

# MANUAL ON TECHNICAL GUIDELINES FOR HOSPITALS AND HEALTH FACILITIES PLANNING AND DESIGN

VOLUME 5 - APPENDICES

DEPARTMENT OF HEALTH  
Manila  
1994

## APPENDIX A

### EXISTING DOH HEALTH FACILITIES

(source: DOH - Hospital Operations and Management Service and  
DOH - Bureau of Licensing and Regulation)

Currently, the total number of DOH Gov't/Public hospitals is six hundred twenty four (624) of various types such as special, specialty, medical centers, regional, provincial, district, municipal and medicare community hospitals. Included here are eighty two (82) new ten (10) bed hospitals spread over the fourteen regions which were constructed in 1990. Majority of these existing hospitals are in Region 4 (14%) but the total number of beds are concentrated in the National Capital Region/Metro Manila Area (30.01% of 41,428). Combining the government and private beds, Region 8 has the highest bed-population ratio of 1: 1040 while NCR/Metro Manila Area has the lowest with 1:246. This somewhat illustrates the inequity of health resources distribution in some regions.

## APPENDIX B

### CURRENT CATEGORIES OF HOSPITALS

Based on Sec. 6 of the D.O.H. Administrative Order No. 68-A, S. 1989, entitled "Revised Rules and Regulations Governing the Registration, Licensure and Operation of Hospitals in the Philippines" and pursuant to Sec. 16 of R.A. 4226, otherwise known as the "Hospital Licensure Act", hospitals shall be classified as follows:

(1) **GOVERNMENT OR PRIVATE:**

**Government Hospital** - operated and maintained partially or wholly by the national, provincial, municipal or city government or other political subdivision, board or other agency thereof.

**Private Hospital** - privately owned, established and operated with funds raised or contributed through donations, or by private capital or other means by private individuals, association, corporation, religious organizations, firm company or joint stock association.

(2) **GENERAL OR SPECIAL:**

**General Hospital** - provides services for all kinds of illnesses, diseases, injuries or deformities.

**Special Hospital** - provides services for one particular kind of illness/disease or medical health care need.

(3) **PRIMARY, SECONDARY AND TERTIARY CATEGORY ACCORDING TO SERVICE CAPABILITIES OFFERED:**

**Primary Hospital** - equipped with the service capabilities needed to support licensed physicians rendering services in Medicine, Pediatrics, Obstetrics, and Minor Surgery.

**Secondary Hospital** - equipped with the service capabilities needed to support licensed physicians rendering services in the field of Medicine, Pediatrics, Obstetrics and Gynecology, General Surgery and other Ancillary Services.

**Tertiary Hospital** - fully departmentalized and equipped with service capabilities needed to support certified Medical Specialists and other licensed physicians rendering services in the field of Medicine, Pediatrics, Obstetrics and Gynecology, Surgery, their subspecialties and Ancillary Services.

(4) **TRAINING AND NON-TRAINING:**

**Teaching and Training Hospital** - departmentalized hospital with accredited Residency Training Program in a specified specialty or discipline.

## APPENDIX D

### PATIENT CARE AREAS

(source: Philippine Electrical Code, Article 7.11.6)

Patient care areas, classified as follows, shall be those areas designated by the governing body of the health care facility in accordance with the type of patient care anticipated:

- (1) **General Care Areas** are patient bedrooms, examining rooms, treatment rooms, clinics, and similar areas in which it is intended that the patient shall come in contact with ordinary appliances such as a nurse call system, electrical beds, examining lamps, telephone, and entertainment devices. In such areas, it may also be intended that patients be connected to electromedical devices (such as heating pads, electrocardiographs, drainage pumps, monitors, otoscopes, ophthalmoscopes, peripheral intravenous lines).
- (2) **Critical Care Areas** are those special care units, intensive care units, coronary care units, angiography laboratories, cardiac catheterization laboratories, delivery rooms, operating rooms, and similar areas in which patients are intended to be subjected to invasive procedures and connected to line-operated, electromedical devices.
- (3) **Wet Location** is a patient care area that is normally subject to wet conditions including standing water on the floor or routine dousing or drenching of the work area. Routine housekeeping procedures and incidental spillage of liquids do not define a wet location.



## APPENDIX E

### CATEGORIES AND SOURCES OF HOSPITAL HEALTH CARE WASTE

(source: Manual on Hospital Waste Management by  
the DOH Environmental Health Service)

Health Care Waste are those generated from hospitals; clinics (e.g. medical, veterinary, dental, maternity, lying-in); laboratories; blood banks; research offices; drug manufacturers and other institutions, like schools, colleges and universities and the like producing health care waste.

#### Categories and Sources of Hospital/Health Care Waste:

##### A. General Waste

- includes domestic-type waste, packing materials, non-infectious animal bedding, wastewater from laundries and other substances that do not pose a special handling problem or hazard to human health or the environment.

##### B. Pathological Waste

- consists of tissues, organs, body parts from surgical operations, biopsy and autopsy, human fetuses and animal carcasses; and most blood and body fluids.

##### C. Radioactive Waste

- generated from nuclear medicine section, diagnostic and therapeutic procedures and the paraphernalia used. This is in the form of solid, liquid and gas contaminated with radio nuclides, exemplified by radio-iodine technetium 99 and tridium in particular, excreta of patients who underwent radio isotopic therapeutic application, the needles and syringes, test tubes and tap waste washing of such paraphernalia.

##### D. Chemical Waste

- comprises discarded solid, liquid and gaseous chemicals; for example from diagnostic and experimental work, and cleaning, housekeeping and disinfecting procedures. Chemical waste may be hazardous or non-hazardous. For the purpose of choosing the most appropriate waste handling method:

###### D.1 Hazardous chemical waste is considered to be waste when it is:

- toxic;
- corrosive (acids of  $\text{pH} < 2$  & bases of  $\text{pH} > 12$ );
- flammable;
- reactive (explosive, water reactive, shock sensitive);
- genotoxic (carcinogenic, mutagenic, teratogenic or other wise capable of altering genetic material); for example, cyto-toxic drugs.

###### D.2 Non-hazardous chemical waste consists of chemicals other than those described above, such as sugars, amino acids, and certain organic and inorganic salts.

##### E. Infectious Waste

- includes cultures and stocks of infectious agents from laboratory work, waste from surgery and

autopsies on patients with infectious diseases, waste from infected patients in isolation wards, waste from potentially infectious cases, waste that has been in contact with infected patients undergoing haemodialysis (e.g. dialysis equipment such as tubing and filters, disposable towels, gowns, aprons, gloves and laboratory coats) and waste that has been in contact with animals inoculated with an infectious agent or suffering from an infectious disease.

**F. Sharps**

- include needles, syringes, scalpels, saws, blades, broken glass, nails and any other items that can cause a cut or puncture.

**G. Pharmaceutical Waste**

- includes pharmaceutical products, drugs and chemicals that have been returned from wards, have been spilled, are outdated or contaminated, or are to be discarded because they are no longer required.

**H. Pressurized Container Waste**

- include those used for demonstration or instructional and other purposes, containing innocuous or inert gas, and aerosol cans that may explode if incinerated or accidentally punctured.

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- includes pharmaceutical products, drugs and chemicals that have been returned from wards, have been spilled, are outdated or contaminated, or are to be discarded because they are no longer required.

**H. Pressurized Container Waste**





- include those used for demonstration or instructional and other purposes, containing innocuous or inert gas, and aerosol cans that may explode if incinerated or accidentally punctured.

