

Chapter 2 Contents of the Project

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2-1 Contents of the Request

As a result of the discussions with the counterparts in Haiti, it has been confirmed that the contents of the request under this project were as follows in respect to the Tuberculosis Control Center and the Sigueneau Sanatorium.

Incidentally, the Haitian counterparts are as follows:

Dr. Gérard Desir, Ministre de la Santé Publique et de la Population

Dr. Gaston Delouches, Directeur Générale, S.P.

Dr. Francisque Milord, Directeur de l'Unité d'exécution et de Coordination

Dr. Camille H. Clermont, Directeur, Bureau de Contrôle de T.B.

Ms. Eceler Louis, Ingénieur Chef de la Section de Génie

Ms. Seymour Beauboeuf, Architects

Ms. Pierre-Marie Boisson, Ingénieur Civil

They are the officials of the Ministry of the Public Health and population.

2-1-1 Tuberculosis Control Center

The original plan for this center has been worked out in advance by the Haitian Ministry of Public Health and Population in accordance with the basic conceptual program for the tuberculous control which had been reached to a consensus in the Ministry. As part of the national medical facilities program designed for the T.B. control, the Ministry of Public Health and Population time and again explored what facilities should be established first. As the result, the concept of this center has been given a concrete form. The original plan called for a total floor space of some 3,500 m².

One of the requested contents agreed on after a series of discussions for the establishment of this center, but the floor space was reduced as a whole so that the project may be conducted within the framework of the Japanese cooperation satisfying the functions called for in the original plan.

The following figure indicates the original plan of the center.

1. Office of the Director
2. Office of the Administrator
3. Office
4. Small Conference Room
5. Assembly Hall (Large conferences, lectures and audio-visual presentation)
6. Booth
7. Office of Doctors and Nurses (6 rooms)
8. Medical consultation and treatment rooms (5 rooms)
9. Central Sterilizing Supply
10. X-ray Rooms (3 rooms)
11. X-ray Technicians' Rooms (2 rooms)
12. Endoscopy
13. Anteroom for Endoscopy
14. Endoscopy Technicians' Room
15. Reception for Laboratory
16. Laboratory
17. Laboratory Technicians' Room
18. Aerosol Therapy
19. Nurses Room for the above
20. Pulmonary function test
21. Nurses Room for the above
22. Doctor's Office for the above
23. Storage
24. Custodian Office
25. Stand-by room for the above
26. Food Storage
27. Laundry
28. Medical supply storage
29. Equipment storage
30. Machine Room
31. Emergency Power Generator Room

In addition, the facilities for common use are included:
Entrance Hall, Outpatients' Waiting Hall Corridors and Toilets.

The incidental facilities include the systems for electric power, telephone (piping only), water supply and drainage, and air-conditioning (only for top-grade rooms).

On the basis of this original plan, different views were set forth on the possibility of reducing the total floor space without hampering the functions.

The Haitian Ministry of Public Health and Population was of the view that the minimum floor space was 3,150 m², 10% down from the initial floor space, and that the more reduction would impair the functions.

The Japanese study team insisted that the floor space could be reduced to a further extent, as the rooms were still larger to the design standards of Japan even if it was reduced by 10%, and therefore that the floor space should be reduced to a little further extent.

The Haitians stressed, however, that the aforementioned floor space would be indispensable because the climatic conditions are different from those of Japan and because the congestion of outpatients in their waiting hall and the flexibility with which the rooms could be remodeled in the future had to be taken into account.

The request for the equipment may be classified as follows for each facility.

1) Clinical test sector

Binocular microscope, fluorescent microscope, refrigerator, centrifuge, incubator, constant-temperature water bath.

2) X-ray sector

X-ray unit, film-hanger, cassette, filmviewer, dark-room lamp.

3) Bronchoscopy sector

Bronchoscope (for infant, child, adult), forceps, head lamp, laryngoscope (for child, adult), biopsy and grasping.

4) Furniture and furnishings

Desk and chair, filing cabinet, steel locker, meeting table, folding chair etc.

2-1-2 Sigueneau Sanatorium

Upon consultation with Dr. Sudo, the contents of the request for the Sigueneau Sanatorium was confirmed to construct four buildings, together with necessary equipment including out-of-stock parts at the X-ray and laboratory building and other existing facilities, that is, a building for medical clinic, a building for intensive care, a building for dining and a cottage for emergency power generator in addition to the existing buildings.

The four planned buildings have a total floor space of 600 m².
The rooms for each building are as follows:

1) Building for medical clinic

Consultation rooms

Treatment room (1)

Pharmacy (1)

Storage (1)

Waiting Hall (1), Toilet (1) and small storage (1)

2) Ward for intensive care

One room each for male and female serious patients,
each room accommodating 10 patients

Nurse Station (1) with a Toilet

Toilet (1) and Shower Room (1) for patients.

3) Building for dining

Capable of accommodating 150 persons

4) Cottage for power generator

To be installed with a 30 KVA emergency power generator.

The request for the equipment may be classified as follows for each facility.

1) Building for medical clinic

Medical equipment -- Cart cabinet, wheel chair, binocular microscope, film viewer, instrument cabinet, medicine cabinet, autoclave, stretcher, pneumothorax instrument, etc.

- Furniture and furnishings -- Library cabinet W/sliding doors
steel locker, filing cabinet, commodity storage shelves,
copy machine, electric fan, long chair, etc.
- 2) Ward for intensive care
- Medical equipment -- Mobile X-ray unit , oxygen concentrator,
hospital bed , bedside cabinet, overbed table , autoclave,
stretcher, suction unit, sterilizer, etc.
- Furniture and furnishings -- Slop sink , electric fan ,
food cart, etc.
- 3) Building for dining
- Furniture and furnishings: Table, chair
- 4) Existing X-ray and laboratory building
- Medical equipment: Doctor's desk, nebulizer, medicine cabinet,
laboratory side table , etc.
- Furnishings: Folding chair, library cabinet W/sliding doors,
filing cabinet, electric fan, water softener, etc.
- 5) Existing kitchen
- Furniture and furnishings: Freezer, refrigerator
- 6) Existing laundry building
- Furniture and furnishings: Washing machine with dehydroator
- 7) Existing wards
- Medical equipment -- Irrigator stand

2-2 Concept for the Establishment of Tuberculosis Control Center

The National Tuberculosis Control Center is now situated in Port-au-Prince having only one X-ray machine, and people in the low income bracket are examined free of charge on a small scale. Its building is grand in external appearance, but its internal facilities are such at present that the center is far from satisfying the existing requirements for medical care, which ought to be carried out by the government.

In respect to the No. 1 Sanatorium, the original plan appears to have called for the establishment of one sanatorium after another as is

discernible from the use of the expression "No. 1". Why the construction of additional sanatorium was called off after the completion of the No. 1 Sanatorium is not clear, but this suggests that there has once been a national program against tuberculosis.

The WHO Tuberculosis Expert Committee has issued a recommendation to provide technical advice on tuberculosis control programs in developing countries. According to this recommendation, an outpatient system is recommended for treatment. This system has been introduced after a comprehensive achievement of the target of tuberculosis control and an objective assessment of the cost-effectiveness. The WHO committee has recommended a comprehensive control program which includes not only the sector of medical technology but the importance of educational and public activities and cooperation from community residents, etc.

As regards the necessity of free sanatorium for poor and critical patients, consideration must be as a matter of course given from a humanitarian point of view, aside from a standpoint of cost-effectiveness.

It is the understanding of the Haitian Ministry of Public Health and Population that the battle against tuberculosis is the biggest issue posed for the medical sector in Haiti. The Minister of Public Health and Population is a physician who is a specialist in the respiratory organ. Under this guidance, a tuberculosis control program has been elaborated in the Ministry in line with the aforementioned WHO recommendation. The advancement of the talks with Japan for the cooperation is making it possible for the Ministry to give a concrete form to the program.

The plan calls for the establishment of a central tuberculosis control center in the capital of Port-au-Prince as the first step. On the basis of its achievements, regional centers are scheduled to be established in each region. These centers will provide services to outpatients and will not be equipped with facilities for the inpatient services. These are provided for almost free of charge, only nominal fees are charged. Administratively, the centers will belong to the Department of Contagious Diseases, Bureau of Public Hygiene and Prevention, Ministry of Public Health and Population. Whether the center will be placed under the jurisdiction of the Tuberculosis Division, which is placed under the Department of Public Hygiene and Prevention, or the Tuberculosis Division itself will develop into this center has yet to

be clarified. Be the matter what it may, the center will be managed with a national budget after its establishment. The center will have a control bureau and a central clinic as its integral organizations. The two sections will be organized as indicated below. The center will be staffed with one administrator, 15 physicians, 6 technicians, 42 nurses and hygienists, 9 assistant nurses and other personnel.

Tuberculosis Control Bureau

Education and training sector -- 1 physician and 3 nurses

Preventive inoculation sector -- 1 physician, 2 nurses and
6 assistant nurses

Administrative sector -- 1 administrator, 3 secretaries,
1 receptionist and 1 accountant

Social welfare sector -- 15 nurses and hygienists

Tuberculosis Care Center

Consultation and treatment sector -- 10 physicians and 10 nurses

X-ray sector -- 3 technicians

Bronchoscopy sector -- 2 physicians, 6 nurses and 3 assistant
nurses

Medicine spray therapy sector -- 4 nurses

Pulmonary function test sector -- 1 physician and 2 nurses

Clinical test sector -- 3 technicians

According to its concept the purpose of this center is such that the center will play the following roles under an overall control program.

- 1) The screening of inhabitants in the metropolitan area and the treatment of outpatients will be carried out.
- 2) Project for prevention, such as vaccination and publicity and education about prevention will be performed in the same area.
- 3) On the basis of the aforementioned experience, the most efficient national control program befitting to the realities of the republic will be formulated, and technology and methods for its implementation will be developed.

4) The center will serve as the institution for the training and retraining of staffs required for the nation-wide control of tuberculosis. The staffs who are to be trained at this center will be engaged in actual work at the center.

5) While executing this control program, the center will serve as the supply source of budgets, staffs, materials, equipment, etc., provide technical guidance and act as over-all center for the administration of tuberculosis control.

The foregoing is an outline of the concept for the establishment of the Tuberculosis Control Center. The tuberculosis control program which the ultimate purpose of the establishment of this center is something which transcends the category of mere on-the-spot medical care and in a large measure belongs to the administrative sector. As for the planning of this center, the sectors associated with administration are exceedingly important, too.

2-3 Necessity for Expansion of Sigueneau Sanatorium and Equipment

2-3-1 Outline of the Sanatorium

It is understood that this sanatorium was established as an "asile" for tuberculosis patients in 1939 when Stenio Vincent was President. From then on, the Sigueneau Asile became a place for the death of poor patients.

In May 1975, five sisters of Petite Soeur de Sainte-Therese, a Haitian convent, began to take care of the Asile's patients with the approval of the Ministry of Public Health and Population, being unable to refrain from stepping in at the sight of their misery.

