

CENTRAL SUPPLY ROOM LAYOUT

382 - 67

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December 5, 1967

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

Dear Mr. Johannides:

Please find attached a report on a study of the layout for the proposed Central Supply Room.

The purpose of the study was to develop a layout of the C.S.R. which would allow an efficient flow of materials while eliminating the danger of cross-contamination and minimizing the traveling distances between the C.S.R. and other departments or units.

The study was conducted by Mr. M. O. Jacobs, Project Assistant and Mr. P. Gonzalez, Project Director. I would like to take this opportunity to acknowledge the fine cooperation received from Miss Mitchell, Director of Nursing Services; Mrs. O'Dell, Supervisor of C.S.R. and Mrs. Gutekunst, Supervisor of Surgery Department.

Sincerely,

Pablo Gonzalez
Project Director

PG:cf

attachment

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BACKGROUND

At the request of Administration, the Systems Engineering Department conducted an evaluation of the proposed layout for the Central Supply Room and prepared alternative layouts of that department.

Construction of the 1968 expansion will begin shortly; therefore, proper planning of the facilities such as fixtures and sterilizers was necessary in order that plumbing and wiring could be roughed-in.

PURPOSE

The purpose of the study was to develop a layout which will allow the best possible flow of materials within the C.S.R. and which will minimize danger of cross contamination.

The layout should also consider the access to the different areas in the C.S.R. from other departments in order to minimize traveling distances and traffic.

SUMMARY OF PROCEDURE

Briefly stated, the steps leading to the completion and acceptance of the final layout were as follows:

1. Plans of the present and proposed C.S.R. were obtained.
2. Several C.S.R. layouts -- as published by manufacturers and consultants -- were researched.
3. Meetings were held with Mrs. O'Dell, Mrs. Gutekunst and Miss Mitchell in order to evaluate future demands as well as trends in equipment and disposables.
4. Data concerning the flow of materials through C.S.R. was obtained.
5. Flow of personnel and materials to and from C.S.R. was obtained or estimated from past surveys and experience of personnel involved.
6. Several layouts were prepared and evaluated as to work flow, work station dimensions, future expansion needs and danger of cross contamination.
7. Five alternative layouts were presented to Mr. Skinner, Mr. Johannides, Miss Mitchell and Mrs. O'Dell.
8. The results of the presentation and discussion led to the development of a sixth layout which was proposed during a subsequent meeting and approved by all parties involved. This sixth layout was turned over to the architect to be incorporated into the expansion plans.

DISCUSSION

The following is a more detailed discussion of the Central Supply Room operation and characteristics; it also includes a discussion of the proposed layout and the procedure used to develop it.

Areas of a C.S.R.

The Central Supply Room consists of six main work areas:

1. Receiving and Cleaning. Here the instruments, equipment and utensils are received, washed and prepared (in packs) for sterilization.
2. Clean work area. Linen is received from the Laundry and surgical packs are made in this area.
3. Sterilizers. All linen, instruments and utensils are brought here for sterilization.
4. Sterile storage. Instruments, utensils and other sterile supplies are stored in this area until requisitioned by the units.
5. Unsterile-Clean-Storage. Clean, but unsterile equipment such as suction machines and other unsterile supplies are stored in this area until requisitioned.
6. Still Area. Water for P.T., Pharmacy and Surgery is distilled and bottled in this area.

One area not mentioned above is the Sterile Surgical Storage Area. This room had already been allocated within the Surgery Department and did not need to be considered.

Receiving and Cleaning of Surgical Instruments.

Presently the surgical instruments are cleaned and sterilized in the workroom within the Surgery Department. However, it was decided by those concerned that this function should be performed in the C.S.R. after the expansion is completed.

Therefore, one prime consideration for the proposed layout was the allocation of facilities and space for a R & C area for surgical instruments. During the meetings held it was agreed that a separate R & C area should be provided because of the necessity for careful handling of the surgical instruments and the danger of cross contamination.

Types of Materials Processed Through C.S.R.

The proposed C.S.R. will process four main types of materials or supplies.

1. Surgical instruments from the Surgery Department.
2. Instruments, utensils and equipment from the nursing units.
3. Linen is processed and sent to the Surgery Department in the form of surgical packs.

- (A)
4. Distilled and sterilized water.

Flow of Materials

The next step in the analysis was to determine the flow of materials through the C.S.R.

This flow was determined to be as follows:

1. Surgical instruments
 - a. From surgery to receiving and cleaning.
 - b. At R & C the instruments are washed and packed.
 - c. From R & C to the sterilizers and sterilized.
 - d. From the sterilizers to the Surgery Department.
2. Utensils and instruments from units
 - a. From units to R & C.
 - b. Process through R & C.
 - c. From R & C to sterilizers.
 - d. From sterilizers to sterile storage.
 - e. Store at sterile storage until requisitioned by the units.
3. Equipment from units.
 - a. From units to R & C.
 - b. Process through R & C.
 - c. From R & C to unsterile storage.
 - d. Store at unsterile storage until requisitioned by units.
4. Linen.
 - a. From Laundry Department to clean work area.
 - b. Make surgical packs.
 - c. From clean work area to sterilizers.
 - d. From sterilizers to Surgery Department.
5. Water.
 - a. Water is distilled and bottled at the still work area.
 - b. From still to sterilizers.
 - c. From sterilizers to sterile storage.
 - d. Store at sterile storage until requisitioned by P.T., Surgery, or Pharmacy.

