to - bidders prepared, reviewed and approved -- by whom? MOH, MOE, AID?

RENOVATIONS:

- Same process as for new construction

? - ? — BIDS AND NEGOTIATIONS

- To be done at the provincial level
- Determine fixed amounts of construction for each project

? - ? — CONSTRUCTION PHASE

- Monitor and inspect construction

? — OCCUPANCY OF BUILDING

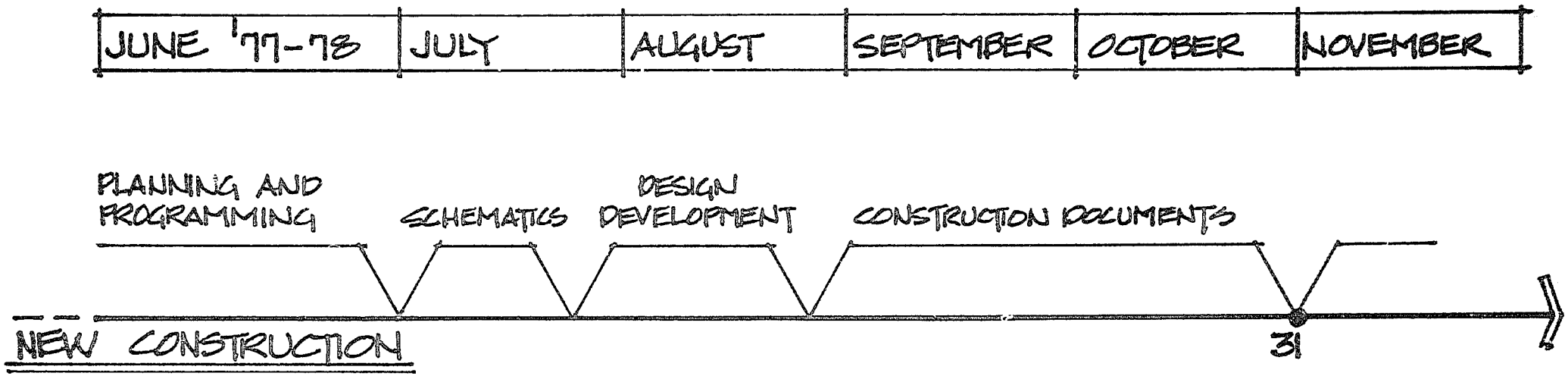
- Educate staff
- Educate community

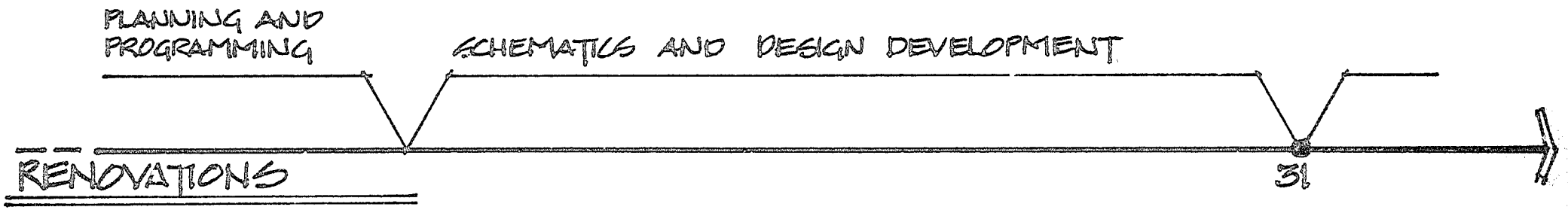
? - ? EVALUATION OF FACILITIES

- Critical to perform a post-occupancy evaluation of the new basic health centers.

It is recommended that the MOH project coordinator and the architects/engineers set up a time line for those phases of the facility development process that will occur in Tunis and in the provinces once construction documents are approved. This time line is illustrated on the following page. In addition, it is recommended that a time line be developed for coordinating the entire project -- the retraining of personnel, purchasing equipment, facility development, and all of the critical decision points, reporting deadlines, etc., to insure that when the building is accepted as ready for occupancy, the staff is there, the equipment and furnishings are in place and health care can be delivered as planned.

The referenced time line assumes that sufficient architectural resources can be committed to the project immediately. As previously stated, the MOH is actively exploring options/alternatives for the remaining portion of the work; i.e., essentially all of the renovation design work and for the new buildings, design development through construction documents.





FACILITY DEVELOPMENT PROCESS

III. INTEGRATED HEALTH CARE DELIVERY SYSTEM

A. SUMMARY OF GENERAL PROGRAM

The goal of the government of Tunisia's policy of integration is to improve access into and the efficiency of the rural health care delivery system initially for the people of Siliana and Sidi Bou Zid provinces and eventually for all peoples of the country.

The curative and preventive services that are being integrated into one system include:

1. adult routine basic clinical care for minor illness, chronic illness, minor trauma and emergency first aid, stabilization of major trauma;
2. pediatric routine basic clinical care as indicated in Item 1 above;
3. prenatal, labor and delivery, postnatal care, and routine gynecology;
4. family planning;
5. nutrition and health education;
6. immunizations/vaccinations;
7. environmental education;
8. malaria screening;
9. water supply testing;
10. inspection of public and commercial places; and,
11. dog control.

NOTE: The general program elements were reviewed with Dr. Rejeb. No changes in these elements are noted.

B. PROGRAM FOR REVISED FACILITIES

The above mentioned services are to be provided on an out-reach basis as well as in the new basic health centers ("Centres de Sante de Base"). Integrated services will be delivered at:

1. the community level in homes, schools, commercial and public places;

2. the basic health centers [1]

   a. Types A1, A2 and A3 are the outpatient, integrated services components of the package. The differences are the size of the population/service area and the presences of no physician, an itinerant physician or a full-time physician.

      (1) Type A1 will provide basic medical and preventative care to a population of up to 2,500 people. Type A1 can expand to an A2 only. No physician visits are assumed initially.

      (2) Type A2 will provide the same services as A1 and will serve a population of 2,500 - 5,000. Type A2 can expand to either an A3 to increase its service capacity as the population increases or can add a maternity component and expand to a Type B. Regular physician visits are assumed at Type B -- along with a full-time midwife.

      (3) Type A3 will serve a population of 5,000 - 10,000. It can expand into a Type C by adding the maternity component as well as 7 - 9 inpatient general medicine beds as the population increases and should the need and demand occur. It assumes a full-time physician. (No Type A3 facilities are planned for this project.)

   b. Type B has both the outpatient component of an A2 plus the inpatient maternity component. Type B facilities will serve a population of 5 - 10,000. Services will include the basic integrated services of Type A2 plus maternity (7 beds) and family planning services. Type B expands into a Type C. Type B assumes a full-time midwife on staff as well as regular physician visits.

   c. Type C centers are to serve a population that exceeds 10,000. These centers assume the presence of a full-time physician and will provide extensive outpatient services (Type A3 capacity [2]) as well as maternity and short stay general medical

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1 Last year 3 types of basic health centers were proposed; currently, the revisions have resulted in 5 types. See Section IV for a summary description of staffing, services and architectural program data.

