SPACE ALLOCATIONS TO IMPLEMENT THE TEACHING OF INTERIOR DESIGN IN A COLLEGE SITUATION

by

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Approved by

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APPROVAL SHEET

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Increased enrollment of students majoring in interior design has created problems of limited space for the activities performed in laboratory classes.

The major activities performed in a college interior design laboratory were determined through conversations with staff members and from personal observations. These were: drafting, selecting samples, rendering color, displaying materials, teaching, and exhibiting student work. Drafting table arrangements with minimum, good, and excellent clearance were drawn to determine space requirements. The materials used in the performance of each activity were grouped into storage units. These groupings served as the basis for storage units designed to represent the principles of good storage, such as ease of handling stored articles, visibility of stored articles, clearance space related to the types of stored articles, and storage units located near the area where activities are performed.

A flat floor plan for twenty to twenty-five students was drafted for an interior design laboratory located in the School of Home Economics of the University of North Carolina at Greensboro. Wall elevations were presented for this laboratory to show the location of storage units. In addition, a lighting plan was presented.

Correspondence with other institutions indicated that inadequate space and storage facilities were common problems. Therefore, the space requirements and the designs for storage units suggested for this laboratory should be applicable to other situations.

ACKNOWLEDGMENTS

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CHAPTER I

INTRODUCTION

The concurrent impact of increased enrollment and higher faculty-student ratios in colleges and universities has limited the amount of space available for laboratories and storage areas.[1] Good use of space and adequate equipment contribute to the quality of the home economics program.[2] A national publication suggests the following:

> A home economics building should express the educational program that goes on within it and the philosophy of the profession.[3]

This statement suggests that effective use of space and principles of storage should be applied in the laboratory environment. There needs to be unity between principles taught and principles applied in schools. Hudnut, Harvard University Professor, points out that "our schools should be laboratories for the demonstration of that unity."[4]

Instructors teaching interior design laboratory classes are aware of the importance of good use of available space and storage facilities. A student working in a laboratory requires three times the

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[1] Albert L. Pugsley, Physical Plants for Higher Education, A Report to the Housing Conference for Home Economics, (Kansas State University, Manhattan, 1961), p. 42.

[2] Planning Space and Equipment, Prepared by the American Home Economics Association and the Home Economics Branch Misc. Pub. No. 25 (Washington: U.S. Government Printing Office, 1956), p. 1.

[3] Ibid.

[4] Joseph Hudnut, Architecture and the Spirit of Man (Cambridge: Cambridge University Press, 1949), p. 241.

amount of space required by a student working in a classroom.[5]

The increased enrollment of interior design majors in the home economics program has created space problems in interior design laboratories. A national publication suggests the following:

> Today...interior design...(is)...demanding an ever increasing number of home economics graduates. With this expansion in professional opportunities have come needs for increased space and rearrangements of existing space in colleges and universities training professional home economists.[6]

The increased enrollment of students majoring in interior design also intensifies the need to evaluate existing space and storage practices. Functional planning of space and storage facilities involves careful consideration of the total needs and requires creative thought. Nelson points out that "functional sufficiency is no guarantee whatever of good design"[7]; nevertheless, all good designs are functional.

One objective of the interior design curriculum is to foster creativity in students. Esteros has stated that creativity is fostered best when problems are a challenge and tools and environment to stimulate their solution are provided.[8]

Preliminary to this study of space planning in the interior design area of the School of Home Economics of the University of North Carolina at Greensboro, a small number of schools and universities were surveyed to determine how others had solved this problem with the hope

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[5]Pugsley, p. 42.

[6]Planning Space and Equipment, p. 2.

[7]George Nelson, Problems of Design (New York: Whitney Co., 1957), p. 8.

[8]Gertrude Esteros, "Basic Concepts in Home Furnishings," Journal of Home Economics, LV (January, 1963), p. 42.

that their experiences might lead to better solutions. A copy of the letter used in the survey appears in the appendix. Eleven colleges and universities replied to the letter. These replies reveal the need for storage units which are related to activities performed in the interior design laboratory and also the lack of adequate space for students colleges and universities are presently teaching.

Purpose of the Study

The purposes of this study were: (1) to determine space and storage needs for major activities commonly performed in an interior design laboratory, (2) to determine the amount of space required for various drafting table arrangements, (3) to design storage units in accordance with the space and storage needs for major activities, (4) to develop designs of storage units that may be used by other interested colleges and universities, and (5) to combine the findings into a flat floor plan for an interior design laboratory to be located in the School of Home Economics of the University of North Carolina at Greensboro.

CHAPTER II

PROCEDURE

The procedure used in planning space arrangements and in designing individual storage units for an interior design laboratory located in the School of Home Economics of the University of North Carolina at Greensboro is discussed in this chapter.

The major activities performed in the college interior design laboratory were determined through conversations with present staff members teaching interior design and from personal observations. An activity was considered to be "major" if it were performed over an extended period of time by all members in the laboratory classes.

The amount of space required to perform these major activities was determined through a study of previous research recommendations and through measurements of the space used in performing these activities. Several different space arrangements of equipment were presented for consideration.

The materials used in the performance of each activity and requiring permanent storage space in the laboratory were grouped in various storage unit combinations. These groupings served as the basis for storage units related to activities. Consideration was given to overlapping in the use of some materials for more than one activity.

Storage units were designed to illustrate the principles of effective storage as follows: ease of handling stored articles,

visibility of stored articles, clearance space related to the types of stored articles, and units located near the area where the specific activity is performed.

General consideration was given to the lighting needs and to interior surfaces, since both were related to the total laboratory environment.

The space needs for major activities and for storage units were co-ordinated into a floor plan designed for the interior design laboratory located in the School of Home Economics of the University of North Carolina at Greensboro.

CHAPTER III

REVIEW OF LITERATURE

Literature written about storage for an interior design laboratory was not found; however, the principles of storage were reviewed and studied. Several sources were used in preparation for designing storage units to implement the teaching of interior design in a college situation. Some sources stated that their findings were based upon previous research recommendations.

The function of planned storage units was emphasized in the literature and has been divided into the following topics: ease of handling stored articles, factors affecting good visibility, flexibility of planned storage, and location of storage units within an area.

Ease of Handling Stored Articles

The height and depth of storage shelves and the energy required for removal or replacement of stored articles have been studied in relation to the energy required for removal or replacement of stored articles.

Recommended Height for Shelves above the Floor

In 1937 a Washington and Oregon State study made in relation to body measurements and preferred activity heights by Wilson, Roberts, and Thayer, recommended actual heights depending upon the article and whether there was an obstruction to reach over. If there was no obstruction

and the articles were light-weight, a maximum height of seventy-nine inches above the floor was recommended. If there was an obstruction twelve inches wide, a maximum height of seventy-six inches was recommended for light-weight articles and a maximum height of seventy-one inches above the floor for plates.[1] An obstruction of twenty-four inch depth, the usual kitchen counter depth, was not included.

In 1948 at Cornell University, research in kitchen storage was conducted by Heiner and McCullough to determine the food items, utensils, china, and glassware a family commonly stored in the home. They recommended a maximum height of seventy-two inches above the floor for storage shelves as the maximum height that a woman of average statue could comfortably reach.[2]

McCullough also recommended seventy-two inches above the floor as the maximum height for a storage shelf that could be easily reached in a 1952 research project on household storage units.[3]

In 1956 another study on the most satisfactory heights for storage of household articles in relation to the energy required for replacement or removal of articles, conducted by McCracken and Richardson, recommended that articles requiring both hands for removal or replacement

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[1]Maude Wilson, E. H. Roberts and Ruth Thayer, Standards for Working Surface Heights and Other Space Units of the Dwelling, Washington Agricultural Experiment Station, Bulletin 345, 1937, p. 23.

[2]M. K. Heiner and H. E. McCullough, Functional Kitchen Storage, Cornell University Agricultural Experiment Station, Bulletin 846 (June, 1948), p. 19.

[3]H. E. McCullough, Space Design for Household Storage, University of Illinois Agricultural Experiment Station, Bulletin 557, 1952, p. 6.

"should not be lower than twenty-eight nor higher than fifty-two inches above the floor."[4] High storage space was avoided for frequently used or heavy articles because additional energy was found to be used in reaching such areas.[5]

In a publication prepared by a committee of the American Home Economics Association in 1956, the maximum height of sixty inches above the floor was recommended for shelves containing individual student work materials.[6]

Recently research in relation to various height and depths of storage shelves and working surfaces has been concerned with the energy cost to the body.

In 1959 Bratton studied the relationship of postural conditions in specific household tasks while sitting or standing. Some of the actual heights recommended were shown in the following:*

Activity	Height of reach above floor (Inches)	Oxygen consumed per minute increase over standing (Per Cent)
Arm reach	46	12
Arm reach	56	24
Arm reach	72	50
Arm reach and trunk bend	22	57
Step up 7 inches	no reach	119
Arm reach and trunk bend	3	131

*E. C. Bratton, Some Factors of Cost to the Body in Standing in Work and Sitting to Work under Different Postural Conditions, Ithaca, New York: Cornell University Experiment Station Memoir 365 (June, 1959), p. 11.

[4]Earl C. McCracken and Martha Richardson, "Human Energy Expenditures as Criteria for the Design of Household Storage Facilities," Journal of Home Economics, LI (March, 1959), p. 205.

[5]Ibid., LI, p. 206.

[6]Planning Space and Equipment, Prepared by the American Home Economics Association and the Home Economics Education Branch Misc. Pub. 25 (Washington: U.S. Government Printing Office, 1956), p. 20.

In 1961 Weaver and Keiser studied the relationship of body angle bend and energy cost to the body while performing simple household tasks. They found a direct relationship between the degree of body angle bend and energy cost to the body; however, they recommended additional research of posture and the effect upon energy cost.[7]

The recommended maximum height for easily reached shelves has varied in the above research from seventy-nine inches above the floor to fifty-two inches above the floor.

Recommended Depth for Shelves

Various shelf depths have been recommended for storage units depending upon the type of articles to be stored on the shelf.

In 1948 McCullough and Heiner stated that shelving "4½ inches deep or less would accommodate from 80 to 90 per cent of the supplies."[8] In this study shelving of "2½, 3½, 4½, and 6½ inches" in depth was reported to be the most functional depth for shelves containing kitchen supplies.[9] No articles were stored behind other articles even when they were like articles.

Later McCullough recommended a minimum shelf depth of four inches up to a maximum inside shelf depth of twenty-four inches for shelves containing household supplies. She has suggested that the articles with the greatest depth, when in the position to be stored, determine the correct depth of a storage shelf.[10]

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[7]M. B. Keiser and E. K. Weaver, "Body Movements Related to Energy Used," Journal of Home Economics, LIV, No. 6 (June, 1962), p. 480.

[8]Heiner and McCullough, p. 25.

[9]Heiner and McCullough, p. 25.

[10]McCullough, pp. 12-75.

In determining shelf depths for household linens, Woolrich and Herrington suggested shelf surfaces in multiples of a four-inch module--twelve, sixteen, and twenty inches. They found that "surfaces less than 12 inches or more than 20 inches deep have limited functional use...."[11] Since this research was limited to household linens, the recommended shelf surface space was less, because they were able to stack like kinds of folded linens.

Another study in 1956 was undertaken in seven western states to determine the food items commonly stored and their space needs. The results of this survey classified needed space for storage of food items by centers, with recommendations of shelf depths to minimize the placing of items in front of each other. Homemakers were asked to arrange food items on test shelves and from the measurements of the space used, measurements were recommended for each center according to the below.

DIMENSIONS OF LINEAR STORAGE, IN INCHES*

CENTERS	HEIGHT	DEPTH	LINEAR LENGTH
SERVE	6	4.0	19
	9	9.5	55
	11	7.0	8
MIX	6	5.5	50
	8	6.5	48
	10	6.0	22
RANGE	7	7.0	4
	9	5.0	16
	11	6.0	4
	over 11	9.0	5
SINK	8	7.0	14

*Alison C. Throne and Others, Space Required to Store Food in Western Farm Kitchens, Utah Agricultural Experiment Station Bulletin 388 (July, 1956), p. 13.

[11]Avis M. Woolrich and J. D. Herrington, Storage Units for Household Linens, U.S. Department of Agriculture Research Bulletin 150 (Washington: U.S. Government Printing Office, 1956), p. 3.

In a study previously cited, various shelf depths were recommended for shelves at the same height above the floor, depending upon whether the person used one hand or both hands for removal or replacement of articles.[12] Bratton had previously stated that both hands used continously for activities "lessened the strain" and aided in maintaining body balance.[13] Therefore, McCracken and Richardson recommended a minimum shelf depth of twelve inches at sixty-four inches above the floor if both hands were used. If one hand was used for removal or replacement, only eight inches was recommended for shelf depths at the same height above the floor. Narrow shelves were also recommended in the more accessible areas above the work surface.[14]

Recommended Clearance Space

The amount of clearance space available around articles or side-to-side clearance and between shelf spacing has also been found to affect the ease of handling stored articles.

Side-to-side Clearance

Wilson recommended side-to-side clearance based upon the type of articles stored on shelves. If articles were rigid or fragile, one-half inch on all sides was allowed. If articles were not rigid or fragile, one-fourth inch was allowed around articles.[15] This was one

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[12] McCracken and Richardson, pp. 205-206.

[13] E. C. Bratton, Oxygen Consumed in Household Tasks, Ithaca, New York: Cornell University Agricultural Experiment Station (August, 1951), p. 9.

[14] McCracken and Richardson, pp. 205-206.

[15] Maude Wilson, Consideration in Planning Kitchen Cabinets, Corvallio, Oregon: Agricultural Experiment Station Bulletin 445 (November, 1947), p. 15.

of the first attempts to recommend side-to-side clearance space needed by specific articles found in the literature reviewed.

In 1955 a study conducted by Woolrich, White, and Richards indicated that "the human factor had the greatest influence on the amount of side-to-side clearance used."[16] This study may indicate that research in relation not only to frequency of use and types of articles, but in relation to personal work habits which affect the amount of clearance, may be needed.

In 1962 a study determining the most satisfactory ways to store folded garments in southern rural homes revealed that the need for side-to-side clearance increased as the depth of the shelf surface was increased or as the height of the shelf surface was raised above eye level or lowered below wrist level. As the depth of the shelf increased, additional clearance space around articles was needed for ease of removal or replacement of articles in the back of shelves. Side-to-side clearance of at least one inch was allowed between stacks of folded garments for ease of handling.[17]

Shelf Spacing to allow for Clearance above Articles

In addition to the clearance space around the sides of articles, consideration must be given to the correct spacing of shelves to allow for clearance space above articles. Between-shelf clearance space was

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[16]Avis M. Woolrich, Mary White, and Margaret Richards, Storage Space Requirements for Household Textiles, U.S. Department of Agriculture Research Bulletin 62-2 (Washington: U.S. Department of Agriculture, 1955), p. 14.

[17]Kathryn Philson, Folded Garment Storage for Southern Farm Homes, Auburn Agricultural Experiment Station Bulletin 341 (May, 1962), pp. 14-15.

defined by Woolrich and Herrington as the additional "clearance needed to place and remove" articles.[18]

The type of shelf used in the storage units affected the amount of clearance space needed above articles for ease in handling. More handling room or between-shelf clearance around articles was needed in units with fixed shelves than in units with sliding shelves, trays, or drawers; since the latter three are drawn out which automatically provides space above the stored articles. In shelving twenty inches deep, fixed shelves required a between-shelf spacing of seven to twelve inches; however, drawers or sliding shelves required a between-shelf spacing of four to six inches for ease in handling folded linens. Woolrich and Herrington suggested substracting two inches from each between-shelf clearance recommended, if movable shelf surfaces were used in the place of fixed shelves.[19] Philson has called pull out shelves "space savers".[20]

The statements above review the recommended space for clearance around stored articles and clearance above stored articles. In addition to this, the height and the depth of shelves affects the recommended spacing between shelves.

Woolrich and Herrington allowed more space between shelves located at the top and bottom of storage units. Shelves were spaced close together near the center of the unit.[21]

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[18]Woolrich and Herrington, p. 3.

[19]Woolrich and Herrington, pp. 15-16.

[20]Philson, p. 4.

[21]Woolrich and Herrington, p. 16.

Philson found the depth of shelves was related to the correct spacing of shelves in storage units. For shelving thirteen inches deep, a clearance of two inches was needed above articles and for shelving eighteen inches deep at least three inches above articles was necessary. The deeper shelves in storage units required wider shelf spacing to provide between-shelf clearance for easy reach to the back of the shelf.[22]

Another way to determine shelf spacing has been according to the vertical space required by the tallest article on the shelf. Heiner and McCullough allowed one-half inch above the tallest article in storage units to determine the shelf spacing. Using this method, shelves were spaced from three inches to approximately thirteen inches apart.[23] Throne, Taylor, Hurst, and Bennion also used the same method but allowed one inch of free space above the top of articles.[24]

Length of Shelves

Various lengths of storage units have been recommended. In some cases the length is based on individual needs plus the necessary clearance needed around articles within storage arrangements. McCullough measured the longest article in the position it was to be stored to determine the length of storage units.[25] In other cases the length is based on the space required by the selected article plus the necessary clearance. Woolrich, White, and Richards measured the article and

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[22]Philson, p. 4.

[23]Heiner and McCullough, p. 25.

[24]Throne, Taylor, Hurst, and Bennion, p. 405.

[25]McCullough, p. 6.

added side-to-side clearance needed by the article in determining the necessary length for any storage unit.[26]

Factors Affecting Visibility of Stored Articles

Visibility of stored articles also needs to be considered in planning storage areas. Most authors mention visibility although precise studies have not been made. Listed below are the factors most frequently mentioned as affecting visibility of stored articles.

(1) The arrangement of stored articles within units. Frequently used articles have been stored in the areas closest to eye level or at an average distance of 61.1 inches above the floor.[27]

(2) Related items have been grouped together for convenience to the user.

(3) Only items of like kinds were stored behind each other on the shelf or stacked on top of each other.[28]

(4) The type of shelf used affected visibility of stored articles. Pull-out shelves bring articles out and into view.[29]

(5) The height and depth of shelves from the floor affected visibility of stored articles.[30]

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[26]Woolrich, White, and Richards, p. 11.

[27]Maud Wilson, Closets and Storage Space, U.S. Department of Agriculture (Washington: U.S. Government Printing Office, November, 1940), p. 1.

[28]Philson, pp. 14-15.

[29]Woolrich and Herrington, pp. 15-16.

[30]Wilson, Considerations in Planning Kitchen Cabinets, Corvallis, Oregon: Oregon Agriculture Experiment Station Bulletin 445, 1947, p. 15.

(6) The quantity and quality of light available in the area affected visibility of stored articles.

(7) The size and type of opening affected the visibility of stored articles.[31]

Flexibility of Storage Units

A committee of the American Home Economics Association made the following statement:

> Storage space and its equipment should be sufficiently flexible to permit its adjustment to varying amounts, sizes, and kinds of items stored and should be adequate for possible future needs.[32]

Adjustable shelves have been recommended for meeting the changing needs of the user and for increased flexibility of storage arrangements.[33] Wilson, a pioneer in planned storage research, recommended adjustable fittings for a closet used by more than one person at different times.[34] Adjustable rods in closets that were raised or lowered in children's rooms has been credited to Wilson's suggestion.

The type of device used for adjusting shelves was mentioned by Philson as a factor controlling the ease of flexibility of storage units. She maintained that shelves were adjusted with greater ease if shelves were moved to a new position rather than adjusting each individual metal cleat to a new position.[35]

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[31] Woolrich, White, and Richards, p. 11.

[32] Planning Space and Equipment, p. 17.

[33] Philson, p. 4.

[34] Wilson, Closets and Storage Space, p. 1.

[35] Philson, p. 4.

Location of Storage Units

Most authors have recommended locating stored articles at the place where they are used the greatest number of times. Listed below are some of the generally accepted practices or guides for planned storage space suggested by a committee of the American Home Economics Association.

1. Storage space should be arranged so that items are located close to where they are first used.
2. Frequently used items should be stored where they can be taken out and put back with a minimum of effort.
3. All items should be stored so that they can be easily seen, reached, and readily grasped.[36]

This committee also recommended movable storage units for facilities and equipment to be used in more than one area of a room.

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[36] Planning Space and Equipment, p. 17.

CHAPTER IV

A BASIS FOR PLANNING A COLLEGE INTERIOR DESIGN LABORATORY

Colleges and universities are faced with the problem of limited space in an interior design laboratory resulting from increasing numbers of students. In planning the use of available space, consideration should be given to the needs of different classes, the range of daily activities, and possible future needs for space. Planning expansion for future needs is "one of the most difficult things to do...for home economics on a college or university campus."[1] First, it is difficult to estimate the number of students that will be majoring in interior design in ten or twenty years. Second, the method of teaching may alter in the future. For example, a change of instructors may bring a change in teaching methods. Third, space may be increased in the future. Future and present needs are a part of all comprehensive plans.

