

| Male and female standing heights (including shoes) | includes 97.5 percentile | includes 95% U.S. adults |
|--|--------------------------|--------------------------|
| 1905 75.0  | 1790 70.4                | 1640 64.8                |
| 1775 69.8  | 1685 65.5                | 1540 60.6                |
| 1640 64.8  | 1540 60.6                |                          |

English Beds. Small Single 900 x 1900, New Std. Single 1000 x 2000, Small Double 1350 x 1900, New Std. Double 1500 x 2000

Dimensional notation system: Numbers appearing in boxes are measurements in millimeters. Numbers outside boxes are measurements in inches.

| Male and female standing heights (including shoes) | includes 97.5 percentile | includes 95% U.S. adults |
|--|--------------------------|--------------------------|
| 1905 75.0  | 1790 70.4                | 1640 64.8                |
| 1775 69.8  | 1685 65.5                | 1540 60.6                |
| 1640 64.8  | 1540 60.6                |                          |

Dimensional notation system: Numbers appearing in boxes are measurements in millimeters. Numbers outside boxes are measurements in inches.

**SPACE FOR 3 POINT TURNS**

- One-Way Passage: 915 36
- Two-Way Passage: 1525 60
- Wheelchair Overall Length: 1065 42

**SPACE FOR 360° TURN**

- Wheel Pivot: 1880 74
- 1825 64 Axle Pivot
- 1575 62 Dia
- 1830 72 Dia
- 1625 64 Axle Pivot
- 1880 74 Wheel Pivot

**ELEVATOR IS REQUIRED TO SUPPLEMENT LONG STAIRS AND ESCALATORS**

- Maximum Height Of Controls: 1525 60
- Maximum Floor Gap: 10 375
- Opening: 865 34
- 1725 68 Minimum

**MINIMUM WC**

- Hgt: 510 20
- 1840 72
- Handrail Hgt: 840 33
- 815 32
- 1065 42

**DEAF AND HARD OF HEARING**

- Add Visual Signals and Displays To Audio Signals
- Emphasize Printed Matter, Symbols
- And Pictures, Use Teletext
- Increase Volume Of Audio Signals, e.g. Amplify Phones and Ringers

**BLIND**

- Use Braille
- Project Characters e.g. Room Numbers: 10 4 Thick And 1525 60 Above Floor
- Knurl Back Surfaces Of Handles And Knobs On Doors Opening To Danger
- Add Audible Signals To Visual Signals
- Prefer Gas Ranges For Audible Clues
- Hard Surfaces Aid Sound Detection
- Use 1065 42 Railings With 150 6 Curbs Around Dangerous Areas
- Avoid Open Stairs And Stair Nosings
- Avoid Projections, Tripping Hazards, And Low Hanging Obstructions
- Floor Openings 150 6 Exclude Cane Tips
- Right Angle Grid Patterns Are Easier To Comprehend Than Curves & Serpentine

**WHEELCHAIR DISABLED YOUTHS**

| Age  | High Forward Reach A | Head Height B | Eye Level C | Shoulder Pivot D | Forward Reach E | High Shelf Reach F | Low Shelf Reach G |
|------|----------------------|---------------|-------------|------------------|-----------------|--------------------|-------------------|
| 9-12 | 1130 44.5            | 1165 45.8     | 1060 41.8   | 830 32.6         | 460 18.1        | 1135 44.6          | 370 14.5          |
| 6-9  | 965 38.0             | 1140 44.8     | 1035 40.8   | 860 33.8         | 390 15.3        | 955 37.6           | 510 20.0          |
| 4-6  | None                 | 1065 42.7     | 985 38.8    | 830 32.7         | 345 13.6        | None               | 620 24.5          |

**Reaches and Clearances:**

- High Shelf Reach To Front: 1075 42
- High Shelf Reach To Back: 1155 45.5
- High Shelf Reach: 1720 67.7 (Men), 1500 59.0 (Women), 1410 55.5 (Youths)
- Work Space Minimum: 1065 42
- For 360° Turns: 1450 57
- Switches And Phone Dial Height Max: 1220 48
- Phone Dial Height Min: 1085 42
- Work Clearance: 380-510
- 15-20
- Optimum Shelving Zone All Adults: 610-780 24-30
- Low Shelf Reach To Back: 455 18
- Lowest Shelf Reach Level: 270 10.7
- Toe Clearance: 255 10
- Toe Space: 180 7
- Maximum Threshold Height: 25 1

**LINE OF HANDRAIL** (DIMENSIONS SHOWN ARE FROM FRONT EDGE OF TREADS TO TOP OF HANDRAIL)

**CRITICAL ANGLE STAIR**

**MAX RAMP (HANDICAPPED): 4°53' OR 1 IN 12**

**MIN TREAD (MOST CODES)**

**MIN TREAD FOR HANDICAPPED (ANSI)**

**MAX RISER FOR ASSEMBLY AND INSTITUTIONS (MOST CODES), RESIDENTIAL MAX: 8"**

**MIN. RISER**

**IN 1" INCREMENTS**

**MIN. HANDRAILS FOR RAMPS**

**2'-8" TO 2'-10" MIN. HANDRAILS FOR RAMPS**

**7" MIN. TOE SPACE**

**STAIRS**

- INTERIOR STAIRS
- EXTERIOR STAIRS
- STEP LADDERS
- LADDERS
- CRITICAL ANGLE STAIR
- STEP RAMP OR RAMP
- TREADS

**NOTES**

- In areas of public access, the maximum riser of 7 ins. and minimum tread of 11 ins. is required for new stairs. See pages on concrete, steel, and wood stairs for additional information.
- T=tread; R=riser.
- Maximum height between landings is 12 ft.
- Rule-of-thumb formula is:  $2R + 1T = \geq 24 \text{ in. } \leq 25 \text{ in.}$  Typical stair:  $2R \times 7 \text{ in.} + 1T \times 11 \text{ in.} = 25 \text{ in.}$
- Exterior stairs generally are not as steep as interior stairs, for safety reasons. A general rule is  $2R + 1T = 26 \text{ in.}$  If riser is 6 ins., tread would be 14 ins. Minimum number of risers should be 3, for a minimum of 18 ins. change of level.
- Ramped walks are preferred for less than 18 in. change of level. Maximum rise for any ramp is 30 in.
- For rise of 3 ins., maximum ramp slope may be 1:8; up to 6 in. maximum rise is 1:10 for existing buildings or sites. All other ramps shall be not more than 1:12. Stepped ramps are not recommended for public use.

**Formulas:**

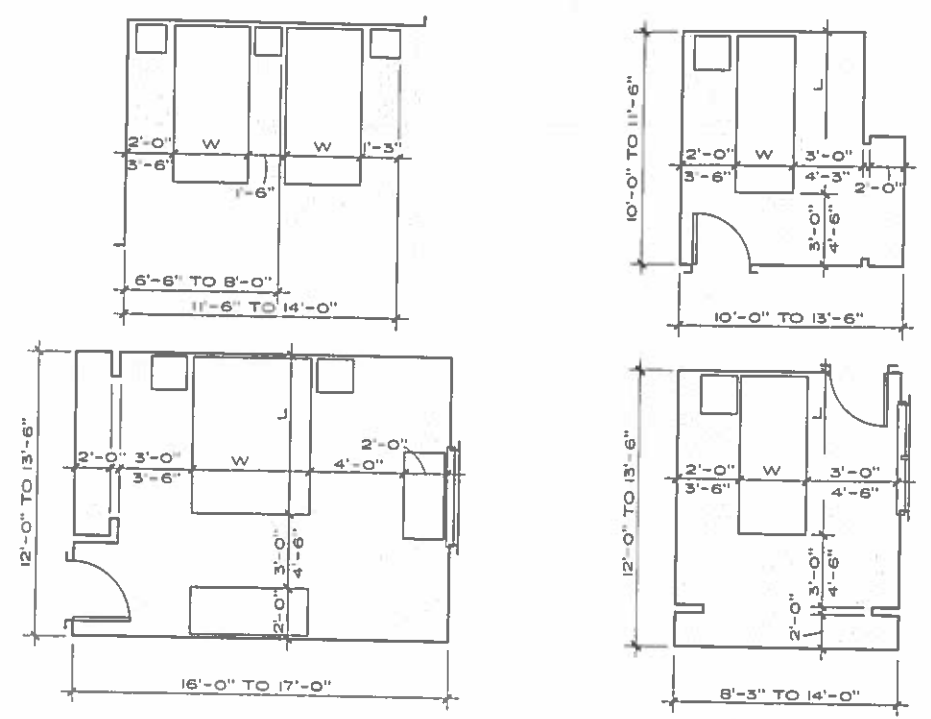
- $T = 20 - 4R$
- $R = 15 - 3T$

TREADS AND RISERS

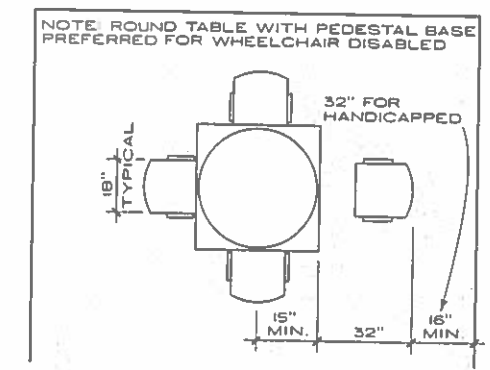
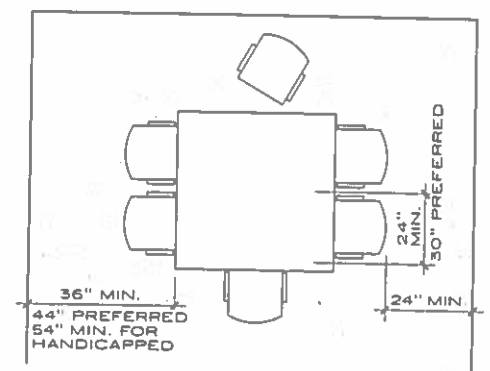
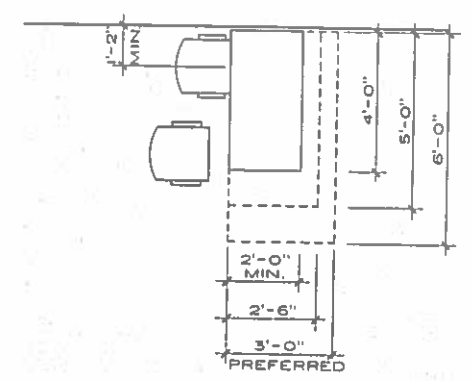
Paul Vaughan, AIA, Charleston, West Virginia

**BED SIZES**

| TYPE   | W   | L   |
|--------|-----|-----|
| SING   | 72" | 84" |
| QUEEN  | 60" | 82" |
| DOUBLE | 54" | 82" |
| ANGLE  | 39" | 82" |
| FULL   | 30" | 75" |
| TWIN   | 30" | 53" |



**MINIMUM CLEARANCES FOR BEDROOM FURNITURE**



**RECTANGULAR TABLES (IN.)**

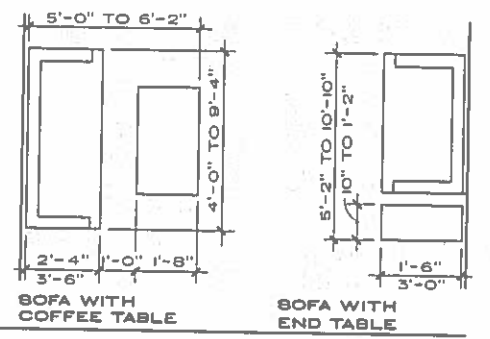
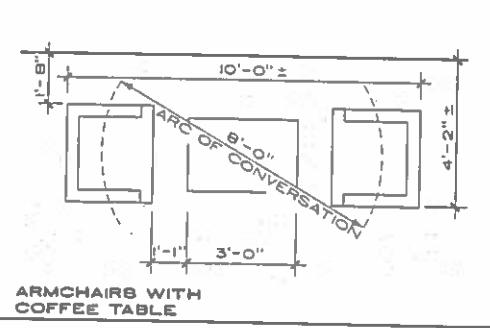
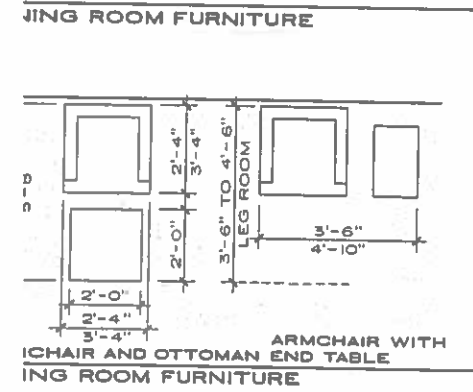
| TABLE SIZE | SEAT | WHEELCHAIR |
|------------|------|------------|
| 48 x 48    | 4    |            |
| 48 x 60    | 4    | 2          |
| 48 x 72    | 4-6  | 2-4        |
| 48 x 84    | 4-6  | 4-6        |
| 60 x 84    | 6-8  | 6          |

