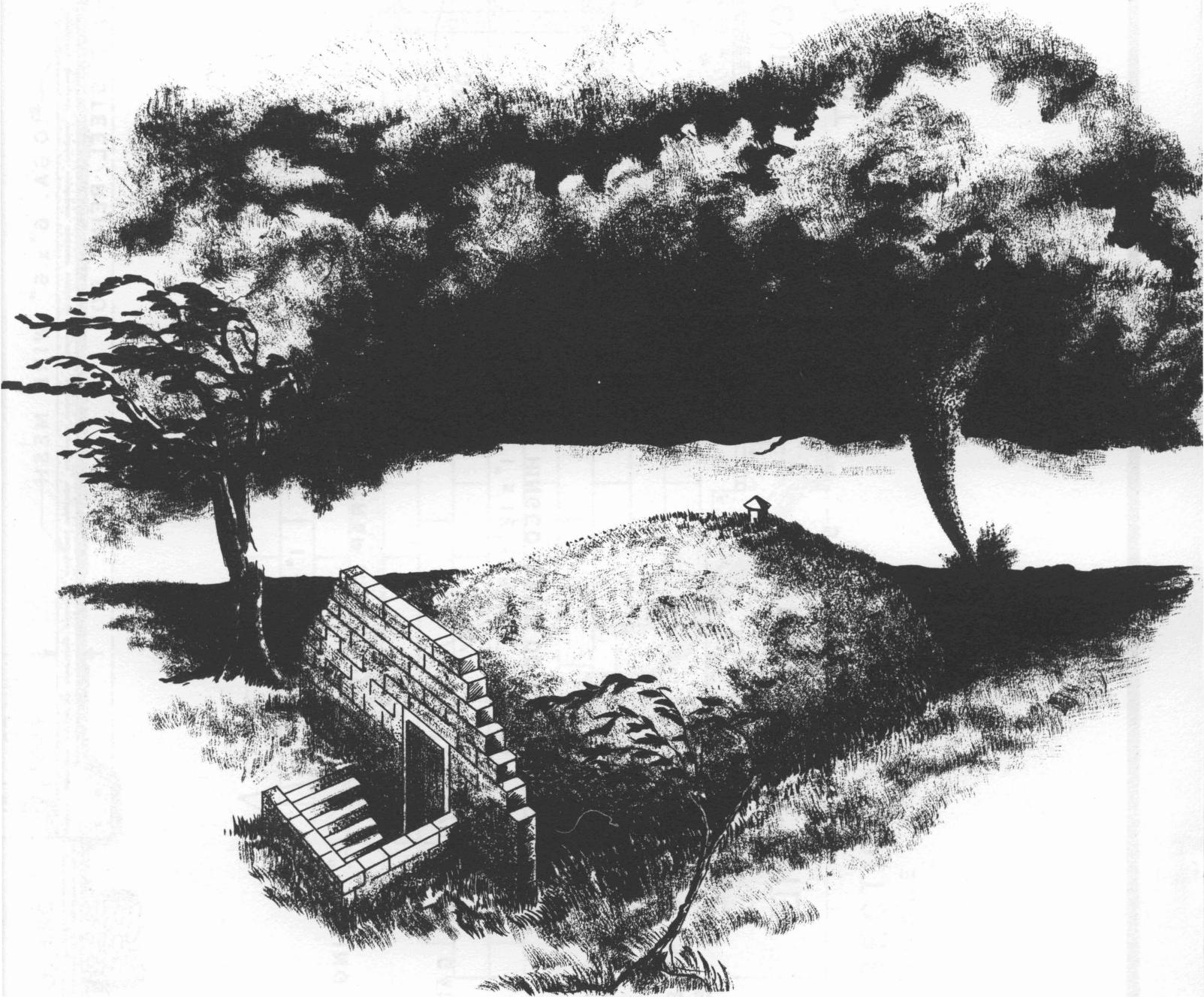


The Disaster Cellar



TEXAS AGRICULTURAL EXTENSION SERVICE

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THE DISASTER CELLAR

TRY TO IMAGINE the angry, black funnel of a tornado rushing directly toward your home. Where would you and your family go for protection? Many Texans have experienced this and other disasters from time to time. A safe place is necessary in both rural and suburban areas. A good storm cellar can be built by you and your family without special skills and with

only a few special tools. A plan appears in this leaflet along with information on how to stock the cellar with emergency provisions. Upon advice of building materials dealers, county agents and other specialists, you can modify this plan to suit your needs if they vary from the specifications shown. These suggestions can make your storm cellar more convenient and usable for other purposes.