> Just as a family planning a new home thinks simultaneously of its present needs and those it forsees for 10-even 20 or 30 years, so must an institution...plan for the present and for an anticipated future covering several decades.[2]

Flexibility is another requirement for the facilities of an institution. Whenever possible, space should be planned for a varying number of students and for a variety of teaching methods.

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[1] Planning Space and Equipment, Prepared by the American Home Economics Association and the Home Economics Branch Misc. Pub. No. 25 (Washington: U.S. Government Printing Office, 1956), p. 4.

[2] Ibid.

The steps taken prior to planning the proposed interior design laboratory to be located in the School of Home Economics of the University of North Carolina at Greensboro were: (1) listing major activities, (2) determining space needs of major activities, (3) planning various arrangements of equipment, and (4) designing storage facilities for materials used in the performance of major activities.

No one list of activities applies to all colleges and universities teaching interior design. Activities differ, because goals and methods of teaching interior design differ.[3] Each institution needs to examine the nature of their program to determine the variety and relative importance of activities.

The relative importance of learning activities differ for institutions. Therefore, it was necessary to establish a list of major activities for this institution for the purpose of this study. An activity was considered to be major if it were performed over an extended period of time by all members participating in laboratory classes.

Furthermore, activities commonly associated with the teaching of interior design and considered to be major were determined through conversations with staff members presently teaching interior design and from personal observation of activities performed in the interior design laboratory. These activities will be discussed in later chapters in the following order: (1) drafting, (2) selecting samples, (3) rendering color, (4) displaying materials, (5) teaching, and (6) exhibiting student work.

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[3] Ibid., p. 5.

CHAPTER V

SPACE NEEDS FOR THE MAJOR ACTIVITIES OF AN INTERIOR DESIGN LABORATORY

Any activity in a laboratory requires space for the individual while working and for the needed equipment. Some activities require more space than others. Many activities are performed in the same space although the individual's working positions may vary and the arrangements of equipment may differ.

The space needs for an interior design laboratory are discussed below according to the previous listing of major activities for this institution.

Drafting

Drafting is the most important major activity performed in an interior design laboratory. For the student majoring in interior design, drafting is the language tool for presenting a design idea. Learning to express creative design solutions with drafting tools is easier when adequate space is provided. The main equipment necessary to perform this activity are individual drafting tables and stools. A flat space adjoining the drafting table is needed to accomodate tools. Additional space is needed around each drafting table and stool for circulation of students and instructors in the room.

Selection of Drafting Tables and Stools

Drafting tables should be lightweight for flexibility of classroom arrangements and for ease of room maintenance. The desk surface should be smooth with a hard, dull finish which provides "good light reflection free from glare."[1] The size of the working surface needed varies depending upon the size of individual projects. The amount of space available in the laboratory also controls the size of the working surface. While sizes of individual projects may vary, a program encompassing a major in interior design should provide drafting tables that will permit the execution of projects of a size comparable to those used in the profession.

Drafting tables should be adjustable. Research points out the desirability of adapting working surfaces to fit individual body proportions.[2] Staley suggests:

> There is no one best dimension for anything used by or made by human beings. If possible, make everything adjustable...[3]

Drafting tables are provided for the interior design laboratory in the School of Home Economics at this institution. The drafting surface is thirty-six inches by twenty-four inches. The height of the drafting surface is thirty-six inches when flat. This height allows students to stand or sit while drafting. Standing relieves fatigue

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[1] Planning Space and Equipment, Prepared by the American Home Economics Association and the Home Economics Branch, Misc. Pub. No. 25 (Washington: U.S. Government Printing Office, 1956), p. 59.

[2] M. J. Davis, M. L. Swartz, and R. E. Emerson, An Adjustable Height Table for the Laboratory or Home, West Virginia Agricultural Experiment Station Circular 92 (June, 1954), p. 3.

[3] L. W. Staley, Dimensions of the Human Figure (Ohio: Cleveland Designers & Consultants, 1957), p. 1.

which may occur after sitting for long periods of time. Some drafting tasks are accomplished easier in a standing position. There is a side surface for accommodating drafting tools. It is sixteen inches by twenty-four inches.

The drafting surface is also adjustable in two positions by tilting up the back of the surface. A slanted surface provides greater visibility of work and tools, such as the T-square and triangle. If the surface is tilted up too high, tools tend to slide off the drafting surface. The most important advantage of a slanted drafting surface is decreasing the angle of body bend necessary to perform drafting tasks, as illustrated below.

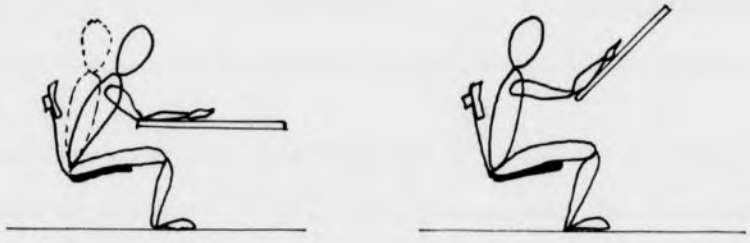

Figure 1.--Angle of Body Bend Decreases as Tilt of Drafting Surface Increases

A range of working-surface heights are suggested by authorities. Dimensions of the seated human figure, as given in Architectural Graphic Standards, are based on work-top heights of twenty-nine inches.[4] Research has indicated that individuals prefer a range of table heights from approximately twenty-four inches to approximately thirty inches. Ridder stated, "the height of the chair seat directly influenced the

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[4]C. H. Ramsey and H. R. Sleeper, Architectural Graphic Standards (New York: John Wiley and Sons, Inc., 1961), p. 669.

height chosen for each table surface."[5] The body proportions particularly height of individuals also affect the heights chosen for each table surface.[6]

Comfortable seating based upon the proportions of the human figure should be provided for students sitting for long periods of time. The space requirements of the seated human figure, presumably average, are illustrated below.[7]

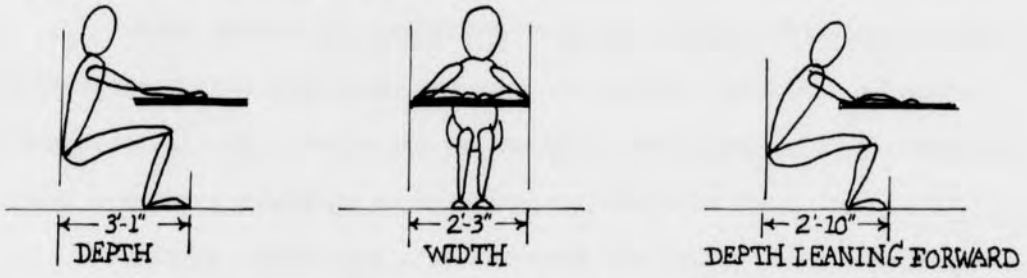

Figure 2.--Space Requirements of the Seated Human Figure

Comfortable seating that fits the proportions of the human figure is affected by the seat height, seat depth, and the shape and placement of the support provided for the back.

The height of a drafting stool seat should be adjustable to accommodate a range of body proportions. Research points out that individual preferences for a seat height vary from approximately thirteen inches to nineteen inches above the floor.[8]

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[5]C. A. Ridder, Basic Design Measurements for Sitting, University of Arkansas Agricultural Experiment Station Bulletin No. 616 (October, 1959), p. 32.

[6]Ibid., p. 33.

[7]Ramsey and Sleeper, p. 669.

[8]Ridder, p. 90.

The depth of a seat back should be adjustable for different activities. A seat depth of "16.5 inches" has been recommended for a chair used for dining, writing, and games.[9] A seat depth for drafting has not been determined to the writer's knowledge. Since many activities are performed in the interior design laboratory, seat backs should be adjustable. The seat back should also be curved to fit the curvature of the body to lessen fatigue.

Swivel chairs are suggested to allow better visibility of different areas of the classroom and ease of access. Mobility of seated students permits the instructor to use different areas of the classroom without requiring students to move chairs about the laboratory.

Drafting stools are also provided for the interior design laboratory at this institution. The seat is curved, has a hard surface, and is sixteen and one-half inches deep and nineteen and one-half inches wide. The seat is adjustable from twenty-five and three-fourth inches to thirty-three inches above the floor. Curved seat backs are adjustable to allow various depths from fifteen and three-fourth inches to nineteen and one-half inches. The position of the seat back is adjustable from seven to nine inches above the seat. The height of the seat back is six inches.

Clearance space is needed around drafting tables and stools to provide for movement from one area to another. The amount of clearance space suggested is based upon individual drafting units. A drafting unit includes the drafting table with side surface and the drafting stool. The dimensions, as given in Architectural Graphic Standards,

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[9]Ridder, p. 40.

are based upon wider drafting tables than the tables located in the laboratory of this institution. The size of the drafting table does not affect the required clearance. Suggested clearance on all sides of a drafting table are: minimum-- twenty-six inches, good-- thirty inches, and excellent-- thirty-six inches. These are shown in Figure 3.[10]

Placing drafting tables next to each other provides aisles as the means of access to other areas of the laboratory. Clearance space needed between drafting stools and tables determines the most desirable clearance between rows. A minimum clearance of thirty-six inches between rows is needed to allow twenty-four inches behind stools. Research points out that a clearance of twenty-four inches is needed for one person walking past a seated person.[11] Since several students must use the same traffic path, a clearance of forty-eight inches is a desirable spacing between rows of drafting tables. This spacing allows thirty-six inches for clearance behind drafting stools.

Classroom Arrangements of Drafting Units

Drafting tables may be arranged in a number of different ways but all arrangements must provide adequate clearance for the instructor to circulate among students. In addition, the student needs ease of access to storage areas. Some arrangements are more flexible than others. Grouping drafting tables reduces the total amount of space required

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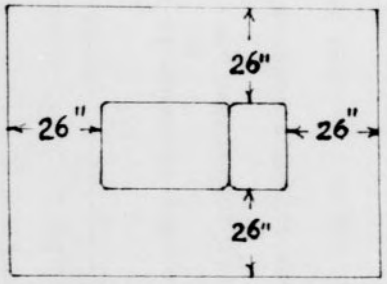
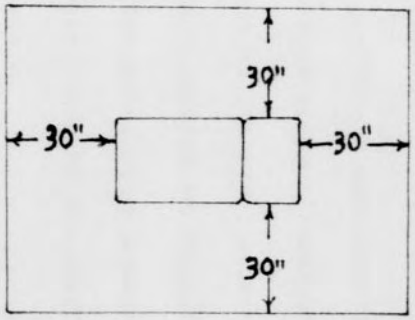
[10] Ramsey and Sleeper, p. 716

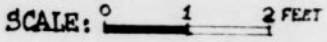
[11] H. E. McCullough and Others, Space Standards for Household Activities, University of Illinois Agricultural Experiment Station, Bulletin 686 (May, 1962), p. 5.

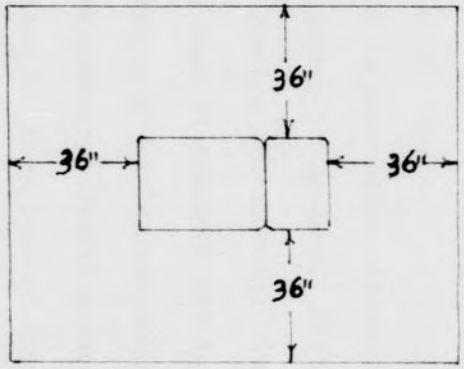


MINIMUM



GOOD





EXCELLENT

FIGURE 3 CLEARANCES AROUND DRAFTING UNITS

and accomodates larger numbers of students within an interior design laboratory.

Two or more drafting tables may be joined to one another with clearance space allowed behind drafting stools. Drafting tables are joined at the right side of the table for right-handed persons. Free space is needed on the left side of the drafting surface for manipulating the T-square, since drawing is accomplished with the right hand. The opposite side of the drafting surface needs to be free for left-handed persons.

Grouping drafting tables next to each other affects the length of the traffic path in the interior design laboratory. Aisles between rows provide students access to other areas of the room. Students walking behind other students causes some distraction within the laboratory. Obviously students in the center of aisles are the most affected by long aisles. For this reason, the number of drafting tables placed next to each other needs to be considered. Long rows of drafting tables require less floor space but lengthen the traffic path and provide some inconvenience for the instructor and students. When six drafting tables are grouped together and allowing two inches between tables, twenty-six feet and ten inches is the total length of the traffic path required. This is shown in Figure 4. In room arrangements for this interior

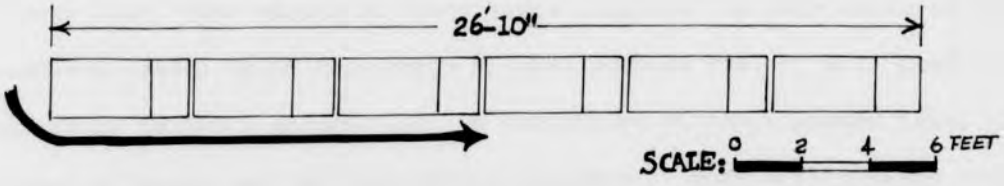


Figure 4.--Length of Path Increases as Number of Combined Units Increase

design laboratory, five drafting tables are the greatest number grouped together in a continuous line. The total length of this traffic path is twenty-two feet and six inches.

Six arrangements for twenty drafting tables with minimum, good, and excellent clearance are shown in Figures 5 through 10. The following arrangements are presented: (1) twenty individual drafting tables with clearance on all sides of the table, (2) ten individual tables combined with five double drafting units, (3) ten double drafting units, (4) four double drafting units combined with four triple units, (5) five units of four tables with clearance at ends of the rows, and (6) four units of five tables each with clearance at the ends of the rows. The tables are spaced two inches apart when combined.

This study showing the floor space required for six arrangements each with minimum, good, and excellent clearance indicates the possible choice of arrangement within a given amount of space. Minimum clearance requires the least amount of floor space in each arrangement. In the opinion of the writer, twenty-six inches clearance is inadequate for drafting. Good or excellent clearance permits better access to other areas and promotes creativity by removing the cramped space atmosphere.

Grouping tables saves floor space. For example, the amount of floor space required for individual tables with good clearance is 750 square feet. The amount of floor space required for four units of five combined tables, with two inches allowed between tables, with good clearance is 560.3 square feet. A difference of 189.6 square feet, the amount of space used by four aisles, is saved. Both arrangements provide good clearance at the periphery of the room.

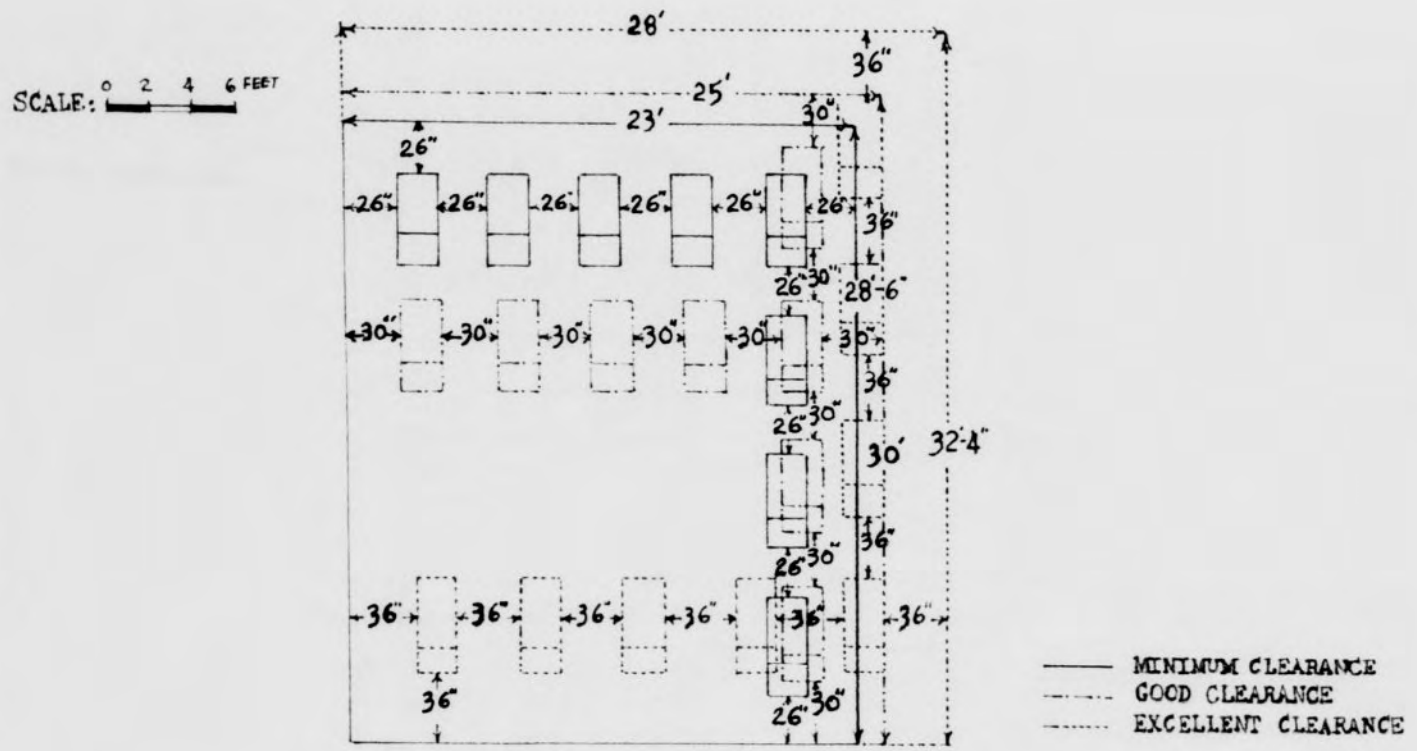


FIGURE 5 ROOM DIMENSIONS REQUIRED FOR TWENTY INDIVIDUAL UNITS WITH MINIMUM, GOOD, AND EXCELLENT CLEARANCE

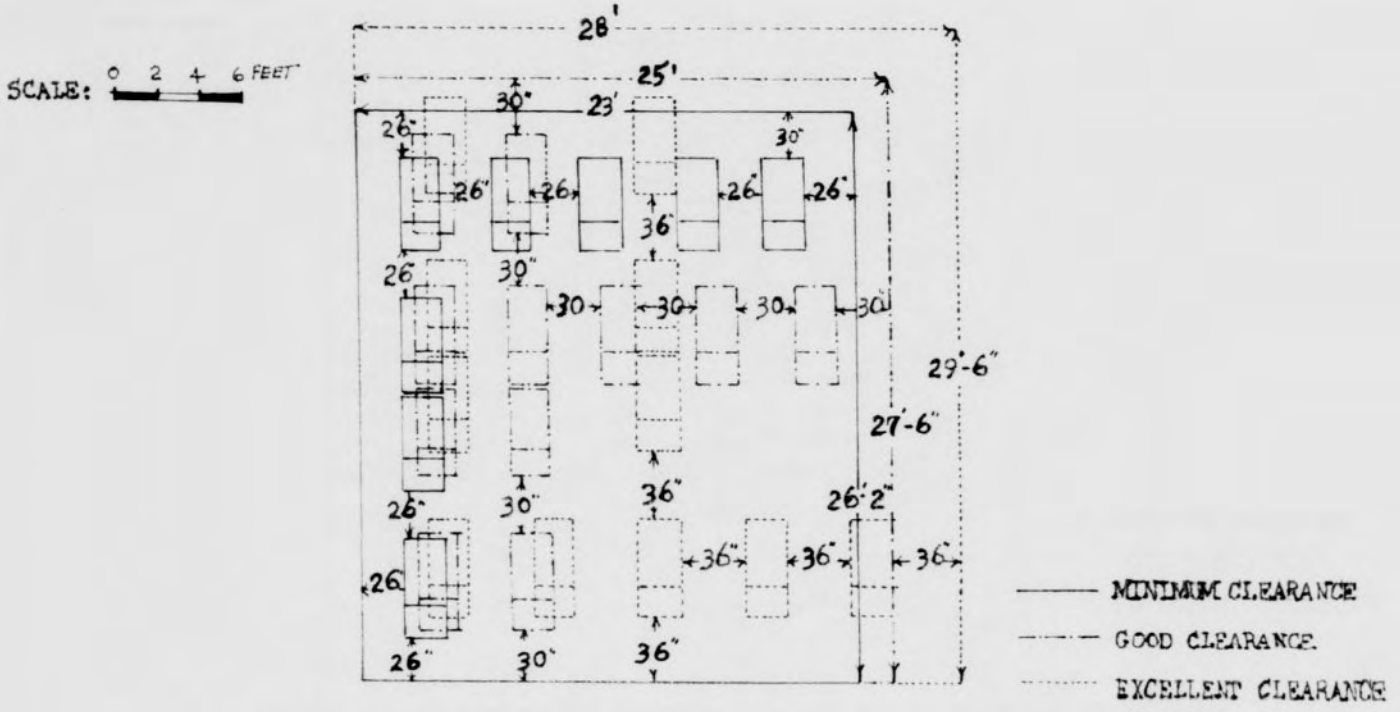


FIGURE 6 ROOM DIMENSIONS REQUIRED FOR TEN INDIVIDUAL AND FIVE DOUBLE DRAFTING UNITS WITH MINIMUM, GOOD, AND EXCELLENT CLEARANCE