**SQUARE TABLES (IN.)**

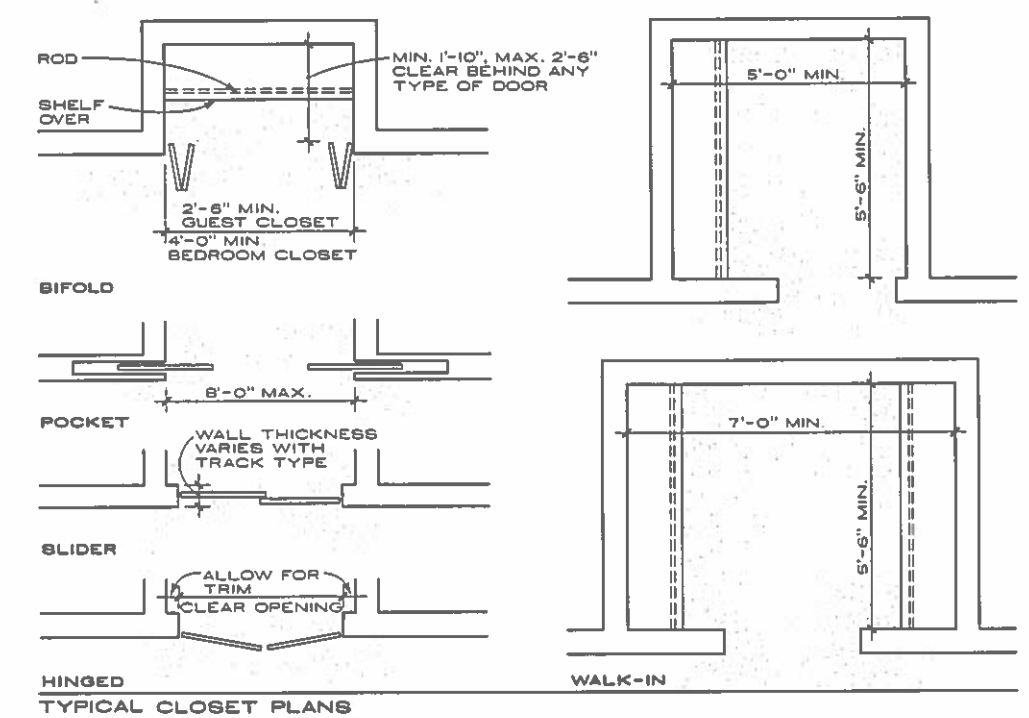
| TABLE SIZE | SEAT | WHEELCHAIR |
|------------|------|------------|
| 30 x 30    | 2    |            |
| 36 x 36    | 2-4  |            |
| 42 x 42    | 4    | 2 (TIGHT)  |
| 48 x 48    | 4-8  | 2          |
| 54 x 54    | 4-8  | 4          |

**ROUND TABLES (IN.)**

| TABLE SIZE | SEAT | WHEELCHAIR |
|------------|------|------------|
| 30         | 2    |            |
| 36         | 2-4  |            |
| 42         | 4-5  |            |
| 48         | 5-6  | 2          |
| 54         | 5-6  | 4          |

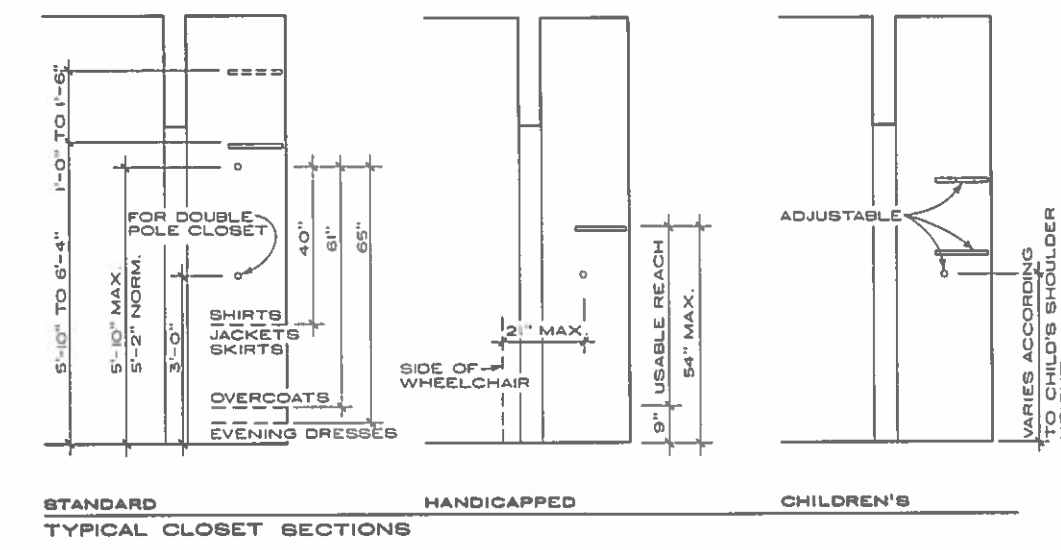
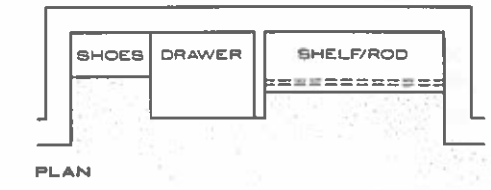


**MINIMUM CLEARANCES FOR LIVING ROOM FURNITURE**

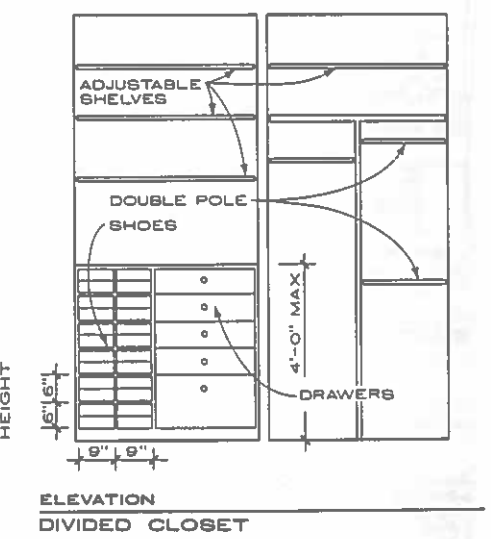


**TYPICAL CLOSET PLANS**

- NOTES**
- No closet bifold door should exceed a 2 ft panel. Largest door stock in pocket and sliding door is 4 ft.
  - All closet doors should allow easy access to top shelves.
  - Doors for children's closets can be used as tackboards, chalkboards, or mirrors.
  - Consider use of hinged doors for storage fittings and mirrors.
  - Walk-in closets should be properly ventilated and lit.
  - Provide clear floor space at least 30 by 48 in. for wheelchair approach. Pole and shelf height is 54" maximum for handicapped.
  - Percentage of accessibility of closets varies with door types used: Bifold at 66 2/3% min.; pocket at 100%; sliding at 50% or more; and hinged at 90% depending on hardware and door thickness.



**TYPICAL CLOSET SECTIONS**



**RESIDENTIAL STORAGE**

**SHELVING.** Standard shelving sizes are 6, 8, 10, and 12 in., although shelving up to 18 in. deep is desirable for closet shelving. Shelving may be either fixed or adjustable.

**DRAWERS.** Typical drawers are from 16 to 24 in. deep, 12 to 36 in. wide, and 2 to 8 in. deep or deeper. Often built into casework, drawers may be of wood, metal, or molded plastic.

**CLOSETS.** Standard closet depth is 24 to 30 in. for clothing and 16 to 20 in. for linens.

**BOXES.** Closet storage fittings such as boxes and garment bags can be used for supplemental or seasonal storage.

**STORAGE REQUIREMENTS**

**BEDROOM.** Allow 4 to 6 ft of hanging space per person. Allow 8 linear ft of hanging space for closets shared by 2 people. Allow 12 in. of hanging space for 6 suits, 12 shirts, 8 dresses, or 6 pairs of pants.

**LINEN STORAGE.** Place near bedrooms and bathrooms in a closet with 12 to 18 in. deep shelves. Supplemental storage in bins or baskets may be needed. Provide minimum 9 sq ft for 1-2 bedroom house; 12 sq ft for 3-4 bedroom house.

**BATHROOMS.** A mirrored wall cabinet 4 to 6 in. deep is typical bathroom storage, supplemented by space for supplies of soap, toothpaste, and other toiletries.

**COATS.** A closet near an entry door for coats and rainwear is desirable in most areas of the country. Provide

extra 2 to 3 in. in depth for air circulation and added bulkiness of overcoats.

**CLEANING EQUIPMENT.** A closet at least 24 in. wide for storage of vacuum cleaners and household cleaning supplies is helpful. Locate closet near center of house and provide electrical outlet so vacuum can be left connected.

**KITCHEN/DINING.** See pages on kitchen planning for recommendations.

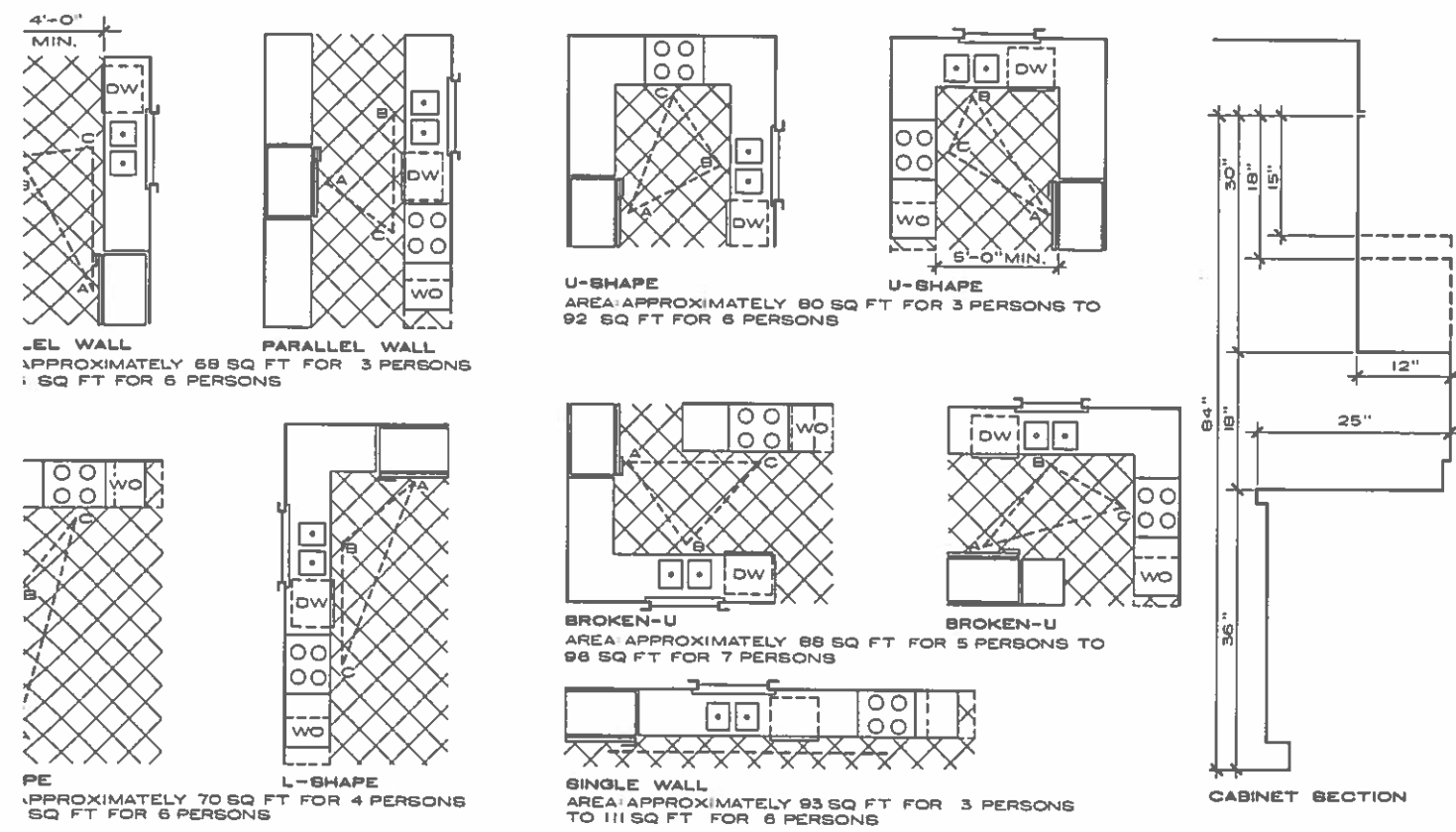
**OTHER STORAGE.** Most families have additional storage needs. For custom design work, these needs must be analyzed and storage planned. Storage rooms and attic and basement areas are possible supplemental storage locations.