In December 1976, Sister Sudo visited the Sigueneau Asile for the first time. The following year, she was officially assigned to the sanatorium by the Ministry of Public Health and Population as the regular chief physician.

Thanks to the efforts of the sisters in recent years, the facilities have been improved with aid from organizations in Canada, the Netherlands and Japan as well as from the government of Haiti. The asile has been turned into a sanatorium.

The location of the existing facilities is shown in Fig. 2-2. There

is a thicket of assorted trees on the southwestern side of the access which leads to the sanatorium buildings in front of the facilities. There are female wards on the right-hand side of the porchway and male wards on the left. In addition to the wards, there are toilets and showerroom buildings each for males and females, two laundry buildings, a kitchen building, two wells and two water supply towers, and a radiography and laboratory building. Of these facilities, a laundry building, a water supply tower, and radiography and laboratory building will soon be ready to complete.

As regards medical equipment, there is practically nothing other than the equipment installed in the new radiography and laboratory building and 200 beds.

The sanatorium is roughly speaking, managed, in the following manner.

1) Patients who want to enter hospital are received into hospital when chest abnormalities have been observed in radiography. The hospitalization and treatment are free. After they are discharged, they are given medicine free of charge as outpatients.

Number of inpatients -- A total of 200, including 113 males and 87 females

Number of outpatients -- 1,500 a month in the aggregate. Outpatient treatments are provided once a week and only medicine given on the other days.

2) The operation fund consists of total of \$3,050 a month including \$2,700 a month, budgeted by the Ministry of Public Health and Population, and regular contributions of \$350 a month. With this fund, all expenses other than the outlays for medicine and the salaries to government staff officials are taken care of. The biggest single item of expenditure is for meals to the patients and staff of a total of 250 person, exceeding \$2,000 a month.

3) Medicine is supplied by the Tuberculosis Control Bureau every month, but the quantity is neither constant nor enough. Contributions equivalent to \$180 or so come from the Grace Children's Hospital. The shortage is covered by contributions from supporting organizations both at home and abroad.

4) Staff

Physicians: Regular 1 person
Non-regular 3 persons

(One physician works two days a week and two physicians a day a week.)

Assistant nurses: 4 persons

Laboratory technician: 1 person

(The technician works in the morning three times a week.)

X-ray technician: 1 person

(The technician works in the morning twice a week.)

Custodians: 4 persons

(Sisters, as the meal supply custodians, The qualified assistant nurses and the qualified laboratory technicians.)

In addition, there are 33 other personnel in all. They include five kitchen workers, seven persons engaged in cleaning and taking care of the patients in serious condition, 12 farm workers (beans, corn and foxtail millet), two persons engaged in repair work and carpentry, five laundry men, one night guard and one driver.

2-3-2 Necessity for the Expansion of Facilities

The present necessity of expansion of facilities stems each from the following reasons.

1) New Building for Medical Clinic

Plans call for the establishment of two consulting room, one treatment room, one pharmacy and one storage. The existing consulting room is so small that there is no space for necessary equipment. Moreover only one room is available at present, so it is inconvenient for two physicians to work at one and the same time. It is hoped that there should be two consulting rooms with one treatment room between them. Being no pharmacy at all at present, there is a need to establish a pharmacy and a storage which can be locked and protected against robbery.

2) New Ward for Intensive Care

A well-equipped ward for serious patients is considered necessary. The necessary facilities include a nurse station, shower-room and toilet,

electrical outlets, etc. It is also considered necessary to have an assembly hall for the education of patients and religious services. The plans call for the use of the existing building as an assembly hall upon completion of the aforementioned, new ward.

3) New Dining Hall

At present, the inpatients have meals in their beds. There are neither tables nor chairs. Placing their meal trays on the floor, patients squat down and eat. Serving meals is quite a job.

If a dining hall is constructed in the existing courtyard close to the kitchen, all that is necessary will be a roof without walls for the economization of construction.

4) Emergency Power Generator Facilities

The supply of electricity is frequently suspended. Power generator facilities will be installed for electric lights, freezers and refrigerators, germ storages, etc.

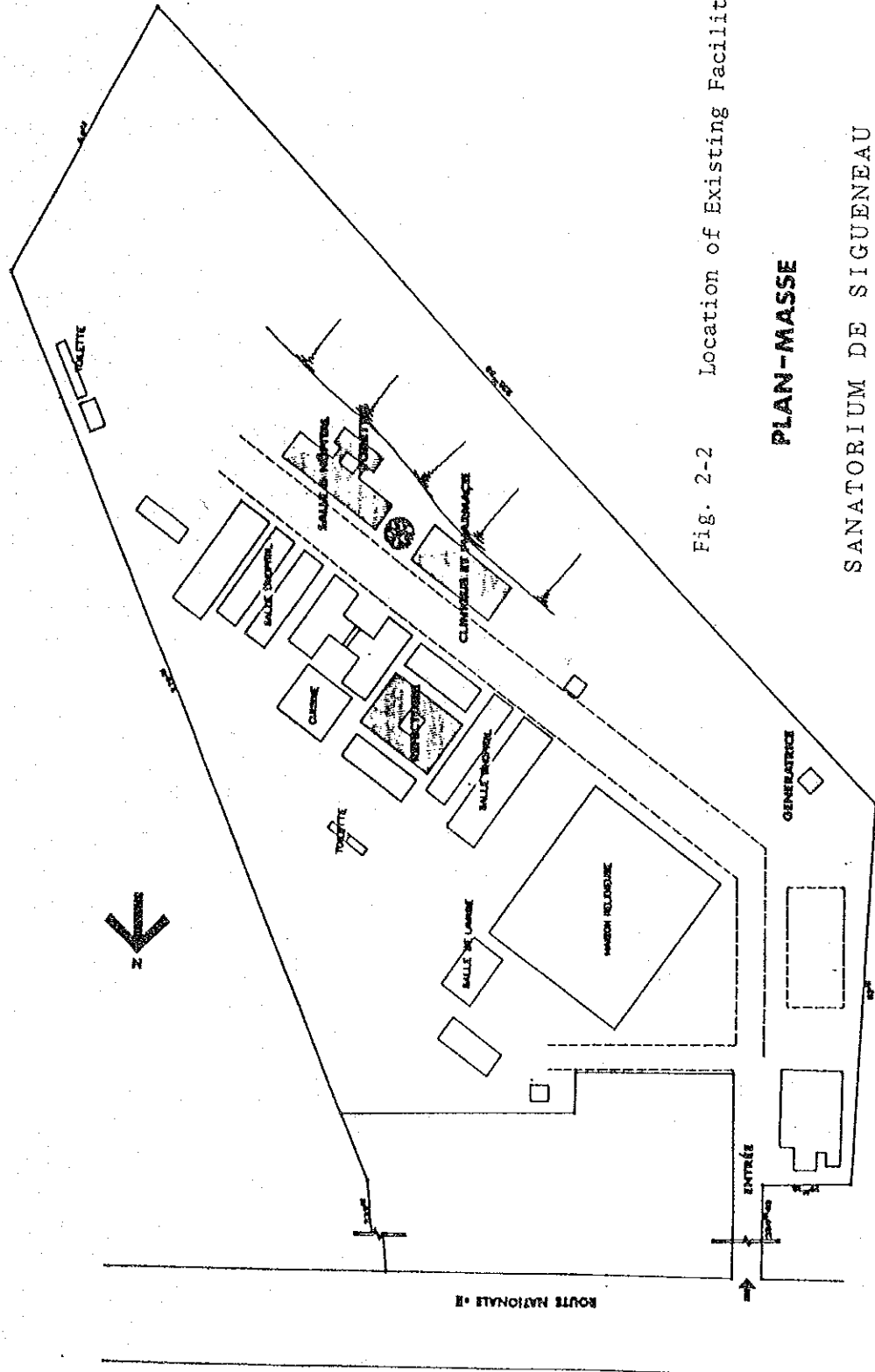


Fig. 2-2 Location of Existing Facilities

PLAN-MASSE

SANATORIUM DE SIGUENEAU

Chapter 3 Sites for the Construction

Chapter 3 Sites for the Construction

3-1 Site for the Center

The site, covering an area of about 13,000 m², is situated on Avenue Jean Claude Duvalier, about 100 m above the sea level and about 3 km east from the center of the city of Port-au-Prince. About 600 m away from this site, the Grace Children's Hospital of the International Child Care (ICC) is playing an active role in the prevention and treatment of tuberculosis. The mutual collaboration between the proposed center and this hospital is expected to produce multiplicative effects. As means of access to the center by visitors after the opening of the center's service, the Government of the Republic of Haiti has expressed its intention of providing them with low-fare bus service.

The site faces the 8-m-width Avenue Jean Claude Duvalier and measures 114.5 m in frontage and 112.5 - 128.82 m in depth. The site slopes downward from northeast to southwest with a height difference of about 1.5 m. On the northern side of the site, a vacant lot stretches. There are dwellings on the eastern side and a courtyard surrounded by a stone wall is situated on the southern side.

Fourteen meters inward from the borderline of the frontal road, high-tension transmission lines are suspended in the air in parallel with the road, and a steel tower is located at a point of 37 m from the northern border of the site. According to officials of the Government of the Republic of Haiti, no buildings can be built in any area which is situated under a high-tension line and stretches 35 m from the borderline of a road, but no restrictions are imposed on its use for access roads and parking lots.

The electric wires which run over the frontal road may supply 3000 V of electric power. A water supply pipe, more than 20 mm ϕ is introduced into the site which faces the road, but as for the water quantity, there is a need to cope with the situation with the installation of a water tank, etc. For drainage, a side gutter and a drainage are laid along the frontal road.

3-2 Site for the Expansion of Sigüeneau Sanatorium

The Sigüeneau Sanatorium is situated along National road No. 2 near Leogane, or 30 km west from Port-au-Prince. Covering an area of 20,000 m², the site is irregular in shape, measuring about 200 m in depth and about 100 m in frontage, as indicated in Fig. 2-2.

The site is surrounded by farms and a thicket of assorted trees. The access which is connected with National road measures about 230 m as the crow flies, so that no adverse effects are produced on things on the compound by the noise and other factors of traffic on the National road. The site is flat as a whole. The neighborhood of the southwestern border slopes down about 2 m.

The existing buildings consist of an X-ray and laboratory building on the right-hand side of the access and a convent on the left-hand side. Farther on the left-hand side, there are separate ward buildings for male and female inpatients and a kitchen building. Around them, a toilet, a shower cabinet, a laundry shed and a storehouse are situated.

Into the site, 3000 V of electric lines are introduced and usable. There are two fenced wells for water supply, each being equipped with a water tower of 3 tons capacity.

Chapter 4 Basic Design

4-1 Overview of Infrastructure for Construction

The Republic of Haiti, situated in lat. 18-20° N. and long. 72-74° W., has many mountains, most of which are treeless. Flatlands account for about 17% of the national land. Geographically, the Republic belongs to sub-tropical zone. The climate may be defined as sub-tropical and oceanic but differs, depending on the district and height, as the Republic's land-forms are complex. The rainy season comes in twice a year -- from April to May and from August to October. Precipitation stands at 150 - 200 mm a month on the average in the rainy season and 30 - 90 mm in the dry season, the annual precipitation reaching 1,300 mm.

