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Standard Guide for Cleaning of Exterior Dimension Stone, Vertical And Horizontal Surfaces, New or Existing¹

This standard is issued under the fixed designation C1515; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This guide describes materials and procedures which may be used to clean dimension stone exteriors as well as the conditions under which they may be used. It is intended to aid owners, maintenance supervisors and building managers, architects and engineers, and contractors in cleaning vertical exterior dimension stone on commercial, residential and institutional structures. This guide may also be helpful to those who wish to clean stone masonry on bridges, retaining walls, ramps, and plazas, and free-standing stone objects such as statuary, memorials and grave markers.

1.2 This guide relates primarily, to routine maintenance of the surface finish of exterior dimension stone. The techniques noted herein may not be appropriate or cost effective with regard to restoration of disfigured, severely soiled or stained stonework, or of stonework of particular historic importance. In cases where staining occurs on surfaces which have cultural, civic, historic or architectural significance, consultation with a specialist is recommended.

1.3 The user of this guide should also obtain and have on file at both the job site and the office Material Safety Data Sheets (MSDS) describing the nature of all chemical products utilized during the cleaning process.

1.4 A file of literature from the manufacturers of all products involved within the scope of each project should be available for reference.

1.5 These procedures are not intended for interior stonework.

1.6 This guide offers an organized collection of information or a series of options and does not recommend a specific course of action. This document cannot replace education or experience and should be used in conjunction with professional judgment. Not all aspects of this guide may be applicable in all circumstances. This ASTM standard is not intended to represent or replace the standard of care by which the adequacy of a given professional service must be judged, nor should this document be applied without consideration of a project's many unique aspects. The word "Standard" in the title of this document means only that the document has been approved through the ASTM consensus process.

~~1.7 The values stated in either inch-pound units or SI units are to be regarded separately as standard. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.~~

1.7 The values stated in inch-pound units are to be regarded as standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.8 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety and health practices and determine the applicability of regulatory requirements prior to use.*

2. Referenced Documents

2.1 ASTM Standards:²

C119 [Terminology Relating to Dimension Stone](#)

C503 [Specification for Marble Dimension Stone](#)—~~Specification for Marble Dimension Stone~~

E1971 [Guide for Stewardship for the Cleaning of Commercial and Institutional Buildings](#)

¹ This guide is under the jurisdiction of ASTM Committee C18 on Dimension Stone and is the direct responsibility of Subcommittee C18.07 on Environmental Properties, Behavior, and Cleaning.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

3. Terminology

3.1 Terms used in this guide are defined in Terminology C119.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *exterior dimension stone*—a general term for a stone installed in a location where temperature, moisture and wind-carried contaminants are regulated solely or primarily by the forces of nature.

3.2.2 *qualified contractor*—a person, persons or organizations having expertise in stone cleaning, proved by documented projects demonstrating successful work, consistency in business or consultancy for a period of five or more years.

4. Significance and Use

4.1 Exterior dimension stone is chosen for use in contemporary architecture in part because of its aesthetic appeal. Aesthetics can be significantly diminished when dirt, grime, fly ash, algae and other contaminants collect on the surface of stone.

4.2 This guide is intended to assist those who wish to preserve the original appearance of a new structure or to return a stone-clad building to its original color and appearance.

4.2.1 Note that cleaning may not be able to return discolored or faded stone to its original appearance.

4.3 This guide may be used as a construction document.

5. General Information

5.1 Exterior stone is used in honed, textured, or polished finishes in many modes in exterior environments. However, trade experience discourages the use of a polished finish marble or limestone on exterior applications due to susceptibility to damage by acids in rain or snow, and by wind-driven dirt particles.

5.2 The use of dark colored marbles and limestones for exteriors is discouraged because fading in direct sunlight has been experienced. Discolored or faded stone may not be able to be returned to its original color by cleaning.

5.3 Only marbles with an “A” Soundness Classification should be used for exterior installations. An exception is travertine marble (“C” Soundness Classification) which may be installed with its natural voids either filled or unfilled. See Specification C503 for soundness classification of marbles.

5.4 Stone installed in a mortar bed should be allowed to cure properly. Do not apply surface treatments to stone set horizontally in a mortar bed for at least four weeks following installation.

5.5 Carefully identify all wet pedestrian areas with barricades, “danger” signs or bright red or orange-colored “danger” pylons.

5.6 Always test any cleaning method on a sample area to determine its effectiveness. Always refer to the manufacturer’s instructions.

5.7 When choosing the materials and procedures for cleaning dimension stone, the most appropriate materials and procedures should be chosen to promote eco-efficiency and avoid adverse impacts on humans, the structure itself, and the environment, see Guide E1971. The alternative cleaning processes, cleaning products and their storage, use, and disposal, equipment choices, and training of personnel involved in the work need to be assessed.

5.7.1 Certain pertinent questions should be considered here: (1) how is the building used? (2) are there any special cleaning requirements caused by the type or finish of dimension stone used? If so, identify the cleaning task and performance requirements, (3) are there any at-risk human populations to consider? (4) are there any issues relating to building age or architecture? (5) what criteria or measures will be used to evaluate the quality of cleaning and repairs?

6. Normal Maintenance

6.1 In accessible areas, routinely follow maintenance procedures as specified for Polished Stone, Honed Stone or Textured Finish Stone as applicable. The large expanses of stone traditionally found on exterior multi-story installations should be cleaned as often as necessary to remove accumulated pollutants.

6.1.1 A practice as simple as a hosing down with potable water on a regular basis will prevent accumulation of dust and acidic deposits left by rain or snow.

6.1.2 The cleaning of stone should be done only by qualified contractors who have the craftsmen, equipment, resources, and technical expertise to do the work, as well as make any repair, resetting, or repointing that may be necessary.