1 Andrew Roberts, AIA, Washington, D.C.  
r J. Pettorino, AIA, Hicksville, New York

Robin Andrew Roberts, AIA; Washington, D.C.  
R. L. Speas, Jr.; Hugh N. Jacobsen, FAIA; Washington, D.C.

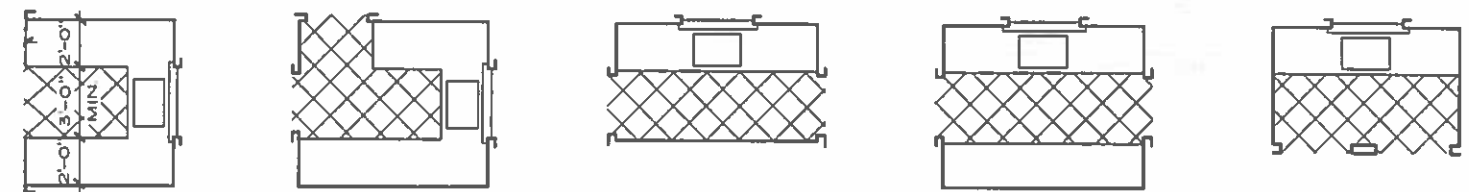
Storage, and floor areas required for various food on functions. The location and order of both is and associated work surfaces should be de-

Storage: Minimum 18 sq ft of space for basic storage with an additional 6 sq ft/person served.

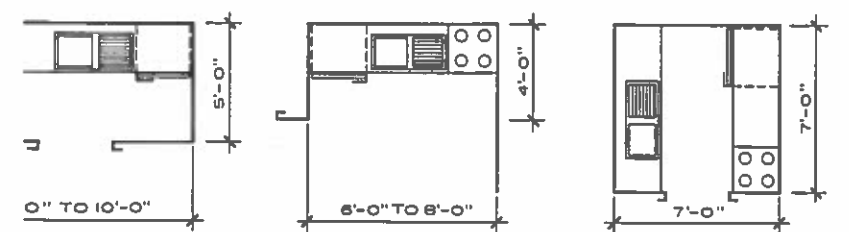


**ESSENTIAL KITCHEN ARRANGEMENTS**

SMALL KITCHENS USUALLY HAVE UP TO 10 RUNNING FEET OF COUNTER AND EQUIPMENT. AVERAGE KITCHENS HAVE UP TO 20 RUNNING FEET OF THE SAME. USUAL EQUIPMENT INCLUDES UNDERCOUNTER REFRIGERATOR



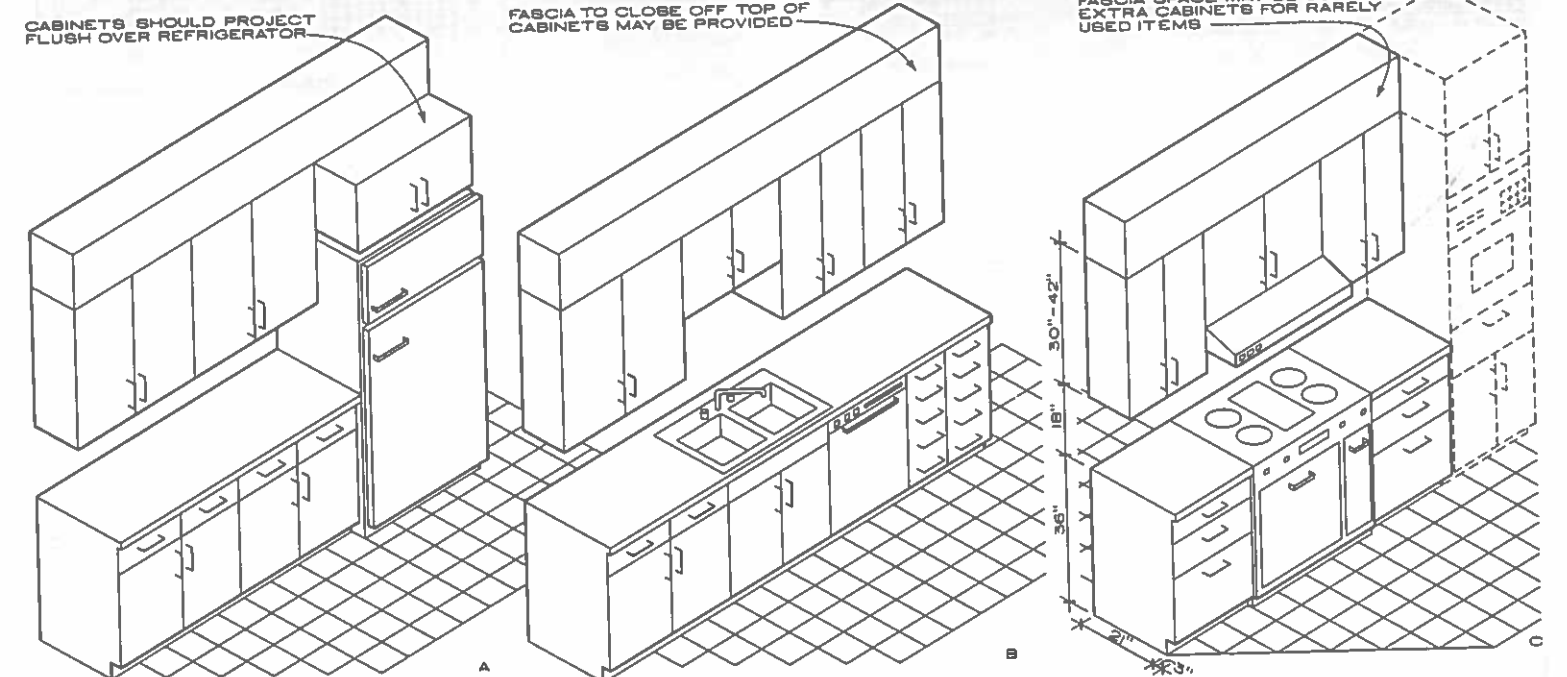
**REFRIGERATOR TYPES**



**REFRIGERATOR HEIGHTS**

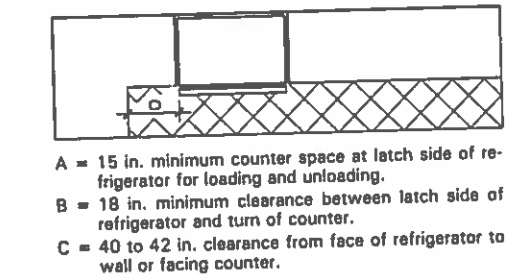
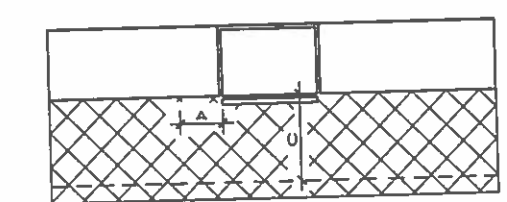
Andrew Roberts, AIA; Washington, D.C.  
John E. Jr., AIA; Hugh N. Jacobsen, FAIA; Washington, D.C.

**RESIDENTIAL DESIGN**



**REFRIGERATOR CENTER**  
(Receiving and Food Preparation)

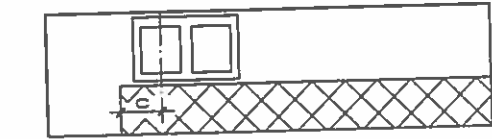
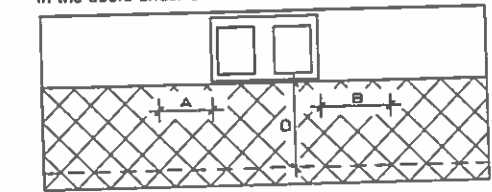
Provide storage for mixer and mixing bowls; other utensils: sifter, grater, salad molds, cake and pie tins, occasional dishes, condiments, staples, canned goods, brooms, and miscellaneous items.



A = 15 in. minimum counter space at latch side of refrigerator for loading and unloading.  
B = 18 in. minimum clearance between latch side of refrigerator and turn of counter.  
C = 40 to 42 in. clearance from face of refrigerator to wall or facing counter.

**RANGE CENTER**  
(Food Preparation, Cleaning, and Cleanup)

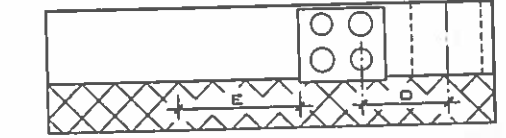
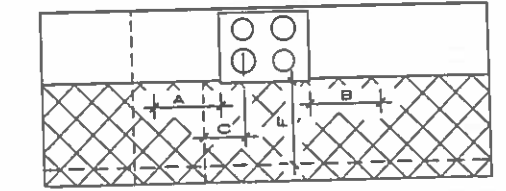
Provide storage for everyday dishes, glassware, pots and pans, cutlery, silver, pitchers and shakers, vegetable bins, linen, towel rack, wastebasket, cleaning materials and utensils, garbage can or disposal, and dishdrain. Some codes require louvers or other venting provisions in the doors under enclosed sinks.



A = 18 to 36 in. counter space on side of sink.  
B = 24 to 36 in. counter space on side of sink. Provide 24 in. counter space at either right or left if dishwasher is used.  
C = 14 in. minimum clearance between center of bowl and the turn of counter.  
D = 40 to 42 in. minimum clearance from face of sink to wall or facing counter.

**RANGE CENTER**  
(Cooking and Serving)

Provide storage for pots, potholders, frying pans, roaster, cooking utensils, grease container, seasoning, canned goods, breadbin, breadboard, toaster, plate warmer, platters, serving dishes, and trays.



A, B = 18 to 24 in. counter space on either side of cooking facility.  
C = 14 in. minimum clearance between center of front unit and the turn of counter.  
D = 16 in. minimum clearance between center of front unit and nearest piece of high equipment or wall, or between center of wall oven and adjoining wall.  
E = 36 to 42 in. counter space between range and nearest piece of equipment.  
F = 40 to 42 in. clearance from face of range or oven to face of wall or facing counter.

**CLEARANCES**

**KITCHENS FOR THE HANDICAPPED**

The preferred cooktop and counter height is 30 to 33 in., but may be standard 36 in. Open floor space is necessary for wheelchair maneuverability; observe a 5 ft minimum turning radius. Smooth, nonskid flooring is required. Indoor-outdoor carpet is preferred, but difficult to maintain in a kitchen. Linoleum or vinyl tile is acceptable. Knee space is necessary under sink counter. Insulate pipes to avoid scalding. Provide cooktop controls at

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Arthur J. Pettorino, AIA; Hicksville, New York  
R. E. Powe, Jr., AIA; Hugh N. Jacobsen, FAIA; Washington, D.C.

front to avoid reaching across hot surfaces. Wall ovens should preferably be set so that top of open oven door is 2 ft 7 in. above floor. Side-by-side refrigerator-freezer is preferred, although units with freezer on bottom are acceptable. Dishwashers should be front-loading.

Round tables with pedestal bases are preferred. A 4 ft diameter will accommodate two wheelchair users; a 4 ft 5 in. diameter will accommodate four wheelchair users.

Storage considerations for the wheelchair disabled include use of pegboard for pots, pans, and utensils. Vertical drawers in base cabinets allow for storage of food that would otherwise be out of reach of wheelchair users. Narrow shelving mounted to the backs of doors in cabinets or closets provides accessible storage for food and utensils.

