AGREED MINUTES OF DISCUSSIONS ON THE CHILDREN'S PROGRAMME FOR THE UNIVERSITY TEACHING HOSPITAL, LUSAKA, ZAMBIA

In response to the request made by the Government of the Republic of Zambia for the construction project of the children's hospital in Zambia (hereinafter referred to as "the Project") and in accordance with Japan/Zambia Joint-Communique which was made public on the occasion of President Kaunda's recent visit to Japan, the Government of Japan has sent, through the Japan International Cooperation Agency (hereinafter referred to as "JICA"), a basic design survey team headed by Dr. Keijiro Suruga to conduct a basic design survey for 25 days from October 25th, 1980. The Team had a series of discussions and exhanged views with the Zambian authorities concerned.

Both parties have agreed to recommend to their respective Governments to examine the results of the discussions attached herewith toward the realisation of the Project.

Done this day 31st October, 1980, in the English language, in Lusaka, Zambia.

Dr. Keijiro SURUGA
TEAM LEADER
THE JAPANESE SURVEY TEAM

Dr. Joseph M. Kasonde
PERMANENT SECRETARY AND
DIRECTOR OF MEDICAL SERVICES
MINISTRY OF HEALTH

M I N U T E S

1. The proposed name of the Project is the University Teaching Hospital Neonatal and Paediatric Surgical Centre (hereinafter called the "the Centre").

2. For the purpose of these minutes the term "Centre" refers to a unit within a hospital complex.

3 The proposed site of the Project will be within the University Teaching Hospital campus in Lusaka, Zambia.

(hereinafter referred to as "the Project Site").

4. The objective of the Project is to provide necessary buildings, incidental facilities and equipment for the Centre at the Project site.

5. The basic concept of the proposed Centre is as follows:-

(a) Following the policy of Japanese Technical Cooperation Programme to Zambia, the Centre will be functionally defined as a teaching centre to post and under-graduates at the University Teaching Hospital, and will include clinical research.

(b) The Centre will be functionally connected to the existing facilities of the Univeristy Teaching Hospital.

(c) The main role of the Centre is care of newborn infants (particularly premature babies), paediatric surgery and basic paediatric training based on the above two specialties which are important ones in the paediatric field.

(d) The function of the Centre will be to improve neonatal and paediatric surgical work in Zambia and will be beneficial both for saving lives of many sick small infants who need intensive care and a high level of medical technology and for promotion of child health.

(e) Medical equipment will be provided taking into consideration maintenance costs, durability and effectiveness for transfer of technology.

6. The Zambian Team expressed the intention of the Zambian Government to expand the proposed Project to cater for all aspects of child health care. The Japanese Team will take the above intention into consideration in the selection of the Project site and the design of the Centre.

7. The Zambian Team expressed the desire that the proposed Centre should have a capacity for not less then 100 beds.

8. The Japanese Survey Team will convey the desire of the Government of the Republic of Zambia to the Government of Japan that the Japanese Government will take the necessary measures to cooperate in implementing the Project and will provide the building and other items as listed in Annex 1 within the scope of Japanese Economic Cooperation in grant form.

9. Taking into consideration the grant assistance conditions of the Japanese Government, the Government of the Republic of Zambia will:-

   (a) provide data and information necessary for the design and the construction;

   (b) prepare the Project site before the start of construction;

   (c) provide other items listed in Annex II;

   (d) ensure prompt unloading and customs clearance for imported materials and equipment for the construction of the Project, and also facilitate the internal transportation for them

   (e) exempt Japanese nationals concerned from customs duties, internal taxes and other fiscal levies which may be imposed in Zambia on the occasion of the supply of goods and services for construction;

   (f) provide and accord necessary permission , licences and other authorisation required for carrying out the Project.

10. Annexes 1 and II are part of the agreed minutes.

A N N E X 1

Items requested by the Government of the Republic of Zambia whose cost will be borne by the Government of Japan:-

(1). Facilities:

(a) Administration (K.S.) 17.

- Consultation Rooms
- Staff offices
- Junior Doctor's Rooms
- Night Duty Rooms
- Lecture Theatre
- Nursing Office
- Others

(b) - Wards:

1. Premature
2. Surgical
3. Isolation
4. Paediatrics

(c) Laboratory Rooms: (K.S.) 17

- Emergency Test.
- Surgical Pathology
- Autopsy

(d) Physical Examination Rooms

(e) X - Ray Rooms

(f) Operation Theatre Suite

(g) Procedure Rooms

(h) Breast Feeding Rooms

(i) Others

(2) Medical Equipment

(3) Detail Design and Supervisory Services.

ANNEX II

1. Items whose cost will be borne by the Government of the Republic of Zambia.

1. Water supply and steam supply to the building.
2. External drainage and sewage line from the building.
3. Electrical main power/line to the building.
4. Telephone lines and telephone equipment
5. Exterior facilities and landscaping.
6. Provision of scope necessary for such construction, as temporary office, working area, stock yards and others.
7. Installation of Sub-station with transformer.
8. Temporary water supply, electricity and telephone services during construction.

AGREED MINUTES OF THE SECOND DISCUSSIONS ON THE CHILDREN'S PROGRAMME FOR THE UNIVERSITY TEACHING HOSPITAL LUSAKA – ZAMBIA

The Japanese study team on the Centre headed by Prof. K. Suruga of Juntendo University was despatched to Zambia from 10th to 21st February 1981 by the Government of Japan to discuss the draft report on the basic design for the construction of the University Teaching Hospital Neonatal and Paediatric Surgical Centre (herein after called the Centre) with the representative authorities of the Government of the Republic of Zambia, headed by Dr. J.M. Kasonde, Chairman of the Centre Construction Committee.

Having completed a series of meetings, both sides agreed on the following points:

1. Name of the Centre
   The Name of the Centre was decided as "The University Teaching Hospital Neonatal and Paediatric Surgical Centre".

2. The Draft Report on the said Centre was explained by the Japanese Team and the Zambian Team fully understood the contents. The Zambian Team also confirmed its acceptance of the report in principle with amendments contained in Appendix I.

3. Medical Equipment
   The list of medical equipment provided in the report was examined by the Zambian Team. Modifications proposed by the Zambian side are shown in Appendix - II
   Minor modifications necessary to finalize the equipment list will be considered by the Japanese Team within the budget allocation for the Centre under the grant assistance and technical cooperation programme.

/2.....

It was agreed that both the medical equipment provided for this project and that provided under the Technical Cooperation Programme shall be used at the Centre after its completion.

4. Personnel Allocation
The Zambian Team agreed to indicate medical, nursing and administrative personnel before the completion of the Centre.

The Zambian Staff who will be engaged in the maintenance of facilities and medical equipment will similarly be indicated.
Appendix III shows the tentative personnel requirements.

5. The Japanese team will recommend to the Government of Japan to provide the grant aid for the construction of the Centre along the lines stated in the final report.

