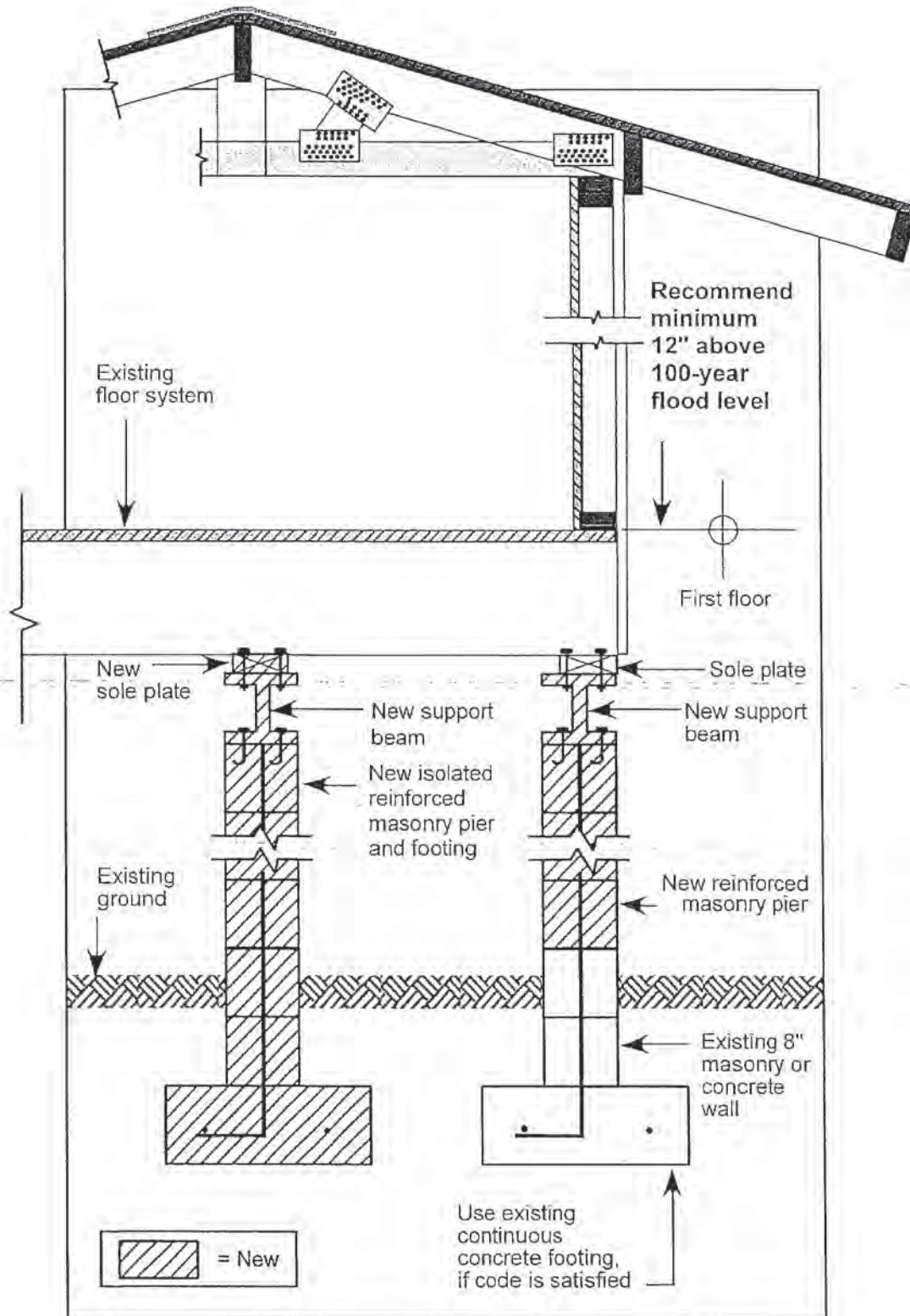


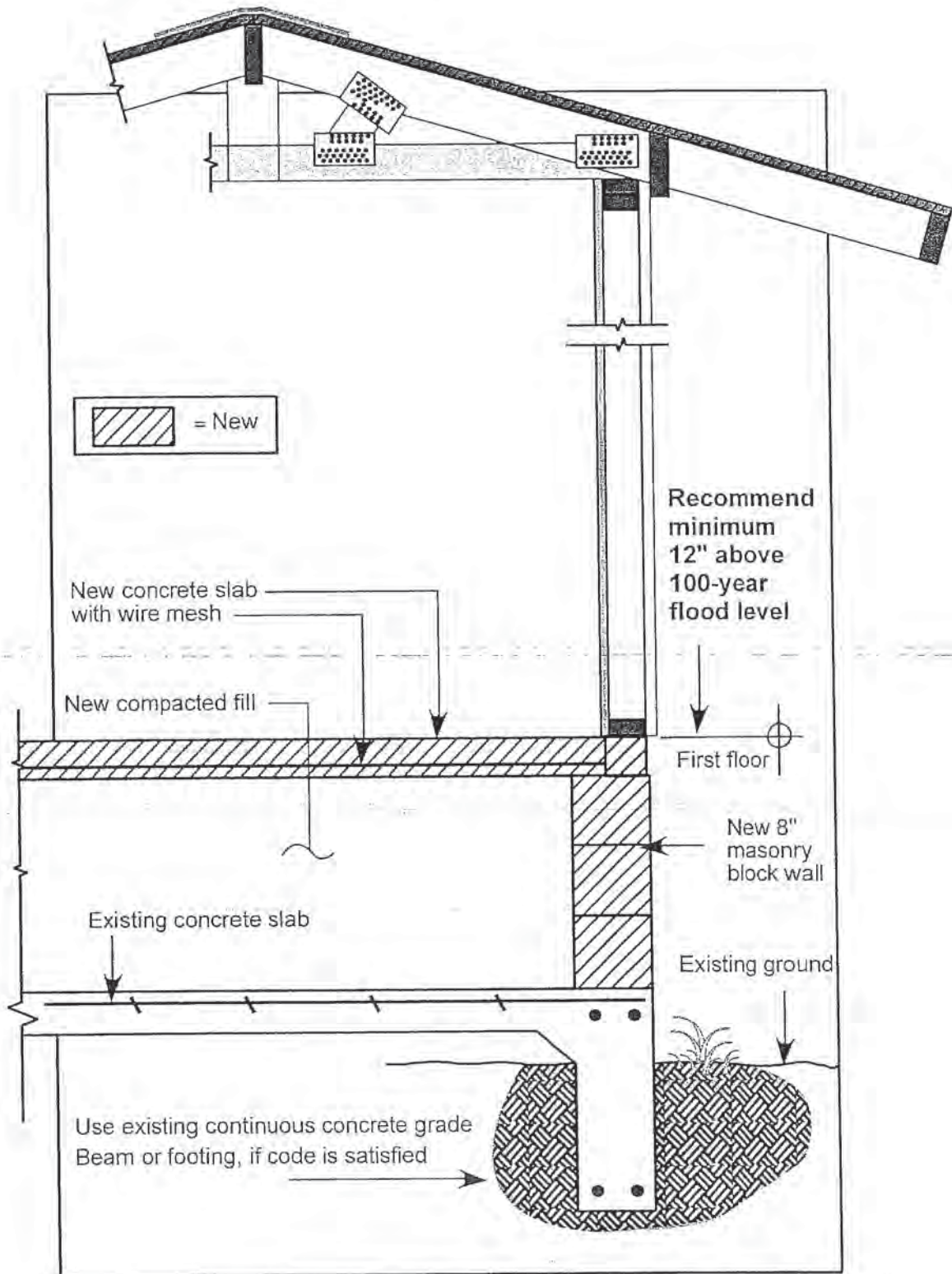
## **Part 4. Things You Can Do to Protect Your Property**

