dynamic loads, such as thrust. Inadequate support can cause piping to fail under its own weight, resulting in fire, explosion or property damage. Building design must take into consideration the structural loads created by the support of piping systems.

Hangers or supports must not react with or be detrimental to the pipe they support. Hangers or supports for metallic pipe must be of a material that is compatible with the pipe to prevent any corrosive action. For example, copper, copper-clad or specially coated hangers are required if the piping system is constructed of copper tubing. Hangers and supports must be constructed of noncombustible materials to prevent premature failure in a fire. Also, nonmetallic materials can elongate, deform and "creep" under load. This section prohibits combustible hooks, straps, bands, brackets and hangers. Building structural components are listed as a means of support because piping often rests on wall plates, beams, joists and similar structural members where such members are capable of carrying the additional load of the piping. Gas piping must not depend on other piping for support; thus, it must be supported from the structure independently. Gas controls for appliances can be stressed and damaged by unsupported piping drops that bear on or produce bending moments in the controls. A simple check for proper support at an appliance connected with rigid piping is to open the union and observe any movement of the piping. If the piping drops or moves in any direction, it is evident that stress is being applied to the appliance controls. Eliminating such stress is one of the advantages of using flexible gas connectors (see Section G2424).

SECTION G2419 (408)
DRIPS AND SLOPED PIPING

G2419.1 (408.1) Slopes. *Piping* for other than dry gas conditions shall be sloped not less than 0.25 inch in 15 feet (6.4 mm in 4572 mm) to prevent traps.

❖ The required minimum slope (0.14-percent slope) is intended for gas known to contain enough water vapor to cause condensate to form inside the piping. Such conditions are rarely, if ever, encountered today.

G2419.2 (408.2) Drips. Where wet gas exists, a *drip* shall be provided at any point in the line of *pipe* where *condensate* could collect. A *drip* shall also be provided at the outlet of the *meter* and shall be installed so as to constitute a trap wherein an accumulation of *condensate* will shut off the flow of gas before the *condensate* will run back into the *meter*.

❖ Drips, often referred to as "drip legs," are distinct from sediment traps. Modern gas supplies and distribution systems are typically dry; thus, drips would be required only when recommended by the gas supplier.

G2419.3 (408.3) Location of drips. *Drips* shall be provided with *ready access* to permit cleaning or emptying. A *drip* shall not be located where the *condensate* is subject to freezing.

❖ A drip is not the same as a sediment trap; they are required for different reasons (see Section G2419.4).

G2419.4 (408.4) Sediment trap. Where a sediment trap is not incorporated as part of the *appliance*, a sediment trap shall be installed downstream of the *appliance shutoff valve* as close to the inlet of the *appliance* as practical. The sediment trap shall be either a tee fitting having a capped nipple of any length installed vertically in the bottom-most opening of the tee or other device *approved* as an effective sediment trap. Illuminating *appliances*, ranges, *clothes dryers* and outdoor grills need not be so equipped.

❖ In addition to the code requirement, most appliance manufacturers require the installation of a sediment trap (dirt leg) to protect the appliance from debris in the gas. Note that a drip leg is not the same as a sediment trap (see Section G2419.2). Sediment traps are necessary to protect appliance gas controls from the dirt, soil, pipe chips, pipe joint tapes and compounds and construction site debris that enter the piping during installation and repairs. Hazardous appliance operation could result from debris entering gas controls and burners. Despite the fact that utilities supply clean gas, debris can enter the piping prior to and during installation on the utility side of the system and on the customer side.

Sediment traps are designed to cause the gas flow to change direction 90 degrees (1.57 rad) at the sediment collection point, thus causing the solid or liquid contaminants to drop out of the gas flow [see Commentary Figure G2419.4(1)]. The nipple and cap should not be placed in the branch opening of a tee fitting because this would not create a change in direction of flow and would allow debris to simply pass/jump over the capped nipple collection point. Commentary Figure G2419.4(2) illustrates a relatively ineffective sediment trap, however, such configurations are not expressly prohibited by this section. The code does not specify a minimum length for the capped nipple, therefore, it could be from a close nipple on up. Three to 6 inches (76 to 152 mm) is the customary length. The capped nipple must be in a vertical plane to allow the sediments to fall in by gravity. The sediment trap must be as close to the appliance inlet as practical to be able to capture sediment from all of the piping upstream of the appliance connection. The sediment trap must be downstream of the appliance shutoff valve to allow the trap to be serviced after closing the upstream shutoff valve. Manufactured sediment traps are available that have the configuration of a straight section of pipe and are equipped with cleanout openings. Although it would be wise to install sediment traps at all appliance connections, they are not mandated by code for gas lights, ranges, clothes dryers and outdoor grills. These appliances are also susceptible to harm from debris in gas, especially ranges and clothes dryers, and the appliance manufacturer may require sediment traps where the code does not. The code's logic is that these exempt appliances are manually operated rather than automatically operated; therefore, the user would be in attendance and aware of a problem.