**RESIDENTIAL DESIGN**

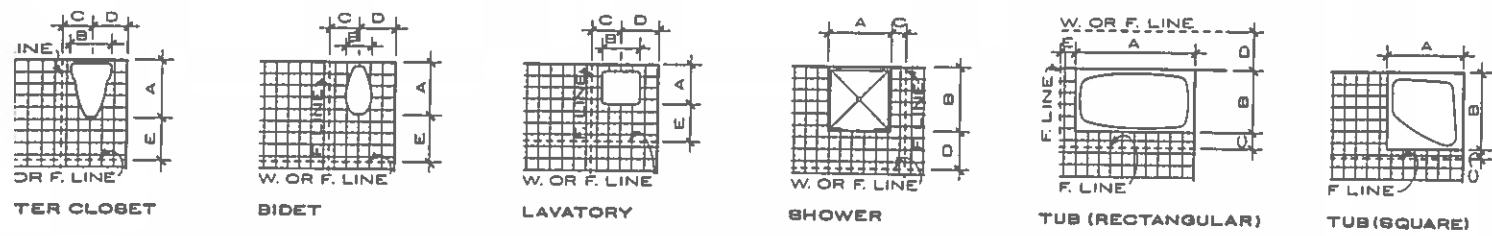


FIGURE 1. FIXTURE SIZES AND CLEARANCES (IN.) W = WALL F = FIXTURE

| FIXTURE           | A       |         | B       |         | C       |         | D             |               | E             |               |
|-------------------|---------|---------|---------|---------|---------|---------|---------------|---------------|---------------|---------------|
|                   | MINIMUM | LIBERAL | MINIMUM | LIBERAL | MINIMUM | LIBERAL | MINIMUM       | LIBERAL       | MINIMUM       | LIBERAL       |
| Water closet      | 27      | 31      | 19      | 21      | 12      | 18      | 15            | 22            | W = 18 F = 18 | W = 36 F = 34 |
| Bidet             | 25      | 27      | 14      | 14      | 12      | 18      | 15            | 22            | W = 18 F = 18 | W = 36 F = 34 |
| Lavatory          | 16      | 21      | 18      | 30      | 2       | 6       | 14            | 22            | 18            | 30            |
| Shower            | 32      | 36      | 34      | 36      | 2       | 8       | 18            | 34            |               |               |
| Tub (rectangular) | 60 STD. | 72      | 30 STD. | 42      | 2       | 8       | W = 20 F = 18 | W = 34 F = 30 | 2             | 8             |
| Tub (square)      | 38      |         | 39      |         | 2       | 4       |               |               |               |               |

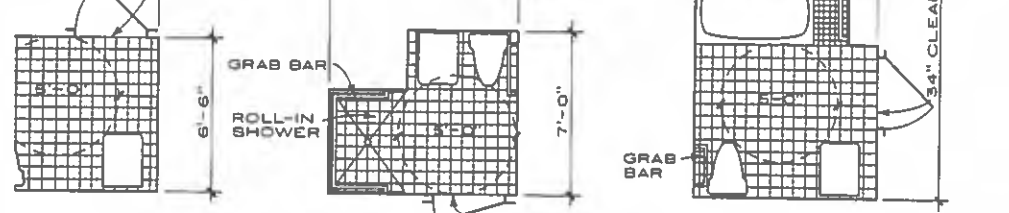
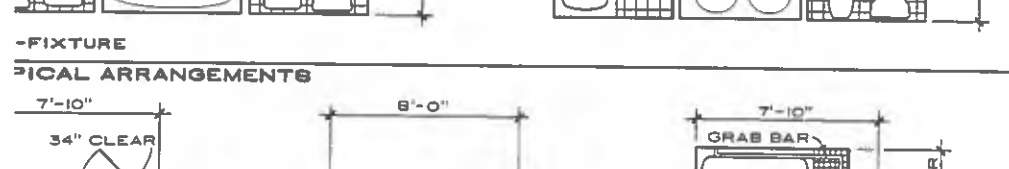
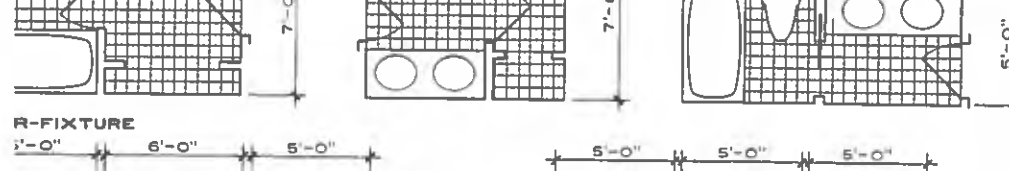
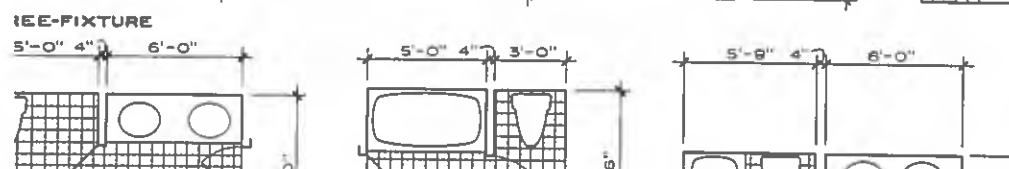
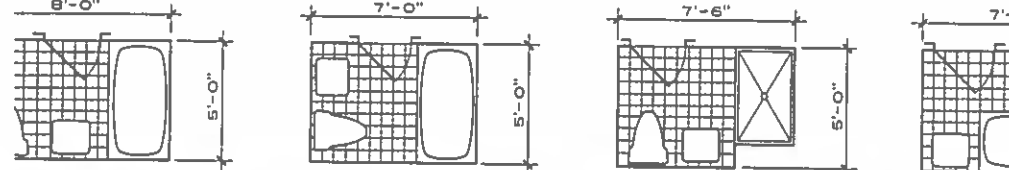
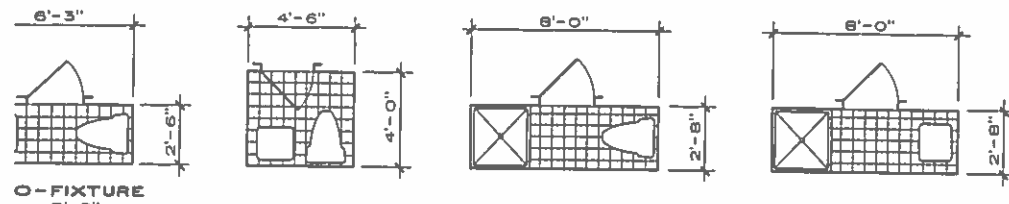


FIGURE 2. ARRANGEMENTS FOR THE WHEELCHAIR DISABLED

- NOTES**
1. Typical bathroom accessories include medicine cabinet, mirror, soap dish, towel rack, and toilet paper holder.
  2. Convenience outlets for electric toothbrushes, razors, and hair dryers should be provided. They should be electrically grounded for user safety.
  3. Bathroom ventilations may be achieved by natural means (window or operable skylight) or with mechanical exhaust fan.

- NOTES**
1. Provide space for wheelchair maneuverability; observe 5 ft minimum radius.
  2. Additional space next to water closet will allow for side transfer from wheelchair.
  3. Provide knee space under sink. Insulate pipes to avoid scalding.
  4. Use grab bars around water closet and tub.
  5. Roll-in shower may replace tub and is more convenient for many wheelchair disabled.
  6. Bathroom door to be minimum 32 in. clear opening and to swing outward. Use lever hardware on both sides.

Andrew Roberts, AIA; Washington, D.C.  
J. Pettorino, AIA; Hicksville, New York

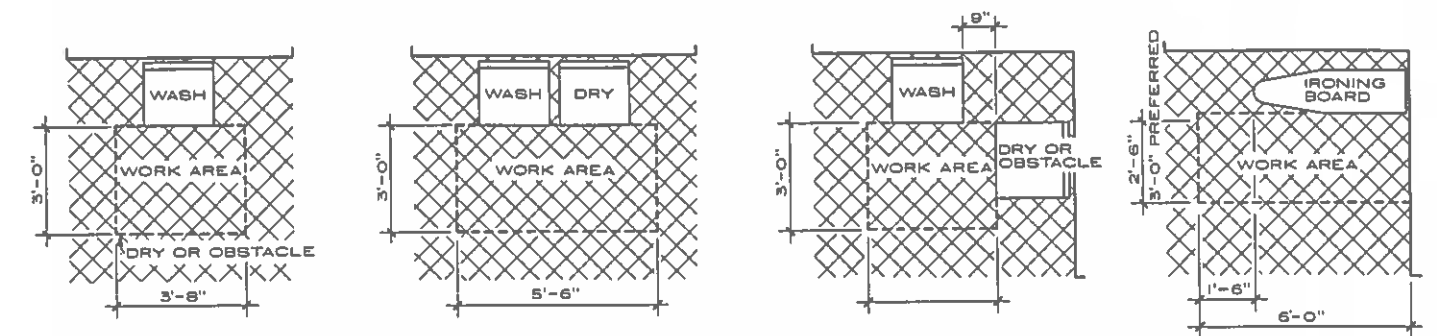


FIGURE 3. LAUNDRY EQUIPMENT CLEARANCES

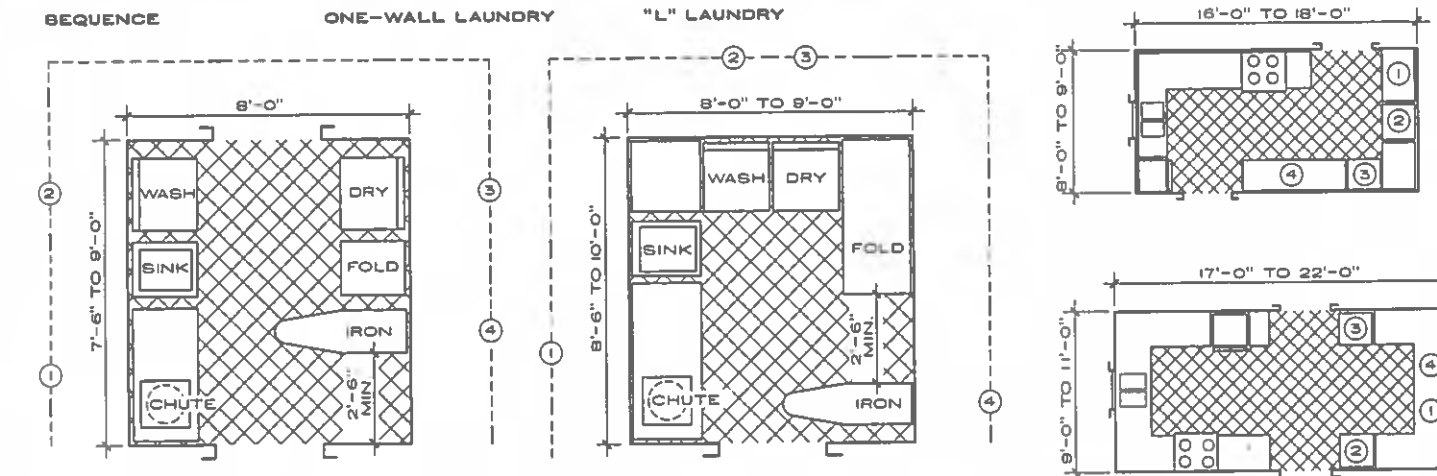
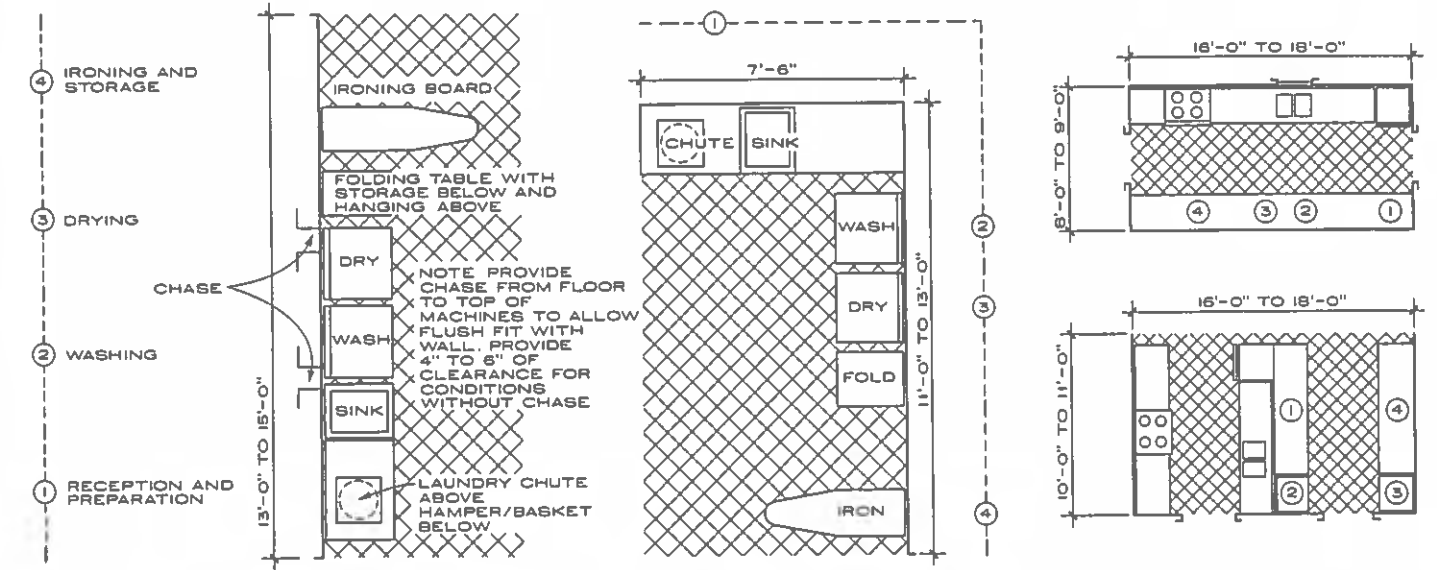