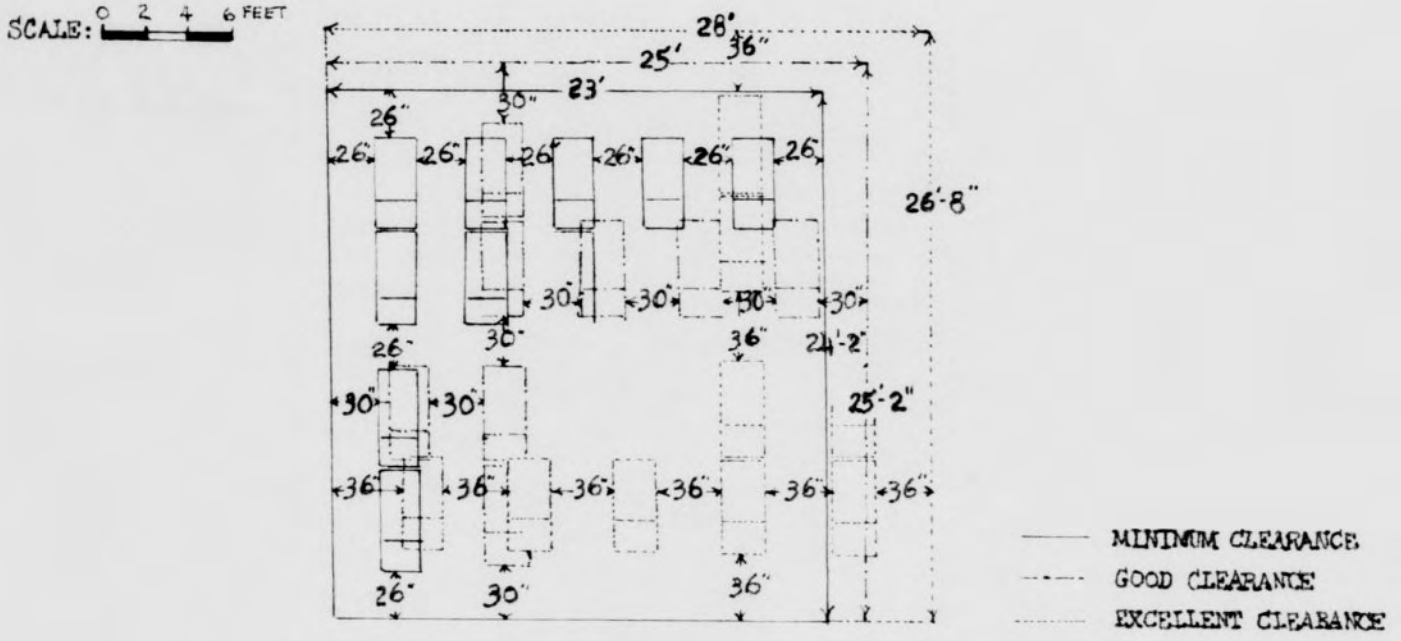


FIGURE 7 ROOM DIMENSIONS REQUIRED FOR TEN DOUBLE DRAFTING UNITS WITH MINIMUM, GOOD, AND EXCELLENT CLEARANCE

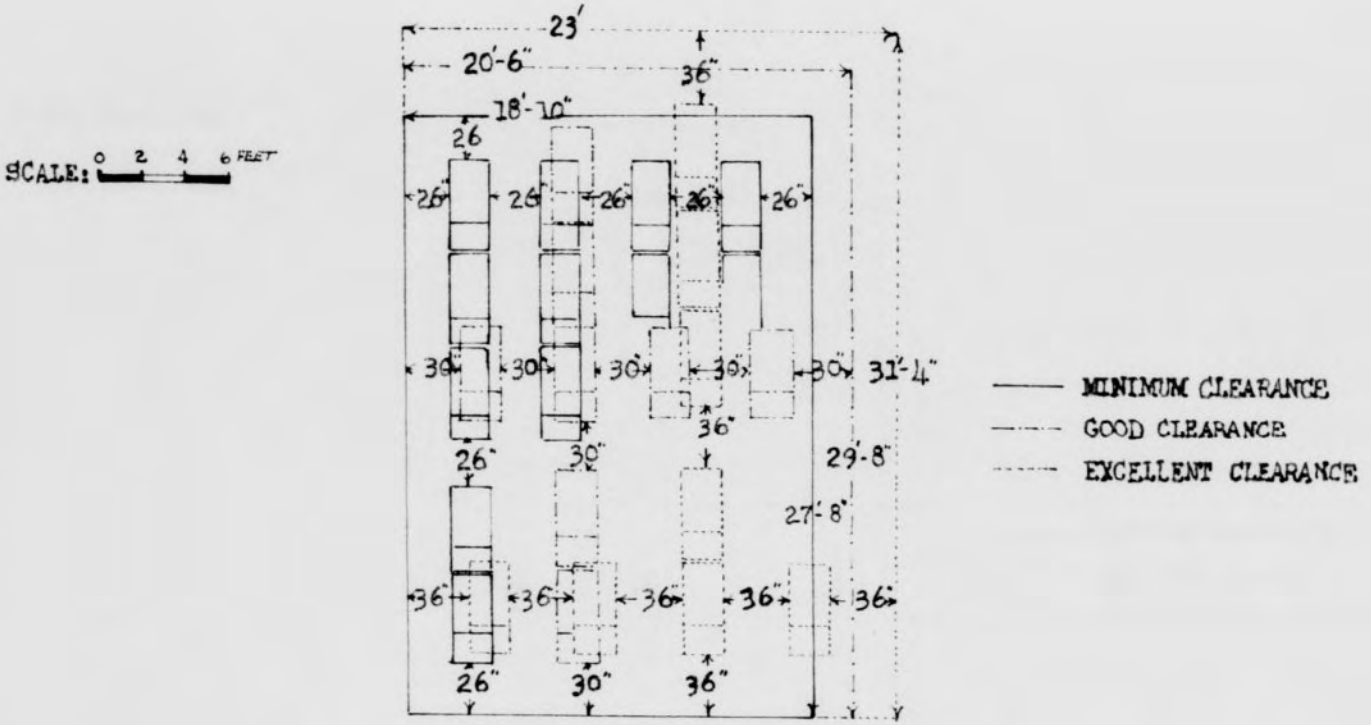


FIGURE 8 ROOM DIMENSIONS REQUIRED FOR FOUR DOUBLE DRAFTING UNITS AND FOUR TRIPLE UNITS WITH MINIMUM, GOOD, AND EXCELLENT CLEARANCE

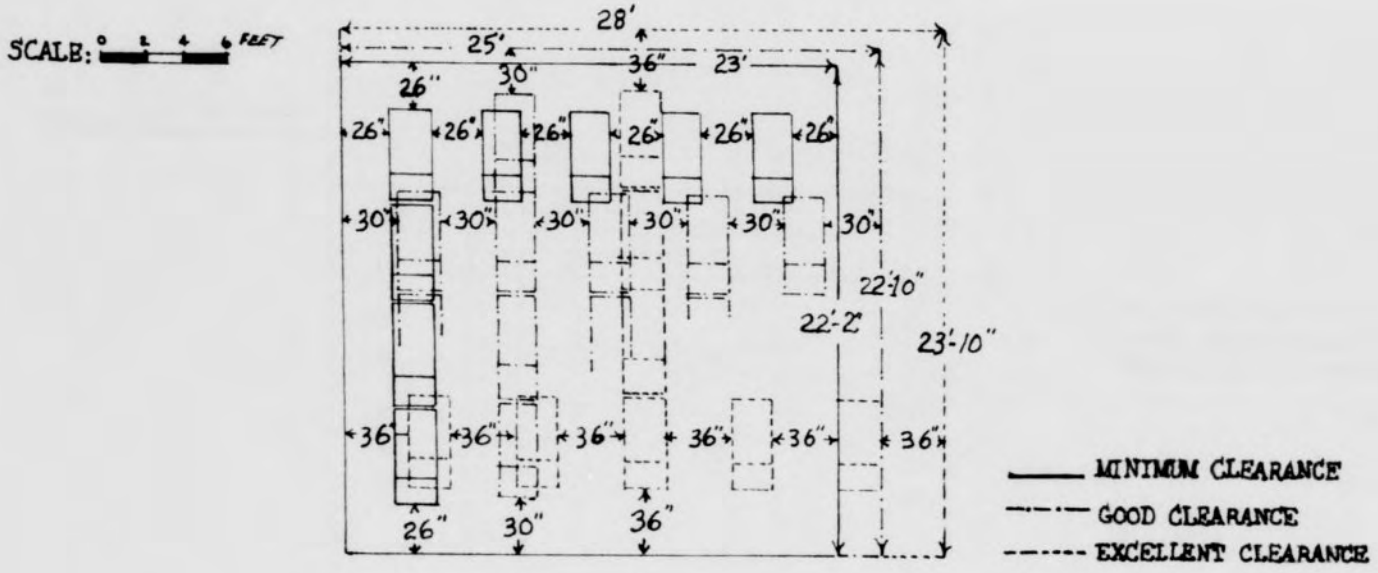


FIGURE 9 ROOM DIMENSIONS REQUIRED FOR FIVE UNITS OF FOUR DRAFTING TABLES COMBINED WITH MINIMUM, GOOD, AND EXCELLENT CLEARANCE

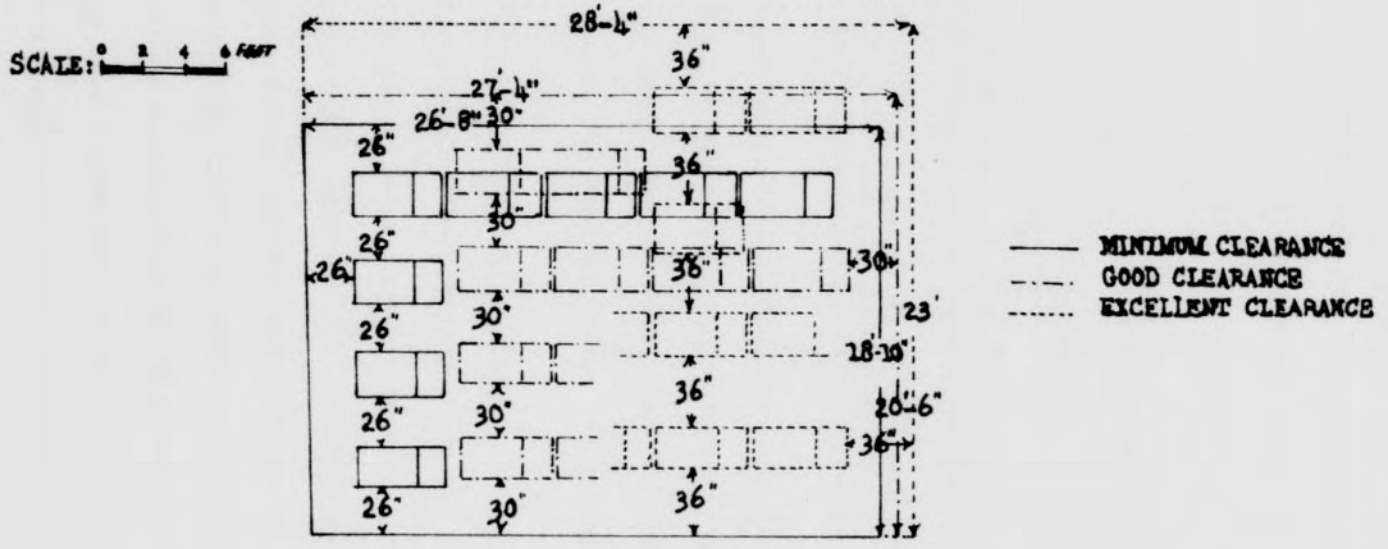


FIGURE 10 ROOM DIMENSIONS REQUIRED FOR FOUR UNITS OF FIVE DRAFTING TABLES COMBINED WITH MINIMUM, GOOD, AND EXCELLENT CLEARANCE

The amount of space required for the six arrangements of twenty drafting tables with minimum, good, and excellent clearance is shown below. The amount of floor space required decreases as the number of drafting tables combined increases.

Arrangement	Minimum Square Feet	Good Square Feet	Excellent Square Feet
Individual tables	655.50	750.00	905.33
Ten individual with five double units	601.83	687.50	826.00
Ten double units	555.83	629.17	746.67
Four double with four triple units	521.06	608.17	720.67
Five units of four	509.83	570.83	667.33
Four units of five	502.22	560.33	651.67

Combinations of different clearances may be used in the same arrangement of drafting units to accommodate areas of the laboratory that require additional space. For example, the area around the entrance needs additional space for ease of access and safety.

Selecting Samples

Many colleges and universities provide the opportunity for interior design students to select samples representing the materials used in design solutions. When students are concerned with the textures and color of materials, design problems are a greater challenge because they are more realistic. The problem of mixing and rendering color to gain the desired effect of selected samples is a challenge. Space needs for selecting samples depend upon the size and quantity of samples.

A flat surface is needed for transporting samples to another area of the laboratory. Storage for samples and a movable cart will be discussed in Chapter VI.

Rendering Color

The student's ability to use line, form, scale, and texture may be expressed through drafting. Another important design element is color which greatly influences the final effect of an interior and has many emotional connotations. Color combinations may be planned by selective samples of fabric, wall coverings, and floor coverings. Only by mixing combinations of color does a student gain a knowledge of the makeup of colors which have varying values, hues, and intensities. Designers need to create new combinations and uses of color. Pigments that mix with water are generally used in interior design renditions.

Space needs for rendering color vary according to the number of students and the type of equipment provided in the laboratory. The essential equipment for rendering color are a sink and an ample flat surface for accommodating tools used to perform the activity.

Selection of a Sink

Sometimes students mix colors at the sink area; therefore, the material selected for the sink is important. Porcelain enamel and stainless steel are considered for the sink material. Porcelain enamel has a tendency to retain dried color spots which are difficult to remove. Therefore, a white sink material should be avoided as a color selection. Also porcelain enamel chips and may discolor with time.[12] Stainless

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[12] F. Ehrenkranz and L. Inman, Equipment in the Home (New York: Harper & Brothers, 1958), p. 121.

steel is a better selection for the sink material. Stainless steel is easy to clean and resistant to scratches.

A large sink bowl is needed when more than one student uses the same sink. Students work at different speeds; therefore, it seems unlikely that all students would mix colors at the same time. A large single-bowl counter sink, twenty-one inches by twenty-four inches, was selected as the most desirable size for this laboratory. A sink bowl of this size accommodates the various sizes of paint cans, muffin tins, and other such tools. A width of twenty inches was considered to be the minimum for the interior design laboratory. A depth of seven inches was considered to be the minimum for the sink bowl. A deeper sink bowl may provide easier maintenance of the sink area.

Selection and Height of Counter Surface

A flat counter surface is needed on both sides of the sink for student's equipment. Stainless steel is a good choice for the material but more expensive than others. Also stainless steel causes more noise. A good grade of laminated plastic would be an alternate choice.[13]

The sink bowl depth is considered when determining the counter height. It is suggested women of average height prefer sink bowls seven inches deep for counters thirty-six inches high.[14] Students working in an interior design laboratory are not working long periods of time at the sink area mixing color. Thus the height of the counter

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[13]Elaine K. Weaver and Velma V. Everhart, Work Counter Surfaces Finishes, Ohio Agricultural Experiment Station Bulletin 764, 1955, p. 53.

[14]Ehrankranz and Inman, p. 121.

around the sink seems to be more important than the height of the sink. A counter height of thirty-six inches is suggested for this laboratory.

A washable wall surface for the wall behind the sink area is desirable to provide easy upkeep. A good grade of laminated plastic is suitable for this purpose.

Displaying Materials

Displays help interior design majors to learn the effects obtained when materials are combined or grouped together. By planning displays, students gain a deeper understanding of the effects of combining materials and in turn develop creative solutions. It seems advisable to include this activity in the teaching of interior design.

Bulletin boards and flat counter surfaces for displays were planned. Storage for the many materials used in displays will be discussed in Chapter VI.

Teaching

The space needs for teaching in a college interior design laboratory are difficult to determine because classes and teaching methods differ. Flexibility of space arrangements needs to be considered for the different activities, because different methods of teaching are employed. In this institution, two different rooms are available for sharing visual aids. In addition to personal consultations, demonstrations and illustrated talks are likely to be used by instructors.

The space required varies with the type of demonstration. Demonstrations are used to provide information, to create interest, or to set standards of work by showing how a process is done. Demonstrations

vary in scope from the very short one used in showing a small group some creative ways to plan spaces, to the large formal ones given to a large audience visiting the interior design laboratory. The equipment and facilities needed to perform a demonstration are a flat surface on which materials may be used and facilities for storage of such materials. Illustrated talks are similar to demonstrations and require similar space.

A chalkboard is needed in a college interior design laboratory. The chalkboard should be visible to all students and mounted so the chalkrail is thirty-two to thirty-six inches above the floor.[15] The distance from the chalkboard to the student sitting at the most distant point in the laboratory is a consideration for good visibility. This distance should not exceed thirty-five feet in the opinion of the writer.

A variety of chalkboard colors are available. Some consider green easiest to see with the least amount of glare; however, green is more difficult to erase and requires more cleaning than black chalkboards. Black with a dull finish is considered a good choice for the laboratory.

In teaching interior design, instructors consult with individual students about their solutions to design problems. Clearance necessary to circulate among students at drafting tables was discussed previously (pp. 24-26).

Completed student work is often graded in the interior design laboratory. Space for students to leave completed projects is needed.

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[15]Ramsey and Sleeper, p. 453.

Instructors need flat surfaces to grade completed projects. Flat counter surfaces were planned in this interior design laboratory for this activity.

Exhibiting Student Work

Exhibiting student work provides a method for recognizing outstanding design solutions which in turn serve as a visual example for other design students. When an instructor uses the exhibit to supplement class teaching, the projects provide a method of visual teaching. Exhibition of completed projects also depicts the progress of the class. Space was planned in the interior design laboratory for exhibiting students' completed projects.

The material selected for the exhibit board should be soft and durable. Cork material is considered to be desirable by many; however, cork tends to show holes and pieces chip off with time. In the opinion of the writer, a good grade of plywood covered with burlap material will serve the needs of the laboratory. Burlap material will also add texture.

Other Space Needs

Space should be planned for students' materials not related to the major activities performed in the interior design laboratory. These materials are: (1) student wraps such as coats, scarfs, and umbrellas; and (2) study materials related to other classes, such as books and notebooks.

To avoid the necessity of bringing these materials into the drafting area, a desirable location for student wraps and study materials is planned near the main entrance.

Seven feet of hanging space is needed to accommodate the wraps of twenty students. It is suggested that three hangers per linear foot be placed on a hanging rod. The desirable mounting height for the rod is sixty inches above the floor.[16] Shelves above the hanging rod will accommodate other materials.

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16 Planning Space and Equipment, p. 20.

CHAPTER VI

DESIGN FOR INDIVIDUAL STORAGE UNITS PLANNED FOR MAJOR ACTIVITIES

Storage planned for the materials required for major activities of an interior design laboratory implements the teaching of interior design. Instructors and students are able to locate materials with greater ease when storage is organized. Well-planned storage also provides visual examples of creative design.

Designs for storage presented are based upon the major activities of this institution; however, other institutions with similar storage problems may find these designs useful in solving their storage problems. In most cases, larger or smaller storage units can be obtained by altering the suggested width of the storage unit.

Specific dimensions required for these storage units are difficult to suggest because sizes of materials and equipment differ and possible arrangements for materials is unlimited. Nevertheless, there are general principles of storage which can be applied to every storage plan. Storage space should be arranged so that materials are located close to where they are used. Frequently used materials should be stored so they can be taken out and put back with a minimum of effort. Materials should be stored so they can be easily seen, reached, and readily grasped. Storage facilities planned should be flexible to permit varying sizes, quantities, and kinds of materials presently stored and be adjustable for possible future needs. The storage units

presented in this chapter apply these storage principles.

Storage Unit for Drafting

Drafting tools are used by students in almost every laboratory period. Some institutions with limited space require students to take materials to and from the laboratory, while others permit students to leave materials in the laboratory. It is desirable to plan locked storage facilities for drafting tools since they are frequently misplaced, quite expensive, and easily damaged.

The tools commonly associated with drafting are: triangles, rulers, inking supplies, tape, scissors, lead, pencils, lead sharpeners, T-squares, tracing paper, and drawing boards. Individual tote drawers will accommodate all drafting tools except T-squares, tracing paper, and drawing boards.

Individual Drawers

It is desirable for every student majoring in interior design to have a drawer for storage of drafting tools. Individual storage drawers or tote boxes that can be locked, for student drafting tools, save steps and reduce loss and confusion in the laboratory.

