

EVALUATION OF
PROPOSED RADIOLOGY LAYOUT

385 - 67

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COMMUNITY SYSTEMS FOUNDATION

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385
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December 19, 1967

Mr. David F. Johannides
Assistant Administrator
W. A. Foote Memorial Hospital
205 N. East Avenue
Jackson, Michigan 49201

Dear Mr. Johannides:

Please find attached a report on the "Evaluation of Proposed Radiology Layout".

The study was conducted by Mr. M. O. Jacobs, Project Assistant. Its purpose was to evaluate the layout of the proposed Radiology Department in terms of flow, storage space and office space. The report discusses two alternative layouts, confirms the availability of sufficient office area for the present staffing and shows the projected requirements for storage of films and reports for the next three years.

During the course of the study we had the opportunity of briefly reviewing several film and report filing systems. I would like to recommend that consideration be given to study the present filing system and to evaluate the feasibility of installing a different system.

Excellent cooperation was received from Dr. Payne, Chief Radiologist; Mr. Babcock, Chief Technician and Mrs. Schaeffer, secretary. I want to express our gratitude for this cooperation.

Sincerely yours,

Pablo Gonzalez
Project Director

PG:cf

attachment

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EVALUATION OF PROPOSED RADIOLOGY LAYOUT

W. A. FOOTE MEMORIAL HOSPITAL

JACKSON, MICHIGAN

PROJECT NO: MG-FJ-12d
PREPARED BY: COMMUNITY SYSTEMS
FOUNDATION
DATE SUBMITTED: December 5, 1967
PROJECT ENGINEER: M. Orry Jacobs

INTRODUCTION

The W. A. Foote Memorial Hospital will be undertaking an expansion of the present facility within the next year. Architectural plans have been prepared and are currently being evaluated.

One of the new facilities planned for the expansion is the new Radiology Department. The Systems Engineering Department was requested to evaluate the work flow within the proposed area and to determine the adequacy of filing space and office space for clerical personnel.

SUMMARY OF RECOMMENDATIONS

1. Two alternative layouts for the filing and sorting area were prepared and are shown in Appendix D.
 - A. Alternative No. 1 offers the most film storage capacity.
 - B. Alternative No. 2 is the most favorable in terms of what the Chief Radiologist recommends, i.e. a viewing area for doctors. This alternative however offers 40% less film storage than Alternative No. 1.
2. The feasibility of obtaining automatic equipment for the filing of reports should be considered in the future.
3. It is recommended that -- as time permits -- a study be undertaken to determine the best filing system for films in the Radiology Department.

WORK FLOW ANALYSIS

An analysis of the work flow within the proposed work areas shows the flow to be extremely efficient and well designed.

Appendix A shows a diagram of the film flow from the radiographic rooms through the clerical area. A breakdown of the flow is as follows:

1. Films originate at the radiographic rooms.
2. The unprocessed films are taken to the dark room and processed.
3. Developed films are given to the sorter through the pass-through window.
4. The new films and possibly older films for comparison are combined into one packet at the sort desk.
5. Films are either held at the sort room or passed through the pass-through window to the clerical personnel for distribution.

There is one disadvantage to the total flow; the distance between the clerical area and the Chief Radiologist's office is approximately 150 feet. It is recommended that films be delivered in batches or unit loads (except emergency films) in order to minimize the total traveling time.

FILM STORAGE ANALYSIS

File storage in the Radiology Department is divided into two categories: storage of X-Ray films and storage of radiology reports.

Currently, one year of films and five years of reports are stored in the department. Additional storage is located in the basement.

Data concerning the number of visits to the Radiology Department during the past 3½ years was obtained and plotted (see Appendix B). The only visits analyzed were the ones for which large films were obtained since these are the only visits for which films and reports are stored within the Radiology Department.

The graph indicated that a 7% growth rate had been experienced over the past two years. Using this growth rate, a forecast was made of storage needs for the coming three years (see Appendix C). Current storage space in the Radiology Department proper was used as a base, since storage is at capacity.

Storage capacity needed under a 15% growth rate was also computed, to obtain an idea of the storage needed if the growth rate should increase faster than at the current rate.

Two alternative layouts were prepared for the sorting and storage areas. These are shown in Appendices D-1 and D-2. A sketch of the film cabinets can be found in Appendix F.