Location of a Disaster Cellar

Since tornadoes generally move from southwest to northeast, the storm cellar should be located southwest of the house. Its entrance should face northeast. The cellar should be located far enough from the house that a falling

wall, large trees or other debris will not block the entrance. Select a well-drained site which can be landscaped to harmonize with the home surroundings.

Design and Construction

Storm cellars should be strong to withstand the impact of falling debris. The cellar also should be watertight, economical and relatively easy to keep. Cast-in-place concrete, precast concrete or concrete masonry meet all of these requirements. The plan in this leaflet shows the correct construction steps for a concrete masonry storm cellar with a cast-in-place top.

The size cellar to build depends on expected use. For an extended period of comfortable occupancy, allow about 10 square feet of floor area per person. When the cellar is filled to capacity for a short time only, each person will need at least 2 square feet of standing room. The cellar shown in this plan is the smallest size recommended for a family of six and includes space for storage of emergency supplies.

Materials

The floor, roof and steps are of cast-in-place concrete. Cast-in-place concrete should be made of quality materials. With average aggregate, the mix should contain at least 6 sacks of cement per cubic yard of concrete. If concrete is job-mixed, use the following proportions: 1 part cement; $2\frac{1}{4}$ parts sand; 3 parts gravel.

The steel should be rust free and positioned near the center of the slab.

The masonry units shown are of the light-weight aggregate type available from materials dealers throughout Texas. They should be laid in a mortar consisting of 1 part masonry cement and 3 parts sand. Enough mixing water is added to obtain a workable mortar.

Always lay the block for the corners first. Each block is leveled carefully and plumbed

since the corners are guides for the rest of the wall. A line stretched between the corners serves as a guide for the intermediate block. If the wall is long and the line sags at the center, lay the block near the center to hold up the line.

Many techniques are used to place mortar for the joints. One method is to spread a strip of mortar along the face shells of the block. The only mortar placed on the block being laid is put along the end-face shells. The finished joint after each block is leveled should be $\frac{3}{8}$ of an inch. A tooling iron or grooving tool run along each joint before the mortar has hardened compacts it.

Doors may be made of marine or exterior type plywood. Use sound lumber for headers and other wooden members.

Waterproofing

Trouble with seepage and dampness varies in different parts of the State. Where the water table is high, part of the cellar can be above the general level of the ground as shown. Then earth is piled around and over the cellar to give the protection from winds the same as complete

underground construction. Further waterproofing can be accomplished by installation of tile and coating the blocks with asphalt or a waterproofing paint as shown in the details. The tile drain must be adequately drained to a seepage pit or carried to an outlet to make it effective.

Safety Features

Adequate ventilation is necessary in a storm cellar. All vents should be equipped with sliding doors that operate from the inside. These doors should be checked periodically to make sure that they open and close freely. The door should be constructed as shown and properly fitted so

that it will open easily. Tools to aid in removal of debris that might block the entrance should be kept in the cellar at all times. Electric power, water and sewer connections usually are not made to the storm cellar since they often fail during a tornado or similar disaster.

Other Uses

Many storm cellars are designed for multiple uses. In some cases they are used for vegetable storage. Since most tornadoes occur in April, May and June when the supply of vegetables usually is exhausted, this combination works well.

SUGGESTED EQUIPMENT FOR THE DISASTER SHELTER

- Fire extinguisher
- Shovel
- Windup clock
- One sheet
- Pick
- Folding cot
- Water in jugs
- Three or four cans of canned heat
- Jellied alcohol stove
- Waterproof matches in tin box
- Can opener
- Candles
- Battery radio
- Paper supplies
- Games for children
- Covered pail
- Flashlight with extra batteries
- One blanket
- Two large towels
- Jack knife
- Paper plates and cups
- Sauce pan
- Old newspapers
- First aid kit

SUGGESTED FOOD SUPPLY FOR YOUR DISASTER SHELTER

The following list provides food for one person for 7 days. You may vary the quantities to fit your family numbers and needs.

