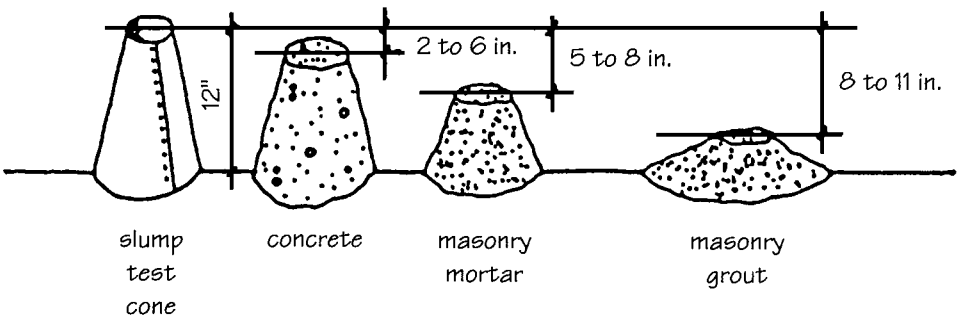
Grout with a water-cement ratio and slump similar to concrete is too dry and stiff for use in masonry. It will not flow into unit cores and wall cavities to properly fill voids and encapsulate reinforcing steel and connectors.

Masonry grout should have a fluid consistency for pouring or pumping into small spaces that are often congested with reinforcing steel.



Concrete	Masonry Mortar	Masonry Grout
Concrete is generally mixed with the *minimum* amount of water required to produce workability appropriate to the method of placement. The amount of water is determined by laboratory mix design.	Masonry mortar is generally mixed with the *maximum* amount of water required to produce good workability with a given unit. The amount of water is determined by the mason based on masonry unit absorption and field conditions.	Masonry grout is usually mixed with the *maximum* amount of water required to produce good flow properties. The amount of water is determined by the mason based on masonry unit absorption and field conditions.

Figure 15-2 Masonry grout should be a fluid consistency with a slump of 8 to 11 in.

Specified admixtures and pigments should be added in the approved quantities only after all other ingredients are mixed. Pigments should always be prebatched for consistency in color.

To avoid excessive drying and stiffening, mortar batches should be sized according to the rate of use. Loss of water by absorption and evaporation can be minimized on hot days by wetting the mortar board and covering the mix in the mortar box. Within the first $1^1/_2$ to $2^1/_2$ hours of initial mixing, the mason may add water to replace evaporated moisture (refer to Chapter 6). *Retempering* is accomplished by adding water to the mortar batch and thoroughly remixing. Sprinkling of the mortar is not satisfactory. Mortars containing added color pigment should not be retempered, as the increased water will lighten the color and thus cause variation from batch to batch.

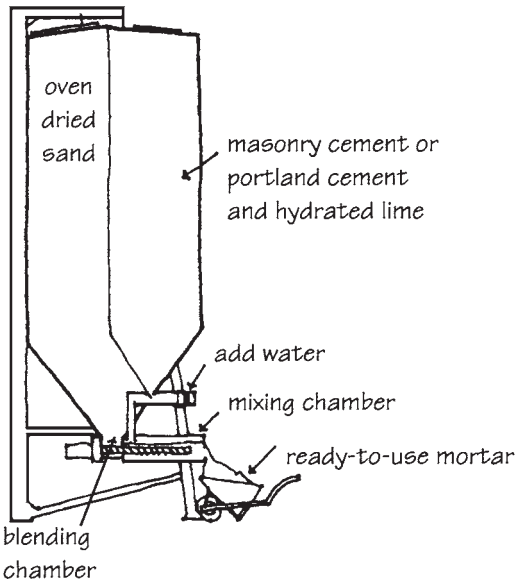


Figure 15-3 Mortar silo.

15.2.3 Masonry Units

Concrete masonry units are cured and dried at the manufacturing plant, and should never be moistened before or during placement because they will shrink as they dry out. If this shrinkage is restrained, as it normally is in a finished wall, stresses can develop that will cause the wall to crack.

When brick is manufactured, it is fired in a high-temperature kiln which drives virtually all of the moisture out of the wet clay. Fired bricks are extremely dry until they absorb enough moisture from the air to achieve a state of moisture equilibrium with their surroundings. Brick that is very dry when it is laid causes rapid and excessive loss of mixing water from the mortar, which results in poor adhesion, incomplete bond, and water-permeable joints of low strength. Brick that is very dry and absorptive is said to have a high initial rate of absorption (IRA) or high suction. Optimum mortar bond is produced with units having initial rates of absorption between 5 and 25 g/min/30 sq in. (refer to Chapter 3). If the IRA is higher than 30 g/min/30 sq in., the units should be wetted with a garden hose the day before they will be used so that moisture is fully absorbed into the units but the surfaces are dry to the touch before being laid. Visual inspection of a broken brick will indicate whether moisture is evenly distributed throughout the unit (*see Fig. 15-4*). A surface film of water will cause the brick to float. Where prewetting of units is not possible, the time lapse between spreading the mortar and laying the unit should be kept to a minimum. Some experts recommend that brick not be wetted in winter because some high-suction units produce better bond strength in cold weather than low-suction units.

A simple field test can be performed to determine whether brick should be prewetted. Draw a circle the size of a quarter on the bed surface of a unit, using a crayon or wax pencil. With a medicine dropper, place 12 drops of water inside the circle and time how long it takes for them to be absorbed (*see Fig. 15-5*). If the water is completely absorbed in less than 1 minute, the brick is too dry and should be wetted.