HAZARD-FREE HOUSES FOR ALL — YOUNG OR OLD

All houses should provide safe and comfortable living for their occupants — young or old.

If a house is thoughtfully designed, it can, without major alterations, fulfill the much-talked of needs for:

- **A safe environment for any family.*** The high rate of home accidents makes it imperative that houses be designed and built to eliminate as many hazards as possible for all members of the family throughout the life span. It is cheaper to build safety precautions into new construction than to add them later.

- **A suitable house for people past middle age.** The needs of older people are only an intensification of the needs of the general population — that is, convenience becomes a necessity and safety becomes paramount. A flight of stairs that is difficult for a young adult to manage, may be impossible for an older person. A slippery walk may result in a bruise for a younger person, but for an older person it may mean a broken hip. Unusual features, that might jeopardize the resale value of a house or make it less suitable for occupancy by others, are not essential for any age group.

- **A convenient house for the physically disabled.†** A few special adaptations will probably be necessary in most houses which are to be occupied by wheel-chair patients or persons who must conserve energy for their well-being; however, if a house is well-planned, it should be possible to make these adaptations without major alterations. Considerable research on living practices and environmental needs for heart patients has been done by various heart associations, and on energy-saving kitchens by the Clothing and Housing Research Branch, Department of Agriculture. Research on kitchens for wheel-chair patients has been done by the University of Illinois, Department of Home Economics.

It is assumed in this publication that basic safety standards for structural soundness, fire resistance, sanitary plumbing, and safe wiring, as specified by local or national building codes, will be met by architects, builders, and/or contractors.††

For detailed information on the various phases of house planning and construction, see other pamphlets in the Small Homes Council’s circular-series.

* The encouragement of safe practice is as important as a safe environment in reducing home accidents. Fatigue, psychological factors (worry, emotional upsets), careless habits, and the lack of bodily coordination (particularly among children, the sick and the aged) are causes of accidents which a safe environment alone cannot eliminate. Care in planning a house, however, can reduce the likelihood of serious injuries from such accidents. For suggestions of safe practices in homes, write to the National Safety Council, 425 N. Michigan Avenue, Chicago, Illinois 60611


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GOOD DESIGN REDUCES HAZARDS

This house plan is efficient in its arrangement and use of space. Traffic routes are short and simple; related areas are close together; adequate storage is provided at the primary points of use. The plan is suitable for occupants of all ages because the family room can be easily converted to a bedroom when children are grown and a downstairs bedroom is needed by aging parents.

A house of efficient design from the standpoint of space arrangement and use is well on its way toward being a hazard-free house. Efficient arrangement reduces disorder, fatigue, and the likelihood of falls. Good house design requires:

• Placement of related activity areas on the same level and close together — i.e. a coat closet near the front entrance; a play area for preschool children near the mother’s work area; drying area near laundry equipment.

• Short, simple traffic routes which are adequately wide for their purpose.

General passage halls should be at least 3'-4" wide; the passageway between the front of a kitchen cabinet and the front of an appliance, 4 feet or more.

Interior doorways should have a free opening of 2'-6" to provide clearance for moving furniture and also for wheel chairs. This means that doorways having hinged doors should be at least 2'-8" wide; doorways with sliding doors, at least 2'-6".

• Ample storage space in every room where it will be needed.

• An adequate amount of non-glare light, both natural and artificial.

• No unnecessary changes in floor level, and no sharp corners or projections, such as on mantels.

The one-story house is desirable for people past middle-age. Multiple-level houses should, if possible, have a bedroom and a bathroom on the first floor.

Passageways and doorways should be wide enough for furniture to be moved with ease.
STEPS, STAIRWAYS AND FLOORS

Falls are one of the major causes of home accidents. The possibility of falls for young and old is reduced considerably by the one-level house which has non-skid floors and non-trip floor coverings.

IF THERE IS A CHANGE IN LEVEL

Small Changes in Level
Small changes in level are hazardous. For this reason, avoid single steps — both outside and inside the house. Stairs should have at least 3 risers; single risers are only acceptable at the entrance stoop.

Landings for exterior steps leading into the house should be on approximately the same level as the inside floor.

If small changes in level are necessary, a ramp can be used. (If provision is being made for wheel chairs, the desirable maximum rise of ramps is 1.4 inches in 12 inches. In no case should the rise exceed 2 inches in 12.)

Stairways
If the house is to have a basement or second story, precautions must be taken in designing the stairway in order to reduce the number and the seriousness of possible falls.

• Stairways — long or short — should have handrails on both sides for all steps. Furniture handling dictates that the minimum clear width between handrails be 3'-4".