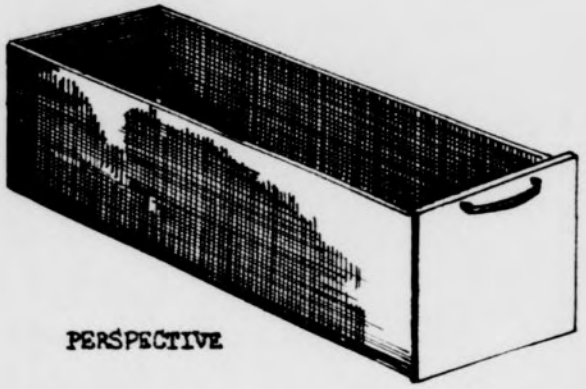
The inside dimensions of the drawer are determined by the dimensions of objects to be stored in the drawer. The depth of the drawer is determined by the height of objects stored plus one inch for clearance above the objects. The depth of the drawer needs to be six and three-fourth inches to allow storage of "fishing tackle" boxes which students commonly use for small tools. The width of the drawer is determined by the width of the widest object stored plus one inch for

side-to-side clearance. The width needs to be nine and one-half inches to allow storage of plastic triangles, based upon the sizes of triangles commonly used in student drafting. The length of the drawer, front to back, is determined by the depth of drawing boards stored with this unit. The length should be twenty-six inches to allow storage of unfinished work. The inside dimensions of an individual drawer are shown in Figure 11.

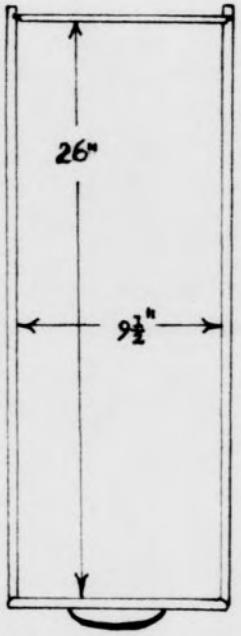
Installed drawer locks are more expensive than padlocks; however, installed locks present a pleasing appearance in the laboratory. Keys, necessary for installed locks and many padlocks, require instructor's time for issuing and sometimes replacement of keys is necessary. Combination locks solve many problems created with locks requiring keys. When padlocks are necessary, the combination type lock is a good choice for student drawers.

Drawing Boards

Various sizes of drawing boards are used in the laboratory. Storage was planned for the largest size commonly used. The dimensions of this board are twenty-four inches by thirty-one inches. Frequently students add handles to the sides of drawing boards which increases the width to twenty-five and one-fourth inches. The depth of the storage units is twenty-eight inches based upon the depth of the drawing boards plus clearance. The height of the board, thirty-one inches, plus clearance above the drawing board is thirty-two and one-fourth inches. The space and counter depth bring total height of counter to thirty-eight inches. The depth and height dimensions of the counter are shown in Figure 12. The width of the unit requires one and one-fourth inches



PERSPECTIVE



TOP VIEW

SIDE VIEW

SCALE: 0 1 FOOT

FIGURE 11 DRAWER FOR STORAGE OF DRAFTING TOOLS

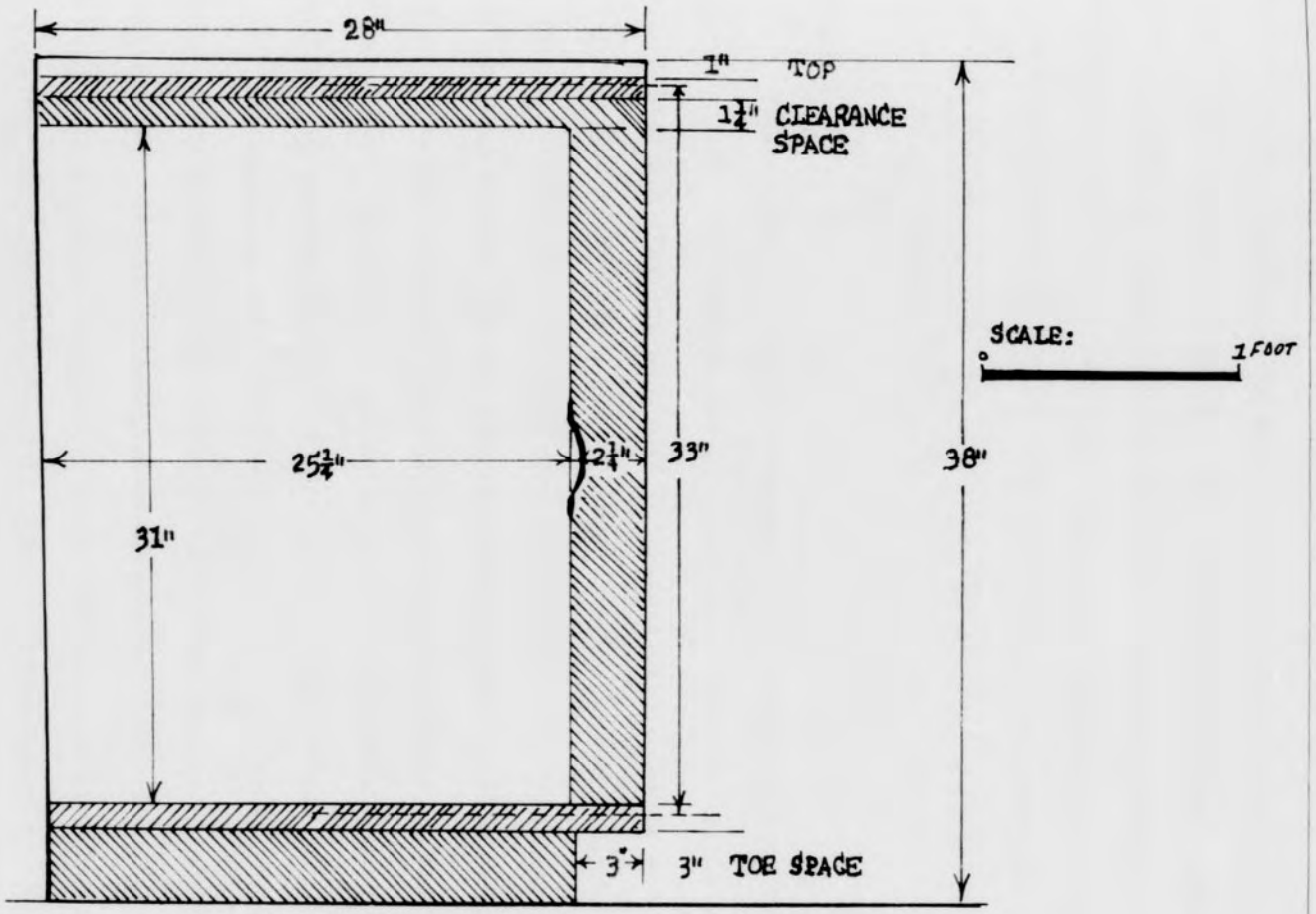


FIGURE 12 SIDE SECTION OF STORAGE FOR DRAWING BOARDS

for each board, based upon the width of boards, three-fourth inch, plus side-to-side clearance, one-half inch. Vertical partitions should be one-fourth inch in thickness and removable for greater flexibility. Drawing boards are stored in a vertical position because less energy is required to remove or replace drawing boards in this position. The drawing board unit is shown in Figure 13. Large tracing pads may also be stored in this unit.

T-squares

Storage was planned to accommodate the largest size of T-square commonly used in the interior design laboratory. The dimensions of this T-square are thirteen inches at the widest point, thirty and one-half inches long and three-fourth inches deep. The inside width of the storage unit is sixteen inches, based upon the width of the T-square. This width provides storage for two rows of twenty T-squares. The height is thirty-two and one-fourth inches, based upon the length of the T-square plus clearance. The depth, front to back, is twenty-seven inches. The dimensions for storage of T-squares are shown in Figure 14.

The plans for this laboratory require storage for the drafting tools of forty interior design students since more than one class uses the laboratory. Storage is designed to accommodate forty students in this class. A suggested arrangement for a drafting unit is illustrated in Figure 15. The total length of the unit is fifteen feet.

Storage Unit for Samples to be Used by Students

Samples provided for interior design students should be separated from samples used by instructors for demonstrations and displays.

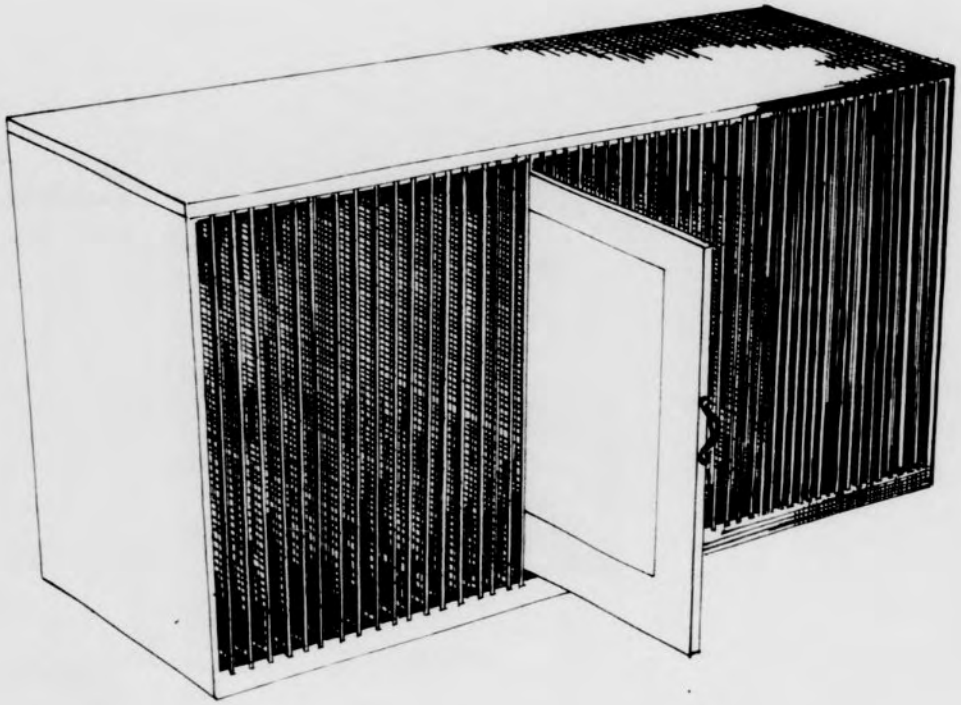


FIGURE 13 PERSPECTIVE OF STORAGE FOR DRAWING BOARDS

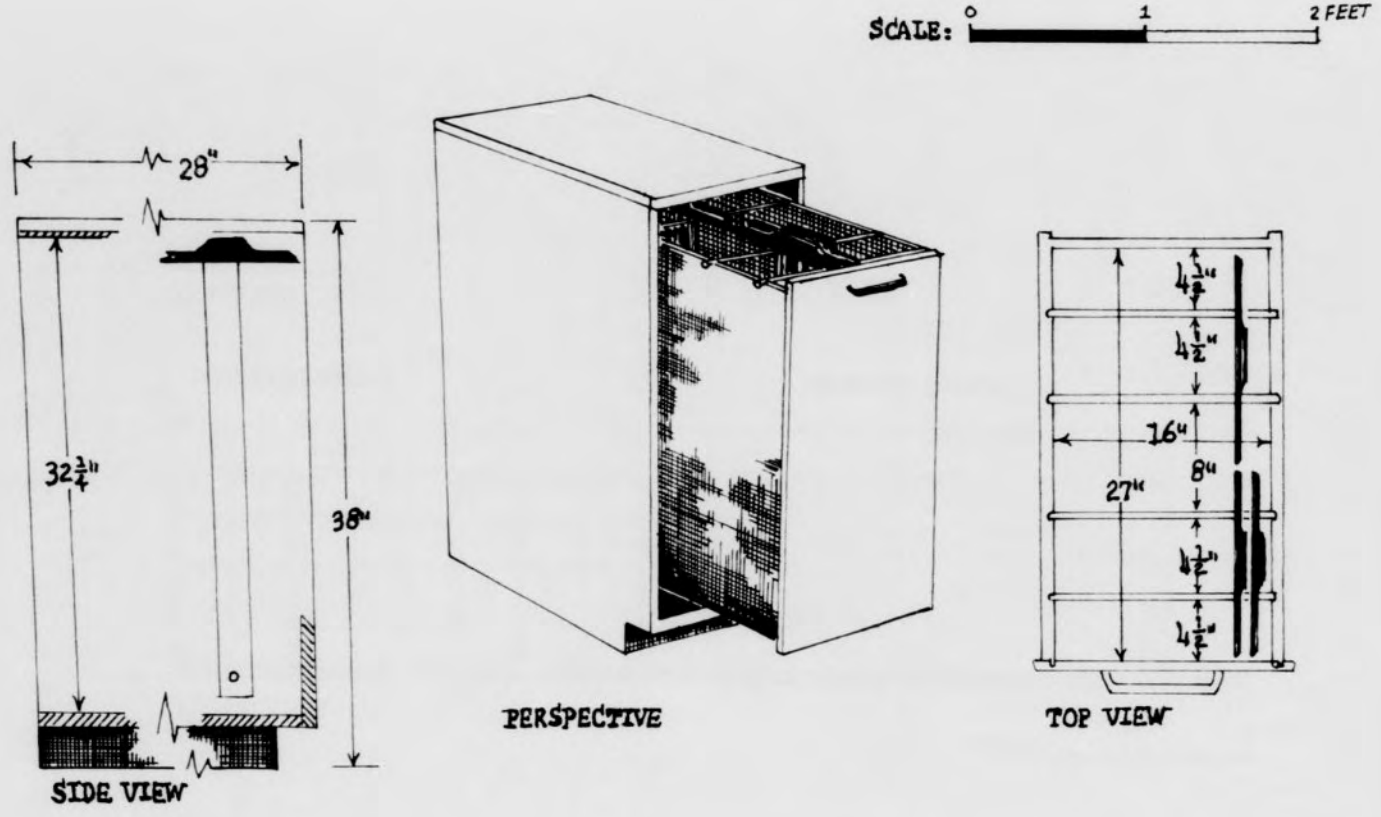


FIGURE 14 DRAWER FOR STORAGE OF T-SQUARES

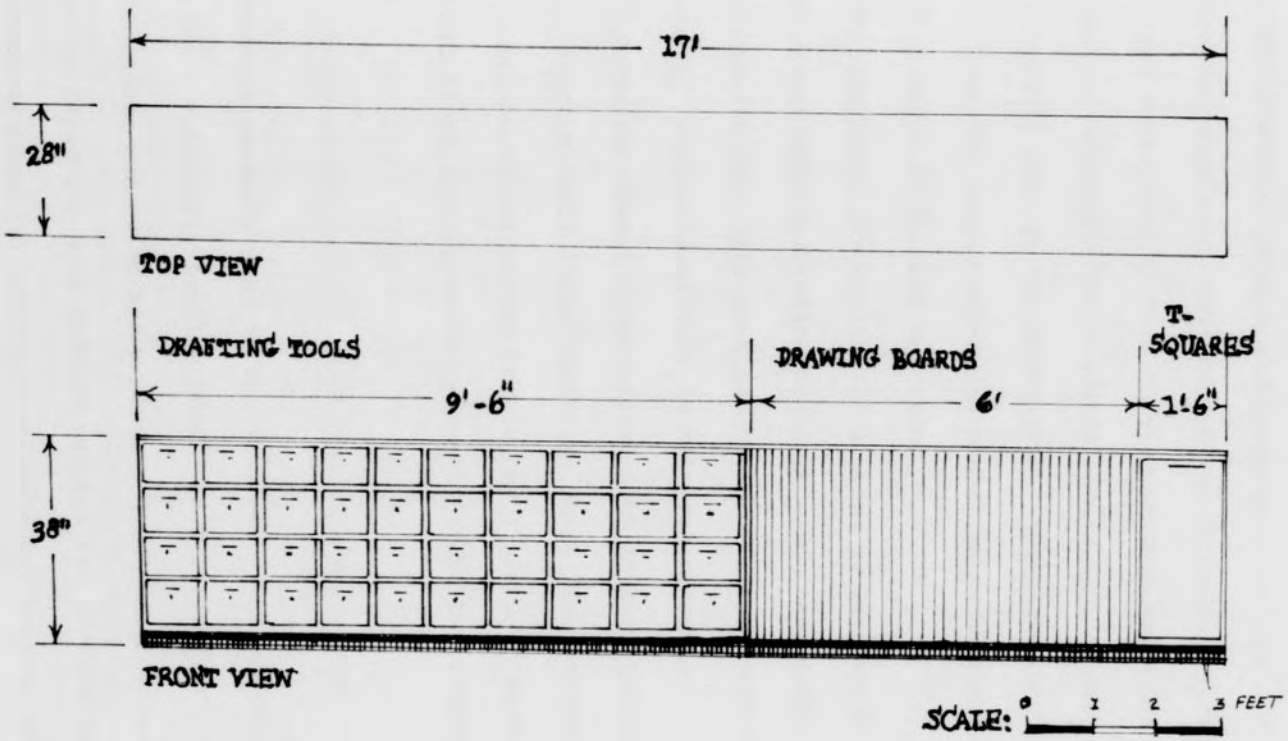


FIGURE 25 STORAGE UNIT FOR DRAFTING EQUIPMENT

Small samples are sufficient for student design problems, while large samples are needed for demonstrations and displays. Thus samples can be separated according to size and purpose.

Samples supplement design problems by providing interior design students with experience in working with texture and color. The selection of samples available for students should be representative of current materials used in the profession. Therefore, an effort should be made to keep the sample selection replenished so students are provided with a range in texture and color.

The suggested dimensions for storage of samples in this institution are based upon the following: (1) sizes and facilities of samples presently used with some projection for future needs, and (2) the amount of space available in this laboratory.

The samples commonly associated with an interior design laboratory are: fabrics, soft floor coverings, hard floor coverings, wall coverings, and publications and catalogues containing samples. Permanent storage facilities should be planned in the laboratory for these materials.

Fabrics

Fabrics commonly used in the laboratory are upholstery and drapery samples. Upholstery samples should be separated from drapery samples to reduce confusion and provide convenience to the user. Also, it is easy to replenish when related samples are grouped together.

Numerous sizes of samples complicate any storage plan. The sizes of fabrics range from swatches approximately one inch square to longer fabrics lengths suitable for wall mountings.

Small swatches of fabrics should be stored so students can use samples in different places in the laboratory. Therefore, the storage device should be lightweight and provide ease of removal or replacement. Hardboard trays are suggested by some as a durable container. In the opinion of the writer, plastic tote trays are a better choice because they are light. Transparent plastic tote trays allow quick identification of stored articles. Easier maintenance of the sample area is possible if lids are provided for each tray. Since transparent trays are quite expensive rectangular plastic dishpans can be used. A limitation of plastic dishpans is the lack of a lid which may increase the maintenance required for the fabric samples area.

Many different sizes of plastic dishpans are available. The dimensions for the portable boxes selected for this laboratory, based upon the size of dishpan commonly found in stores, are sixteen inches wide by eighteen inches long by five and one-half inches deep. The size of the portable box affects the over-all dimensions needed for fabric storage and if another size of dishpan is selected, suggested over-all dimensions would need to be altered.

The arrangement of portable boxes within a storage unit also affects the dimensions suggested for storage. Numerous arrangements are possible.

Open shelves, with storage space for sixteen portable boxes, are suggested for this laboratory. Open shelves provide better visibility of stored articles and additional convenience in removal or replacement of stored articles.

The dimensions suggested for the open shelves are based upon

the size of portable boxes selected for this laboratory. The inside height, six and one-half inches, is based upon the depth of the portable box plus clearance. The total width, thirteen feet, is based upon storage of lengths of eight combined portable boxes plus clearance. The depth, front to back, sixteen inches, is based upon the width of portable boxes turned lengthwise plus clearance. A suggested plan for storage of fabric samples is shown in Figure 16.

Since plastic dishpans are not transparent, color identification of the various fabric samples may be provided by purchasing them in different colors. The colors suggested for this laboratory are red, yellow, green, blue, purple, black, white, and beige. All of these colors are presently on the market with the exception of purple. One dishpan may be painted purple.

Soft Floor Coverings

Soft floor covering samples include the various types of rugs. Portable trays are also suggested for storage of rug samples. The suggested dimensions for storage of drapery or upholstery are identical to the dimensions suggested for the storage of soft floor coverings. Rug samples are located below drapery and upholstery samples since rugs are heavier. Less space is needed for storage of rugs because fewer samples are usually required in design problems and fewer samples are available. A plan for the storage of rug samples is suggested in Figure 16.

Hard Floor Coverings

Hard floor covering samples are heavier than the other samples used in the laboratory and require special storage considerations.