- **Diagrams Showing Things You Can Do to Mitigate Flood Damage**

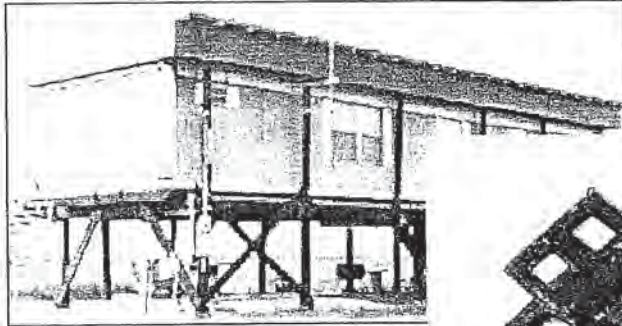
## Elevating a Structure with Crawlspace Foundation



# Elevating a Slab-on-Grade Wood Frame Structure



# Elevating a Mobile Home

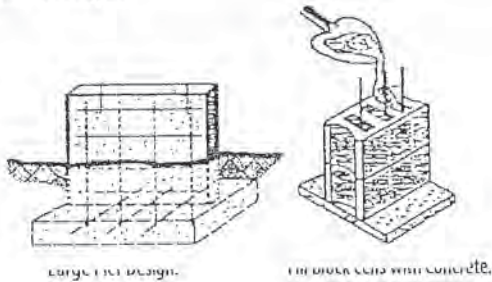


Manufactured Home Showing Cross Bracing and Foundation.

Foundations, cross bracing and tiedowns are the three basics of the proper elevation and anchoring of a manufactured home. Each is essential for a safe and secure mobile home installation.

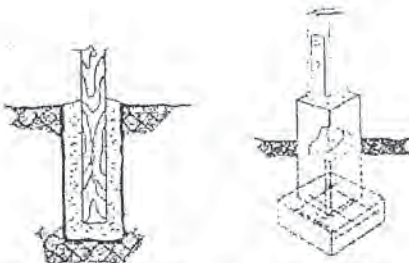
## Foundations

A poured concrete footing, reinforced with rebar, gives maximum stability. Extend rebar from the footing and up into the steel reinforce concrete or concrete block pier. Solidly fill each concrete block with concrete. Cast threaded anchor bolts into the top of each pier to anchor the mobile home frame to the foundation. Posts attached to piers with special connectors cast into the concrete are also effective. In areas with soft ground, post foundations may be able to achieve the required foundation strength. Drive posts into the ground down to a rock foundation, or to a depth specified by an engineer. Backfill posts with concrete for maximum strength.



Large Footing.

Fill Block Core with Concrete.



Post Backfilled with Concrete.

Post Anchoring.

**Note:** In order for manufactured/mobile home owners located in Special Flood Hazard Areas to be eligible for NFIP flood insurance, their manufactured/mobile home must be able to resist floatation, collapse or lateral movement either by: 1) Over the top or frame ties to ground anchors; 2) or in accordance with the manufacturer's specifications; 3) or in compliance with the community's flood plain management requirements unless it is a manufactured/mobile home on a permanent foundation continuously insured by the NFIP on the same site since 9/30/82. (Source: NFIP Standard Flood Insurance Policy, Article 6, Paragraph H)

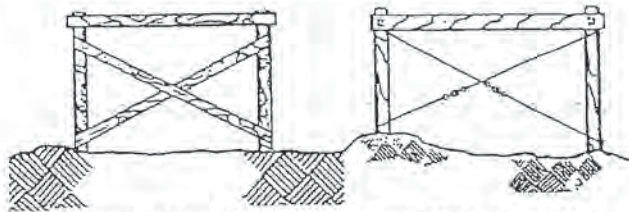


## Slab Anchor

This type of anchor is embedded in a cement foundations slab. Straps are then tied from the anchor to the frame of the manufactured homes.

## Cross-Bracing

Diagonal bracing reduces foundation twisting and the potential of collapse in flooding or high winds. Brace foundation posts with 2-inch nominal lumber bolted to the piers, or with steel rods fitted through drilled holes, fastened with nuts and tightened with turnbuckles.



Diagonal Bracing with Wood.

Diagonal Bracing with Steel Rods.

## Tie-Down Straps

Tie-down straps are used at the base of the manufactured home and can be tied over the top. The most common failure is pullout of the ground anchor. For maximum pullout resistance, cast the anchor into a concrete deadman.



Tie Down Straps.

