

## *Technical Notes on Brick Construction:*

# **STAINS: Identification & Prevention**

Presented by the Brick Industry Association

### SUMMARY OF RECOMMENDATIONS:

#### Identification:

- Use photos and descriptions for preliminary identification of efflorescence or stains
- When uncertain of correct identification of efflorescence or stain, have experienced brick personnel or professionals verify prior to cleaning

#### Prevention:

- Do not clean brickwork with unbuffered hydrochloric (muriatic) acid
- Use cleaning agent or procedure recommended by brick manufacturer to prevent cleaning-related stains
- Store brick off ground and cover with non-staining waterproof material
- Protect top of unfinished brickwork from weather

### INTRODUCTION

Brick has been used to create beautiful buildings for centuries. Most of these structures have a substantial history of outstanding performance. In some instances the appearance is affected by the development of efflorescence or stains. These may originate from materials in the brick or mortar, from adjacent materials, and from outside sources such as cleaning agents. Each has a particular chemical composition and a unique means of removal.

Identification of the origin of the efflorescence, stain or foreign material is the first step in returning brickwork to its proper appearance. Some stains are often misidentified or are mistaken for efflorescence. Since correctly identifying efflo-

rescence or a stain can be difficult, it is recommended that experienced brick personnel or professionals verify the efflorescence or type of stain. Misidentification may result in application of an inappropriate correction method. When correctly identified, efflorescence and stains can generally be removed. Inappropriate correction methods may result in further staining or damage of the brickwork.

Further information on the formation and prevention of efflorescence is discussed in Technical Note 23A. Once final identification of efflorescence or a stain is made, refer to Technical Note 20 for removal recommendations.



## EFFLORESCENCE

Efflorescence is not considered a stain but will be discussed here for identification purposes. Refer to Technical Note 23A for causes and prevention. Efflorescence is normally a harm-



Photo 1, Efflorescence

less deposit of water soluble, white salt crystals, as shown in Photo 1. In some instances, efflorescence may appear on mortar joints as shown in Photo 2. Efflorescence may appear in limited areas on the surface of brickwork as shown in Photo 3 or, in extreme cases, cover the entire brickwork surface.

Efflorescence is usually white in color; however, all white stains on brick masonry are not necessarily efflorescence. Lime run and white scum, as discussed below, are occasionally mistaken for efflorescence.

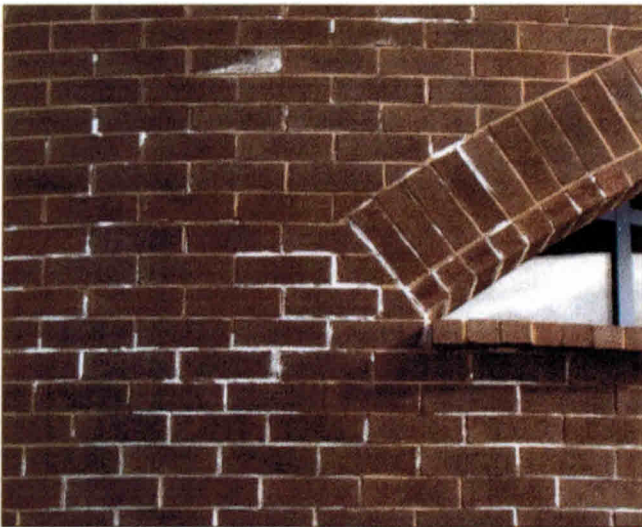


Photo 2, Efflorescence on mortar joints



Photo 3, Efflorescence in limited areas

## LIME RUN (CARBONATE DEPOSITS)

Calcium carbonate deposits, sometimes referred to as “lime run,” usually appear as white or gray, crusty formations originating from a spot and running down the face of the wall, as shown in Photo 4. However, the term “lime run” is misleading since the stain is not a direct result of the lime component in the mortar. In fact, hydrated lime actually helps to reduce the risk of lime run. Lime run nearly always occurs at a small hole or opening or hairline crack in the face of the brick masonry, as shown in Photo 5.

The source of the calcium compounds that contribute to lime run can be trim, mortar, backing, or other construction materials. Lime run requires large quantities of water that follow the same path over an extended period of time, similar to the formation of stalactites in limestone caves. The water takes any of several calcium compounds into solution and brings them to the surface of the masonry through an opening. At the surface, the solution reacts with carbon dioxide in the air, thus forming the crusty calcium carbonate deposit.

Materials containing cement are sources of calcium compounds and are an integral component of, or may be in contact with, the brickwork. To reduce the possibility of lime run, excess water must be eliminated or the path must be disrupted. Once lime run begins, it is likely to continue until the water source is stopped. ▶▶▶

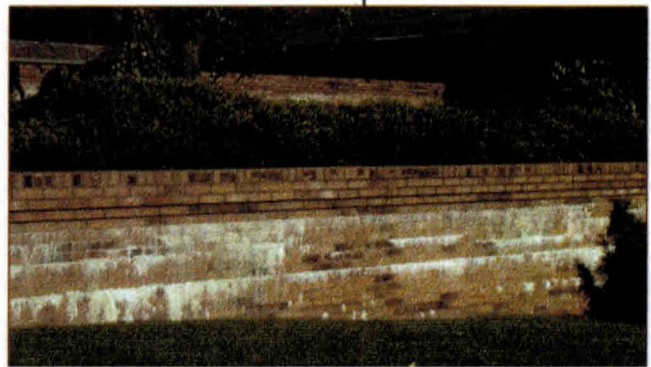


Photo 4, Lime run



Photo 5, Lime run