6. The Japanese Team and the Zambian Team agreed to recommend to their respective Governments that construction of the Centre should start by October 1981.

7. Appendices I - III are an integral part of these agreed minutes

Done this 18th day of February, 1981, in the English Language, in Lusaka, Zambia.

Keijiro Suruga

Prof. Keijiro Suruga
Team Leader
THE JAPAN SURVEY TEAM

J. Kasonde

Dr. Joseph M. Kasonde
Permanent Secretary and
Director of Medical Services
MINISTRY OF HEALTH
ZAMBIA

APPENDIX - I

GENERAL

1. Block II and III will be shifted towards East by increasing 3 meters of length of corridor.

2. Ramp will be made covered so as to protect from rain and sun.

BLOCK - I (O.P.D. & ADMINISTRATION)

3. There will be separate toilets for male and female and separate toilets for visitors and staff.

4. Staff room No. 4 (Ground floor) will be converted into patients records room and accordingly one staff room will be reduced.

5. Provision of Cleaner's Room near the O.P.D. toilets will be made on each floor.

BLOCK - II GENERAL DIAGNOSTIC AND TREATMENT

6. Duty room will be converted into scrub - up room

BLOCK - III (WARDS)

7. Office room will be converted into reception.

8. Reception and Instrument store will be adjusted to accommodate linen store

9. Breast feeding and Mothers waiting will be combined to make one room with attached toilet on each floor.

10. Number of Isolation rooms to be increased in Paediatrics ward on the ground floor.

11. Lecture Theatre on ground floor will be made bigger by combining existing milk room and will be called Tutorial room.

12. Milk room on first floor will be made bigger by adding lecture theatre into it.

13. Endoscopy room should be constructed and equipped in such a way as to serve as a multi purpose room catering for sterile non- surgical procedures such as exchange transfusion.

Appendix II

I. In view of the number of beds in the ICU and because isolation wards may on occasion simultaneously require utilization of respirators at least 9 respirators should be provided.

2. At least 30 incubators will be required in order to cope up with the present rate of admission.

3. An autoclave (preferably the run-through type) will be needed in the milk room to ensure a high standard of cleanliness of the bottles.

The Japanese Government is requested to consider provision of the above listed requirements.

Appendix III

Tentative list of personnel to be assigned to the Centre.

I.	Medical and Technical		
	Doctors	a) Consultant Paediatric Surgeons	2*
		Consultant Paediatricians	2*
		Senior Registrars	3*
		Registrars	8*
		Junior & Senior House Officers	8*
		b) Anaesthetists	3*
		c) Radiologist	I*
		Radiographer	I*
	Nurses		40(I6*)
	Medical Lab. Technicians		6
II.	Engineering and Technical		
		a) Medical Equipment Technicians	2
		b) Mechanical Engineers	I
		c) Engineering Technicians	3

* In addition to existing staff compliments.

/2.....

III. Administrative - Supervisory

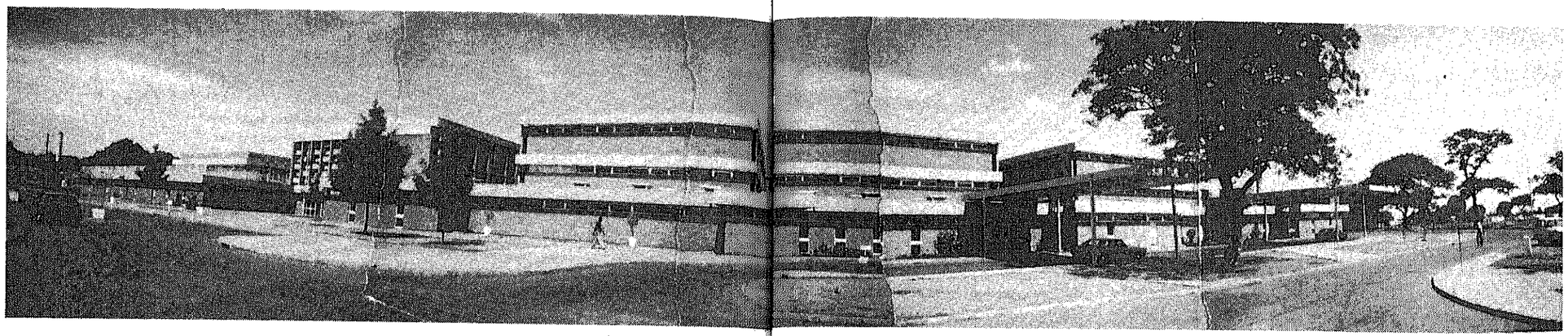
a)	Nursing Officer	I
b)	Sisters	2
c)	Housekeeper	I
d)	Records Clerks/Receptionists)	6
e)	Maids	20
f)	Porters	4

In order to ensure continuity in the long term and in accordance with the suggestions put forward to the Zambian Government, it will be necessary to organise orientation and or specified training for some of the Zambian personnel listed above between now and the completion of the Centre.

