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Chemically Removing Paint From And Repainting Brick Masonry

Procedure code:

421114S

Source:

Developed For HSPG(NPS - Southeast Regional Office)

Division:

Masonry

Section:

Brick Unit Masonry

Last Modified:

07/20/2016

PREFACE: Before undertaking any project involving paint removal, applicable state and federal laws on lead paint abatement and disposal must be taken into account and carefully followed. State and federal requirements may affect options available to owners on both paint removal and repainting. These laws, as well as any requirements prohibiting volatile organic compounds (vocs), should be requested from the state historic preservation officer in each state. (from preservation brief 28, "painting historic interiors")

PART 1---GENERAL

1.01 SUMMARY

A. This procedure includes guidance on chemically removing paint from and repainting brick masonry.

NOTE: Sandblasting is not recommended by the secretary of the interior's standards for rehabilitation and shall not be used. High-pressure water blasting is also not recommended without adequate testing or experience as it may erode soft brick and drive moisture into the wall.

B. Brick, properly fired, is a durable surface which does not need a sacrificial coating such as paint, to protect it. Painting often creates long term maintenance problems. However, brick that has been painted, is usually NOT properly fired and needs the protection provided by the application of paint. Furthermore, brick which has been damaged by abrasive cleaning may require painting in order to seal the masonry from excessive water penetration which, if not protected, can lead to further deterioration of the masonry.

C. Safety Precautions:

CAUTION: chemicals often used to remove paint are highly caustic to flesh and toxic.

1. Both acids and alkalies are used in the cleaning process. The wrong type of acid can burn and/or dissolve both the brick and the mortar. Adjacent and imbedded materials, i.e. glass or iron cramps, can also be damaged.

2. Failure to properly neutralize the chemicals, or inadequate rinsing can cause salts, stains and other residues to remain on the surface of the brick, residues which may be impossible to remove.

D. Historic Structure Precautions:

1. Masonry buildings were sometimes painted from the start. A study of all of the paint layers should be conducted to determine what were the original colors and if any special treatments were used.
2. For buildings in which all paint is to be removed, retain small representative areas of paint to provide a paint history of the building for future research.
3. An archives of the paint history of the building is to be maintained. This is to include any paint samples taken during research, samples of the new paint colors and the manufacturer's technical information.

E. See 01100-07-S for general project guidelines to be reviewed along with this procedure. These guidelines cover the following sections:

1. Safety Precautions
2. Historic Structures Precautions
3. Submittals
4. Quality Assurance
5. Delivery, Storage and Handling
6. Project/Site Conditions
7. Sequencing and Scheduling
8. General Protection (Surface and Surrounding)

These guidelines should be reviewed prior to performing this procedure and should be followed, when applicable, along with recommendations from the Regional Historic Preservation Officer (RHPO).

F. For general information on the characteristics, uses and problems associated with paint, see 09900-04-S. See also 09900-07-S for other guidelines pertaining to paint removal and application.

1.02 SUBMITTALS

A. Samples:

1. Under the supervision of the RHPO, test panels, using the appropriate cleaning methods, shall be done to determine the best method to remove paint. The "best method" shall be defined as that which successfully removes the paint with no, or minimal, damage to the masonry substrate.
2. Testing shall be done in unobtrusive locations on each building exposure. The methods used, their application, etc. shall be in accordance with manufacturer's instructions and shall duplicate those procedures proposed for the overall paint stripping process. The RHPO shall select the test areas and shall conduct a thorough evaluation of each method after paint removal is complete to determine the best method for the overall stripping.
3. The testing shall include an evaluation of the materials and techniques proposed for the protection of surrounding areas from the chemicals used to strip the paint. Especially important is an evaluation of the method to be used to collect the cleaning effluent.
4. A representative of the cleaning materials manufacturer(s) (for proprietary cleaning systems) shall be present during the preparation and application of the test areas.

1.03 PROJECT SITE CONDITIONS

A. Environmental Requirements:

1. To prevent water in the masonry from freezing, no paint stripping shall be done if temperatures are expected to fall below 40-48 degrees (F) during the stripping process, or within 24 hours of completing the stripping. If allowed by the chemical manufacturer, heated rinse water may be used if lower temperatures are expected.