Frequency

Due to a lack of time, it was not possible to obtain frequency of flow of the different types of materials within the C.S.R. However, it was possible to estimate the flow of materials from other departments to C.S.R. and from C.S.R. to the other departments and, thus, to approximate the frequency of flow within the C.S.R.

A previous survey (Traffic Study - unpublished) showed that between 60 and 90 trips per day are taken by nursing personnel to the C.S.R. This area is the single, most frequented area by this type of personnel.

Personnel from C.S.R. make at least four trips per day to the different units to take and collect equipment, instruments and utensils.

Linen is brought between 4 and 6 times per day from the Laundry and delivered once per day to the Surgery Department.

Approximately 50 trips are taken each day to and from the dumbwaiter to receive and/or send supplies to the units.

For surgical instruments, it was assumed that each operation performed will require one trip to the C.S.R. or an average of 20 trips per day. To return the instruments to surgery, fewer trips will be required since unit loads can be prepared and delivered 5 times per day.

From these frequencies, it was possible to simulate the approximate frequency of flows within the C.S.R.

Layouts and Flow Analysis

Several layouts were developed and flow process charts prepared for each of the layouts. A master sheet, showing distances for each flow for each layout was prepared in order to compare each of the layouts against the others.

The layouts and the master comparison sheet will be found in the Appendix.

Analysis of Layouts

Knowing the distances and the approximate frequencies involved in handling the different types of materials, the actual travel for each of the alternatives was prepared. This information can be found in the Appendix.

Total traveling distances were found to be as follows:

Alternative No. 1	--	18,192 feet per day
Alternative No. 2	--	16,996 feet per day
Alternative No. 3	--	15,510 feet per day
Alternative No. 4&5	--	22,459 feet per day
Alternative No. 6	--	15,286 feet per day

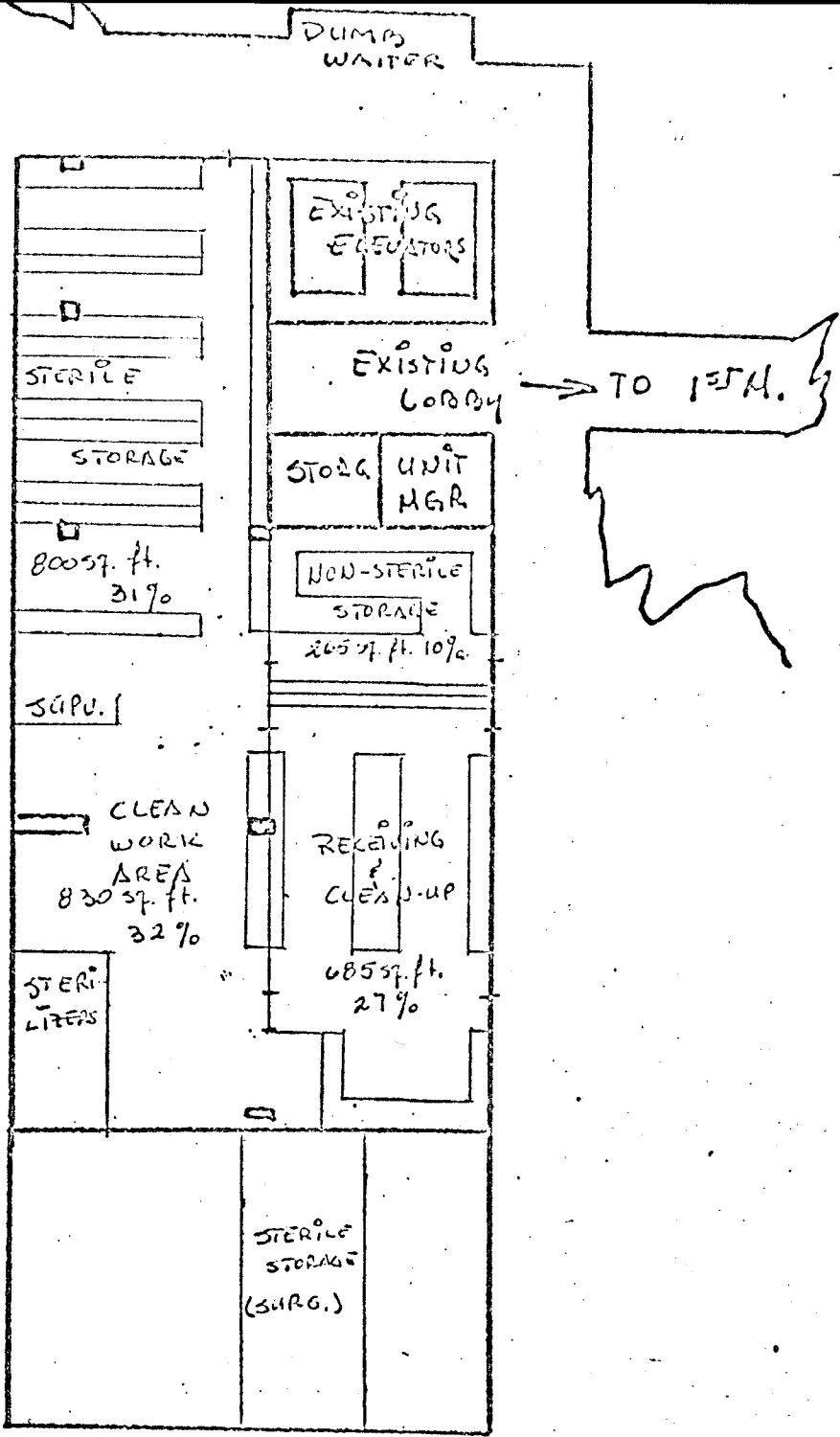
It must be mentioned that due to the relatively low frequency of handling water and the fact that the still is located in approximately the same location in all the layouts, it was not necessary to analyze that specific flow.