FIGURE 4. PARALLEL LAUNDRIES AND TYPICAL LAUNDRIES FOR THE HANDICAPPED

- LAUNDRIES FOR THE HANDICAPPED**
- For the wheelchair disabled, having laundry facilities close to the kitchen combines several time-consuming activities with a minimum of movement from place to place.
- The basic necessities for an accessible laundry facility are the following: front-loading automatic washer, dryer, storage shelving for supplies, lightweight steam iron, ironing board, and a surface for folding.
- Laundry equipment controls are to be within high for-

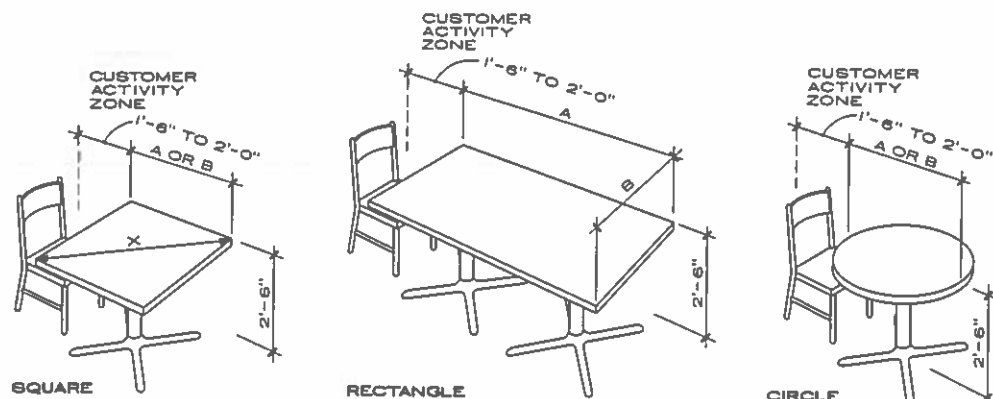
ward or side reach ranges. Controls shall be operable with one hand and not require tight grasping, pinching, or twisting of the wrist.

For an accessible laundry area, provide storage for supplies within high forward or side reach ranges and all working surfaces at a comfortable seated work height of 29 in. with knee clearance below.

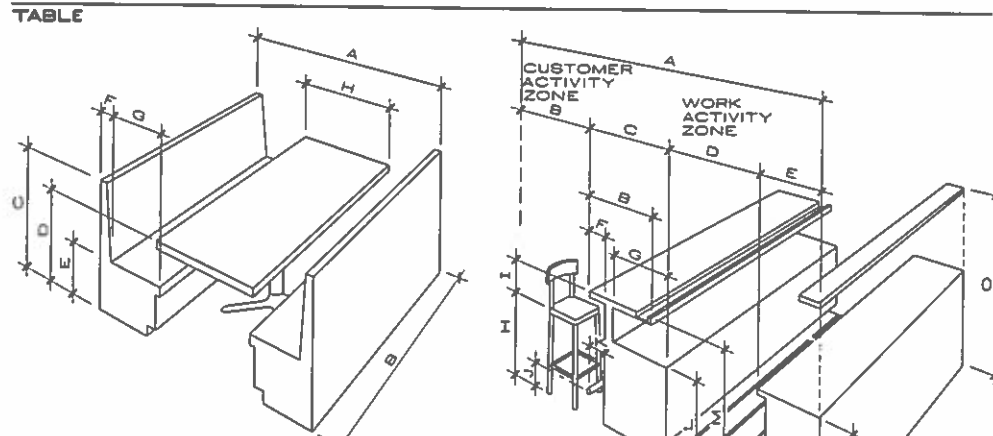
**APARTMENT HOUSE LAUNDRIES**

In apartment houses, locate laundry rooms in the basement or on the ground floor of the building near necessary mechanical equipment, piping, and ventilation.

- LAUNDRIES WITH KITCHEN**
- Locate laundry rooms on grade, to provide surfaces to absorb vibrations from operation and to not disturb the apartment dwellers.
- Provide convenient access from dwelling units to laundry room. Incorporate into the laundry room design folding tables and vending machines for soap, bleach, and other laundry powders.
- Provide the ability for visual inspection of the laundry room for the security of the users. Also, laundry rooms in large apartment buildings are public areas where apartment dwellers socialize and meet each other, so provide area to accommodate this necessary function.



| SQUARE  |                |                 | RECTANGLE       |                 | CIRCLE         |         |                |
|---------|----------------|-----------------|-----------------|-----------------|----------------|---------|----------------|
| PERSONS | A OR B         | X               | PERSONS         | A               | B              | PERSONS | A              |
| 2       | 2'-0" to 2'-6" | 2'-10" to 3'-6" | 2               | 2'-6" to 3'-0"  | 2'-0" to 2'-6" | 4-5     | 3'-6" to 4'-0" |
| 4       | 2'-6" to 3'-0" | 3'-6" to 4'-3"  | 2 (on one side) | 3'-4" to 4'-0"  | 2'-6" to 3'-0" | 6-7     | 4'-6" to 5'-0" |
|         |                |                 | 6               | 5'-10" to 6'-0" |                | 7-8     | 5'-6" to 6'-4" |
|         |                |                 | 8               | 6'-10" to 7'-0" |                | 8-10    | 6'-0" to 7'-2" |



**A** Seat back to seat back: 5'-0" to 6'-2"  
**B** One person per side: 2'-0" to 2'-6"  
 Two persons per side: 3'-6" to 4'-8"  
 Recommended maximum for serving and cleaning: 4'-0"  
**C** 3'-0" to 4'-0"      **F** 0 to 4"  
**D** 2'-6"              **G** ± 1'-8"  
**E** 1'-6"                **H** 2'-0" to 2'-6"  
**NOTE**  
 Local regulations determine actual booth sizes. Tables are often 2 in. shorter than seats and may have rounded ends. Circular booths have overall diameter of 6'-4"+.  
**BOOTHS**  
  
**NOTE**  
 All dimensions are minimum clearances. Seating layouts show general configurations and are not intended to depict any specific type of operation. Tables may be converted from square to round to enlarge seating capacity. Booth seating makes effective use of corner spaces.  
**TYPICAL SEATING ARRANGEMENTS**  
  
**NOTE**  
 All dimensions are minimum clearances. Seating layouts show general configurations and are not intended to depict any specific type of operation. Tables may be converted from square to round to enlarge seating capacity. Booth seating makes effective use of corner spaces.  
**TYPICAL SEATING ARRANGEMENTS**

Richard J. Vitullo; Washington Grove, Maryland  
 Cini-Grissom Associates, Inc.; Food Service Consultants; Washington, D.C.

**NOTES**

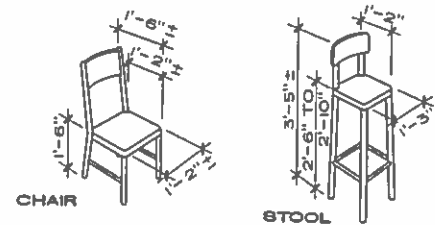
Round tables are usually recommended only for seating 5 persons or more.

Dimension "A" depends on the perimeter (1'-10" to 2'-0" per person) necessary to seat required number. For cocktails, 1'-6" is sufficient.

Tables wider than 2 ft-6 in. will seat one at each end.

Minimum sizes are satisfactory for drink service; larger sizes for food. Tables with widespread bases are more practical than four-legged tables.

Tables and arrangements are affected by the type of operations and the style of service. The use of flaming trays, busing carts, high chairs for children, and handicapped access must be considered.



**AVERAGE CAPACITIES PER PERSON**

| TYPE OF ROOM            | SQUARE FEET |
|-------------------------|-------------|
| Banquet                 | 10-12       |
| Cafeteria               | 12-15       |
| Tearoom                 | 10-14       |
| Lunchroom/coffee shop   | 12-16       |
| Dining room/restaurant  | 13-16       |
| Specialty/formal dining | 17-22       |

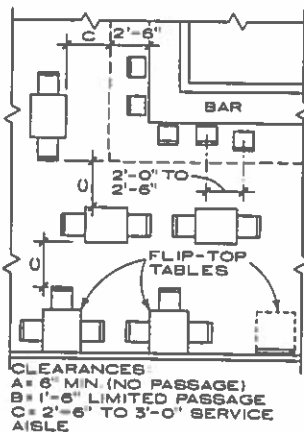
**NOTE**

Figures are general and represent minimum average dimensions. No maximum exists. Seating allowances and requirements may vary to suit individual operations.

**GENERAL DESIGN CRITERIA**

- Service aisles: 30-42 in.
- Square seating, 66 in. minimum between tables, 30 in. aisle plus two chairs back to back.
  - Diagonal seating, 36 in. minimum between corners of tables.
  - Wall seating, 30 in. minimum between wall and seat back.
  - Minimum of 30 in. for bus carts and flaming service carts.
- Customer aisles:
- Refer to local codes for restrictions on requirements.
  - Wheelchair requirements, 35-44 in. aisle.
  - Wall seating, 30 in. minimum between walls and table.

- Tables:
- Average 29 in. high.
  - Allow space around doors and food service areas.



**CLEARANCES**  
**A** = 6" MIN. (NO PASSAGE)  
**B** = 1'-6" LIMITED PASSAGE  
**C** = 2'-6" TO 3'-0" SERVICE AISLE

**GENERAL**

Conference rooms should be located for proximity to user groups within a building and for accessibility to outside guests. Since a conference room typically serves to communicate a firm's "image" to others, finishes are usually selected from higher quality materials to suggest a prominent and visible location. When a conference room functions as a multiuser or multigroup space, the position of access doors is altered and acoustical folding partitions or movable walls may be used. The designer should note the additional requirements imposed by building codes for assembly occupancy for larger rooms.

**FINISHES**

Carpeted floors, acoustical wall panels, or fabric wall coverings and acoustic ceilings should be used. Avoid using "attention-getting" patterns and colors on walls which may decrease focal emphasis of tables, seating,

and speaker or projection area. All finishes should be carefully examined for flame spread and smoke-generated ratings.

**LIGHTING**

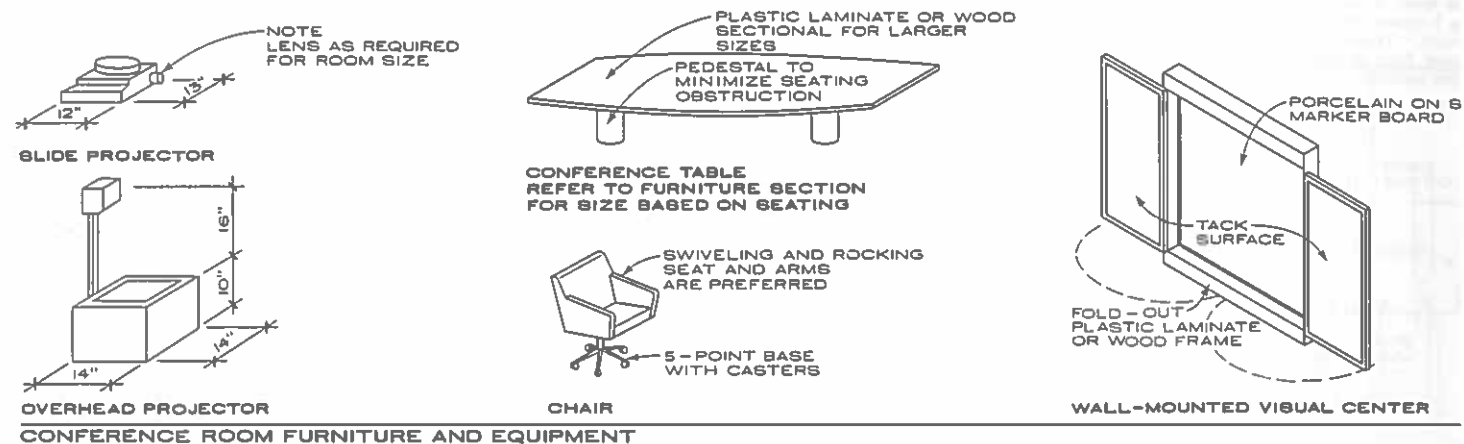
Parabolic lens fluorescent fixtures provide good general lighting with less glare. Directional fixtures such as track lighting may be used for presentation areas. Use dimming switches.

