

# *Family* SHELTER PLANNING



TEXAS A & M UNIVERSITY • College Station, Texas

---

TEXAS AGRICULTURAL EXTENSION SERVICE, J. E. Hutchison, Director

# CONTENTS

- 3 What Is Fallout?
- 3 Protection Against Fallout
- 5 Shelter Considerations
- 5 Shelter Alternatives
- 11 Shelter Furnishings and Equipment
- 12 Shelter Arrangement
- 14 Disaster Shelter Financing

*Suggestions contained in this publication are only highlights. Each family will have different ideas and preferences in carrying out shelter plans and preparations. Emergency housekeeping will not be easy, but neither will it be too difficult if properly planned and arranged. You cannot live luxuriously under emergency conditions, but you can expect to live.*

ORGANIZATION

OPERATION

AGRICULTURAL EXTENSION SERVICE  
U.S. DEPARTMENT OF AGRICULTURE



# FAMILY SHELTER PLANNING

Laura J. Russell, Extension Area Specialist in Housing-Home Furnishings; Bobye J. Riney, Former Extension Rural Civil Defense Specialist, Texas A&M University.

**N**O ONE LIKES to think about a nuclear attack, but in these days of international tension, it could happen. Government officials have been making civil defense preparations for years. In the event of an all-out attack, these officials say 85 to 90 percent of this nation's population could survive radioactive fallout if sheltered adequately. Such preparation also assures family protection in case of natural disaster.

The following information is designed to enable rural and urban families to know their own situation as to existing protection and the ways this protection can be increased.

## WHAT IS FALLOUT?

Why are fallout shelters necessary? When a nuclear weapon explodes, it forms a fireball, pulverizing everything within a 3 to 5 mile radius. It carries this debris upward, mixes it with radioactive materials of the bomb and forms a mushroom shaped cloud. When the pulverized material cools, it comes back to earth and constitutes fallout.

Only very strong, reinforced underground shelters can protect against the first three dangers of a nuclear explosion—blast, heat and initial radiation; but radioactive fallout, the fourth and greatest danger to the largest number of people, can be stopped by shielding. Radioactive fallout releases gamma radiation, similar to X-rays, that can penetrate various thicknesses of material including the human body.

## Fatal Accumulated Dosage

Fifty percent of all individuals exposed to 450 roentgens\* would become sick and die; 600 r. would be fatal to 99 percent. However, small amounts of radiation, absorbed over a long time are less harmful than a short concentrated exposure, since the body cells are rebuilding constantly.

## PROTECTION AGAINST FALLOUT

Three things give protection against fallout—*time, distance and mass shielding.*

\*Roentgen: A unit for measuring radiation exposure.

**Time**

Fallout decays with the increase of time. For every 7-fold time increase, radioactive intensity decreases by a factor of 10. Example: if radiation intensity measured 1,000 roentgens per hour (r/hr.) at H+1 (1 hour after blast), seven hours later it would measure only 100 r/hr.; and, 49 hours later (7×7) it would measure 10 r/hr.

**Distance**

The farther from the radiation source, the smaller amount of radiation received.

**Shielding**

Various thickness or mass give protection against radiation. The heavier and denser the shielding material, the more and better the protection.

Material	Thickness necessary to reduce radiation to 1/100 Inches
Concrete	16
Soil	24
Wheat	48
Wood	60

Any type structure is safer than none at all, so everyone has some kind of protection, but is it enough? The following guidelines can help families rate protection offered by the home and decide if more is needed.

*Determine distance from possible nuclear explosion.*

Military installations are primary first-strike targets. While the prevailing, high-altitude winds in Texas generally are from west to east, this may not always be the case. Further, no one can predict where detonations will occur. For these reasons, each family should provide as much protection as possible.

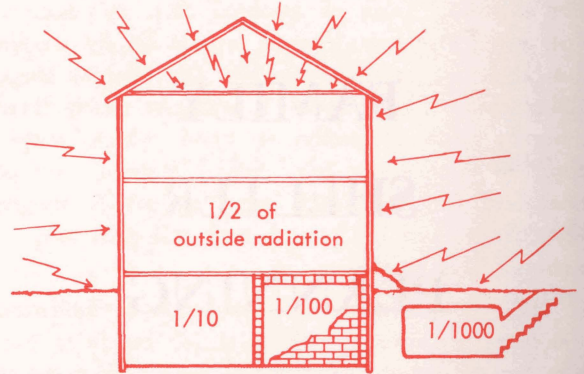
*Estimate protection value of safest place in home.*

The amount of protection offered by any structure is known as the Protection Factor (PF). The PF expresses how much less radiation a person would get in a protected place than if unprotected in the open. If a structure has a PF of 100, it is 100 times safer than outdoors.

*Example:* Outside radiation measured 1,000 roentgens per hour (r/hr.) and a shelter had a PF of 100, thus radiation inside the shelter would be 10 r/hr.

Protection Factors of common buildings are approximately:

Frame house	2
Frame house basement	10
Inside of brick house	10
Brick house basement	30
Improved, concrete block basement shelter	100
Underground shelter with 3 feet of earth	5,000



*Example:* Assume radiation measured 1,000 r/h—the frame house with a PF of 2 would cut radiation to 500 r/hr. The accumulated dose 36 hours later would be approximately 1,300—still fatal. But the improved, concrete block basement shelter with a PF of 100 would cut radiation to 10 r/hr. Accumulated dose 36 hours later would be approximately 126 r/hr.

*Example:* Assume the home is directly downwind from a surface explosion of a 10-megaton weapon, with wind speed of 60 miles per hour, at an altitude of 40,000 feet. Figures below in parentheses are the expected total roentgens of radiation after 2 weeks of continuous occupancy.

Miles distance downwind from explosion	Outdoors	First floor of 2-story house	Basement	Basement shelter	Underground shelter
10	NO SURVIVORS			Dead and Injured from blast	USUALLY NO SYMPTOMS OF ILLNESS
30	(8000)	(4000)	(800)	(80)	
50	(8000)	(4000)	(800)	Little Sickness (80)	
100	(3000)	(1500)	Many Sick (300) Some Die	(20)	
200	(1200)	(600)	(120) Little Sickness (80)		
300	(800)	Many Die (400)			
400	Many Die (400)	Some Sick (200)	(40)		

Shelter Rating Chart. Circle your family's protection.