As can be seen from the above analysis, Alternative No. 6 is the best as far as flow of materials, and traveling distances is concerned.

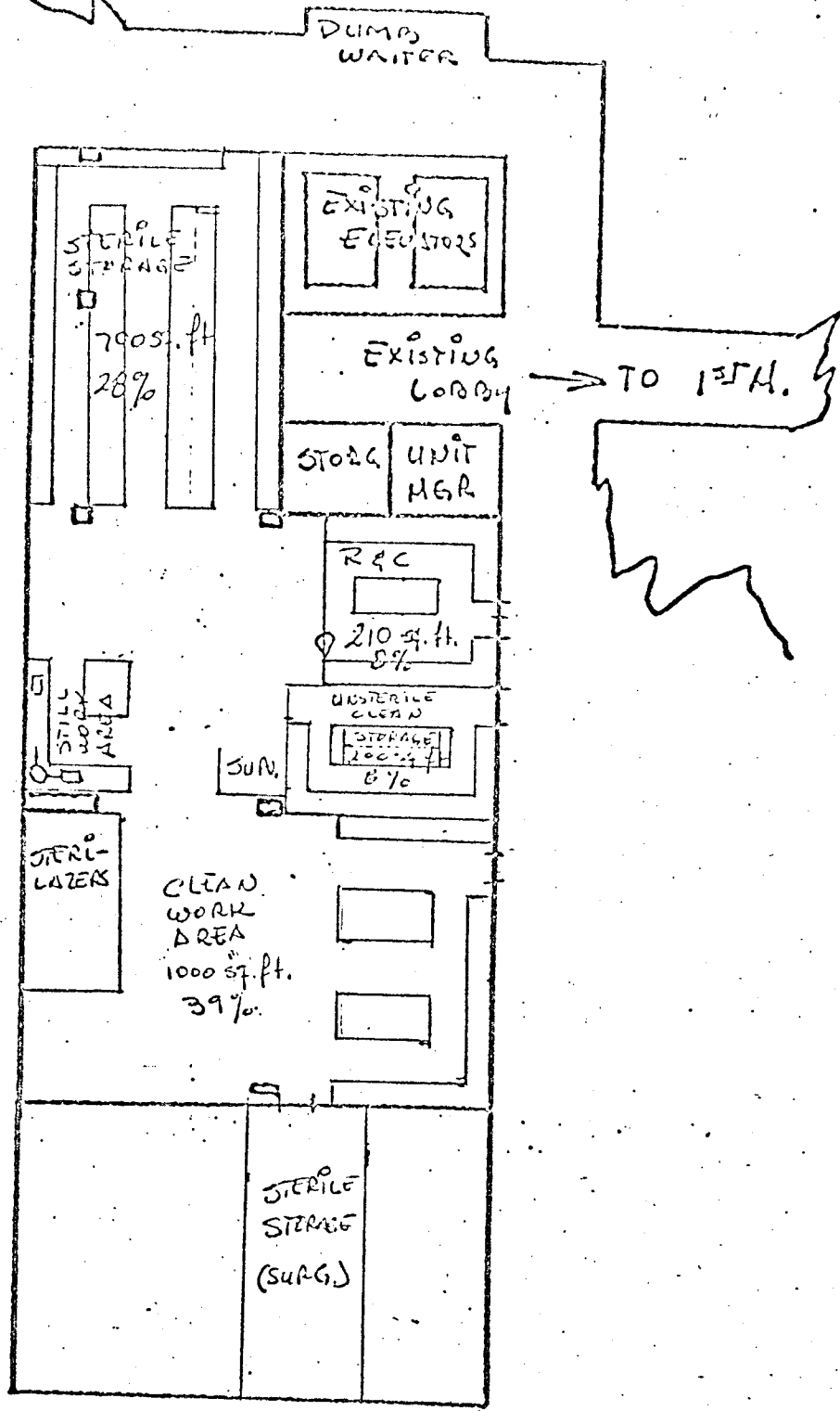
Also due to separation of the Receiving and Cleaning Areas, danger of cross contamination is minimized. For additional protection, partitions are proposed in order to keep each of the working areas as isolated as possible.

The sterilizers are located as centrally as possible in order to minimize travel and allow for a smooth flow of materials.

A larger scale layout of the alternative accepted is attached in the Appendix.