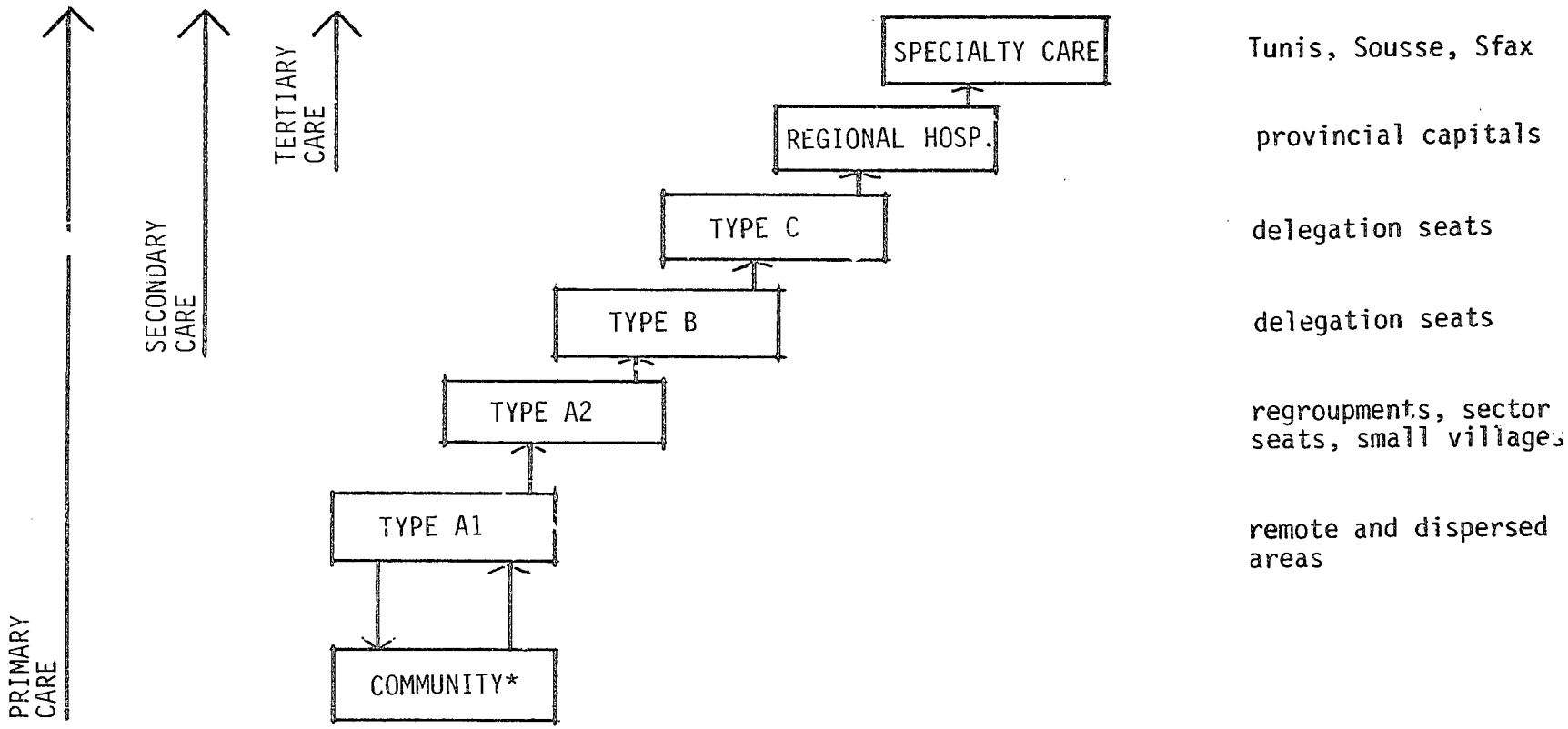
2 With a population of 7 - 9,000 the outpatient component of the A2 can be used in combination with the maternity and the small hospital.

inpatient care for adults and children. Space should be provided in Phase I for expanded laboratory and future X-ray.

3. The regional rural hospitals are existing facilities in the provincial capitals. The program of integrated servic. is the same as for Type C basic health center, plus radiology, expanded laboratory, library, classroom and office space for the training/ recycling of existing workers, continuing education for the medical personnel and an expanded outpatient and inpatient capacity.

In summary, the levels of care for the integrated services referral network within the system are illustrated in the following diagram:

C. REFERRAL NETWORK OF THE SYSTEM



* Community-based, integrated health services include comprehensive curative, preventative, educational services and, for example, routine dental care and mental health services.

D. LOCATION BY TOWN OR SECTOR AND FACILITY TYPE

NEW CONSTRUCTION	SILIANA	SIDI BOU ZID
(5) Type C	El Krib Rohia	Jelma Ouled Haffouz Mezzaouna
(1) Type B	Robaa	---
(3) Type A2	---	Zafria Es Saida Bir El Amama
(13) Type A1	Juma Ed Dkhania Sadiane Es Smirat M' Sahia El Haria	El Kerma Loussada Zitouna El Hania El Mansourah Hachana (El Milia) El Hameima
RENOVATION &/OR EXPANSION		
(2) Regional Hospital	Siliana	Sidi Bou Zid
(6) Type C	Makthar Bou Arada Gaafour	Maknassay Regueb Sidi Ali Ben Aoun
(1) Type B	---	Menzel Bouzaine
(2) Type A2	Sidi Bou Rouis Kesra	---
(7) Type A1	El Jmilet Sidi Mor Ched Bou Jlida El Arousa	El Mech Bouttoument M'Ghilla

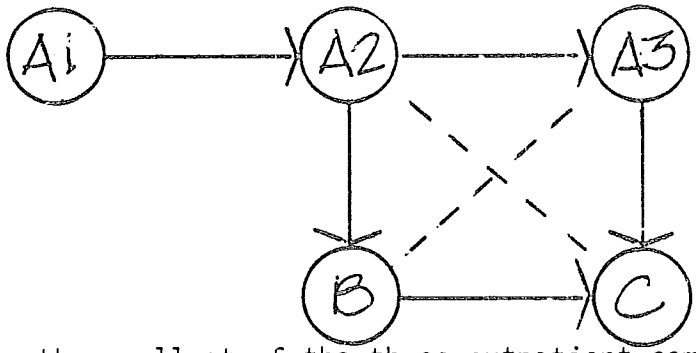
IV. REVISED ARCHITECTURAL PROGRAM DATA [1]

A. INTRODUCTION AND MODIFICATIONS

Upon arrival Dr. Rejeb, architect Ghedira and the contractor thoroughly reviewed and revised the architectural program data to reflect the priorities and policies of the MOH. Several modifications to the preliminary architectural program resulted. These include:

1. The design of a standardized, prototypical, expandable package as per official announcement by the Minister of Health; this policy meant we really began a new design process.

2. This "package" includes 5 rather than 4 buildings -- Types A1, A2, A3, B and C. They are related conceptually in the following way:



Type A1 is the smallest of the three outpatient components. It can only expand to a A2 by increasing its exam and education capacity. Type A2 can expand in 3 ways: (1) by increasing its outpatient capacity and becoming a Type A3, (2) by maintaining the outpatient capacity and adding a maternity component, Type B, and (3) by adding only the inpatient components. Type B becomes a Type C by increasing both the outpatient component (A3 capacity) and adding a short stay hospital capacity for general medicine patients. Type C expansion is given direction but is not programmed.