Alternative No. 1

This layout consists of fifteen (15) film storage cabinets and the sorting desk. This number of film storage cabinets will allow more than one year's storage capacity even at a rate of growth of 15% per year for the next three years.

Alternative No. 2

This layout consists of nine (9) film storage cabinets, the sorting desk and a viewing area for physicians. Compartments or bins are provided for each doctor above the viewing area. These bins will be used to place each physician's reports and films.

The viewing area was added at the expense of six film storage cabinets or 40% of the storage capacity.

The Chief Radiologist feels that the advantages of the viewing area will exceed the disadvantages created by the loss in storage since the majority of the film recalls occur within a short period of time after the patient's visit.

COMPARISON OF STORAGE CAPACITY

Appendix E shows two tables comparing alternatives 1 and 2 for a 7% and a 15% rate of growth.

If storage is a prime consideration, it is obvious that alternative No. 1 should be chosen. However; not having made a study of the film recalls or of the advantages of a viewing area in the sorting room, a recommendation on one of the alternatives will not be made at this time.

SECONDARY FILM STORAGE AREA

The proposed layout for the secondary film storage area can be found in Appendix G.

This layout allows for twenty-seven (27) film storage cabinets (486' lineal feet) which will accomodate approximately thirty (30) months of films.

The remainder of the films will be stored in the basement storage area.

REPORT STORAGE ANALYSIS

Presently there are eleven (11) report storage cabinets (see Appendix F for sketch of equipment) with a present capacity for five years (124 lineal feet).

The proposed office area has room for twelve (12) cabinets or 135 lineal feet. This means that sometime during 1968 the storage capacity will be less than five years at the present rate of growth. It may then be necessary to store some reports in another area -- sort room, secondary film storage area or basement.

If the ceiling heights permit it, the cabinets could be double stacked; this would allow between 18 and 24 cabinets or 202 to 270 lineal feet of storage. Such a set-up would not be entirely practical due to the heights of the upper drawers; however, it is an alternative to consider in the future if report space is needed in the immediate office area. Another consideration would be to stack smaller cabinets on top of the present cabinets.

Alternative No. 1 shows the report cabinets as presently utilized.

Alternative No. 2 shows the report cabinets double stacked. An automatic retrieval system would require approximately the same floor area as shown in Alternative No. 2.

OFFICE AREA

The area for clerical personnel allows three secretarial desks (46" X 30") and a receptionist counter (36" X 30").

Under the present staff level, this is sufficient.

