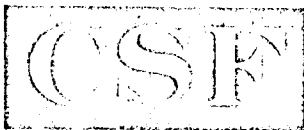


FLATWORK IRONING STAFFING

# 430 - 68

AUTHOR: R. BROWNLOW



COMMUNITY SYSTEMS FOUNDATION

ANN ARBOR • BALTIMORE • INDIANAPOLIS

CENTRAL OFFICE  
111 N. Main Street  
Ann Arbor, Michigan 48103  
313-761-1846

May 7, 1968

Mr. Karl F. Greth  
Director of Personnel  
Foote Memorial Hospital  
Jackson, Michigan 49201

Dear Mr. Greth:

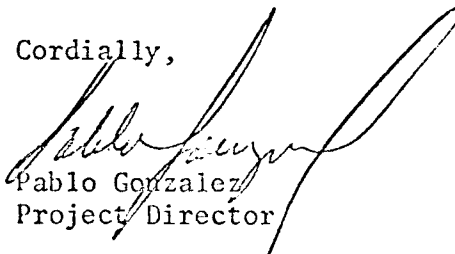
Please find attached a report on the staffing requirements for the proposed flatwork ironer with automatic folder.

The study was conducted by Mr. Ronald Brownlow, Research Assistant, with the full cooperation of Mr. E. Stimer, Supervisor of Laundry Department.

The study was concerned only with the flatwork ironing operations, and basically recommends that one position should be eliminated by the proposed equipment. Although data on other activities was not collected, our observations lead us to believe that another position may be eliminated through combination of duties and operations such as lay-up, shake-out and flatwork ironing.

If any further assistance is required on this or any other areas, please feel free to contact us.

Cordially,



Pablo Gonzalez  
Project Director

PG:blm

cc: Mr. Stimer  
Mr. Johannides

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### OBJECTIVE

The objective of this study is to evaluate the effect of the proposed new equipment on Laundry Staffing. This evaluation has two phases: First, the determination of required man-hours for the flatwork ironing operation with the present standard ironer, and: Second, the required man-hours with the proposed new equipment.

## SUMMARY

The present standard ironer requires 116.9 man-hours per week to process the present volume of flatwork; however, 160 man-hours per week are allocated to the flatwork ironing operation by the Laundry Department; however, approximately 30 to 40 man-hours per week of this allocated time is used for functions other than the ironing operation.

Under the proposed equipment, the required man-hours is reduced to a level of 52-62 man-hours per week depending on the ironing speed. This proposed equipment which will be installed will reduce the man-hours required by the equivalent of one person (40 hours per week) and also provide sufficient man-hours for vacation periods, sick leave, and flatwork volume fluctuations of the Laundry Department in addition to the extra 30-40 weekly hours spent by the flatwork ironer crew on other unrelated functions such as tumble work, folding, etc.

## LAUNDRY METHODOLOGY MANUAL

In this study the Hospital Staffing Methodology Manual, MM-2 Laundry, was used in analysis, evaluation, and prediction of the flatwork ironing operation. The study relied primarily on section F, Flatwork Ironing Operation, as a basis for determining the effect of the new ironer upon Laundry staffing. Forms LY-2, LY3 and LY-13 of the methodology were used during the study. (See Appendix A)

### DESCRIPTION OF PRESENT EQUIPMENT

The present equipment used in the flatwork ironing operation is a standard 120 inch four roller ironer that was installed in 1945. The unit has no folding or spreading devices, and therefore, is classified as a flatwork ironer with "no accessories."

The maximum feed ribbon speed is 58 feet per minute; however, the present unit processes standard items with acceptable moisture removal and quality at a feed ribbon speed of 38 feet per minute. Special items (double thickness) can be processed with acceptable quality and dryness at a slower rate of 28 feet per minute.

Presently the ironing unit runs 89% of its operating time at the 38 feet per minute rate and 11% at the slower rate of 28 feet per minute.

The steam pressure requirements for the present ironer is 100 pounds per square inch (PSI). The feed ribbon speed is dependent upon this pressure and any deviation causes the rate to be lowered.

Normally, all items to be processed through the ironer are fed from the feed rail which requires a prior lay-up operation. This operation is closely related to the flatwork ironing operation because it aids in determining the rate of the feed ribbon.

## DESCRIPTION OF PROPOSED EQUIPMENT

The proposed new equipment is a 126 inch, six roller flatwork ironer with an automatic folding device that folds items laterally into quarters or halves. The items pass directly from the flatwork ironer to the folding device and are deposited on a table. The cross folding and stacking of the linen is completed by Laundry personnel. This type of equipment shall be referred to as flatwork ironer and automatic folder.