3. Lodging/apartment(s) to be provided at all types. The lodging should be an expandable design; i.e., the basic core unit (studio apartment with kitchenette and bath) for the nurse at A1/A2 can become a 1 bedroom apartment for the midwife at B or a 2 or 3 bedroom unit -- for a physician and his family at Type C/A3.

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1 The reader is referred to Section V of the July 1977, Final Report for the preliminary architectural program data.

The Minister of Health indicated that Types A should be outpatient and B and C include some inpatient capacity. These are a reverse labelling as indicated in the July 1977, Final Report.

4. No Type A3 facilities will be built under this immediate project. It was decided, however, that it should be part of the "package".

5. In the Types A1 and A2 (and therefore B) centers, there is no need for separate entrances for men and women, no need for distinctly separate waiting rooms. The potential for subdividing the waiting room was decided. Dr. Rejeb indicated that visits for each sex will probably be scheduled in blocks of time; for example, children and women in the morning, men in the afternoon.

6. The medical records system will be family-oriented, stored on open shelves in the reception area. These shelves are to be built-in and should be divided into 20cm bins. The shelves should hold files that are 25cm x 35cm.

7. The location of the waiting area has been changed. It should be in direct proximity to the exam/consultation area; i.e., visible from and direct access to the exam rooms. Movable partitions/screens can be used to subdivide the large space if necessary. Significant discussion occurred over the waiting room. The advantages of maintaining one large space and using movable partitions are:

   a. difficult for nurse to monitor patients if floor-to-ceiling walls are used,

   b. multi-use of space for large group education is limited considerably,

   c. with continuous services, more potential for scheduling activities, and

   d. the psychological effect of crowding in small rooms is undesirable.

8. All types of facilities are to have the following modifications:

   a. a "salle de soins" that will function in the traditional way -- first aid, dressing changes, injections/vaccinations, return visits. Patients coming to the "soins" do not go through the normal registration process. They are given a card with their return visit(s) schedule. These are checked off and later entered into the medical record. The "soins" should have its own door to the outside to avoid crowding in the general waiting area and should be accessible from within the building for staff.

   b. lodging as described in Item 3 above.

   c. built-in local storage along with central storage.

d. pharmacy area/room that is directly accessible from the outside via a "pass-through" window.

e. except for A1 where education for large groups will occur in the waiting room and for small groups, demonstrations will be in the "soins", all types (A2, A3, B and C) shall have a large education room with a demonstration counter.

f. a counter where mothers can change babies' diapers in the vicinity of toilets.

g. a place for infant and adult scales in proximity to exam rooms.

h. change rooms for each exam/consult room for patient to disrobe.

i. office for outreach worker: in A1 this office is a future exam room; in A2, A3, B, C, this office shall have its own door directly to the outside.

j. covered outdoor seating.

9. Support services (kitchen, laundry, bulk storage) will be shared by the maternity and hospital components -- Types B and C.

10. Registration shall be at separate places for inpatients and outpatients. Separate entrances for inpatients and outpatients shall be provided.

11. Future services currently not in the program but are related to community based health care are,for example, dental and mental health. Consider where these might go in the designs -- Type A3.*

12. Type C facility should have:

a. emergency/minor trauma room with provisions for suturing and the setting of simple fractures;

b. place for future X-ray;

c. 1 single bedroom for the isolation of a male or female patient;

d. 7 - 11 maternity beds plus 7 - 9 general medicine beds, without additional construction. This range of expansion is designed into the Type C;

e. an office for the administrator;

f. no patient lounges because of short average length of stay;

g. nurse control area with bed for staff nurse.

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* See Appendix II for example schematic.

13. Water is a big problem in the remote areas of Siliana and Sidi Bou Zid. All facilities will have at least a gravity fed water source, a roof top reservoir, as appropriate.

14. No central heating will be provided in Types A1, A2 and A3. Only the inpatient bedrooms will have central heating in Types B and C. The question remains How to heat the examination rooms?

15. Telephone will be provided in Types B and C.

16. Staff toilet(s) should be provided in all centers as appropriate.

17. In A1 and A2, a "mini" lab and pharmacy are distinct zones but are included in the registration area.

B. ASSUMPTIONS FOR FACILITIES

A principle goal of architectural programming is to gather enough information about the activities and functions of the people who deliver health care and those who receive the services so that the facility can be appropriate to the purposes of the program. Facility design is based on assumptions. The following charts demonstrate the essential assumptions underlying the design requirements for the 5 new types of basic health centers. These data along with the revised architectural program are the basis for the design package.

ASSUMPTIONS

TYPES OF BASIC HEALTH CENTERS

	A1	A2	A3	B	C
1. Population Served:	Under 2,500	2,500 - 5,000	5,000 - 10,000	5,000 - 10,000	over 10,000
2. Assumed Locations:	Dispersed regroupments	Sector seats	Delegation seats	Delegation seats	Delegation seats
3. Assumed Provider Staffing: (minimum - future)					
Physician	0 - 1/4	1/4 - 1/2	1 - 2	1/4 - 1/2	1 - 2
Midwife (recycled)	1/4 - 1/2	1/4 - 1/2	1/2 - 1	1 - 1	1 - 2
Nurse (recycled)	1 - 2	1 - 2	2 - 4	1 - 2	3 - 6
Outreach (recycled)	0 - 1/4	1/4 - 1/2	1/2 - 1	1/2 - 1	1 - 2
4. Assumed Support Staffing:					
Clinical aid/assistant	--	--	1 - 1	--	?
Midwife assistant	--	--		1 - 1	1 - 2
Laboratory technician	--	--	1/2 - 1	--	1/2 - 1
X-ray technician	--	--	--	--	1/2 - 1
Pharmacy clerk	--	--	1/2 - 1	--	1/2 - 1
Reception/clerk	--	--	1/2 - 1	0 - 1/2	1/2 - 1
Administrator	--	--	0 - 1/2	--	1/2 - 1
Administrative clerk	--	--	0 - 1/2	--	1/2 - 1
Custodian/laundry	--	--	1/2	1/2 - 1	1/2 - 1
Cook	--	--	--	1/2 - 1	1 - 1
Cook helper	--	--	--	0 - 1/2	1/2 - 1
Ambulance driver	--	--	--	--	1 - 1

ASSUMPTIONS
continued

	A1	A2	A3	B	C
5. Integrated out and inpatient, and outreach services:					
Home and school health	X	X	X	X	X
Commercial and public inspection	X	X	X	X	X
Minor illness adults and	X	X	X	X	X
Chronic care children	X	X	X	X	X
Minor trauma	X	X	X	X	X
Stabilize major trauma	X	X	X	X	X
Emergency first aid	X	X	X	X	X
Family planning	X	X	X	X	X
Nutrition education	X	X	X	X	X
Health education	X	X	X	X	X
Environmental education	X	X	X	X	X
Pre-post natal care	?	?	X	X	X
Pharmacy and medications	X	X	X	X	X
Pediatric care	X	X	X	X	X
Set simple fractures	--	--	X	--	X
X-ray	--	--	--	--	?
Normal labor and delivery	--	--	--	X	X
Gynecology	X	X	X	X	X
Outpatient surgery	--	--	--	--	X
Laboratory	?	?	X	X	X
6. Expansion:	A1 ⟶ A2	A2 ⟶ A3 A2 ⟶ B A2 ⟶ a mini C	A3 ⟶ C	B ⟶ C	C - undefined programmatically