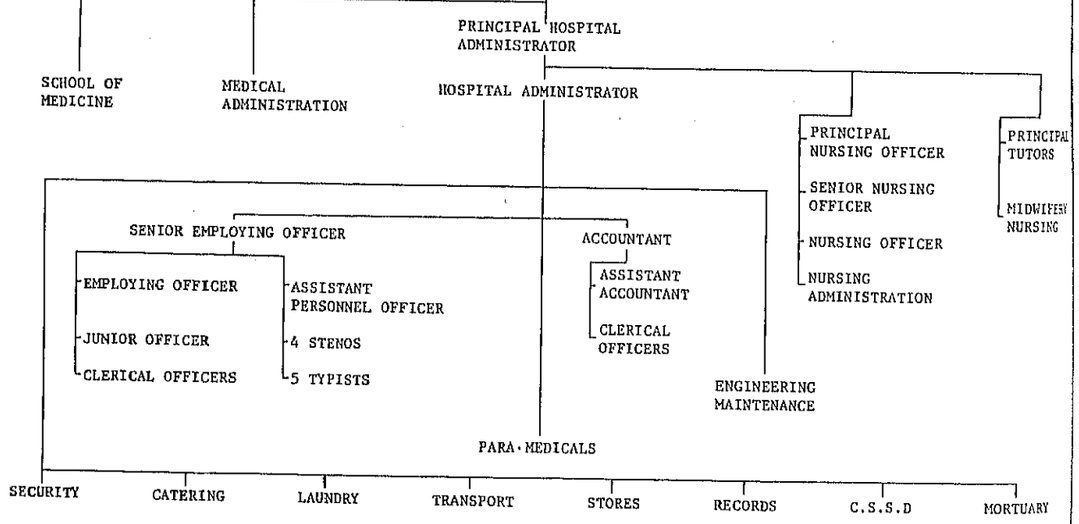
APPENDIX A UTH FACILITIES INVESTIGATION REPORT

B LIST OF MEDICAL EQUIPMENT

C COST PARAMETERS FOR CONSTRUCTION IN ZAMBIA

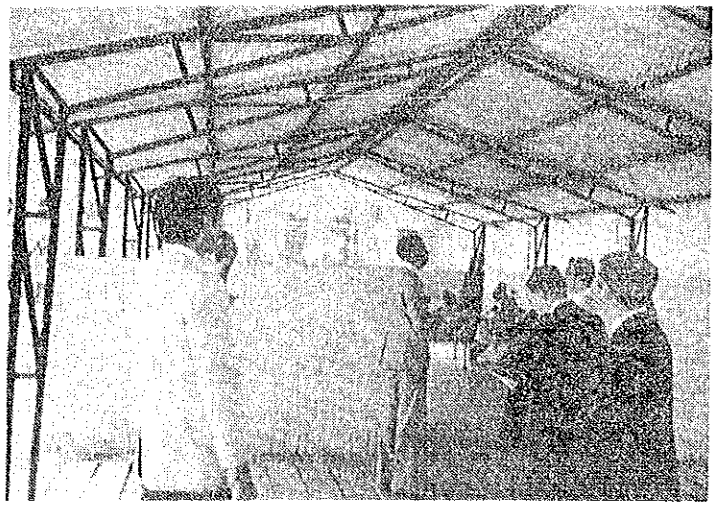


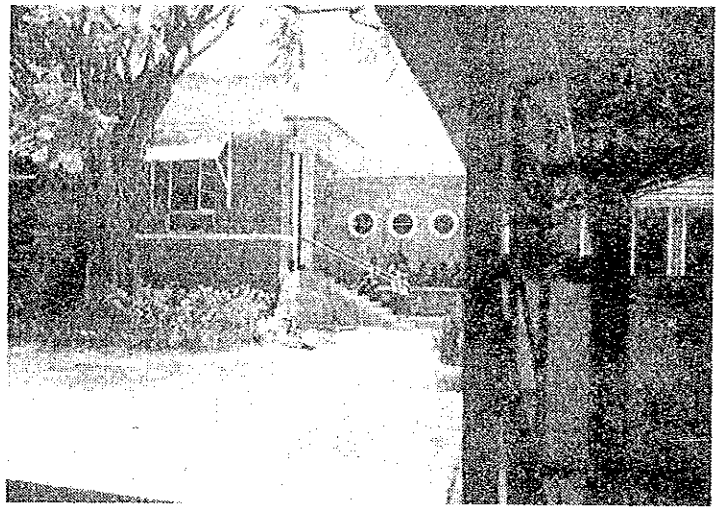
UTH ORGANIZATION

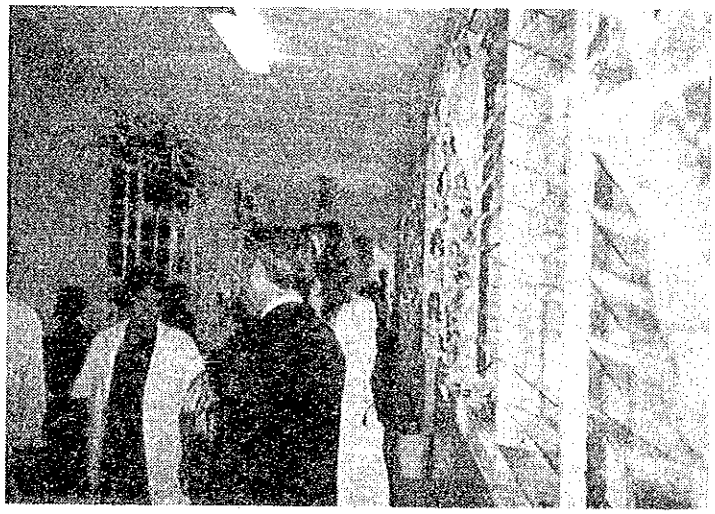


APPENDIX A UTH FACILITIES INVESTIGATION REPORT

1. The Role of UTH
2. Existing Paediatric Wards
   - Ward
   - Paediatric OPD
   - Central Diagnostic
   - Existing Staff Allocation
3. Maternity, Obsteric & Premature Unit
4. Operating Theatre
5. Intensive Care Unit
6. General OPD, Emergency Department
7. Paediatric OPD
8. X-ray Department
9. Pharmacy
10. Blood Bank
11. C.S.S.D
12. Laundry
13. Kitchen, Cafeteria
14. Mortuary, Autopsy







Existing Paediatric Ward

1. The Role of UTH

As shown in Table 2-1, UTH is the central hospital in the Lusaka Province and at the same time the only teaching hospital in Zambia.
In the field of education, the hospital engages in student education for the last 3 years of the medical department clinical course as well as training of the post-graduate residents. As the central hospital, it has an Emergency Department, and it is said that 80% of baby birth in Lusaka City take place in the hospital. The hospital had additional mission of supplying medicine and medical materials from its pharmacy and C.S.S.D to 36 Health centers in the Lusaka city area.

The following are some major statistical figures:

1.	Number of out-patients - average per day		1,636
	Number of in-patients	- " "	1,720
	Number of operations	- " "	43
	Number of births	- " "	56

2.	Average hospitalization period	
	Paediatrics	7 days
	Obstetrics	2 days
	Surgery	8 days
	Internal Medicine	4 days
	Total average	6 days

(From UTH Static Department)

2. Existing Paediatrics Ward

Ward

The ward is located among old hospital buildings, and it consists of 5 parts; 3 general wards and one each of separated ward and transfusion ward. As per one Nursing unit 80 to 120 babies are hospitalized. Each ward has exclusive senior and junior registrars and students and residents are trained by the senior and junior registrars.
Nurses work on 3 shifts of 8:00AM to 1:00PM, 1:00PM to 8:00PM, and 8:00PM to 8:00AM. 3 nurses are on duty at night. There are staff nurses and enrolled nurses and dayly paid workers.

At one part of a ward, there are 4 ICU beds. The beds are for critically sick babies who cannot be addmitted to the Premature-baby Unit since they once left the hospital, and the facility is by no means perfect.
All rooms contain a number of babies with natural ventilation system. Adult beds are used and the mats are placed at about 80 cm height from the floor.

Meals for other patients are brought from the central Kitchen. To babies, breast feeding is predominant and there are sleeping facilities provided for the mothers, as a mother's hostel, who come to the ward once every 3 hours. Guidance is given to these mothers for breast feeding, meals and sanitation.
The table below shown in and out of a certain nursing unit on the day the survey was made.

(November 5, 1980)

No. of Admission	0
Transfer-In	1
Transfer-Out	1
Discharged	9
	1
Death	2
Ward Strength	97

Paediatrics Out-patients

The paediatric ward above mentioned has an out-patient clinic Department and performs the mission of a filter clinic.
The consultation is free of charge, and as a rule, the time is from 7:30AM to 12:30PM and from 2:00PM to 4:00PM. Emergency case at night is accepted.
There are 3 consultants in this Department and they change the position with other Department in every 3 months.