The standard ironing speed (feed ribbon speed) for the six roller ironer has a range of 42 feet per minute (minimum) to 126 feet per minute (maximum). Since the equipment is not available for actual testing, estimates of acceptable ironing speeds were used in this evaluation study. Mr. L. Stimer, Laundry Supervisor, estimates that the new ironer and folder could process standard flatwork items at 70 to 80 feet per minute at acceptable moisture and quality levels. For the special items category, the ironing speed estimated was in the 50 to 60 feet per minute range.

The Laundry Department based this estimated ironing speeds on similar equipment performances in other establishments and existing laundry policies and procedures. These speeds were considered to be the rates which will function smoothly with other non-ironing functions.

The new ironing unit will run approximately 87% of its operating time at the standard item rate (70 to 80 feet per minute) and 13% of its operating time at the special item rate (50 to 60 feet per minute).

Steam pressure requirements are slightly higher for the new ironer than for the present equipment. The maximum operating pressure is 125 PSI which is currently beyond the range of the present boilers; however, the present

boilers can operate at 110 PSI (maximum) until the new proposed boilers can be installed. Therefore, the new ironing unit will be temporarily operating under the required pressure causing the expected standard ironing speed (70 to 80 feet per minute) to decline to a lower rate (probably 60 to 70 feet per minute).

This reduction in ironing speed is necessary in order to obtain an acceptable level of quality and moisture.

As previously stated, all items to be processed through the ironer will require a prior lay-up operation. This operation will still be necessary for the new equipment; however, small flatwork items (under 40 inches on the largest side) and large flatwork items (over 40 inches on the largest side) can be fed from the feed rail of the ironer at a faster rate due to a partial vacuum spreading device.



## VOLUME

The initial step in the evaluation of the flatwork ironing operation was the determining of the volume of items processed through the ironer per week. Usually, this volume is classified into small and large flatwork categories.

The Laundry Department had previously sampled and recorded similar data during February, 1968. It was validated by further sampling and found to be accurate. (See Appendix A)

The volume data showed the total number of items processed per week through the present ironing unit as 15,318 items. Of this total, large flatwork items were found to be 51% or 7,742 items per week, and small flatwork items 49% or 7,576 items per week. For the study these items were further classified according to size as shown in Appendix A.

There is no expected increase in flatwork volume in the near future according to the Laundry Department estimates. Therefore, the present volume figures remain constant in the computation of man-hours for the proposed ironer and automatic folder.

### PRESENT EQUIPMENT - STANDARD MAN-HOURS

By using the methodology manual, the standard man-hours for the flatwork ironing operation with the present equipment was found to be 116.9 man-hours per week.

This figure was obtained by using Form LY-13 of the Laundry Methodology. Flatwork items were classified according to size, normal processing times established, and man-hours computed. Personal fatigue and delay allowance of 17% was included in the total standard man-hours per week.

(See Appendix B, Table I)

Presently, 160 man-hours are allocated to the flatwork ironing operation with the present ironing unit. The 160 man-hours allows four employees to perform the flatwork operation classified as two feeders and two folders; however, it is estimated by the Laundry Department that approximately 30 to 40 man-hours per week are used by these employees in other functions (tumble folding, shakeout, lay-up).

According to the methodology, the crew required for a flatwork ironer with no accessories, operating at 38 feet per minute and present volume, should be the present two folders and two feeders (See Appendix C).

### PROPOSED EQUIPMENT - STANDARD MAN-HOURS

By applying the methodology in the same manner as the present equipment computations, standard man-hours for the flatwork ironing operation were determined (See Appendix B, Table II). Because the ironing speeds of the proposed unit has only been estimated--not established--and also the steam pressure problem previously discussed, various man-hour figures were computed as shown in Table III of Appendix B.

Table III shows the required man-hours per week, at various ironing speeds combinations. The most desirable combination can be selected according to the prevailing conditions existing at the time of installment.

## CONCLUSIONS

Under the present equipment 116.9 man-hours are required to process 15,318 pieces of flatwork weekly. Under the proposed ironing unit, the man-hours required would fall to a level ranging between 54 man-hours per week (ironing speed @ 90 feet per minute) to 64 man-hours per week (ironing speed @ 60 feet per minute). See Appendix D.

The new equipment will reduce the required man-hours for the flatwork ironing operation at least 52 man-hours per week and not more than 62 man-hours per week, depending on the ironing speed. This indicates that Laundry personnel would, at the installment of the proposed unit, be over-staffed by the equivalent of one and one-half employees.