C. SUMMARY OF FUNCTIONAL SPACE REQUIREMENTS

1. OUTPATIENT COMPONENTS	net area	OUTPATIENT (OP) A1	OUTPATIENT (OP) A2	OUTPATIENT (OP) A3	OP of A2 + MATERNITY B	OP of A3 + MATERNITY & HOSPITALIZATION C
primary entry	6 m2	1	1	2	1	2
registration with medical records, pharmacy, mini-lab combined	21 m2	1	1	--	1	--
registration with medical records	21 m2	--	--	1	--	1
pharmacy	9	--	--	1	--	1
laboratory with sterilization	6 m2	--	--	1	--	1
waiting	30 m2	1	1	2	1	2
education in waiting. .	--	1	--	--	--	--
separate education . .	24 m2	--	1	1	1	1
exam-consult	12 m2	1	2	4	2	4
dressing	2 m2	1	2	4	2	4
gynecology exam (future scales rm.) .	9 m2	1	--	--	--	--
infant & adult scales room & dressing . . .	9 m2	--	1	2	1	2
minor trauma	16 m2	--	1	1	1	1
"soins" (1st aid, shots, return visits) . . .	16 m2	1	1	2	1	2
outreach office	12 m2	1	1	1	1	1
general storage	12 m2	1	1	2	1	2

FUNCTIONAL SPACE REQUIREMENTS, cont.

	net area	OUTPATIENT (OP) A1	OUTPATIENT (OP) A2	OUTPATIENT (OP) A3	OP of A2 + MATERNITY B	OP of A3 + MATERNITY & HOSPITALIZATION C
1. OUTPATIENT COMPONENTS, cont.						
staff lounge with toilets & kitchenette	18	--	--	1	--	1
patient toilets	6 m2	1	1	2	1	2
staff toilet	2 m2	1	1	--	1	--
staff/service entry . .	--	1	1	1	1	1
2. RESIDENCE/LODGING						
studio apt. with kitchen & bath	55 m2	1	1	--	--	--
1 bedroom apt	60 m2	--	?	--	1	--
2 bedroom apt.	65 m2	--	--	1	--	1

FUNCTIONAL SPACE REQUIREMENTS, cont.

2. INPATIENT COMPONENTS

	net area	OUTPATIENT			INPATIENT	
		A1	A2	A3	B	C
primary entry (mat. & hosp.)	8 m2	--	--	--	1	1
registration (mat. & hosp.)	9	--	--	--	1	1
hospital records	6	--	--	--	1	1
sub-waiting (mat.)	15	--	--	--	1	1
nurse control with pharmacy & staff bed	12	--	--	--	1	2
family planning	16	--	--	--	1	1
laboratory	12	--	--	--	1	1
sterilization	9	--	--	--	1	1
labor with toilet	15	--	--	--	1	1
delivery with storage.	15	--	--	--	1	1
4-bed maternity patient room .	36	--	--	--	1	2
3-bed maternity patient room .	32	--	--	--	1	1
maternity bath - 2 t., shower, tub, baby care counter with sinks	25	--	--	--	1	1
male patient room - 3-4 beds .	27	--	--	--	--	1
female patient room,3-4 beds .	27	--	--	--	--	1
isolation room	12	--	--	--	--	1
patient toilet, with shower, 2 sinks. (male and female) . .	8	--	--	--	--	2
administrator	12	--	--	--	--	1
laundry with storage	20	--	--	--	1	1
kitchen with storage	25	--	--	--	1	1
clean linen	6	--	--	--	1	1
utility	4	--	--	--	1	1

FUNCTIONAL SPACE REQUIREMENTS, cont.

2. INPATIENT COMPONENTS, cont.

	net area	OUTPATIENT A1	OUTPATIENT A2	OUTPATIENT A3	INPATIENT B	INPATIENT C
staff toilet with shower, sink, lockers	8	--	--	--	1	1
general storage	±12	-	--	--	3	4
future x-ray	24	--	--	--	--	1
service entry	--	--	--	--	1	1

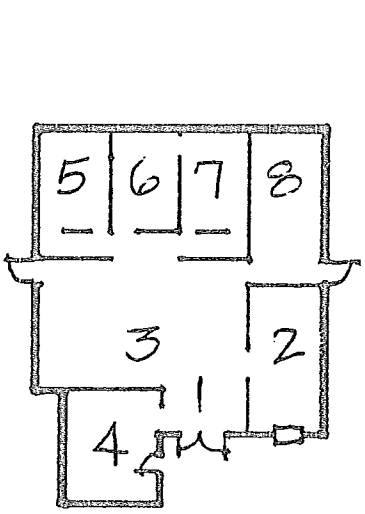
D. PRELIMINARY SUMMARY (July 3, 1978)

TOTAL SQUARE METER REQUIREMENTS
BY TYPE OF BASIC HEALTH CENTER

TYPES	A1	A2	A3	B	C
OUTPATIENT ONLY					
net m2	128	192	320		
40% of net	51	77	128		
gross m2	179	269	448	--	--
OUTPATIENT & INPATIENT					
net m2				501	807
50% of net				251	404
gross m2	--	--	--	752	1211
RESIDENCE					
gross m2	50	50	60	55	60

OUTPATIENT SERVICES ONLY

1 PATIENT ENTRY
2 REGISTRATION, MEDICAL RECORDS, PHARMACY, MINI-LAB
3 WAITING
4 "SOINS" WITH STERILIZATION
5 OUTREACH OFFICE (FUTURE EXAM)
6 GYN EXAM (FUTURE SCALES AND CHANGE AREA)
7 EXAM - CONSULT WITH CHANGE AREA
8. TOILETS: M, F, STAFF
9 LODGING FOR NURSE



179 m2

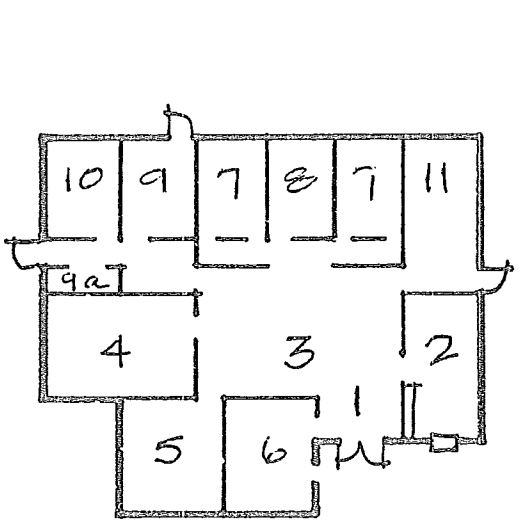
0 5 10 15
METERS

PATIENT ENTRY

A1

SCHEMATIC DIAGRAM

1 PATIENT ENTRY
2 REGISTRATION, MEDICAL RECORDS, PHARMACY, MINI-LAB
3 WAITING
4 EDUCATION
5 MINOR TRAUMA
6 "SOINS" + STERILIZATION
7 EXAM - CONSULT WITH CHANGE AREA
8 SCALES + CHANGE AREA
9 OUTREACH OFFICE
9a OUTREACH STORAGE
10 GENERAL STORAGE
11 2. PATIENT TOILETS
1 STAFF TOILET
12 LODGING FOR NURSE