Number of out-patients on the previous day of the survey was 145 new patients and 86 revisits.
Micro-bus is public transporation means in the city and patients come to the hospital either on foot or in the bus.

Central Treatment Department

This department is equipped with an X-ray room for breast picture taking. On the previous day of the survey, there were 43 picture taking cases. Films are developped manually and stored independently.

Examination of blood and urine is performed in a small independent building.
Medicines are brought in from the pharmacy in the new Hospital Block twice a week.
Since the existing Paediatric facilities were left untouched in the UTH developping plan and are separated from newly built UTH, inevitably there are some confusion and overlapping between the two facilities.

Number of Current Staff

Existing paediatric ward (300 beds)

· Doctors	Consultant	3
	Senior registrar	6
	Junior and senior house officer	12
· Nurses	Staff nurse	38
	Zambia enrolled nurse	40
· Phamacists	Pharmacist	1
	Pharmacy dispenser	3
· Para-medical staff	Laboratory technician	2

Premature ward (70 beds)

· Doctors	Consultant	1
	Senior registrar	1
	Junior and senior house officer	4
· Nurses	Staff nurse	9
	Zambia enrolled nurse	15

3. Maternity, Obsteric and Premature Unit

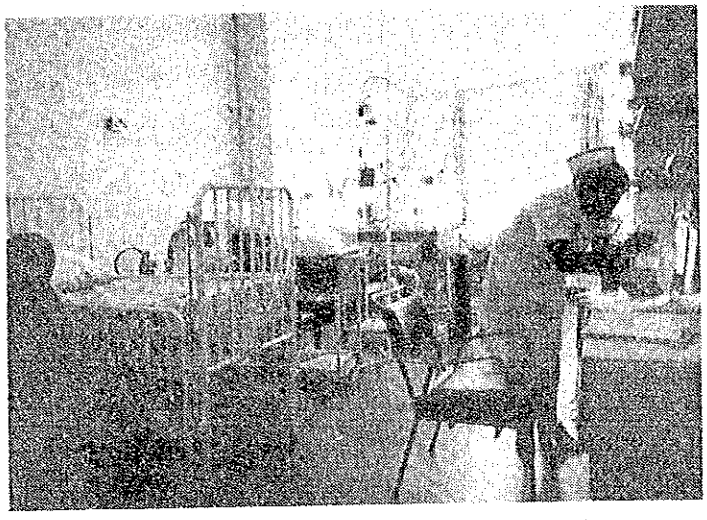
This department receives out-patients and health centres in the city send pregnant mothers. It is said that an 80 percentage rate of baby birth in the city are taken care of by UTH.

There are 20 delivery beds and additional 4 beds for observation use.
Pregnant women are taken care of preponderantly.
Hospitalization is 6 to 24 hours after delivery. A car sends the mothers and babies home twice a day.

When the delivery was not smooth or born babies of less than 2,000g, they are sent to the adjacent premature unit as a rule.
The premature room is attended by 8 nurses, 1 chief nurse and 2 doctors.

Only parents are permitted to visit the premature room and babies are fed by the mother directly. 2 to 3 babies are put in one cot.

The room is heated and a ventilating-fan is installed at the window.



SPECIAL TREATMENT

ICU & NURSE STATION

4. Operating Theatre

The operating theatre is managed by the chief nurse and operation is performed 5 days a week, during 9:00AM through 1:00PM and 2:00PM through 4:00PM in 16 units every week, as a rule. In the preceding month of the survey, there were 480 cases of operation. There are total 8 operating rooms, among which 5 rooms only are being used.
The 5 rooms are used as follows:

1. General
2. Orthopaedics
3. Obstetics
4. Special (ophtholmology, otorhinolaryngology, urology)
5. Others

Each operating room is equipped with anethesiology room, procedure room, and toilet room. The used tools are put in a pass boxes which are carried by the exclusive staff of the processing corridor to the sterilization room belonging to the operation theatre.
Each operating room is attended by an exclusive nurse team (1 trained theatre nurse, 3 crews and 1 runner) and by 2 persons working in the processing corridor.

The operating room is cleaned every day with mops, and completely cleaned and sterilized every saturday.

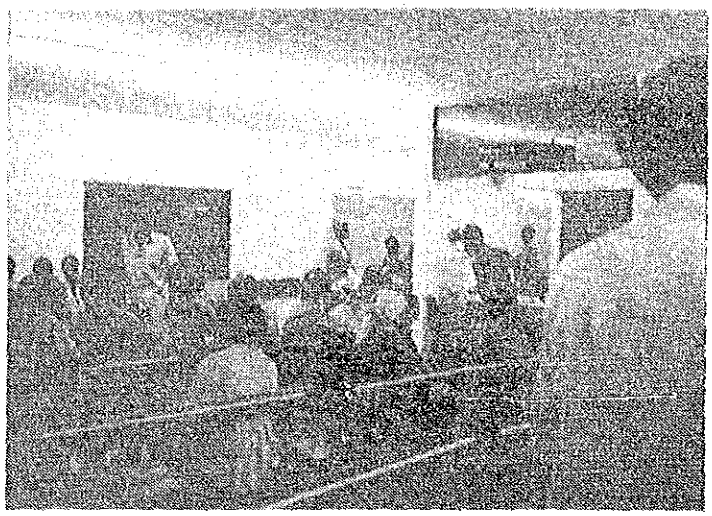
Students can observe operation in the room. Few family members can wait in the operation. Each operating room is air-conditioned.

Operating rooms for emergency patients and infants exist independent of the Central operating theatre.

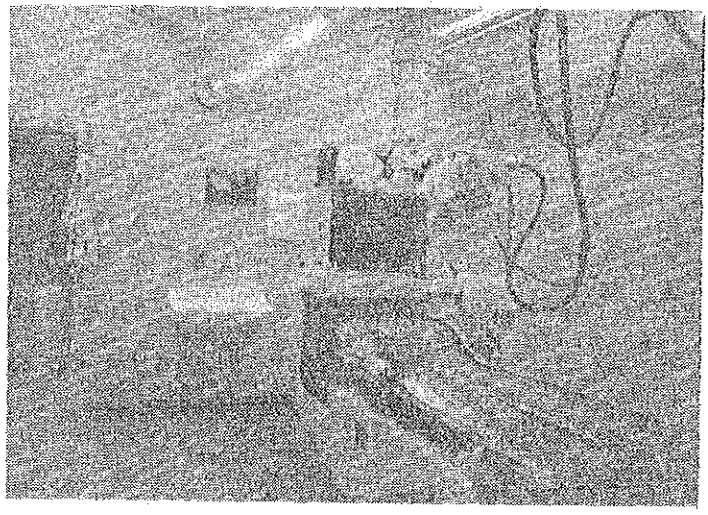
5. ICU (Intensive Care Unit)

ICU is installed next to the operating theatre and in it patients immediately after operation or critical patients are hospitalized. It contains 10 beds, out of which 2 are in Isolation rooms. At the time the survey was made it had 2 patients.