Geologically, Port-au-Prince and its perimeter feature calcareous soil. Sigueneau and its periphery, 30 km west from Port-au-Prince, are covered with a layer heaped up with volcanic ash.

Earthquakes: In Dominica situated in the eastern section of the Hispaniola Peninsula, or 300 km from Port-au-Prince, the capital of Haiti, earthquakes with magnitudes of 6 - 8 on the Richter scale have been recorded in recent years. In Haiti, however, there have only been slight earthquakes with magnitudes of up to 2 on the Richter scale. For the existing buildings, practically no consideration is given to measures against earthquakes.

Hurricanes: A tropical hurricane, generated over the north of the African continent, moves in the north-northwest direction and churns across the Caribbean Sea, heading to Florida. Haiti is situated along the hurricanes' course. Normally, hurricanes assault from August to October with winds of up to 70m/sec (Typhoon Allen, 1980), and the average hours of sustenance stand at 24 - 72 hours.

Fortunately its geographical position, however, Port-au-Prince is shielded by a range of mountains in the Republic of Dominica in the east. This natural barrier serves to shun the center of a hurricane. For this reason, the hurricanes assaulting Port-au-Prince seldom exceed a wind velocity of 31 m/sec. When the aforementioned Typhoon Allen passed across Haiti, a wind velocity of 30 m/sec was recorded over the mountains along Port-au-Prince. There is a need to give full consideration to the structure of roofs and their construction method, strength of caves, etc.

Building Materials, Etc.

Lumber: Construction lumber is imported, the dimensions being 2" x 4" in specification. Miscellaneous local lumber is used for temporary supports, but it has many curves and its quality is poor.

Cement: Cement is produced by "Le Ciment d'Haiti S.A." situated in Fond Mombin, 30 km away from Port-au-Prince. This cement plant is capable of producing 300,000 tons of cement a year only for the limit of home consumption, which are all delivered to the Government of the Republic of Haiti.

The cement produced by this plant is in accord with the existing French specification CPA325 and used in the construction of structures.

Reinforcing bars: L'Acierie d'Haiti S.A., situated along National road No. 100 in Port-au-Prince, is engaged in rolling. 6 to 25 mm ϕ of reinforcing bar are produced according to the ASTM specifications.

Aggregates: Coarse aggregates, fine aggregates and crushed lime stones are mainly used as aggregates. A aggregate collection site is situated along a mountain on the outskirts of Port-au-Prince, and its aggregates are directly carried off to the city.

Concrete blocks: Concrete block plants, situated in the city of Port-au-Prince, produce blocks with the above aggregates and cement.

Building technology: A six-storied reinforced concrete building has been constructed in the city of Port-au-Prince, and buildings, three stories or so high, are observed anywhere in the city. It is understood that there is nothing to worry about the workers' skilfulness, as long as their finish work is not taken into account. An on-the-spot check indicates the existence of dwellings with unique designs everywhere, suggesting that men of talent have been brought up in painting, sculpture and other sectors in Haiti.

4-2 Basic Design Policy

With the conditions of the aforementioned basic building survey and other factors taken into account, the basic policy will serve as a guideline for building design as introduced below.

- 1) An attempt shall be made to make an effective use of the site with full consideration given to a possible expansion or renovation

in future.

2) An attempt shall be made to design strong and durable buildings within the local building capacity and within the framework of the budget.

3) Local materials shall be mobilized as much as possible to meet the construction methods and to facilitate the future maintenance of the proposed buildings.

4) The running cost to meet the local conditions shall be taken into account after the completion of the proposed buildings.

5) The proposed buildings shall be adaptable to the sub-tropical climate and natural features.

4-3 Outline of Buildings

4-3-1 Port-au-Prince Tuberculosis Control Center

Structure and scale: One-storied reinforced concrete building (1) with a floor area of 3,150 m²

4-3-2 Sigueneau Sanatorium

1) Medical Clinic Building

Structure and scale: One-storied reinforced concrete building (1) with a floor area of 193 m²

2) Ward for intensive care

Structure and scale: One-storied reinforced concrete building (1) with a floor area of 204 m²

3) Dining hall

Structure and scale: One-storied reinforced concrete building (1) with a floor area of 182 m²

4) Power generator building

Structure and scale: One-storied reinforced concrete building (1) with a floor area of 14 m²

5) Others

Roofed passage between buildings

4-4 Location Plan

4-4-1 Port-au-Prince Tuberculosis Control Center

The road in front of the center runs from northeast to southwest. As high-tension transmission wires are suspended in the air in parallel, it is prohibited to construct buildings in areas within 35 m inward from the borderline of the road, but it is possible to construct an accesses and parking lots and plant trees. This means that any buildings shall have to be constructed more than 35 m away from the road, and the area between the road and the buildings shall serve as a buffer zone which protects the buildings from the noise, vibration and exhaust gas generated by traffic on the road.

The whole of the site gently slopes downward in the southwest direction, and the neighborhood of the southwestern border is covered with a thicket of assorted trees.

The functions of the center may roughly be classified into two sectors -- a tuberculosis screening bureau and a tuberculosis care center, each of which consists of four to six divisions.

In the light of the characters of the buildings, there are many outpatients. Therefore, it is indispensable that the functions of the waiting room should be taken into full account to the users. The basic conceptual chart presented by the Ministry of Public Health and Population features a courtyard type of the plan. As this concept is adopted to fit the local climate and natural features, the location of administration, medical examination, inspection and assembly blocks around the courtyard is considered to be of much effective to ventilation and the waiting hall.

The southwestern part of the site will be kept as a green zone with as many existing trees left as they are, and the northeastern part will be used as a parking lot.

4-4-2 Sigueneau Sanatorium

The existing ward building is situated on the east side of the main road, about 10 m wide. With the main entrance located at the center, the building is divided into two sections -- the front side for male inpatients and the back side for female inpatients. This time, a medical clinic building, a intensive patients' ward building, a dining hall, and power generator building are schemed out an extension.

The dining hall is planned to locate in the courtyard which is encircled by the existing kitchen and ward buildings. Of the areas where the road leading to the main entrance to the ward building, the medical clinic building will be located on this side and the intensive patients' ward building on the other side with due consideration given to the work flow corresponding to the function of the existing facilities. The location of the power generator building has been studied from the stand point of the noise and it is decided to detach as far from the ward buildings as possible and located it at a place close to the service wire pole.

4-5 Buildings Plan

4-5-1 Port-au-Prince Tuberculosis Control Center

The concept of the Haitian side about the tuberculosis center is as follows.

A. Tuberculosis screening bureau

Education and training, immunization, administration and social welfare.

B. Tuberculosis care center

Medical examinations, radiography, endoscopy, aerosol therapy, pulmonary function tests, analyses and researches.

That is, information and data will be collected in actual medical examinations and supplied to the sector of administration on prevention, education and training, etc. It is made a target to medically examine about 500 outpatients a day.

For this purpose, arrangements are so made that as ample room as possible will be set aside in the center of the building for the waiting hall of outpatients. The hall will be made a comfortable place to stay at with due consideration provided to ventilation, and each clinical block will be set around the hall with due thoughts given to the flow planning.

As for the administrative sector, an attempt is made to separate the flow planning completely between staffs and outpatients.

Each space for waiting in the clinical, laboratory and other blocks associated with outpatients will be placed along stretch from the central

waiting hall and made ready to locate to make the laboratory functions efficient.

4-5-2 Sigüeneau Sanatorium

The rooms required for each building as enumerated in the request for the construction of extension building at the Sigüeneau Sanatorium are as follows.

Medical Clinic Building

- Medical examination rooms (2) -- sinks and work tables
- Treatment room -- sink and work table
- Pharmacy and waiting room -- receptionist's counter
- Storage (large)
- Storage (small)
- Toilets for males and females
- Terrace for waiting

Ward for intensive care

- Separate ward buildings for males and females -- each with 10 beds to a total of 20 beds
- Nurse station
- Toilet and shower cabinet for nurses
- Toilets and shower cabinets for patients

Dining Hall Building

- Breezy dining hall and corridors to each building

Power Generator Building

It is decided that each building will be made one-storied and located with due consideration given to its relations with the existing buildings as stated in respect to the plan of location. The medical clinic building will be furnished with a terrace for the waiting of outpatients and each room in the building is designed to space opening for efficient ventilation.

4-5-3 Sectional and Dimensional Plans

To cope with the natural conditions unique to a subtropical area, it was a practice to check sunlight and rain-water by making buildings tall and their roofs sharp in pitch and to disperse radiant heat by widening the space of the attic as are observed in local rural communities. But it has gradually become a practice to construct pillars, beams and floor

boards with reinforced concrete and walls with reinforced concrete blocks against hurricane disasters and for other considerations. This suggests that such construction methods have gradually taken root in conjunction with an improvement of the quality of cement, reinforcing rods, concrete blocks and other building materials and an increase in their supply.

The sectional plan is designed to place adiabatic materials under the roof slabs, disperse the radiant heat coming from the roof by improving the ventilation of the attic, provide consideration to the ventilation by furnishing walls with wide openings, and make use of porous blocks and other materials as "brise-soleil" to shade the sunlight. The elevation calls for effective use as a means to give life to the individuality of each building.

4-6 Selection of the Construction Method and Planning of Structure

(1) Selection of Construction Method

The selection of construction method is considered from viewpoints of various factors as follows: (1) earthquakes and hurricanes; (2) conditions of local construction; (3) construction schedule; (4) costs; (5) maintenance and management after the completion of construction; and others.

According to the results of the field survey and collects data analysis, the local construction method has been selected, including the use of local materials. The reinforced concrete structure (regid frame) is adopted for columns, beams and floors, and reinforcing concrete blocks for walls.

The principle of the selected construction method is against the factors mentioned above as follows:

Against (1):

It is required in views of the importance of public use that a building is safe. The local construction method is able to meet its need.

Against (2), (3), (4):

The construction materials are obtained with ease, and it is no problem from the standpoints of workability, construction schedule and economization in that the local construction method is popular in the country.

Against (5):

It is easy to maintain, and manage to the building after the completion construction because of no uses of lumber and steel frame.

(2) Planning of Structure

Concerning structure planning, there are no regulations and standards against earthquakes in this country. Therefore, the design is considered to be appropriate for the adoption of Japanese standard code and the Standards of Architectural Institute of Japan, arranging them to meet the local conditions. According to the above mentioned, the reinforced concrete structure is adopted for the building, and as for long term load the building is designed to secure enough safeness to the loads mentioned below;

Seismic forces:

Generally, the earthquakes in the country they said to be slight so far(Max. Modified Mercalli scale of earthquake intensities II) seldom occur in the country. According to the recorded data, of earthquakes. In Dominica it was recorded at maximum of magnitude 8.1 on 4th August, 1946, and recently a magnitude 6.4 occurred on March 23, 1979. The proposed site is a 300 km distance from the focus of these earthquakes and its subsoil is composed of with line rock masses. For these reasons, it seems to be barely felt by a few people.