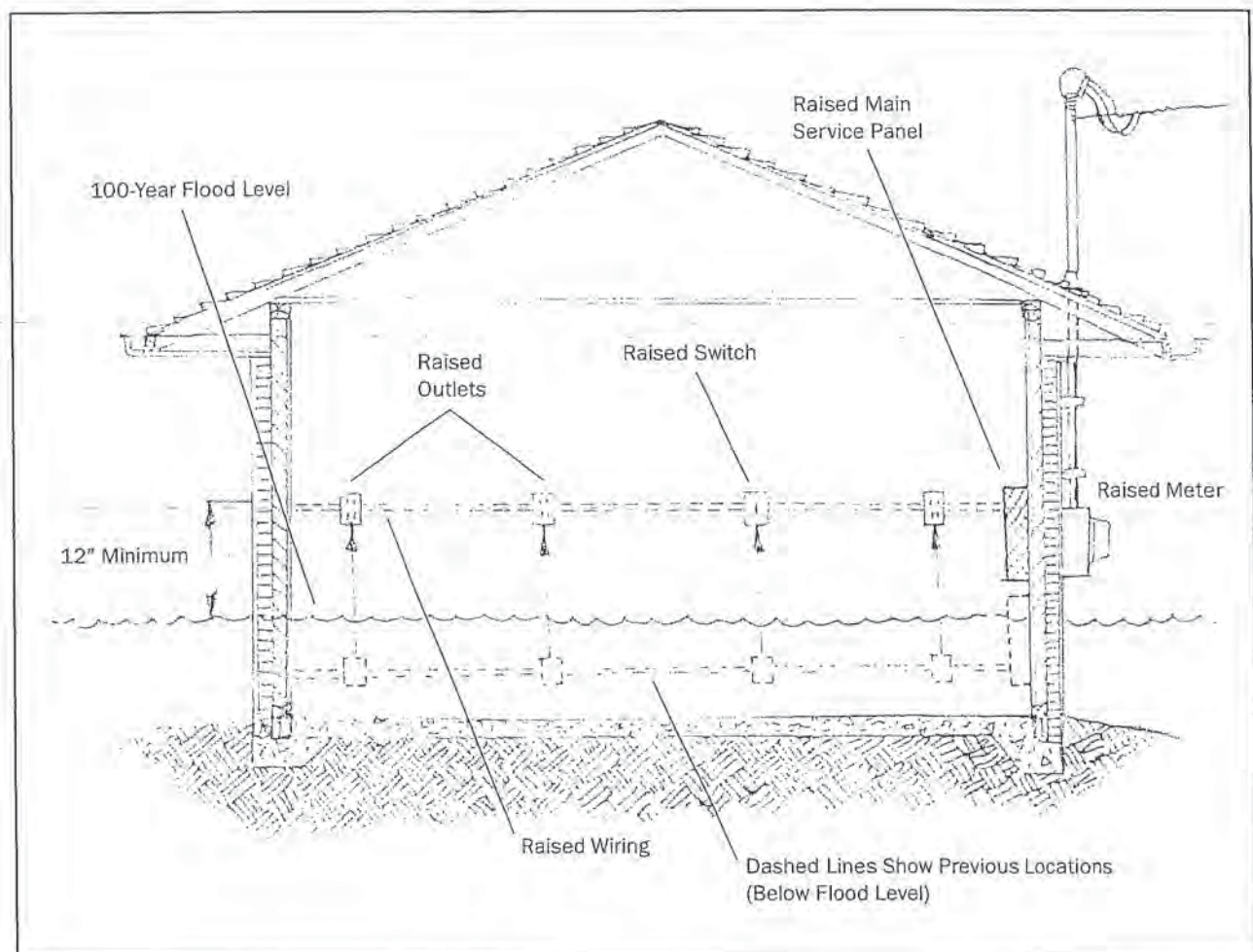
Tie Components.

## Elevating an Electrical System

The surest way to protect your valuable electrical system is to keep it from getting wet. When rebuilding after a flood, or repairing by wet floodproofing, move all wiring at least one foot above the 100-year flood level. All outlets, switches, light sockets and junction boxes, as well as the main breaker or fuse box and electric motors, should be out of danger of getting wet.

Run wires overhead. If a wire has to run into the areas that could get wet use a wire rated for underground use. No wire should end in the flood zone and all junctions should be in approved junction boxes. If a wire has to terminate below the 100-year flood level it should be specially marked in the panel box and turned off at the time of a flood warning.

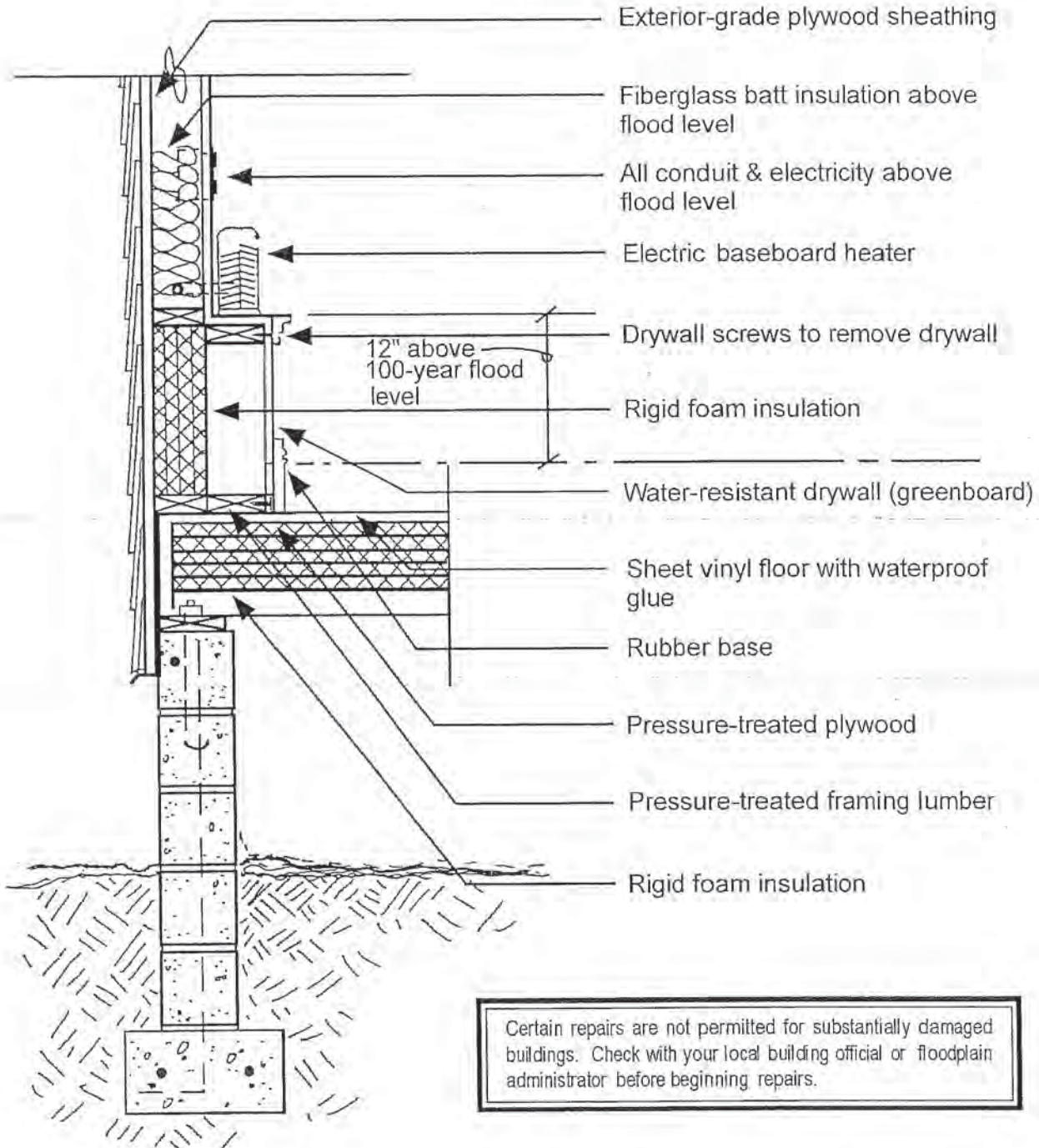
Change all outlets to ground fault interrupters (GFI). Be sure all electrical wiring is done by a licensed electrician and approved by the local building department.