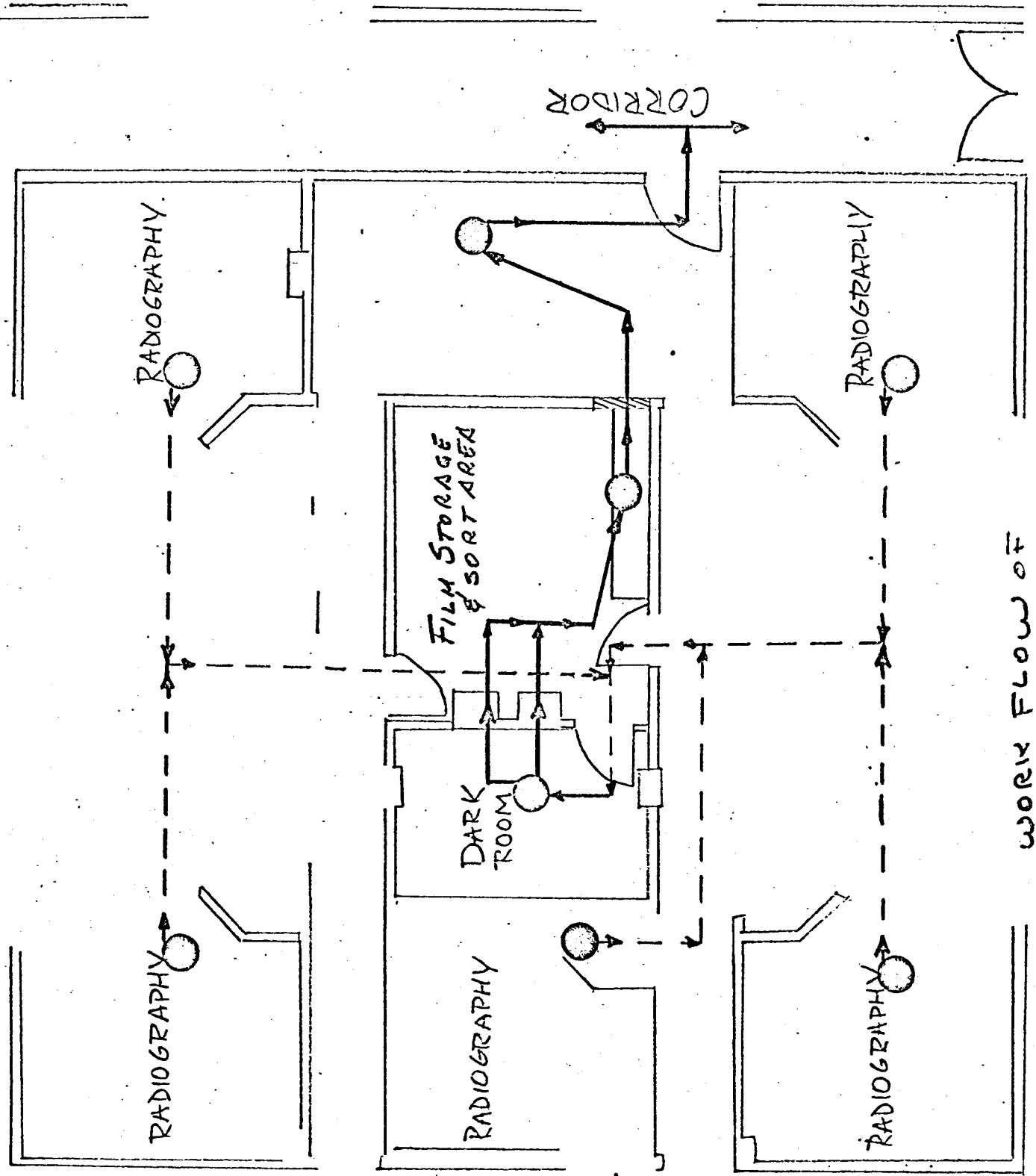
CONCLUSIONS

1. The film storage capacity in the sorting room depends on which alternative is chosen and on the rate of growth.

The storage capacity will vary from 9 months to 17 months through 1970 depending on the above mentioned factors.

2. The report storage capacity will be less than five years within the next 12 months. If it is desirable to maintain a five year storage in the office area, it will be necessary to change the layout or to change the storage system, e.g. an automatic retrieval or storage of reports with the films.
3. The office area is quite adequate for the present level of staffing.
4. The flow of film and work is quite efficient within the work areas and the only disadvantage to the total flow is the distance between the office area and the Chief Radiologist's office.

APPENDIX



LEGEND

○ - Operation

--- Flow of unprocessed films

→ Flow of processed films

WORK FLOW OF FILMS IN THE PROPOSED RADIOLOGY DEPT.

SCALE: 1/8" = 1', M.O.

12/7/67

APPENDIX - B-1

NUMBER OF VISITS TO RADIOLOGY DEPARTMENT*

YEAR	PERIOD	1 OUTPATIENTS	2 INPATIENTS	1&2 TOTAL
1964	Jan.-Jun.	5502	4347	9849
1964	Jul.-Dec.	6501	4442	10943
1965	Jan.-Jun.	6988	4991	11979
1965	Jul.-Dec.	7244	4758	12002
1966	Jan.-Jun.	8065	4920	12985
1966	Jul.-Dec.	8910	4761	12771
1967	Jan.-Jun.	8051	4955	13006

*Only large films were considered since only those are stored in the department.

PREPARED BY: M. O. Jacobs
12/7/67

APPENDIX - B-2

Radiology visits, large films only*



RADIOLOGY VISITS ↑

TIME →

M. O. J.
12-8-67

* LARGE FILMS AND ASSOCIATED REPORTS ONLY (ONLY STORED IN RADIOLOGY)