In designing, the maximum acceleration (A_{max}) is estimated from the distance (x) from the epicenter and the characteristics of the subsoil with the formula (a) in the case of the earthquake of $M = 8.1$ which had occurred in Dominica. The safety rate is also taken into consideration to obtain the final value. (See Fig. 4-1).

$$A_{max} = 10^{0.44M - 1.379 \log x + 1.04} (\text{cm/sec}^2) \dots\dots\dots (a)$$

$A_{max} = 16 (\text{cm/sec}^2)$ is obtained with $M = 8.1$ and $X = 300\text{km}$.

Furthermore, with the safety factor of two times, the maximum design acceleration is to be $30 (\text{cm/sec}^2)$. This figure is approximately 1/10 of the design seismic live load used in Japan, corresponding to 6 on the modified Mercalli scale. It is also about the same as the design value (zone: 1) in the Uniform Building Code (U.B.C.)

Wind pressure: The geographical environment of the proposed site prevents hurricanes from directly attacking it and the maximum wind velocity

seldom exceeds 110 km/hr (30 m/sec) in Port-au-Prince. Therefore, the maximum momentary wind velocity is obtained as shown below.

$$V_0 = 1.1v + 7 = 40 \text{ (m/sec) } \dots\dots\dots (b)$$

For the average height of the buildings being under 10m, a uniform wind pressure is applied. Since the design momentary wind velocity in Japan 63 (m/sec), the design wind pressure q in the proposed site will be about $1/2$ ($q = 70 \text{ kg/m}^2$). Moreover, according to the U.B.C. on wind design, the wind pressure q seems to be $q = 75 \sim 100 \text{ kg/m}^2$. Accordingly, the wind pressure in the design will be $q = 100 \text{ kg/m}^2$ to be on the safe side with an even distribution with respect to the height and direction. As regards the wind force coefficient, the Japanese standard building code is adopted.

Since the subsoil is generally lime rock, the bearing capacity is expected to be sufficient. However, in some areas where it is covered with volcanic ashes, it will be necessary to reduce the bearing capacity of subsoil.

(a) Formula: A survey report on the damage caused by the Miyagiken-oki Earthquake (June 12, 1978. $M = 7.4$)

(b) Formula: Obtained from the observation data on the maximum momentary wind velocity and the maximum wind velocity during major typhoons in Japan.

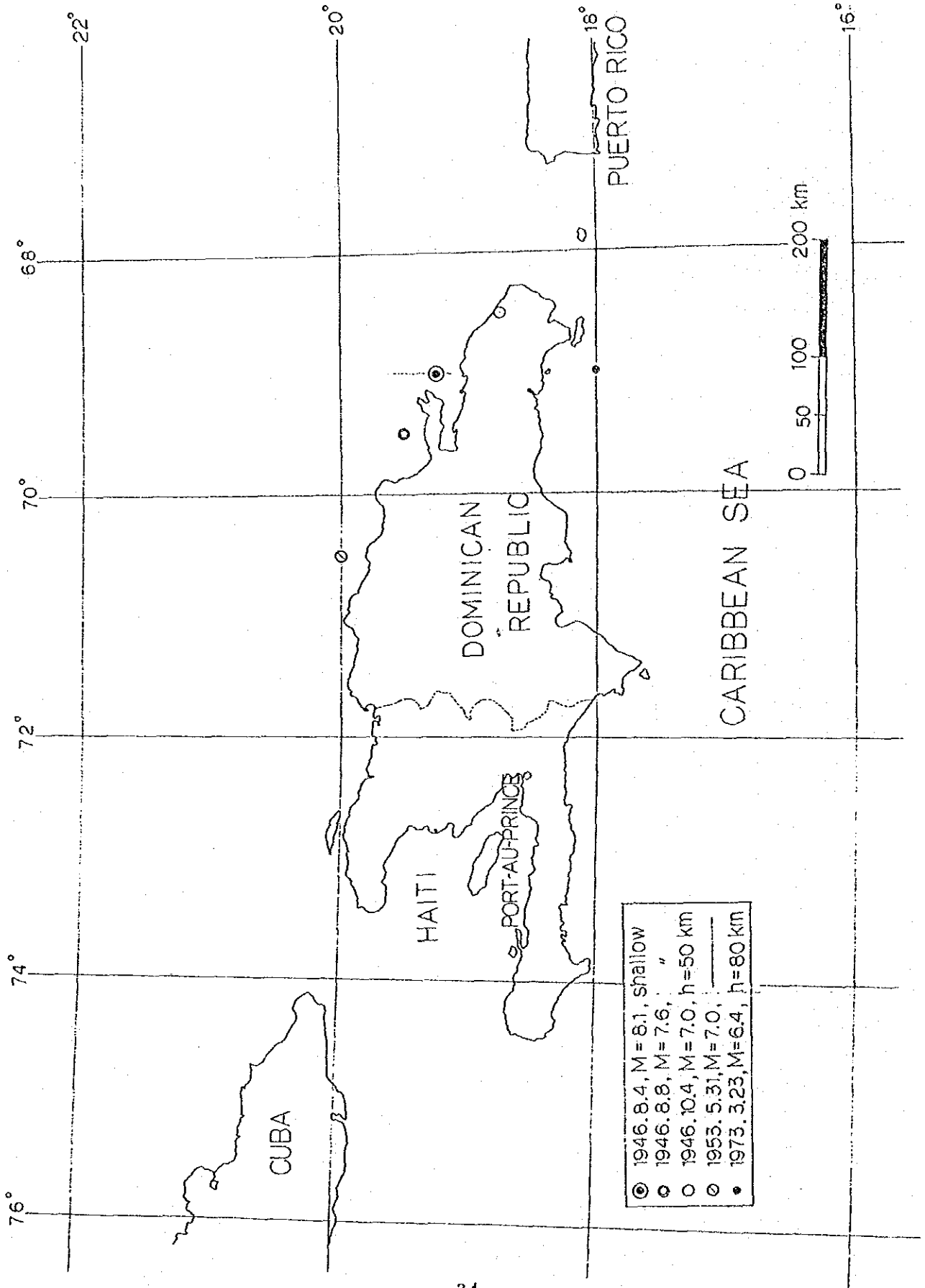


Fig. 4 - 1

4-7 Facilities Program

Practically no equipment parts are locally produced and almost every parts is imported from the United States and other countries. As for maintenance, there are few technicians and the existing facilities are neither put to full use, nor operated by them properly. It is therefore necessary to draft a basic rule to minimize facilities, so that they may be put to full use.

(1) Water Supply Plans

Tuberculosis Control Center

No water conduits are available in the road situated in front of the site. The water conduit, more than 20 ϕ , laid into the site across the road will be used.

Sigueneau Sanatorium

There are two wells and water tower tanks (both with a capacity of 3 m³ or so in capacity), one of which is under construction. Plans will be formulated for their use.

(2) Drainage Plans

For the treatment of wastewater, no central treatment facilities are available and individual septic tanks are used.

Neither clear-cut legal and technical standards for drainage nor its facilities are available.

Tuberculosis Control Center

Gutters and drainpipes are provided on both sides of the road in front of the site. According to the plan, miscellaneous water and wastewater which discharged from the treatment tank are lead to gutters and drainpipes. As no specific standards are available for a treatment tank, plans will be worked out for the installation of a treatment tank the capacity of which corresponds to the number of persons who will make use of it.

Sigueneau Sanatorium

General drainage and the drainage of the treatment tank will be devised as a percolation type. Now that there is a well in the compounds, the place for the treatment tank will be selected so that the impact on the well may be minimized.

(3) Sanitary Fixture Program

An medical equipment together with sanitary fixture are to be installed at the clinics of both areas to give full play to their functions.

Tuberculosis Control Center

Washrooms

For staff personnel: Western-style water closet, washstands, a set of liquid soap holder, mirrors, paper holders and other accessories.

Shower rooms

A complete set of fixed shower devices

Office of physiicians, medical examination rooms and rooms practically the same as above.

Washstands (to be installed if necessary)

Sigueneau Sanatorium

Washrooms and shower rooms

For staff personnel: Western-style water closet, washstands, paper holders and other accessories and complete sets of shower devices.

For patients: Night chairs (non-flush type), washhand forcets and complete sets of shower devices.

Medical examination rooms: Washstands and sinks.

(4) Air-cooling and Ventilation Facilities

Tuberculosis Control Center

Plans will be formulated to institute the office of the Director, office of the Administrators, Small-conference hall, each laboratory (sputum and other test rooms) with window-type air-conditioners, and other necessary rooms with electric fans.

Sigueneau Sanatorium

Plans will be formulated for the installation of ceiling-type electric fans in the medical consultation and treatment rooms, nurse stations, etc.

(5) Electric Facilities Plan

A. Electric Lights, Wall Plug Sockets and Electric Power

For both sites, high-tension wires are stretched along the frontal

road. Electric wires will be stretched to receive necessary electric power through a transformer. As there is no precise information about the regulations for the local supply of electric power, plans will be worked out in accordance with American standards, in principle, now that practically every piece of electrical equipment is mainly imported from the United States.

Tuberculosis Control Center

Office of the director, medical examination rooms, office of physicians and each laboratory are luminated at 300 Lx. and the storage rooms and the waiting hall at 100 - 150 Lx.

For lighting, fluorescent lamps will be used, in principle. As for wall plug sockets, a layout for their appropriate location will be formulated with due consideration given to their use in each room (also in relation to the use of medical instruments).

A necessary electric power program will be drawn for water pumps, air-conditioning devices, etc.

Sigueneau Sanatorium

The luminous intensity of the medical examination rooms, treatment rooms and pharmacy will be set at 300 Lx and that of other rooms at 100 - 150 Lx. For lighting, fluorescent lamps will be used, in principle.

