FORM NRC-313M (5-79) 10 CFR 35

U.S. NUCLEAR REGULATORY COMMISSION

APPLICATION FOR MATERIALS LICENSE — MEDICAL

Approved: GAO R0557

INSTRUCTIONS – *Complete Items 1 through 26 if this is an initial application or an application for renewal of a license. Use supplemental sheets where necessary. Item 26 must be completed on all applications and signed. Retain one copy. Submit original and one copy of entire application to: Director, Office of Nuclear Materials Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, D.C. 20555. Upon approval of this application, the applicant will receive a Materials License. An NRC Materials License is issued in accordance with the general requirements contained in Title 10, Code of Federal Regulations, Part 30, and the License is subject to Title 10, Code of Federal Regulations, Parts 19, 20 and 35 and the license fee provision of Title 10, Code of Federal Regulations, Part 170. The license fee category should be stated in Item 26 and the appropriate fee enclosed.*

1.a. NAME AND MAILING ADDRESS OF APPLICANT *(Institution, firm, clinic, physician, etc.)* INCLUDE ZIP CODE

Baystate Medical Center - SH/WWU
759 Chestnut Street
Springfield, Mass. 01107

TELEPHONE NO.: AREA CODE( )

1.b. STREET ADDRESS(ES) AT WHICH RADIOACTIVE MATERIAL WILL BE USED *(If different from 1.a.)* INCLUDE ZIP CODE

Baystate Medical Center - SH/WWU
759 Chestnut Street
Springfield, Mass. 01107

2. PERSON TO CONTACT REGARDING THIS APPLICATION

Suresh M. Brahmavar, Ph.D.
Director, Medical Physics Service
Radiation Safety Officer

TELEPHONE NO.: AREA CODE( )

3. THIS IS AN APPLICATION FOR: *(Check appropriate item)*

a. ☐ NEW LICENSE
b. ☐ AMENDMENT TO LICENSE NO.
c. ☒ RENEWAL OF LICENSE NO. 20-01412-03

4/30/79 7A

4. INDIVIDUAL USERS *(Name individuals who will use or directly supervise use of radioactive material. Complete Supplements A and B for each individual.)*

Robert A. Grugan, M.D.
Won C. Park, M.D.
Robert A. Stein, M.D.
Alan J. Stark, M.D.
David B. Ross, M.D.

5. RADIATION SAFETY OFFICER (RSO) *(Name of person designated as radiation safety officer. If other than individual user, complete resume of training and experience as in Supplement A.)*

Suresh M. Brahmavar, Ph.D.
Director, Medical Physics Service

6.a. RADIOACTIVE MATERIAL FOR MEDICAL USE — Not Applicable

RADIOACTIVE MATERIAL LISTED IN:	ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS *(In millicuries)*
10 CFR 31.11 FOR IN VITRO STUDIES		
10 CFR 35.100, SCHEDULE A, GROUP I		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP II		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP III		
10 CFR 35.100, SCHEDULE A, GROUP IV		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP V		AS NEEDED
10 CFR 35.100, SCHEDULE A, GROUP VI		

ADDITIONAL ITEMS:	MARK ITEMS DESIRED "X"	MAXIMUM POSSESSION LIMITS *(In millicuries)*
IODINE-131 AS IODIDE FOR TREATMENT OF HYPERTHYROIDISM		
PHOSPHORUS-32 AS SOLUBLE PHOSPHATE FOR TREATMENT OF POLYCYTHEMIA VERA, LEUKEMIA AND BONE METASTASES		
PHOSPHORUS-32 AS COLLOIDAL CHROMIC PHOSPHATE FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
GOLD-198 AS COLLOID FOR INTRACAVITARY TREATMENT OF MALIGNANT EFFUSIONS.		
IODINE-131 AS IODIDE FOR TREATMENT OF THYROID CARCINOMA		
XENON-133 AS GAS OR GAS IN SALINE FOR BLOOD FLOW STUDIES AND PULMONARY FUNCTION STUDIES.		

6.b. RADIOACTIVE MATERIAL FOR USES NOT LISTED IN ITEM 6.a. *(Sealed sources up to 3 mCi used for calibration and reference standards are authorized under Section 35.14(d), 10 CFR Part 35, and NEED NOT BE LISTED)*

ELEMENT AND MASS NUMBER	CHEMICAL AND/OR PHYSICAL FORM	MAXIMUM NUMBER OF MILLICURIES OF EACH FORM	DESCRIBE PURPOSE OF USE
Cobalt-60 Our amendment #9 - (3/22/77), Our letter dated 12/30/76	Teletherapy & Sealed Source Model #C-146 or #C-151 AECL NPI-20-6000W Neutron Products	6000 Curies	For installation in Teletherapy Unit Theratron 780

7904250165 XA

FORM NRC-313M (5-79)