APPENDIX F  
ELECTRICAL SYMBOLS

DESCRIPTION	SYMBOL	
A. OUTLET	FLOOR	WALL
A.1 DUPLEX RECEPTACLE		
A.2. SINGLE RECEPTACLE		
A.3 AIRCON		
A.4 SPECIAL PURPOSE		
A.5 TELEPHONE		
A.6 INTERCOM		
A.7 GROUND		
A.8 ISOLATION MONITOR ROOM INDICATOR		
A.9 BED LIGHT		
A.10 X-RAY WARNING LIGHT		



ELECTRICAL SYMBOLS

DESCRIPTION	SYMBOL
B. FAN COOLING UNIT	
C. AIR CONDITIONING CONDENSING UNIT	
D. PANEL BOARD	
E. EMERGENCY LIGHT	

**SPECIFICATIONS AND RECOMMENDED DESIGNS OF X-RAY FACILITIES**

(source: DOH Radiation Health Service)

**G.1 X-Ray Facilities for a District Hospital**

- A. Maximum Bed Capacity: 100
- B. Location: ideally located in the ground floor, near outpatient and emergency departments.
- C. Minimum Number of Rooms and Minimum Space Requirements: at least 32 square meters
  - 1. X-ray room, darkroom and control room
    - One (1) x-ray examination room and control room - at least 16 square meters
    - One (1) darkroom - at least 5 square meters
  - 2. One (1) film filing, film viewing and interpretation room
    - at least 6 square meters
  - 3. One (1) restroom - at least 1.5 square meters
  - 4. Patient waiting area
- D. Equipment and Accessories:
  - 1. One (1) 100 mA, 125 kV x-ray unit
  - 2. One (1) pc. caliper with 1.0 cm graduation
  - 3. One (1) unit 5-gallon manual processing tanks or manual thermocontrolled processing tanks (if possible)
  - 4. Three (3) pcs. carbon fibre/bakelite cassettes with high speed intensifying screens for each x-ray film size
  - 5. Six (6) pcs. film hangers for each x-ray film size
  - 6. Two (2) pcs. darkroom safelights and one pc. darkroom exhaust fan
  - 7. One (1) pc. lead rubber apron and pair of lead rubber gloves with lead equivalence of at least 0.25 mm
  - 8. One (1) pc. wooden film drying rack
  - 9. One (1) pair of stirring paddles
  - 10. One (1) pc. metallic stem dial type thermometer

11. One (1) pc. darkroom interval timer
12. One (1) set lead markers
13. One (1) pc. illuminator for four films
14. One (1) stationary grid
15. One (1) pair lead rubber gloves
16. One (1) leaded passbox

E. Manpower:

1. A physician who has been certified as a medical specialist in Radiology by the Department of Health medical manpower committee (for government facilities)
2. A physician who has completed the module 1 of the Department of Health - Philippine College of Radiology Stepladder Training Program in Radiology ( for primary government facilities )
3. At least one (1) radiologic or X-ray technologist duly licensed by the PRC
4. One (1) qualified Radiation Health and Safety Officer

F. Physical Plant Specifications and Recommended Design/Layout:

1. X-ray Room

- 1.1 All indicated walls of Figure G-1 (walls A to F) must be made of any of the following materials to a height of at least 2 meters from the floor or ground outside the x-ray room.
  - a. at least six (6) inches poured concrete OR at least six (6) inches concrete hollow blocks with all cavities filled and packed with concrete and plastered with at least 1/2 inch cement plaster on each side of the blocks, OR,
  - b. at least 1/16 inch (1.5mm) thick lead sheet. Note that care must be taken to avoid punctures in the lead sheet which may occur during installation. It is recommended that the lead sheet be glued onto and sandwiched between wooden panels.
- 1.2 Both halves of the door leading to the x-ray room must be lined with 1/16 inch (1.5mm) thick lead sheet from edge to edge including door jambs (hamba) to a height of at least two (2) meters from the floor. To prevent sagging of lead sheet, they must not be nailed nor punctured. It is recommended that the lead sheet be glued onto and sandwiched between wooden panels.
- 1.3 Windows must be provided for ventilation along wall D but the base of the windows must be located not lower than two (2) meters from the ground outside the x-ray room.
- 1.4 A lead glass viewing window with lead equivalence of at least 1.5 mm must be provided for wall E. The lead glass viewing window must be wide enough to view the patient during the examination. The outer edge of the lead glass viewing window should be at least 18 inches from the outer edge of wall E. Wall E shall not exceed 2 meters in height to provide technician-patient communication.
- 1.5 A red warning light bulb must be put-up outside and above the door leading to the x-ray room to be illuminated automatically when the machine is switched "ON". Warning notice on the door should



have the following announcements: "X-RAY ROOM - DO NOT ENTER WHEN THE RED LIGHT IS ON"

- 1.6 A rectangular canal for electrical cables of the x-ray machine shall be provided along the floor from the high tension transformer to the back of the control console booth. For information regarding the location and the dimensions of the rectangular canal, the engineer who will install the x-ray machine must be consulted. This canal must be provided with a cover made either of wood, aluminum or tin sheets to protect the cables. It shall be constructed in such a way that when the cover is placed, the cover and the floor are at the same level.
- 1.7 A steel rod with curtains must be provided for the dressing booth.
- 1.8 Two (2) steel rods, 50 cm. long 45 cm. apart, for hanging lead rubber aprons and lead rubber gloves must project from wall D.
- 1.9 Inside the control booth, a cassette rack (See Figure, G-2) for storing x-ray film cassettes when they are not in use must be provided as indicated in the design.

Note: Do not store x-ray film cassettes inside the darkroom.

Do not leave x-ray films inside the cassette for a long period of time.

- 1.10 The walls shall have a minimum height of 3.0 meters.
- 1.11 A double pole, double throw (DPDT), 60 amperes, 250 volt safety switch box (for 100 mA, 125 kV x-ray machine) must be installed on the side of wall G. The bottom of the switch box should be at eye level.

## 2. Darkroom

- 2.1 The darkroom must be entirely light proof. There must be no light leaks into the darkroom.
- 2.2 A light tight door must be provided in the darkroom. This door must be painted matte black and must have a door lock.
- 2.3 The darkroom must have a dry area with a working bench for loading and unloading of cassettes and a wet area for processing tanks. The darkroom must also have a regular sink, preferably of tiled concrete.
- 2.4 The darkroom floor should be water proof and washable. The floor and the lower half walls of the wet area must be covered with bathroom tiles, pure chrome yellow in color, with a drain in the floor center.
- 2.5 The ceiling and the walls of the darkroom except the lower half walls of the wet area, should be painted with chrome yellow with no white pigment added to the paint. The walls must be washable
- 2.6 Storage cabinet with five partitions for different sizes of fresh x-ray films must be provided above or underneath the counter top of the dry area (See Figures G-3a and G-3b).
- 2.7 For details of the construction of a tiled concrete x-ray film processing tanks for manual film processing, please refer to Figures G-4a to G-4d. A master tank must be made of a tiled concrete with insert tanks that can be purchased commercially.
- 2.8 On the ceiling of the darkroom, two separate electrical convenience outlets must be provided. One



is for the ceiling fan and the other one is for white light (incandescent) illumination.

- 2.9 White light illumination using incandescent bulb must be provided inside the darkroom for the purpose of carrying out work that does not require safelight. Illumination is needed for activities such as room cleaning, mixing of solutions, etc.
- 2.10 A light-tight air-inlet and air-outlet with an exhaust fan should be installed inside the darkroom. The air-inlet must be installed near the floor while the air-outlet must be installed above the processing tank near the ceiling (See Figures G-5a and G-5b).
- 2.11 A standard safelight must be provided inside the darkroom. It should be installed 4 ft. above the working bench.
- 2.12 On the wall of the dry area, three electrical convenience outlets must be provided at top level, one of which is for the darkroom safelight.
- 2.13 On the wall of the wet area, an electrical convenience outlet must be provided for the exhaust fan.
- 2.14 On the wall above the regular tank at a height of not lower than 100 cm, from the top of the tank, two steel rods 45 cm. long and 37. cm. apart must project.
- 2.15 A wooden frame for different sizes of film hangers must be provided on the wall between the wet and the dry area.
- 2.16 The darkroom must have an adequate supply of fresh water.
- 2.17 A pair of plastic paddles must be provided inside the darkroom for mixing processing chemicals. One will be used for mixing fixer solution while the other for mixing developer solution.
- 2.18 Fiber glass tank or container with cover to be used for storing fixer solution, must be provided inside the darkroom.
- 2.19 A wooden frame for film drying (See Figure G-6) must be provided inside the darkroom if film dryer is not available.