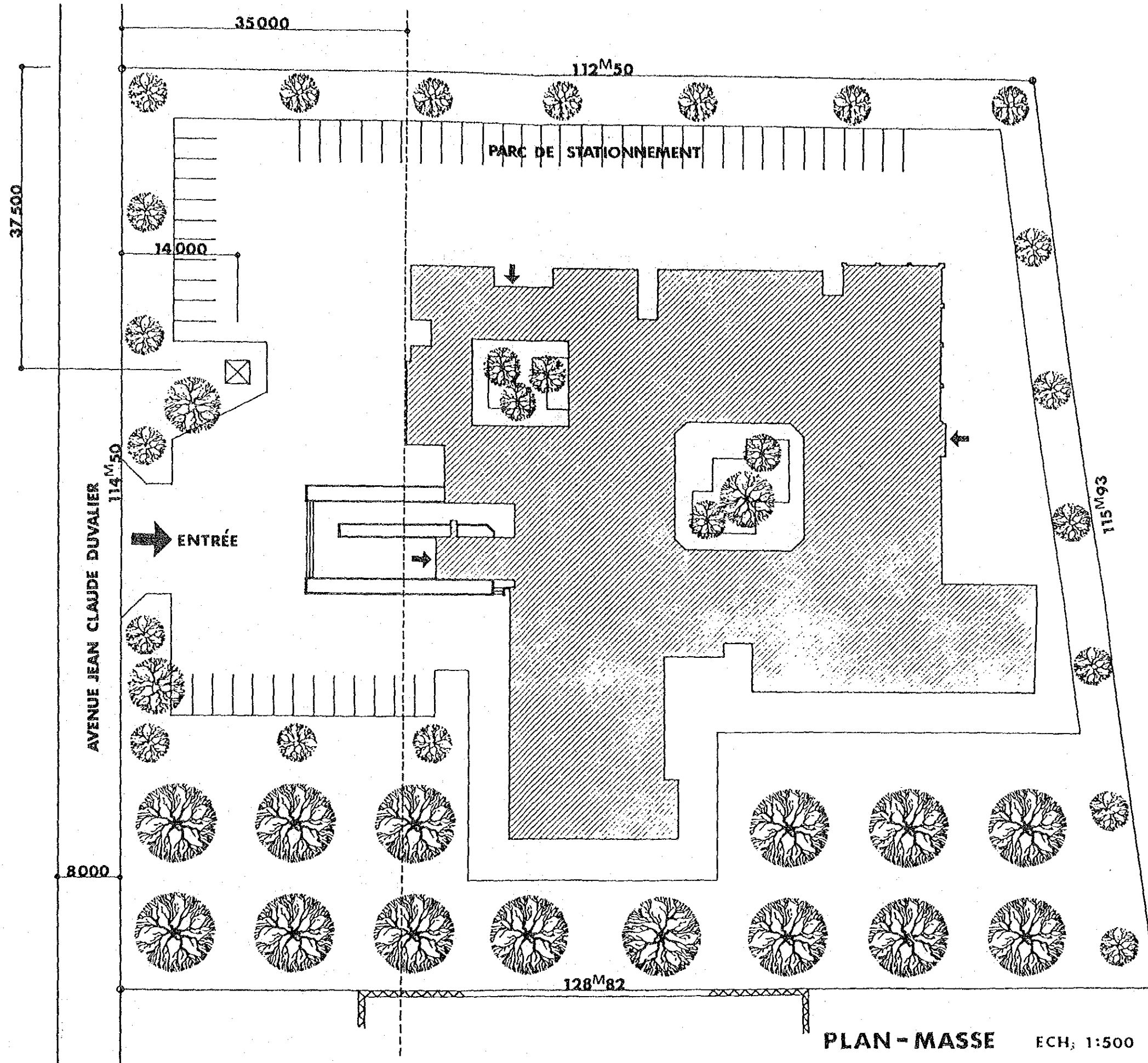
B. Communication Facilities

As it is necessary to install telephone facilities in conjunction with the construction of a new control center, tubes for communication wires will be installed under this project.

(6) Plan for Installation of Power Generators

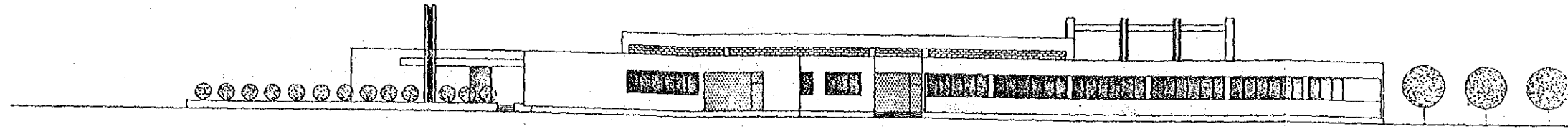
Because of the existence of power distribution wires, both facilities may be supplied with electric power. The frequent occurrence of a power suspension is likely to impede the routine medical care service, so that both facilities will be equipped with a 30 KVA power generator to assure the supply of a minimum necessary degree of electric power.

4-8 Basic Design Drawings

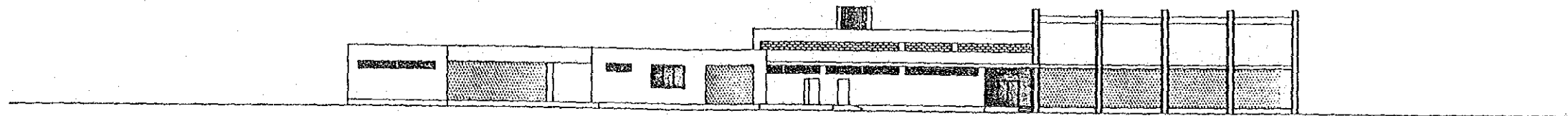


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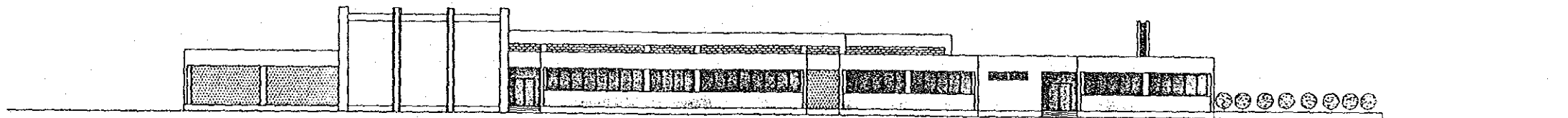
CENTRE DE CONTROLE DE TUBERCULOSE



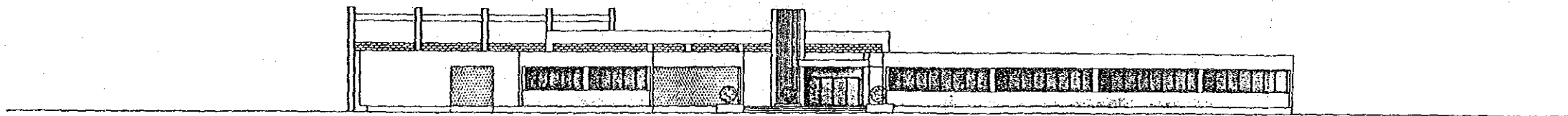
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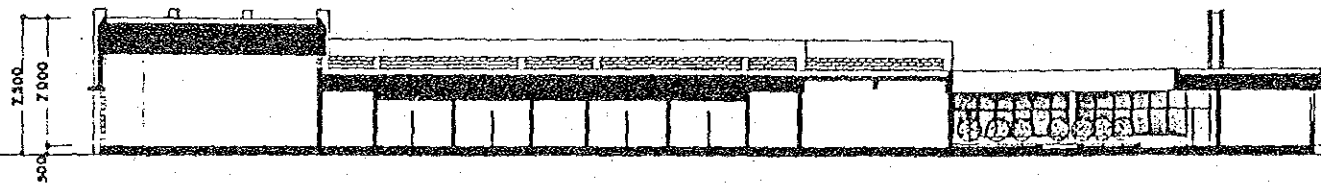
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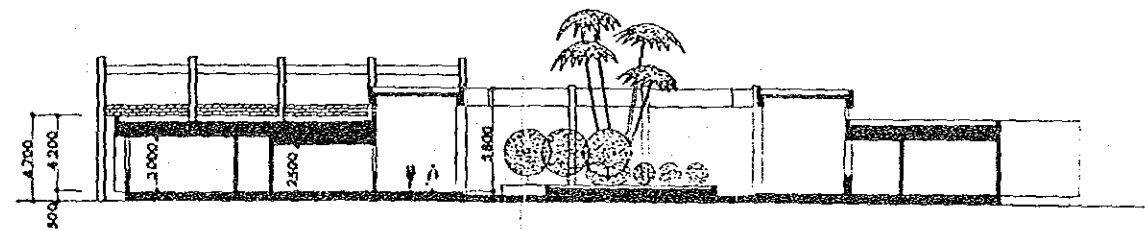
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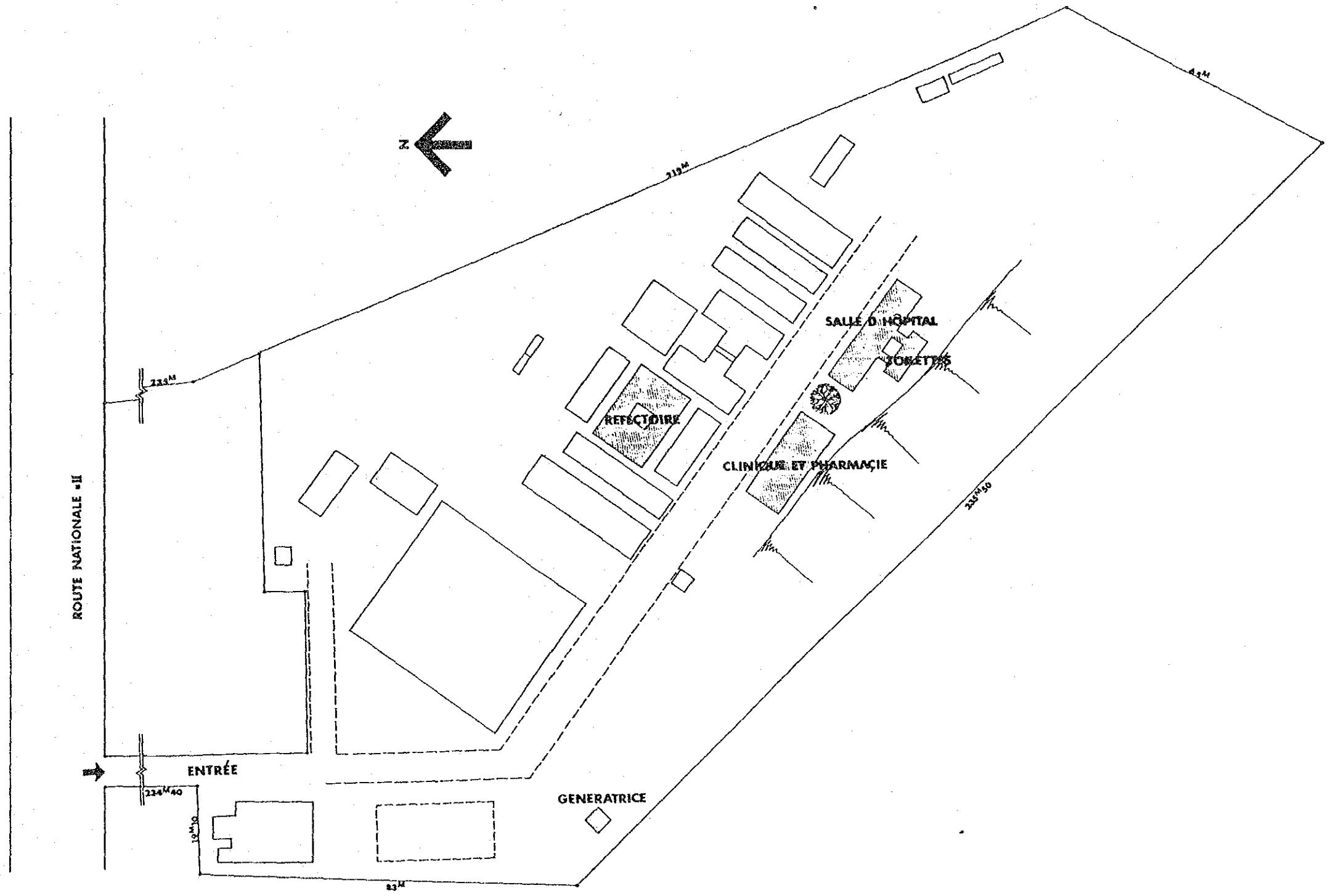
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SECTION A ECH 1:400