**MECHANICAL**

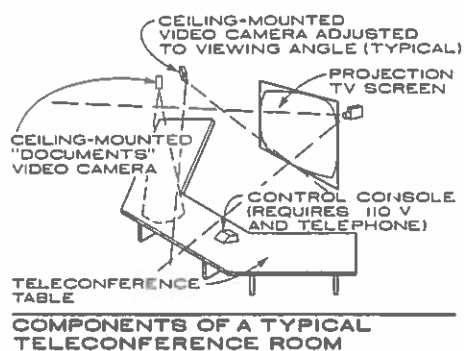
Provide a minimum of eight air changes per hour plus a minimum of 10 cu ft/min of outside air per person for odor-free air and good ventilation. Provide an exhaust system to be manually controlled from the room. Careful attention should be given to sound attenuation of diffusers.

**TELECONFERENCING**

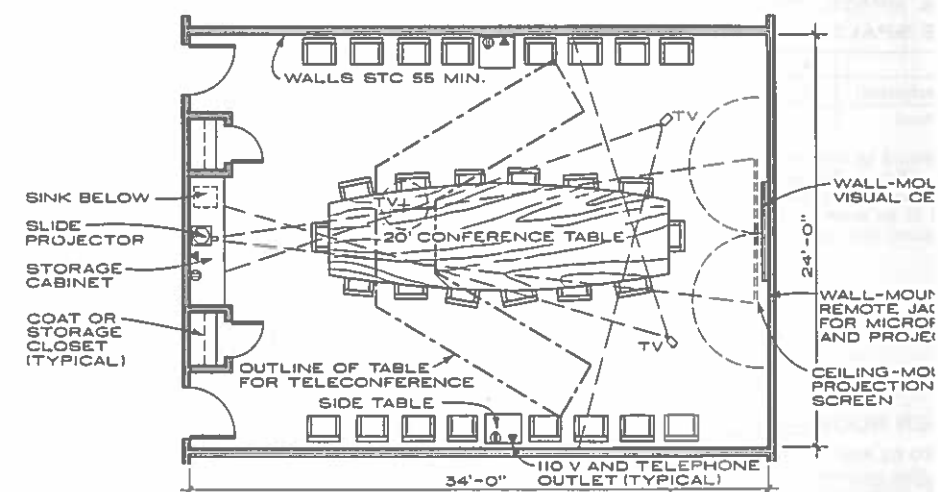
The space and furniture requirements for teleconferencing are different from the typical conference room aspects are geared toward video camera requirements. Typically, the conference is held between groups in separate locations linked by video satellite. The layout includes two ceiling-mounted video cameras cover the participants and an optional direct aimed document camera, a projection television (front or rear projecting) for the remote participant a control console which interfaces the video camera, telephone, and satellite linkage. The room arrangement is such that all participants may view and be simultaneously. Mixing presentation media (projectors, flip charts, etc.) becomes more difficult teleconferencing, while the requirements for acoustical ventilation remain unchanged from the typical conference room. Lighting must be in accordance with requirements of the video system used.



CONFERENCE ROOM FURNITURE AND EQUIPMENT

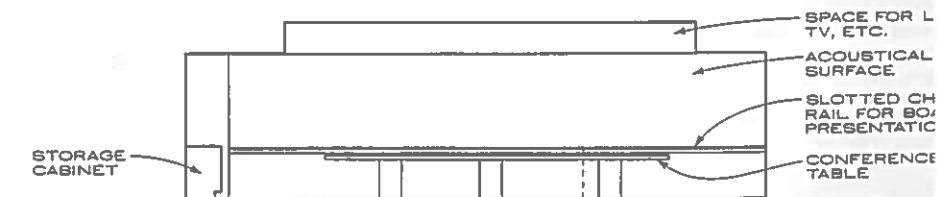


COMPONENTS OF A TYPICAL TELECONFERENCE ROOM

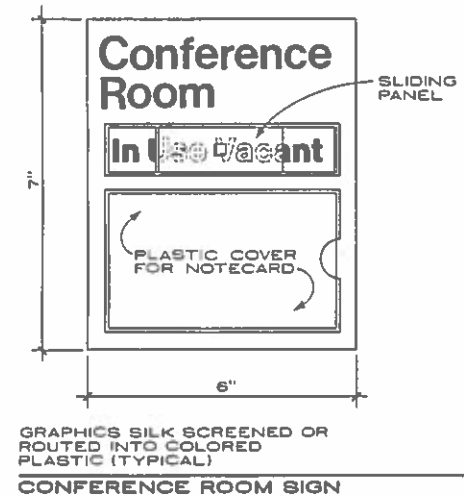


PLAN NOTE

Components of both traditional and teleconferencing conference rooms are shown. The "board room" layout here is not recommended for teleconferencing. See dashed layout, components at left, and general notes above.

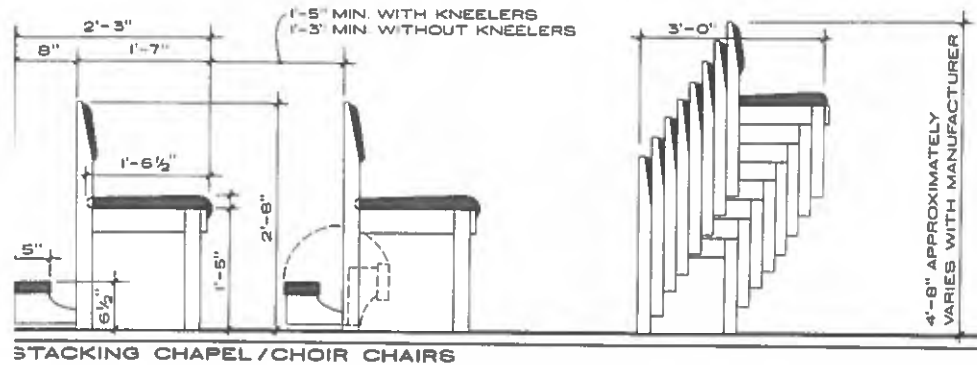


SECTION TYPICAL CONFERENCE ROOM (25 - 30 PERSONS)



CONFERENCE ROOM SIGN

J. Kevin Lloyd, AIA; Barge, Waggoner, Sumner & Cannon; Nashville, Tennessee

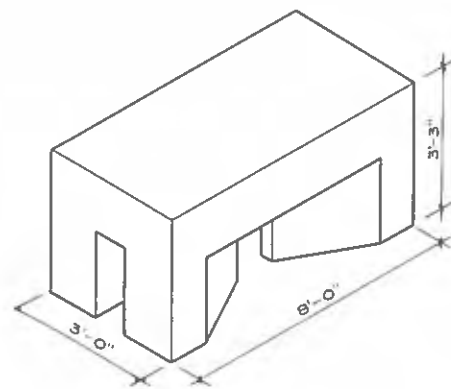


**STACK CHAIRS**

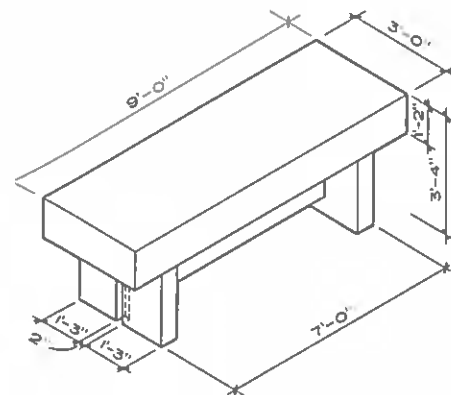
A variety of stacking or modular chairs are available and well suited to uses such as small churches, chapels, and choir areas where flexibility of arrangement or complete removal is desired. Like pews, these chairs may be upholstered in differing degrees and equipped with kneelers, book holders, and other features. In addition, most manufacturers offer an interlocking device that enables the user to join rows of chairs together for temporarily fixed arrangements. Stacking capability allows efficient storage of chairs. When worship spaces become large enough to require a sloped floor for proper sight and sound lines, chairs are generally not advisable.

**ALTAR/COMMUNION TABLE**

In most churches, the altar or communion table is the primary focus and therefore the most visually prominent



ALTAR

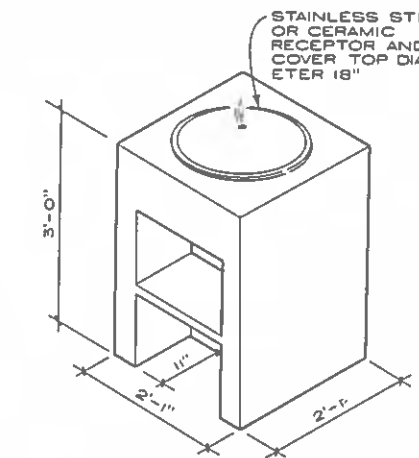


COMMUNION TABLE

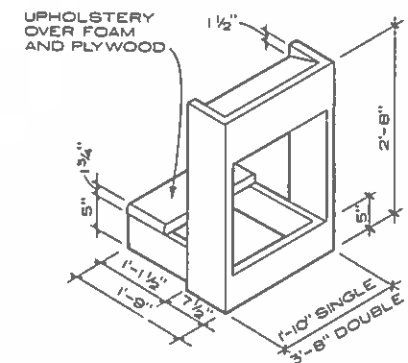
furnishing. Style and symbolism of the altar/table are deeply rooted in the liturgy of individual churches and usually require the participation and theological direction of both clergy and laity during design. Appropriateness of scale and material are particularly important and widely variable. The altar/table is among the most suitable furnishings for artist collaboration in design and execution.

**BAPTISMAL FONT**

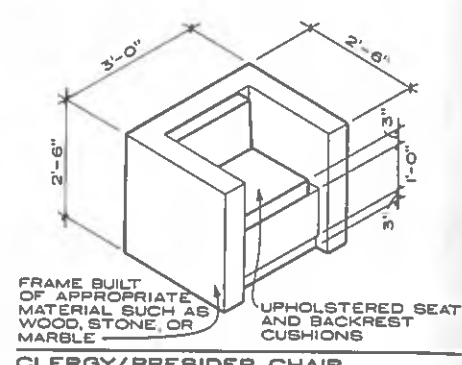
A font for ceremonial sprinkling of infants and/or adults may be placed in various locations including at the chancel/sanctuary or at the entrance to the church in the narthex. In some cases, the font may be alternately moved between these locations. Usually space for gathering of family and friends is required around the font and, in many churches, the font is required to be in a position that permits general viewing of a baptism by the entire congregation. Churches practicing baptism by im-



BAPTISMAL FONT



INDIVIDUAL KNEELER

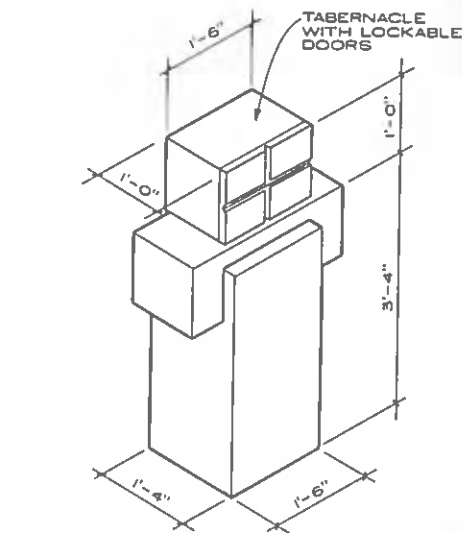


CLERGY/PRESIDER CHAIR

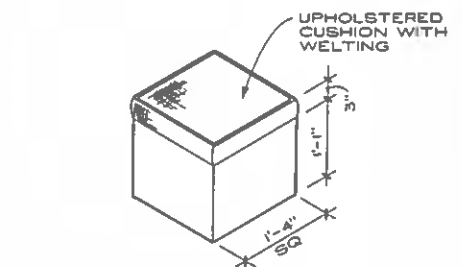
ersion or submersion require an altogether different style of baptistry involving a pool or tank that allows full entry by laity and clergy. Prefabricated baptistry tanks are available and custom installations possible.

**TABERNACLE**

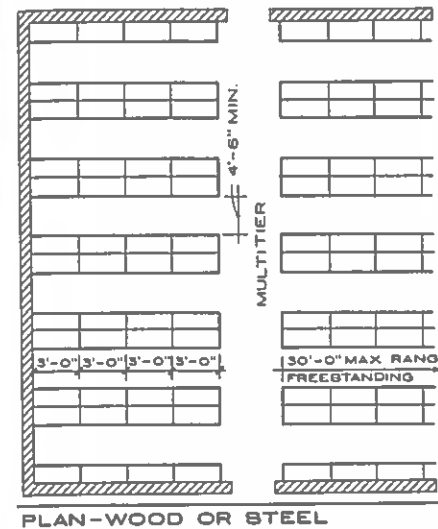
The tabernacle generally associated with Roman Catholic, Orthodox, and Episcopalian ("ambry" rather than tabernacle) churches is a very significant element in the worship environment, acting as the place of repose for the consecrated Host—the body of Christ. It is often a highly artistic and custom furnishing. Careful attention to the liturgical attitudes of the individual church and review of the document "Environment and Art in Catholic Worship" (for Roman Catholic churches) should guide the design and placement of the tabernacle.