• Short flights of stairs with landings are preferable to a single straight flight. No straight flight should have more than 16 risers.

• Stairways with winders (steps of non-uniform width) are dangerous, due to the change in the width of the tread, and are not recommended.

• Stairways should not be steep. Risers should be uniform in height; treads, uniform in width. The sum of the height of a riser and the width of a run (tread less overhang) should not be less than 17 or more than 18 inches. Overhang should be 1 to 1 1/2 inches.

For interior steps, the desirable height for risers is 7 inches. Six inches is suggested for stairways to be used by older or slightly handicapped persons.

For exterior steps, the height of risers should be limited to 5 to 6 inches.

• Open risers and balusters offer special hazards to the preschool child. The former should be avoided; the latter should be so spaced that a child cannot get his head caught between the spindles.

• All stairways should be well-lighted. Install indoor switches for outdoor steps, and three-way switches at top and bottom of all stairs.

Obstructions
Because all traffic areas should have a smooth even floor, do not use interior door thresholds.

Where sliding doors or partitions are installed in room or passageway areas, ceiling tracks are preferred to floor tracks. Tracks which protrude above floor level should never be used in traffic areas.
Finish of Walking Surfaces
Floors and stairways finished with materials which do not require waxing are preferable to those that do. Waxing floor surfaces may improve the appearance and wearing qualities of the floor, but it may create a serious slipping hazard if improperly applied. If wax is necessary, use a slip-resistant type. Unwaxed wood and cork tile have high non-slip qualities.

Non-slip flooring is especially important in the kitchen and bathroom. Unglazed ceramic mosaic tile or unwaxed vinyl or vinyl asbestos is suggested for these rooms.

The use of detergents rather than soap is recommended for washing linoleum, vinyl, terrazzo, and ceramic tile floors since the detergents make the floor less slippery when it is wet.

Floor Coverings
From a safety standpoint, wall-to-wall carpeting is strongly recommended. Partial floor coverings are apt to be hazardous because people trip or slip on them. If small rugs are used, they should have non-skid backs or should be used with non-skid pads.

All carpets and rugs should lie smooth, especially at the edges where people start across them. If necessary, tack rugs down at the edges.

STORAGE

Many falls can be averted by providing plenty of well-designed storage space and by training members of the family to put objects in their assigned places when not in use. Objects left on floors and steps, and the use of make-shift ladders to reach stored objects are major causes of falls.

Storage space should be easily accessible and convenient. It should be possible to store objects close to their point of use and within easy reach.

- No shelf should be higher than 72 inches from the floor. Shelves adjustable in height are recommended, especially for children's use.
- Shelves of storage units should be constructed to support the weight of objects to be stored without tipping or collapsing. Glass shelving, when used for such purposes as medicine cabinets, should be shatterproof.
- Closets and storage units having full-front and full-height access provide more efficient and less hazardous storage than those having an ordinary door which is narrower and shorter than the closet front.
- Storage space should be well-lighted. Closets more than 3 feet deep should have an electric light, preferably one that automatically turns on or off as the door is opened and closed. To avoid a fire hazard, place the light so that flammable material cannot come in contact with the bulb.
- As a guide to the amount and kind of storage space recommended in homes, see the Small Homes Council’s publications, Cabinet Space for the Kitchen and Household Storage Units.

Good housekeeping practices in the storage of articles are essential to avoid mishaps and fires. Important precautions include:

- Store poisons in containers which are well-marked to avoid errors. Place the containers away from the reach of children. Cabinets with locked doors are recommended for storage of poisons.
- Avoid cluttered storage of rags, papers, and trash which are likely to be ignited spontaneously. Keep oily rags and highly flammable solutions in tightly closed metal containers and store them outside of the house proper. (Most states require that gasoline containers be painted red.)
- Take precautions in storage (and disposal) of pins, razor blades, scissors, knives, matches and pressurized containers.
The hazard of bumping into doors can be materially reduced if hinged doors swing into rooms. An outward swing is allowable only if the door does not open into a line of traffic. Never hang a door so that it swings into a downward flight of stairs. The practice of pushing doors back against the walls when they are not in use also reduces accidents.

Installation of sliding or folding doors is another way to reduce accidents. These doors are especially recommended for closet fronts since they also conserve space.

Floor-to-ceiling doors of glass usually need protection—especially when there are children in the family. The suggestions given in the section on windows (page 7) apply to such doors.

Avoid the use of spring-activated doors and double-acting doors.

Isolate the bedroom area from the rest of the house by a door in order to prevent rapid spread of fire.