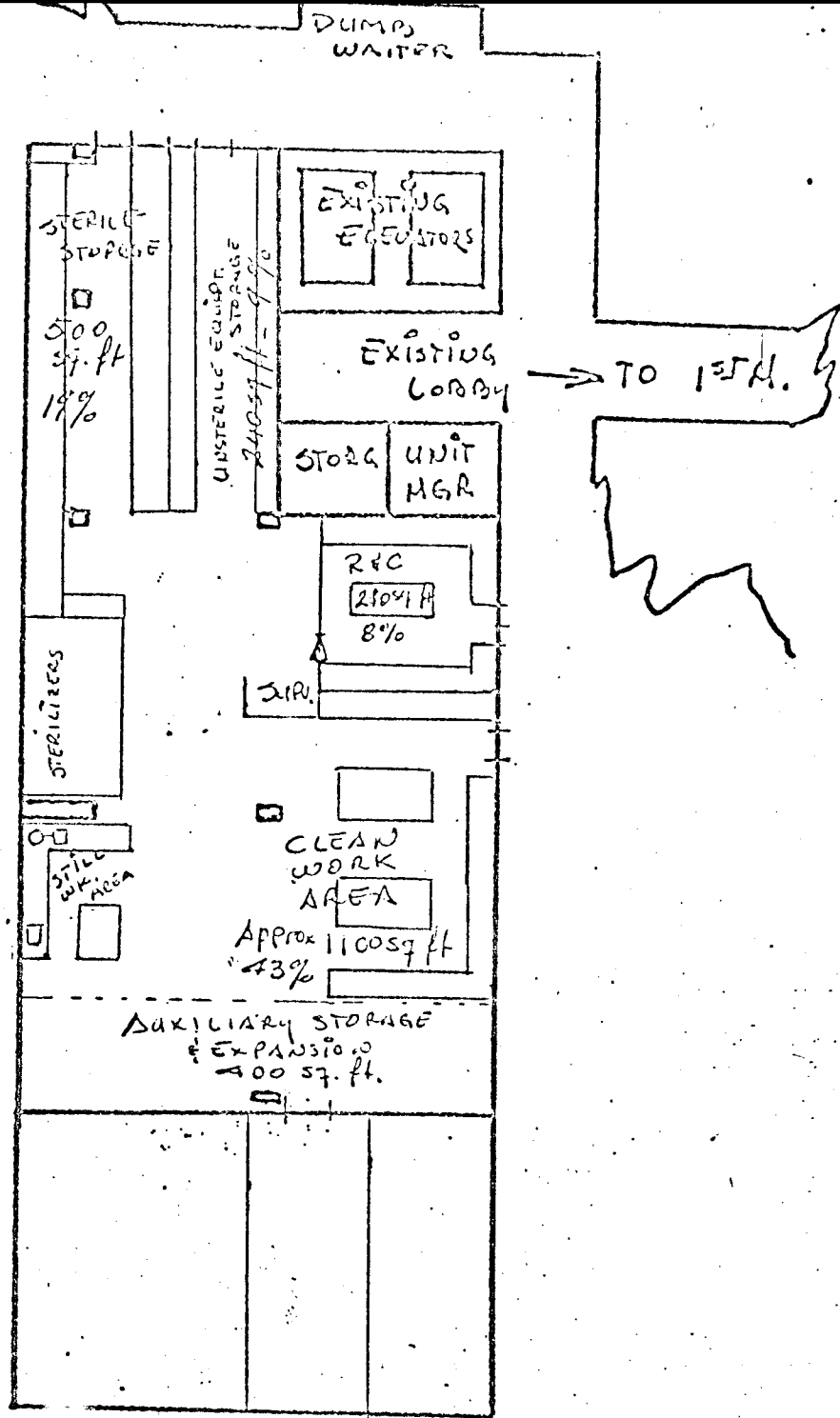


PROPOSED EXPANSION
CENTRAL SUPPLY ROOM
SCALE: 1/16" = 1'
ALTERNATIVE No. 1

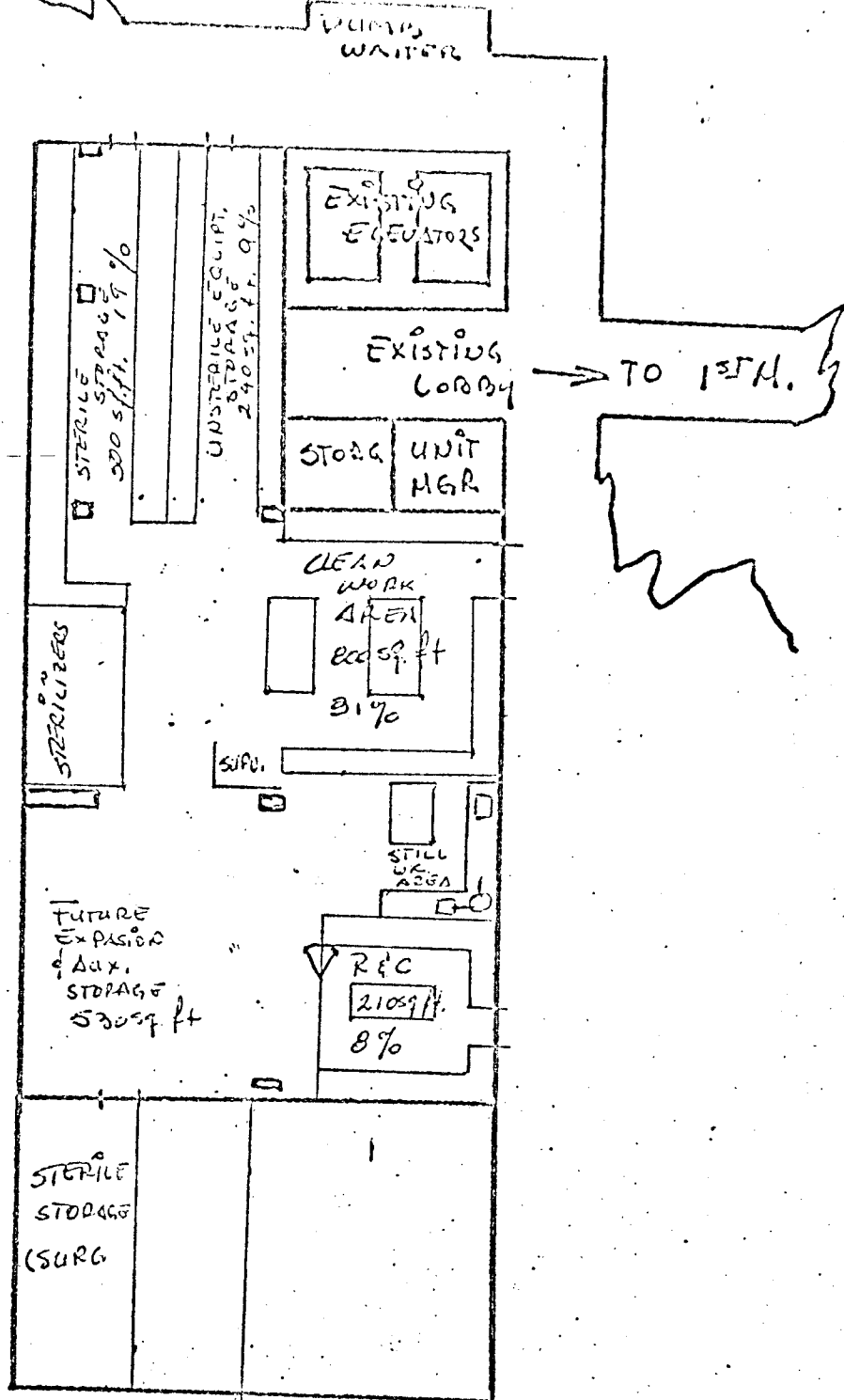


PROPOSED EXPANSION
CENTRAL SUPPLY ROOM
SCALE: 1/16" = 1'
ALTERNATIVE No. 2



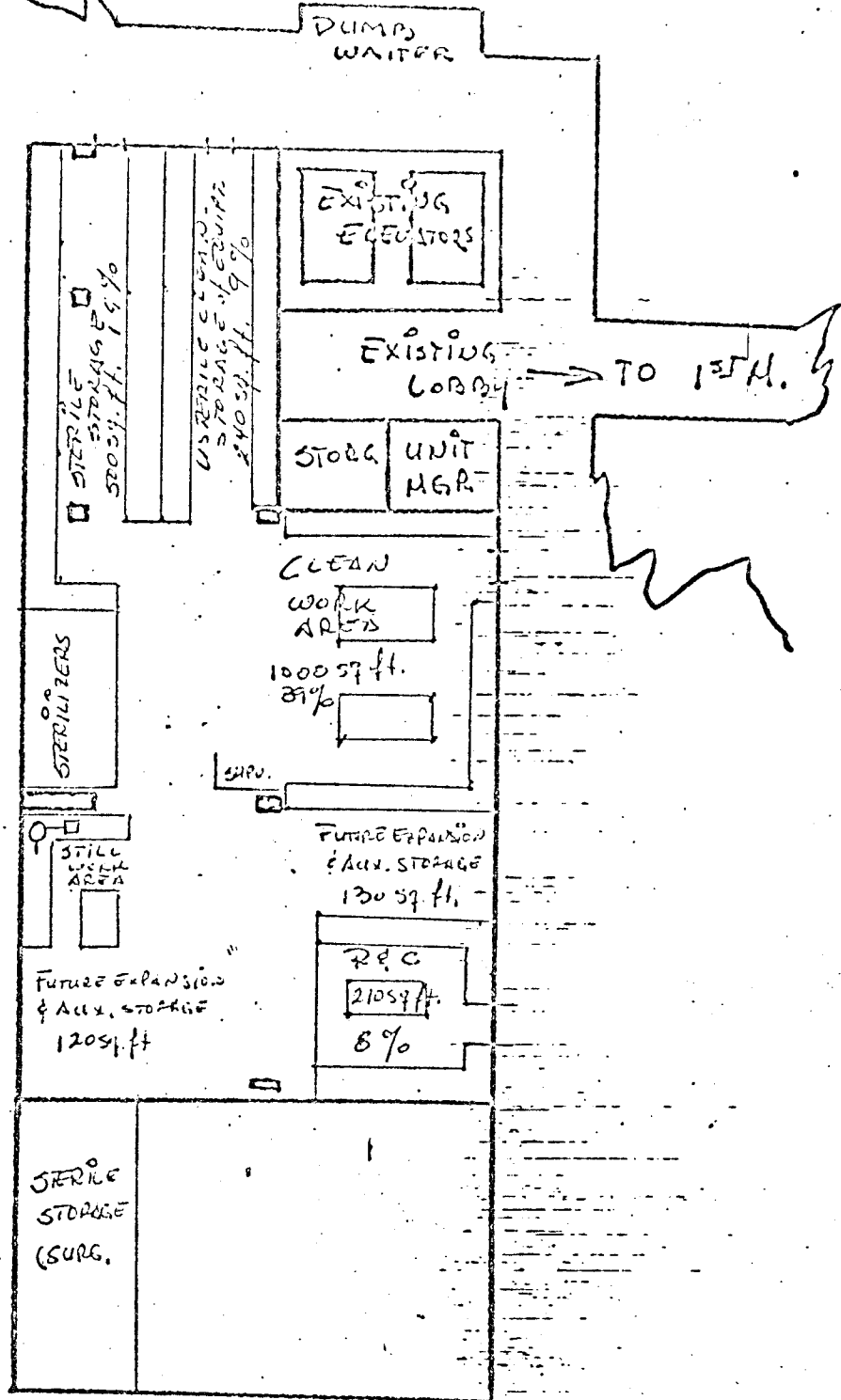


PROPOSED EXPANSION
 CENTRAL SUPPLY ROOM
 SCALE: $\frac{1}{16}'' = 1'$
 ALTERNATIVE No. 3

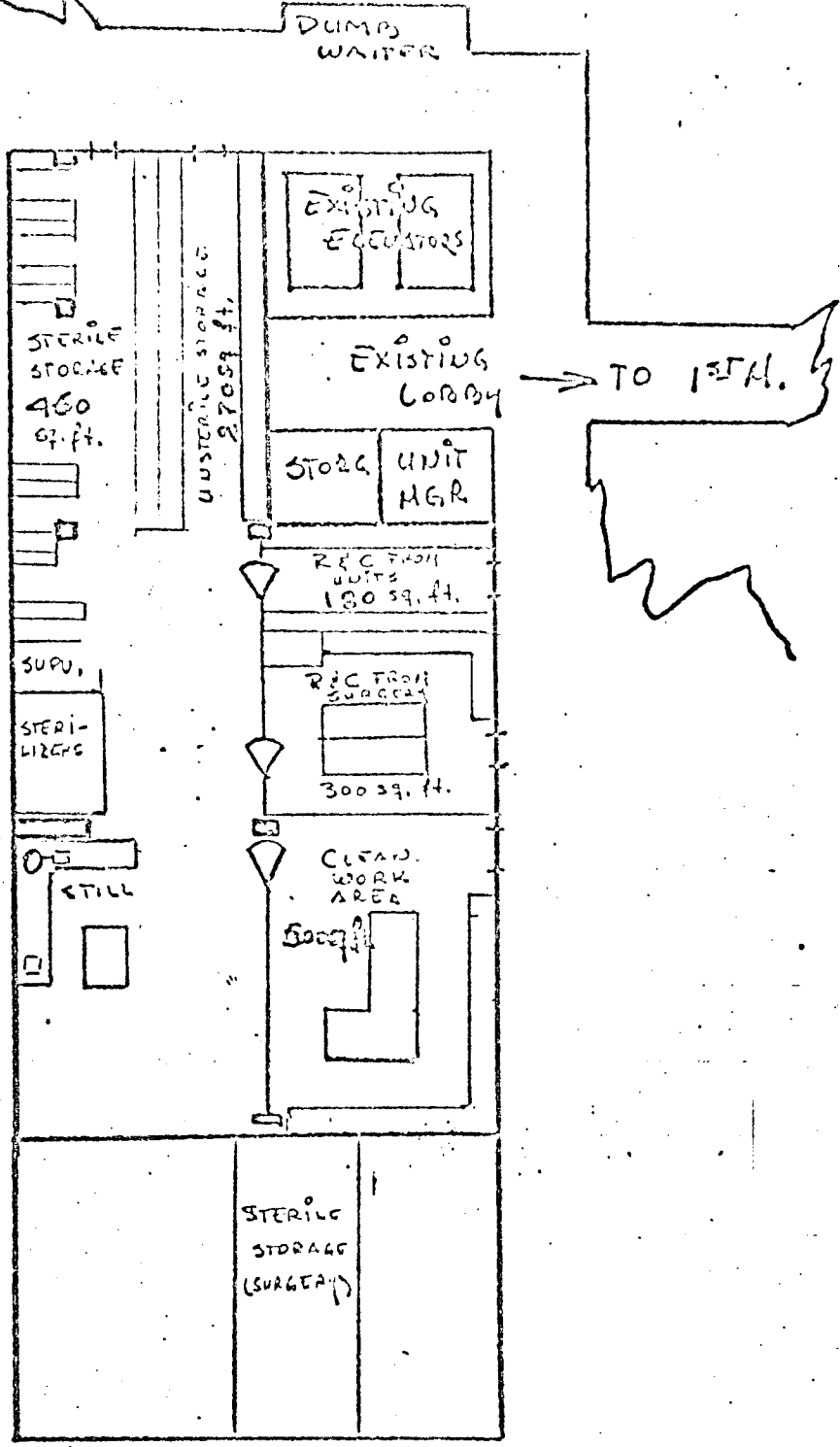


PROPOSED EXPANSION
 CENTRAL SUPPLY ROOM
 SCALE: 1/16" = 1'
 ALTERNATIVE NO. 4





PROPOSED EXPANSION
 CENTRAL SUPPLY ROOM
 SCALE: $\frac{1}{16}'' = 1'$
 ALTERNATIVE NO. 5



PROPOSED EXPANSION
 CENTRAL SUPPLY ROOM
 SCALE: 1/16" = 1'

ALTERNATIVE No. 6



COMPARISON OF DISTANCES TRAVELED

DISTANCE IN FEET						
	ALT. 1	ALT. 2	ALT. 3	ALT. 4&5	ALT. 6	
1. Instruments from Surgery	120	146	142	106	133	
a. From Surgery to R&C	36	70	70	32	56	
b. Process clean	20	12	12	12	20	
c. From R&C to sterilizers	44	40	20	26	24	
d. From sterilizers to Surgery	20	24	40	36	34	
-TOTAL-	222	176	138	200	133	
2. Instruments etc. from units (by elevator)						
a. From elevator to R&C	44	32	32	76	52	