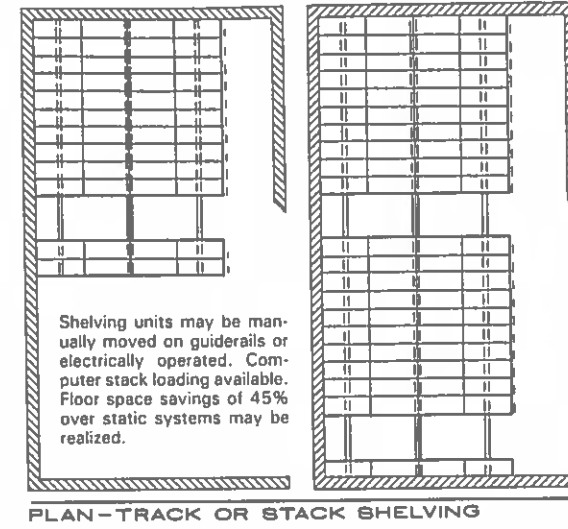
TABERNACLE



ACOLYTE STOOL



PLAN-WOOD OR STEEL



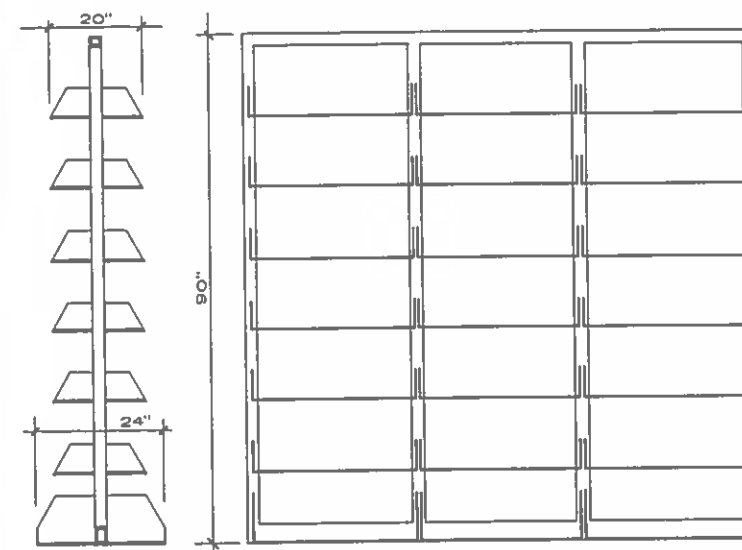
PLAN-TRACK OR STACK SHELVING

**SHELF CAPACITY AND DEPTH**

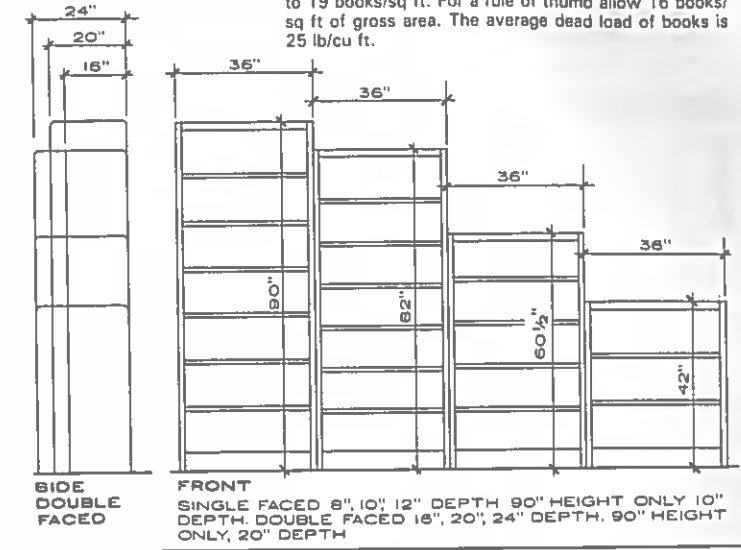
| TYPE OF BOOK                   | VOLUMES PER LINEAR FT. | SHELF DEPTH (IN.) |
|--------------------------------|------------------------|-------------------|
| Children's                     | 10-12                  | 8                 |
| Fiction and economics          | 7                      | 8                 |
| History and General Literature | 7                      | 8                 |
| Reference                      | 7                      | 10                |
| Technical and Scientific       | 6                      | 8                 |
| Medical                        | 5                      | 10                |
| Law and public documents       | 4-5                    | 8                 |
| Bound periodicals              | 5                      | 10-12             |
| U.S. Patent spec.              | 2                      | 8                 |

**BOOK CAPACITY PER GROSS FLOOR AREA**

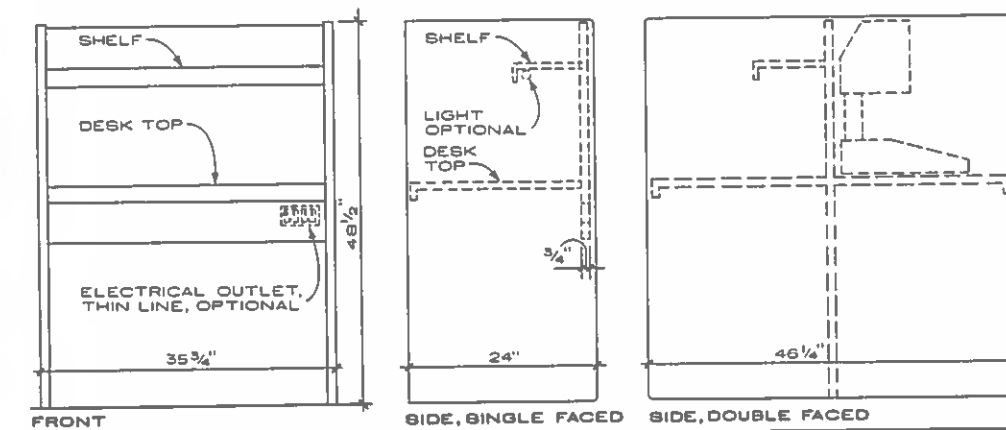
Many variables must be considered: size and kind of books, book lifts, carrels, number and width of aisles, ultimate capacity, and so on. Variances run from 13 1/2 to 19 books/sq ft. For a rule of thumb allow 16 books/sq ft of gross area. The average dead load of books is 25 lb/cu ft.



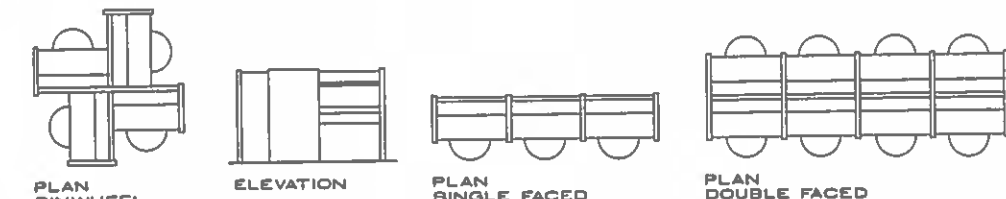
ADJUSTABLE SHELF UNIT, STEEL



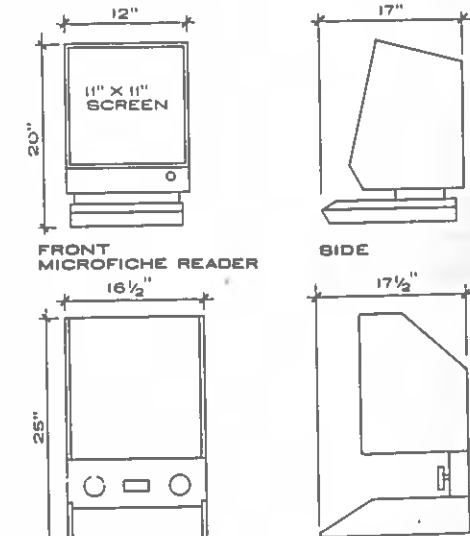
ADJUSTABLE SHELF UNIT, WOOD



FRONT CARRELS



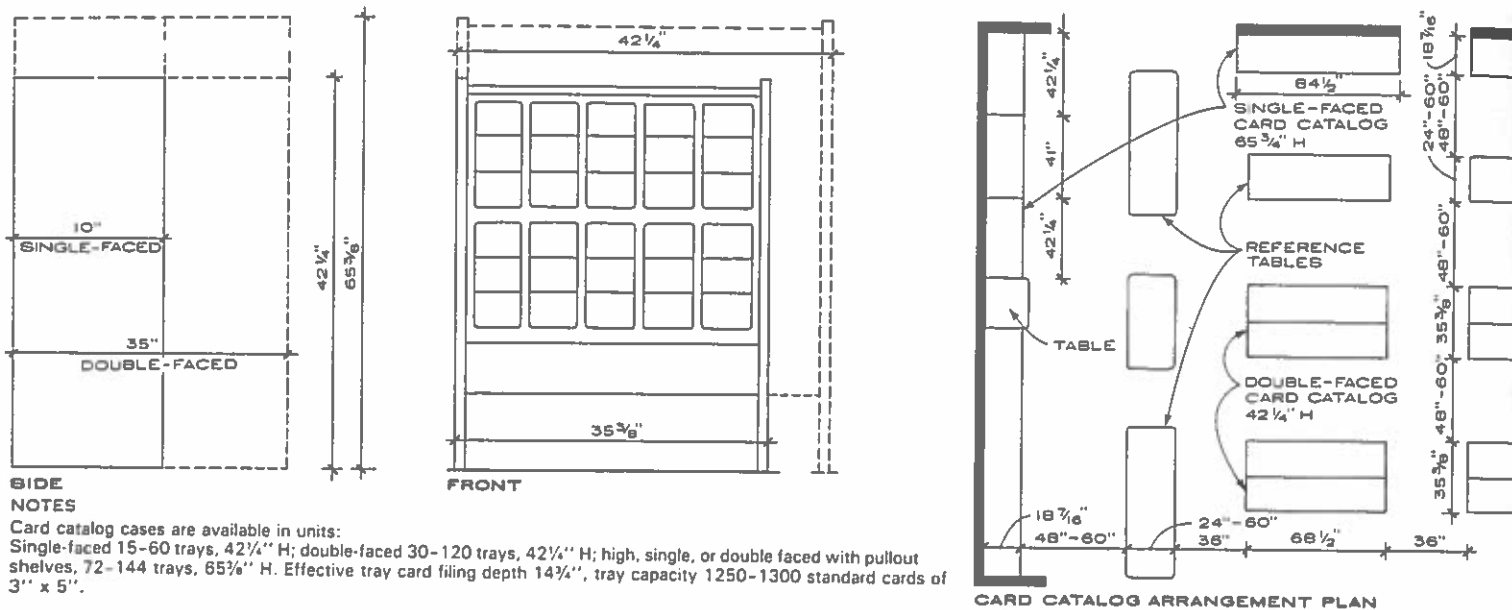
CARREL ARRANGEMENTS



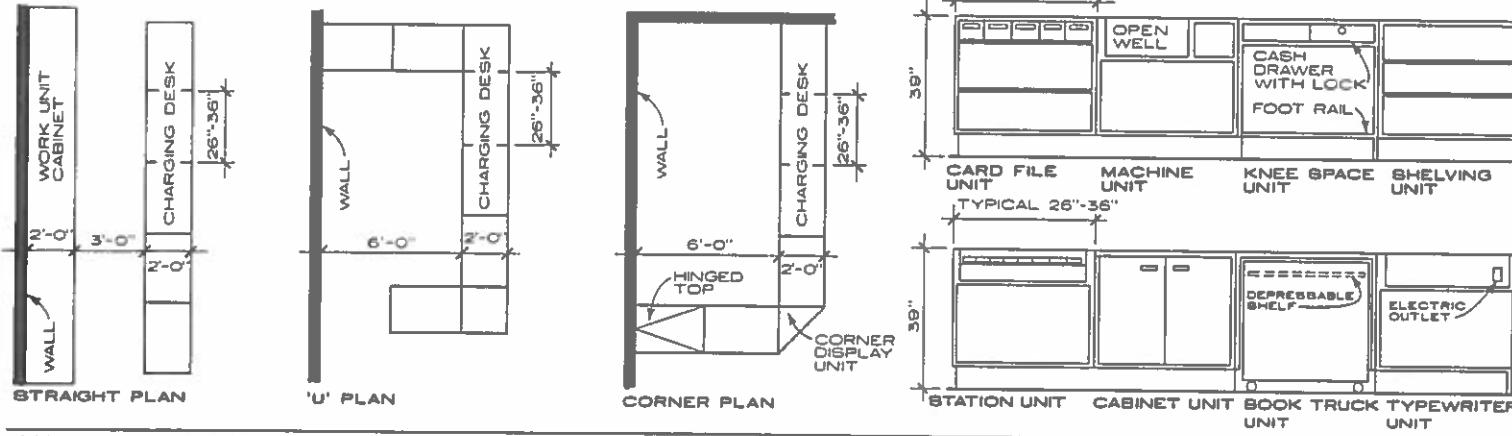
FRONT MICROREADER FOR FICHE OR FILM NOTE

Generally microfilm and microfiche readers and video display terminals (VDT) are positioned on tables.