269 m2

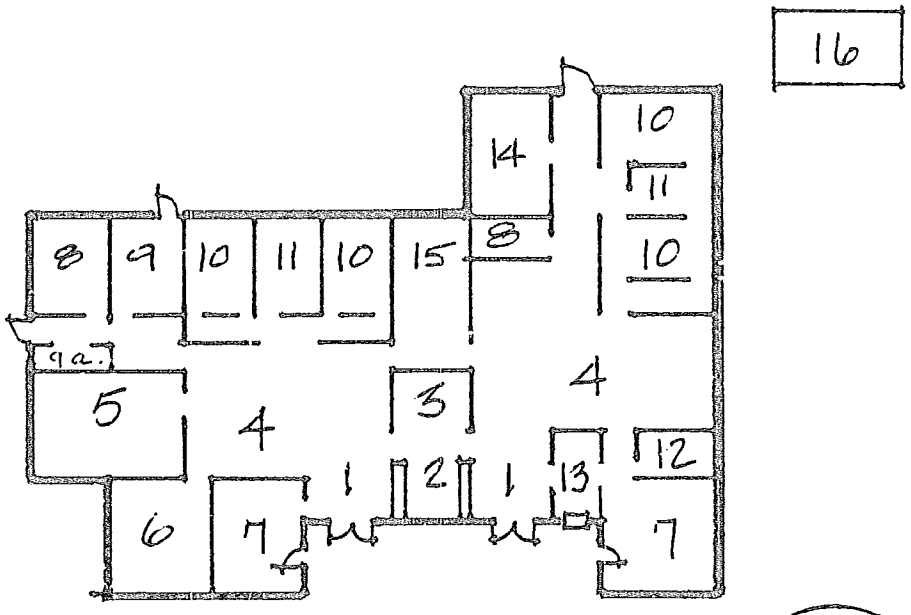
0 5 10 15 METERS

PATIENT ENTRY

A2

SCHEMATIC DIAGRAM

1 PATIENT ENTRY (M & F)
2 REGISTRATION
3 MEDICAL RECORDS
4 GENERAL WAITING
5 EDUCATION
6 MINOR TRAUMA
7 "SOINS"
8 STORAGE
9 OUTREACH OFFICE
9.a OUTREACH STORAGE
10 EXAM-CONSULT. + CHANGE AREA
11. PATIENT SCALES + CHANGE AREA
12. STERILIZATION
13 PHARMACY
14 STAFF LOUNGE + TOILETS
15 PATIENT TOILETS
16 LODGING FOR PHYSICIAN



448 m2

0 5 10 15
METERS

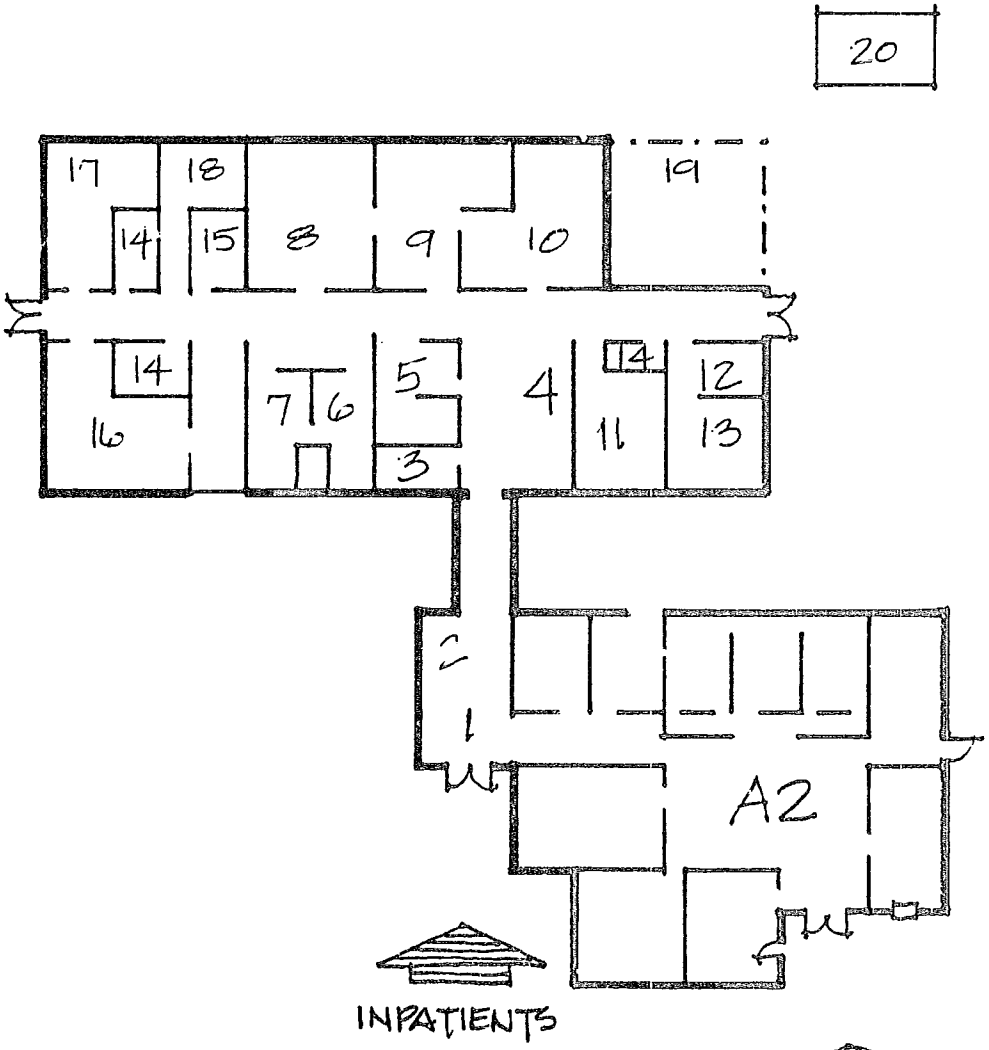
PATIENT ENTRY

A3

SCHEMATIC DIAGRAM

A2 OUTPATIENT + MATERNITY

1	MATERNITY ENTRY	12	STERILIZATION
2	REGISTRATION	13	LABORATORY
3	MED. RECORDS STORAGE	14	STORAGE
4	SUB-WAITING	15	CLEAN LINEN
5	NURSE CONTROL	16	KITCHEN
6	LABOR & TOILET	17	LAUNDRY
7	DELIVERY	18	STAFF TOILET + LOCKERS
8	PATIENT ROOM - 4 BEDS	19	FUTURE PATIENT ROOM - 4 BEDS
9	TOILETS + BATH + BABY CARE		
10	PATIENT ROOM - 3 BEDS	20	LODGING - MIDWIFE
11	FAMILY PLANNING		