## SHELTER CONSIDERATIONS

Many factors determine a family's needs, such as nearness to an assumed target, available resources and family preferences. There are many alternatives when considering shelter—each family will find different ways to meet these needs. All will consider these same basic factors:

### Shielding

Any number of materials may be used for shielding against gamma radiation. The heavier and denser the material, the less it takes and the better it is. The shielding value of material such as concrete, dirt, wood and hay depends largely on its weight per cubic foot, or mass density. Dirt weighs about 100 pounds per cubic foot. It will give nearly three times as much protection as wood, which weighs about 38 pounds per cubic foot. A cubic foot of reinforced concrete, brick, sand or gravel weighs between 100 and 150 pounds and will provide protection in that ratio.

For example, if you want shelter to cut radiation 100 times, to have 1/100th as much inside as outside, you need about 16 inches of reinforced concrete on the shelter sides and about 10 inches on top. To do the same job with dirt, you need 2 feet of earth on the sides and 15 inches on top.

### Size

Shelter size will vary according to number of persons occupying it. Allow 10 square feet per person as a minimum. More space is desirable from the standpoint of comfort and utility.

### Location

The shelter may be in the home basement, or constructed outside aboveground, underground or partly underground. Underground shelters may be connected to a basement, if available, to provide additional area for movement as radioactive intensity decreases.

### Entrance

The entrance must have at least one right angle turn unless a heavy shielding door is used. Radiation, like light, travels in a straight line. Sharp turns in a shelter entrance will reduce radiation intensity inside. The doorway should be as small as possible, yet permit movement of supplies and equipment. Larger items may need to be placed in the shelter before it is completed.

### Ventilation

For a basement shelter, adequate ventilation can be provided by vents in the shelter wall, permitting

air to be drawn from the upper floor(s). A blower may increase comfort. A blower is essential for underground shelters and should provide not less than 5 cubic feet per minute of air per person. Use vent pipes at least 3 inches in diameter for blowers. Special filters are not necessary, if the intake is protected with a hood or gooseneck fixture. If the shelter will have open fires for cooking or heating, provide an extra air intake for adequate oxygen. Electric hot plates and electric space heaters will not use up oxygen.

### Radio Reception

The shielding necessary to keep out radiation also affects radio reception. Check reception as soon as shelter is complete. You may need to install an outside antenna to receive reports from the Emergency Broadcasting System on essential information during an emergency. Radios should be battery operated with extra batteries provided.

### Lighting

Provide continuous, low-level lighting with a four-cell hot-shot battery to which is wired a 150-milliamperere flashlight-type bulb. Such a device with a fresh battery will furnish light continuously for at least 10 days. A spare battery assures a light source for 2 or more weeks. Also provide flashlight or electric lantern for periods when brighter lighting is needed. Shelters also should have a regular electrical outlet since power may be continued in many areas.

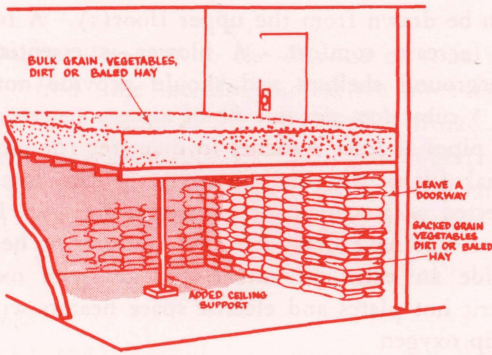
### Drainage

If fallout shelter is built below ground or partly in ground, provide drainage, regardless of the material used. In problem areas, where the terrain permits, install a tile drain around the shelter base to carry away ground water. In soil where the water table is likely to be high, use a partially buried or above-ground shelter.

## SHELTER ALTERNATIVES

Each family has the following choices when planning family shelter:

- The safest area in the home or on the farm
- Core concept
- Shelter in new house construction
- Basement as fallout shelter
- Construction of underground or aboveground shelters
- Convert storm or root cellars
- Community shelters



Added shielding gives extra protection to safest area in the home.

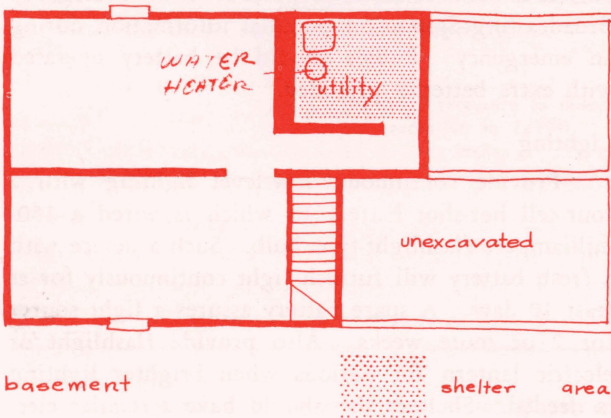
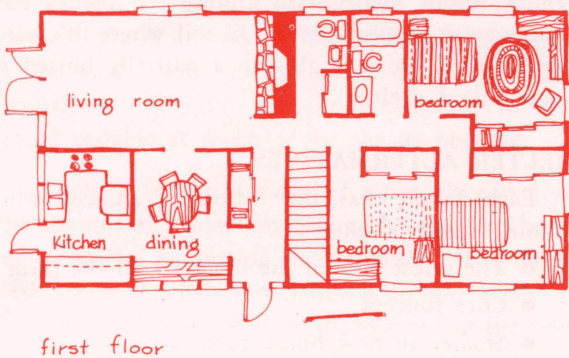


Illustration of a 26'x52' single-story house with basement. The shelter area in the basement is, in part, defined by two foundation walls and the masonry bearing wall supporting the fireplace construction.



The shelter area in the middle diagram above is covered with a concrete slab that also serves as a base for the tile flooring in the bathrooms of the lower diagram.

- Public shelters
- Emergency shelters

### The Safest Area

The safest area in the home usually is a center hallway or storage closet away from windows and outside doors. Extra protection may be provided by adding shielding. Stack sandbags, concrete blocks or other matter in front of doors, sides of house (if area is on outside wall) and overhead. When adding material, do not overload the structure. Beams may need to be reinforced with additional posts. Do as much reinforcing as possible before an emergency arises; with extra sandbags stored for fast use. It also may be necessary to add a blower and ventilating pipe. More protection is desirable in heavy fallout area, but this will best fit the needs of some families. Plan to provide more protection in the future if the situation changes.

### Core Concept as Fallout Shelter

In areas where fallout intensity may not be extremely high or where it is impractical to build underground due to water level, consider the core concept when adding shelter, remodeling the house or building a new house. This simply means that an inner portion of the house is reinforced with as much as 16 inches of concrete or a combination of 24 inches of concrete blocks and soil to assure a PF of 100 or more as shown on Pages 6, 7, and 8. Usually, reinforced areas will be the utility room or pantry of an existing house. Installing a hot water heater in the shelter area provides an extra source of drinking water.