b. Process clean	24	12	12	12	12	
c. From R&C to sterilizers	50	40	20	26	20	
d. From sterilizers to sterile storage	60	50	34	40	34	
e. From sterile storage to elevators	44	42	40	46	40	
-TOTAL-	246	210	172	230	172	
3. Instruments etc. from units (by dumbwaiter)						
a. From dummy to R&C	68	66	66	106	66	
b. Process clean	24	12	12	12	12	
c. From R&C to sterilizers	50	40	20	26	20	
d. From sterilizers to sterile storage	60	50	34	40	34	
e. From sterile storage to dummy	44	42	40	46	40	
-TOTAL-	120	124	128	104	148	
4. Linen to Surgery Department						
a. From elevators to clean work area	78	60	48	32	60	
b. Process (make packs)	12	12	12	12	12	
c. From C.S.A. to sterilizers	8	28	28	24	40	
d. From sterilizers to Surgery	22	24	40	36	36	
-TOTAL-	158	134	114	179	100	
5. Large unsterile equipment						
a. From elevators to R&C	42	32	32	76	32	
b. Process clean	24	12	12	12	12	
c. From R&C to unsterile storage	44	34	30	56	28	
d. From unsterile storage to elevators	48	56	40	35	28	

ACTUAL TRAVEL

Alternative No. 1

Description of Trip	A	B	C
	Distance In Feet	Frequency Of Trip Per Day	Total Distance In Feet Per Day (A X B)