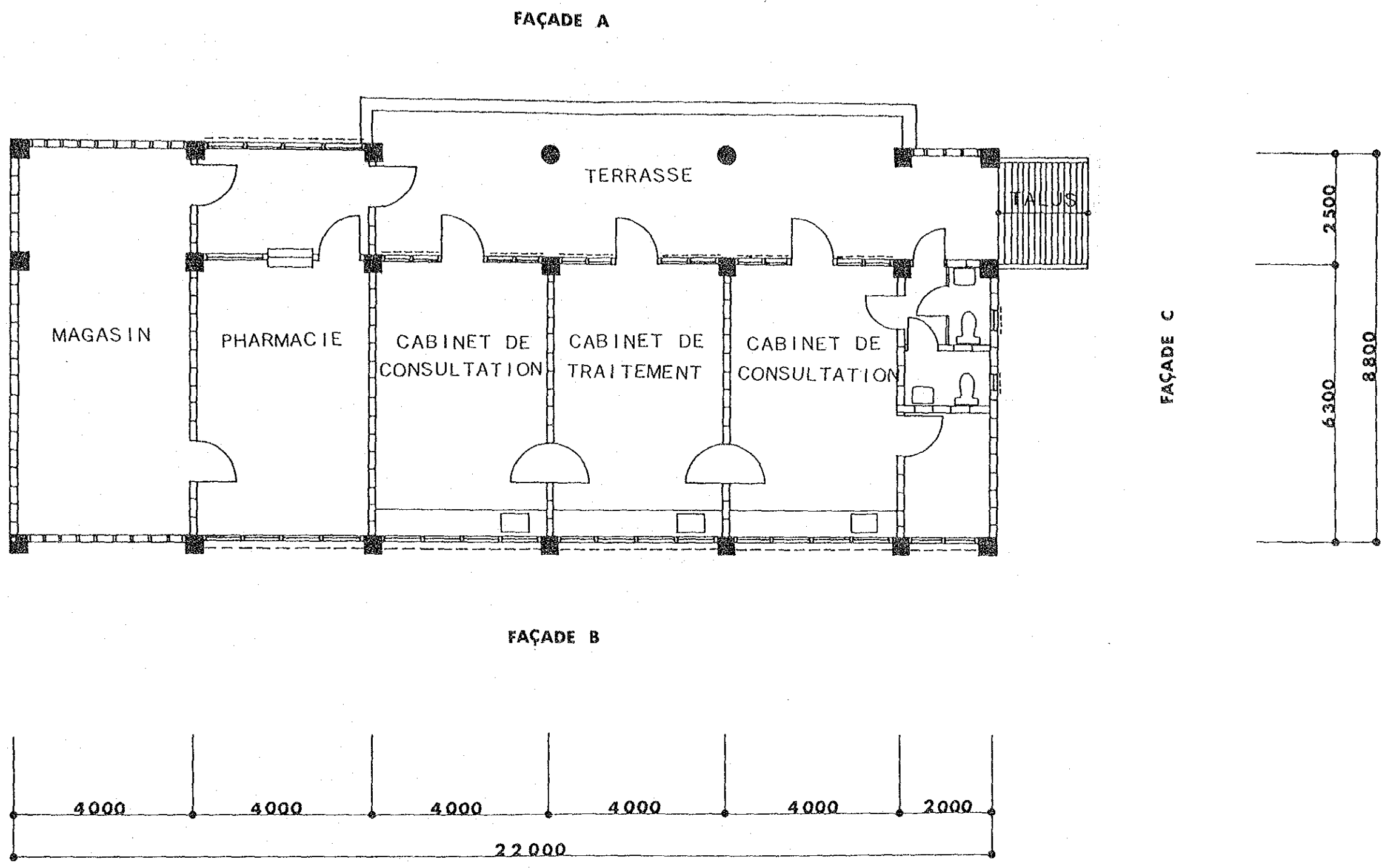


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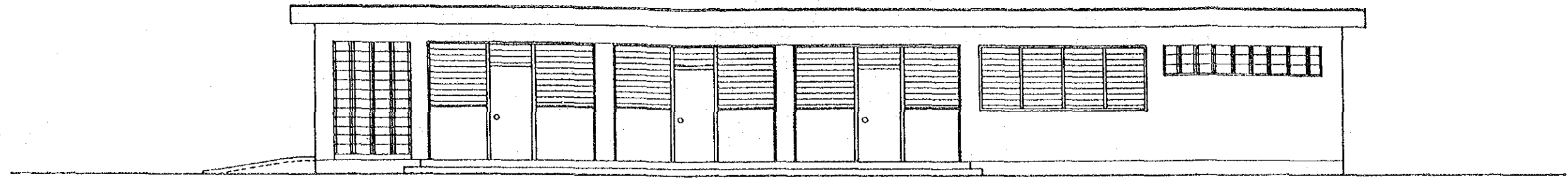


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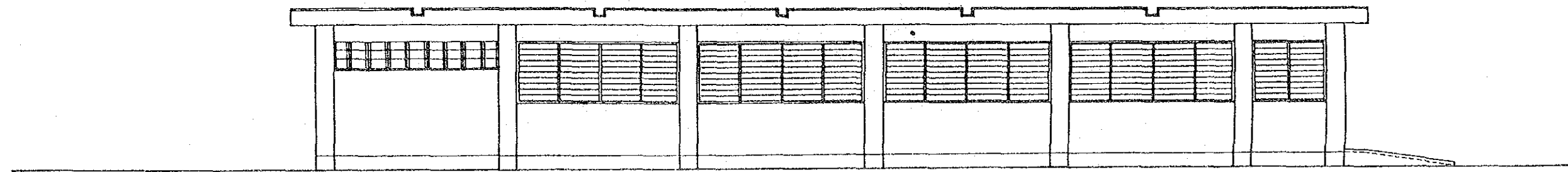
SANATORIUM DE SIGUENEAU



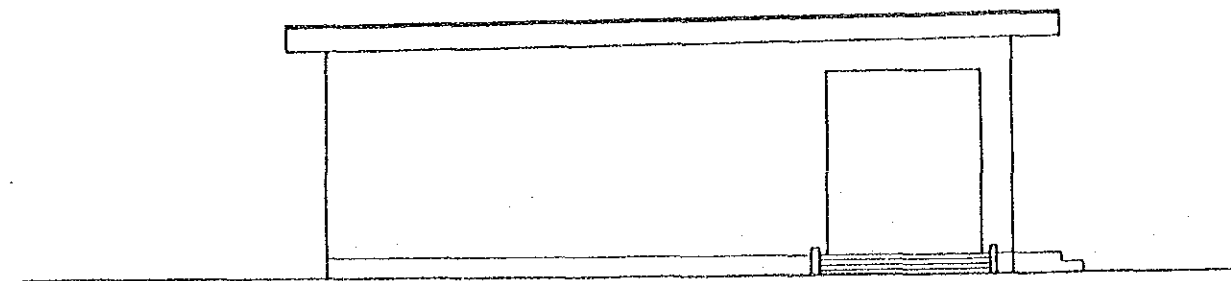
PLAN ECH 1:100
 CLINIQUE ET PHARMACIE



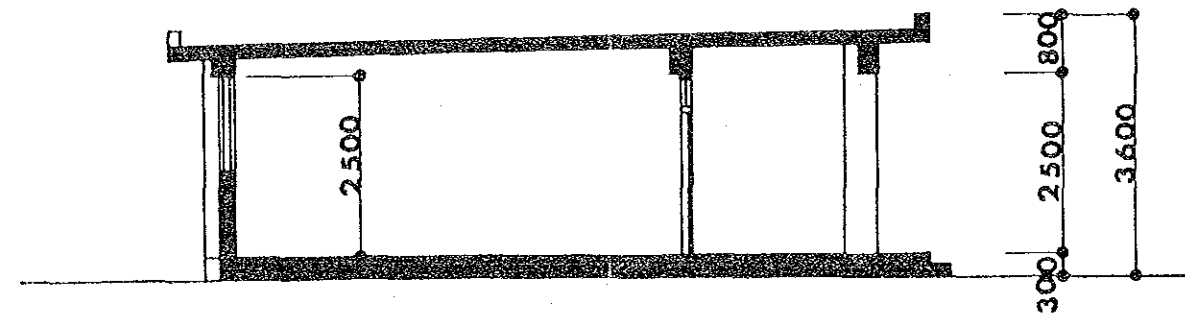
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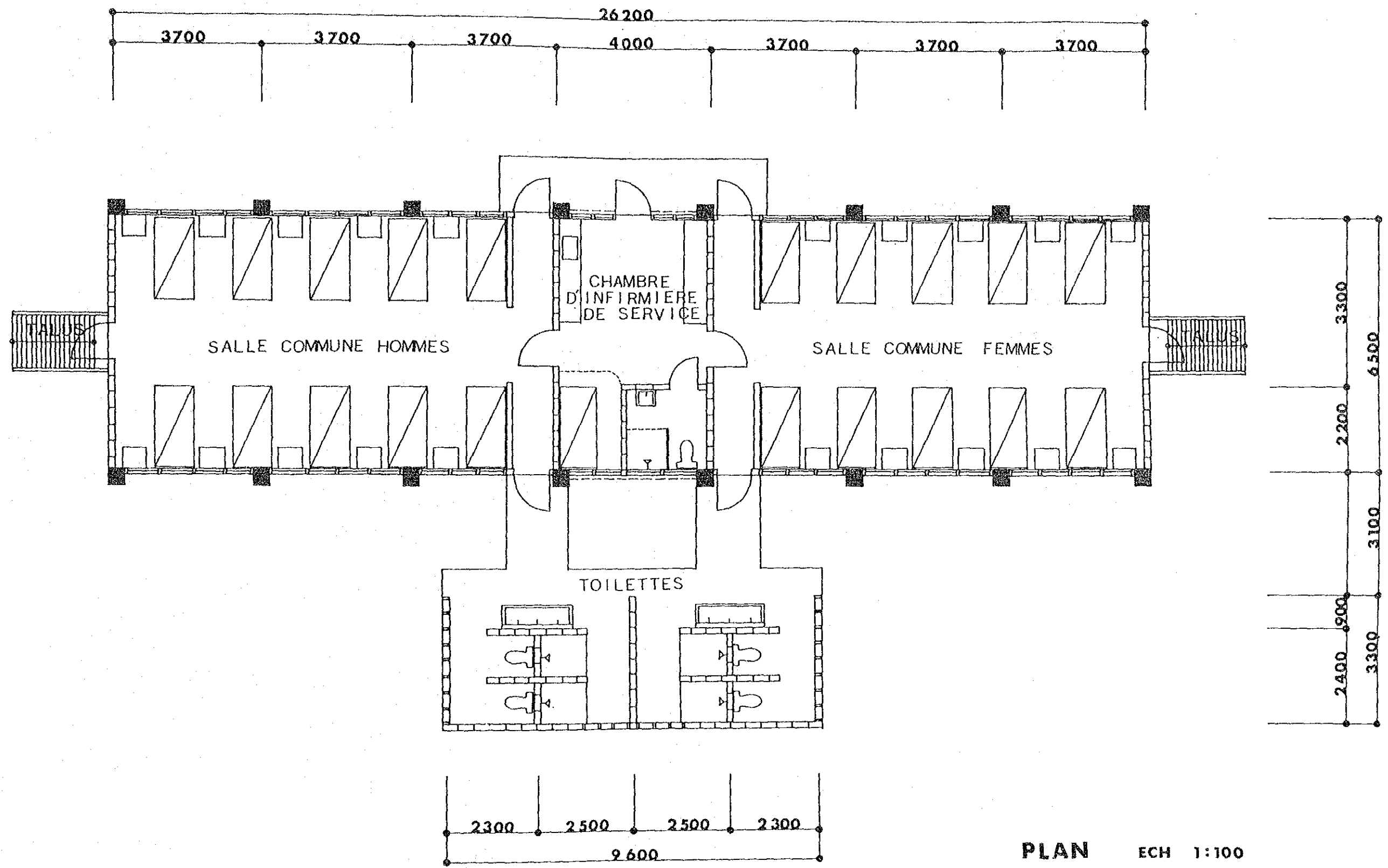
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FAÇADE C ECH 1:100