### Shelter in New House Construction

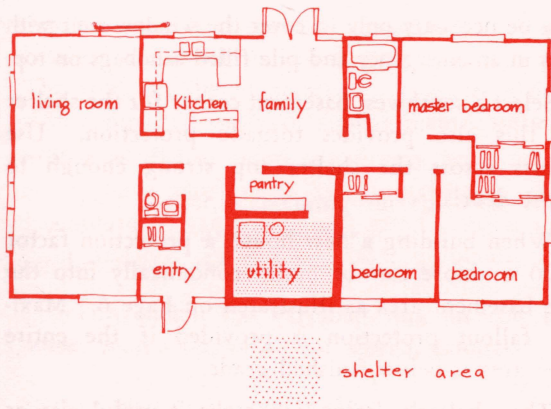
You have more planning flexibility at the beginning of your building program. By building a fallout shelter in a new house, space can be made more usable, construction work is less costly and the overall space relationships within the house will be better than if a fallout shelter is added to a house already built.

The core concept, basement, under and above-ground shelters discussed are all applicable in new house construction.

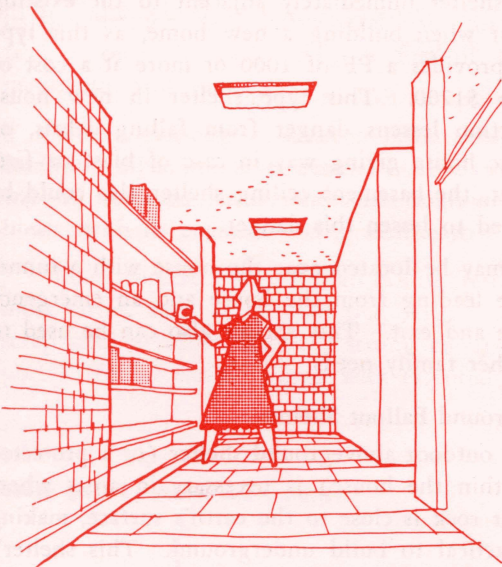
Other advantages of planning shelter at beginning of building program include:

*Natural protection.* When selecting a site, protection can be obtained from landscape features when assuming the direction of a nuclear blast. In some areas, the most probable direction can be predicted; such as toward known defense installations, indus-

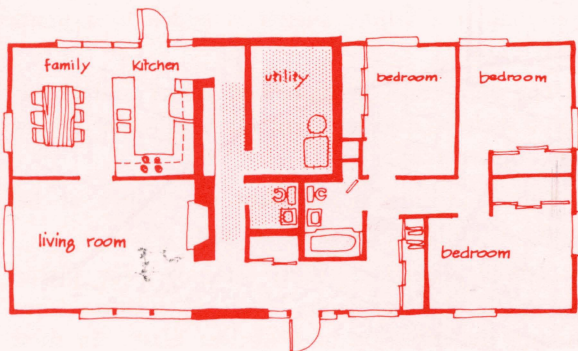




One story house plan showing shelter in utility area.



Kitchen pantry within sheltered area.



Another one story plan with shelter area indicated.

trial areas or the centers of large cities. Since any material casting a shadow offers some protection against blast and heat waves, a house could be situated on the far side of a hill or partially built into the hill. If your building site is close to a large water source, you may want to install a sprinkler system with appropriate drainage ditches. Washing away radioactive particles from the shelter's roof and sides reduces radiation intensity. This system requires water pumps, unless gravity flow is available.

*Other protection factors.* Paved terraces and drives next to the structure provide an area more easily decontaminated. Masonry buildings close by also act as a thermal shield, or can provide a barrier shield from fallout. However, if nearby buildings are flammable, they present a fire hazard. Distance between buildings should be at least 50 feet to eliminate fire hazard.

*Multipurpose uses.* Consider other uses of the shelter area in the early planning stages. The area could be used as a guest bedroom, recreation or play room, utility, storage workshop or darkroom.

*Built-in utilities and physical features.* These include water supply, hot water heater for extra water, bath facilities, electrical outlets, lighting, heating, hinged top bunks that fold up, hinged wall table and ample storage, (plan for lighting and water supply in case of power failure) and floor covering. If the house is arranged so that the kitchen, bathroom, utility room or entry hall is directly over the shelter, you could eliminate the wood floor by laying floor covering directly on the shelter's concrete roof in the basement. Savings in floor joists and wood floor further reduce shelter cost.

The following indicate both basement and core concept shelter protection.

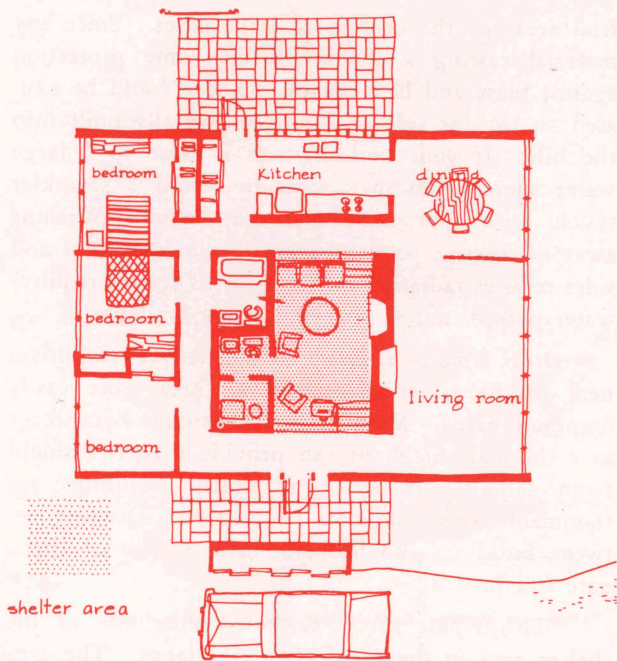
### Basement as a Fallout Shelter

A few Texas homes have basements which may provide as much protection as necessary, although most were not designed originally as fallout shelters and additional shielding usually is desirable.