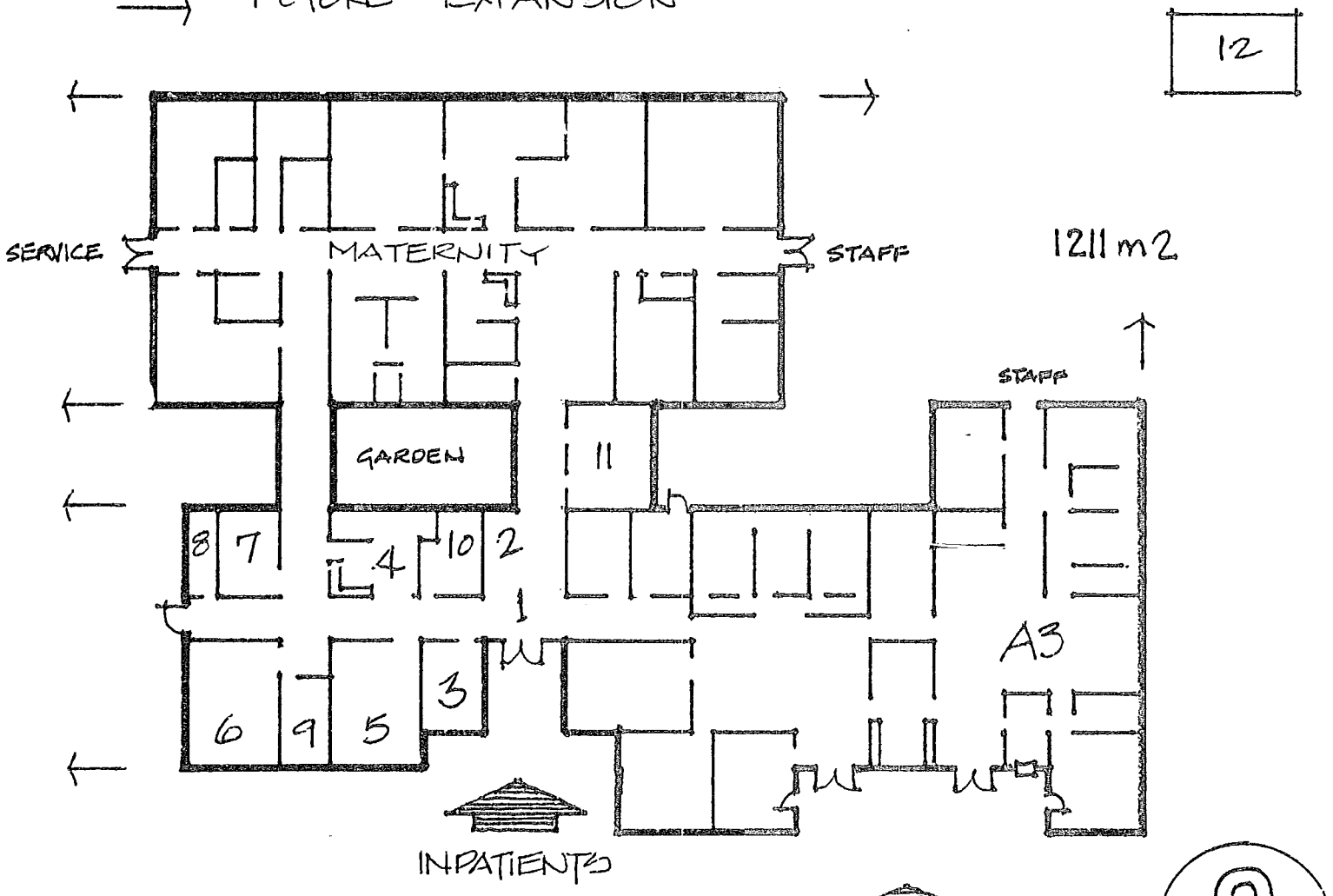
752 m2

B

SCHEMATIC DIAGRAM

A3 OUTPATIENT + MATERNITY + HOSPITALIZATION

1 ENTRY (SAME AS FOR MATERNITY)
2 REGISTRATION "
3 ADMINISTRATOR
4 NURSE CONTROL
5 PATIENT ROOM · 3-4 BEDS · (F)
6 PATIENT ROOM · 3-4 BEDS · (M)
7 PATIENT ROOM · 1 BED (M/F)
8 STORAGE
9 TOILET + SHOWER (M)
10 TOILET + SHOWER (F)
11 FUTURE X-RAY
12 LODGING FOR PHYSICIAN
COVERED AMBULANCE PARK
→ FUTURE EXPANSION



C

SCHEMATIC DIAGRAM

V. CONSTRUCTION COST ESTIMATES

A. BACKGROUND, MATERIALS, ASSUMPTIONS

In recent months the construction industry has experienced decreased activity. GOT officials, local architects and engineers indicate that the slump has resulted in lower costs per square meter of construction. Opinion varies as to whether the decline in construction costs has bottomed-out or not; there was concurrence that in the preliminary estimates, the following costs/m2 should be used: Types B and C, 120 DT/m2; Types A1, A2, A3, 100 DT/m2; lodging, 100 DT/m2.

Materials were discussed with the consulting engineers ("bureau d'etudes")--in particular the local construction techniques using stone or brick. The advantages of brick far outweighed those for stone:

- o Greater flexibility for expansion;
- o Cross-sectional thickness is less in dimension, better in performance;
- o Stone is not always cheaper;
- o Brick construction is more rapid;
- o Stone construction is difficult to control for quality of work;
- o Stone construction has problems with dampness (homogeneous, continuous materials);
- o Brick cavity wall with air space behaves much better;
- o Brick is a module, stone is not, problems in dimensioning building during construction.

Assumptions the engineering firm used in the detailed cost estimates include:

- o Brick cavity wall with air space;
- o Central heating in patient rooms;
- o Inclusion of built-in counters and storage in rooms;
- o Site preparation not included;
- o No fixed or movable medical equipment included;
- o All types will have a water source for plumbing;
- o Lodging costs estimated for 60 m2.
- o No exterior lighting, fences, perimeter walls, walkways, driveway, parking is included at this point;

- o Hook-ups to electrical assumed to be proximal to site;
- o Calculations for structure assumed a deeper piling than may be necessary -- 3 m, rather than 2 m deep;
- o Insulation (cork) in all roofs;
- o Shutters for all windows;
- o Simple, straight-forward materials, finishes, etc., appropriate for construction in and use in a rural setting.

B. COST ESTIMATES FOR NEW CONSTRUCTION

The following preliminary cost estimates were prepared by the contractor after preliminary schematics had been developed (July 11, 1978). The recommended dinar/square meter figures were used. (Note: the gross square meter areas are slightly different than those figures developed in the preliminary space requirements on page 23 of this report.)