XA Copy Has Been Sent to PDR

INFORMATION REQUIRED FOR ITEMS 7 THROUGH 23

For Items 7 through 23, check the appropriate box(es) and submit a detailed description of all the requested information. Begin each item on a separate sheet. Identify the item number and the date of the application in the lower right corner of each page. If you indicate that an appendix to the medical licensing guide will be followed, do not submit the pages, but specify the revision number and date of the referenced guide: Regulatory Guide 10.8 , Rev. _____ Date: _____

U.S. Nuclear Regulatory Commission
Regulatory Guide 10-8 January 1979

7. MEDICAL ISOTOPES COMMITTEE	
X	Names and Specialties Attached; and
X	Duties as in Appendix B; or *(Check One)*
	Equivalent Duties Attached
8. TRAINING AND EXPERIENCE	
X	Supplements A & B Attached for Each Individual User; and Details Enclosed
X	Supplement A Attached for RSO.
9. INSTRUMENTATION *(Check One)*	
X	Appendix C Form Attached; or
	List by Name and Model Number
10. CALIBRATION OF INSTRUMENTS See Note	
X	Appendix D Procedures Followed for Survey Instruments; or *(Check One)*
	Equivalent Procedures Attached; and
	Appendix D Procedures Followed for Dose Calibrator; or Not applicable *(Check One)*
	Equivalent Procedures Attached
11. FACILITIES AND EQUIPMENT Details enclosed	
X	Description and Diagram Attached
12. PERSONNEL TRAINING PROGRAM Details Enclosed	
X	Description of Training Attached
13. PROCEDURES FOR ORDERING AND RECEIVING RADIOACTIVE MATERIAL Not applicable	
	Detailed Information Attached
14. PROCEDURES FOR SAFELY OPENING PACKAGES CONTAINING RADIOACTIVE MATERIALS *(Check One)* Not Applicable	
	Appendix F Procedures Followed; or
	Equivalent Procedures Attached
15. GENERAL RULES FOR THE SAFE USE OF RADIOACTIVE MATERIAL *(Check One)* Not Applicable	
	Appendix G Rules Followed; or
	Equivalent Rules Attached
16. EMERGENCY PROCEDURES *(Check One)* Details Enclosed	
	Appendix H Procedures Followed; or
X	Equivalent Procedures Attached
17. AREA SURVEY PROCEDURES *(Check One)*	
	Appendix I Procedures Followed; or
X	Equivalent Procedures Attached
18. WASTE DISPOSAL *(Check One)* Not Applicable	
	Appendix J Form Attached; or
	Equivalent Information Attached
19. THERAPEUTIC USE OF RADIOPHARMACEUTICALS *(Check One)* Not Applicable	
	Appendix K Procedures Followed; or
	Equivalent Procedures Attached
20. THERAPEUTIC USE OF SEALED SOURCES Not Applicable	
	Detailed Information Attached; and
	Appendix L Procedures Followed; or *(Check One)*
	Equivalent Procedures Attached
21. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE GASES (e.g., Xenon – 133) Not Applicable	
	Detailed Information Attached
22. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL IN ANIMALS Not Applicable	
	Detailed Information Attached
23. PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6.b	
X	Detailed Information Attached

FORM NRC (8-78)

24. PERSONNEL MONITORING DEVICES

TYPE (Check appropriate box)			SUPPLIER	EXCHANGE FREQUENCY
a. WHOLE BODY		FILM	R.S. Landauer, Jr., and Co.	Every month
		TLD	--	
		OTHER (Specify)	--	
b. FINGER		FILM	--	
		TLD	R.S. Landauer, Jr., and Co.	Every month
		OTHER (Specify)	--	
c. WRIST		FILM	--	
		TLD	--	
		OTHER (Specify)	--	

d. OTHER (Specify)

Not Applicable

25. FOR PRIVATE PRACTICE APPLICANTS ONLY Not Applicable

a. HOSPITAL AGREEING TO ACCEPT PATIENTS CONTAINING RADIOACTIVE MATERIAL

NAME OF HOSPITAL

MAILING ADDRESS

CITY | STATE | ZIP CODE

b. ATTACH A COPY OF THE AGREEMENT LETTER SIGNED BY THE HOSPITAL ADMINISTRATOR.

c. WHEN REQUESTING THERAPY PROCEDURES, ATTACH A COPY OF RADIATION SAFETY PRECAUTIONS TO BE TAKEN AND LIST AVAILABLE RADIATION DETECTION INSTRUMENTS.