Attendance of doctors is in the form of the doctor in charge at the ward being helped by an anesthesiologist. When necessary, the anesthesiologist waits in the rest room at night.
There are specially trained 14 nurses for ICU and 2 to 4 are constantly on duty.
As a rule, ICU does not take care of babies, but it is told that babies immediately after an operation may be attended by ICU.
At the head of each bed, there is a panel of screen type which is equipped with illumination, a blower outlet, 6 electric outlets, a sphygmomanometer, and an oxygen inhaler. There is no centralized observation monitor unit. Though the room is air-conditioned, in daytime, the windows are open for ventilation. Specimen is taken out to outside Laboratory in most cases.



OPD-WAITING ROOM



X-RAY ROOM

6. Out-patient and Accident and Emergency Department (OPD)

Since UTH attends to patients through introduction, it has a filter clinic at the front gate to take care of general out-patients and emergency patients of internal medicine type. *
Emergency out-patients are brought to the emergency department within UTH. Patients who are considered to require observation of the filter clinic internal medicine or surgery emergency department are put in Day wards of the Emergency Department. They are checked by doctors the next morning again, and if necessary are hospitalized. The Day ward has 67 beds, which can be broken down to 15 beds for paediatrics and obstetrics, and 21 beds each for surgery and internal medicine.

* Babies are sent to the existing Paediatric ward.

7. Paediatric Out-patient Department (2F of new building)

This department takes care of patients sent from the Out-patient Department attached to the existing paediatric ward and the filter clinic only, and reservation system is adopted for consultation. The cartes are controlled by the reservation center and brought to the Out-patient Department every morning according to the reservation. The consultation hours are from 7:30AM to 12:00AM and 2:00PM to 4:00PM.

Students in the clinical course (5th through 7th grades) are trained here.

8. X-ray Department

This department is situated behind the emergency department. It is equipped with 8 rooms and 12 X-ray apparatuses. The apparatuses are made by GE (General Electric Co.), purchased through the GE agent, and the agent performs maintenance once every 6 months as a rule.

The X-ray Department consists of 4 radiology doctors, 8 radiology technicians and 1 mechanical engineer.

After being read at the film reading room in the center, the films are filed neatly in the order of registration numbers.
50,620 films were taken during the period of January through October, 1980.
(Major machines that the department has are General radiography apparatus, tomograph apparatus and Radiographic & Fluoroscopy Apparatus with TV system.)

9. Pharmacy

Medicines are supplied to the Out-patient Department and all wards. In the Out-patient Department, there are about 1,200 medication cases daily. Medicines that are commonly given are in the pre-pack system for expedition and simplification of the medication.

LABORATORY

BLOOD BANK

Since there are about 200 doctor signatures to be checked in the prescription, the check is performed with the doctor prescription register numbers.

Messengers come to the pharmacy once or twice a day from wards to receive medicines.
The pharmacy also supplies medicines to health centers in the city and has an exclusive car for the purpose.

A chief pharmacist is on duty 24 hours a day to be prepared for emergency case.

It is said that medicines are in tendency of shortage.

10. Blood Bank

The blood bank is situated in a one-story independent building among old buildings.
A bus makes a tour to volunteers about 3 times a week Carrying volunteer lists of policemen, soldiers and students, Blood donation is numbered for 600 to 800 cases a month, and blood of 450 to 500cc is taken from each volunteer at a time. Used injectors are disposed Change of blood stocks between the survey day and the day before is shown below.

	Blood type / No. of donations	O		A		B		AB	
		Total	*	Total	*	Total	*	Total	*
Nov. 3	21	52 (2)	26 (-)	27 (1)	10 (-)	16 (-)	12 (-)	2 (-)	- (-)
Nov. 4		55 (2)	24 (-)	24 (-)	41 (-)	18 (-)	13 (-)	4 (-)	- (-)

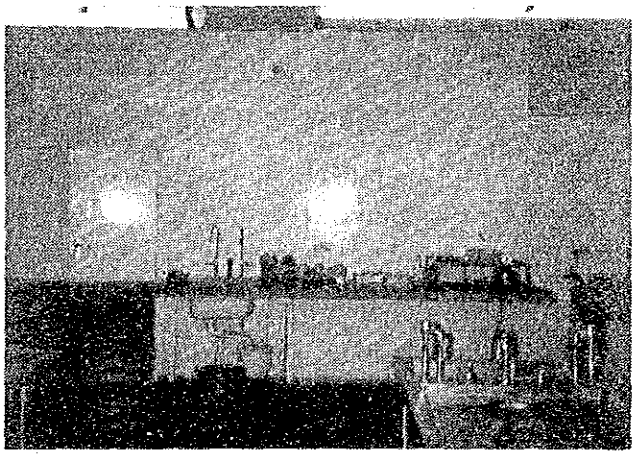
* indicates donation based on reservation.

Figures are for plus blood. Figures in parentheses are for minus blood.

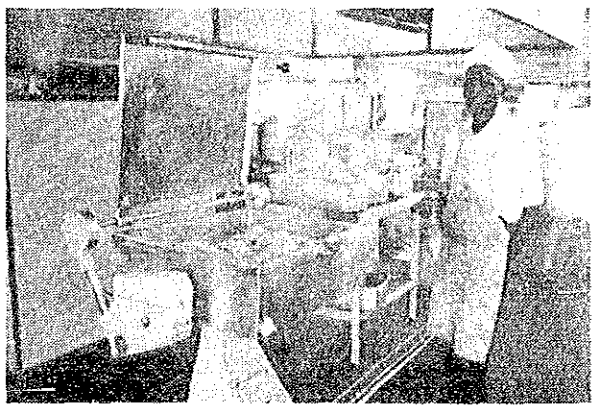
11. C.S.S.D (Central Sterilize Supply Department)

This department locates in an independent one story building next to the boiler house.
The department supplies tools and materials to the out-patient, obstetrics and ICU departments, as well as supplying injectors, gloves and clothings for operation to the Central operating theatre.
Each nurse station is equipped with a thermal-sterilizer and often some of the autoclaves and dry thermal sterilizers that handle minute articles are broken.

CENTRAL STERILIZE SUPPLY DEPT.



MORTUARY



KITCHEN

12. Laundry

The laundry department is installed next to CSSD.
Bed sheets, bed covers, pillow covers, diapers, blanket and doctors' white uniforms are washed, machine-dried and pressed here.
(Nurse uniforms are being washed individually.)

The department is using one washing machine of 375 kg/h, 2 dryers and 2 sheet rollers.

As a rule, sluicing is performed by each department.

13. Kitchen and Cafeteria

Patients are fed with 3 meals at 7:00, 12:30 and 16:30, and in addition there is a tea time at 15:00 in the afternoon.