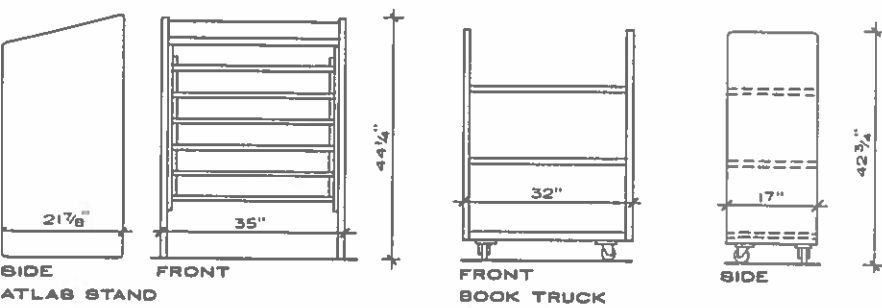
LIBRARY EQUIPMENT



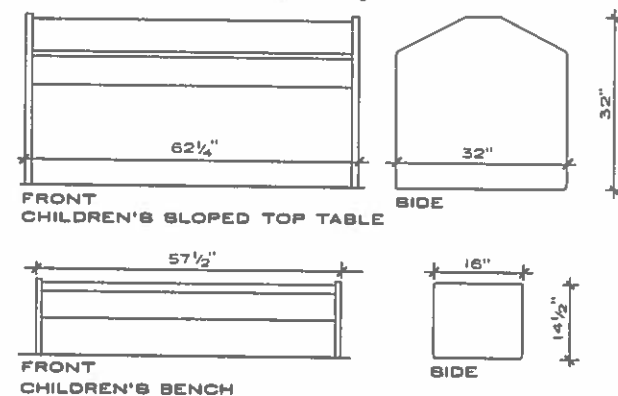
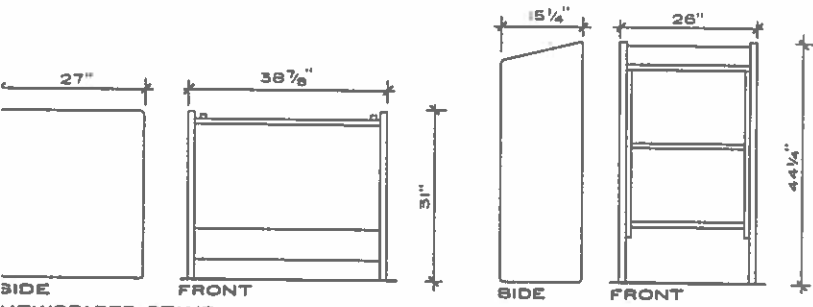
CARD CATALOG CASES



CHARGING DESKS

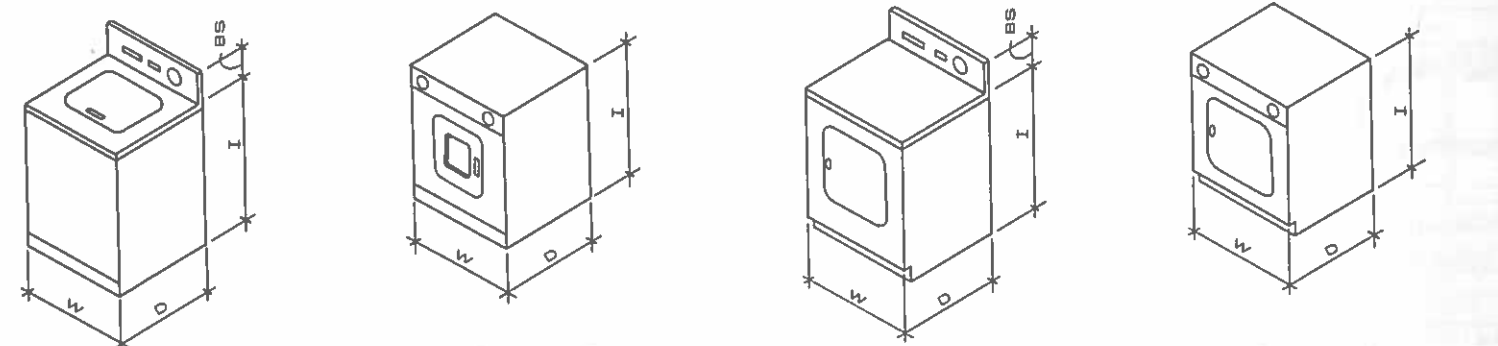


**MISCELLANEOUS LIBRARY EQUIPMENT**  
Magazine display rack: wall, counter, revolving island, mobile  
Vertical newspaper rack  
Paperback rack or island drum  
Record storage: stands, shelving, rollout browser bins  
Record display unit  
Video cassette cabinets and display racks  
Audio cassette cabinets and display racks  
Audio/visual carrel  
Periodical index table  
Consultation benches  
Display units: wall and freestanding  
Security installation at checkout/charge desk  
High-density mobile shelving



MISCELLANEOUS LIBRARY EQUIPMENT

Walter Hart Associates, AIA; White Plains, New York



**FREESTANDING - TOP OR FRONT LOADING AUTOMATIC WASHERS** (SOME HAVE KICK SPACES, SOME NOT)

|    | MIN.   | MAX.     | OTHER           |
|----|--------|----------|-----------------|
| W  | 25 1/2 | 27       | 25 5/8 - 26 3/4 |
| D  | 24 7/8 | 28 23/32 | 25 - 28 5/16    |
| H  | 36     | 36 1/2   | 36 1/8 - 36 1/4 |
| BS | 6 3/32 | 8 1/4    | 6 1/2 - 8 1/2   |

**UNDER COUNTER**

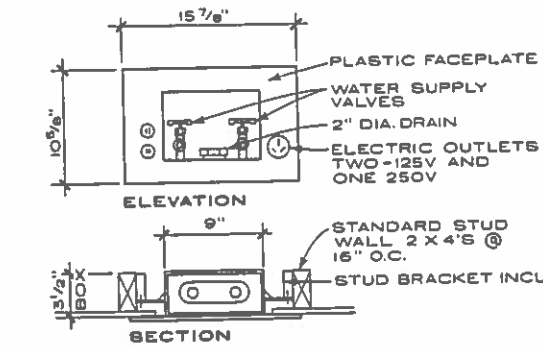
|   | MIN.   | MAX.   |
|---|--------|--------|
| W | 26 3/4 | 30 1/4 |
| D | 24 7/8 | 24 7/8 |
| H | 34 1/2 |        |

**FREESTANDING FRONT LOADING AUTOMATIC DRYERS** (SOME HAVE KICK SPACES, SOME NOT)

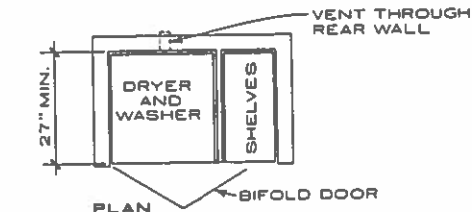
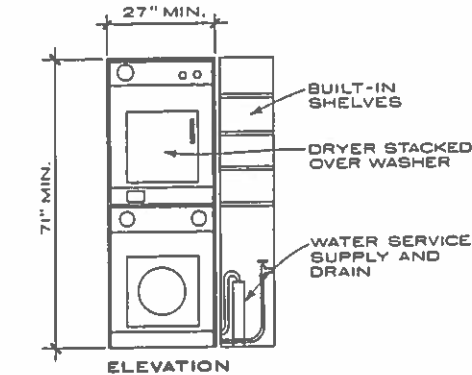
|    | MIN.   | MAX.     | OTHER           |
|----|--------|----------|-----------------|
| W  | 26 1/4 | 31 1/2   | 27-31           |
| D  | 24 1/8 | 28 23/32 | 25 - 28 5/16    |
| H  | 36     | 36 1/2   | 36 1/8 - 36 1/4 |
| BS | 6 3/32 | 8 1/4    | 6 1/2 - 8 1/2   |

**UNDER COUNTER**

|   | MIN.   | MAX. |
|---|--------|------|
| W | 26 3/4 |      |
| D | 24 7/8 |      |
| H | 34 1/2 |      |



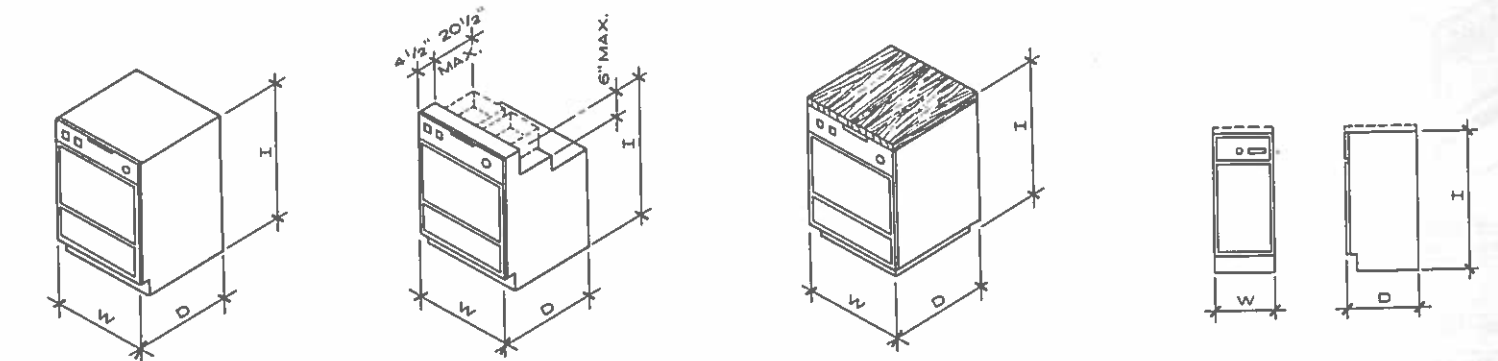
UTILITY CONNECTION BOX (RECESSED)



WASHER AND DRYER STACKED IN CLOSET

GENERAL NOTES

See kitchen & laundry layout pages for locations of washers & dryers and wall chases for pipes & vents and for dishwasher locations. Where clearances of doors of machines (when open) may be a problem, check manufacturers catalog for "open-door" dimension. All dimensions given are actual ones but certain variations in body design may affect actual depths of models. Check all units for exact voltage. Some units available with gas.



AUTOMATIC DISHWASHERS

| UNDER COUNTER |          |        |        | UNDER SINK |        |        | MOBILE (WITH COUNTER TOP) |   |          |        |        |
|---------------|----------|--------|--------|------------|--------|--------|---------------------------|---|----------|--------|--------|
|               | MIN.     | MAX.   | OTHER  |            | MIN.   | MAX.   | OTHER                     |   | MIN.     | MAX.   | OTHER  |
| W             | 23       | 24     | 23 7/8 | W          | 24     | 24 1/4 | 24                        | W | 22 1/2   | 27     | 24 5/8 |
| D             | 23 11/16 | 26 1/4 | 25 1/2 | D          | 24     | 25 1/2 | 25                        | D | 23 11/16 | 26 1/2 | 25     |
| H             | 33 1/2   | 34 1/2 | 34 1/8 | H          | 34 1/2 | 34 1/2 | 34 1/2                    | H | 34 1/8   | 39     | 36     |

TRASH COMPACTOR: UNDER COUNTER OR FREESTANDING

|   | MIN.   | MAX.    | OTHER  |
|---|--------|---------|--------|
| W | 11 7/8 | 17 3/4  | 14 7/8 |
| D | 18     | 24 3/16 | 18 1/4 |
| H | 33 1/2 | 35      | 34 1/2 |

William G. Miner, AIA, Architect; Washington, D.C.  
R. E. Powe, Jr., AIA; Hugh Newell Jacobsen, FAIA; Washington, D.C.