According to the methodology manual, the crew required for a flatwork ironer with an automatic folder, operating between 10 and 110 feet per minute and the present volume, should be two feeders and one folder. (See Appendix C)

Therefore, the proposed equipment can reduce the Laundry Department a minimum of 52 man-hours per week. This justifies a reduction of one, and possibly 1½ employees from the flatwork ironing operation; however, vacation periods, frequent sick leaves, and possible additional future flatwork warrant only the reduction of one employee's man-hours (40 hours per week).

APPENDIX A

SAMPLE FORMS AND VOLUME  
OF FLATWORK PER WEEK

SUMMARY OF LARGE FLATWORK PIECE COUNT

(1) NAME OF ITEM	(2) NUMBER OF ITEMS DURING 4-WEEK SAMPLE **	(3) WEEKLY AVERAGE COLUMN (2) ÷ 4	(1) NAME OF ITEM	(2) NUMBER OF ITEMS DURING 4-WEEK SAMPLE **	(3) WEEKLY AVERAGE COLUMN (2) ÷ 4
SHEETS @ 38	N O R M A L	2005			
DRAW SHEETS @ 38		2120			
BED SPREADS @ 38		325			
PEDI CRIB SHEETS @ 38		135			
PEDI SHEETS @ 38		195			
SURGERY SHEETS @ 38	S U R G E R Y	1185			
JACKETS AND SURGERY DRESSES @ 28		800			
LARGE SQUARES @ 28		160			
X-RAY SHEETS @ 38	X R A Y	50			
X-RAY DRAW SHEETS @ 38		100			
N.R. LARGE SHEETS @ 38	N R S	56			
N.R. DRAW SHEETS @ 38		40			
N.R. BED SPREADS @ 38		31			
N.R. SHEETS @ 38	H O M E	80			
N.R. DRAW SHEETS @ 38		80			
N.R. BEDS SPREADS @ 38		40			
JACKETS AND GOWNS NURSERY	E @ 28	300			
SHRINKAGE	K T R @ 28	1 bolt <sub>wk</sub>			
DRAPES	H @ 28	40			
<p>*Total is obtained by adding the sums of the first set of columns to the sums of the second set of columns.</p> <p>** PREVIOUSLY SAMPLED BY LAUNDRY DEPARTMENT.</p>			<p>Total Weekly Average of Large Flatwork Pieces **</p>		7742



APPENDIX B

MAN-HOURS COMPUTATION



TABLE I

FLATWORK IRONER MAN-TIME COMPUTATION FOR PRESENT STANDARD IRONER WITH NO ACCESSORIES IS DERIVED FROM MM-2 LAUNDRY STAFFING METHODOLOGY MANUAL.

TOTAL FLATWORK  
Ironing Speed: at 38 ft/min.

CATEGORY	(1) ITEM DESCRIPTION	(2) ITEMS/WEEK	(3) (M-M/item) NORMAL TIME	(4) (M-M/wk) MAN-TIME
Large Sheets	Bed Spreads	3772	.727	2742.2
Small Sheets	Regular Sheets	2340	.554	1296.4
Pillow Cases and Single Gowns	Crib Sheets			
	Crib Spreads			
	Clinical Towels			
	Hand Towels			
	Pillow Cases			
	Pillow Slips			
	Wrist Restrainers			
	Small Squares	7128	.167	1190.4
Aprons	Aprons	374	.239	89.4
Small Items	Small Misc. Covers	159	.126	20.0
Special Items*	Breast Binder	135	.105	14.2
	O.B. Doctor Tops	25	.175	4.4
	Body Restrainers	85	.105	8.9
	Jacket and Dresses	1100	.455	500.5
	Large Squares	160	.583	93.3
	Drapes	40	.908	36.2
TOTALS		15318		5995.975

LINE 1. Total of Column (4) 5996 Normal Man-Min/wk.  
 LINE 2. Line 1 X 1.17 (P.F. and D Allowance) 7015.3 Man-min./wk - Standard  
 LINE 3. Line 2 ÷ 60 minutes/hour 116.9 Man-Hours/wk

\*Ironing speed for these items is 28 ft/min.

Source: MM-2 Laundry Methodology and Laundry Dept. Data  
 TABULATED BY: Ron Brownlow  
 DATE: May 7, 1968

APPENDIX C

Recommend Crew Compositions

TABLE I

RECOMMENDED CREW COMPOSITIONS PER LANE FOR VARIOUS FEED RIBBON SPEEDS. PRESENT AND PROPOSED EQUIPMENT OPERATE ONLY ONE LANE.