26. CERTIFICATE
(This item must be completed by applicant)

The applicant and any official executing this certificate on behalf of the applicant named in Item 1a certify that this application is prepared in conformity with Title 10, Code of Federal Regulations, Parts 30 and 35, and that all information contained herein, including any supplements attached hereto, is true and correct to the best of our knowledge and belief.

a. LICENSE FEE REQUIRED
(See Section 170.31, 10 CFR 170)

(1) LICENSE FEE CATEGORY:
Renewal

(2) LICENSE FEE ENCLOSED: $ 270.00

b. APPLICANT OR CERTIFYING OFFICIAL *(Signature)*
Harry C.F. Gifford

(1) NAME (Type or Print)
Harry C.F. Gifford

(2) TITLE
President
Baystate Medical Center

c. DATE
March 25, 1979

Item 7: MEDICAL ISOTOPE COMMITTEE

Names and Specialties

1. Said M. Zu'bi, M.D. (Chairmen) - Nuclear Medicine
2. Won C. Park, M.D. - Radiation Therapy
3. John Rousou, M.D. - Cardiology
4. Paul Hetzel, M.D. - Oncology
5. John Sullivan, M.D. - Pathology
6. Thomas Parker, M.D. - Radiology
7. James Polga, M.D. - Nuclear Medicine
8. Robert Stein, M.D. - Radiation Therapy
9. George Holsten, III, M.D. - Pathology
10. John Turner, M.D. - Nuclear Medicine
11. Suresh M. Brahmavar, Ph.D., Radiation Safety Officer - Medical Physics

Item 7

Date: March 26, 1979

Item 8: TRAINING AND EXPERIENCE

Supplement A for each user in Item 4 is enclosed.

Supplement A for Radiation Safety Officer and a copy of his resume enclosed.

Supplement B Not applicable.

Users are on license - Info directed 6/4/79

Item 8

Date: March 26, 1979

APPENDIX C

INSTRUMENTATION

1. Survey meters

a. Manufacturer's name: EG & G 8004

Manufacturer's model number: #8004

Number of instruments available: One

Minimum range: 0.1 mr/hr to 1000 mr/hr

Maximum range: 1.0 ~~mr~~ r/hr to 1000 r mr/hr

b. Manufacturer's name: Victoreen: Thyae III

Manufacturer's model number: Meter: 490; Probe: 489-110

Number of instruments available: Two

Minimum range 0.01 mr/hr to 2.0 mr/hr

Maximum range 2.0 mr/hr to 200 mr/hr

2. Dose calibrator Not Applicable

Manufacturer's name: _____

Manufacturer's model number: _____

Number of instruments available: _____

3. Diagnostic instruments (Dosimetry Systems)

Type of Instrument	Manufacturer's Name	Model No.
a) Electro-Meter	Victoreen	570
R-Chambers (3)	Victoreen	131, 621, 70-5
b) Fluoroscopy Survey Meter	Victoreen	666
Diagnostic Probe (1)	Victoreen	SN520
c) Medical Physics Meters	Capintec	122
Probes (2)	Capintec	0.5 cc; PM-30

4. Other

a) TLD System: On Order
b) Dosimetry System: On Order
c) Iso-dose Plotter: On Order

Item 10: Survey Instruments

CALIBRATION OF SURVEY INSTRUMENTS

Check appropriate items

XXX 1. Survey instruments will be calibrated at least annually and following repair.

XXX 2. Calibration will be performed at two points on each scale. The two points will be approximately 1/3 and 2/3 of full scale. A survey instrument may be considered properly calibrated when the instrument readings are within ± 10% of the calculated or known values for each point checked. Readings within ± 20% are considered acceptable if a calibration chart or graph is prepared and attached to the instrument.

____ 3. Survey instruments will be calibrated

____ a. By the manufacturer

XXX b. At the licensee's facility

(i) Calibration source Cs-137
Manufacturer's name victoreen
Model no. Techlops #726
Activity in millicuries 100 mCi
Accuracy ±5%
Traceability to primary standard NBS

*(ii) The calibration procedures in Appendix D, Section I will be used. Yes

or

(iii) The step-by-step procedures, including radiation safety procedures are attached.

____ c. By a consultant or outside firm

(i) Name _____

(ii) Location _____

(iii) Procedures and sources

____ have been approved by NRC and are on file in License No. _____

____ are attached

* At the present time we do not have a calibration laboratory space. Arrangements are being made to acquire 170 square feet of Lab space to carry out calibrations under safe conditions.

Item No. 10
Date: March 26, 1979

99286

Item 11: FACILITIES AND EQUIPMENT

All details of our Co-60 Teletherapy facility can be obtained from the following references and documents in your file:

Our letters dated: March 25, 1974
September 22, 1972
July 14, 1972
March 20, 1972

Application of Renewal of License #20-01412-02.

Amendment #6 to License #20-01412-03 dated May 17, 1974.

Diagram attached with details of Item 17 - Area Survey Procedures.

Item 11

Date: March 26, 1979

Item 12: PERSONNEL TRAINING PROGRAM

a) Radiation Therapy Staff:

Technologists: ARRT certified or eligible or graduates of AMA approved community college - 2 year program.

Physicists: Meet or exceed the minimum requirements of "Qualified Expert" as defined by NRC 10 CFR; 35.24 dated January 8, 1979.