1. Preliminary Estimates: Dinar/Square Meter (7/11/78)

TYPE A1	172 m2 x 100 DT/m2	=	17,200			41,280 *
	contingency 10%		1,720			4,128
			18,920	DT	or	$ 45,408
TYPE A2	266 m2 x 100 DT/m2	=	26,600			63,840
	contingency 10%		2,600			6,384
			29,260	DT	or	$ 70,224
TYPE A3	480 m2 x 100 DT/m2	=	48,000			115,200
	contingency 10%		4,800			11,520
			52,800	DT	or	$126,720
TYPE B	773 m2 x 120 DT/m2	=	92,760			222,624
	contingency 10%		9,276			22,262
			102,036	DT	or	$244,886
TYPE C	1,207 m2 x 120 DT/m2	=	144,840			347,616
	contingency 10%		14,484			34,761
			159,324	DT	or	$382,377

* 1 Tunisian Dinar = 2.4 U.S. Dollars

LODGING	55 m2 x 100 DT/m2	=	5,500
	contingency 10%		550
			6,050 DT

2. Preliminary Estimates (7/17/78) by Section of Construction, prepared by A.E.U.D., the consulting engineering firm.

TYPE A1	construction	21.738,500
	contingency	1.000,725
	15% escalation over 18 months.	3.260,775
		26.000,000 DT
TYPE A2	construction	30.810,500
	contingency	2.568,000
	15% escalation	1.621,500
		38.000,000 DT
TYPE A3	construction	53.695,500
	contingency	3.250,175
	15% escalation	8.054,325
		65.000,000 DT
TYPE B	construction	84.054,000
	contingency	5.284,000
	15% escalation	12.662,000
		102.000,000 DT
TYPE C	construction	133.277,000
	contingency	6.731,450
	15% escalation	19.991,550
		160.000,000 DT

We discussed these figures with the engineers who agreed that they were quite high -- especially for the smaller buildings (A1, A2, A3) in comparison to the estimates by square meter. They were in the process of revising these estimates. The revisions that appear in the following section are the final estimates prepared by the engineering firm on July 19, 1978.

3. Revised Cost Estimates for New Construction (7/19/78) by A.E.U.D., the consultant engineer. (See Appendix I for the breakdown by section.)

TYPE A1	construction	18.534,000			
	contingency	686,000			
	15% escalation	2.780,000			
		22.000,000	DT	or	$ 52,800 *
TYPE A2	construction	27.667,000			
	contingency	1.183,000			
	15% escalation	4.150,000			
		33.000,000	DT	or	$ 79,200
TYPE A3	construction	47.211,500			
	contingency	2.707,500			
	15% escalation	7.081,000			
		57.000,000	DT	or	$136,800
TYPE B	construction	79.731,500			
	contingency	3.268,500			
	15% escalation	12.000,000			
		95.000,000	DT	or	$228,000
TYPE C	construction	121.438,000			
	contingency	4.909,000			
	15% escalation	18.653,000			
		145.000,000	DT	or	$348,000
LODGING	50 m2 x 110 D/m2	5.500,000			
	contingency	175,000			
	15% escalation	825,000			
		6.500,000	DT	or	$ 15,600

* 1 Tunisian Dinar = 2.4 U.S. Dollars

C. SUMMARY OF COST ESTIMATES FOR NEW CONSTRUCTION

Figures are those prepared by A.E.U.D. on 7/19/78.

	SILIANA	SIDI BOU ZID		DINAR	TOTAL
TYPE A1	6	7	(13)	22,000	286,000
TYPE A2		3	(3)	33,000	99,000
TYPE A3	--	--	(0)	57,000	- 0 -
TYPE B	1	--	(1)	95,000	95,000
TYPE C	2	3	(5)	145,000	725,000
		GRAND TOTAL IN TUNISIAN DINAR FOR NEW CONSTRUCTION ONLY			1,205,000

Using a conversion rate of 1 dinar = 2.4 dollars, the estimate for all new construction, excluding residences, is $2,892,000.

VI. RECOMMENDATIONS AND ISSUES FOR DISCUSSION

A. ARCHITECTURAL RESOURCES

The most significant problem is that of limited architectural resources. As previously stated, this problem has been discussed with MOH officials and alternatives are actively being explored. Alternatives to the 1 MOH architect being responsible for the design of 18 renovations and 5 new building types, with site plans for 40 facilities through the design development (avant project) phase include:

NEW CONSTRUCTION -- MOH architect transfers the revised schematics (esquisse) plus sketches of interior elevations for built-in cupboards, shelves, counters, storage units, critical dimensions, critical electrical, window locations, door sizes and types, and all requirements for the 5 building types, to a private architect or an architectural/engineering firm for design development ("avant project") through construction documents ("project d'appel d'offres").

RENOVATIONS -- All of the design work will be contracted out to an architectural firm, whose "mission" includes the entire design process. The MOH architect should play an active role in the mid-phase review of the schematic design and design development phases. Program reviews are critical prior to working drawings.

B. DETERMINE RESPONSIBILITIES

The facility development process through the preparation of working drawings, specifications, contract documents, along with the final cost estimates is covered in Item A above. The remainder of the process should be clarified and answer questions like:

1. Where and how will the notice-to-bidders be made public? Can local contractors be "invited" to bid?

2. Who will evaluate the bids submitted at the local level? How will a final decision be made?

3. What role does the MOE play in this process? a review role? an approval role? When and at what point(s) in the process?

4. How will the renovations be handled?

5. For renovations under 5,000 dinar, can the provincial governor simply take "avant project"/design development drawings and negotiate directly with a local contractor -- bypassing the formal bid process?

6. When will the fixed amount be determined? At final cost estimates or after bids are opened? The later time is recommended for obvious reasons: the exact amount for each project is known.

C. EDUCATION - COMMUNICATION BROCHURE

This project reflects a recent and delicate policy shift which will affect the entire country ultimately. Even within the last year the key participants have changed, yet the program has continued. The point is simply that certain information about the program of integrated services needs to be documented in such a way that in the future, different health administrators, practitioners, architects, planners, etc., both in Tunis and at the provincial and local levels, will fully understand the assumptions, the goals, and - in particular - the facilities that will house the integrated services. It is strongly recommended that an information packet be developed immediately.

This packet should be different from the working drawings and specifications that really are the information a contractor, architect, or engineer need. This information packet should be brief, easy to read, a summary of how the holistic system of the basic health centers work. A health or health-related professional should be able to understand the concepts as well as the manifestations of the concepts. For each type of center materials in this packet/booklet should include services to be provided, staffing minimums and optimums, patient-types to be seen, population data, referral sources, drawings which show the A1 basic health center and the next size (A2), etc., how the concept of expansion works, guidelines for when to actually expand; typical layout drawings with furniture and major equipment shown, a MOH contact number for questions to be answered/technical assistance to be delivered about the basic health centers and the integrated services. This information packet/booklet should precede the working drawings in the process, can be an educational tool for the various participants both centrally and locally, might serve as a framework for community education so that the people who utilize these integrated services will better understand the program and the facility that houses the services.

NOTE: A significant amount of this material is contained in this final report in preliminary form.