### 3. Reading/Viewing Room

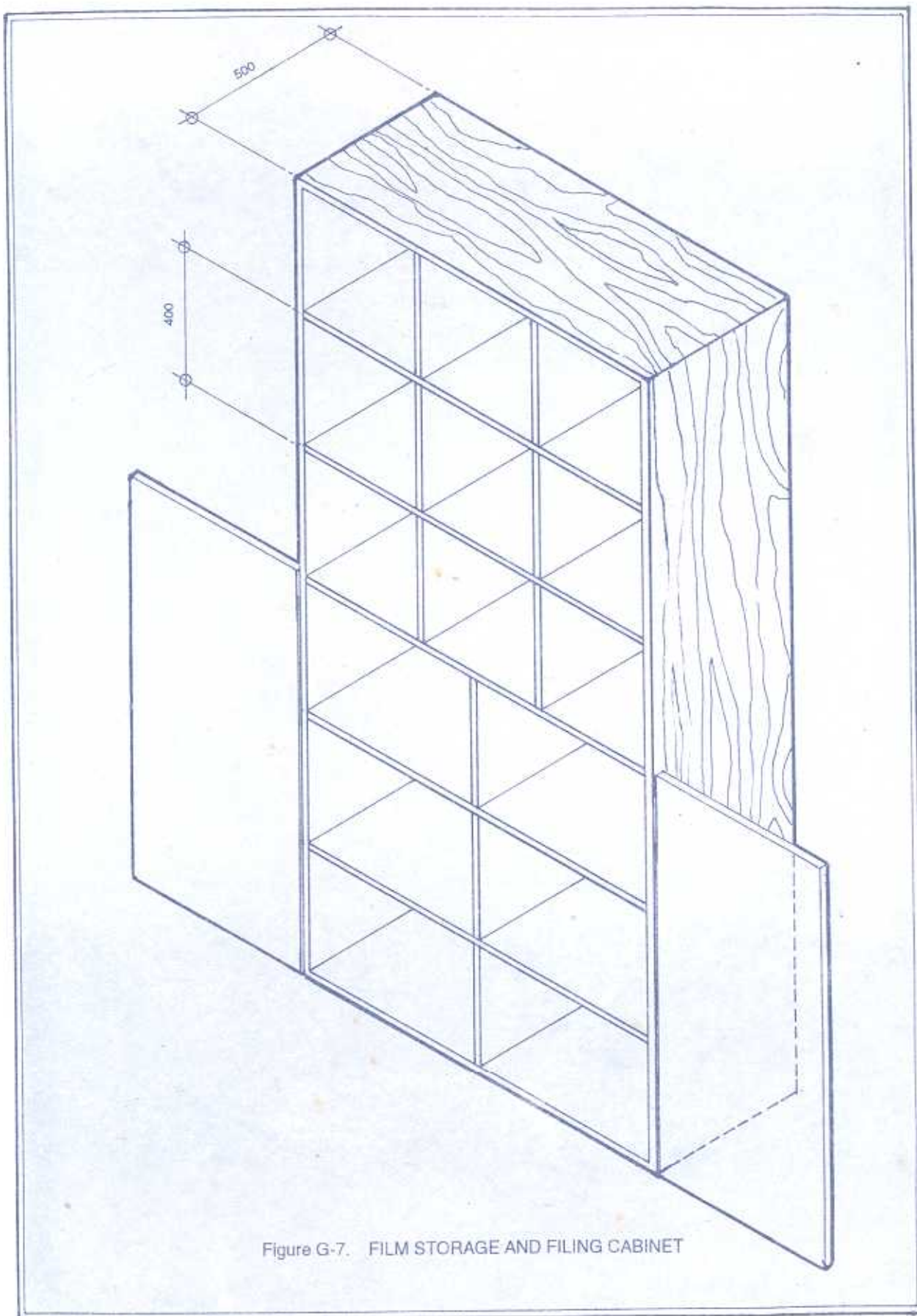
- 3.1 A built-in cabinet with upper shelves for active filing of patient radiographs and lower shelves for storing x-ray request and result forms, patient logbooks, patient indexes, and other supplies must be provided (See Figure G-7).
- 3.2 A built-in x-ray film viewing box (negatoscope) must be provided.
- 3.2 An electrical outlet must be provided for the viewing box to provide power to the fluorescent lamps of the viewing box.

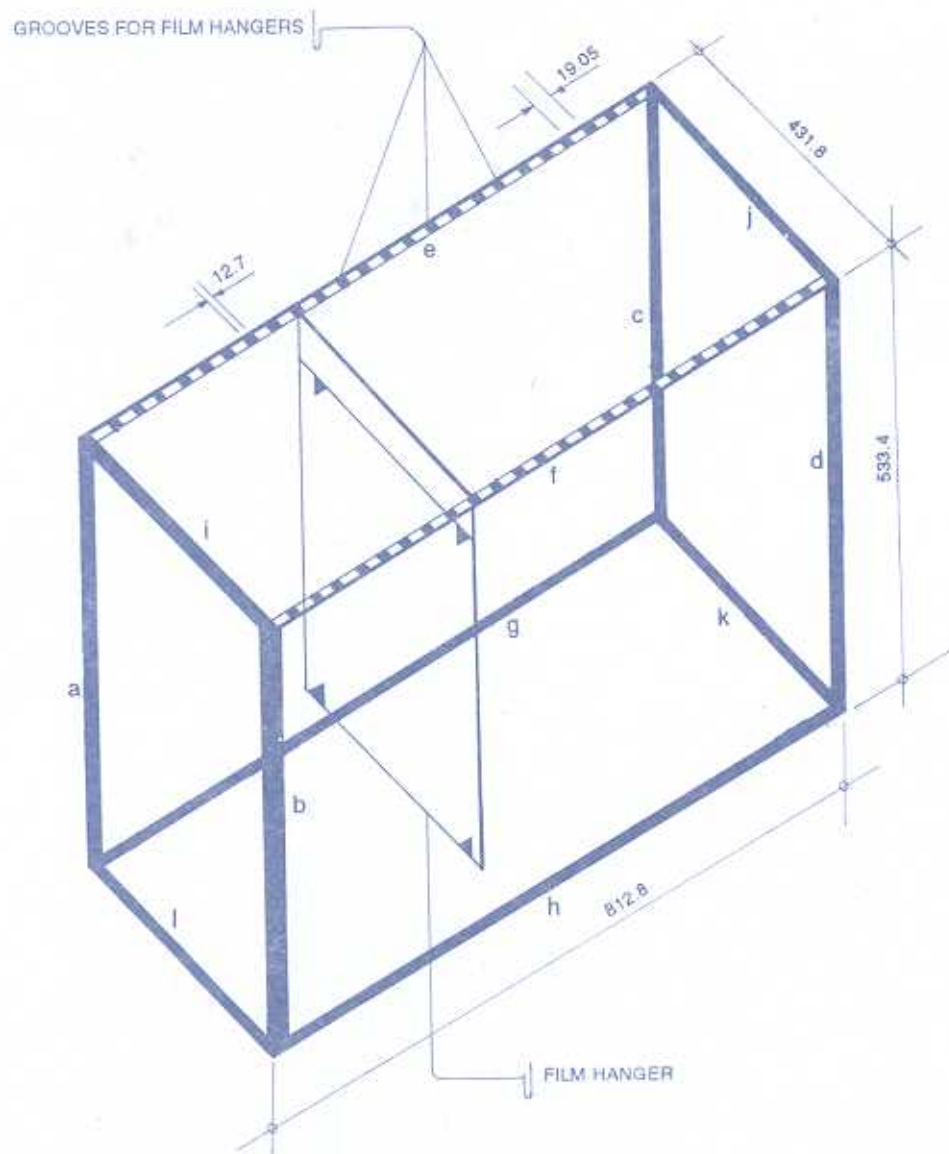
### 4. Patient Waiting Area

- 4.1 Benches must be provided along the corridor and adjacent to the x-ray room for waiting patients.

### 5. Others

- 5.1 For long term storage of unused x-ray films, a room free of radiation and chemical contamination and air conditioned 24 hrs. a day is required.