10 steam pots and ovens are used for cooking.
Dishes and tablewares are washed and stored by each ward since the automatic washer in the kitchen is broken.
Dishes and tablewares are not particularly sterilized.

There is an underground storage, containing corn powder, vegetable, potato, etc.
600 to 700 meals for the staff are also prepared in the kitchen.
Employees at the kitchen work on 3 shifts, 5:30 to 16:30, 13:30 to 20:00 and 20:00 to 7:00.

14. Mortuary and Autopsy

This installation locates at the base floor of the building at the East Street south end. It has 3 sutopsy rooms with onlooker seats and 21 mortuary refrigerators of 3 corpse capacity.
In most cases corpse are taken by the family immediately after death and buried in the ground.
During the period of 5 days preceding the survey, 92 corpses were taken by the families.
Autopsy is performed by legal regulation and with agreement with the family.

APPENDIX B LIST OF MEDICAL EQUIPMENT

INDEX

OUT-PATIENT DEPARTMENT		
OPD-1	-1	X-ray Film Viewer
OPD-2	-1	X-ray Film Viewer
OPD-3	-1	Examine Couch [illegible]
PHARMACY		
PHA-1	-1	Refrigerator for Pharmaceuticals, Sterilizer
CENTRAL DIAGNOSTIC & TREATMENT DEPARTMENT		
CDD-1	-1	General Radiography Apparatus
	-2	Mobile X-ray Apparatus Condenser Type
	-3	X-ray Accessaries
CDD-2	-1	Radiography Apparatus for Paediatric
	-2	X-ray Accessaries
CDD-3	-1	Automatic X-ray Film Processer
	-2	X-ray Film Cassette
	-3	X-ray Developping Accessaries
CDD-4	-1	Protective Apron
CDD-5	-1	X-ray Film Viewer
CDD-6	-1	Film Cabinet
CDD-7	-1	VTR Set
	-2	Projector
CDD-8	-1	Electro Caroliograph Device
	-2	Linear Scan Ultrasonic Tomography
	-3	Electro Encephalograph Device
	-4	Fiber-Bronchosope
	-5	Examining Couch
CDD-9	-1	Gas Analyzer Apparatus
	-2	Spectro-Photometer
	-3	Flam Photometer
	-4	Osmo-Metre
	-5	Microscope
	-6	High-speed Centrifuge
	-7	Draft-chamber
CDD-10	-1	Rotary Microtome
CDD-11	-1	Autopsy Table
	-2	Counter Balance

OPERATING THEATRE SUITE		
OT-1	-1	Paediatric Surgery Operating Set
	-2	Micro Surgery Equipment
	-3	Surgical Operation Instruments
	-4	Fiber-Gastroscope for Paediatric
	-5	Fiber-Bronchoscope for Paediatric
	-6	Rectoscopy for Paediatric
	-7	Cystoscope for Paediatric
	-8	Duct Bouzie Set
	-9	Endoscopy Sterilizer
OT-2	-1	Recovery Bed
	-2	Automatic Infussion Pump
	-3	Heart Monitor
	-4	Stretcher
OT-3	-1	Refrigerator for Pharmaceuticals
OT-4	-1	Water Sterilizer (4 person capacity)
	-2	Stretcher
	-3	Autoclave
	-4	Soap Dispenser, Sterilized Brush Dispenser
OT-5	-1	Surgical Light
	-2	Operating Table
	-3	Anesthesia Apparatus w/Respirator
	-4	Respirator
	-5	Radiographic Apparatus
	-6	Heat Exchanger
OT-6	-1	Surgical Light
	-2	Operating Table
	-3	Electro Surgical Apparatus
	-4	Blood-loss Measuring Device
OT-7	-1	Rotary Microtome
	-2	Surgical Light
	-3	Operation Table
	-4	Electro Surgical Apparatus
	-5	Anesthesia Apparatus
	-6	Surgical Monitor Apparatus
	-7	Blood loss Measuring Device
	-8	Direct Current Defbricator for Paediatric
	-9	ECG/H.R./Blood Prdssure Monitoring Apparatus
	-10	Thermo-Exchanger Apparatus

OPERATING THEATRE SUITE		
OT-8	-1	Rotary Microtome
OT-9	-1	Auto Clave
	-2	Ethy E.O.Gas Sterilizer
	-3	Auto Clave
	-4	Instrument Boiling Sterilizer
WARD		
WRD-1	-1	Milker
WRD-2	-1	Auto-Infusion Pump
	-2	Automatic Respirator
	-3	Sunction Bottle for Central Piping System
		Oxygen Flow Meter for Piping Use
	-4	Incubator
	-5	Oxygen Tent
	-6	Dressing Cart
WRD-3	-1	Doppler Faetus Detector
	-2	Electro Thermometer
	-3	Transfusion Pump (Cylinge Type)
	-4	Ultrasonic Neblizer
	-5	Sunction Pump
	-6	Incubator
	-7	Infant Warmer Stand
	-8	Infant Respirator
	-9	Patient Monitor
	-10	Transcutaneous PO_2 Meter
	-11	Incubator Stretcher
	-12	Neonatal Care Monitor
	-13	Oxygen Blender, Analyzer
WRD-4	-1	Beds/Cots
	-2	U.V. Sterilizing Lamps
WRD-5	-1	Bath-tub, Infant Scale
WRD-6	-1	Autoclave
SPAREPARTS		

Above medical equipment for the Centre will also include the medical equipment by the Japanese Technical Cooperation programme.

APPENDIX C

COST PARAMETERS FOR CONSTRUCTION IN ZAMBIA

December, 1980

Quantity Surveying Section
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1. Building Materials

There are two distinct spheres of development in Zambia: Projects on or near the Line of Rail must be distinguished from those in rural areas distant from the Line of Rail.

Materials are supplied on the Line of Rail at predictable and often controlled prices. These materials must in the main be transported to site by the contractor involved because very few suppliers possess transport facilities sufficient to service individual projects. Few materials are supplied locally and those are used mainly in locally financed construction and maintenance work. There are no builders merchants in the provinces of sufficinent size to supply large projects.

Locally obtained materials are restricted to water, sand, stone, crude bricks and to a limited extent, timber. Even these materials are not, as will be noted below, universally or perennially available.

Haulage costs are at present K0.15 per tonne kilometer although costs will be less to a contractor using his own transport and able to ensure full loads and some return loads. Many sites may become inaccessible during the rains and, indeed, some may be cut off annually for some months when only barges may service them. Due to poor road conditions vehicles are subject to frequent breakdowns which introduces an additional risk element into contracts.

Because of the foregoing I have given prices in the list that follows ex-factory on the Line of Rail only. An approximation of cost on site may be made by applying the haulage rate given above to individual materials.

(a) Water — Costs very considerably dependent upon whether there is an established water supply available or whether the contractor must install his own. In the latter case the contractor may have to sink a borehole, build a river intake and/or erect a water tower.

