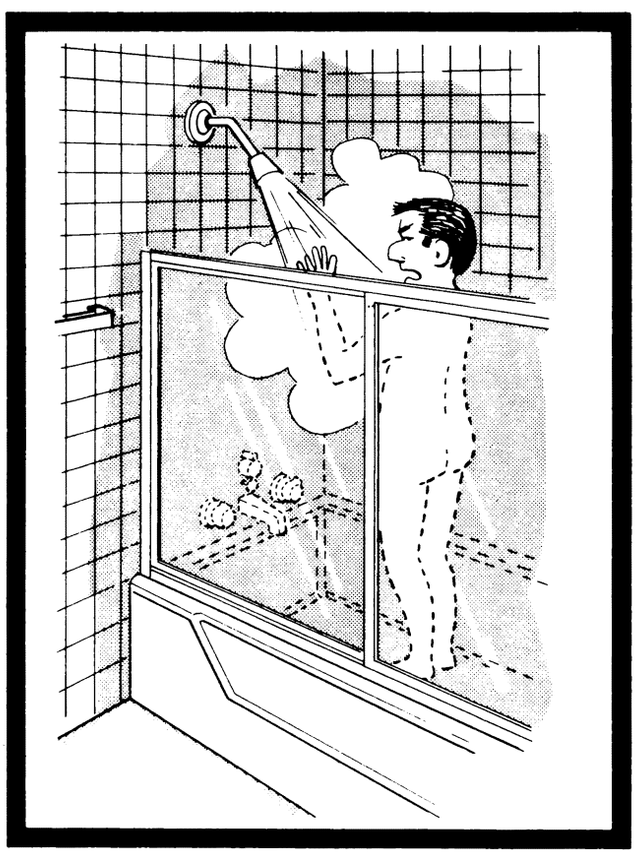
# *Safe Bathrooms* ●●● Hot Water Burns

Many persons have experienced the surprise and shock of hot (or cold) water flow from the shower head when they expected water to flow from the tub spout. The results are sometimes humorous; at other times they are tragic. This experience results when manual diversion of water flow between the shower head and tub spout is required. Many present-day faucet sets fall in this category. If the "hot" side is opened and the previous usage was recent, hot water burns and scalding can result. In addition, falls or injury from quick reflex action can occur, regardless of actual water temperature, when the experience is totally unexpected.

Health authorities generally agree that water temperature of 115°F is the practical limit of human skin tolerance. Some individuals can endure slightly higher temperatures for a brief period. Table 3 classifies water temperature relative to human contact.

**TABLE 3 RELATIVE WATER TEMPERATURES**

| | |
|---|---|
| **Below 65°F** | **Cold** |
| **65 to 90°F** | **Cool to Tepid** |
| **90 to 98°F** | **Warm** |
| **98 to 105°F** | **Hot** |
| **105 to 115°F** | **Very Hot** |
| **115°F and Above** | **Destructive to Human Tissue** |



**Inconvenient location of hot and cold water controls in tub – shower combinations can cause severe burn accidents.**

**Conveniently positioned hot and cold water controls and the use of temperature control devices can help reduce accidental tub – shower burns.**

Children or other persons not familiar with the operation of the single-lever faucet can initially set the control too high and thus be badly burned. There are simple measures available to reduce or eliminate hot water burns. It is possible to control the temperature of the total water system by regulation of the water heater thermostat. This would serve to lower the tank water temperature, but the water heater recovery time would be increased. Dishwashing and laundering normally require water at much higher temperatures than is required for bathing; therefore, limiting the degree of high temperature at the hot water source would be impractical.

A mixing valve installed on the "hot" side of the water tank would temper water as it is used and would provide full-system protection. This arrangement would also tend to reduce energy consumption by the water tank, since the flow in the hot water piping would be a mixture of hot and cold water. Under current living habits, such an installation would require a separate hot water line to the laundry and dishwashing area, thereby increasing construction costs; however, this cost is not considered extravagant in relation to the protection offered the resident and his family in the use of the bathroom facilities.

The most dollar-effective means of controlling water temperature is the use of thermostatic valves to regulate the temperature for bathtub, shower stall, and lavatory. The problem of large-area scalds from domestic hot water can be solved by fitting the bathroom supply with such a tempering device. Since part of the family laundering is accomplished in the lavatory, kitchen sink, and bathtub, any device which would eliminate total hot water at these locations would meet some consumer objections, regardless of the safety feature.

