

AUSTRAL MASONRY – CLEANING PRECAUTIONS

The methods of general cleaning listed in order of increasing rigour are:

Dry Brushing

Dry hand brushes from small soft to hard scrubbing brushes can be used to remove soft or loose surface deposits such as dust, salts and weak crusts. However, it is possible that surface deposits of soluble salts will reappear if water enters the surface of permeable masonry and subsequently evaporates from the surface. Repeated dry brushing may eventually arrest the appearance of the salts, but washing will probably be more efficient.

Water Washing

This is one of the gentlest processes available. Use of bucket and brush or garden hose and brush can generally remove most surface dirt. This will remove surface deposits of soluble salts, but will probably fail to remove hardened calcium carbonate or mortar smears. Soaking with water has been used since Roman times, a slow steady stream of water causes the dirt deposits to swell, loosening their grip on the underlying masonry. Accumulated waters, cascading over the face of the masonry, then wash the loosened dirt away.

Steam Cleaning

This is not often used because it is slow. However, it can sometimes help remove deep-seated soiling, softening oily, greasy or tarry deposits and for killing mould or algae on damp surfaces.

Low-Pressure Water Jet

A pump unit projects a low-pressure water jet against the surface to dislodge loosely held material. Often used as a follow up to a loosening process, eg chemical or brushing. Cleaning should begin at the top of the masonry so water will run down and pre-soften the dirt below

High-Pressure Water Jet (Blasting)

This incorporates hot water and a 15° fan nozzle at an appropriate distance (at least 150 mm) from the surface and appropriate pressure. The general procedure is:

- allow at least 7 days for mortar to harden;
- remove large mortar dags with hammer and chisel or scutch hammer
- mask or protect adjacent areas;
- thoroughly wet the wall until suction of masonry unit is complete;
- apply selected cleaning solution starting at the top of the wall;
- let the cleaning solution stay on the wall for 1 to 5 minutes, or as directed by the manufacturer; and
- wash the wall with high pressure starting at the top (do not direct jet onto mortar joints). In general, the higher
- the water pressure, the more effective the cleaning and the greater the potential damage to the surface (see Table 4.1).

Acid should not be used through the jet equipment because:

- It pushes the chemical deep into the substrate making it difficult to remove
- Chemical does not remain on wall long enough to work, thus operator tends to use higher strengths to compensate

- Can cause harm to operator and surrounding environment.

Chemical Cleaning

Many chemicals can be applied to concrete masonry without appreciable injury to the surface, but strong acids or chemicals with a strong acid reaction should definitely be avoided. Even weak acid should be used only as a last resort as it dissolves the cement matrix of the masonry, beginning at the surface. This leaves the face more porous so that it absorbs more water and exposes more aggregate, thereby changing the colour and texture of the masonry. The general procedure is to thoroughly wet the masonry surface, spray or brush a minimum amount of chemical, allow it to act for 1 to 5 minutes and then scrub. Wash it off using one of the methods described above. Precautions are necessary to protect the operator. Occupational health and safety requirements and common sense should prevail. Organic solvents are generally used on small areas of greasy substances by using a bandage or poultice. This can be expensive since they tend to evaporate or be absorbed. The more commonly used solvents are white spirit, carbon tetrachloride, methyl and ethyl alcohols, proprietary paint stripper or dry-cleaning agents. They also tend to leave a visible residue or stain on the masonry.

Detergents are surfactants (surface active agents) and promote wetting of the soiled surface by water. Small quantities of detergent are often used when washing with water, usually at low pressure. Detergents are by no means harmless, with many being chemically-aggressive. They are most effective and can be used in the removal of earth stains.

Acid cleaners should be used only after considerable thought is given to the consequences, such as effect on the masonry, operator and the environment. There is common well-founded resistance to the use of acids on concrete masonry.

Hydrochloric acid (muriatic acid or spirits of salts) is widely used on clay bricks to remove mortar stains since it dissolves portland cement. However, for this reason, it can have serious effects on the surface of concrete masonry if used incorrectly. Generally, a solution of 1 part acid to 20 parts water (maximum strength 1 part hydrochloric acid to 10 parts water) is recommended, while an area of less than 6 m² should be treated at a time.

SAFETY WARNING:

Never add water to acid, always add acid to the water. Hydrochloric acid will not remove salts, and will most likely make removal more difficult. Phosphoric acid is used for the removal of iron bearing deposits (rusty stains). A maximum strength of 1 part acid to 10 parts water should be used.

Phosphoric acid should not generally be used on coloured concrete masonry as bleaching of the iron oxide pigments will result.

Oxalic acid is used for the removal of hardwood timber stains. 120 grams of oxalic acid with 4 litres of warm water is the recommended mix.

Bleaching solutions such as sodium hypochlorite (pool chlorine) have also been found to be very effective and a readily-available chemical for use on hardwood timber stains.

Wet Abrasive (Grit) Blasting

The objective is not to dissolve and wash away the stain but to remove the outer portion of the masonry on which the stain has deposited. Water and grit (usually sand) are directed onto the surface under pressure. Water cushions the abrasiveness of the grit and therefore is less destructive than dry sandblasting. It is generally acceptable only on concrete masonry units that are intended to have their aggregates exposed, eg split-face, shotblasted.

Dry Abrasive (Grit) Blasting

This is commonly referred to as sand blasting. It is seldom used as it opens the surface of the masonry thus making it more susceptible to pollutants and staining.