(b) Sand — (K12.00 per m^2)
Sharp sand is usually dredged from river beds. Local sites may be supplied direct seasonally and stockpiles are held on the Line of Rail. Sand from these stockpiles may be transported to remote sites at times when rivers are in spate. It should be noted that in Western Province the sandy soil prevalent in that area is not suitable as a constituant of concrete or mortar. Soft sand for plastering and screeding is produced from crushed stone, is available on the Line of Rail or from local quarries and costs K2.60 per tonne.

(c) Gravel — (K9.75 per tonne)
Crushed Stone is produced in most areas to a suitable standard for concrete production with the notable exception of Western Province where a solitary quarry at Kaoma produces sub-standard aggregates.

(d) Stone — (Price varies)
Stone is available in most areas and, indeed, is often a hinderance to development as an obstruction below ground level. Stone is only used as a decorative facing material in "prestige" buildings.

(e) Earth — (K4.25 per tonne)
Many areas of Zambia are founded on Laterite which forms on excellent granular filling material. It is widely used as a dry weather road surfacing. Only in Western Province is earth unsuitable as a structural fill because of the poor grading spectrum of the sand.

(f) Lime — This costs K1.80 per 25kg pocket.

(g) Timber — (Softwood from K210 to K396 per M^3)

(Hardwood from K260 to K470 per M^3)
Most structural timber is imported. Because of import restrictions timber has recently been in extremely short supply and this has led to delays to contracts and use of such substitutes as steel lattice purlins and aluminium suspended "tee" system ceilings in domestic construction.

(h) Bitumen — (In barrels K0.21 per litre)
(In bulk K0.19 per litre)

Prices are given for bitument emulsion which is widely used as a binder for all weather roads.

(i) Tar

Tar is not used as a road surface binder in Zambia because it is too brittle to withstand the extreme temperature variations to which it would be subjected.

(j) Asphalt

(K400-00 per tonne)
Asphalt is, as can be seen, very expensive. It is, however, the only material capable of withstanding the temperature extreem to which it is subjected when used on flat roofs. Asphalt may also be used as a binder for paving where loads will be heavy i.e. airport taxiways etc.

(k) Cement

(K3.40 per 50kg pocket)
(K64 per tonne in bulk)

Cement is manufactured in Zambia and is the single most important building material. Shortages of cement, often caused by machinery breakdown, have had very serious affects on the construction industry.

(a) Concrete Blocks

100mm	K30.00	per hundred	All 400 x
150mm	K41.00	" "	200mm
200mm	K54.00	" "	nominal

Cement blocks are the normal walling material in use in Zambia. They are generally available on the Line of Rail. However, even on the Line of Rail, many contractors find it cheaper to manufacture their own blocks on site from basic materials than to buy and then transport the finished product. Certainly manufacture on site is the rule for "bush" jobs.

(b) Timber Component

(i) Trusses Timber roof trusses are used extensively when timber is available. A guide price for a truss spanning 6m and of 22° pitch would be about K150. Timber trusses must be treated against termite attach.

(ii) Frames Timber door and window frames are seldom used in Zambia because of the likelyhood of termite attach. Where such frames are employed they are generally in high cost work and then in hardwood.

(iii) Furniture Furniture is produced in Zambia from imported and local woods. Costs are high but less than equivalent imported furniture.

(iv) Doors Panelled, flush and fremed doors are all manufactured in Zambia. Guide prices are as follows.

825 x 1960 x 44mm	Flush door	K28.00 each
" " "	Framed hardwood door	K41.91 each

(c) Metal Elements

(i) Structural Steel (rolled sections and plates from K560 to K626 per metric tonne)

Steel is imported in rolled sections or plates and bars. There are a number of steel fabricating firms on the Line of Rail and steel is used extensively in building, water towers and radio towers. In domestic buildings steel trusses are often used in preference to timber because they are proof against termite attack. Fabricated structural steel costs about K1200 to K1400 per metric tonne.

(ii) Door and Window Frames

Door and window frames are produced by factories in Lusaka and on the Copperbelt in a unified metric range suitable for use in most situations. The use of these components is general. Some idea of cost may be gained from the following:-

Item	Cost
Door frame for 825 x 1960 door overall size 900 x 2000mm to suit 150mm block wall	M 20.05
Window 1.20 x 1.30m overall with two side-hung opening cassements, burglar bars, fly-screens and sill to suit 200mm block wall	112.00
Casement door with sidelight overall size 2.10 x 2.00m with pair of double doors	192.52

(d) Asbestos Cement Products

Asbestos cement products are produced from local portland cement and imported asbestos fibre.

(i) Roof Sheeting (Range from K4.00 to K4.80 per m^2)

Roof sheets are produced in verious profiles together with accessories such as ridge pieces, caves fillers, barge boards etc. This type of roofing is the most commonly used in low rist building in Zambia. It resists solar heat degradation whilst coping well with heavy rain.

(ii) Flat Sheeting (4.5mm range from K3.63 to K4.10 per m^2)
(6.0mm range from K4.57 to K5.15 per m^2)

Flat sheet is available in two different surface finishes and is most often used as a ceiling lining. One manufacturer uses a sandwitch of two layers of sheet with urethane from filler to provide wall panels for use in industralissed buildings.

(iii) Pipes Sewer pipes including joints 100mm K4.13 per m
150mm K6.23 " "

Asbestos cement pipes are used almost exclusively for water supply schemes and water bone sewage disposal. Jointing is by sleeve and rubber "D" ring. Bends junctions, gully traps etc. are available.

Pressure pipes including joints

75mm	range from	K3.70	to K3.90	per m
100mm	" "	K5.00	to K5.60	" "
125mm	" "	K7.00	to K8.70	" "
150mm	" "	K8.30	to K11.10	" "
200mm	" "	K10.90	to K18.10	" "
225mm	" "	K12.50	to K21.10	" "
250mm	" "	K15.10	to K25.40	" "

Asbestos cement prassure pipes are used in most large water supply systems. Jointing is by sleeve and rubber ring. A wide range of cast iron accessories including bends, tems, saddle pieces, cluice valves and adaptors is available.

(iv) Other Items

Sinks for use in low cost housing and laundries are produced. Other products include garden furniture, flower boxes and pots.

(e) Locally Fabricated Tiles

All glazed ceramic and earthenwore tiles are imported.

(f) Machine Out Kiln Dried Bricks — Commons K75.00 per thousand; Facings K95.00 per thousand

Quality bricks, manufactured from local clay, are not used to the same extent as cement blocks. The use of facing bricks, which are of good quality, is restricted to high cost work.

4. Components Made from Imported Materials

(a) Paint (PVA Emulsion K15.60 per 5 litre tin)
(Glose Paints K19.00 per 5 litre tin)

A number of firms manufacture paint from imported materials.

(b) Varnish (Polyurethene K21.50 per 5 litre tin)

Comments as (a).