Check your pantry at least once a month, preferably more often, and rotate regularly. Bottled water must be changed every 6 weeks.

MILK: Powdered nonfat dry, one package; evaporated, 2 cans (14½ oz.).

JUICES: Tomato, one can (1 qt. 14-oz.); orange, one can (1 qt. 14-oz.); grapefruit, one can (1 qt. 14-oz.).

FRUITS: Peaches, one can (1 lb. 14-oz.); pears, one can (1 lb. 14-oz.); dried prunes or apricots, 1 pound.

VEGETABLES: Tomatoes, two cans (16-oz.); peas, two cans (16 to 17 oz.); corn, one can (12 to 16½ oz.); green beans, one can (15½ oz.).

SOUPS: Assorted, four cans (10½ oz.).

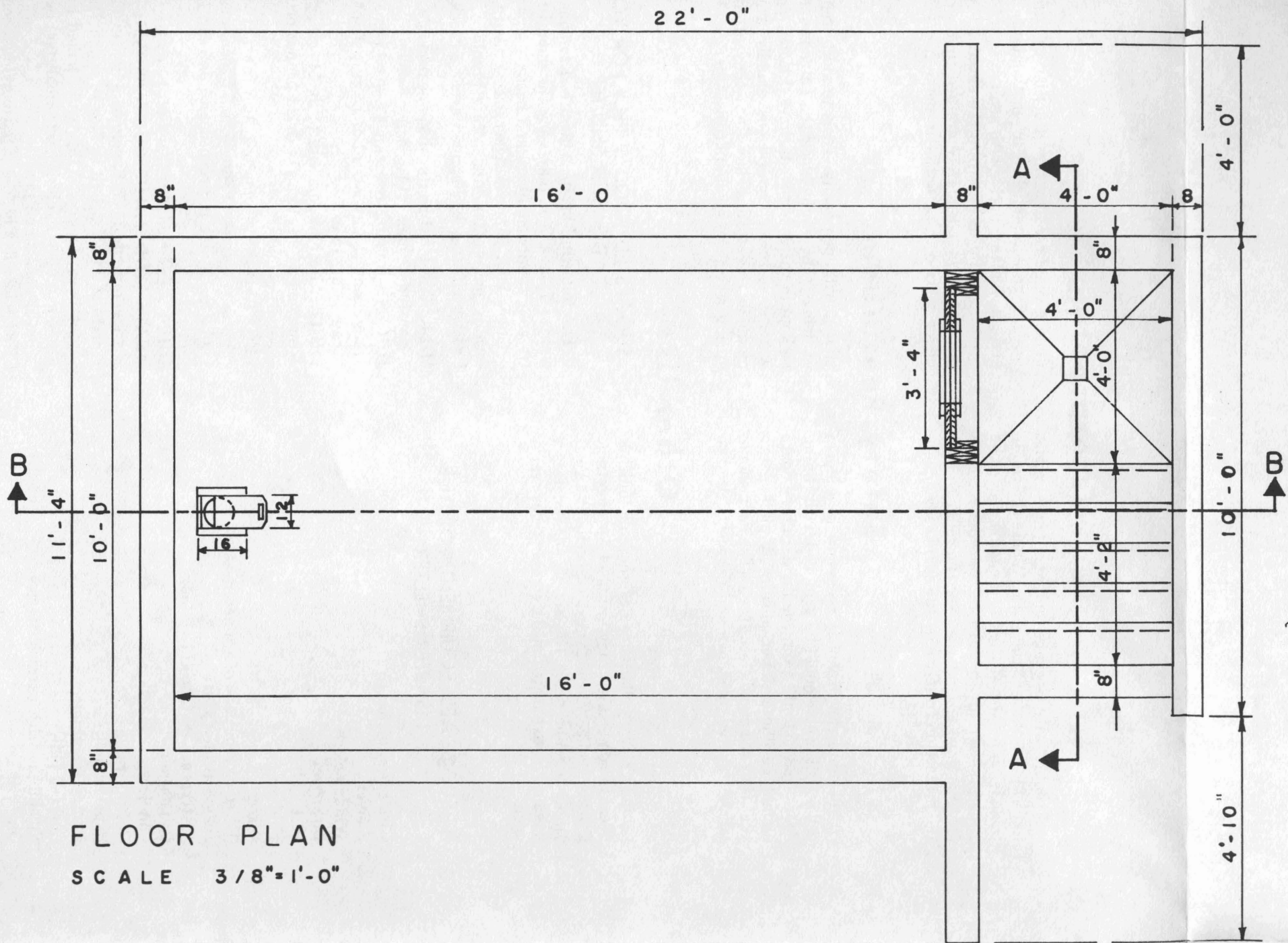
MEATS AND MEAT SUBSTITUTES: Beef stew, one can (1-lb.); salmon, one can (1-lb.) or tuna, two cans (6 to 7-oz.); spaghetti and meatballs, one can (15½ oz.); baked beans, one can (1-lb.); cheese, one small jar; peanut butter, one small jar.