Certain repairs are not permitted for substantially damaged buildings. Check with your local building official or floodplain administrator before beginning repairs.

## Elevating Electric Baseboard Heaters

Protect your electric baseboard heater system by elevating it at least one foot above the 100-year flood level. Use waterproof wall construction materials and techniques for the wall area below the baseboard units.

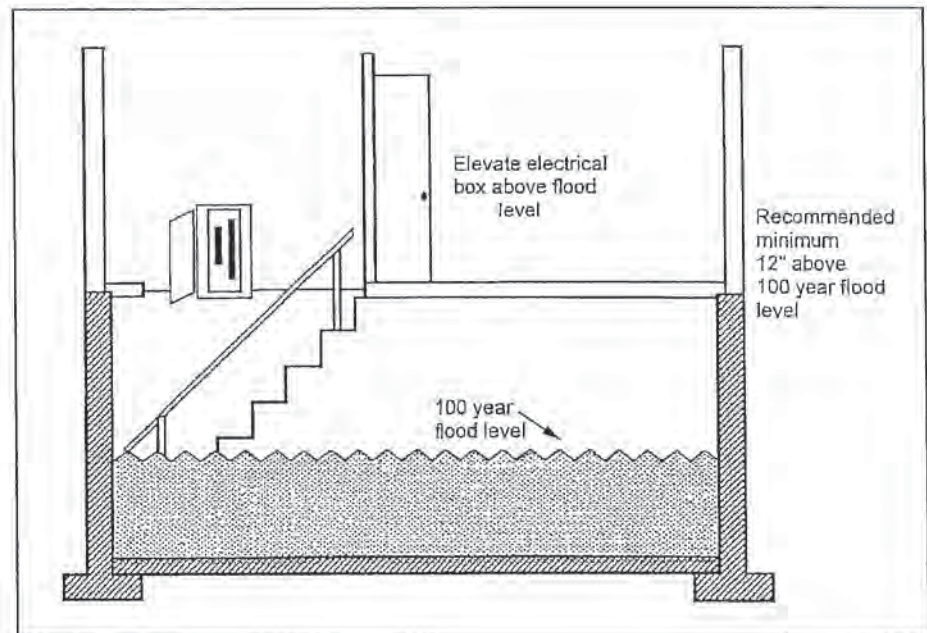


## Elevating or Relocating the Electric Panel

Elevate or relocate your electric panel above the 100-year flood level to help prevent damage. All relevant permits must be obtained before work begins, and all work must conform to state and local building codes.

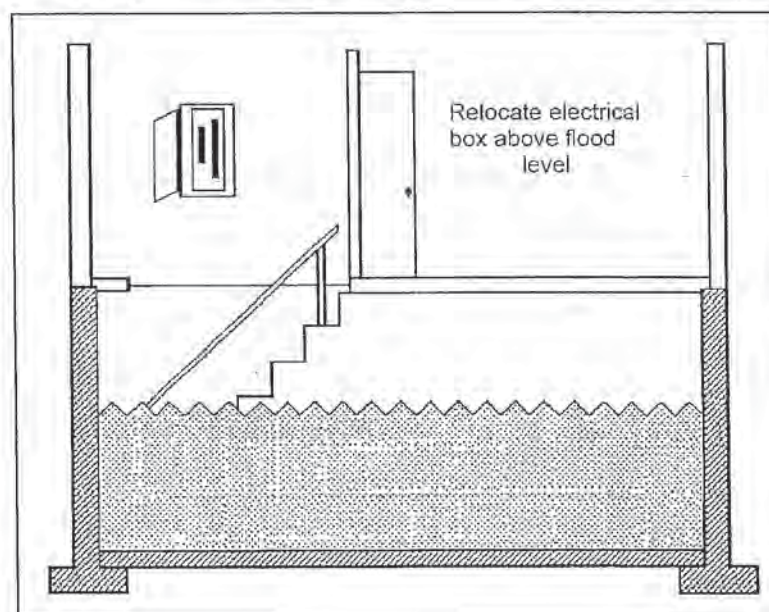
### Elevate

Relocate electric panel to a recommended minimum 12" safety margin above the base flood elevation or the highest known flood level if you are outside of any known flood zone. The maximum panel height is regulated by code.