Physicians: Certified or board eligible for certification by American Board of Radiology in Therapeutic Radiology.

b) Hospital Personnel:

Radiation Safety Instruction Program for the employees of the hospital, particularly directed toward technologists, nursing staff, security personnel, purchasing and receiving, administrators, etc. This program includes the following topics:

Sources of radiation at Baystate Medical Center,

Basics of radiation safety and standards,

Handling of radioactive patients,

Handling of radioactive materials,

Federal, state and local regulations,

Precautions during brachytherapy,

Radiation incidents and emergencies in the community,

Revised unified radiation safety program,

Related questions and answers.

A copy of the announcement sent to hospital departments is enclosed.

Item 12

Date: March 26, 1979

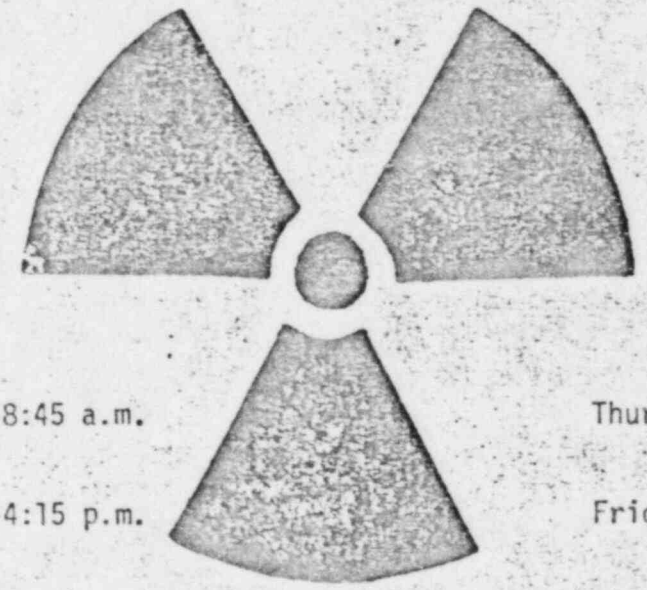
BAYSTATE MEDICAL CENTER

YOU ARE INVITED TO ATTEND A PROGRAM ON

CAUTION

RADIOACTIVE MATERIAL

RADIATION SAFETY



SHU

Monday, March 12th 8:00-8:45 a.m.
Auditorium I

Tuesday, March 13th 3:30-4:15 p.m.
Auditorium I

Wednesday, March 14th 9:30-10:15 a.m.
Auditorium I

WMU

Thursday, March 15th 10:30-11:15 a.
Carmichael B

Friday, March 16th 3:30-4:15 p.m.
Carmichael A

Presented by

Dr. Suresh M. Brahmavar
Ph.D. and Medical Physicist

The Program, this year, is the first one conducted for all Baystate Medical Center employees under a unified Radiation Safety Program. It is designed to meet the needs of both campuses.

The Program, based on the guidelines of the Nuclear Regulatory Commission, the Department of Public Health, O.S.H.A., J.C.A.H., is offered in compliance with the Mandatory Requirements of the State and Federal Regulatory Agencies.

FOR ALL HOSPITAL EMPLOYEES

PLEASE POST

Item 16: EMERGENCY PROCEDURES

A copy of our emergency instructions posted for use by operator of Cobalt-60 Teletherapy (Theratron 780) Unit is enclosed.