APPENDIX - C

PROJECTED REQUIREMENTS FOR ONE YEARS' STORAGE OF FILMS AND FIVE YEARS' STORAGE OF REPORTS

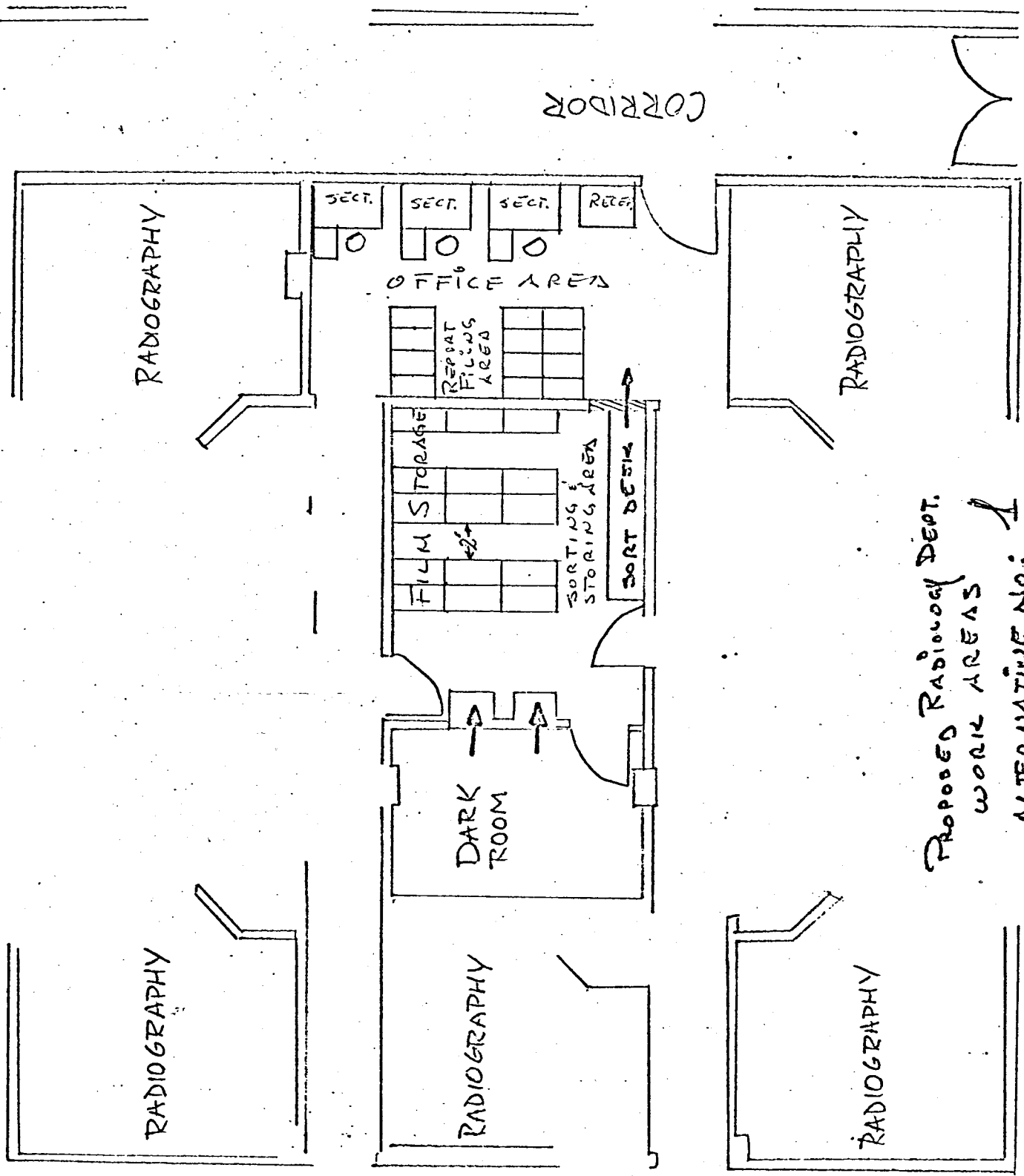
YEAR	REQUIREMENTS IN LINEAL FEET			
	@ 7% GROWTH		@ 15% GROWTH	
	FILMS	REPORTS	FILMS	REPORTS
1967	180	124	180	124
1968	192	153	207	144
1969	205	142	238	166
1970	220	152	274	191

NOTE: Alternative No. 1 provides 275 lineal feet of film storage
Alternative No. 2 provides 162 lineal feet of film storage

Both alternatives provide the same storage capacity for reports (135 lineal feet).