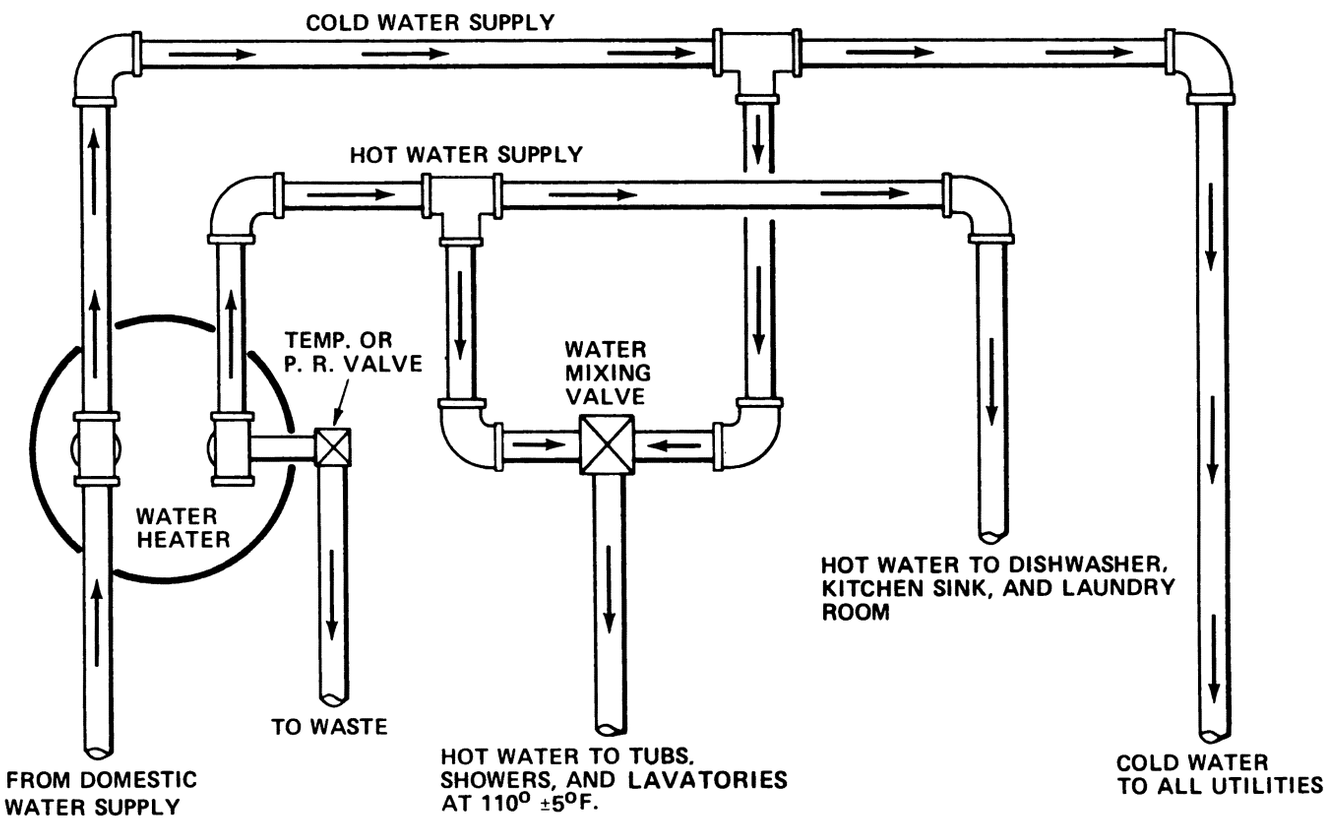



Diagram of Typical Hot Water Tempering System

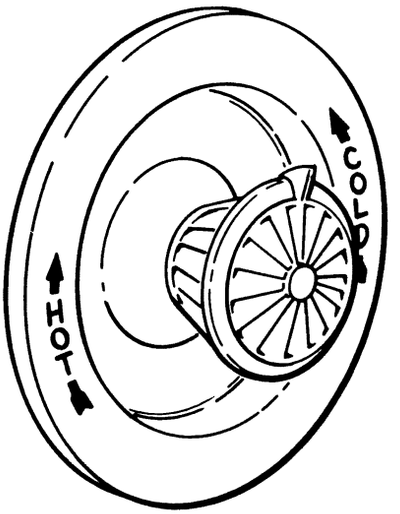
## RECOMMENDATIONS:

To reduce the hazard of hot water burns associated with lavatories, sinks, bathtubs, and shower stalls, the following steps can be taken:

- Use of mixing-spout type faucet sets on bathtubs, lavatories, sinks and shower stalls. Hot water supply to tub, shower stall, and lavatory equipped with an automatic temperature-limiting device set at a maximum of 110± 5°F. (Such a device shall, on failure, fail in either the closed or cold position.)