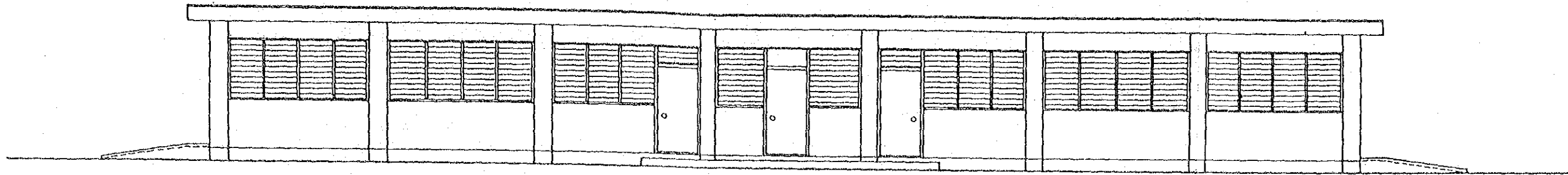


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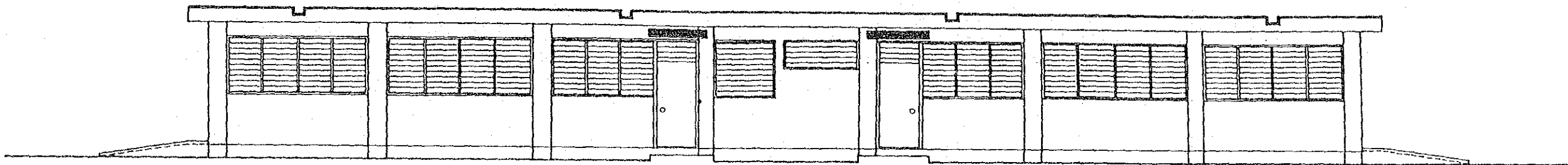


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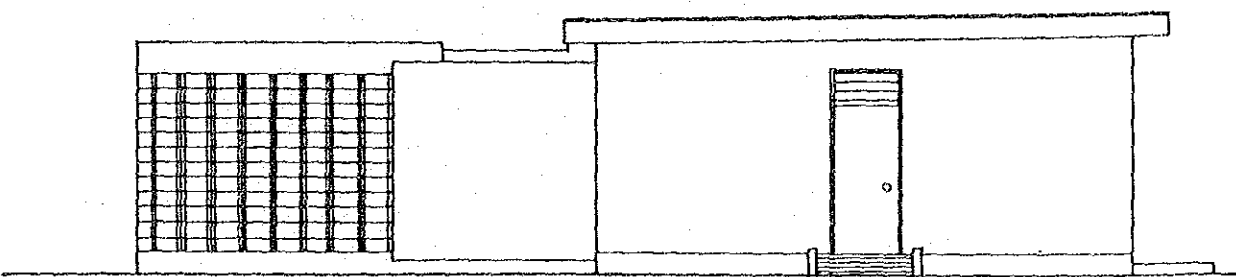
SALLE D'HÔPITAL