1. Instruments from Surgery			
a. From Surg. to R & C	36	20	720
b. Process clean	—	—	—
c. From R & C to Sterilizers	44	5	220
d. From sterilizers to Surgery	20	5	100
TOTAL			1,040
2. Inst. From Units by Elevator			
a. From elev. to R & C	44	80	3520
b. Process clean	—	—	—
c. From R & C to Sterilizers	50	10	500
d. From sterilizers to sterile stores	60	10	600
e. From sterile st. to elevator	44	80	3520
TOTAL			8,140
3. Inst. From Units by DumbWaiter			
a. From dummy to R & C	68	50	3400
b. Process clean	—	—	—
c. From R & C to Sterilizers	50	10	500
d. From sterilizers to sterile st.	60	10	600
e. From sterile stores to dummy	44	50	2200
TOTAL			6,700
4. Linen			
a. From elevator to clean work area	78	6	468
b. Process (make packs)	—	—	—
c. From C.W.A. to sterilizers	8	4	32
d. From sterilizers to Surgery	22	1	22
TOTAL			522
5. Unsterile Equipment			
a. From elevator to R & C	42	15	630
b. Process Clean	—	—	—
c. From R & C to Storage	44	10	440
d. From storage to elevator	48	15	720
TOTAL			1790

TOTAL TRAVEL PER DAY

18,192

Alternative No. 2

Description of Trip	A	B	C