PREPARED BY: P. Gonzalez
12/12/67

APPENDIX - D-1

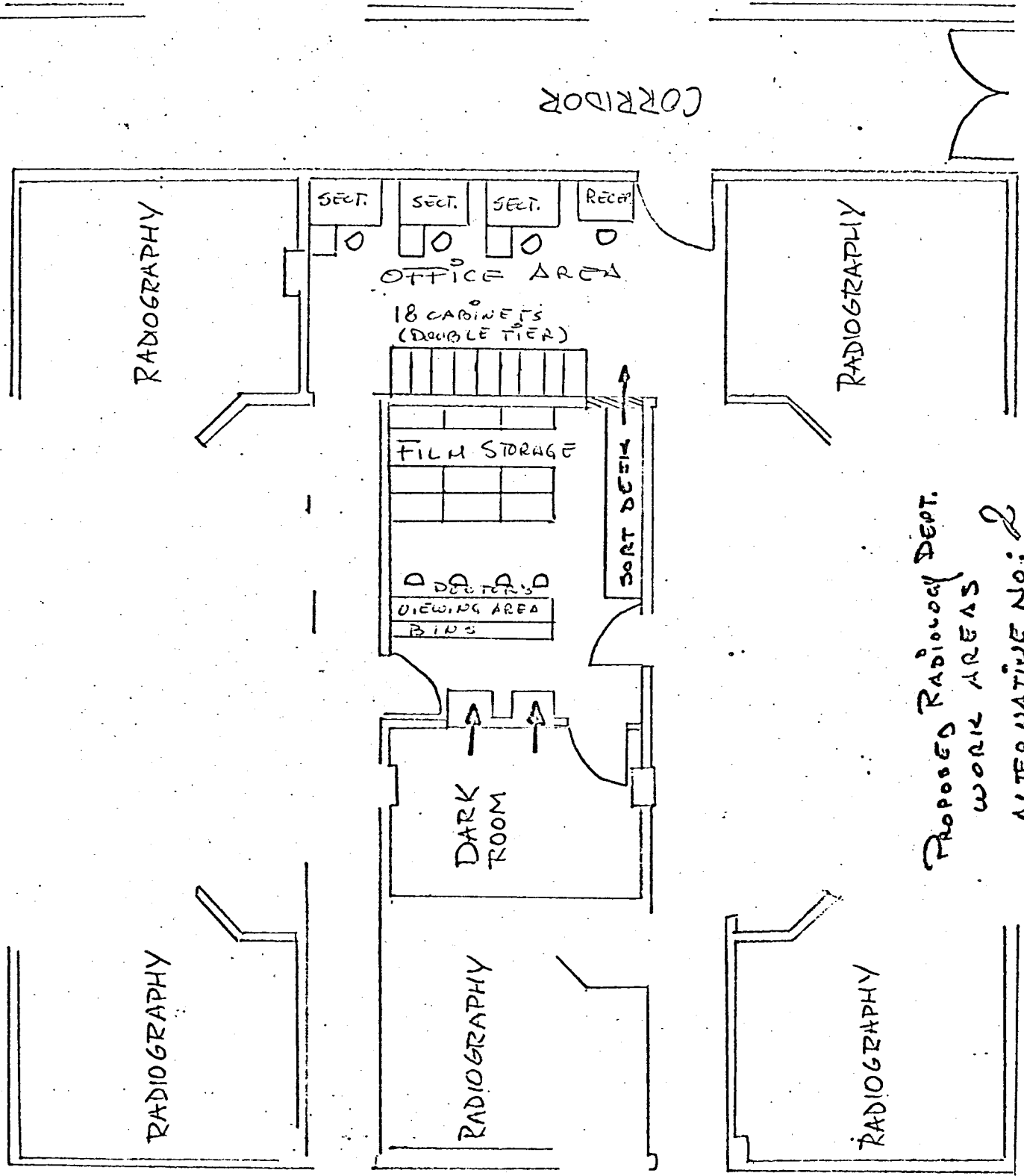


PROPOSED RADIOLOGY DEPT.
 WORK AREAS
 ALTERNATIVE NO: 1

SCALE: 1/8" = 1'

APPENDIX - D-2

M.O. 7
SCALE: 1/8" = 1'