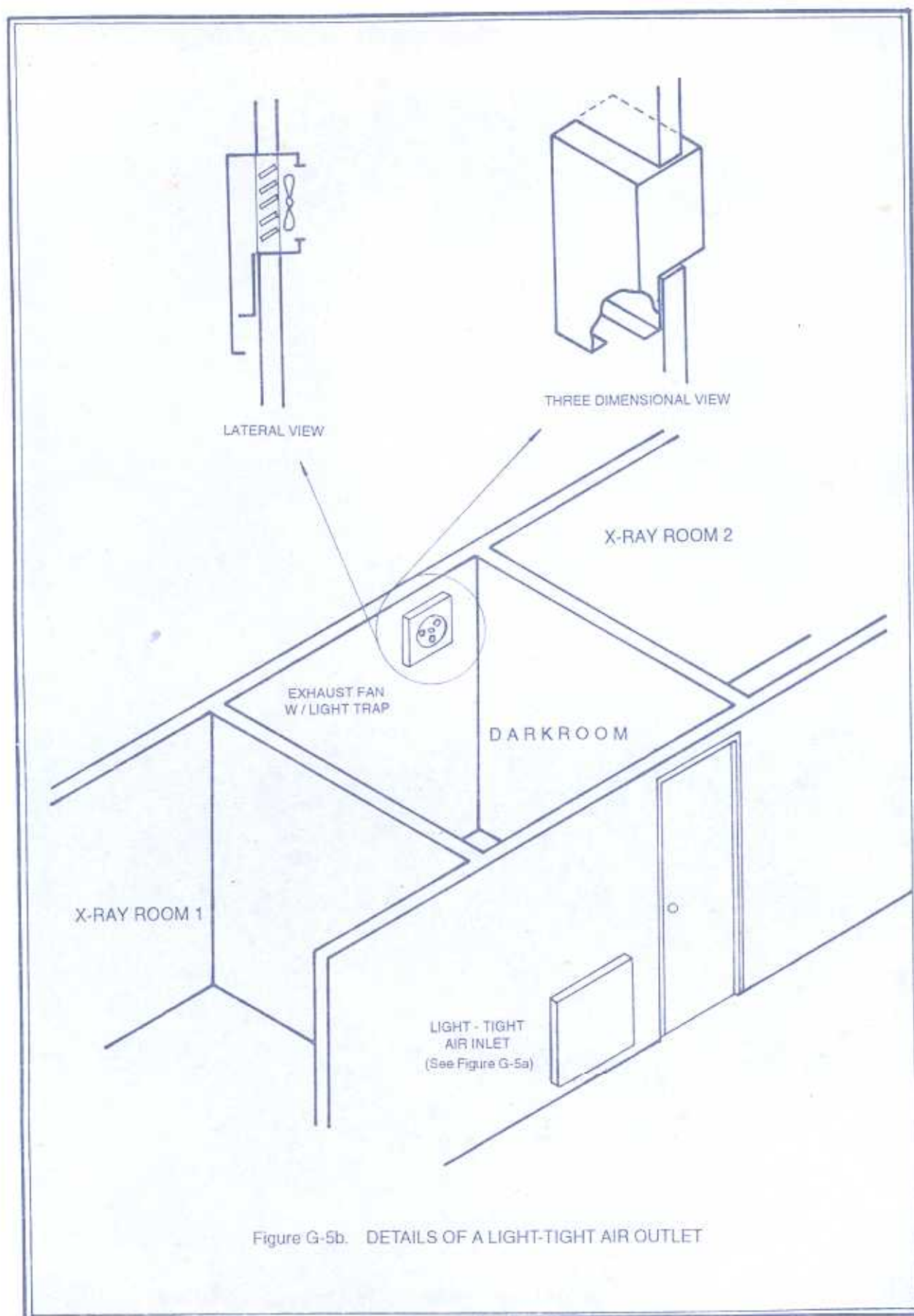




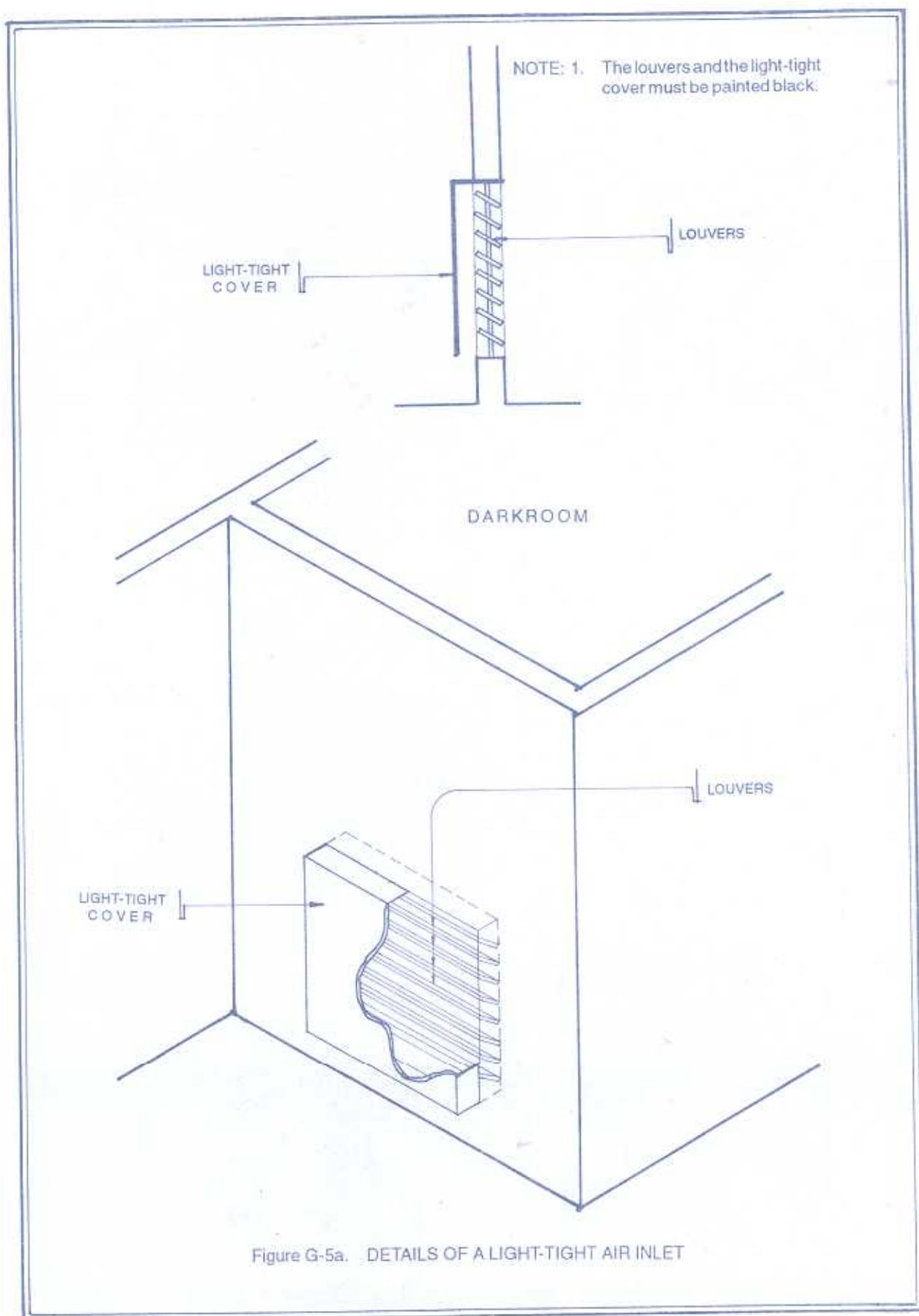
- NOTE: 1. All sides of the wooden frame are open.  
 2. a. Vertical frames (a,b,c,d) shall be 38.1 mm X 38.1 mm in sizes.  
 b. Horizontal frames (e, f, g, h, i, j, k, l) shall be 38.1 mm X 50.8 mm in sizes.  
 3. All dimensions indicated are in millimeters.