(c) Imported Electrical and Sanitary Equipment

(i) Electrical

Most electrical switchgear and controls are imported. There is, however, a plant producing cable and flexible cord which supplies the normal range of conductors for domestic and some industrial applications and a local contractor manufactures light fittings and columns. Electric storage water heaters are manufactured in Zambia. A typical 135 litre heater costs approximately K308.00.

(ii) Sanitary Fittings

All sanitary fittings except the asbestos cement sinks refered to under (a) (iv) are imported. A rough guide to price follows:-

Item	Cost
	K
Low level W.C. suits consisting of white glazed ceramic bowl, plastic seet, flush pipe, plastic cistern, ball valve and syphon fittings	103.00
White glazed ceramic pedestal lavatory basin	47.00
Steel enamelled bath with adjustable cradle	128.00

(d) Glass (4mm clear sheet K16.07 per m^2)
(5mm " " K27.82 per m^2)

All glass for use in construction is imported. As can be seen it is very expensive due to the difficulties of safely transporting such fragile material.

(e) Other Products

Other products manufactured in Zambia from imported materials include galvanised corrugated steel sheet (ranging in price from K4.00 to K8.00 per m^2), galvanised holloware (buckets etc.), galvanised steel pipes steel and timber kitchen fittings and wheelbarrows. One firm manufactures suspended ceiling system components from sheet steel. UFVC pipes and fittings from water supply and drainage are also locally produced.

5. Manpower

Generally labour is used in Zambia to carry out works that would in more developed countries be carried out using heavy plant. Locally hired labour may, for instance, be used to construct earthworks for large sewage ponds.

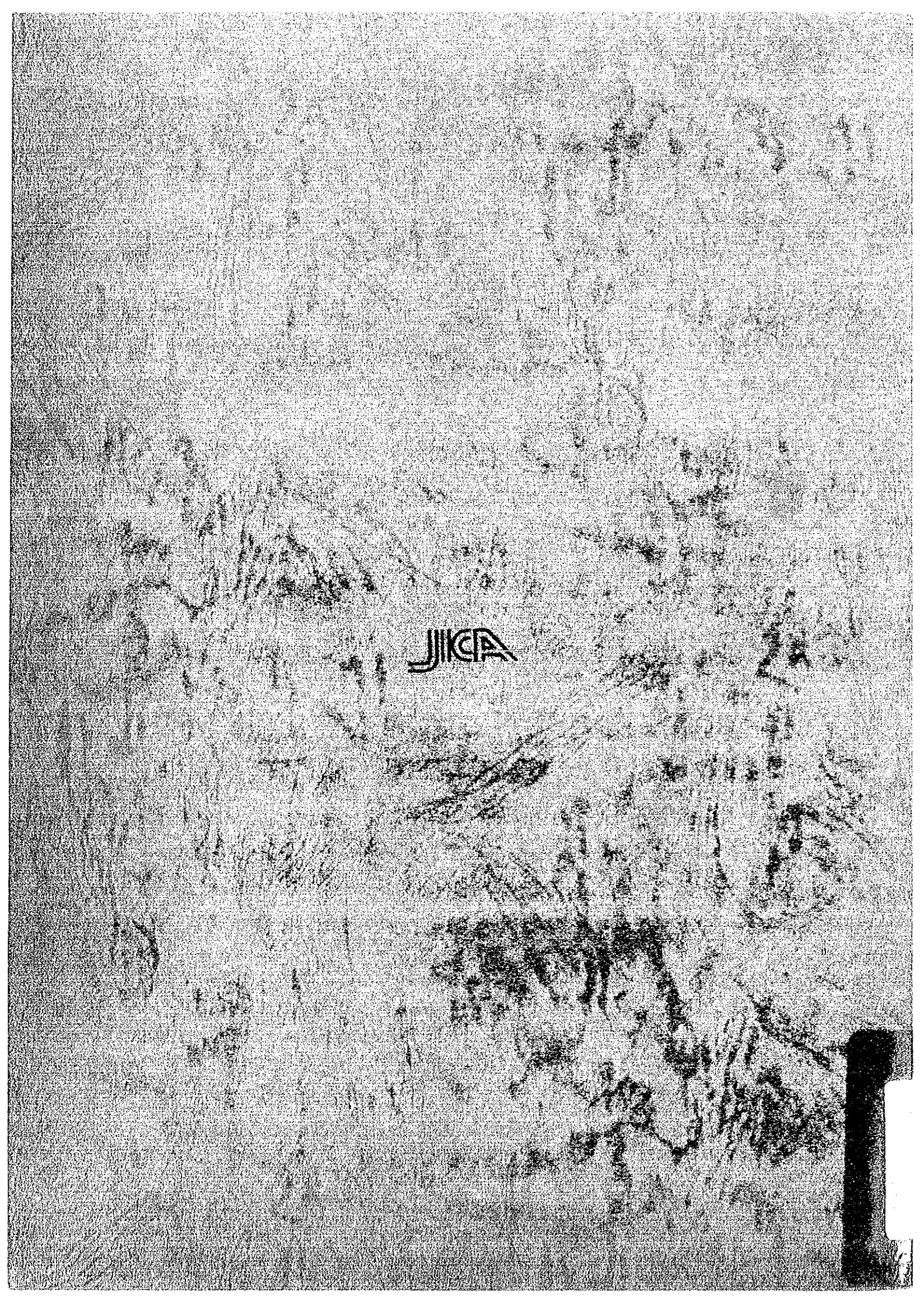
Skilled labour, like materials, is transported to remote sites and so suffers from same difficulties of transport dealt with under 2. For "bush" jobs it is normal for the contractor to arect a small township to house workers.

Minimum wages are set by government and the main categories are set out below. It should be noted that these figures do not take account of the cost of National Provident Fund (insurance) contributions, holidays with pay, housing, transport, walfare, supervision or other overheads connected with the employment of labour.

Watchman	K2.65 per day
Workman (labourer)	K0.33 per hour
Semi-skilled worker	K0.34 per hour
Learner (apprentice)	K0.34 per hour
Skilled worker Class III - Painter and Glazier	K0.44 per hour
- Other Trades	K0.45 per hour
Skilled worker Class II - Painter and Glazier	K0.47 per hour
- Other Trades	K0.53 per hour
Skilled worker Class I - Painter and Glazier	K0.57 per hour
- Other Trades	K0.64 per hour
Operatives Class IV (Driving compressors, crushers, Dumpers to 1cu yd. capacity, mixers etc.)	K0.34 per hour
Operatives Class III (Driving cranes, derricks, dumpers over 1cu yd. capacity, lorries, rollers, small tractors etc.)	K0.38 per hour

Operatives Class II (Driving earthmoving tractors, grades, excavators trenches etc.)	K0.45 per hour
Operatives Class I (Driving earthmoving loading equipment etc. in exceas of 1cu. yd. capacity)	K0,69 per hour

n.b. Hours of work = 48 hours per week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