The following is a recommendation for Efflorescence - Care and Maintenance of Cast Stone Material.

Efflorescence is a crystalline-like deposit that usually appears to sparkle on the surface of cast stone products and other masonry and concrete products. It is usually white in nature and can appear on all types of masonry and concrete material. Depending on where one stands in relation to the stone, viewing the material at different angles and from different distances, allows one to see the crystalline effect more so than others.

Although a controversy, there does not appear to be proof that efflorescence is reason for rejection of cast stone according to ASTM C 1364, Standard Specifications for Architectural Cast Stone. Additionally, builders and architects disagree on why it occurs and when. There is no structural or durability importance, and is commonly temporary, thus should be left alone.

Efflorescence is commonly seen shortly after a building has been washed down or during the fall and winter months when vapor transmission slows down, and masonry stays damp for longer periods of time.

All cast stone material is susceptible to efflorescence because of chemical reactions of moisture entering through the walls or surfaces of cast stone. This moisture combines with the calcium hydroxide in the cement which brings the hydroxide to the surface. This solution then forms a more insoluble compound when it combines with carbon dioxide in the air.

Soluble salts are found in concrete, mortar brick, or cast stone, and must mix with moisture before efflorescence may occur. These salts can be carried into the cast stone by rainwater, or absorbed by standing groundwater. Additionally, some feel that there is enough evidence to suggest that admixtures, masonry cleaners, and deicers, a device or chemical that removes or prevents ice, may increase the salt content when used.

Calcium hydroxide is more soluble in water at cold temperatures which are the reason efflorescence is more apparent during the colder months. Leaving joints open during the colder months of construction is a major cause of calcium hydroxide deposits showing up in the spring.

Common installation problems can influence the occurrence of efflorescence including improper use of cast stone products below ground or improper drainage or moisture barriers. Additionally, insufficient weep holes, installation of cast stone without ventilated wythes, improper use of through-wall flashing or improper use of mortar joints instead of sealant joints, or soffit stones in masonry walls that have been designed incorrectly and become gutters for the wall.

Acid rain is nature’s natural remover of efflorescence. While washing with acids is commonly done to remove efflorescence, one must be careful to consider that the acid mixture they are using may contain chlorides, which can contribute to efflorescence.

When all environmental considerations have been examined, the use of diluted muriatic acid (five to ten percent) will help remove efflorescence and carbonate of lime. Be aware that washing can cause more salts to surface thus still creating the efflorescence effect. Washing a couple times will tend to remove the salts that have been drawn to the surface, and will usually then eliminate the problem of efflorescence.

It is important to plan ahead and properly damp proof planter areas and water table sections to prevent wicking of groundwater. Salt contamination is caused by improper ground storage.

It is important to note that careful planning at the start will assist in eliminating disappointment for any homeowner or com-
mercial designer at the completion of the project. There is so little one can do to change the appearance of cast stone after installation, therefore, we strongly suggest that careful consideration and planning are executed from the start.