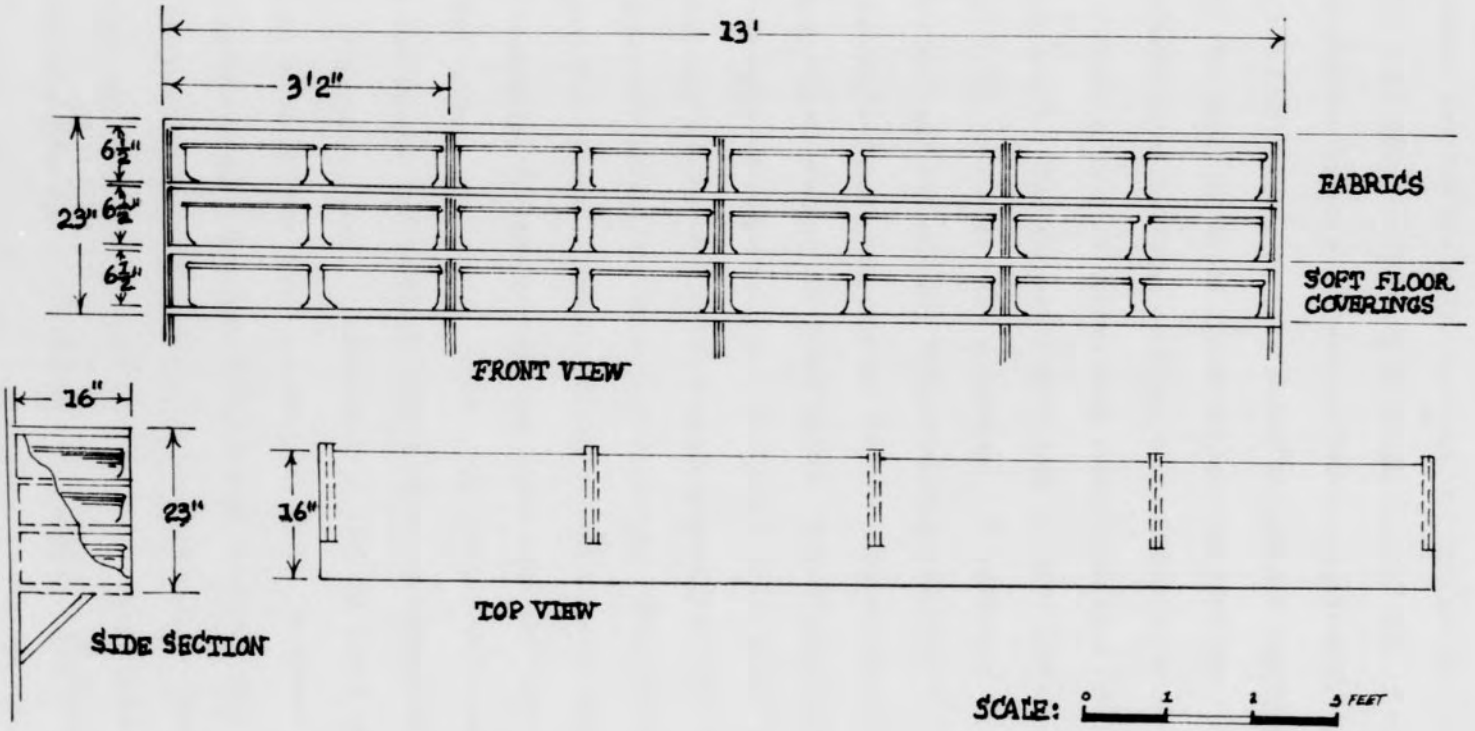


FIGURE 16 PLAN FOR STORAGE OF FABRIC AND SOFT FLOOR COVERING SAMPLES

Also hard floor samples are bulky and require more space. Thus, the height above the floor for storage of these samples should be within the area of minimum reach to reduce the energy required for lifting.

Related hard floor samples should be grouped together for convenience to the user, to avoid confusion, and to save space. Related articles grouped together also enables like samples to be stored on top of each other or stored behind each other. Stacked articles would require less space. The suggested groupings of hard floor covering samples are: (1) hardwoods, (2) softwoods, (3) resilient or smooth floor coverings, and (4) masonry floor covering samples.

Hardwood and softwood samples involve many different sizes of samples which when combined are quite heavy. Slide-out trays are suggested for storage of these samples. Slide-out trays bring articles out, reducing the amount of clearance space needed for open shelving, and provide better visibility of stored articles. Three slide-out trays are suggested for storage of hardwood and softwood floor samples. The dimensions suggested for these trays are based upon the types of samples stored in the trays. The inside depth, nine and one-half inches, is based upon the number and width of wood samples to be stacked plus clearance. The inside width, twenty-nine inches, is based upon the broadest wood samples plus side-to-side clearance. Softwood samples are stored in the lowest open shelf since they are used less frequently.

Storage dimensions for resilient or smooth floor covering samples are based upon the common nine inch square. Three drawers are suggested for the storage of resilient floor coverings in this laboratory. The depth, ten inches, is determined by the depth of samples

plus clearance. The width, ten inches, is based upon the width of samples plus side-to-side clearance. Samples may be filed according to the type of resilient sample in these drawers. Metal name plates labeled with the type of sample may be mounted on cardboard squares to separate each section.

Masonry floor samples are very bulky and heavy. Both hands are required to lift some of these samples; therefore, the samples should be stored at least seventeen inches above the floor to reduce energy cost to the body. The lower the storage of heavy materials; the greater the angle of body bend resulting in greater expenditures of energy. Two drawers are suggested for the storage of masonry floor samples in this laboratory. One drawer is planned for the storage of aggregates, marble, flagstone, and terrazo. The dimensions suggested for the storage of ceramic tile are based upon the sizes and quantities of samples in this laboratory. The depth is eight inches, based upon the height of the tallest samples plus clearance. The width is twenty-one inches, based upon the quantity of samples plus side-to-side clearance. This width provides better visibility of stored articles and eliminates quantities of samples being stacked on top of each other. The dimensions suggested for storage of other masonry samples are ten inches deep by ten inches wide.

The suggested dimensions for storage of hard floor covering samples are combined, as shown in Figure 17. The total length required for the combined samples is four feet and five inches. The depth, front to back, is twenty-four inches. This depth conforms with

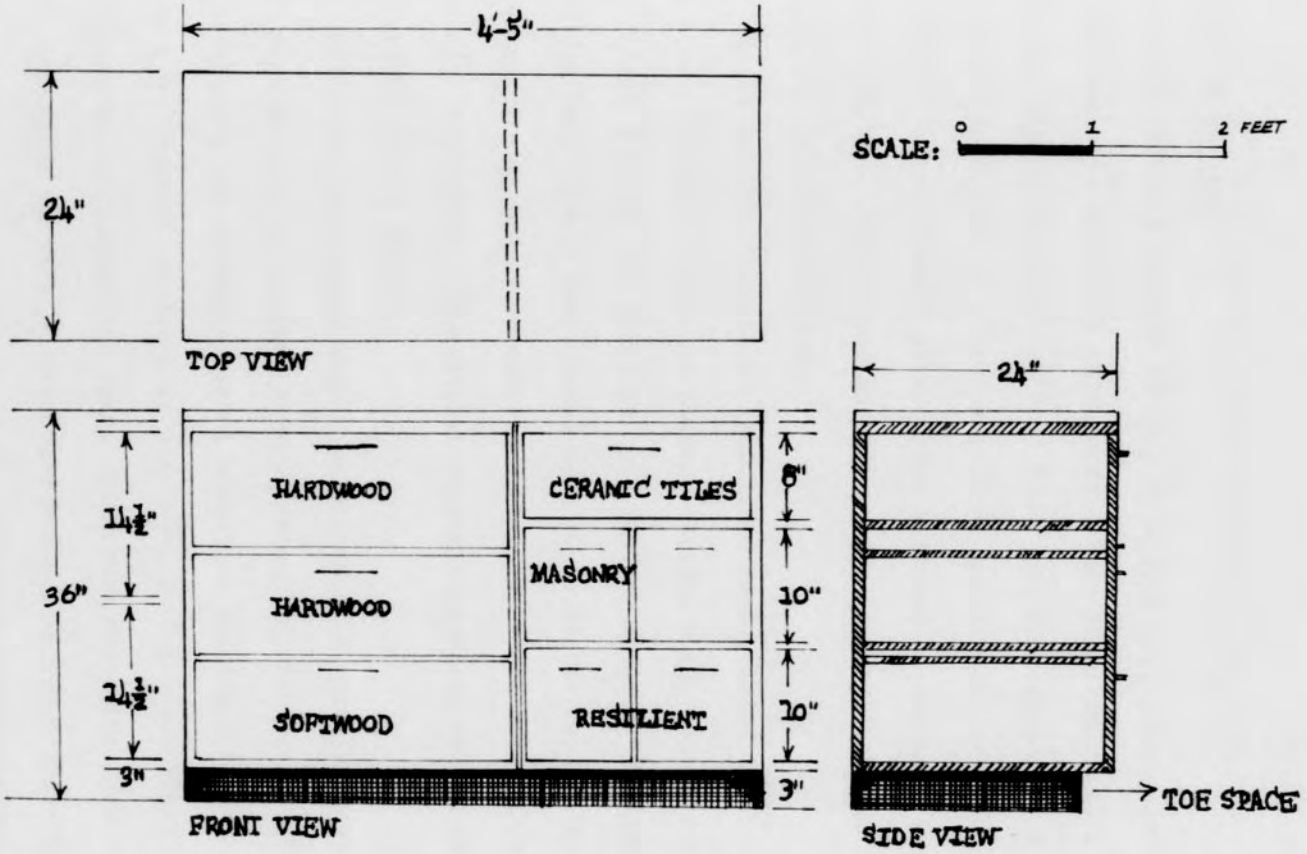


FIGURE 17 PLAN FOR STORAGE OF HARD FLOOR COVERING SAMPLES

the other suggestions for this laboratory. The height is thirty-six inches.

Wall Covering Samples

Wall covering samples include wood paneling, paint samples, fabric samples, and wallpaper catalogues. Wood paneling samples overlap with the storage planned for hard floor covering samples. Since related articles should be stored together, small wood paneling samples may be stored in the drawers planned for hardwood or softwood samples. Large wood paneling samples are suitable for demonstrations and displays and will be discussed later.

Paint samples mounted on individual cards, three by five inches, provide students with a means to compare varying hues, values and intensities. Paint samples can be filed in a shallow drawer. The depth is four and one-half inches deep, based upon depth of the card. The suggested width of the drawer is twenty-two inches, based upon width of the card plus clearance. Five divisions are suggested, spaced five and one-eighth inches apart.

Wallpaper catalogues should be stored in a vertical position to allow greater ease in removal or replacement of catalogues. Most of the catalogues are heavy requiring effort in lifting. A flat surface should be located, as close as possible, to the place where wallpaper catalogues are stored and used. Clearance above the flat surface is needed to permit turning of catalogue pages. It would be desirable for an inclined surface to be provided. Wallpaper catalogues are stored in open, vertical shelves in the plan for this laboratory. Two different widths are suggested to allow for greater flexibility and

provide support for heavy catalogues. The suggested widths are: ten inches, for two open shelves; and fourteen inches, for the third shelf. The height is twenty-six inches, based upon height of wallpaper catalogues plus clearance.

Fabrics used for wall coverings may overlap with some upholstery and drapery fabric samples. The fabrics considered to be suitable for only wall coverings are stored in the drawer suggested for this laboratory. The suggested dimensions are fourteen inches wide by four and one-half inches deep.

The suggested dimensions for storage of wall covering samples are combined, as shown in Figure 18. The total length required for the storage of combined samples is three feet and two inches. The total height is thirty-six inches. The depth is twenty-four inches to conform with other laboratory suggestions.

Publications and Catalogues

Publications containing information about samples and catalogues containing samples of fabrics, soft floor coverings, hard floor coverings, or wall coverings should be stored with the sample unit to save steps, to avoid confusion, and to provide closeness of related articles. Four open shelves are suggested for this laboratory. The suggested height of each open shelf, fourteen and one-half inches, is based upon the height of the publication or catalogue. The suggested width of shelves, thirteen and one-half inches, is based upon the quantity of materials plus clearance. The total length required for storage of publications and catalogues, as suggested for this laboratory, is thirteen and one-half inches. The suggested dimensions are shown in Figure 18.

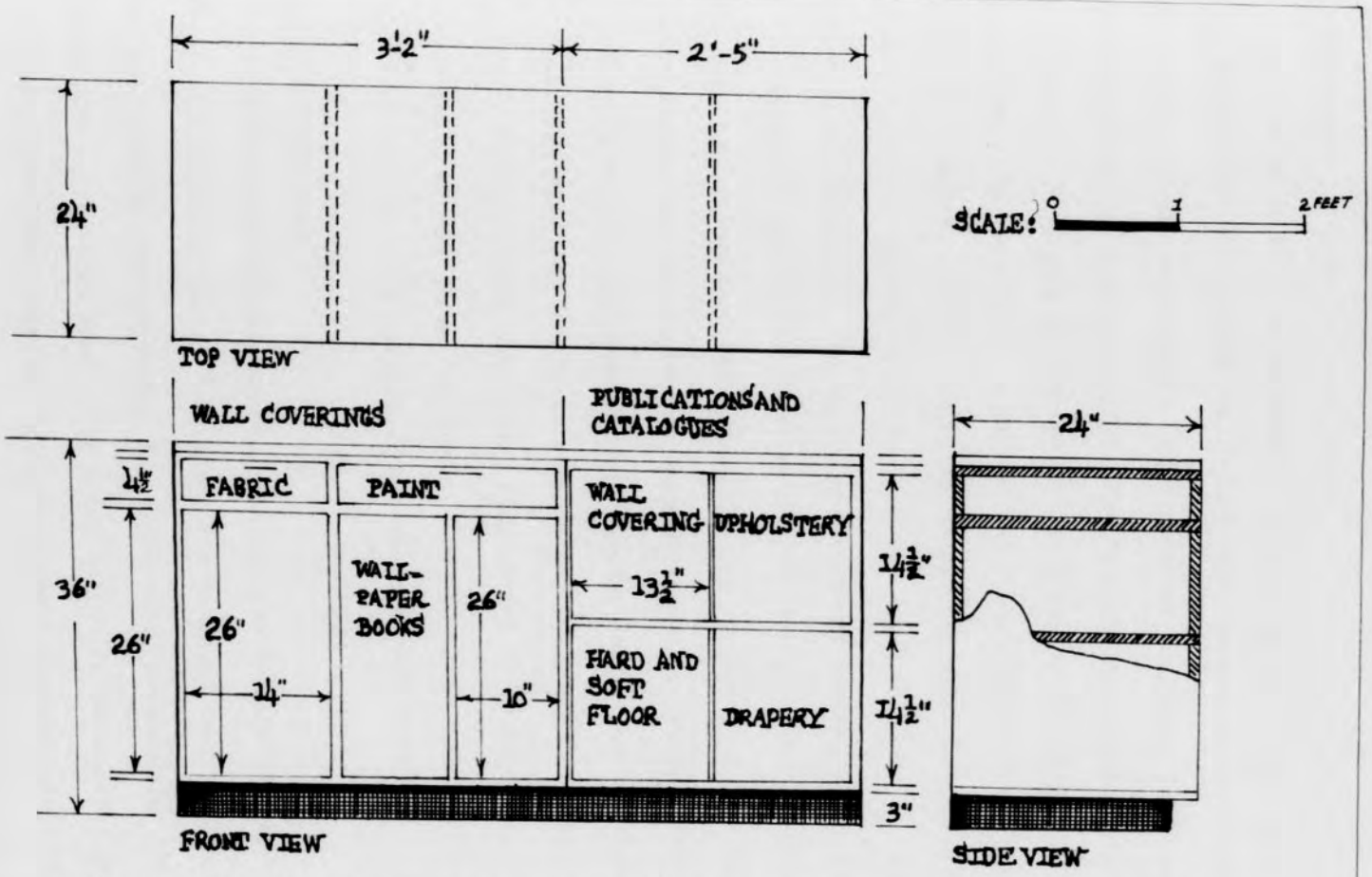


FIGURE 18 PLAN FOR STORAGE OF WALL COVERING SAMPLES AND PUBLICATIONS AND CATALOGUES

Movable Cart

A movable cart was designed for the samples unit to reduce steps and to provide a means for transporting quantities of samples to other areas of the laboratory. The dimensions suggested for this cart are based upon the amount of space available and the needs of this laboratory. The height of the cart is affected by the height of the counter when the cart is to be stored under the counter. The height, twenty-four inches, is based upon the amount of space plus clearance. The depth, twenty inches, is based upon the depth required for sample storage plus clearance. The width, twenty-seven inches, is determined by the amount of space plus side-to-side clearance. Two pull-up side surfaces, twelve inches wide, extend the top surface to fifty-one inches. A wider surface may be needed for demonstrations or transporting samples. Two shelves, spaced eight and one-half inches apart, provide shelving for materials when the top surface is needed for other purposes. The top of the cart provides additional flexibility if it is adjustable to thirty-six inches above the floor. The dimensions for the movable cart suggested for this laboratory are shown in Figure 19.

Sample Storage Unit

The storage suggestions for the different kinds of samples used in the interior design laboratory are combined into a suggested plan for a sample storage unit. The total width required for the sample unit is thirteen feet. The total height is seventy-six inches. The height above the floor of the highest shelf surface, sixty-seven inches, is based upon the recommended reach for women of average height. Three inches is allowed for toe space in front of the unit. The

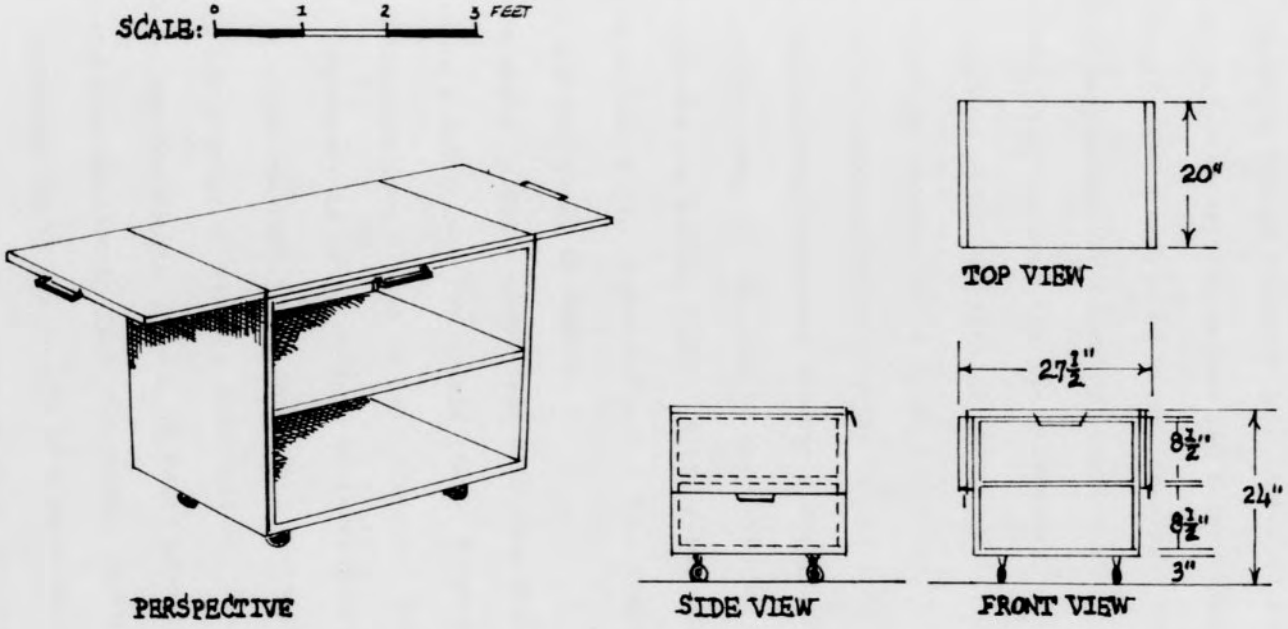


FIGURE 19 PERSPECTIVE OF MOVABLE CART FOR SAMPLE UNIT

suggested plan for the storage of samples is shown in Figure 20.

Storage Unit for Mixing Color

Interior design students gain increased knowledge of color by mixing and rendering varying values and intensities. Therefore, a laboratory should have a source of water for mixing colors. Storage facilities should be planned for cleaning supplies since the sink area also serves as the clean-up area for the laboratory. Cleaning supplies at this unit include materials such as paper towels, soap and soapdish, sponges, cleaning cloths, and a trash container.

Water containers for students to use in mixing colors and cleaning brushes need permanent storage space in the laboratory.

Muffin tins, six by nine by three-fourth inches, are frequently used by students for mixing color. A slide-out tray is suggested for storage of muffin tins. However, muffin tins require considerable storage space and are noisy to handle.

A white, plastic spoon-rest with four shallow containers is suggested as a substitute for muffin tins. A spoon-rest has the advantage of providing four places to hold brushes. The spoon-rest chosen for this laboratory is seven by four by three-fourth inches.

A slide-out tray, with partitions one-eighth inch wide, is suggested for storage of plastic spoon-rests. The inside depth of the tray, seven and one-fourth inches, is based upon the depth of ten stacked spoon-rests plus one-fourth inch clearance. The width, seven and one-fourth inches, is determined by the length of a spoon-rest plus a slight side-to-side clearance. The length, front to back, is five and three-eighth inches which allows one and five-eighth inches clearance. See Figure 21.