PROPOSED RADIOLOGY DEPT.
WORK AREAS
ALTERNATIVE NO. 2

APPENDIX - E

COMPARISON OF CAPACITIES BETWEEN ALTERNATIVES

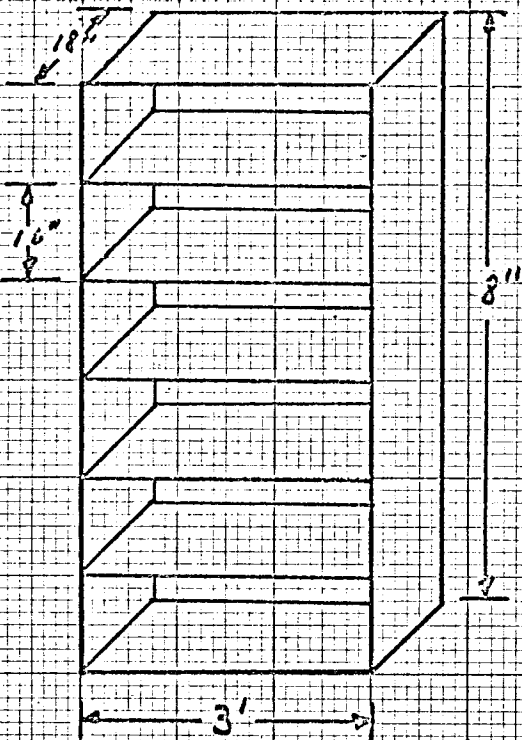
YEAR	CAPACITY IN MONTHS FOR A 7% GROWTH	
	ALTERNATIVE NO. 1	ALTERNATIVE NO. 2
1968	17 months	10 months
1969	16 months	9.5 months
1970	15 months	9 months

YEAR	CAPACITY IN MONTHS FOR A 15% GROWTH	
	ALTERNATIVE NO. 1	ALTERNATIVE NO. 2
1968	16 months	9.5 months
1969	13.5 months	8 months
1970	12 months	7 months

PREPARED BY: P. Gonzalez
12/12/67

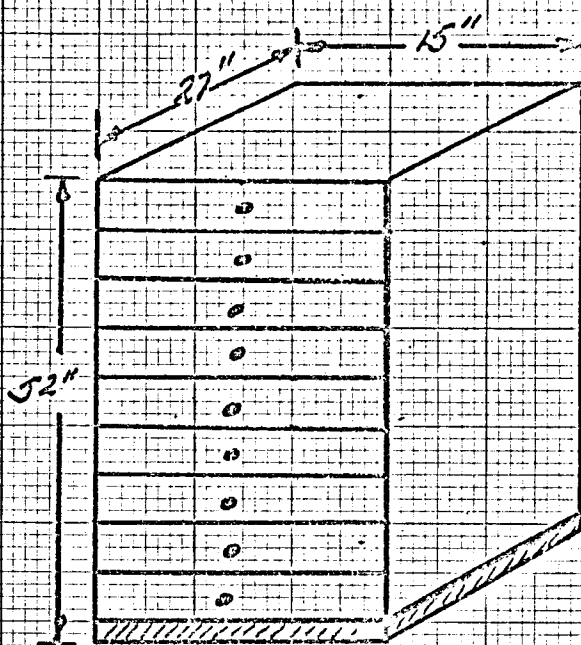
APPENDIX - F

FILM STORAGE CABINET



(18 lineal feet)

REPORT STORAGE CABINET



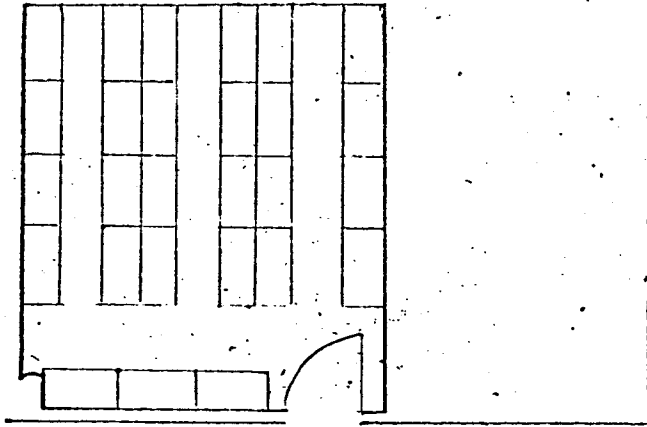
(11.25 lineal feet)

M. D. J.
12/7/67

APPENDIX - G

Secondary Film Storage Area

SECONDARY FILM STORAGE



Scale: 1/8" = 1'

M. G. J.
12/5/67