Figure G-6. WOODEN FRAME FOR FILM DRYING









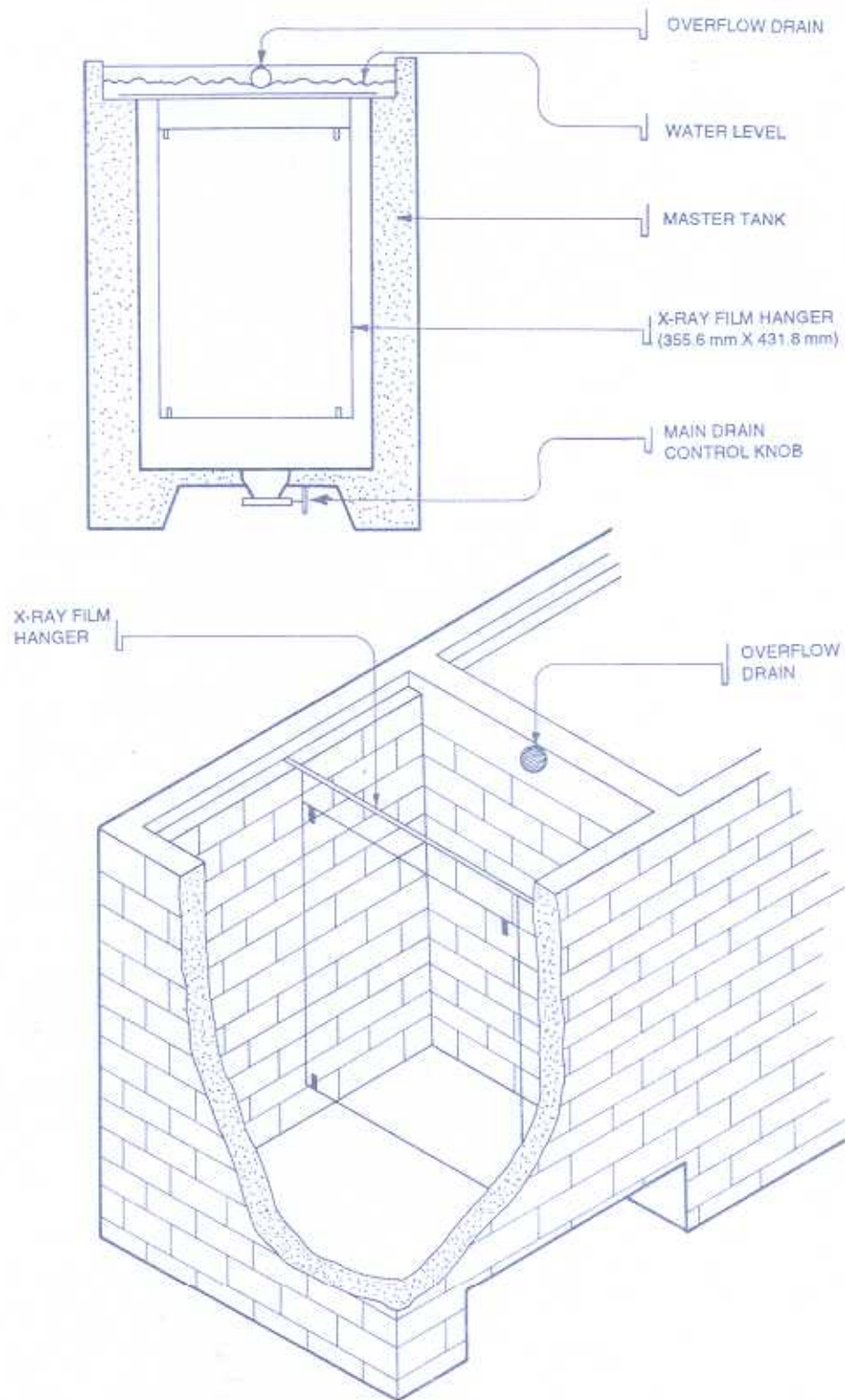


Figure G-4c. RINSE TANK

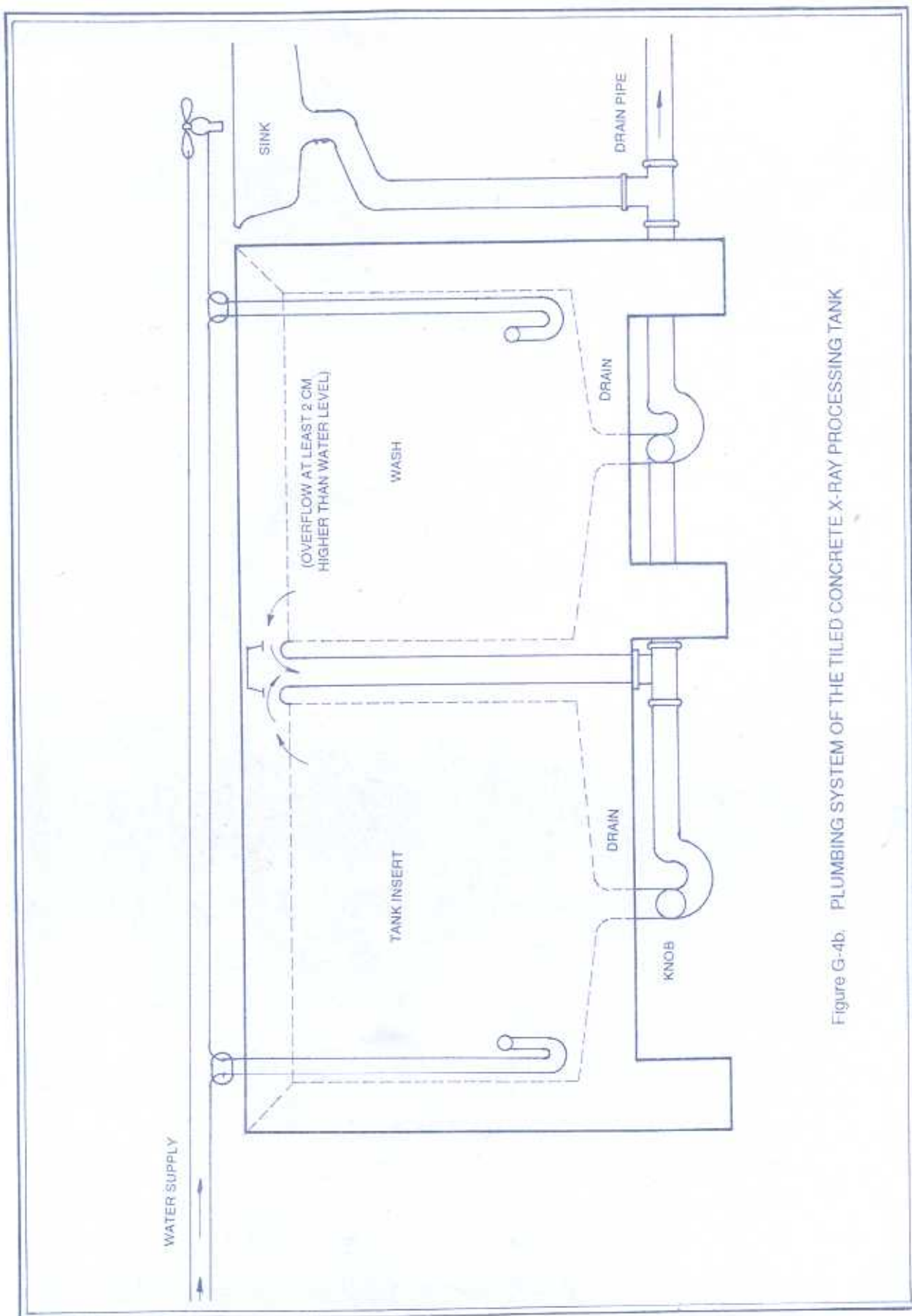


Figure G-4b. PLUMBING SYSTEM OF THE TILED CONCRETE X-RAY PROCESSING TANK

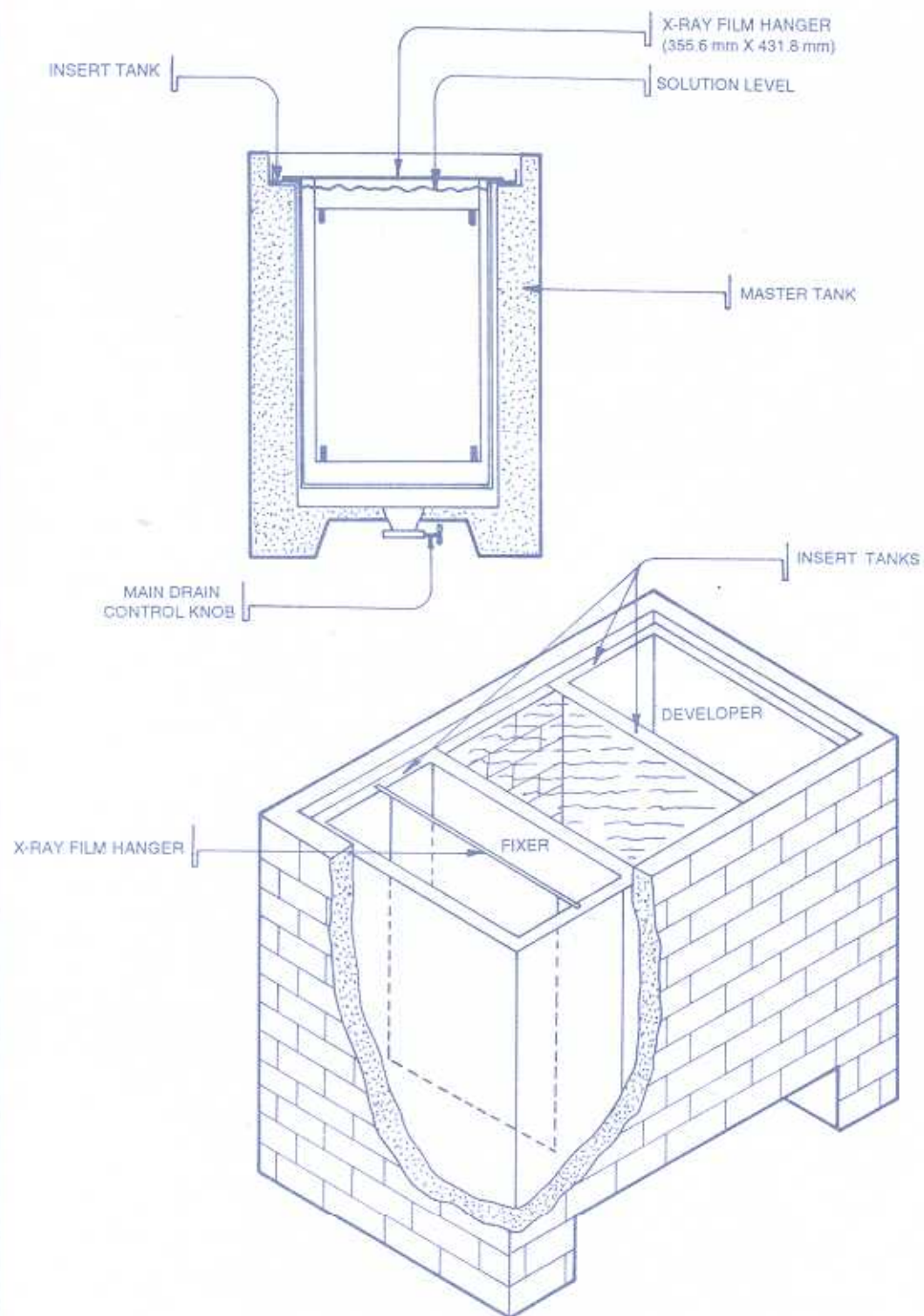