### Relocate

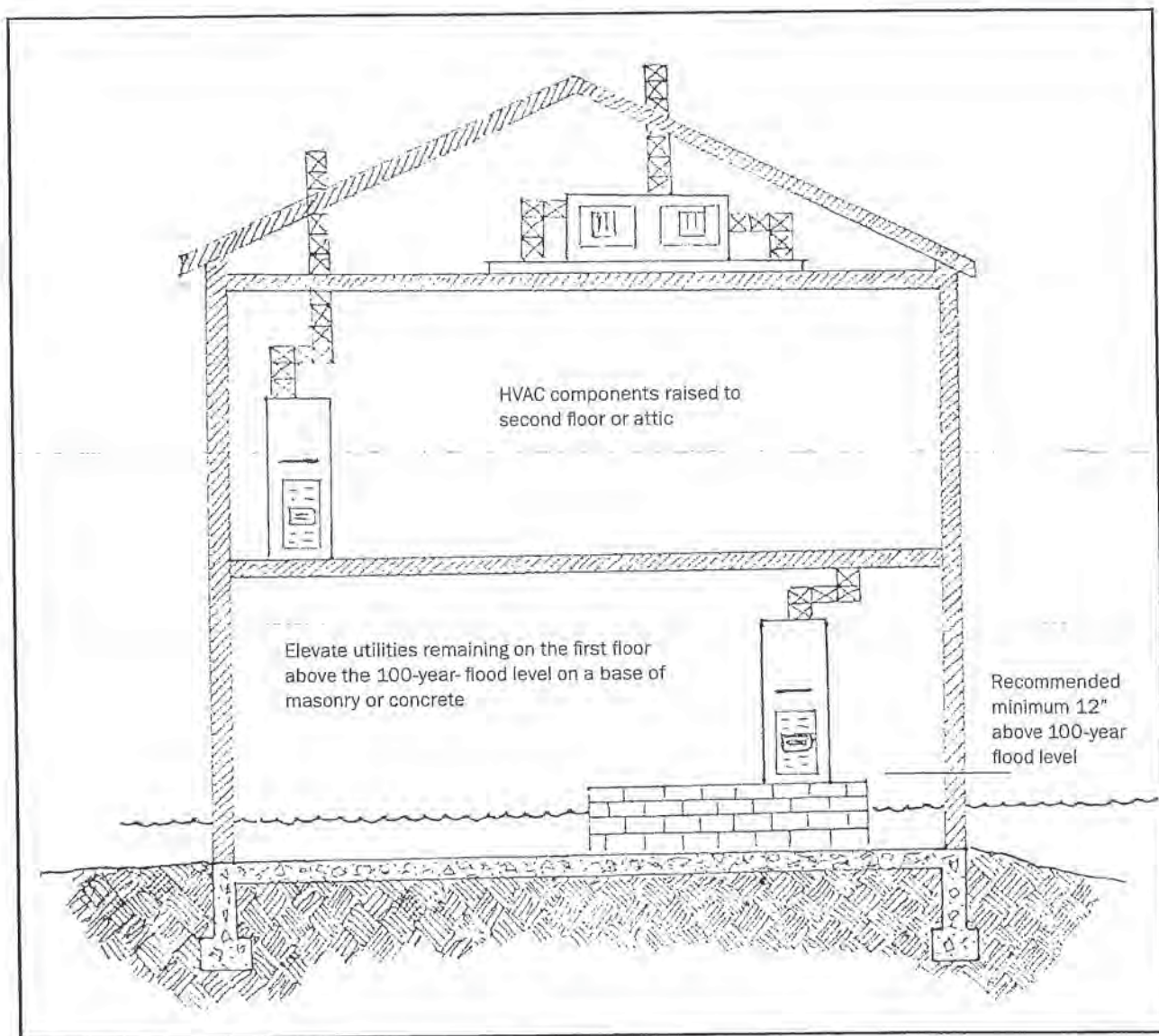
Relocate the electric panel to available space above the first floor to protect it from flooding.



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## Elevating or Relocating the Heating Plant

When relocating or raising the heating plant be sure it will have a 12 inch safety margin above the 100-year flood level. If the existing ductwork for your furnace is below the 100-year flood level (e.g. inside a slab or crawlspace beneath the home) it should be relocated so that it distributes heat from at least one foot above the 100-year flood level. Your local building department can help you determine your 100-year flood level. If you locate the furnace on an upper floor or attic it will require the installation of a “downdraft” furnace, which is slightly different from a standard model. If you are replacing your furnace ask your supplier for information on a downdraft system.

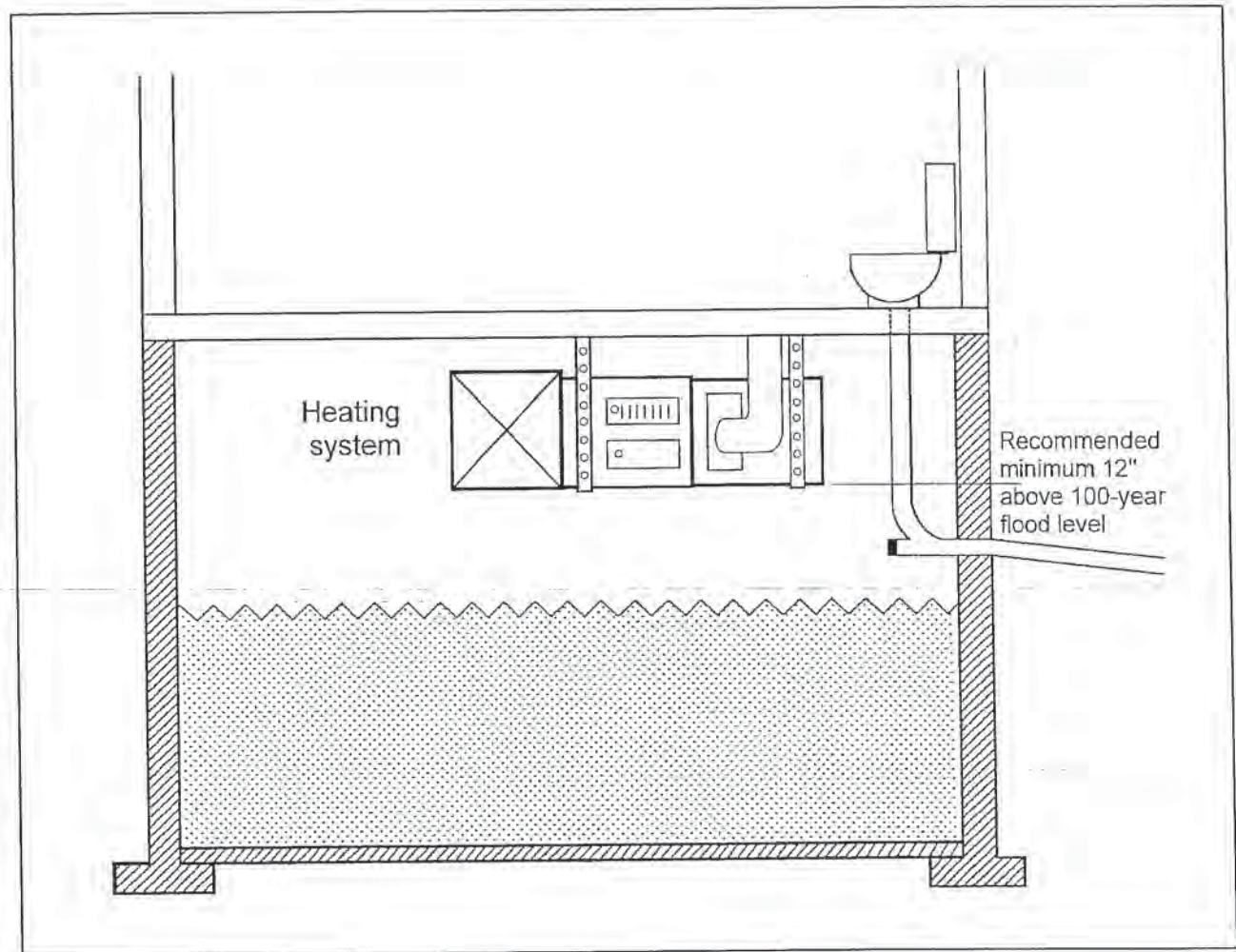


Certain repairs are not permitted for substantially damaged buildings. Check with your local building official or floodplain administrator before beginning repairs.