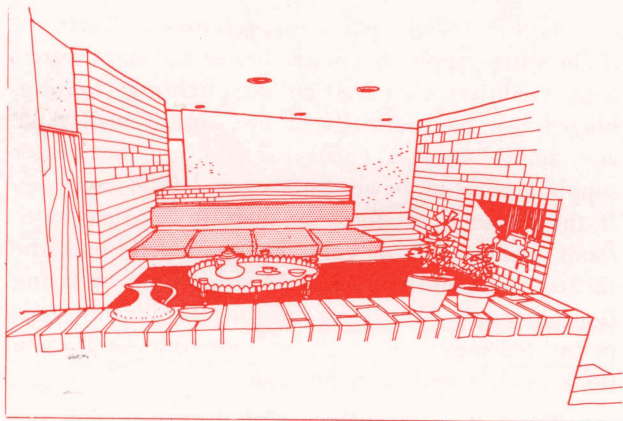
Civil defense authorities generally recommend building a concrete block shelter, a lumber lean-to shelter or a corrugated, asbestos cement lean-to shelter within the basement for maximum protection. This type generally is the least expensive as a do-it-yourself project, with price ranging from \$100 to \$300.

Avoid areas having outside windows. If it is necessary to build in this area, shield windows with materials of same thickness as walls. If a window is located in a window-well completely below grade,

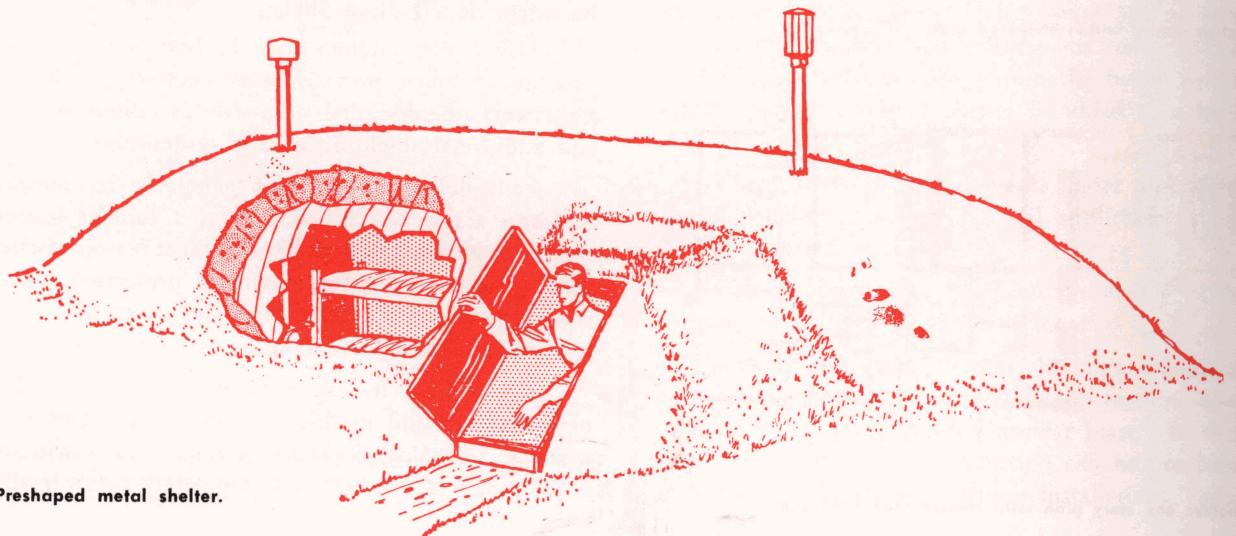




This plan shows the possibility of designing above-ground shelters that become an active area in the function of the plan.



Fireplaces provide emergency heating sources, and their massive construction provides excellent radiation barriers.



Preshaped metal shelter.

it may be necessary only to cover the window-well with boards in an emergency and pile filled sandbags on top.

Select a southwest basement corner for the shelter since this also provides tornado protection. Use supports across the shelter top strong enough to support debris.

When building a new house, a protection factor of 100 or more can be built economically into the entire basement area as illustrated on Page 6. Maximum fallout protection is provided if the entire shelter area is below finished grade.

This shelter's design can make it useful also as a hobby shop, darkroom or storage room.

### Underground Shelter

Some families prefer to erect an underground fallout shelter immediately adjacent to the existing house or when building a new home, as this type shelter provides a PF of 1000 or more at a cost of \$800 to \$1200. This type shelter in new house construction lessens danger from falling debris, or from the house giving way in case of blast or fire. However, the basement ceiling shelter also could be reinforced to lessen this danger.

It may be located near the house with a tunnel entrance leading from the house and an emergency entrance and exit. This shelter also can be used to meet other family needs.

### Aboveground Fallout Shelter

An outdoor aboveground shelter (or a protected core within the house) is necessary in areas where water or rock is close to the earth's surface, making it impractical to build underground. This shelter's exterior usually is constructed of two walls of concrete blocks, approximately 12 to 20 inches apart, tied



together with non-corrosive metal ties. The space between the brick is filled with compacted earth. The roof can be of reinforced concrete slab filled with compacted earth, or similar material, for added protection.

This shelter, depending on thickness of walls and roof, has a protection factor of 250 to 1,000 and can be constructed for about \$900 to \$1,250.

This shelter has excellent dual uses as a tool-house, workshop, utility or storage room.