**Hardware**

Cylinder-type lock sets are recommended for all exterior doors because they permit the door to be opened from the inside without use of a key in case of emergency.

Since bath-set locks used on bathroom and bedroom doors lock from the inside only, they must have a key or other device for unlocking from the outside in an emergency. Such a key should be labeled and placed so that it is readily available.

Shallow closets with full-front access do not permit people to walk into them; thus, they lessen the possibility of a person being trapped when the door is closed. All closets need a device on the inside of the door so that it can be opened from the inside.

Clothes hooks on doors should be placed above eye level.

Glass and china doorknobs present a breakage hazard. Their use is not recommended.
Windows

Never put sidewalks directly beneath windows that open outward.

The sill of a stairway window should be at least 36 inches above the floor so that a person will not go through the glass in the event of a fall down the stairs.

Glass which shatters when a person falls against a window can be a cause of injury.

Accidents of this type can be reduced in floor-to-ceiling windows by placing planting boxes on the interior and by landscaping the exterior. A horizontal barrier is another effective device.

To avoid having people mistake floor-to-ceiling glass areas for a door opening, start the window 6 to 10 inches from the floor or divide the glass at a low height so that it will surely be noticed.

To protect persons from colliding with projecting window sash of awning or casement windows, put a planting bed beneath them—never sidewalks.

Suggested minimum height of sills for second-floor or stairway windows is 36 inches above the floor. These windows should be provided with screens, securely fastened in place but removable in event of fire. Such screens are particularly important on stairway windows as a guard in event a person falls.

All windows which cannot be reached from the ground or porch should be of a type which can be washed from the inside.

Permanent-type, combination storm windows and screens that can be removed and cleaned from the inside are recommended. Roll-up or tension window screens used with windows of sealed double glass are most convenient.

To permit easy exit in case of fire, provide either a door to the outside or at least one window with a 24" x 30" (or larger) opening in all major rooms, including basement recreation room. The bottom of this window should not be higher than 36" above the finished floor in all rooms above grade and 54" in basements. The opening should not be blocked by plants, air-conditioning units or other items.
Special consideration must be given to the design of the kitchen and the bathroom to eliminate hazards peculiar to these rooms.

**The Bathroom**

To reduce the likelihood of falls in the bathroom, install:

- Shower or low tub with a flat, non-skid bottom.
- Nonbreakable and firmly anchored grab-bars by the tub and in the shower.
- No convenience outlet or electrical switch should be within reach of the lavatory, bathtub or shower.

Towel rods which are easily broken — glass, ceramic, brittle-type plastics — should not be used.

**The Kitchen**

A kitchen designed in accordance with recommendations in *Cabinet Space for the Kitchen, Kitchen Planning Standards* and *Separate Ovens* (Small Homes Council circulars) will be relatively free from hazards design-wise.

The maximum height of 72 inches for shelving, as noted on page 4, should be observed. Storage space above a range is not recommended.

Other points to be considered are:

- Do not install a range or counter burners beneath a window. Do not use flammable materials for curtaining windows near a range.
- Counters, range and sink should preferably be the same depth (front to back) so that they will not protrude into the line of traffic. Projections, if unavoidable, should be rounded.

**Plumbing**

Overheated water can cause serious scalding at the sink, lavatory, bathtub, or shower. To avoid this, install: 1) an automatic water heater with a temperature control and a relief valve, 2) a pressure-sensitive, automatic mixing valve on the shower, and 3) mixing-type faucets in the lavatory and bathtub.

Faucet handles should be easy to grip and turn, and should have no sharp edges.

**FURNISHINGS**

Improperly designed furniture can inflict injuries.

- Avoid sharp edges on furniture — choose pieces with rounded corners and edges.
- A catch on the back of drawers will prevent them from being pulled too far and dropped.
- The bottom surface of large or heavy furniture should be high enough off the floor to permit cleaning underneath. Shifting heavy furniture around for cleaning can result in physical strain.

**ELECTRICAL EQUIPMENT**

Power tools and metal cabinets of electric dryers, washing machines, air-conditioning units and other major electrical appliances should always be grounded. This is particularly important if the appliance is located in a room where there is apt to be dampness.

If there are small children in the family, keep power tools in locked cabinets when not in use, and use safety caps on all convenience outlets throughout the house.

**HEATING UNITS**

Whenever possible, install the central heating unit in a separate space enclosed by fire-retardant construction and allow the necessary clearances (see manufacturer’s directions) to avoid fire hazard. A sprinkler-head installed over the heating unit is an excellent precaution against fire.

Gas units should be vented to the outside; oil and coal units require flues. Provide an adequate air supply for the heating unit to prevent faulty and hazardous operation.