## Suspending a Heating System

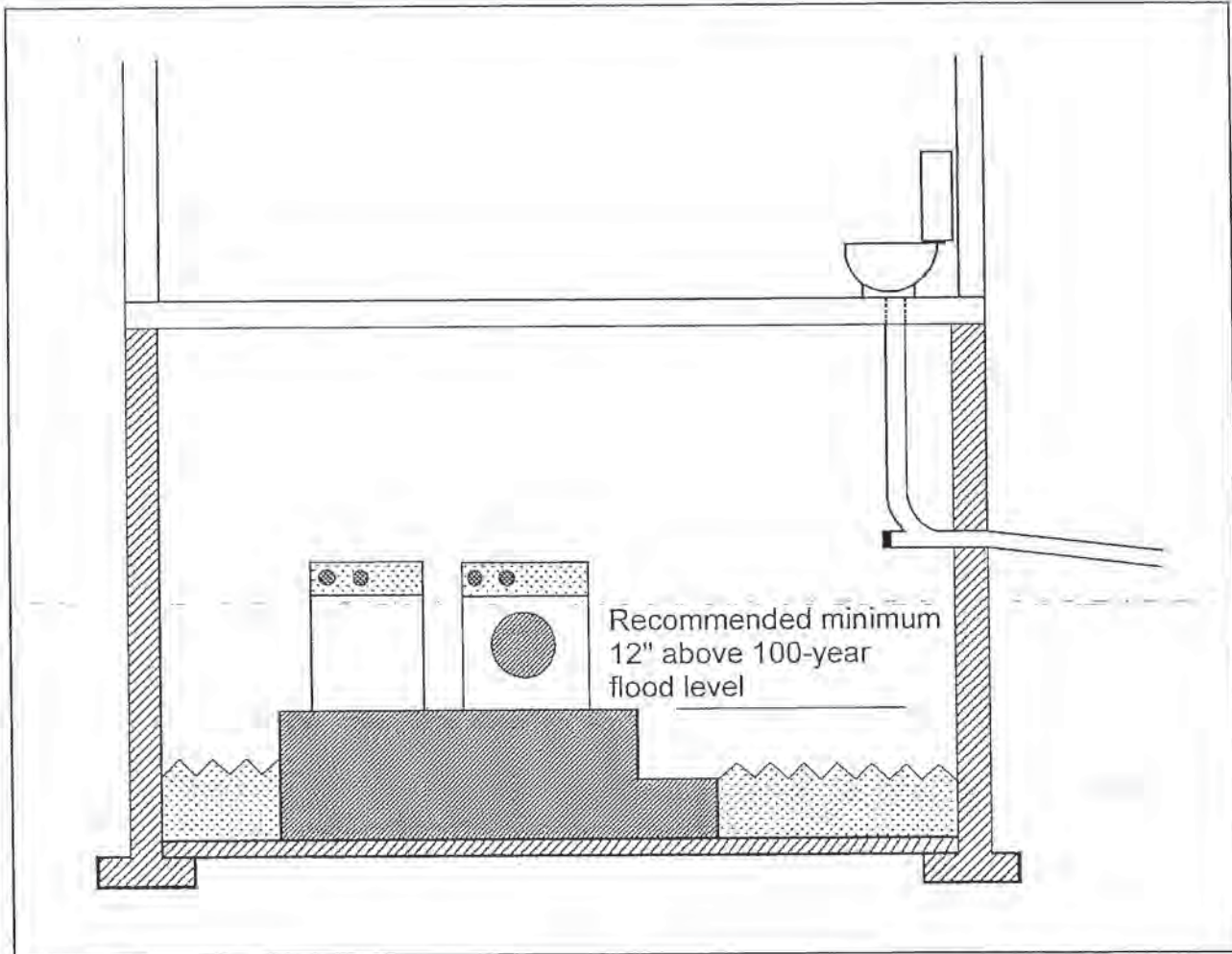
Suspend the heating system with a safety margin of at least 12" above the 100-year flood level and in a manner that conforms to the manufacturer's specifications and all applicable state and local building codes.