D. RENOVATIONS -- SPECIAL PROBLEMS

Renovations poses a special set of problems both for the architect-engineer and for the administrator/client/owner. It is recommended that a contingency is prepared for each renovation rather than use a fixed percentage. In this way 5 - 10% might be the contingency for a fairly simple renovation, 20-25% for a complex renovation. In addition, the contingencies for renovation with expansion of new construction could be done separately so that the contingency may be 5% for expansion, 20% for renovating the existing building.

In addition, it is recommended that the architect - in conjunction with the MOH- determine how to stage the renovations so that services can be continued at least in a reduced fashion.

Furthermore, it is recommended that the new/recent PMIs and family planning buildings located on some of the medical campuses be considered for inclusion in the renovation work. This is a special and significant problem but is at the heart of truly integrating the health services at these sites.

E. POTENTIAL COST REDUCTION AREAS

1. Eliminate 1 clerestory over waiting area in all types.

2. Cost comparison of structural systems: only columns are bearing the roof loads now. Because of expansion and increased flexibility for change, the assumption was well-based.

3. Site preparation may in some cases be a "volunteer" aspect for the project -- local donation.

4. Discuss item-by-item with engineers/architects the quality of the units specified. Request alternatives to evaluate in order to make an informed decision.

F. ADMINISTRATIVE PLANNING

Administratively this project is complex. It is recommended that every effort be made to plan out all of the information, activities, tasks, decision points, parties responsible, etc., to coordinate the components of the entire project. The facility is simply one such component. Relating major activities to time is strongly urged. (See Section II B.)

G. POST-OCCUPANCY EVALUATION

Consideration should be given to evaluation of the building design to determine how appropriate the facilities are to the new program of services. Questions that can be answered include:

- Are the basic assumptions underlying the designs still appropriate?

- Was the program intent sufficiently anticipated?

- What was not anticipated?

- What changes can best be accomplished through staff education? through facility re-design? through operational methods?

This evaluation could be scheduled to begin 3 - 6 months after a facility is operational.

APPENDICES

TYPE A1 ± 175m2

R E C A P I T U L A T I O N

G1	Terrassements	519,000
G2	Structure	7.790,000
G3	Maçonnerie	4.855,000
G4	Etanchéité	1.290,000
G5	Revêtements	897,500
G6	Menuiserie	900,000
G7	Peintureet vitrerie	462,500
G8	Plomberie sanitaire	320,000
G9	Electricité	100,000
G10	Chauffage	100,000
G11	V.R.D.	900,000
G12	Divers a) paillasses	200,000
	b) equipements fixes(placards bancs comptoirs).	200,000
	TOTAL	18.534,000
	somme à valoir pour imprévues	686,000
	18 mois de fluctuations de prix 15 % environ	2.780,000
	Montant total de l'estimation	22.000,000

Fait à Paris, le

BUREAU D'ETUDES

TYPE A2 ± 270m2

RECAPITULATION

G1	Terrassements	718,500
G2	Structure	10.460,000
G3	Maçonnerie	6.966,000
G4	Etanchéité	1.980,000
G5	Revêtements	1.320,000
G6	Menuiserie	2.700,000
G7	Peinture et vitrerie	912,500
G8	Plomberie sanitaire	360,000
G9	Electricité	150,000
G10	Chauffage	150,000
G11	V R D	1.350,000
G12	Divers a) paillasses	300,000
	b) equipements fixes (placards bancs comptoirs).	300,000
	TOTAL	27.667,000
	somme à valoir pour imprévues	1.183,000
	15 % de fluctuation des prix pour 18 mois environ	4.150,000
	Montant total de l'estimation.	33.000,000

Louis. L

TYPE A3 ± 480m2

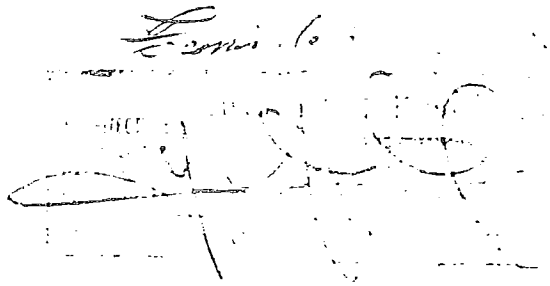
R E C A P I T U L A T I O N

G1	Terrassements	1.057,000
G2	Structures	16.910,000
G3	Maçonnerie	11.214,500
G4	Etanchéité	3.562,500
G5	Revêtements	2.433,000
G6	Menuiserie	6.710,000
G7	Peinture et vitrerie	1.847;500
G8	Plomberie sanitaire	560,000
G9	Electricité	650,000
G10	Chauffage	300,000
G11	V.R.D.	1.750,000
G12	Divers a) paillasses	120,000
	b) equipements fixes (placards bancs, comptoirs).	300,000
	TOTAL	47.211,500
	Somme à valoir pour Imprévues	2.707,500
	18 Mois de fluctuation 15 % environ	7.081,000
	TOTAL DE L ESTIMATION.	57.000,000

TYPE B 775m2 ±

RECAPITULATION

G1	Terrassements	1.594,500
G2	Structure	33.613,000
G3	Maçonnerie	17.232,500
G4	Etanchéité	5.661,000
G5	Revêtements	3.710,000
G6	Menuiserie	7.100,000
G7	Peinture et vitrerie	1.933,000
G8	Plomberie sanitaire	1.030,000
G9	Eléctricité	11.300,000
G10	Chauffage	3.500,000
G11	V R D	2.450,000
G12	Divers a) paillasses	168,000
	b) equipements fixes (placards bancs comptoirs)	400,000
	TOTAL	79.731,500
	Somme à valoir pour Imprévues	3.268,500
	18 mois de fluctuation des prix 15 % environ	12.000,000
	Montant total de l'estimation.	95.000,000



TYPE C ± 1210m2

R E C A P I T U L A T I O N

G1	Terrassements	2.492,500
G2	Structure	52.250,000
G3	Maçonnerie	24.299,500
G4	Etanchéité	9.291,000
G5	Revêtements	5.575,000
G6	Menuiserie	11.550,000
G7	Peinture et vitrerie	3.205,000
G8	Plomberie sanitaire	1.350,000
G9	Electricité	1.700,000
G10	Chauffage	4.000,000
G11	V. R. D.	4.250,000
G12	Divers a) Paillasses	675,000
	b) Equipements fixes (placards, bancs, comptoirs).	800,000
	T O T A L	121.438,000

Somme à valoir pour imprévus 4.909,000

18 mois de fluctuation des prix 15 % 18.653,000

MONTANT TOTAL DE L'ESTIMATION 145.000,000

Lomé, le

LOGEMENTS

50 m2 x 1100/m2	=	5,500,000
18 mois de fluctuation des prix 15 % environ	=	825,000
Somme à valoir pour imprévues		175,000
Montant total de l'estimation d'un logement.		6,500,000 D.

APPENDIX II

THIS SCHEMATIC DIAGRAM SHOWS HOW TYPE A3 -- WITH SMALL VARIATION IN THE BASIC PLAN, COULD HOUSE DENTAL CARE & MENTAL HEALTH SERVICES, IN ADDITION TO PRIMARY CARE / INTEGRATED SERVICES.