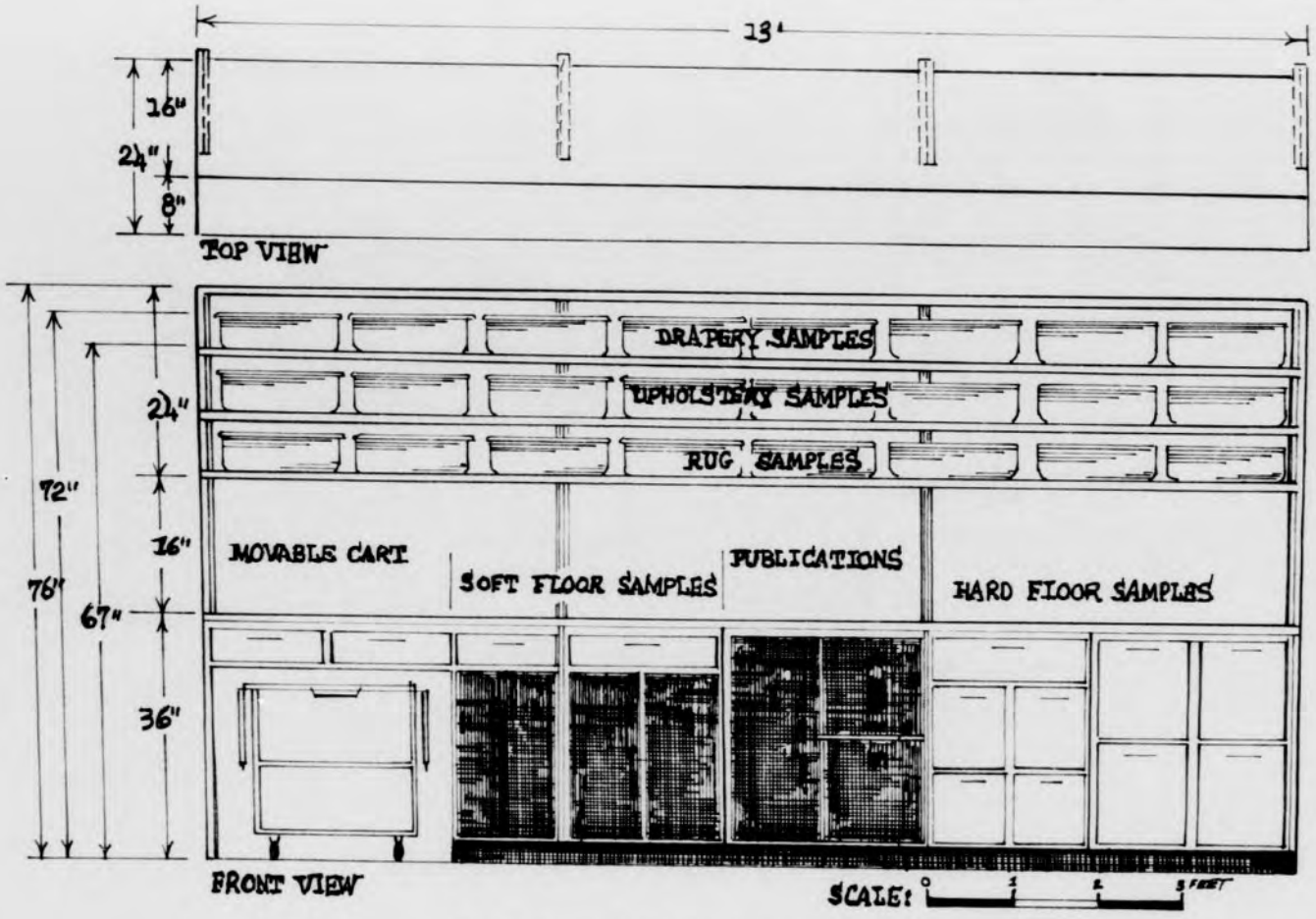


FIGURE 20 STORAGE UNIT FOR SAMPLES

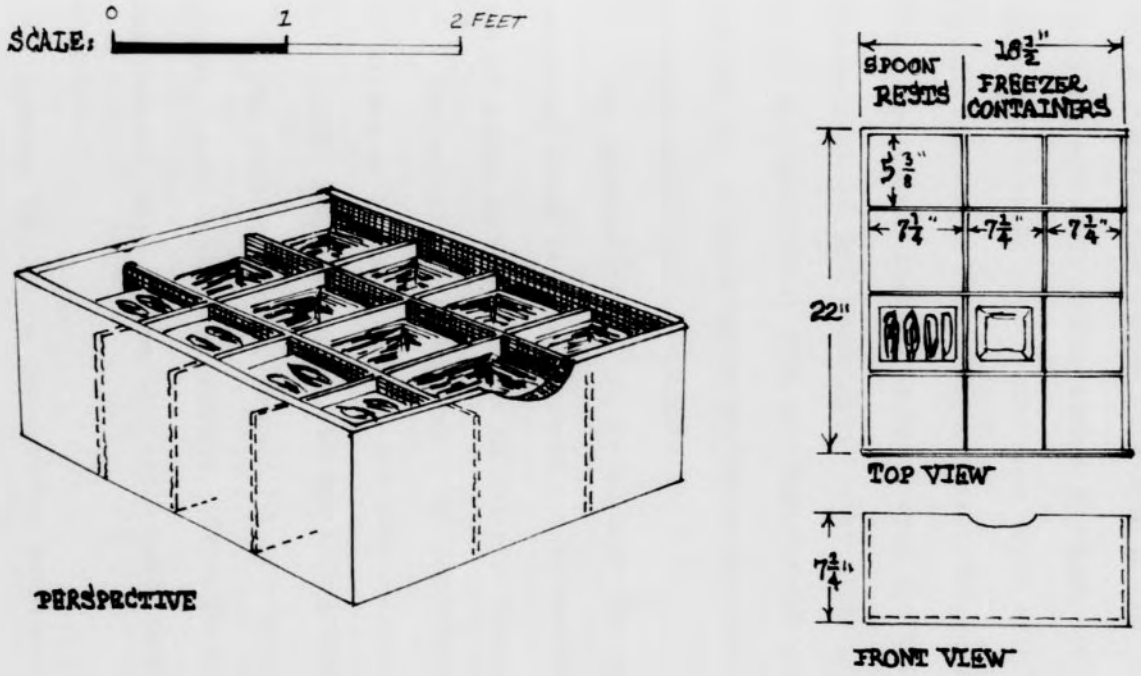


FIGURE 21 PLAN FOR STORAGE OF WATER CONTAINERS

Glass jars are frequently used for cleaning brushes. Adjustable shelves with a waterproof shelf surface may be used for storage of this type of water container. Plastic freezer containers require less storage space and reduce breakage. A slide-out tray is suggested for storage of plastic containers. The size of the chosen plastic container is four and one-eighth inches square by three and one-eighth inches deep. The slide-out tray is partitioned into eight sections to prevent stacks of plastic containers from tipping over. The depth of each partition, seven and one-fourth inches, is based upon the height of stacked plastic containers plus one and one-eighth inches clearance. The width and length of each partition, five and three-eighth inches, is based on the size of the top of the plastic container plus one and one-fourth inches side-to-side clearance. See Figure 21.

The interior of the slide-out tray for water containers should be waterproof since water containers may be wet or damp when stored. A waterproof paint is suggested as an interior finish for the tray.

The usefulness of sliding trays depends upon the workability of the slides or runners on which the tray operates. Metal guides mounted on the sides of trays are suggested for this laboratory.

The student drawers planned for storage of drafting tools such as brushes, paint tubes, and sponges, discussed in an earlier section of this chapter, also accommodate small tools used for mixing and rendering color.

Storage facilities for cleaning supplies are planned near the sink area to save steps. A paper towel dispenser is located on the left side of the sink within easy reach. A soapdish is located on the right

side of the sink. A rack for soap and sponge is suggested for the backsplash. Two pull-out trays are planned under the sink for storage of extra cleaning supplies. The suggested dimensions for these pull-out trays are thirty-six by sixteen by six inches. See Figure 22.

A pull-out bin is suggested for trash materials in this laboratory. The bin should have a removable liner for ease in emptying. See Figure 23.

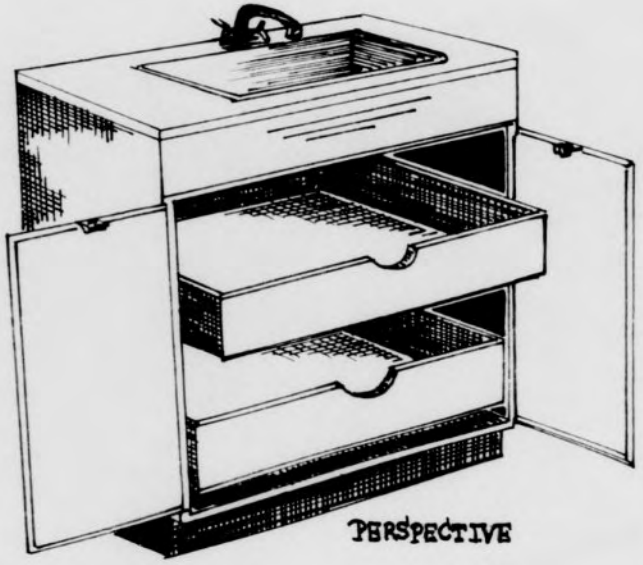
Cleaning supplies and student equipment for mixing colors are combined into a sink storage unit. The total length of this unit, eight feet, is based upon the combined width of stored materials. Extra drawer and shelf space are planned to accommodate additional materials. A backsplash is suggested to prevent spotting of the wall and provide ease of maintenance. See Figure 24.

Storage Unit for Display Materials

Materials used in displays should be stored near the display area for convenience. Display materials include large samples of fabrics, soft and hard floor coverings, and wall coverings. Storage facilities that can be locked are desirable since some materials may be difficult to replace if lost.

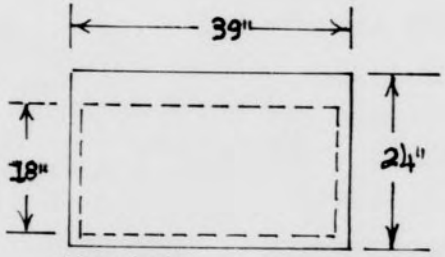
Four slide-out trays are suggested for storage of display rug samples. The suggested width, twenty-two inches, is based on rug samples ten inches square plus a clearance of one-half inch on all sides of samples. The depth, seven and one-third inches, is based on the height of four to seven stacked rug samples plus clearance above samples for slide-out trays.

A metal rod, mounted sixty-four inches above the floor, is

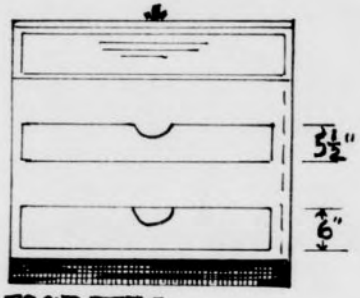


PERSPECTIVE

SCALE: 0 1 2 3 FEET



TOP VIEW



FRONT VIEW

FIGURE 22 PLAN FOR STORAGE OF CLEANING SUPPLIES

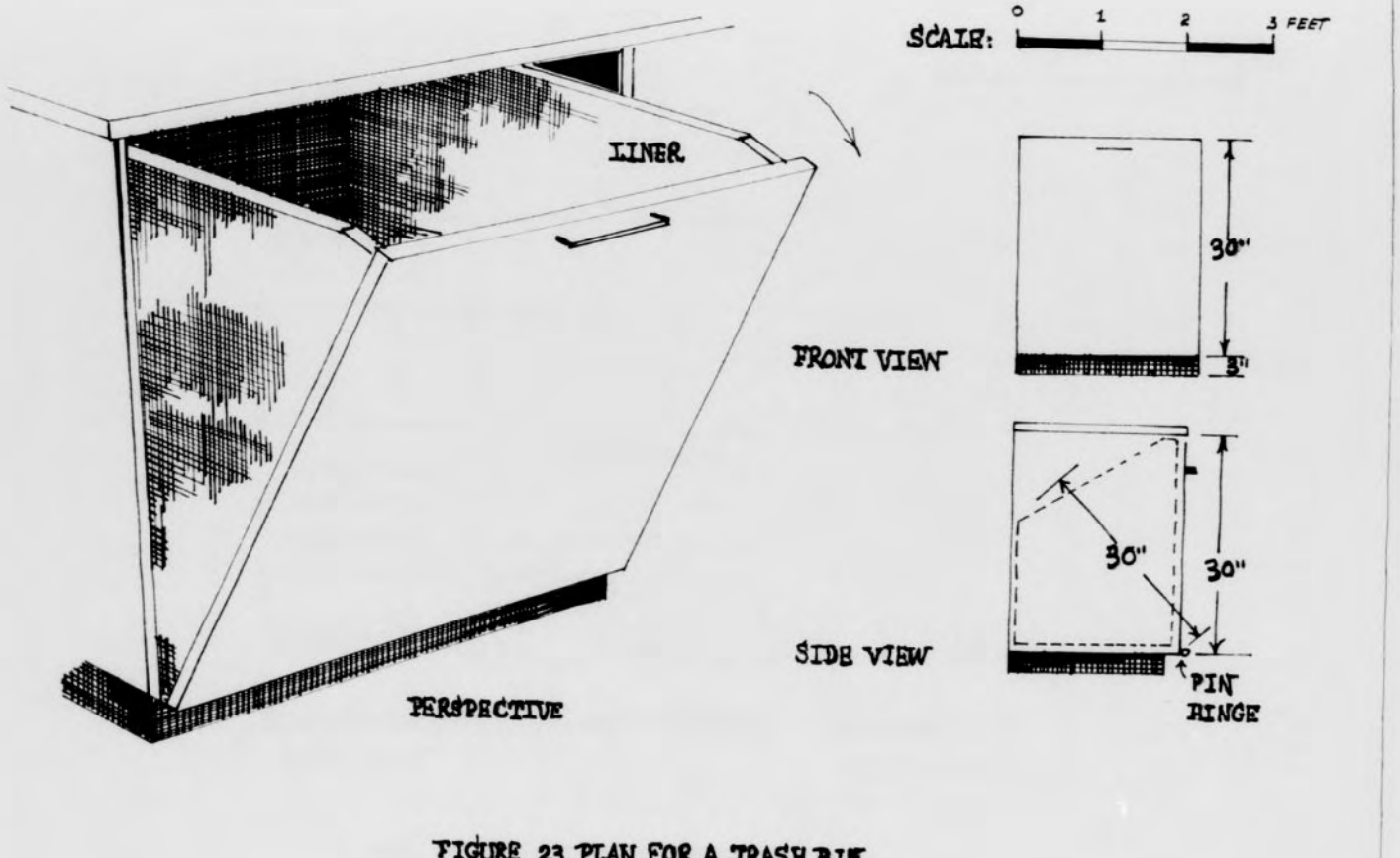


FIGURE 23 PLAN FOR A TRASH BIN

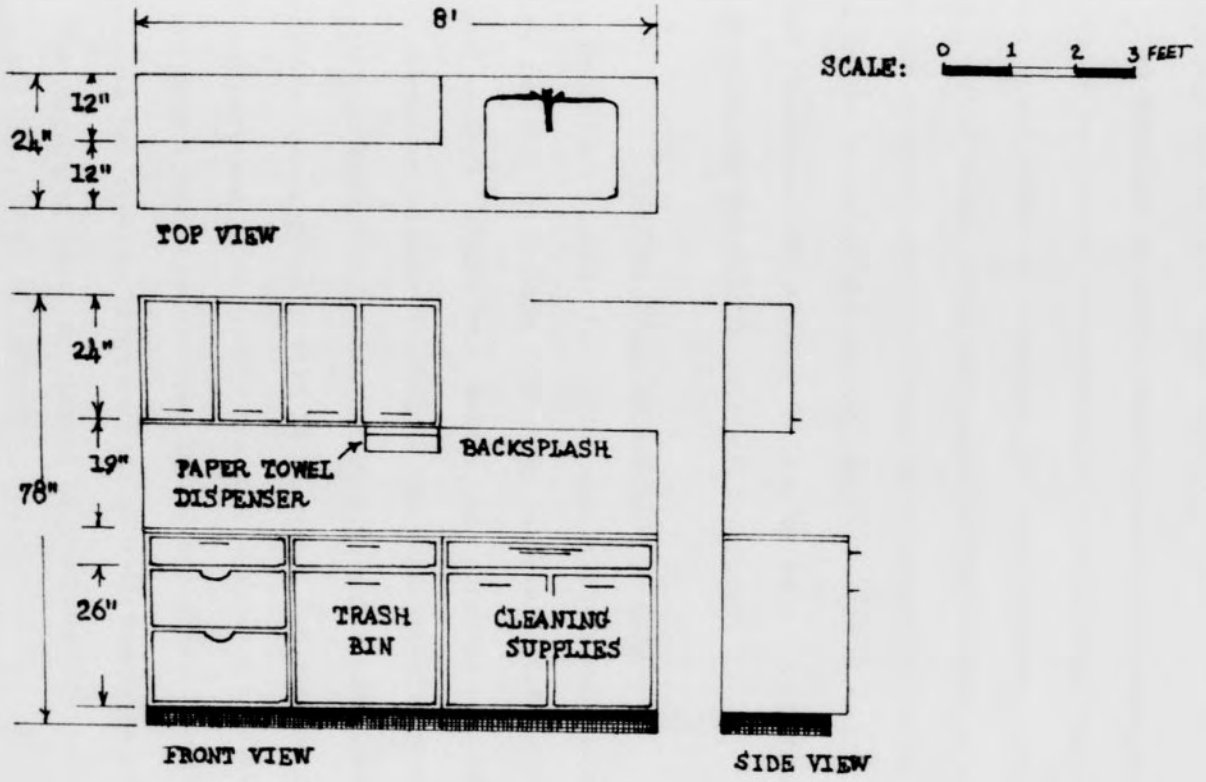


FIGURE 24 STORAGE UNIT FOR MIXING COLOR

suggested for hanging large fabric samples. Skirt hangers with clips are suggested for hanging these samples.

In addition to fabric samples used in displays, storage facilities should be planned for accessories used in these displays such as pictures, trays, baskets, ceramics, and candleholders. Adjustable shelves, twelve inches deep, are suggested for storage of accessories used in the display area. These may be adjusted with metal strips mounted on the sides of the unit. These cabinets should be locked. The suggested dimensions for storage of display materials are combined into a storage unit for display materials. See Figure 25.

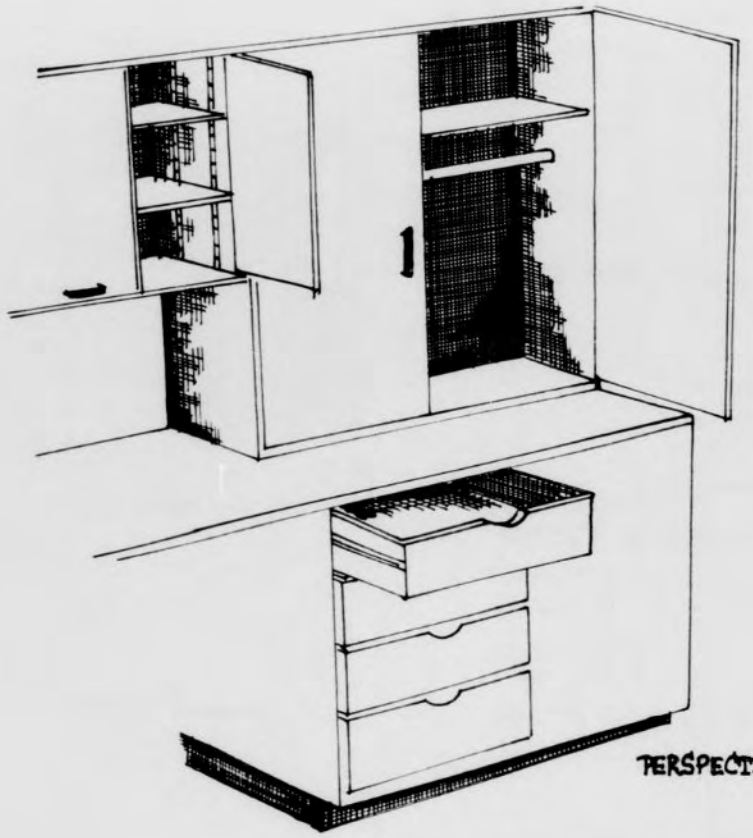
Storage Unit for Teaching Materials.

Organized storage facilities for teaching materials save time and steps for the instructor. Teaching materials include illustrative charts and posters, blueprints, models, and perspective grids.

Seventeen adjustable shelves are suggested for storage of illustrative posters and charts, perspective grids, and completed design projects. An egg crate file is suggested for storage of blueprints. Scaled furniture and other models are stored on an open shelf at the top of the unit since they are used less frequently. Vertical files are suggested for storing large samples of wall coverings and wood paneling. The suggested plan for storage of teaching materials is shown in Figure 26.