CEREALS: Ready-to-eat, 7 (individual-serving pkgs.).

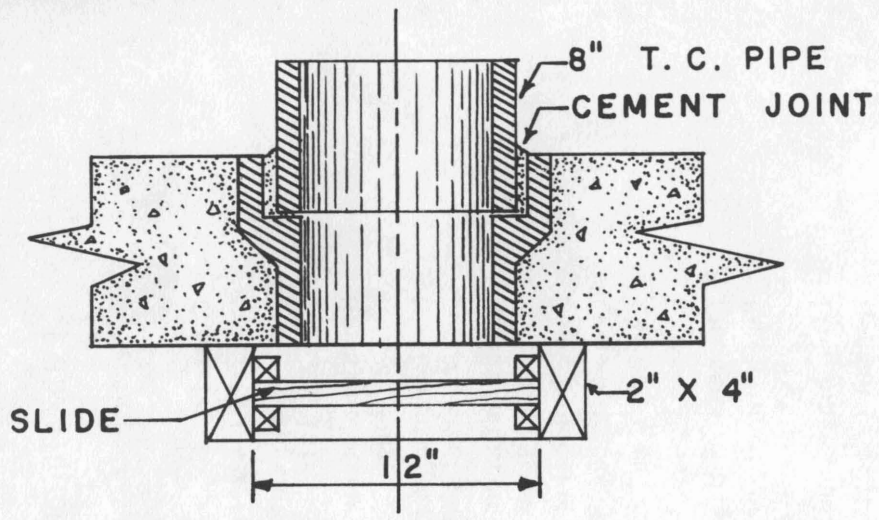
CRACKERS-COOKIES: One box.

BEVERAGES: Instant coffee, one jar, or instant tea (2-oz.); one jar or instant (1-oz.) cocoa, one package (1-lb.).

SOFT DRINKS: 12 bottles.