Item 16

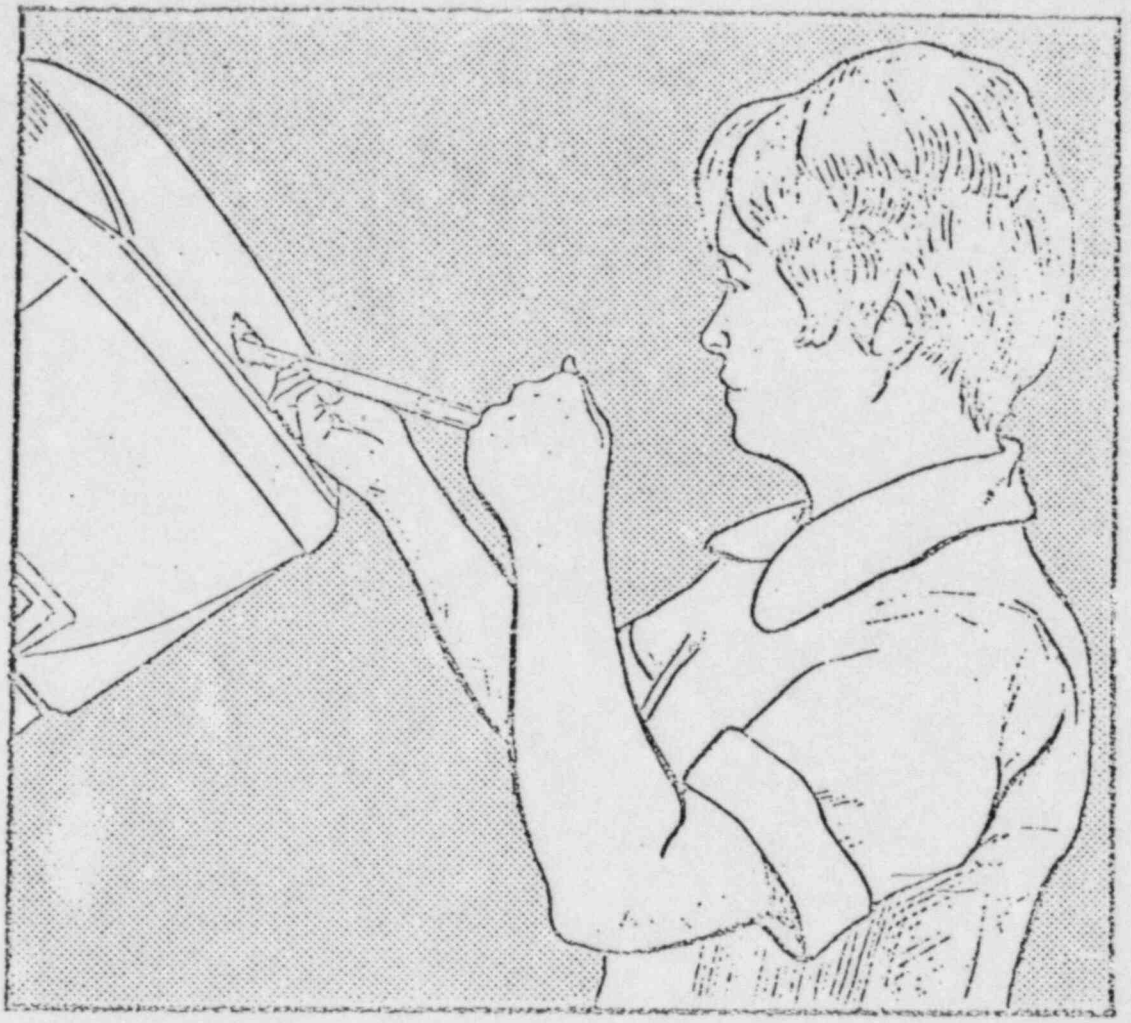
Date: March 26, 1979

EMERGENCY INSTRUCTIONS TO OPERATOR

IN CASE OF POWER FAILURE OR IN THE EVENT THE SHUTTER FAILS TO CLOSE AT THE END OF A TREATMENT OR ANY MALFUNCTION OF THIS MACHINE FOLLOW THE FOLLOWING PROCEDURES.

1. TURN "OFF" THE MACHINE AT THE CONTROL.
2. IF THE SOURCE IS STILL "ON" AND THE PATIENT IS AMBULATORY OPEN THE TREATMENT ROOM AND DIRECT THE PATIENT TO LEAVE THE ROOM.
3. IF THE PATIENT IS NOT AMBULATORY, ENTER THE ROOM AND RETURN THE SOURCE TO THE "OFF" POSITION BY MEANS OF THE EMERGENCY T-BAR. BE SURE TO AVOID THE PRIMARY BEAM OF RADIATION. REMOVE THE PATIENT FROM THE TREATMENT ROOM.
4. CLOSE AND LOCK THE TREATMENT ROOM DOOR.
5. POST A LEGIBLE AND CLEARLY VISIBLE SIGN WARNING OTHERS OF THE EXISTING EMERGENCY CONDITIONS.
6. NOTIFY R. A. GRUGAN, M.D. OR WON C. PARK, M.D. OR SURESH M. BRAHMAVAR, PH.D.

DO NOT ATTEMPT TO CORRECT OR INVESTIGATE ANY MALFUNCTION OF THE UNIT.



This bar is kept near the control panel outside the treatment room and can be used to push the source drawer back into the retracted, safe position. To manually retract the source drawer, use the following procedure:

1. Obtain the emergency T-bar from its location.
2. Insert the end of the T-bar over the red beam condition indicator rod and through the source-head cover.
3. Apply firm pressure to the T-bar and push the source drawer back into the safe position.

NOTE: 1. The source is not in the fully safe condition unless the amber coloured portion of the T-bar is entirely inside the source-head cover. In the fully safe condition, the external radiation fields are at normal levels and repairs can be carried out. The source can be considered relatively safe if none of the red portion of the T-bar is visible.

Item 17: AREA SURVEY PROCEDURES

A copy of the actual survey done is enclosed. This survey was done on March 13, 1974 when the loading of the source was 4486 Curies. (Refer to our letter dated March 25, 1974 and amendment #6 to license #20-01412-03 dated May 17, 1974.)

Periodic spot checks are done around the entrance door and in adjacent areas of the Cobalt-60 room.

Date of last survey: March 23, 1979.

Results: No measurable radiation levels.