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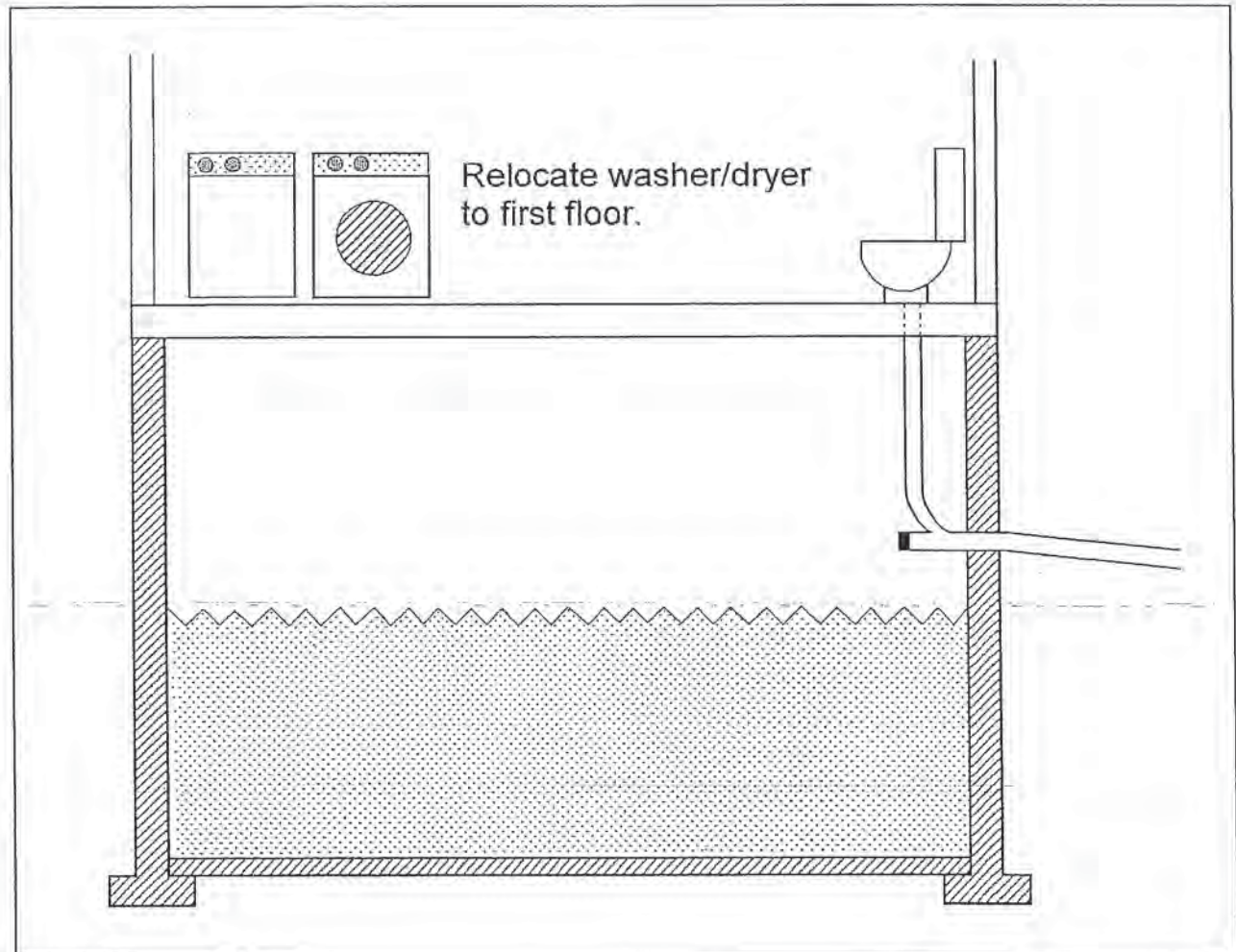
## Elevating a Washer and Dryer

Elevate your washer and dryer on a masonry or pressure treated lumber base to at least a 12" safety margin above the 100-year flood level.



## Relocating a Washer and Dryer

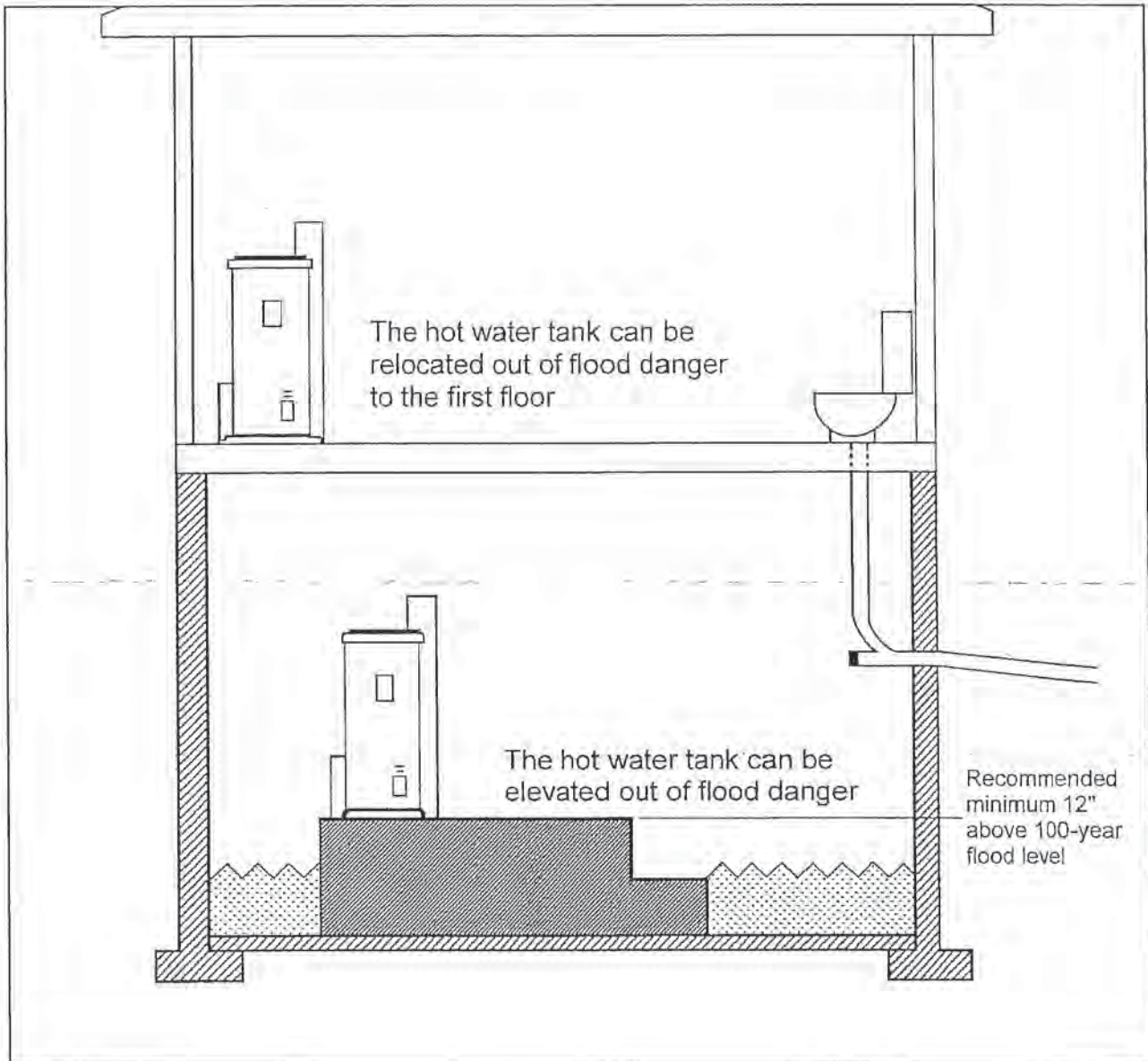
To protect them from flood damage, relocate washer and dryer to a floor at least 12 inches above the base flood elevation.



Certain repairs are not permitted for substantially damaged buildings. Check with your local building official or floodplain administrator before beginning repairs.