### Storm Cellar as Fallout Shelter

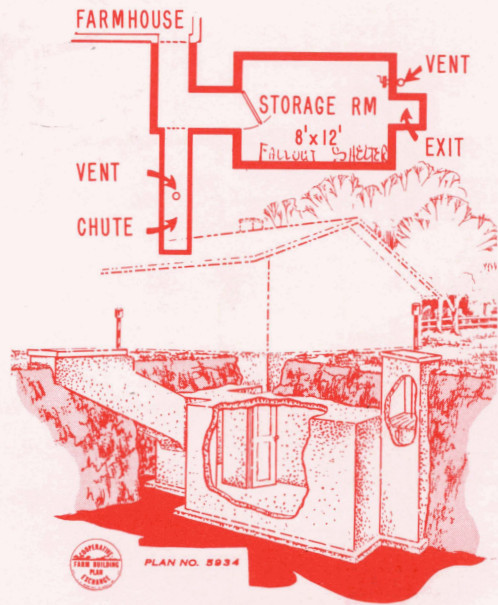
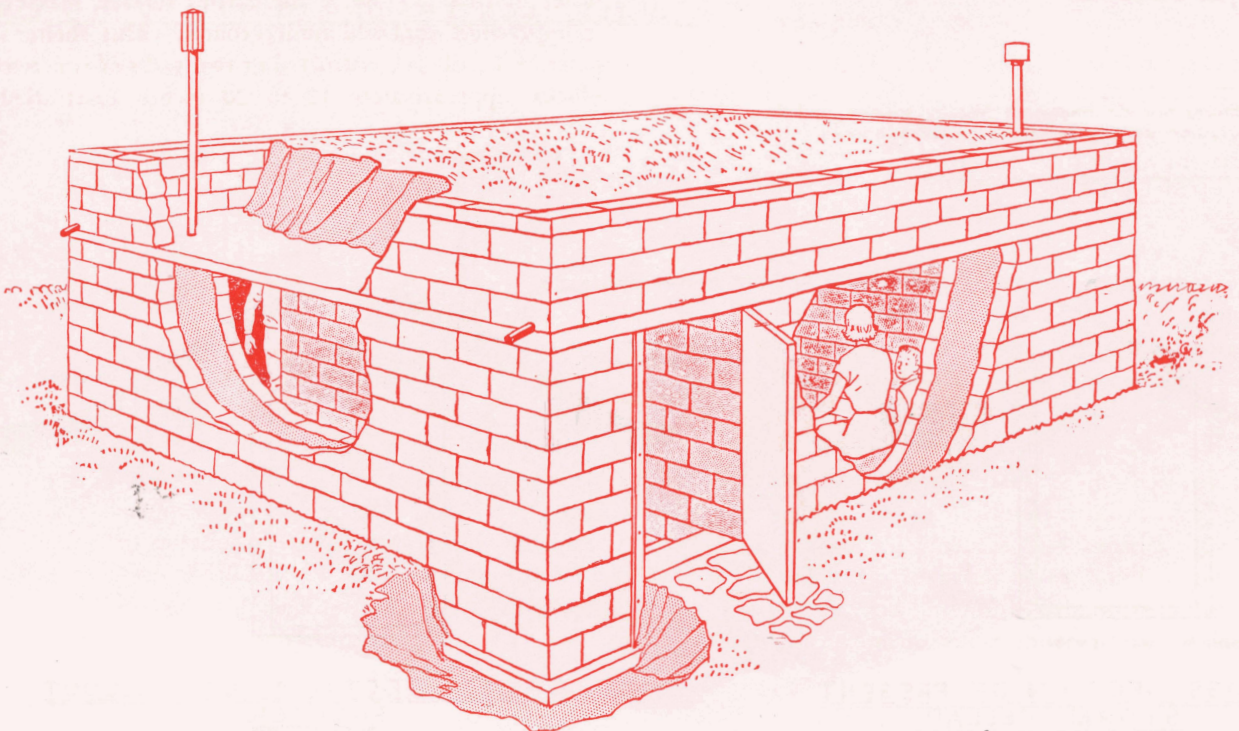
Many Texas families have storm cellars. With little effort and expense, these can be converted into excellent fallout shelters.

Most existing storm cellars will need either a baffled entrance or a heavy steel door, and ventilation. Cover the cellar with 3 feet of earth for maximum protection.

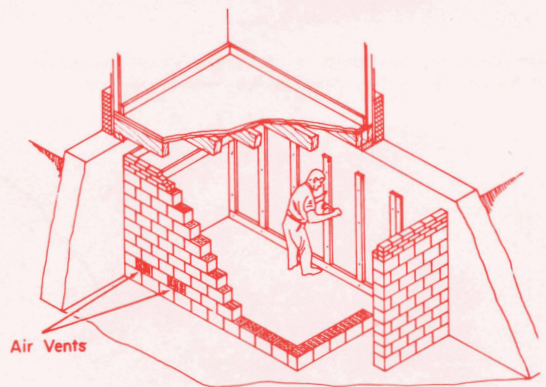
When building a disaster cellar, consider its location. Since tornadoes generally move from southwest to northeast, locate the cellar southwest of the house, with its entrance facing northeast.

Many construction materials can be found around most farms, such as railroad ties, large tree trunks, scrap steel or other materials strong enough to support 3 feet of earth. Equip with essential supplies.

Above ground concrete block shelter.

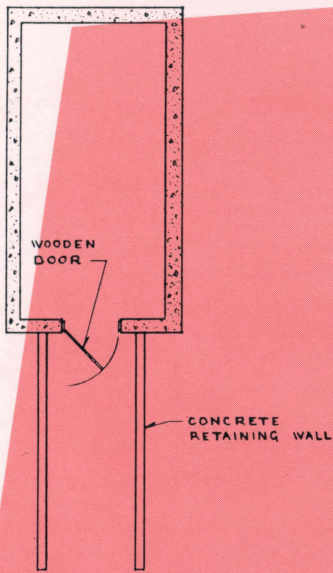


Farmhouse storage room-fallout shelter combination.

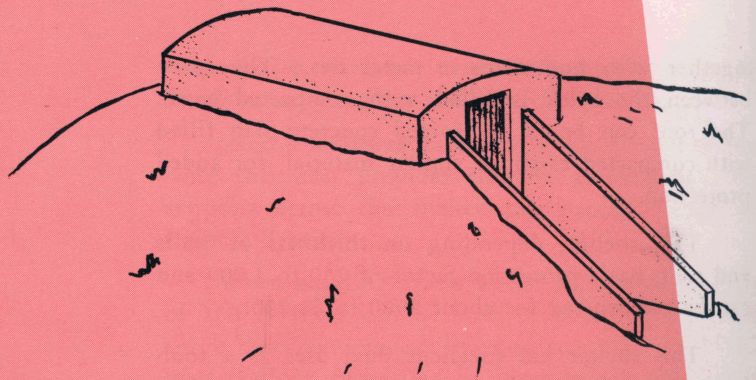


Concrete block corner basement shelter.