Item 17

Date: March 26, 1979

RADIATION SURVEYS OF RESTRICTED AND UNRESTRICTED AREAS: COBALT-60

ROOM (GROUND LEVEL), BASEMENT ROOM AND PATIENT ROOMS (FIRST FLOOR)

Unit: Theratron 780 (AECL)

Location: Springfield Hospital Medical Center
759 Chestnut Street
Springfield, Massachusetts 01107

Source: Cobalt-60; 2.0 cm; AECL type C-146

Nominal Loading Capacity of the Co-60 Facility: 6000 Curies

Present Loading: 4486 Curies as of March 12, 1974

Survey Instrument: EG&G, Model 8004

Date of Survey: March 13, 1974

Method: The radiation levels were measured (in mr/hr) on the most sensitive range of the above survey meter. Repeated measurements were made at the locations indicated by numerals on the enclosed floor plans. The measurements were repeated to include all the routine treatment conditions with the beam "ON" and with the phantom. During these measurements the Cobalt-60 machine was operated in 360° rotational mode; fixed distances and with the source head rotated to 60° and 89° to direct the primary beam to wall "A" (see the enclosed diagram).

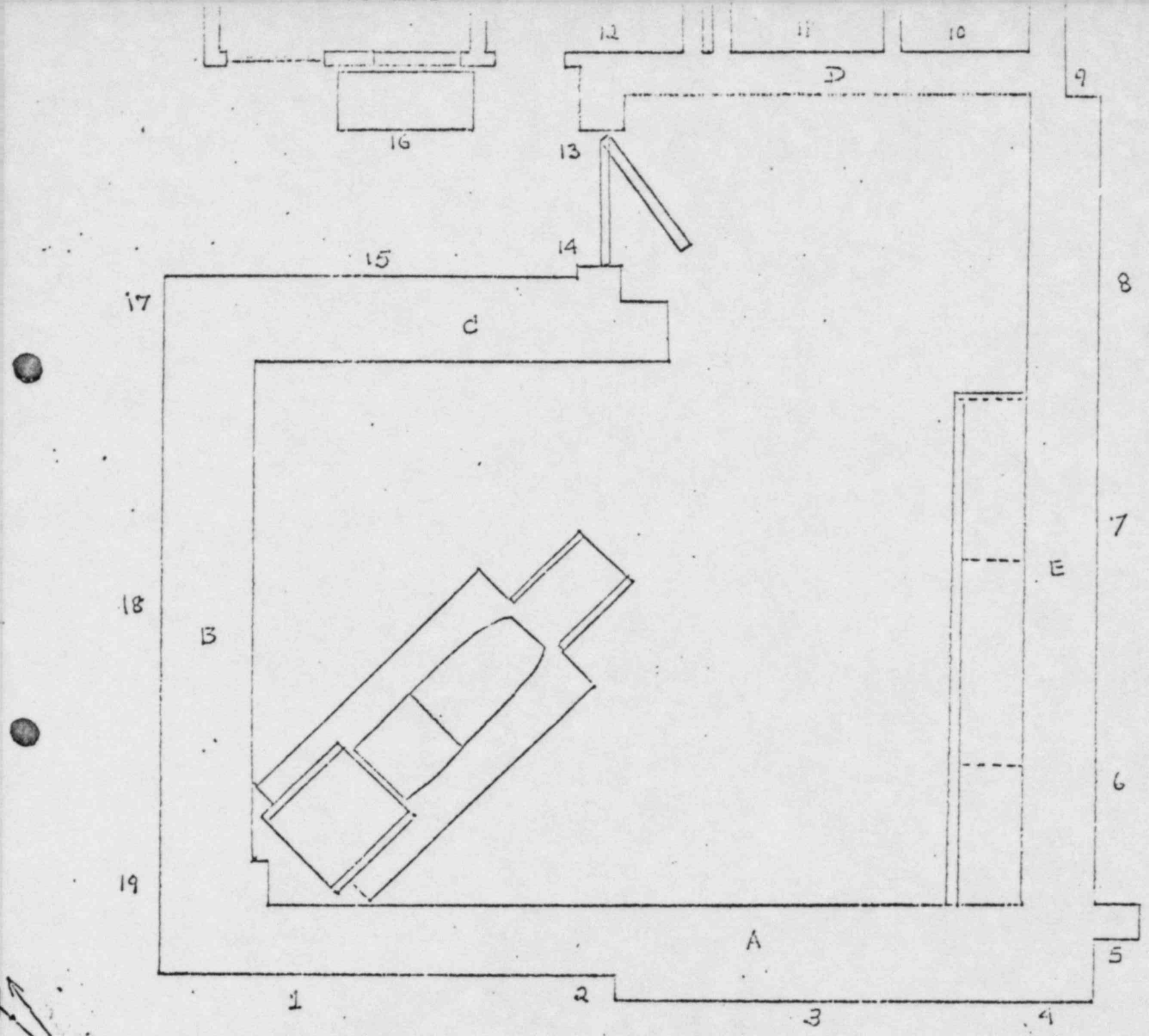
The survey points were very close to the walls and at a height of 4 feet from the floor for the Cobalt-60 Room (Ground Level). For the Basement Room, the survey points were very close to the wall and about 4 feet from the ceiling. For the Patient Rooms (First Floor), these points were close to the walls on either side and close to the floor of the rooms. The collimeters were opened to give a field size of 25 x 25 cm at 80 cm SSD.