	Distance In Feet	Frequency Of Trip Per Day	Total Distance In Feet Per Day (A X B)
1. Instruments from Surgery			
a. From Surg. to R & C	70	20	1400
b. Process clean	—	—	—
c. From R & C to Sterilizers	30	5	200
d. From sterilizers to Surgery	24	5	120
TOTAL			1720
2. Inst. From Units by Elevator			
a. From elev. to R & C	32	80	2560
b. Process clean	—	—	—
c. From R & C to Sterilizers	40	10	400
d. From sterilizers to sterile stores	50	10	500
e. From sterile st. to elevator	42	80	3360
TOTAL			6820
3. Inst. From Units by DumbWaiter			
a. From dummy to R & C	66	50	3300
b. Process clean	—	—	—
c. From R & C to Sterilizers	40	10	400
d. From sterilizers to sterile st.	50	10	500
e. From sterile stores to dummy	42	50	2100
TOTAL			6300
4. Linen			
a. From elevator to clean work area	60	6	360
b. Process (make packs)	—	—	—
c. From C.W.A. to sterilizers	28	4	112
d. From sterilizers to Surgery	24	1	24
TOTAL			496
5. Unsterile Equipment			
a. From elevator to R & C	32	15	480
b. Process Clean	—	—	—
c. From R & C to Storage	34	10	340
d. From storage to elevator	56	15	840
TOTAL			1660
TOTAL TRAVEL PER DAY			16,996 ft.