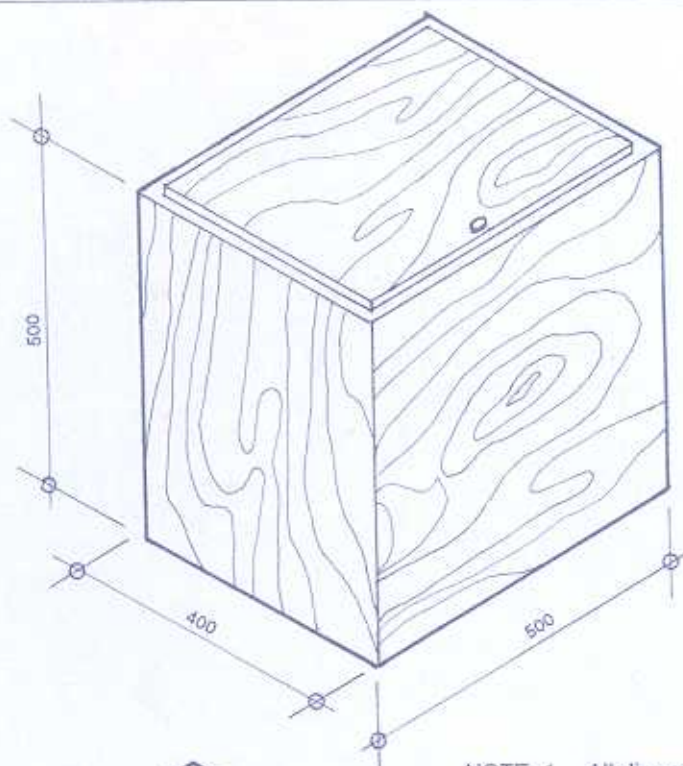


Figure G-4d. DEVELOPER/FIXER INSERT TANK







NOTE: 1. All dimensions indicated are in millimeters.

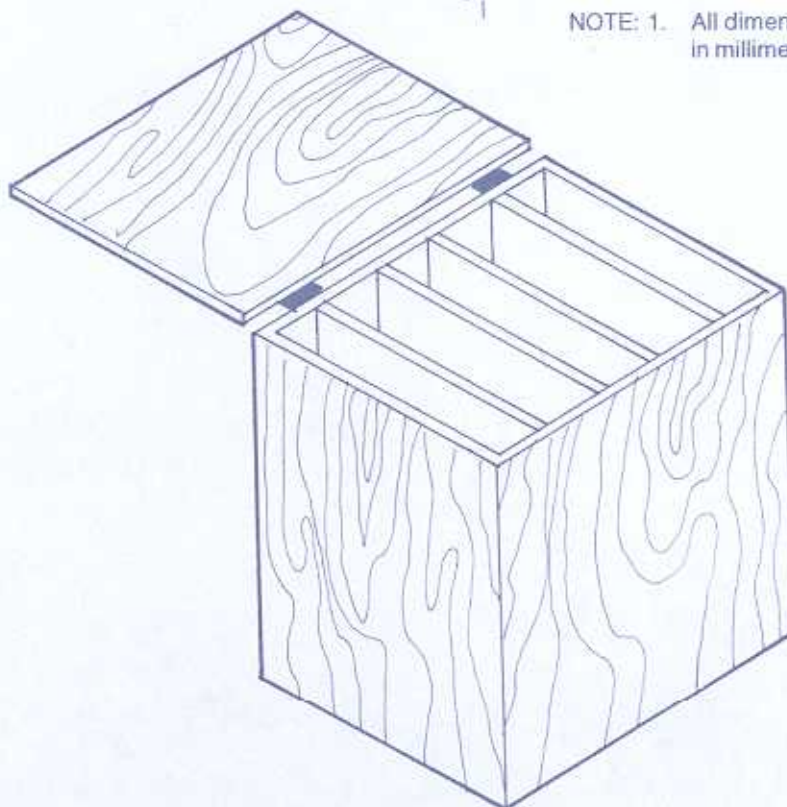


Figure G-3b. FILM BIN (A light-tight storage cabinet for fresh x-ray films)