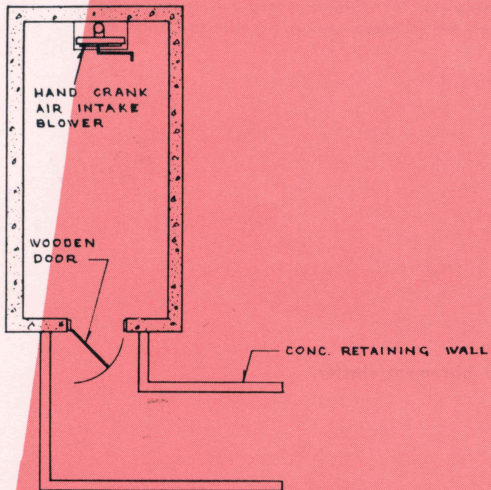




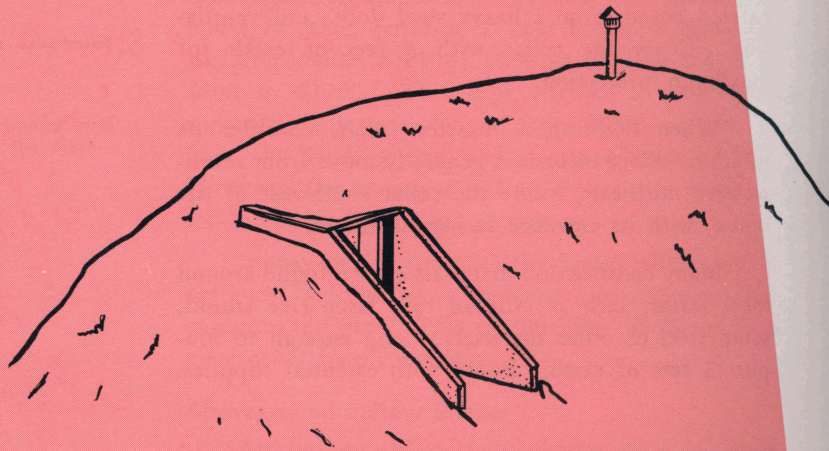
FLOOR PLAN OF PRESENT STORM CELLAR



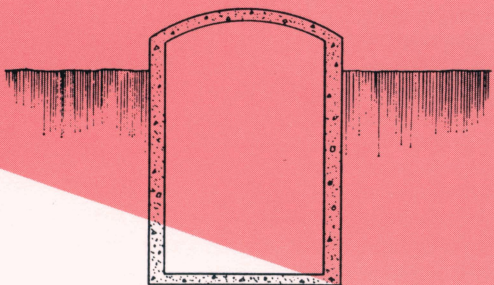
VIEW OF PRESENT STORM CELLAR



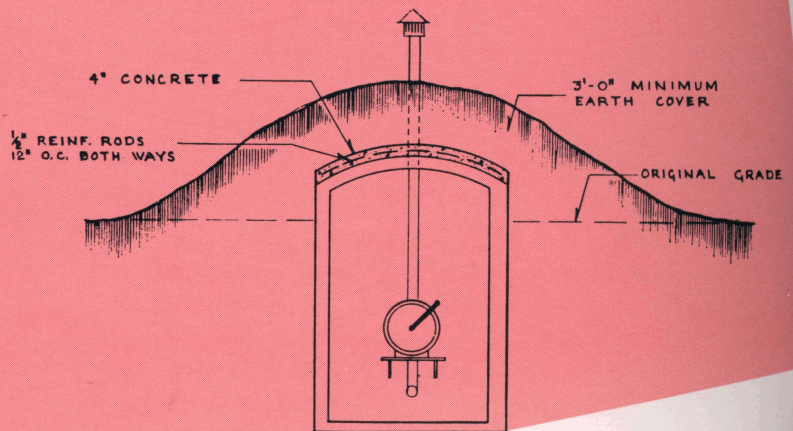
FLOOR PLAN OF FALLOUT SHELTER



VIEW AFTER CONVERSION TO FALLOUT SHELTER



CROSS SECTION OF PRESENT STORM CELLAR



CROSS SECTION OF FALLOUT SHELTER



## Public, Community and Emergency Shelter Areas

The Federal Government is marking and stocking certain buildings which meet a standard of 40 PF and can shelter 50 persons. To qualify these buildings are surveyed by engineers and are marked with the civil defense emblem and are stocked with survival items only. Know the location of these buildings in the community. Many communities are building shelters where families buy a share in the shelter. Any large building will provide some protection, the best area being the center away from outside windows and doors.

Tunnels, mines, caves and culverts also can offer some emergency protection when lacking other plans.

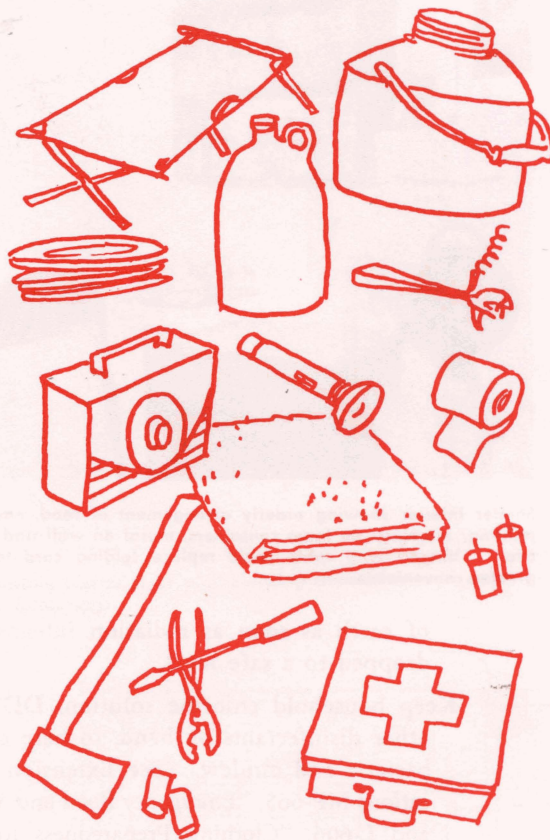
## SHELTER FURNISHINGS AND EQUIPMENT

### Furnishings

- Bunk beds, cots or sleeping bags
- Folding chairs or stools
- Hinged wall table or folding table
- Radio with batteries
- Storage closets and shelves

### Equipment

- Fire extinguisher or household soda
- Hand-operated blower
- Lighting
  - Electrical
  - Flashlight
  - Four-cell hot-shot battery wired to 150 milliamper flash light type bulb
  - Various type lanterns
- HEATING
  - Electric heater if electricity available
  - Mainly obtained by body heat in close quarters, blankets and warm clothing since open flame heating consumes oxygen
- WATER
  - Stored in bottles or large containers or canned. (See Extension Publication MP-665; "Emergency Food and Water.")
  - In rural areas where water is supplied by windmill and covered overhead tanks, water could be piped easily to shelter. If water purity is questionable, use approved, standard water purification methods such as (1) boiling, (2) chlorination, (3) purification tablets or (4) iodine drops.



### ● SANITATION

Tightly covered cans for garbage (wrap garbage in newspaper before putting in can).

Human waste, if not properly cared for, spreads diseases as typhoid, dysentery and diarrhea.

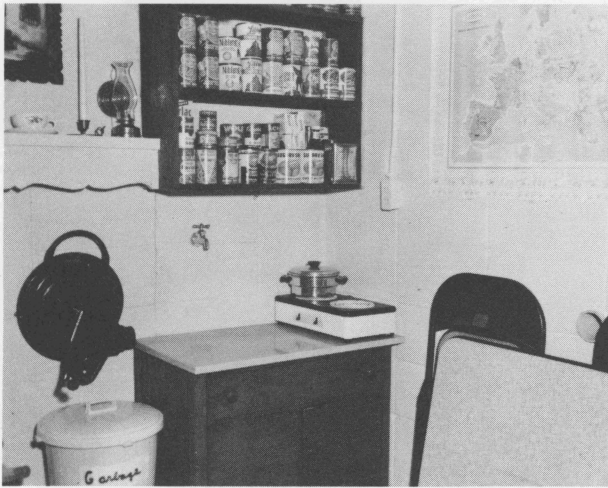
Use metal pail with sealable, disposable plastic bags.