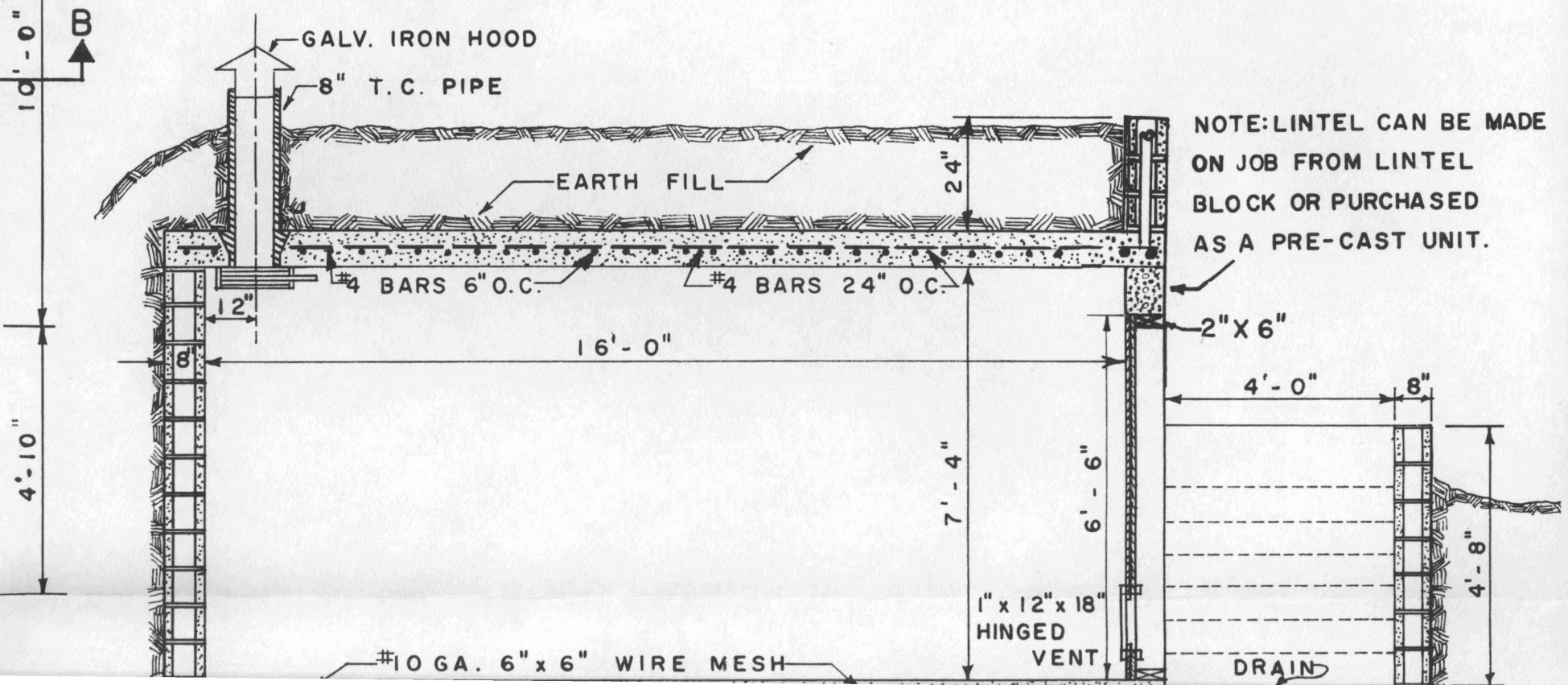


FLOOR PLAN
 SCALE 3/8" = 1'-0"



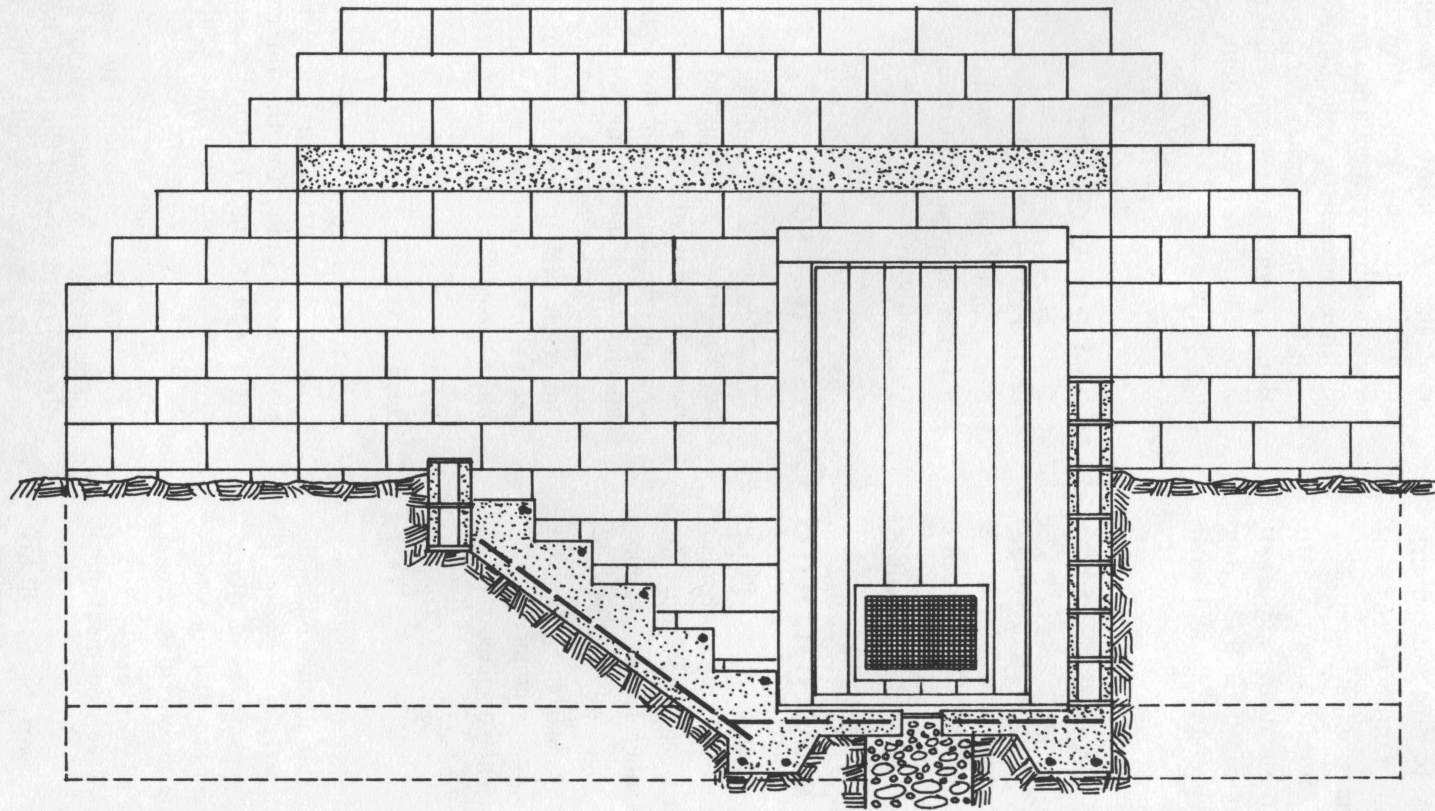
DAMPER DETAIL
SCALE 1 1/2" = 1' - 0"