## Elevating or Relocating a Water Heater

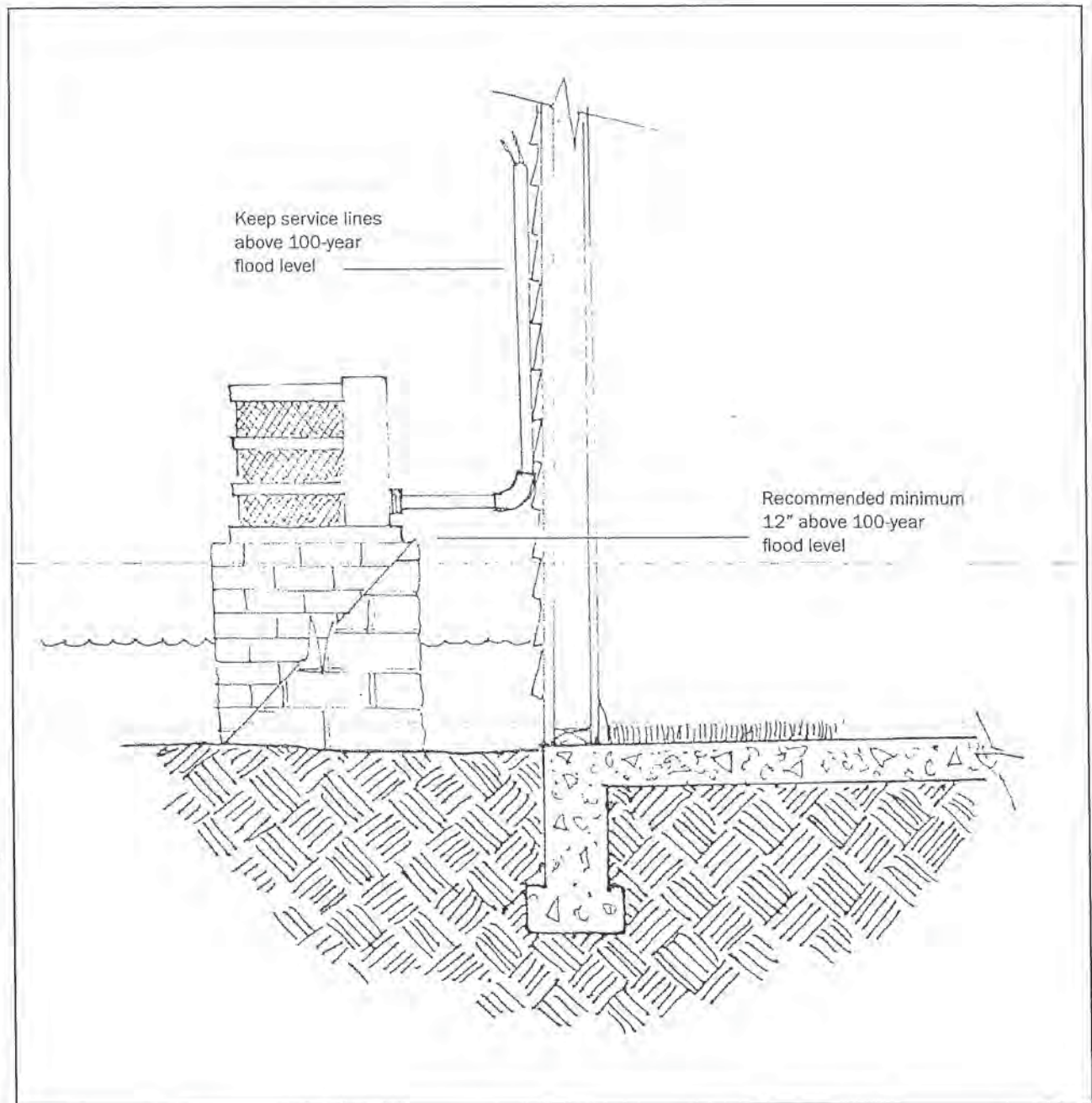
When relocating or raising the water heater be sure that it will be at least 12 inches above the 100-year flood level. Consult your local building department for details.



Certain repairs are not permitted for substantially damaged buildings. Check with your local building official or floodplain administrator before beginning repairs.

## Elevating an Air Conditioning Compressor or Heat Pump

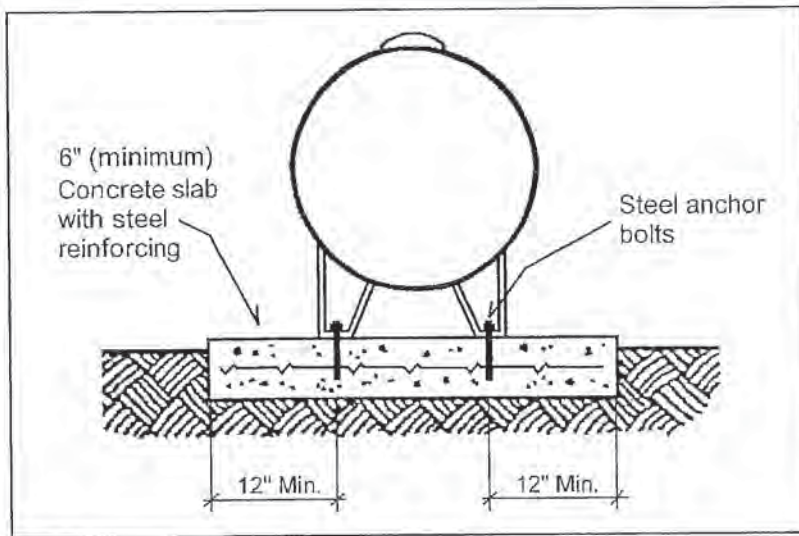
To protect an air conditioning compressor or heat pump elevate it at least 12" above the 100-year flood level on masonry, concrete or pressure-treated lumber base.



Certain repairs are not permitted for substantially damaged buildings. Check with your local building official or floodplain administrator before beginning repairs.

## Anchoring a Fuel Tank

Unanchored fuel tanks can tip over or float. Escaping fuel may result in spills and fires. To prevent this, anchor your fuel tank. Use non-corrosive metal structural supports and fasteners. The type of anchorage, including slab dimensions, will vary depending on the size of the tank. Keep the fuel tank topped off to increase the tank's weight and to reduce its tendency to float.



### Note:

- ◆ Check with the fuel tank manufacturer for recommendations on anchoring.
- ◆ Be sure all work done conforms to state and local building codes.
- ◆ For rented tanks, check with the fuel supplier before making any modifications to the tank.