Results:

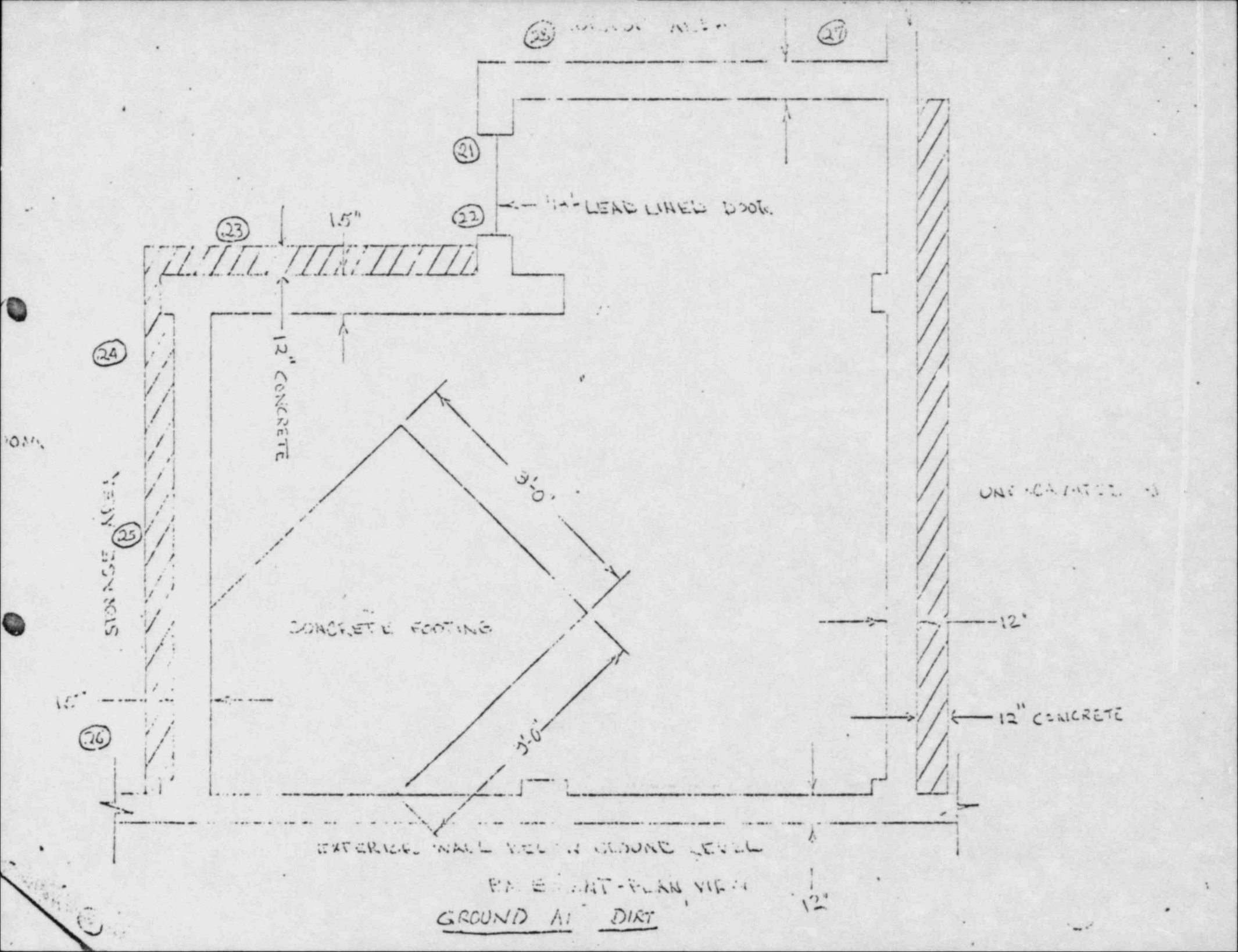
	LOCATION	SURVEY POINTS	ESTIMATED EXPOSURE
I	Cobalt-60 Room: (Ground Level)	All the survey points from 1 through 20 in rotational mode and fixed mode. Survey points 2,3 & 4 when the sourcehead was rotated 60° & primary beam directed to wall "A". Estimated operation in this mode is 2 hr/wk	No measurable radiation levels detected. pt: 2:0.4 mr/hr pt: 3:0.8 mr/hr pt: 4:0.2 mr/hr The max. exposure would be 1.6 mr/wk.