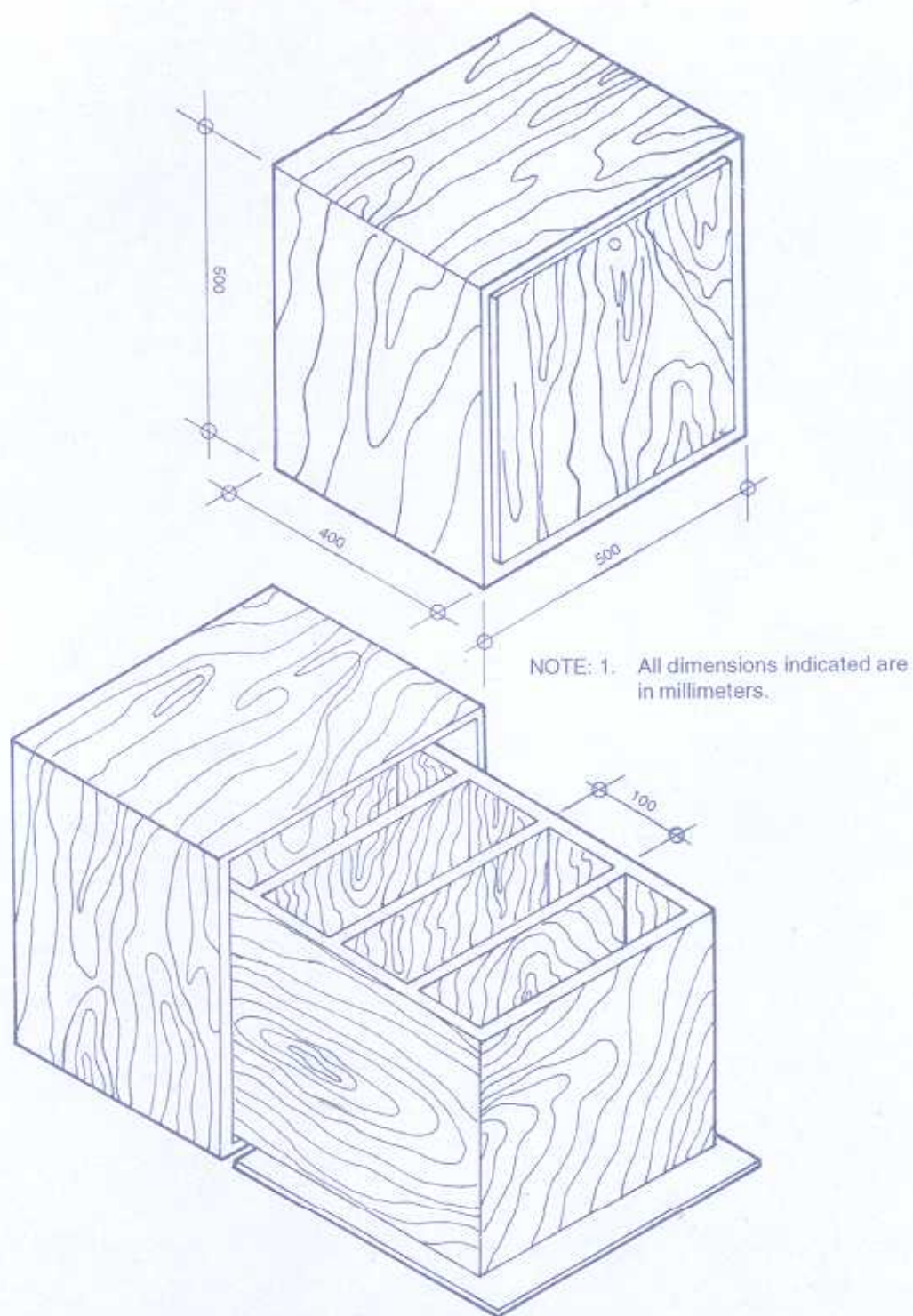


Figure G-3a. FILM BIN (A light-tight storage cabinet for fresh x-ray films)



NOTE: 1. All sides and partitions of the wooden cassette rack shall be made of thick wood or plywood.

2. The frames shall be made of 38,1 mm x 38,1 mm thick wood.

3. All dimensions indicated are in millimeters.

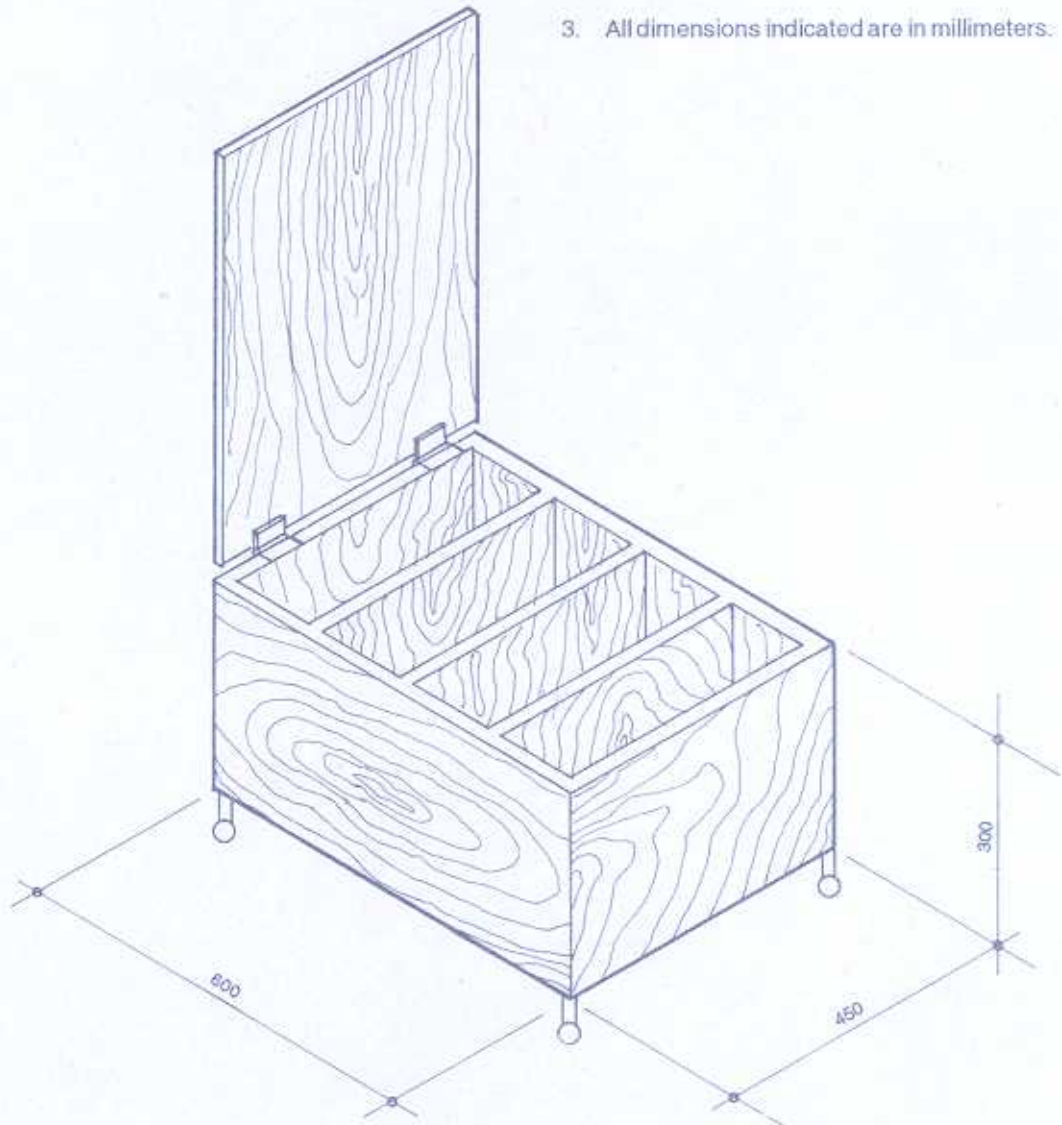


Figure G-2. WOODEN CASSETTE RACK



## **G-2 X-Ray Facilities for a Provincial Hospital**

- A. Maximum Bed Capacity:
- B. Location: ideally located in the ground floor, near outpatient and emergency departments.
- C. Minimum Number of Rooms and Minimum Space Requirements:
  - 1. X-ray room, darkroom and control room
    - Two (2) x-ray examination rooms and control room - at least 23 square meters each room
    - One (1) darkroom - at least 6 square meters
  - 2. One (1) film filing, film viewing and interpretation room
    - at least 9 square meters each room
  - 3. One (1) restroom - at least 1.5 square meters
  - 4. Patient waiting area
- D. Equipment and Accessories:
  - 1. One (1) 500 mA R/F x-ray unit with image intensifier
  - 2. One (1) 100 mA x-ray unit
  - 3. One (1) 300 mA x-ray unit, mobile
  - 4. One (1) automatic film processor, low volume, selected hospitals only (depends on film workload)
  - 5. One (1) thermo controlled processing tank, manual, 10 gallons
  - 6. Three (3) pcs. caliper with 1.0 cm. graduation
  - 7. Three (3) sets lead marker
  - 8. One (1) exhaust fan
  - 9. Two (2) darkroom safelight
  - 10. One (1) pc. metallic stem dial type thermometer
  - 11. One (1) pc. darkroom luminous interval timer
  - 12. Three (3) pcs. lead rubber aprons w/lead equivalence of 0.25 mm
  - 13. Three (3) pairs lead rubber gloves or lead handshields
  - 14. Six (6) pcs. cassettes w/high speed intensifying screen for each film size
  - 15. Six (6) pcs. film hangers for each x-ray film size