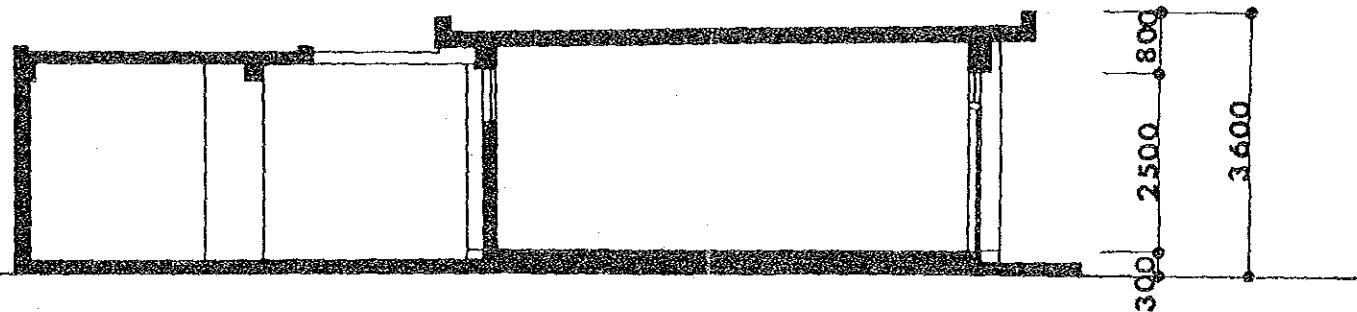
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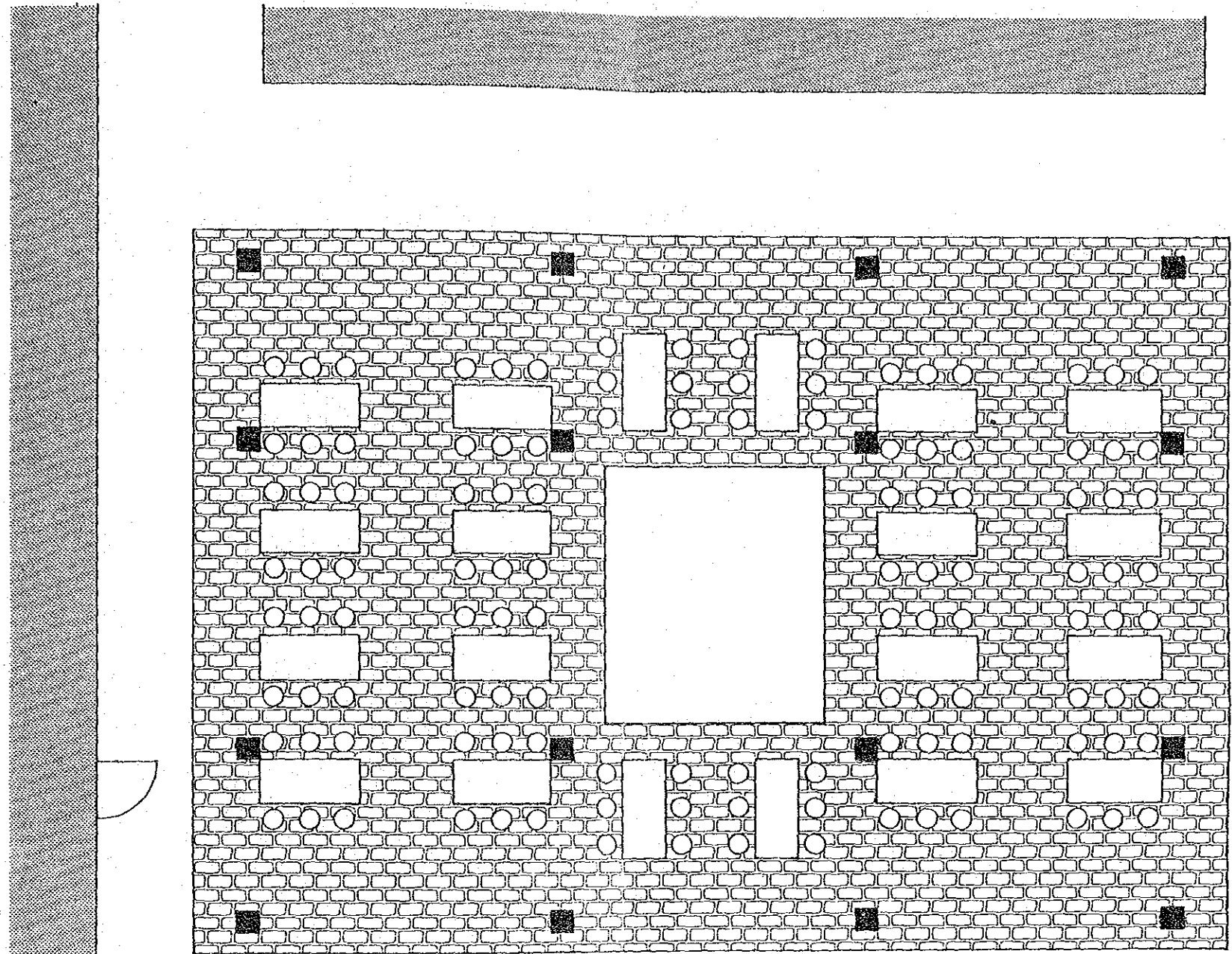
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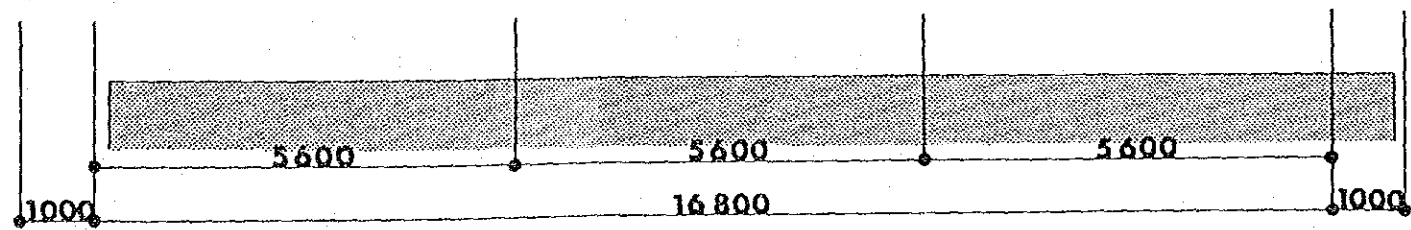
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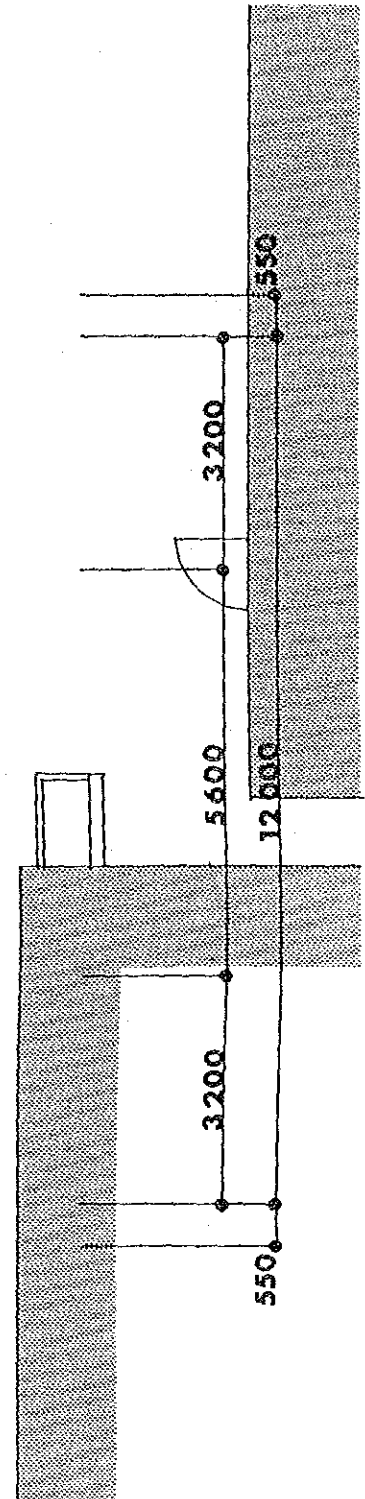
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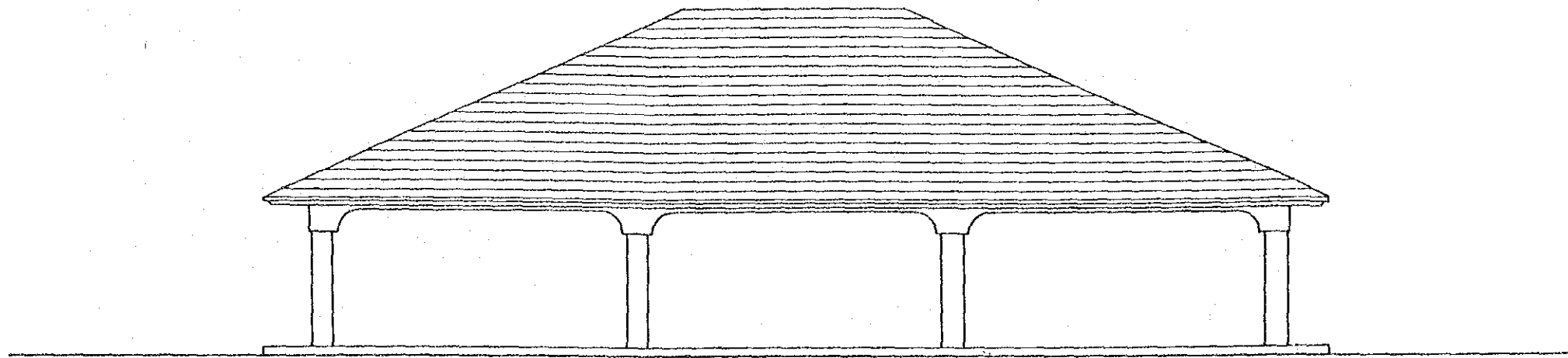
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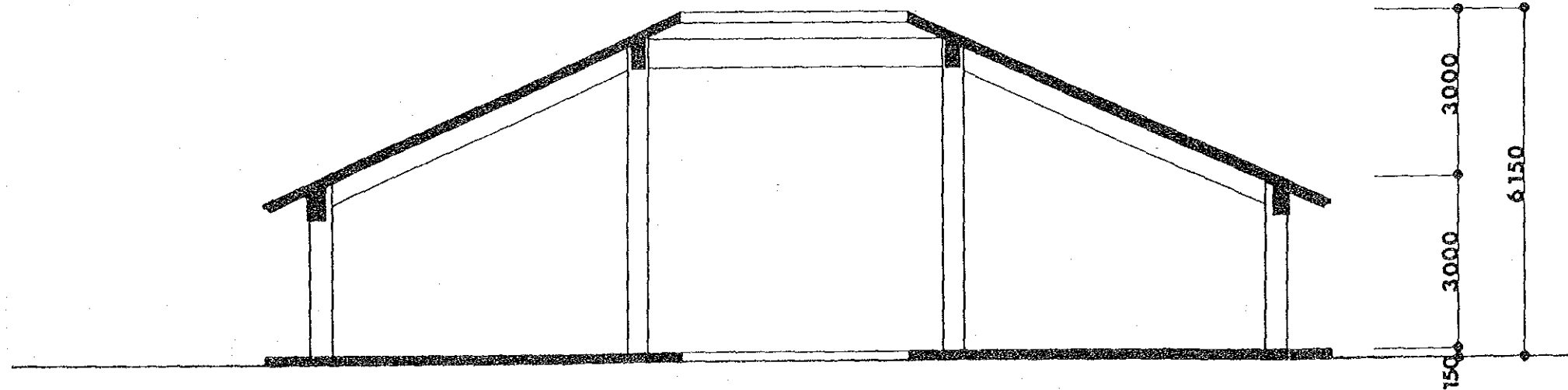
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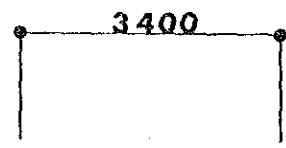
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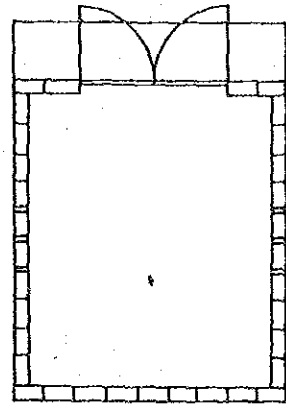
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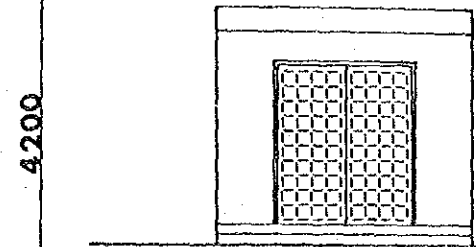
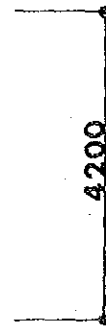
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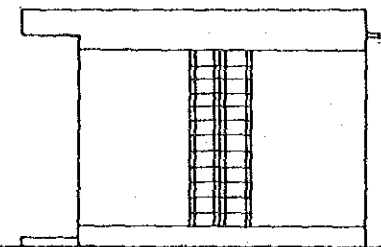
PLAN

ECH 1:100



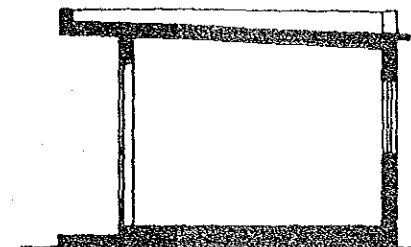
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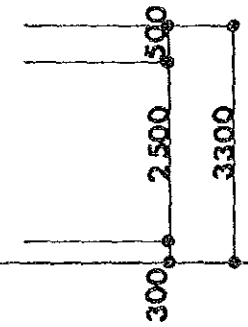
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GENERATRICE

4-9 Equipment Planning

In respect to the latest request for various equipment -- primarily, those for medical care, plans will be formulated for the supply of materials and equipment conformable to the present conditions of both facilities after a full, elaborate study. In other words, the present situation is such that there are an extremely small number of technicians qualified for the maintenance and control of equipment and it is necessary to depend on foreign technicians for their repair, it is essential that such equipment as required to employ sophisticated technology should be avoided to install.

The substance of the latest request may be roughly classified as follows:

- 1) Medical care equipment
- 2) Furniture and furnishings

The equipment and materials requested for both facilities are as follows:

Tuberculosis Control Center

- (1) Medical examination rooms

Medical equipment: Film viewer, examining couches, wash basin stand.

Furniture and furnishings: Desks and chairs

- (2) Treatment rooms

Medical equipment: Examining courche, boiling sterilizer, refrigerator, various shevles

Furniture and furnishings: Chair

- (3) Office of Physicians and nurse stations

Medical equipment: Film viewer

Furniture and furnishings: Meeting table, chairs

- (4) X-ray rooms

Medical equipment: X-ray devices for diagnostic radiography and tomography, film viewer, a set of film processing devices

(5) Endoscopy room

Medical equipment: Bronchoscope, forceps, head lamp (with fiber light sources), laryngoscope

Furniture and furnishings: Chair

(6) Aerosol therapy room

Medical equipment: Nebulizer motor, desk

Furniture and furnishings: Chair

(7) Hepatic function test room

Medical equipment: Spirometer

Furniture and furnishings: Chair

(8) Sputum analysis room

Medical equipment: Binocular microscope, fluorescent microscope, refrigerator, centrifuge, incubator, constant-temperature water bath, laboratory center table

Furniture and furnishings: Chairs

(9) Central material room

Medical equipment: High-pressure boiling sterilizer, cabinet for equipment

Furniture and furnishings: Desk, chair

(10) Office of the Director and administration offices

Furniture and equipment: Desk, chair, folding chair.

Sigueneau Sanatorium

Various equipment and materials have requested not only for the proposed buildings but for the existing buildings as well. The following plans are determined with due consideration given to the present state of the facilities available in the existing buildings.

(1) New building for medical clinic

Medical equipment: Binocular microscope, film viewer, instrument cabinet, medicine cabinet, autoclave, pneumothorax instrument, wheel chair, chart cabinet,

Furniture and furnishings: Library cabinet W/sliding doors, steel locker, electric fan, filing cabinet, copy machine

(2) New ward for intensive care

Medical equipment: Mobile X-ray unit, oxygen concentrator, hospital bed, bedside cabinet, autoclave, stretcher, overbed-table, suction unit, sterilizer

Furniture and furnishings: Food cart, electric fan, slop sink

(3) New dining hall

Furniture and furnishings: Tables, chairs

(4) Existing X-ray and laboratory building

Medical equipment: Nebulizer, medicine cabinet, laboratory side table, doctor's desk

Furniture and furnishings: Folding chair, library cabinet W/sliding doors, filing cabinet, water softener, electric fan

(5) Existing kitchen building, laundry building and patients' ward building

Kitchen building: Freezer and refrigerator

Laundry building: Washingmachine with dehydrator

Patients' ward building: Irrigator stand

4-10 PROGRAM OF THE CONSTRUCTION PROJECT OF THE REPUBLIC OF HAITI