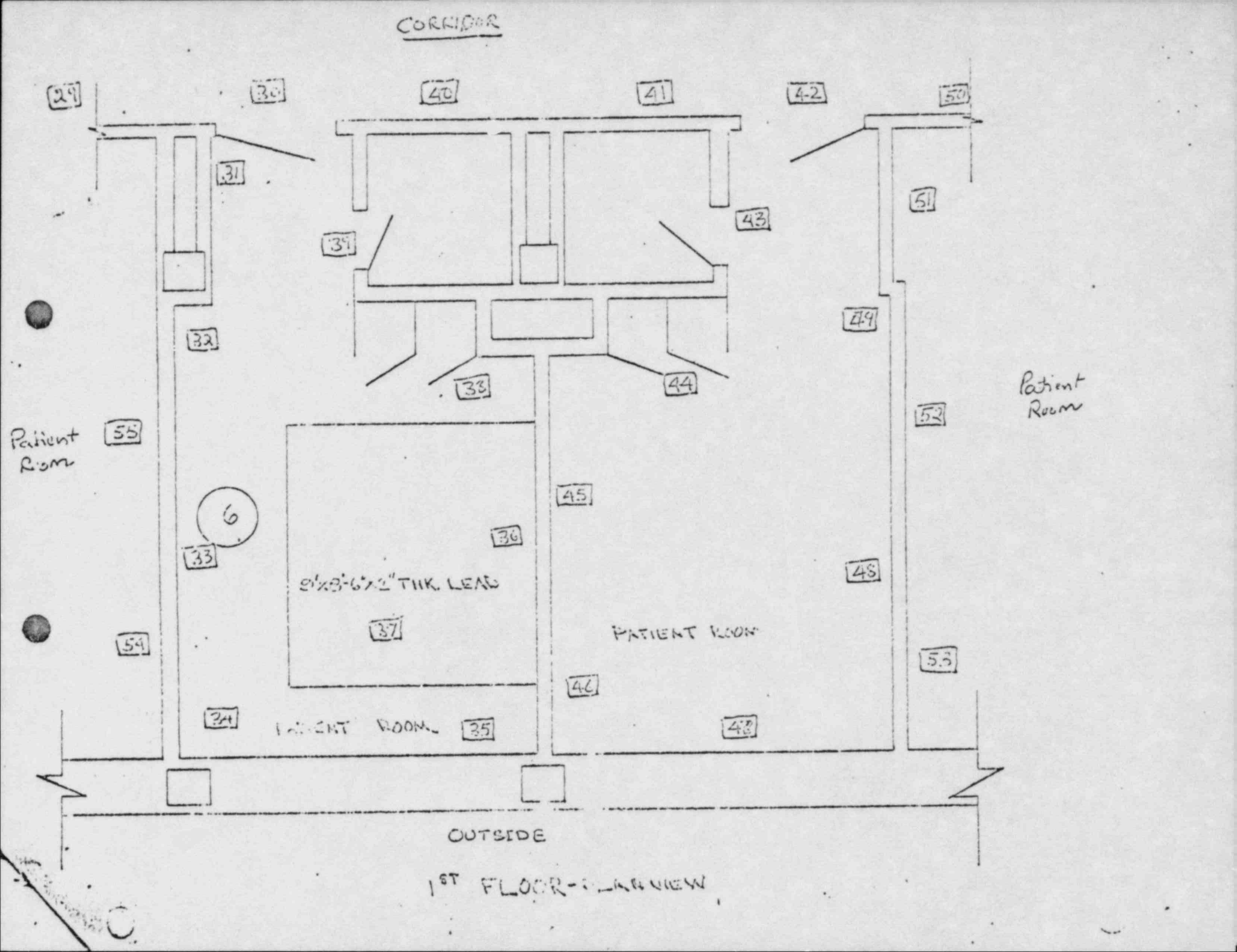
LOCATION	SURVEY POINTS	ESTIMATED EXPOSURE
II Basement Room: (Basement)	Survey points 21 through 28 in all three modes.	No measurable radiation levels detected.
III Patient Rooms: (First Floor)	Survey points 29 through 55 in all three modes.	No measurable radiation levels detected.

Survey Done By: Suresh M. Brahmavar, Ph.D.
Medical Physicist
Radiation Protection Officer



COBALT-60 ROD - GROUND LEVEL


(25)
(27)
(21)
(22)
(23)
(24)
(25)
(26)
1.5"
12" CONCRETE
STORAGE AREA
CONCRETE FOOTING
3'-0"
3'-0"
12"
12" CONCRETE
12"
GROUND AT DIRT



1ST FLOOR-PLAN VIEW

Item 23: PROCEDURES AND PRECAUTIONS FOR USE OF RADIOACTIVE MATERIAL SPECIFIED IN ITEM 6(b)

a) Use of Theratron 780 Unit:

All procedures given in Section 3 (OPERATIONS) of the Instruction Manual, Theratron 780 Cobalt-60 Teletherapy Unit (AECL), Edition 3 (1972) are followed.

b) Copies of the following Radiation Safety Procedures are enclosed:

Report of Teletherapy Tests and Surveys - dated March 13, 1974. The present levels will be less than those given in this report. The present estimated loading is 2243 Ci (March 12, 1979).

Interlock Tests: Electrical and Source Interlocks - March 23, 1979.

Radiation Protection Officer Inspection - March 23, 1979.

Wipe-Test for Cobalt-60. (March 12, 1979)

Item 23

Date: March 26, 1979