NOTE: CELLAR ROOF MAY BE MADE FROM PRE-CAST CONCRETE JOISTS, IF AVAILABLE LOCALLY. CONSULT YOUR SUPPLIER.



NOTE: LINTEL CAN BE MADE ON JOB FROM LINTEL BLOCK OR PURCHASED AS A PRE-CAST UNIT.

SCALE 3/8"=1'-0"

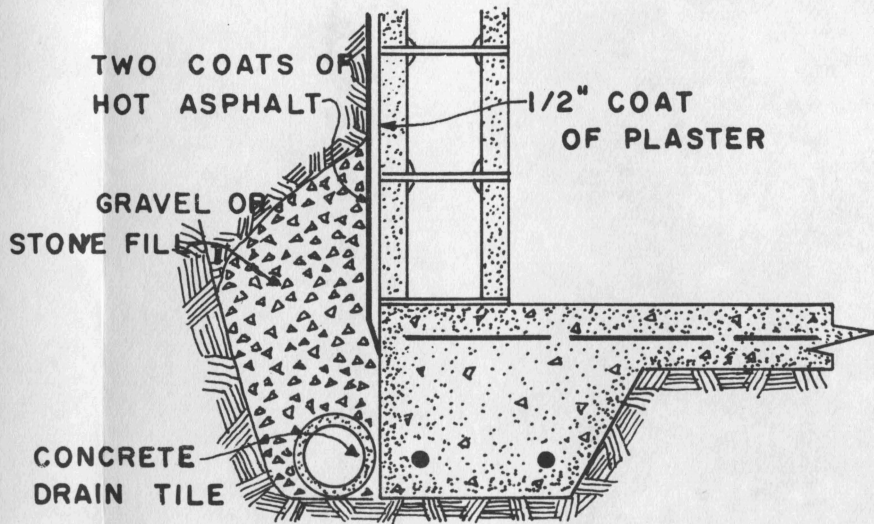
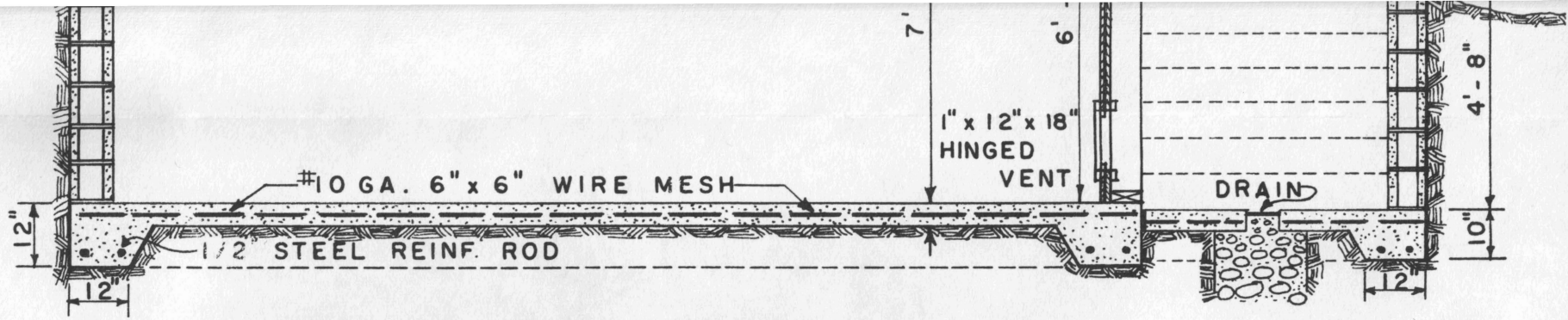


