EXHIBIT 9

U.S. General Services Administration

Guidelines for Using High Pressure Cleaning Equipment on Masonry

CSI Division:
Division 4- Masonry

Section:
Masonry Cleaning

Last Modified:
08/16/2016

Disclaimer

Technical Procedures Disclaimer
Prior to inclusion in GSA's library of procedures, documents are reviewed by one or more qualified preservation specialists for general consistency with the Secretary of Interior Standards for rehabilitating historic buildings as understood at the time the procedure is added to the library. All specifications require project-specific editing and professional judgement regarding the applicability of a procedure to a particular building, project or location. References to products and suppliers are to serve as a general guideline and do not constitute a federal endorsement or determination that a product or method is the best or most current alternative, remains available, or is compliant with current environmental regulations and safety standards. The library of procedures is intended to serve as a resource, not a substitute, for specification development by a qualified preservation professional.

Rewrite
We've reviewed these procedures for general consistency with federal standards for rehabilitating historic buildings and provide them only as a reference. Specifications should only be applied under the guidance of a qualified preservation professional who can assess the applicability of a procedure to a particular building, project or location. References to products and suppliers serve as general guidelines and do not constitute a federal endorsement nor a determination that a product or method is the best alternative or compliant with current environmental regulations and safety standards.

Introduction

When used properly, high pressure cleaning equipment can safely and effectively remove dirt from masonry materials. However, when NOT used properly, this type of cleaning equipment can cause severe damage.

CAUTION: HIGH PRESSURE CLEANING IS NOT RECOMMENDED FOR USE ON POROUS SURFACES SUCH AS MASONRY. RATHER, POROUS SURFACES SHOULD BE CLEANED USING LOW PRESSURE TECHNIQUES.

There are three important factors to consider when specifying the use of high pressure cleaning equipment. All three factors influence the "impact" of the spray on the masonry surface. They are:

1. Pressure rating of water from the nozzle in pounds per square inch (psi)
2. Flow rate of water from the pump in gallons per minute (gpm)
3. Size and type of nozzle or spray tip

Pressure Rating

1. The pressure rating is the rate of intensity that water is supplied to the pump and is measured in pounds per square inch (psi).
2. The pumps most preferred by cleaning contractors are those providing adjustable pressure between 500 and 2,000 psi.
3. Pressures between 1,000 and 2,000 psi are typically used for surface preparation cleaning.
4. For typical masonry cleaning, the pressure rating can range from 500 to 1,000 psi. NOTE: FOR OLDER AND DELICATE SURFACES, MUCH LOWER PRESSURES MUST BE USED.
    a. A low-pressure wash generally measures between 100 psi and 400 psi.
    b. A medium-pressure wash generally measures between 400 psi and 800 psi.
    c. A high-pressure wash generally measures between 800 psi and 1200 psi.

Flow Rate

1. Flow rate is the volume of water supplied by the pump and is measured in gallons per minute (gpm).
2. Higher volume pumps are preferable for masonry cleaning. They allow flexibility in adjusting the water pressure as necessary while providing a strong enough flow of water to thoroughly rinse dirt and cleaner residue from the masonry.

Nozzle Type and Size

1. A fan type nozzle providing a 15-40 degree fan is preferred.
2. Laser tips, O-tips, or any fan spray narrower than 15 degrees should NOT be used on masonry. These types of tips generate a concentrated stream of water which can be damaging to the surface.
3. Nozzles should be held perpendicular to the surface at a distance between 18 and 30 inches from the surface.

Removing Cleaning Compounds After Use

1. Do not use high pressure equipment to apply cleaning compounds to masonry.
    a. High pressure application will make it difficult to completely rinse away cleaning compounds.
    b. Low pressure spray equipment (50 psi maximum) should be used.
2. Traces of cleaning compounds left in the masonry surface can result in severe remedial problems and staining, such as:
    a. Efflorescence
    b. Vanadium staining
    c. Acid burn
    d. Rust and other metallic oxidation stains

Pressure Washing with Hot Water

1. Useful for cleaning when outside temperatures are too cold to clean with cold water.
2. Water temperatures should not exceed 160 degrees. Higher temperatures may adversely react with some chemical cleaners, resulting in surface discolorations or streaking.
3. Hot water is most effective when used in conjunction with alkaline cleaning compounds. It is best used in applications for removing paint, grease and oil.
4. Hot water is NOT effective when used in conjunction with acidic masonry cleaners.

Last updated: Aug 13, 2017