6.1.3 Generally, the processes used in multi-story cleaning will be similar to normal procedures, except that pumps for pressure wash, or steam and rinse water may be employed to economize on the amount of time necessary to the work.

6.1.4 Consult material suppliers and qualified contractors to obtain their recommendations for maintenance, materials or repairs.

6.1.5 Always test any cleaning method on a sample area to determine its effectiveness. Always refer to the manufacturer’s instructions.

6.1.6 Always try the least aggressive cleaning media (potable water) first.

6.1.7 Evaluate project conditions with regard to required protection of adjacent properties and public safety. The protection needed for cleaning multi-story structures will differ from that needed for one or two-story buildings.

7. Polished Dimension Stone

7.1 Polished Stone has a glossy surface that reflects light and emphasizes the color and markings of the material.

7.1.1 Normal maintenance involves only periodic washing with clean, potable water and neutral (pH7) cleaners. “Soapless”

cleaners are preferred because they minimize streaking and filming. Abrasive cleaners should be avoided.

7.1.2 Stone surfaces should first be wetted with clean, hot (not boiling) water. Then, using the cleaner solution (following manufacturer's directions) wash in small, overlapping sweeps from top down, or follow manufacturer's directions if different. Rinse thoroughly with clean, potable water to remove all traces of soap or cleaner solution. If rinsing is done by hand, change the water in the rinse pail frequently. Dry with a soft cloth, cotton flannel or chamois, wiping carefully to avoid streaks. The surface may also be allowed to air-dry.

7.1.2.1 **Warning**—Do not use bleach, acid, or strong alkali solutions on marble or limestone because colors may be lightened and the surface etched.

7.1.2.2 Select a cleaning agent which suits the nature of the stone.

8. Honed Dimension Stone, Normal Maintenance

8.1 A honed finish is a satin smooth surface with relatively little light reflection.

8.1.1 Normal maintenance of a honed finish involves as-needed washing with clean, potable water and neutral (pH7), mildly abrasive cleaners.

8.1.2 Surfaces should be first wetted with hot, clean water. Then, using a mildly abrasive, alkaline cleaner and a medium natural bristle brush, wash in overlapping, swirling strokes. Work from top down or follow manufacturer's directions if different.

8.1.3 Rinse thoroughly then wipe dry with cotton, cotton flannel, or a chamois. Wipe carefully to avoid streaking. Optionally, the stone may be allowed to air-dry.

8.1.4 If further cleaning is needed, make a paste to the consistency of thick syrup by combining a mildly abrasive alkaline cleaning powder and clean, potable water. Apply the paste uniformly over the surface with a broad brush and allow to stand until dry. Then, use a medium bristle brush with additional water and scrub vigorously. (More cleaning powder may be applied at this point.) Rinse thoroughly and dry as described above. Follow manufacturer's directions.

8.1.4.1 See 10.1 and 10.2 for poultice information.

8.1.5 **Warning**—Do not use bleach, acid, or strong alkali solutions on marble or limestone because colors may be lightened and the surface etched.

8.1.5.1 Select a cleaning agent which suits the nature of the stone.

9. Textured Finish Dimension Stone, Normal Maintenance

9.1 Examples of textured finish dimension stone include Thermal Finish Granite, Thermal Finish Limestone, Unfilled Travertine, Rock Face, Split Face, Natural Cleft Slate and Natural Cleft Quartz-Based (Sandstone) Stone. Abrasive, bush-hammered, and sand-blasted finishes are also included in this category.

9.1.1 Regular maintenance becomes difficult if dirt is allowed to accumulate on the uneven surfaces of these stones. If convenient, textured finished stone may be vacuumed clean.

9.1.2 Normal maintenance of textured finish stones involves as-needed washing with clean, potable water and neutral (pH7), mildly abrasive cleaners.

9.1.3 Surfaces should first be wetted with hot, (not boiling) clean water. Then, using a mildly abrasive, alkaline cleaner and a medium bristle brush, wash in overlapping, swirling strokes. Work from top to bottom. Rinse thoroughly with clean water.

9.1.4 **Warning**—Do not use bleach, acid, or strong alkali solutions on marble or limestone because colors may be lightened and the surface etched.

9.1.4.1 Select a cleaning agent that suits the nature of the stone.

10. The Poultice Method

10.1 The General Poultice Method is a special cleaning procedure for removal of deep-seated, time-set dirt and grime. The poultice may be applied to honed or textured stone, and is particularly useful on intricate carvings, moldings and other detailing difficult to scrub. The general poultice is essentially a strong cleaner, applied by way of a holding medium, that concentrates its effort over a period of time.

10.1.1 A poultice applied to polished finish marble will dull the surface, requiring repolishing.

10.1.2 The poultice is used primarily to attack and reduce heavy deposits of normal soiling, or to remove stains resulting from the action of moisture on normal soiling.

10.1.3 For stains resulting from a known origin, see Section 11.

10.2 *Preparation and Application of a Poultice:*

10.2.1 Mix kaolin or Fuller's earth with either a common laundry bleach or a commercial hair-bleaching solution of hydrogen peroxide (H₂O₂) to form a paste the consistency of peanut butter or cake icing. (For estimating purposes, figure a consumption rate of one pound of paste per square foot of surface.)

10.2.2 Moisten the surface of the stone with the same liquid used to make the paste, wetting beyond the extent of the stained areas.

10.2.3 Apply the poultice paste to the stone with a wooden or plastic spatula, insuring a uniform coat about ¼-in. (0.635 cm) thick. Cover the entire area to be cleaned and somewhat beyond to prevent the soil from being forced into the clean stone. Insure the poultice is in full contact with the stone with no entrapped air pockets or voids.