16. One (1) stationary grid
17. Two (2) negatoscope, 8 films
18. One (1) general purpose ultrasound unit, selected hospitals only
19. Two (2) leaded passbox

E. Manpower:

1. A physician who has been certified as a medical specialist in Radiology by the Department of Health medical manpower committee (for government facilities)
2. A physician who has completed the module 1 of the Department of Health - Philippine College of Radiology Stepladder Training Program in Radiology (for primary government facilities)
3. At least one (1) radiologic or X-ray technologist duly licensed by the PRC
4. One (1) qualified Radiation Health and Safety Officer

F. Physical Plant Specifications and Recommended Design/Layout:

1. X-ray Room

- 1.1 All indicated walls of Figure G-8 (walls A to I) must be made of any of the following materials to a height of at least 2 meters from the floor or ground outside the x-ray room.
  - a. at least six (6) inches poured concrete OR at least six (6) inches concrete hollow blocks with all cavities filled and packed with concrete and plastered with at least 1/2 inch cement plaster on each side of the blocks, OR,
  - b. at least 1/16 inch (1.5mm) thick lead sheet. Note that care must be taken to avoid punctures in the lead sheet which may occur during installation. It is recommended that the lead sheet be glued onto and sandwiched between wooden panels.
- 1.2 Both halves of the door leading to the x-ray rooms 1 & 2 must be lined with 1/16 inch (1.5mm) thick lead sheet from edge to edge including door jambs (hamba) to a height of at least two (2) meters from the floor. To prevent sagging of lead sheet, they must not be nailed nor punctured. It is recommended that the lead sheet be glued onto and sandwiched between wooden panels.
- 1.3 Windows must be provided for ventilation along walls A, C and D but the base of the windows must be located not lower than two (2) meters from the ground/floor outside the x-ray room.
- 1.4 A lead glass viewing window with lead equivalence of at least 1.5 mm must be provided for walls F and I. The lead glass viewing window must be wide enough to view the patient during the examination. The outer edge of the lead glass viewing window should be at least 18 inches from the outer edge of walls F and I. Walls F and I shall not exceed 2 meters in height to provide technician-patient communication.
- 1.5 A red warning light bulb must be put-up outside and above the door leading to the x-ray room to be illuminated automatically when the machine is switched "ON". Warning notice on the door should have the following announcement: "X-RAY ROOM - DO NOT ENTER WHEN THE RED LIGHT IS ON"



- 1.6 A rectangular canal for electrical cables of the x-ray machine shall be provided along the floor from the high tension transformer to the back of the control console booth. For information regarding the location and the dimensions of the rectangular canal, the engineer who will install the x-ray machine must be consulted. This canal must be provided with a cover made either of wood, aluminum or tin sheets to protect the cables. It shall be constructed in such a way that when the cover is placed, the cover and the floor are at the same level.
- 1.7 A steel rod with curtains must be provided for the dressing booth.
- 1.8 Two (2) steel rods, 50 cm. long 45 cm. apart, for hanging lead rubber aprons and lead rubber gloves must project from walls C and D.
- 1.9 Sink with counter top must be provided inside the x-ray room for contrast media preparation. Over or underneath the counter top, cabinets must also be provided.
- 1.10 Inside the control console booth, a wooden cassette rack (See Figure G-2) for storing x-ray film cassettes when they are not in use must be provided as indicated in the design.

Note: Do not store x-ray film cassettes inside the darkroom.

Do not leave x-ray films inside the cassette for a long period of time.

- 1.11 The passboxes must be lined with lead at least 1.5 mm. thick.
- 1.12 The toilets should all be provided with toilet bowl, separate faucet, sink with its own faucet and drainage.
- 1.13 A double pole, double throw (DPDT), single phase, 60 amperes, 250 volts safety switch box (for 100 mA, 125 kV x-ray machine) OR DPDT, single phase, 60 amperes, 250 volts safety switch box (for 300 mA, 125kV x-ray machine) or DPDT, single phase, 100 amperes, 250 volts safety switch box (for 500 mA, 150 kV x-ray machine) AND/OR DPDT, three phase, 100 amperes, 250 volts safety switch box (for x-ray machine over 500mA) must be installed on the side wall of the control booth. The bottom of the switch box should be at eye level.

## 2. Darkroom

- 2.1 The darkroom must be entirely light proof. There must be no light leaks into the darkroom.
- 2.2 A light - tight door must be provided in the darkroom. This door must be painted matte black and must have a door lock.
- 2.3 The darkroom must have a dry area with a working bench for loading and unloading of cassettes and a wet area for processing tanks. The darkroom must also have a regular sink, preferably of tiled concrete.
- 2.4 The darkroom floor should be waterproof and washable. The floor and the lower half walls of the wet area must be covered with bathroom tiles, pure chrome in color with a drain in the floor center.
- 2.5 The ceiling and the walls of the darkroom except the lower half walls of the wet area, should be painted with chrome yellow with no white pigment added to the paint. The walls must be washable.
- 2.6 Storage cabinet with five partitions for different sizes of fresh x-ray films must be provided

above or underneath the counter top of the dry area (See Figures G-3a and G-3b).

- 2.7 For details of the construction of tiled concrete x-ray processing tank for manual film processing in case of breakdown of automatic film processor, please refer to Figures G-4a to G-4d. A master tank must be made of tiled concrete with insert tanks that can be purchased commercially.
  - 2.8 On the ceiling of the darkroom, two separate electrical convenience outlets must be provided. One is for the ceiling fan and the other one is for white light (incandescent) illumination.
  - 2.9 White light illumination using incandescent bulb must be provided inside the darkroom for the purpose of carrying out work that does not require safelight. Illumination is needed for activities such as cleaning the room, mixing of solutions, etc.
  - 2.10 A light-tight air-inlet and air-outlet with an exhaust fan should be installed inside the darkroom. The air-outlet must be installed above the processing tank near the ceiling while the air inlet must be installed near the floor (See Figures G-5a to G-5b) We recommend that the exhaust fan be attached to a ducting system.
  - 2.11 A standard safelight must be provided inside the darkroom. It should be installed 4 ft above the working bench.
  - 2.12 On the wall of the dry area, an electrical convenience outlets must be provided at top level, one of which is for the darkroom safelight.
  - 2.13 On the wall of the wet area, an electrical convenience outlet must be provided for the exhaust fan.
  - 2.14 On the wall above the regular tank at a height of not lower than 100 cm. from the top of the tank, two steel rods 45 cm. long and 37 cm. apart must project.
  - 2.15 A wooden frame for different sizes of film hangers must be provided on the wall between the wet and the dry area.
  - 2.16 The darkroom must have an adequate supply of fresh water.
  - 2.17 A pair of plastic paddle must be provided inside the darkroom for mixing processing chemicals. One will be used for mixing fixer solution while the other will be used for mixing developer solution.
  - 2.18 Fiber glass tank or container with cover to be used for storing fixer solution, must be provided inside the darkroom.
  - 2.19 Gas mask must be provided inside the darkroom for protection against chemical fumes when mixing processing chemicals.
3. Reading/Viewing Room
    - 3.1 A built-in x-ray film viewing box (negatoscope) must be provided.
    - 3.2 An electrical outlet must be provided on the wall of the viewing box to provide power to the fluorescent lamps of the viewing box.



4. Patient Waiting Area

4.1 Benches must be provided for waiting patients.

5. Ultrasound Room

5.1 The room must be provided with an air-conditioning unit

6. Clerical Room

6.1 A built-in cabinet with upper shelves for active filing of radiographs and lower shelves for storing x-ray request and result forms, patient logbooks, patient indexes, and other supplies must be provided.

7. Others

7.1 For long term storage of unused x-ray films, a room free of radiation and chemical contamination and air conditioned 24 hrs. a day is required.