ITEM CATEGORY	EQUIPMENT DESCRIPTION	FEED RIBBON SPEED RANGE		RECOMMEND CREW COMPOSITION PER LANE	
		FROM (ft/min)	THROUGH (ft/min)	FEED IRONER (min)	FOLD STOCK (min)
Large Sheets	Present (38 ft/min)	10	45	2*	2*
Small Sheets	Present	10	45	2	2
Pillow Cases and Single Gowns	Present	30	60	1/2	1
Aprons	Present	10	40	1/2	1/2
Small Items	Present	35	60	1/2	1
Large Sheets	Proposed	10	110	2	1
Small Sheets	Proposed	10	110	2	1
Pillow Cases and Single Gowns	Proposed	55	110	1	1
Aprons	Proposed	45	110	1	1
Small Items	Proposed	65	110	1	1

Source: MM-2 Laundry Methodology Manual

Tabulated BY: Ron Brownlow

Date: May 7, 1968

TABLE III

MAN-HOURS PER WEEK FOR FLATWORK IRONER OPERATION WITH NEW PROPOSED IRONER AND AUTO-MATIC FOLDER AT VARIOUS IRONING SPEEDS.

IRONING SPEED COMBINATIONS (ft/min)		STANDARD MAN-MINUTES PER WEEK*	MAN-HOURS/WEEK
STANDARD ITEMS	SPECIAL ITEMS		
60 feet	40 feet	3887.9	64.8
60 feet	50 feet	3870.4	64.5
60 feet	60 feet	3859.8	64.3
60 feet	70 feet	3852.8	64.2
70 feet	40 feet	3608.3	60.1
70 feet	50 feet	3590.7	59.9
70 feet	60 feet	3580.2	59.7
70 feet	70 feet	3573.1	59.6
80 feet	40 feet	3450.3	57.5
80 feet	50 feet	3432.8	57.2
80 feet	60 feet	3422.3	57.0
80 feet	70 feet	3415.2	56.9
90 feet	40 feet	3325.1	55.4
90 feet	50 feet	3307.6	55.1
90 feet	60 feet	3297.0	54.9
90 feet	70 feet	3290.0	54.8

\* includes 17% P.F and D allowance

Source: MM-2 Laundry Methodology  
Manual

Tabulated By: Ron Brownlow

Date: May 7, 1968

APPENDIX D

Comparison Fact Sheet

FACT SHEET-I

SUMMARY OF RELEVANT FACTS COMPARING PRESENT AND PROPOSED EQUIPMENT.

1. Classification - equipment

- A. Present - 120-inch four-roller ironer with no accessories.
- B. Proposed - 195-inch six-roller ironer with automatic folder.

2. Ironing Speed (ft/min)

	<u>Maximum</u>	<u>Acceptable</u>	<u>Special</u>
A. Present	58	38	28
B. Proposed	126	70-80*	50-60*

3. Flatwork Volume

	<u>Large Items/wk</u>	<u>Small Items/wk</u>	<u>Total/wk</u>
A. Present	7742	7576	15,318
B. Proposed	Same*	Same*	Same*

4. Pressure requirements

- A. Present - 100 psi
- B. Proposed - 125 psi

(PROBLEM: Present boilers capacity 110 psi; proposed new boilers capacity is 150 psi.)

5. Flatwork Ironer Man-Hours/wk

	<u>Classification</u>	<u>Man-hours/wk</u>
A. Present -	2 feeders, 2 folders	160
	required standard man-hours/wk**	116.9
	estimated man-hours other than flatwork operation*	30-40

\*\*Derived from MM-2 Laundry Methodology Manual

\* Laundry Department estimates

5. Flatwork Ironer Man-Hours/wk

B. Proposed

IRONING SPEED (ft/min)		Required standard man-hr/wk**
Regular Items@	Special Items@	
60 ft.	40	64.8
60 ft.	50	64.5
60 ft.	60	64.3
60 ft.	70	64.2
70 ft.	40	60.1
70 ft.	50	59.8
70 ft.	60	59.6
70 ft.	70	59.5
80 ft.	40	57.5
80 ft.	50	57.2
80 ft.	60	57.0
80 ft.	70	56.9
90 ft.	40	55.4
90 ft.	50	55.1
90 ft.	60	54.9
90 ft.	70	54.8

\*\* Derived from MM-2 Laundry Methodology Manual

6. Proposed Man-hours reduction

Present required hours	116.9	116.9	116.9	116.9
Proposed hours	64.8	60.1	57.5	55.4
Reduction (hr/wk) -----	52.1	56.8	59.4	61.5
	(60 ft/min)*(70 ft/min)*(80 ft/min)(90 ft/min)			

\* Special items at 40 ft/min.