Regular toilet seat might be placed over pail.

Cut seat out of chair, place pail under it to make commode, especially nice for elderly people.

Tightly covered, 10-gallon water-proof container lined with plastic bag. Attach lid to container to prevent loss. May be used for emergency storage of body waste. Empty small pail into large vessel as often as necessary.

Keep in separate room or in most isolated section until conditions permit removal from shelter. If possible, use caustics and disinfectants to break down solid waste materials and minimize danger of infection. Bury human waste under 12 to 24 inches



Shelter interior showing orderly arrangement of food, emergency lighting, markings on large containers, mural on wall and storage chest. Hinged wall table could replace folding card table for greater convenience.

of earth as soon as radiation intensity has dropped to a safe level.

Keep household chlorine solution, DDT and other disinfectants on hand, to help control bacteria and mildew. (See Extension publications MP-665, "Emergency Food and Water" and L-606, "Clothing Preparedness for Disaster.")

#### ● ADDITIONAL SUPPLIES

Food (See Extension publication MP-665, "Emergency Food and Water.")

Clothing (See Extension publication L-606, "Clothing Preparedness for Disaster.")

Reading and recreation materials

Bible

Civil defense materials

Song books, books, magazines

Games

First aid kit

Infant supplies (See Extension publications MP-665, "Emergency Food and Water" and L-606, "Clothing Preparedness for Disaster")

Baby foods

Disposable diapers, rubber sheeting

Infant's stroller (hanging)

Tools

Ax, crowbar, hammer, nails, screws

Broom, dustpan

Pliers, screw driver, saw, wrench, pocket knife

Shovel, rope, water hose

#### Miscellaneous

Calendar, clock

Dosimeter, rate meter and charger

Large paper bags, napkins, newspapers

Pillows, fireproof mock curtains, blanket, sheets, towels, wash cloths

Sewing kit

Toilet tissue, soap, waterless soap

#### SHELTER ARRANGEMENT

The suggested arrangement factors promote physical comfort and high morale.

#### Activity Areas

##### ● STORAGE WALL

Sanitation area located near entrance for disposal ease. Food and water storage area located above and below food preparation counter for convenience to serving table.

##### ● HINGED WALL TABLE

Size, 27" x 48" attached to wall so that it can be raised when not in use. Raising table rather than lowering allows for larger table. More sturdy than folding table. Has many uses.

##### ● SEATING ARRANGEMENTS

Use folding chairs and stools for table or within floor area. Folding cot also could be used for extra seating and sleeping. Placing a bench-width board on cement blocks for extra seating.



Emergency evacuation supplies here include food and water for one person for one week. Also first aid kit and small case include blanket, clothing and flashlight.



● **SLEEPING ARRANGEMENTS**

Two double bunk beds can be used for multi-purposes by constructing so that top bunk may be lowered during day with bottom bunk used for seating and lowered bunk as back rest. For additional sleeping areas store the one cot mentioned above and three or four sleeping bags in the shelter. Note mock curtain shown above bed. Use space under bunk for extra storage for evacuation supplies as shown and for other supplies such as games or books. Sleeping areas on opposite walls from storage area allows for more and better circulation.

● **FACTORS TO MAINTAIN HIGH MORALE**

Walls and ceilings painted white or light for light reflection (Waterproof, fungus or mold resistant paint)

**Color**

Light-green or soft-yellow paint used effectively on storage area

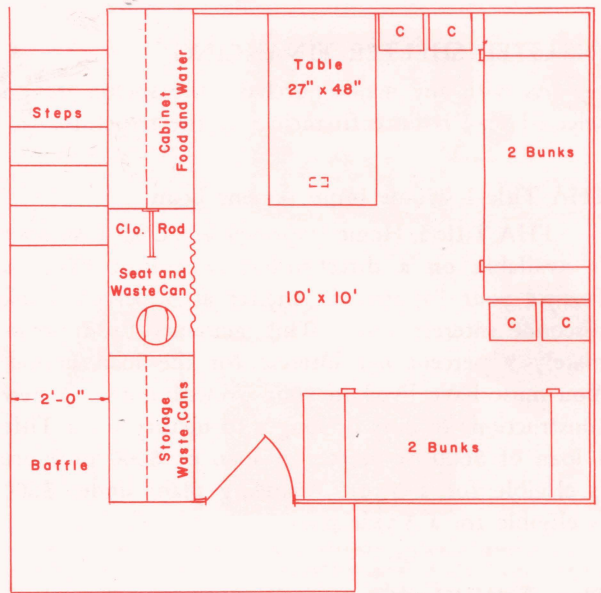
Mock curtains of light or bright color to imply home living

Floor covering might include bright throw rug or used linoleum.

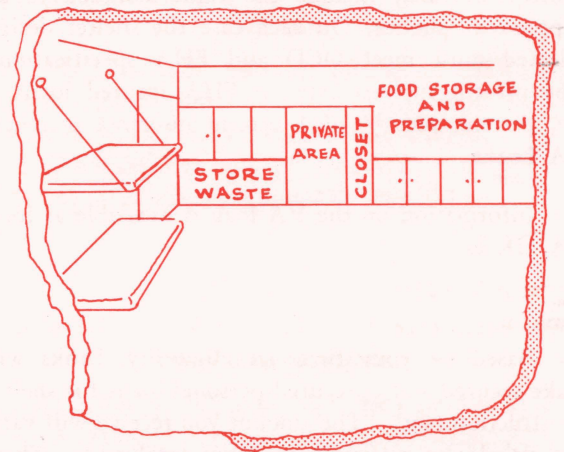
Colorful wall calendar, outdoor scenes for wall pictures or murals