TWO
HOT

GRAY
STONE FILL

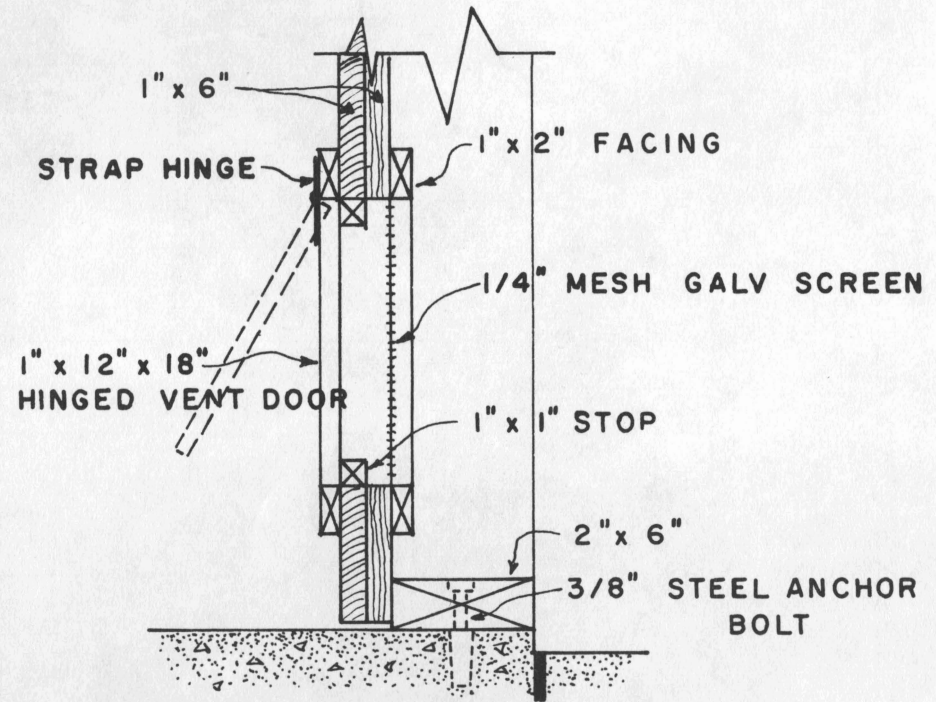
CONCRETE
DRAIN

SECTION AT A-A
SCALE 3/8"=1'-0"



WATERPROOFING DETAIL

SECTION AT B-B
SCALE 3/8" = 1'-0"



DOOR VENT DETAIL

SCALE 1 1/2" = 1'-0"

ESTIMATE OF MATERIALS REQUIRED

*(Quantities should be verified and checked
before ordering.)*

Concrete	7½ cu. yd.
Concrete block (8"x8"x16")	550 each
Steel, reinforcing mesh (6x6— No. 10)	200 sq. ft.
Steel, reinforcing bars (½" diameter) 21' long	5 pcs.
Steel, reinforcing bars (3/8" diameter) 10' long	33 pcs.
Steel, reinforcing bars (3/8" diameter) 16' long	6 pcs.
Sand, builders or brick	1,100 lb.
Cement, masonry	5 sacks
Lumber, 1"x6" center match 7' long	10 pcs.
Lumber, 2x8 S4S 10' long	1 pc.
Lumber, 2x8 S4S 8' long	1 pc.
Pipe (transite or similar) 8" round-4' long	1 pc.
Lock, hinges, nails and screen wire as necessary	
Asphalt or waterproofing paint as required.	

Arranged by

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