Demonstration Unit

The demonstration unit planned for this laboratory includes a chalkboard, six by four feet, and a demonstration desk with a top, six by two feet. The suggested height for the desk is thirty-two inches.



PERSPECTIVE

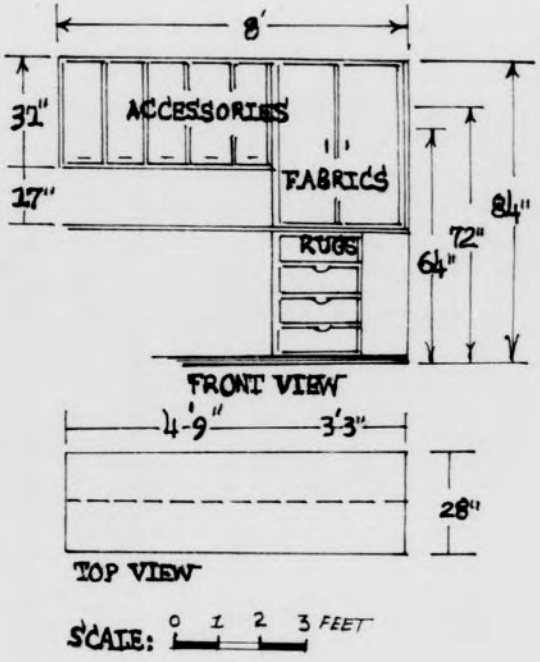
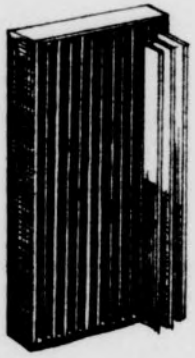
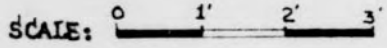


FIGURE 25 STORAGE UNIT FOR DISPLAY MATERIALS



PERSPECTIVE



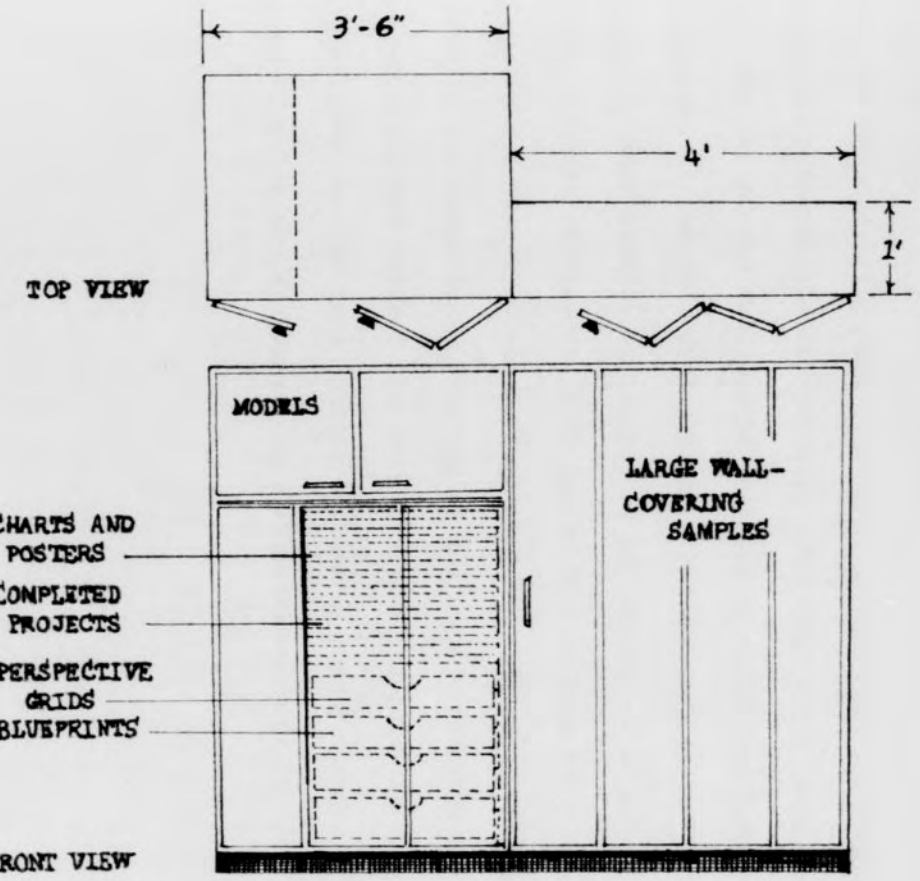


FIGURE 26 STORAGE UNITS FOR TEACHING MATERIALS

Demonstration Desk

The demonstration desk is planned to accommodate teaching supplies such as erasers, chalks, pencils, upholstery pins, tacks, and rulers. The top of the desk may be extended to eight feet with two pull-up leaves at the ends of the desk. Five drawers, twelve by twenty-two by four inches, are suggested for storage of mimeographed materials, student papers, drafting and color rendering tools used in demonstrations. Open shelves are suggested for storage of mat boards also used in demonstrations. The top of the desk surface can be lifted to provide a slanted surface for demonstrations and illustrated talks. The suggested width for this slanted surface is thirty inches. The suggested plan for the demonstration desk is shown in Figure 27.

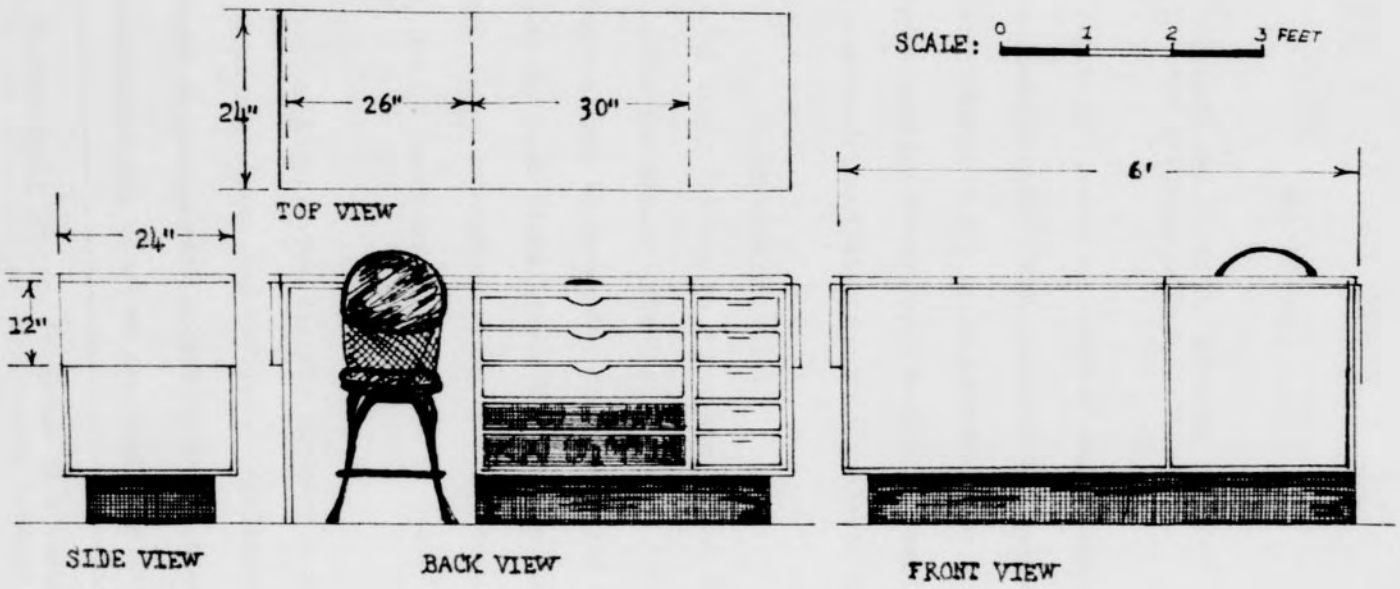


FIGURE 27 PLAN FOR DEMONSTRATION DESK

CHAPTER VII

LIGHTING AND INTERIOR SURFACES IN A COLLEGE INTERIOR DESIGN LABORATORY

Adequate light influences accuracy of workmanship, quality of product, and raises class morale. Both quantity and quality of light affect the seeing environment which is so important for activities performed in the interior design laboratory. Selecting samples in color schemes and mixing colors require lighting that reflects the true colors.

Illumination Level

The amount of light falling on a surface is the level of illumination.[1] To prescribe the proper illumination level for an area, the seeing tasks must be analyzed to determine the amount and kind of illumination that provide the best visibility. For example, drafting requires more light than other major laboratory activities for accuracy of fine detail. Obviously, a high level of illumination is needed in the drafting area.

The Illumination Engineering Society recommends illumination levels for office, schools, store, and industrial applications. A range of illumination levels is recommended according to the type of visual task. These recommendations are shown on the next page as follows:[2]

---

[1] Lighting Fundamentals Course, Prepared by a Committee on Lighting Education of the Illumination Engineering Society (New York: Illuminating Engineering Society, 1960), p. 71.

[2] Ibid., p. 58.

Task	Illumination Currently Recommended				Suggested by the writer as suitalbe for the laboratory
	Office	School	Industry	Store	
	Footcandles				
Drafting	200	100			100-150
Stockrooms	30		20	30	30
Mixing Paint			200		100-150
Chalkboards		150			100-150

Surface Reflectance

The reflectance characteristics of interior surfaces affect the amount and kind of light available on the visual tasks. Dark, dull surfaces absorb a high percentage of light while light, shiny surfaces reflect a high percentage of light. A practical range of reflectances for school interior surfaces which permits some differences in value has been suggested.[3]

Surface	Reflectance Range (Per Cent)
Ceiling Finishes	70-90
Walls.	40-60
Furniture.	35-50
Floor.	30-50

While selections of interior surfaces within the recommended reflectance range would be acceptable, the higher reflectance ranges provide better utilization of light. The recommendations for surface reflectances have gradually increased over the years.

[3] Ibid., p. 58.

Visual comfort is an important consideration in an environment where visual work is performed for a period of time. The amount of light reflected from adjacent surfaces should be similar to prevent eye-strain and fatigue. The amount of light reflected from a surface or emitted from a surface is called brightness. The reflectances of various surfaces are important because they control brightness relationships.[4] The brightness ratio between tasks and adjacent surfaces for schools is three to one.[5] Diffused light that minimizes shadow and reduces brightness ratios prevents glare and its resultant discomfort. Therefore, dark drafting surfaces next to white tracing paper would cause visual discomfort.

Selecting Luminaires.

A luminaire includes the lighting unit, socket, and equipment for controlling light. Luminaires are classified by distribution and direction of light as direct, semi-direct, general diffuse or direct-indirect, semi-indirect, and indirect.[6] Direct luminaires provide the greatest quantity, and also the poorest quality, of light by producing bright spots. Semi-direct or direct-indirect luminaires would be a more desirable choice of luminaire for an interior design laboratory.

The amount of light distributed by a luminaire is affected by the reflectance or transmission characteristics of the shielding material. The shield should conceal the source of light from view in any direction.

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[4] Ibid., p. 73.

[5] Ibid., p. 76.

[6] Ibid., p. 37.

A translucent shield is desirable to scatter or diffuse transmitted light and prevent bright spots. Flassed opal, plastics, and configurated glass are materials generally used.[7]

Fluorescent Lamps

Deluxe cool white fluorescent lamps have been suggested for lighting drafting areas in industry. "Deluxe cool white...has a higher proportion of red and green light than standard cool white, giving it a more balanced color output than other fluorescent lamps."[8] However, deluxe warm white lamps are suggested for use where fluorescent lighting is planned in this laboratory. Deluxe warm white lamps do not distort colors and blend with incandescent lamps. In addition, deluxe warm white lamps enhance: woods, fabrics, and complexions of people.[9]

Lighting for Drafting

A suspended luminous ceiling and an open beam ceiling with a number of suspended lighting fixtures are the two types of general lighting systems considered for this laboratory.

A luminous ceiling provides excellent quality and quantity of light. Also the level of illumination can be controlled more easily with a luminous ceiling. However, the high cost of materials and installation are recognized disadvantages of a luminous ceiling. An alternate choice for the general lighting system is a number of suspended semi-direct lighting fixtures.

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[7]Ibid., p. 12.

[8]Ibid., p. 81.

[9]Ibid., p. 30.

Open Beam Ceiling with Individual Lighting Fixtures

To gain the effect of a luminous ceiling and an architectural effect, an open beam ceiling is suggested for this laboratory. The spacing of the suspended luminous fixtures is determined by the characteristics of the room such as shape, light reflectances of interior surfaces, and type of lighting fixture. Therefore, the spacing of fixtures and other lighting calculations should be planned by the company chosen to install the lighting system.

The suggested dimensions for the open beam ceiling are based upon the drafting table arrangement chosen for this laboratory. The width of the luminous area, twenty feet, is based on the width of combined drafting units. The length of the luminous area, thirty-one feet, is based on the number of drafting table rows plus clearance of three additional feet to allow for future expansion.

The open beam ceiling needs to provide sufficient space for suspended fixtures between the ceiling and the beams. Therefore, beams need to be supported at the sides and from the ceiling. Beams can be assembled by cutting slots in the sides and fitting them together. More efficient light reflection would be provided if the beams were painted a flat or non-gloss white. A natural finish on the lower side of beams would provide an additional architectural effect. The suggested construction features for this open beam ceiling are shown in Figure 28. This beam ceiling may serve to support a luminous ceiling in the future.

Lighting for Other Major Activities

Selecting Samples

Students majoring in interior design are interested in the effects

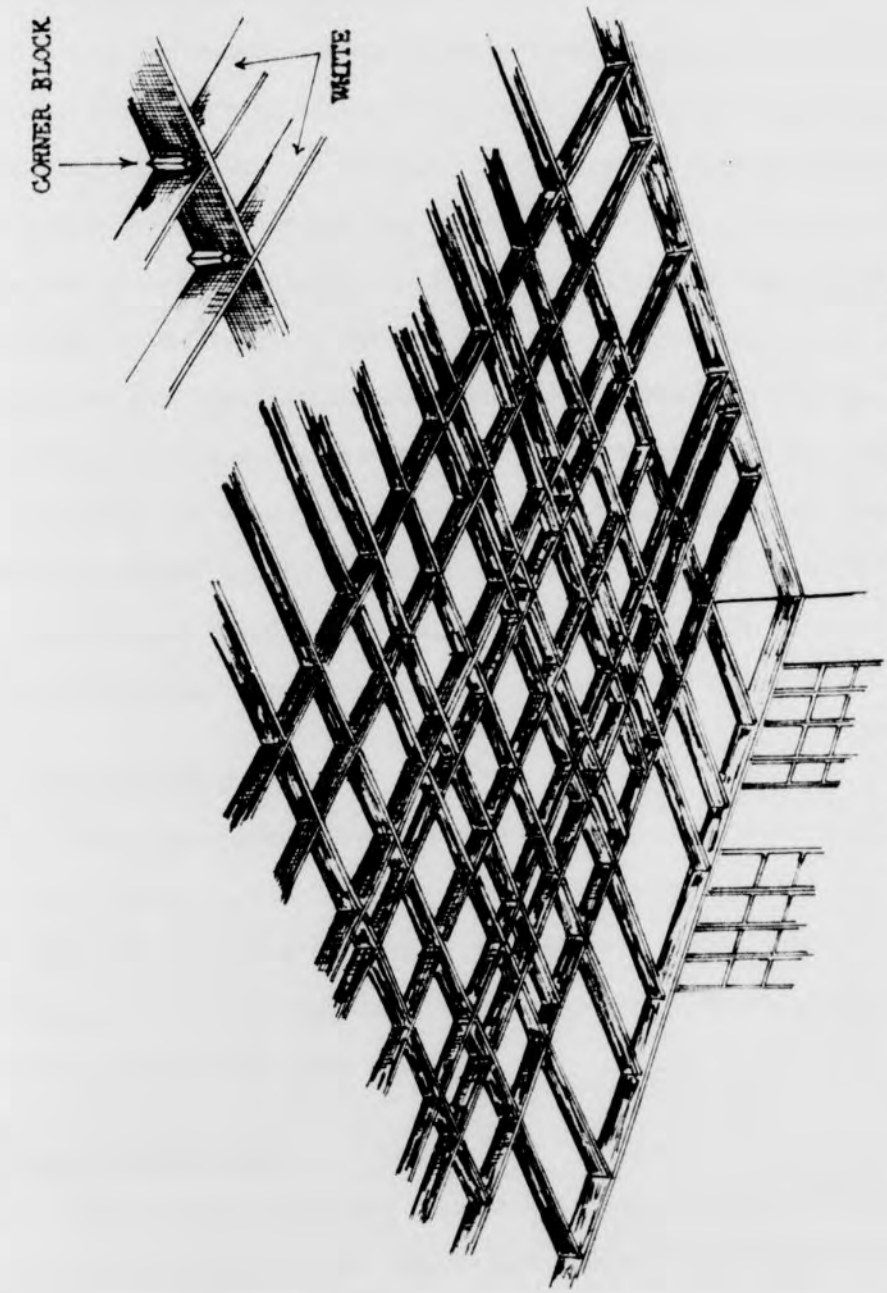


FIGURE 28 PERSPECTIVE OF OPEN BEAM CEILING

of incandescent and fluorescent light on samples. Therefore, both types of lighting should be planned for the sample storage area so students could observe these differences.

At the sample storage area in this laboratory, four suspended lighting fixtures with eight tubes, thirty-six inches long, are suggested for general lighting. In addition to fluorescent lighting, an incandescent strip is suggested for the sample counter area. The suggested dimensions for this incandescent strip are based upon the installation requirements for lighting sockets and lamps. The height, nine inches, is based on the installation requirements of incandescent lamps. The depth, front to back, is also nine inches. The angle on the front is determined by the length of lighting outlets and lamps plus clearance to prevent bright spots. A plastic diffusing material is suggested for the incandescent shield. The suggested over-all length of the incandescent strip is four feet and one-third inches. See Figure 29.

Lighting for Mixing Color

Four suspended fluorescent lighting fixtures with eight lamps, thirty-six inches long, are suggested for lighting the sink area. Since the sample area is located next to the area for mixing color in this laboratory, a student could use the incandescent lighting planned for the sample area when mixing colors.

Lighting for Displays

Both incandescent and fluorescent lighting are needed in the display area so students can observe the different effects of lighting on displays. Seven suspended incandescent fixtures mounted on the beams are suggested for this area. In addition to suspended fixtures, a wall

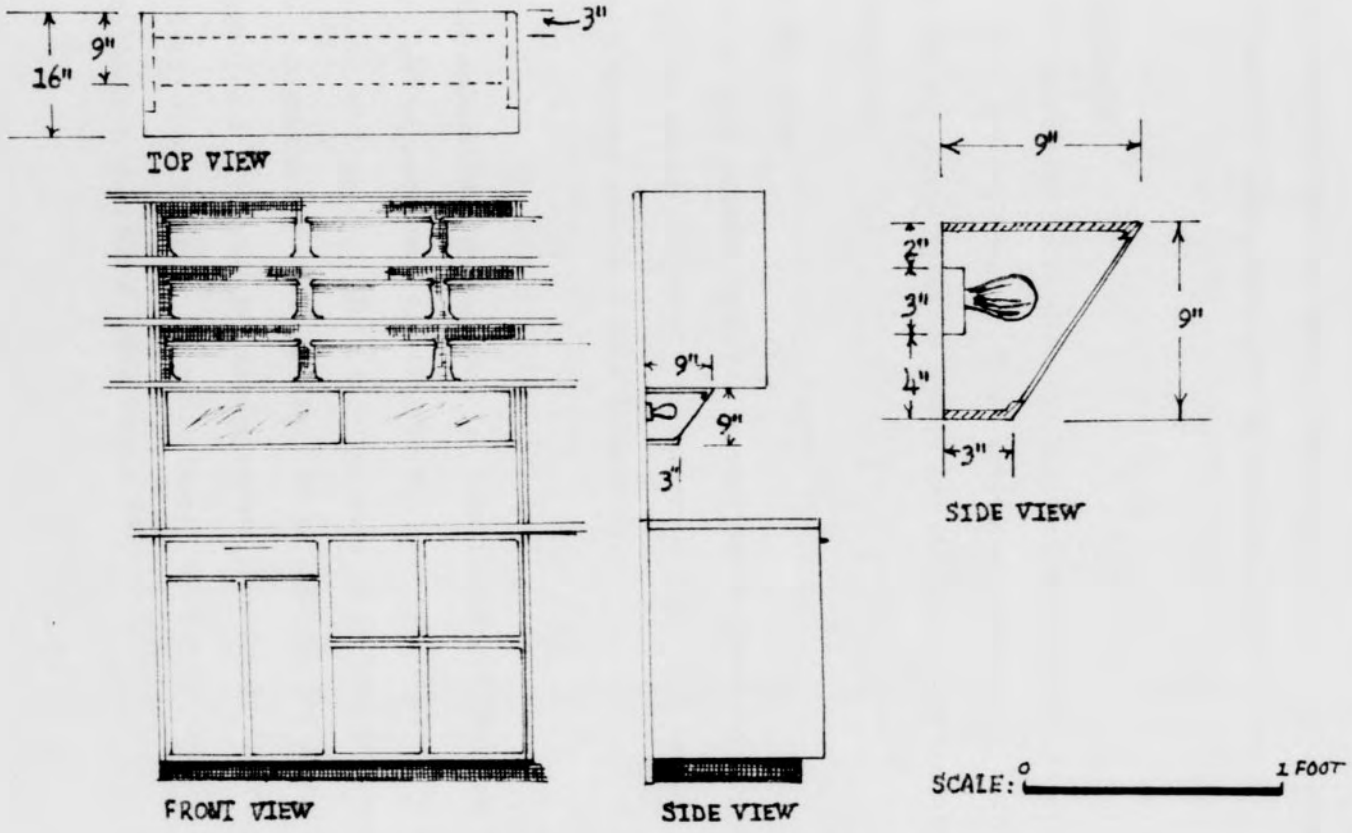


FIGURE 29 LIGHTING FOR SELECTING SAMPLES

bracket with five fluorescent lamps, thirty-six inches long, is suggested for the area over the display board. The length of the wall bracket, fifteen and one-half feet, will provide balanced light for the display board.