Colorful pillow or floor cushions

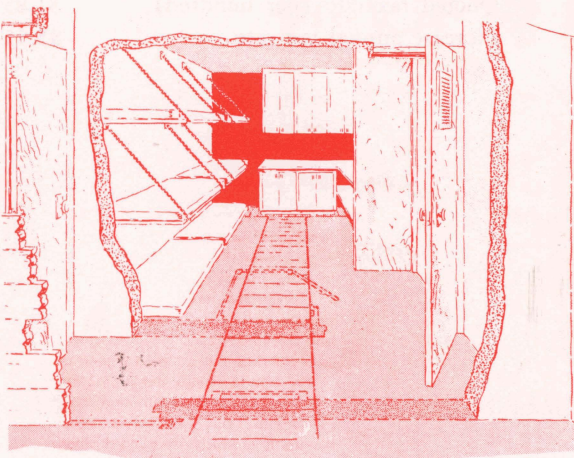
Large wall mirror to increase room size



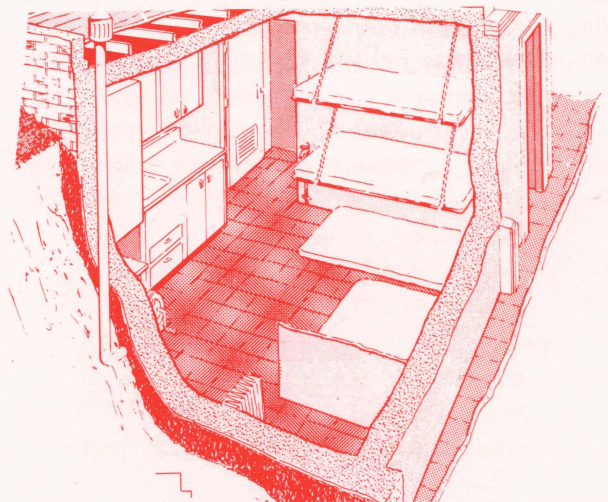
One possible shelter floor plan showing dimensions and arrangement of furnishings.



View of one wall of a shelter plan.



Cut-away view of bunk arrangement in shelter.



Overhead view of kitchen and sleeping areas of a shelter.

## DISASTER SHELTER FINANCING

As with any major purchase, the shelter design selected may require financing of the structure.

### FHA Title I, Home Improvement Loan

FHA Title I, Home Improvement Loan Insurance is available on a direct-to-borrower loan basis to finance your "approved" shelter at 5 percent bank discount interest rate. This amounts to approximately 9 percent net interest for the loan period. You must have lived in your present home, if new construction, 90 days or longer to qualify for a Title I loan of \$600 or more. A loan of \$600 or more is eligible for a 5-year financing plan; under \$600 is eligible for a 3-year plan.

### FHA Title II Loan

FHA Title II, Loan Insurance on proposed new construction may include the value assigned to an "approved" shelter. In each case the shelter design selected must meet OCD and FHA specifications. The present interest rate on FHA insured loans is  $5\frac{1}{4}$  percent, plus  $\frac{1}{2}$  of 1 percent insurance premium.

#### VA Loans

Information on the VA loan is available at local VA offices.

### Banks

Based on your financial eligibility, banks will make secured and unsecured personal loans for shelter construction costs. The amount you receive will vary, but should be sufficient to cover total cost. These loans can be made for 12 to 24 months at 6 to 8 percent interest. Personal bank loans can be obtained best by following good business practices, such as filing a "Statement of Assets" prior to requesting a loan. Your status and past experience with the bank

usually determines the duration, interest rate charged and amount you receive.

### Credit Unions

If you are a member of a credit union, this is another very good source of financing. Many credit unions make 5-year secured or unsecured loans at an interest rate of 1 percent per month on the unpaid balance. This represents a net interest rate of about  $6\frac{1}{2}$  percent yearly. Some credit unions loan \$750 and under without requiring collateral or co-signers.

### Insurance Policies

Insurance policies offer another good possibility for ready cash. Of course, the policy must be the type which accumulates a cash value, such as one of NSLI policies converted to permanent plans. An outstanding loan against an insurance policy usually does not have a set duration period.

There are two popular ways to borrow money on an insurance policy: (1) Use the policy as collateral on a secured bank loan or (2) borrow directly from the insurance firm. The latter would apply to VA (NSLI) insurance with the loans made directly by that agency.

If your shelter is to be built by a reliable contractor, he obtains the necessary building permit required by local governments and insures meeting minimum requirements of building codes.

Determine the tax rate and tax assessment expressed in percentage of total cost of shelter.

#### Example:

Cost of Shelter	\$1000.00
Tax assessment	30%
Available for tax purpose	\$300.00
Quoted tax rate (per hundred)	\$1.85
Increase annual tax rate	\$5.55



## REFERENCES

- EMERGENCY SANITATION AT HOME, H-11-1, Department of Defense, Office of Civil Defense, August 1958.
- FALLOUT PROTECTION—WHAT TO KNOW AND DO ABOUT NUCLEAR ATTACK, Department of Defense, Office of Civil Defense, December 1961.
- FAMILY SHELTER DESIGNS, H-7, Department of Defense, Office of Civil Defense, 1962.
- FINANCING YOUR HOME SHELTER, Office of Civil Defense, Region V.
- HOME PROTECTION EXERCISES, MP 2-1, Department of Defense, Office of Civil Defense, 1959.
- REDUCING THE VULNERABILITY OF HOUSES, Pg. 80, 11, Department of Defense, Office of Civil Defense, August 1963.
- THE FAMILY FALLOUT SHELTER, MP 15, Department of Defense, Office of Civil Defense, June 1951.
- What's New in Home Economics, "Survival Through Planning, Action and Training," April 1962.

## ACKNOWLEDGMENT

Acknowledgment is given to Bill Davis, Region V, Office of Civil Defense; Tommy G. Hollmig, rural civil defense specialist and W. S. Allen, Agricultural engineer, Texas Agricultural Extension Service.

Certain information and sketches were adapted from: "Shelters for Fallout, Natural Disasters and Storage," Arkansas Cooperative Extension Service; "Family Fallout Protection Rating Guide," Minnesota Agricultural Extension Service; and "Reducing the Vulnerability of Houses," Department of Defense, Office of Civil Defense.



## *Ready to serve YOU...*

are your COUNTY EXTENSION AGENTS. They represent both the U. S. Department of Agriculture and Texas A&M University in your county. These agents have ideas and materials that are helpful to everyone, regardless of whether you live on the farm or ranch or in a town or city.

Extension agents have information on a wide variety of subjects. For example, you can learn from them how to farm and ranch more efficiently . . . . achieve more satisfying family living . . . . discover how much we *all* depend on agriculture.

This publication is one of many prepared by the Texas Agricultural Extension Service of Texas A&M University to present up-to-date, authoritative information, based on the results of research. Such publications are available from your local agents whose offices usually are in the county courthouse or agricultural building.

Give your agents a try. They welcome your visits, calls or letters.

