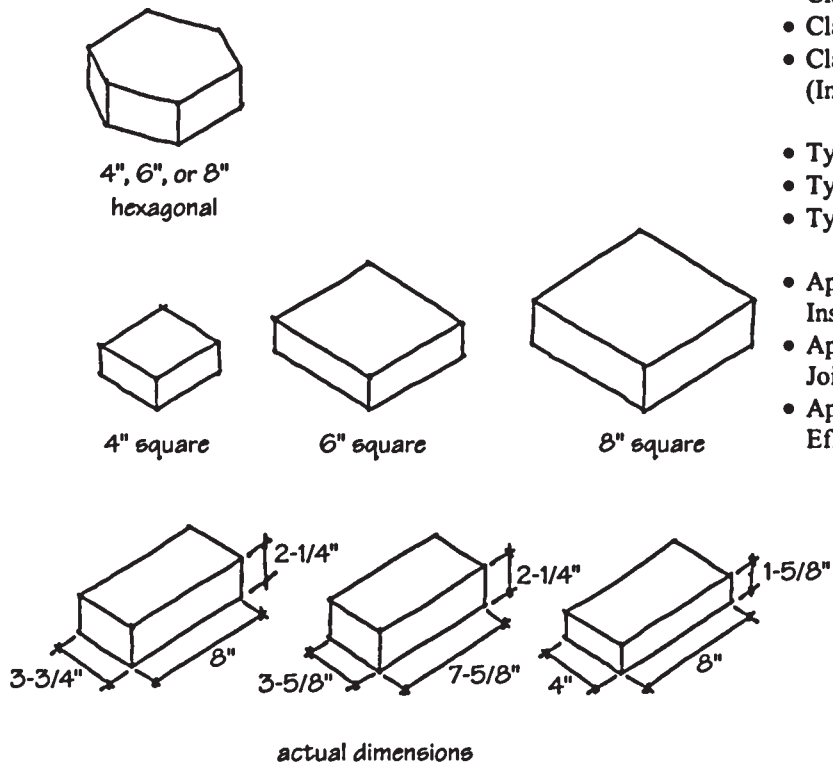


are covered: Type I, heavy traffic; Type II, intermediate traffic; and Type III, low traffic (see Fig. 3-13). Three weathering classifications, SX, MX and NX correspond to similar exposure limitations for face brick of severe, moderate, and negligible weathering. For extruded brick, Class SX requires a minimum average compressive strength of 8000 psi, a maximum average cold water absorption of 8%, and a maximum saturation coefficient of 0.78. Compressive strength and cold water absorption for Class SX molded brick are one-half that of extruded brick at 4000 psi and 16%, respectively. Maximum saturation coefficient is the same at 0.78. Size tolerances for paving brick are governed by the intended method of installation: application PS for setting with mortar joints or in running bond or other patterns not requiring extremely close dimensional tolerances; application PX for setting without mortar joints; and application PA, characteristically non-uniform to simulate the appearance of hand-made brick.

ASTM C1272, *Standard Specification for Heavy Vehicular Paving Brick*, covers units intended for service in heavy-use areas such as streets, commercial driveways, and aircraft taxiways. Two types of brick are covered (see Fig. 3-14). Type R (Rigid paving) is intended to be set in a mortar setting bed supported by an adequate concrete base or on an asphalt setting bed supported by an asphalt or concrete base. Type F (Flexible paving) is intended to be set in a sand setting bed with sand joints and may be installed on a flexible or rigid base. Three different applications are also covered, corresponding roughly to face brick appearance types. Application PS pavers are intended for general use. Application PX pavers are intended for use where dimensional tolerances, warpage, and chippage are limited. Application PA pavers are intended to produce characteristic architectural effects resulting from nonuniformity in size, color, and texture. Type R pavers must have a minimum average compressive strength of 8000 psi, a minimum modulus of rupture of 1200 psi, a maximum cold water absorption of 6%, and a minimum thickness of 2¼ in. Type F pavers must have a minimum average compressive strength of 10,000 psi, a minimum modulus of rupture of 1500 psi, a maximum cold water absorption of 6%, and a minimum thickness of 2½ in.

Appearance depends largely on color, size, texture, and bond pattern. Paving brick is usually uncored and designed to be laid flat. Colors may range from reds to buffs, grays, and browns. Surface textures include smooth, velour, and rough, slip-resistant finishes. Standard or round-edge pavers are available in rectangular as well as square and hexagonal shapes.

*Firebox brick* is used as the lining in the fireboxes of residential fireplaces, and must have resistance to very high temperatures for extended periods of time. Firebox brick is often made from fire clay, which has a higher softening point than surface clay and shale. The low oxide content, which raises the softening point, also causes the brick to burn to a very light brown or light buff color approaching white. Firebox brick is typically installed with a mortar made from ground fire clay. Mortar joints are typically only ⅛ in., or just thick enough to accommodate dimensional variations in the units. Tolerances on dimensional variations are important because tight fit is required to prevent heat loss through the back or sides of the firebox, which could result in both thermal inefficiency and fire hazard. ASTM C1261, *Standard Specification for Firebox Brick for Residential Fireplaces*, covers material requirements, physical properties, and fabrication tolerances. Units must be 100% solid, with no cores or frogs, must have a minimum modulus of rupture of 500 psi, and a pyrometric cone equivalent of 13. Since firebox brick is designed to be laid with very thin refractory mortar joints, the size tolerances permitted by ASTM C1261 are very restrictive (see Fig. 3-15).



- Class SX—Severe Weathering
- Class MX—Moderate Weathering
- Class NX—No Weathering (Interior Use Only)
  
- Type I—Heavy Traffic
- Type II—Intermediate Traffic
- Type III—Low Traffic
  
- Application PS—Standard Mortar Installation
- Application PX—Precision Dry Joint Installation
- Application PA—Architectural Effects

| Physical Requirements |  |            |                                   |            |                                |            |
|-----------------------|--|------------|-----------------------------------|------------|--------------------------------|------------|
| Unit                  | Minimum Compressive Strength, Flatwise, Gross Area (psi) |            | Maximum Cold Water Absorption (%) |            | Maximum Saturation Coefficient |            |
|                       | Average of 5 Bricks                                      | Individual | Average of 5 Bricks               | Individual | Average of 5 Bricks            | Individual |
| Class SX              | 8000   | 7000       | 8                                 | 11         | 0.78                           | 0.80       |
| Class MX              | 3000   | 2500       | 14                                | 17         | no limit                       | no limit   |
| Class NX              | 3000   | 2500       | no limit                          | no limit   | no limit                       | no limit   |

| Abrasion Requirements |                        |  |
|-----------------------|------------------------|--|
| Unit                  | Maximum Abrasion Index | Volume Abrasion Loss, (Max. cm <sup>3</sup> /cm <sup>2</sup> ) |
| Type I                | 0.11                   | 1.7  |
| Type II               | 0.25                   | 2.7  |
| Type III              | 0.50                   | 4.0  |

| Maximum Permissible Extent of Chippage |                           |        |
|--|---------------------------|--------|
| Application                            | Chippage (in.) in From    |        |
|  | Edge                      | Corner |
| PS                                     | 5/16                      | 1/2    |
| PX                                     | 1/4                       | 3/8    |
| PA                                     | as specified by purchaser |        |

Figure 3-13 Requirements for pedestrian and light traffic paving brick. (Tables on this page copyright ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428. Reprinted with permission.)