pressure and temperature within the autoclave to maximum levels, where they remain constant for 5 to 10 hours. Temperature is actually the critical curing factor. Pressure is used as a means of controlling steam quality. Rapid pressure release or "blow-down" causes quick moisture loss from the units without shrinkage cracks. For normal-weight aggregates, the cycle produces relatively stable, air-dry blocks soon after removal from the autoclave. Lightweight blocks may require additional time to reach this same air-dry condition.

Blocks cured by high-pressure autoclaving undergo different chemical reactions from those cured at low pressure. They are more stable and less subject to volume change caused by varying moisture conditions. The improved dimensional stability reduces shrinkage cracking in completed wall assemblies.

2.2.8 Surface Treatment

Concrete blocks are sometimes finished with ceramic, organic, or mineral *glazes*. These special finishes are applied after curing, and then subjected to heat treatment. The facings vary from epoxy or polyester resins to specially treated glass silica sand, colored ceramic granules, mineral glazes, and cementitious finishes. The treated surfaces are resistant to water penetration, abrasion, and cleaning compounds, and are very durable in high-traffic areas.

Surface *textures* are applied to hardened concrete blocks in a number of ways. Grinding the unit face produces a smooth, polished finish that highlights the aggregate colors (*see Fig. 2-8*). Ground faces can be supplementally treated with a wax or clear sealer. Sandblasting a block face exposes the underlying aggregate, adding color, texture, and depth. Split-faced units are produced by splitting ordinary blocks lengthwise. Solid units produce a rough stone appearance, while cored units are used to make split-ribbed block (*see Fig. 2-9*).

Figure 2-8 Concrete blocks face-ground to expose natural aggregate colors.

2.2.9 Cubing and Storage

Once the masonry units have been cured and dried, and any additional surface treatments have been completed, the blocks are removed from the curing racks and assembled in "cubes." The cubes are moved to a storage yard where, depending on the curing method used, they may remain in inventory anywhere from a few days to several weeks before they are shipped to a job site.

2.3 MORTAR AND GROUT MATERIALS

Mortar may account for as little as 7% of the volume of a masonry wall, but the role that it plays and the influence that it has on performance and appearance are far greater than the proportion indicates. The selection and use of various mortar ingredients directly affect the performance and bonding characteristics of masonry. It is important to be aware of the materials available and the effects they may have on the overall integrity of the masonry.

The principal components of masonry mortar and grout are cement, lime, sand, and water. Each of these constituents is essential in the performance of the mix. Cement gives the mortar strength and durability. Lime adds workability, water retentivity, and elasticity. Sand acts as a filler and contributes to economy and strength, and water imparts plasticity. To produce high-quality mortar and grout, each of the ingredients must be of the highest quality.

2.3.1 Cements

The Romans used natural pozzolans to give hydraulic setting qualities to mortar. Concrete and mortar are said to be "hydraulic" if they will set and

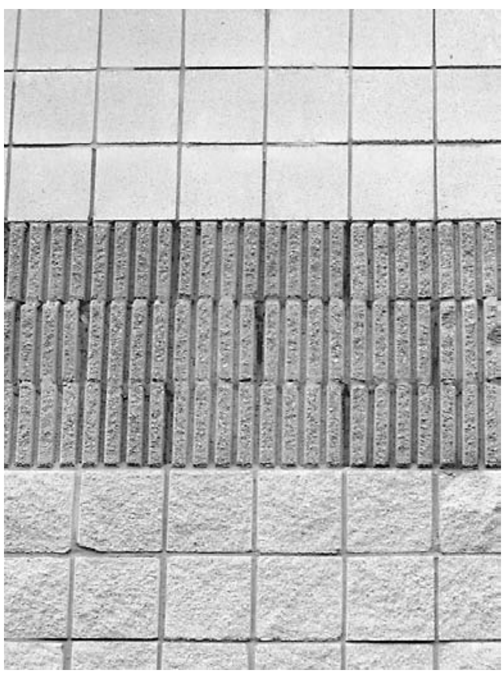

Figure 2-9 Smooth, split-ribbed, and split-faced concrete block.