ACTUAL TRAVEL

Alternative No. 3

Description of Trip	A	B	C
	Distance In Feet	Frequency Of Trip Per Day	Total Distance In Feet Per Day (A X B)
1. Instruments from Surgery			
a. From Surg. to R & C	70	20	1400
b. Process clean	—	—	—
c. From R & C to Sterilizers	20	5	100
d. From sterilizers to Surgery	40	5	200
TOTAL			1700
2. Inst. From Units by Elevator			
a. From elev. to R & C	32	80	2560
b. Process clean	—	—	—
c. From R & C to Sterilizers	20	10	200
d. From sterilizers to sterile stores	34	10	340
e. From sterile st. to elevator	10	80	800
TOTAL			6300
3. Inst. From Units by DumbWaiter			
a. From dummy to R & C	66	50	3300
b. Process clean	—	—	—
c. From R & C to Sterilizers	20	10	200
d. From sterilizers to sterile st.	34	10	340
e. From sterile stores to dummy	40	50	2000
TOTAL			5840
4. Linen			
a. From elevator to clean work area	48	6	288
b. Process (make packs)	—	—	—
c. From C.W.A. to sterilizers	28	4	112
d. From sterilizers to Surgery	40	1	40
TOTAL			440
5. Unsterile Equipment			
a. From elevator to R & C	32	15	480
b. Process Clean	—	—	—
c. From R & C to Storage	30	10	300
d. From storage to elevator	30	15	450
TOTAL			1230

TOTAL TRAVEL PER DAY

15,510^{ft.}

Description of Trip	A	B	C
	Distance In Feet	Frequency Of Trip Per Day	Total Distance In Feet Per Day (A X B)
1. Instruments from Surgery			
a. From Surg. to R & C	32	20	640
b. Process clean	—	—	—
c. From R & C to Sterilizers	26	5	130
d. From sterilizers to Surgery	36	5	180
TOTAL			950
2. Inst. From Units by Elevator			
a. From elev. to R & C	76	80	6080
b. Process clean	—	—	—
c. From R & C to Sterilizers	26	10	260
d. From sterilizers to sterile stores	40	10	400
e. From sterile st. to elevator	40	80	3680
TOTAL			10,420
3. Inst. From Units by Dumbwaiter			
a. From dummy to R & C	104	50	5200
b. Process clean	—	—	—
c. From R & C to Sterilizers	26	10	260
d. From sterilizers to sterile st.	40	10	400
e. From sterile stores to dummy	46	50	2300
TOTAL			8260
4. Linen			
a. From elevator to clean work area	32	6	192
b. Process (make packs)	—	—	—
c. From C.W.A. to sterilizers	24	4	96
d. From sterilizers to Surgery	36	1	36
TOTAL			324
5. Unsterile Equipment			
a. From elevator to R & C	76	15	1140
b. Process Clean	—	—	—
c. From R & C to Storage	56	10	560
d. From storage to elevator	35	15	525
TOTAL			2505
TOTAL TRAVEL PER DAY			22,459

*The difference between these two alternatives is the location of the still.

ACTUAL TRAVEL

Alternative No. 6

Description of Trip	A	B	C
	Distance In Feet	Frequency Of Trip Per Day	Total Distance Feet Per Day (A X B)
1. Instruments from Surgery			
a. From Surg. to R & C	56	2.0	112.0
b. Process clean	—	—	—
c. From R & C to Sterilizers	24	5	120
d. From sterilizers to Surgery	34	5	170
TOTAL			1410
2. Inst. From Units by Elevator			
a. From elev. to R & C	32	80	2560
b. Process clean	—	—	—
c. From R & C to Sterilizers	20	10	200
d. From sterilizers to sterile stores	34	10	340
e. From sterile st. to elevator	40	80	3200
TOTAL			6300
3. Inst. From Units by DumbWaiter			
a. From dummy to R & C	66	50	3300
b. Process clean	—	—	—
c. From R & C to Sterilizers	20	10	200
d. From sterilizers to sterile st.	34	10	340
e. From sterile stores to dummy	40	50	2000
TOTAL			5840
4. Linen			
a. From elevator to clean work area	60	6	360
b. Process (make packs)	—	—	—
c. From C.W.A. to sterilizers	60	2	120
d. From sterilizers to Surgery	36	1	36
TOTAL			556
5. Unsterile Equipment			
a. From elevator to R & C	32	15	480
b. Process Clean	—	—	—
c. From R & C to Storage	28	10	280
d. From storage to elevator	28	15	420
TOTAL			1180

TOTAL TRAVEL PER DAY

15,285 ft.