Viewing Chalkboard

The chalkboard needs adequate lighting so students can see fine details on the chalkboard. Three suspended incandescent fixtures mounted on the beams and directed toward the chalkboard are suggested for this laboratory.

Exhibiting Projects

Seven incandescent fixtures mounted on the beams are suggested for lighting the exhibition area. Incandescent light will enhance colors used in projects and provide a warm atmosphere.

Suggested Lighting Plan

The suggested lighting plan for this laboratory includes fluorescent and incandescent lighting so students can compare the different effects of lighting. This lighting plan is divided into sections as follows: lighting for drafting, Section 1; lighting for selecting samples, Section 2; lighting for mixing colors, Section 3; lighting for displays, Section 4; lighting for exhibitions, Section 5; and lighting for the chalkboard, Section 6. See Figure 30.

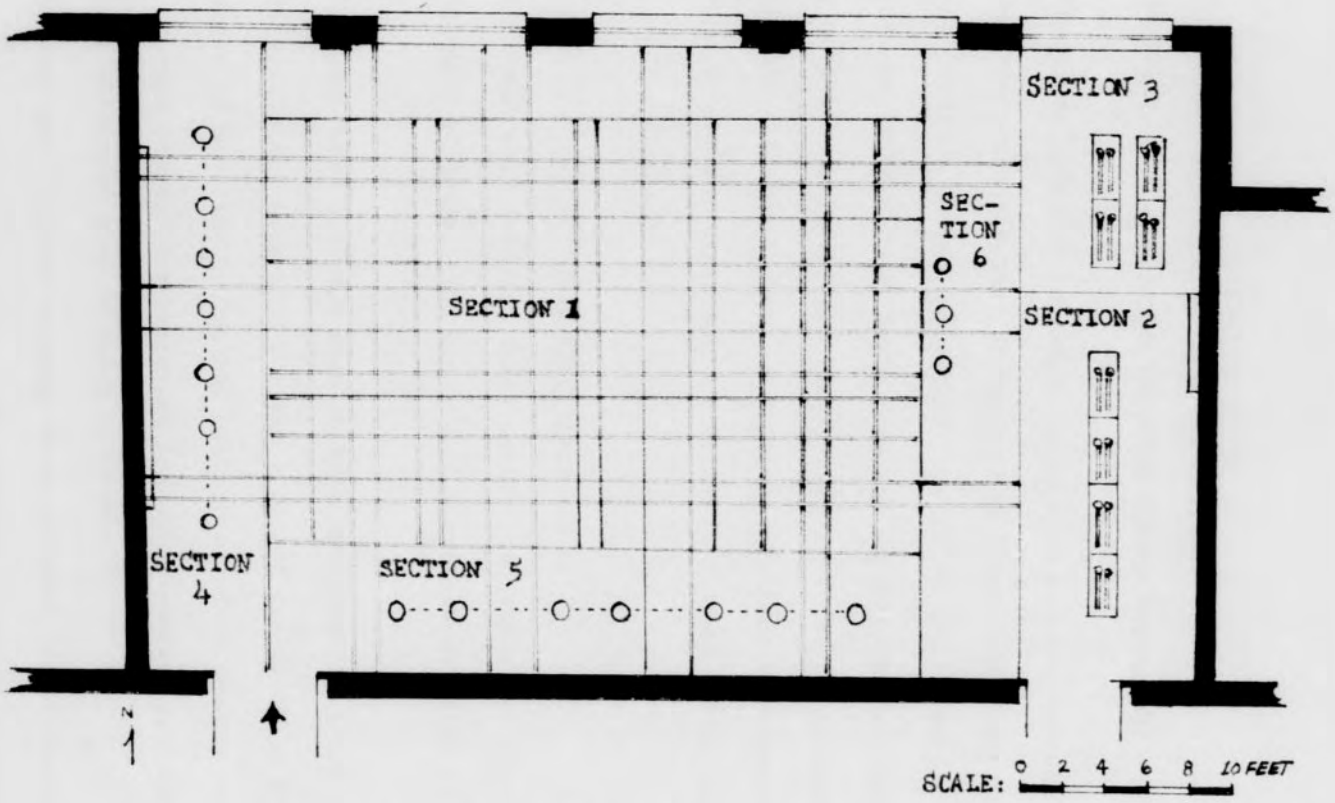


FIGURE 30 LIGHTING PLAN FOR AN INTERIOR DESIGN LABORATORY

CHAPTER VIII

SUMMARY: A CO-ORDINATED INTERIOR DESIGN LABORATORY

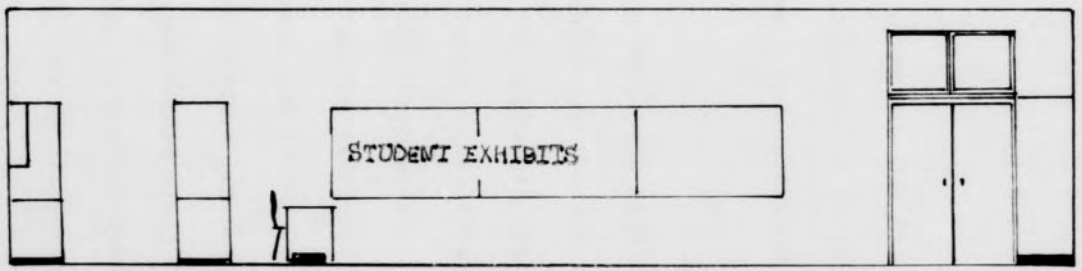
The space required for major activities and for storage units designed for the materials used in performing these activities are combined for an interior design laboratory located in the School of Home Economics of the University of North Carolina at Greensboro. The dimensions of this laboratory are twenty-nine feet and three inches by forty-eight feet and nine inches. A northern exposure provides students with a source of natural light for activities performed in the laboratory.

Wall Elevations

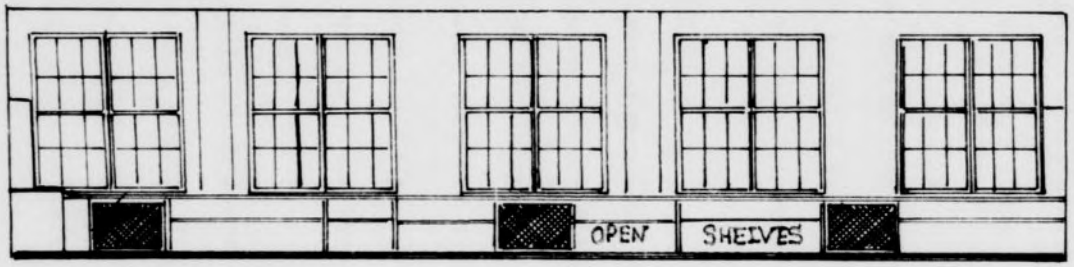
The south wall includes three exhibition panels for mounting completed student projects. The south wall elevation is shown in Figure 31.

The north wall includes open shelves and three enclosed radiators. Metal grills are suggested for the front of radiators to permit the circulation of heat and to conceal radiators. Open shelves are planned to provide storage for magazines and other current publications. The north wall elevation also is shown in Figure 31.

The west wall includes storage units planned for student drafting equipment and display materials. In addition, space is planned in this area for hanging student wraps and for depositing books for conven-



SOUTH WALL ELEVATION



NORTH WALL ELEVATION

SCALE: 0 2 4 6 8 10 FEET

FIGURE 31 SUGGESTED ARRANGEMENT FOR SOUTH AND NORTH WALLS

ience of use on entering the laboratory. The west wall elevation is shown in Figure 32.

The east wall includes the storage units planned for mixing color and selecting samples. The suggested location for the sink is based upon present plumbing connections. Additional storage space is allowed for future space needs. The east wall elevation is shown in Figure 33.

A classroom divider includes storage units for teaching materials and demonstrations. A chalkboard and recessed exhibition board is also planned here. The classroom divider is shown in Figure 33.

Flat Floor Plan

The shape and size of this laboratory limit the number of drafting tables and the amount of clearance space allowed between drafting tables for access to other areas of the laboratory. Ten double units with forty inches clearance between rows are suggested for the drafting table arrangement. The minimum clearance, twenty-four inches, is allowed for the aisle next to the window since fewer students would use this aisle for access to other areas in the laboratory. Forty inches clearance is allowed for the center aisle which serves as the main aisle.

Right-handed students should have natural light over their left shoulder to prevent shadows while working on drafting surfaces. The drafting tables are located so that light falls to the left of students.

The suggested floor plan for the laboratory with storage units and drafting table arrangement is shown in Figure 34. The plan presented in this study is flexible in that it allows space for from twenty to

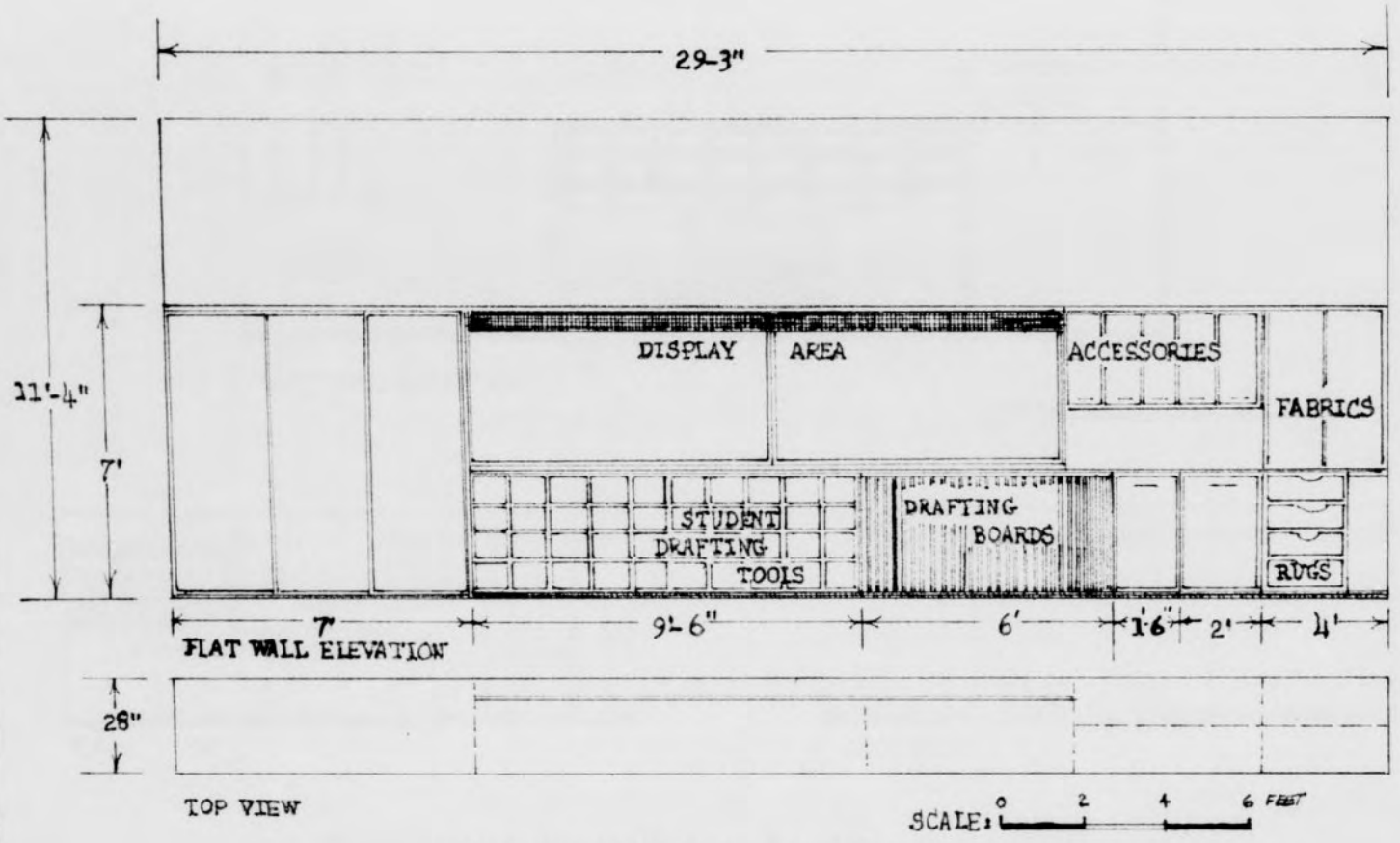
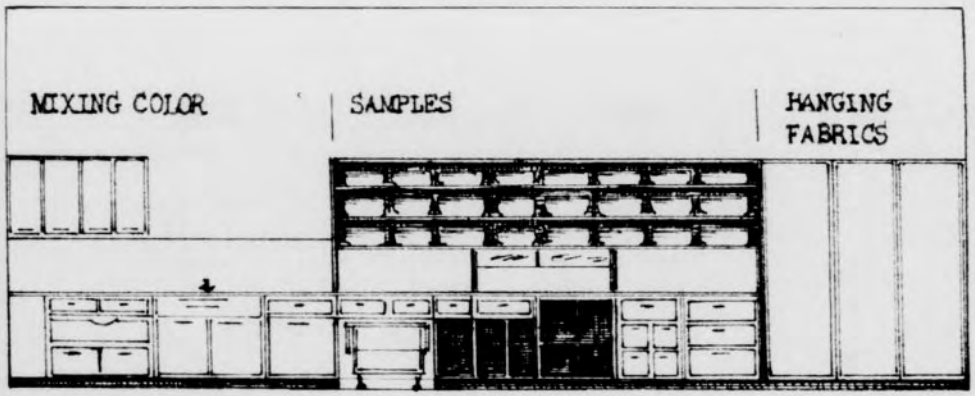


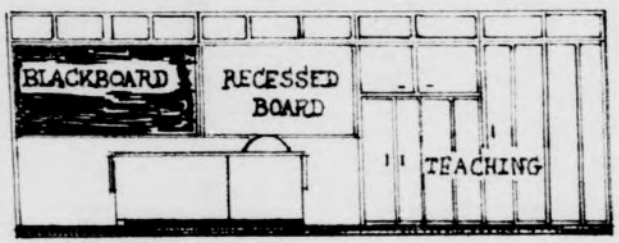
FIGURE 32 SUGGESTED ARRANGEMENT FOR WEST WALL



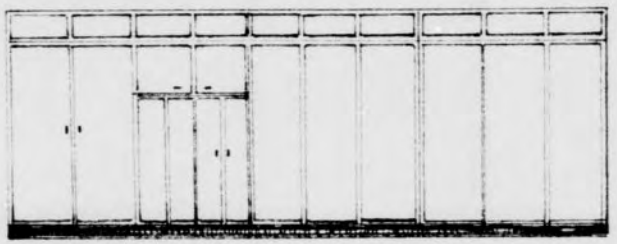
EAST WALL ELEVATION

SCALE: 0 2 4 6 8 10 FEET

CLASSROOM DIVIDER



FRONT VIEW



BACK VIEW

FIGURE 33 SUGGESTED ARRANGEMENT FOR EAST WALL AND CLASSROOM DIVIDER

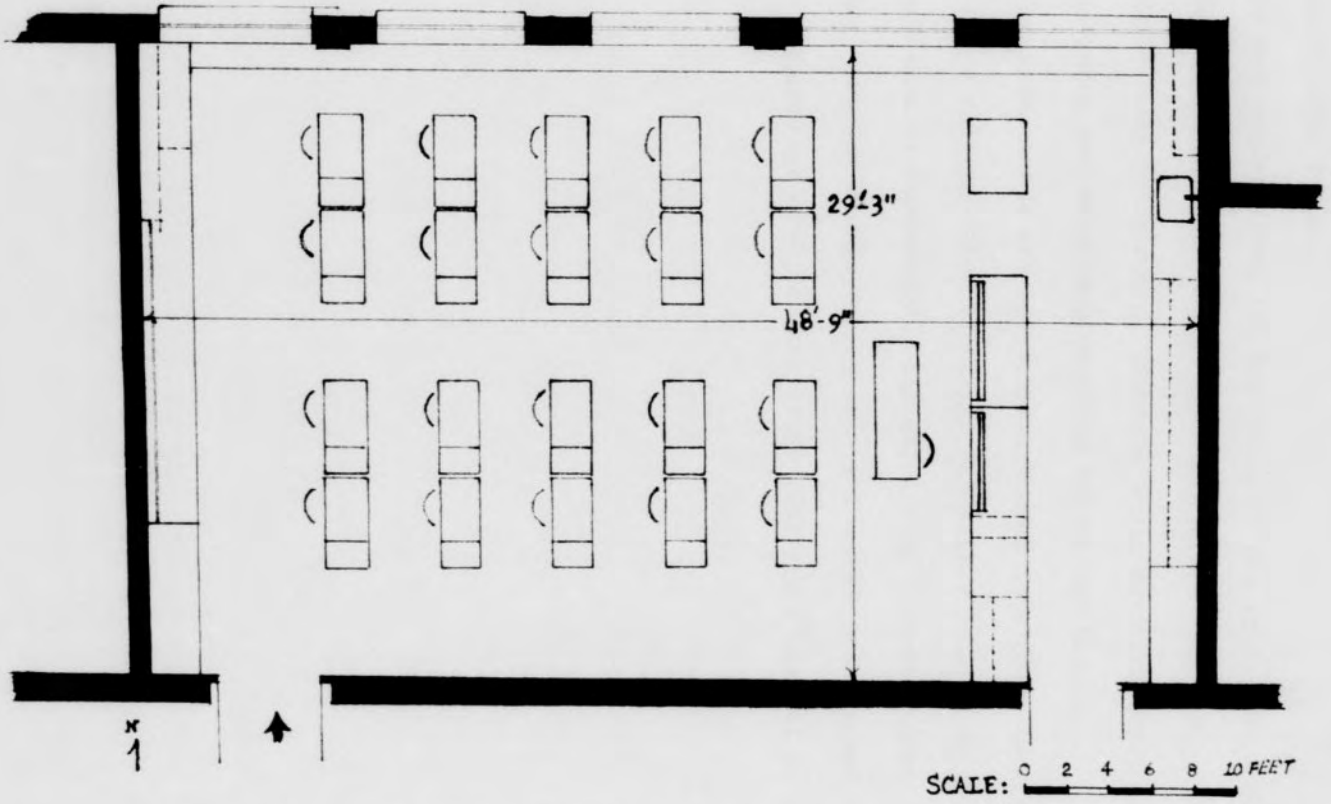


FIGURE 34 A FLOOR PLAN FOR AN INTERIOR DESIGN LABORTORY

twenty-five student drafting tables. However, alterations would need to be adapted to other rooms.

It was evident from the beginning of the study that research on space needs for interior design laboratories was limited. Research on comfortable body positions of students while drafting would be helpful for designing and selecting drafting tables and stools.

The space needs and plans incorporated into this study are suggested for a college interior design laboratory located in the School of Home Economics at Greensboro. Correspondence indicated that co-ordinated planning for interior design activities is a common problem and it is hoped that suggestions made in this study will prove helpful to others.

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APPENDIX

School of Home Economics
The Woman's College, U.N.C.

Greensboro, N. C.
May 10, 1963

Dear

The School of Home Economics of The Woman's College of the University of North Carolina is planning facilities in the interior design area to accommodate the increasing needs of students. In making our plans, we feel that it would be most helpful to know what types of facilities, storage, and space are being used in other colleges for the teaching of interior design.

We would appreciate very much your sending us this information or directing this letter to the person most closely associated with the teaching of interior design or related art.

1. Tell us of any space plans, floor plans, or storage ideas in the interior design area that you are using and like.

2. If you've seen or heard of other storage or space usage ideas that prove helpful, please let us know about them.

We would appreciate any pamphlets, pictures, and illustrative materials on the subject.

Sincerely,

Clara A. Ridder
Professor of Home Economics

Lorene G. Nelms
Graduate Assistant

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Typed

by

Dolores Anne Jones