- Use of full-system or area tempering with hottest water supply to laundry and dishwashing facilities only.

- Use of integral automatic diverter on faucet sets in bathtub and shower combinations.



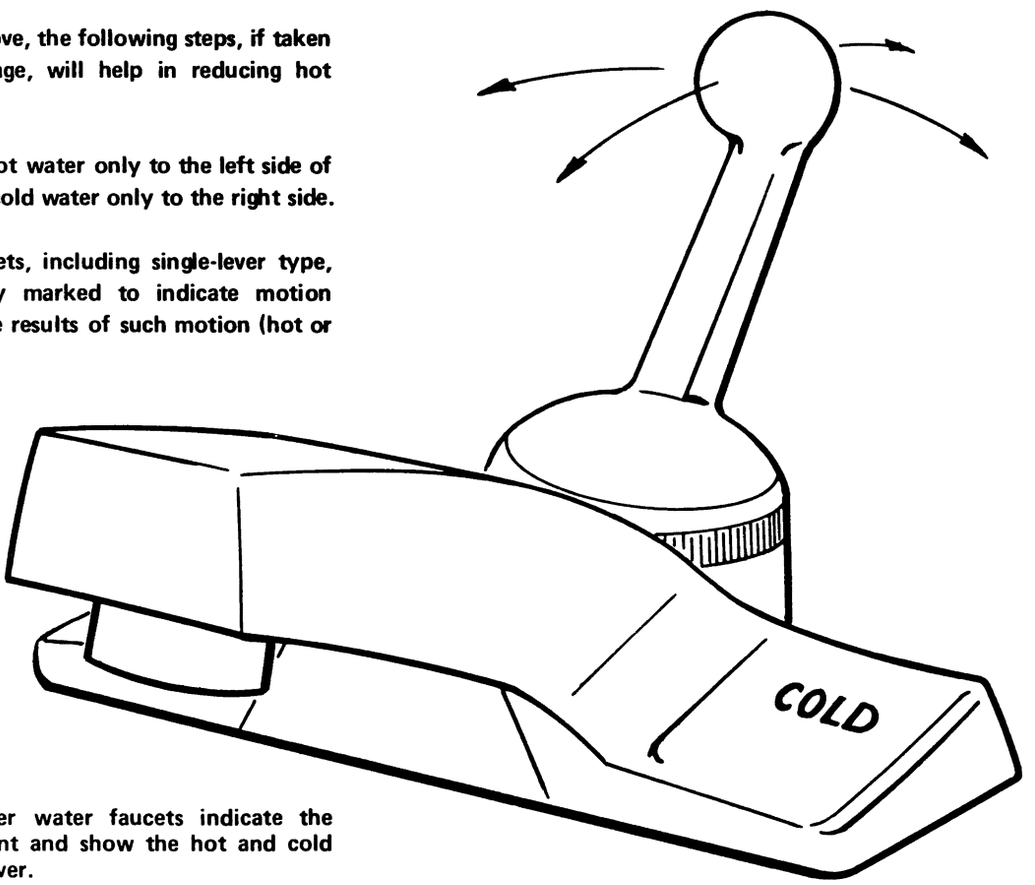

Typical single knob shower control which provides safe mixing of hot and cold water.

## RECOMMENDATIONS:

In addition to the above, the following steps, if taken during the construction stage, will help in reducing hot water burns:

- The piping of hot water only to the left side of faucet sets and cold water only to the right side.

- Use of faucet sets, including single-lever type, that are clearly marked to indicate motion patterns and the results of such motion (hot or cold).




Clearly marked single lever water faucets indicate the direction of lever movement and show the hot and cold positions of the actuating lever.

Before building, consult the BOCA code.

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