2. No cleaning shall be conducted during periods of strong winds when the chemicals may be spread to adjacent unprotected surfaces.
3. Unless otherwise recommended by the paint manufacturer, the ambient temperature shall be between 50-58 degrees (F.) and 95-98 degrees (F.) Do not apply paints when the temperature is expected to fall below 50-58 degrees (F) during the first 24 hours after application.
4. Do not apply any of the coats of paint in the direct sun. It shall be applied only when the surface to be painted is in the shade and the sun is shining on the opposite elevation. The west elevation should be painted in the morning when the sun is shining on the east elevation; the north elevation should be paint around noon when the sun is shining on the south elevation; the east elevation should be painted in the afternoon when the sun is shining on the west elevation; and the south elevation should be painted late in the afternoon when it is in full shade.
5. Do not apply paint to damp surfaces, in misty or rainy weather, in the snow or where there is visible ice or frost on the surfaces.

PART 2---PRODUCTS

2.01 MANUFACTURERS

A. Proprietary Chemicals: (one of the following, or approved equal)

1. [ProSoCo, Inc.](#) [a nongovernment website]
Lawrence, KS 66117
[800-255-4255](tel:800-255-4255)
2. [Diedrich Technologies Inc.](#) [a nongovernment website]
Schenectady, NY 12303
[800-283-3888](tel:800-283-3888)
3. Hydrochemical Techniques, Inc.
P.O. Box 2078
Hartford, CT
06145 [800-278-7681](tel:800-278-7681)
info@hydroclean.com
4. [Dumond Chemicals, Inc](#) [a nongovernment website]
West Chester, PA (corporate office)
[800-245-1191](tel:800-245-1191) or [609-655-7700](tel:609-655-7700)
info@dumondglobal.com

2.02 MATERIALS

A. Off-the-Shelf Chemical Paint Removers:

1. Semi-paste, water rinsing, non-benzol removers such as Strypeeze Semi-paste, or approved equal.
 - a. Characteristic orange color.
 - b. Will work on both latex and oil-based paints, lacquers and varnishes.
 - c. Cling well to round or vertical surfaces. Form an anti-evaporative film as they dry.
2. Non-flammable, heavy bodied, methylene-chloride based removers such as Superstrip Nonflammable, Zip Strip, or approved equal.
 - a. Good for interior use because they are non-flammable.
 - b. Will soften oil-based paints, lacquers, varnish and synthetic baked finishes.
 - c. Because they are so heavy bodied they will cling to vertical and irregular surfaces.

3. Cornstarch or fumed silica to further thicken chemicals so they will adhere to vertical surfaces.

-OR-

One of the following proprietary paint strippers, or approved equal:

- a. Sure Klean Heavy Duty Paint Stripper (ProSoCo, Inc.)
- b. Sure Klean 859 Stripper (ProSoCo, Inc.)
- c. Blok-Guard & Graffiti Control II (ProSoCo, Inc.)
- d. Envirestrip Paint Remover (Diedrich Technologies)
- e. 505 Special Coatings Stripper (Diedrich Technologies)
- f. 606, 606X Caustic Multi-layer Paint Remover (Diedrich Technologies)
- g. Heavy Duty Paint Remover (Hydroclean)
- h. Peel Away 1,2 (Dumond Chemicals, Inc.)

B. Clean, potable water to remove chemical residue.

C. Phenolphthalein: Used to test pH of a surface after stripping with chemicals or any alkaline product. Available at some drug stores or chemical supply houses.

D. Clean, clear white vinegar or other appropriate neutralizer such as Sure Klean Restoration Cleaner (ProSoCo, Inc.), 101 Masonry Restorer/Cleaner (Diedrich Technologies), or approved equal.

E. Paint: From the same manufacturer and appropriately suited for the conditions.

CAUTION: DO NOT USE A VAPOR-IMPERMEABLE PAINT ON SURFACES THAT MIGHT HOLD DAMP FROM GROUND OR THROUGH WALLS SUCH AS BADLY-PITTED BRICK CAUSED BY SANDBLASTING.

3.03 EQUIPMENT

- A. Paint scrapers
- B. Putty knives
- C. Stiff bristle brushes to remove loose, flaky paint
- D. Natural fiber cleaning brush
- E. Synthetic fiber brush
- F. Rollers, and/or spray equipment as appropriate and recommended by paint stripper manufacturers for the application of their various products. Not all types of brushes, etc. are appropriate for all chemicals.
- G. Plastic sheeting and duct tape may be necessary to cover the stripper during dwell time as it evaporates quickly.
- H. Scrapers and/or pressure rinsing equipment to remove sludge.
- I. Nylon bristle brushes Garden hose

PART 3---EXECUTION

3.01 EXAMINATION

A. DETERMINE THE REASON FOR PAINT REMOVAL AND WHY THE BUILDING WAS ORIGINALLY PAINTED.

B. Before work is begun on removing the existing paint film or otherwise preparing the surface, all flashing, gutters and downspouts shall be inspected and repaired or replaced as required.

3.02 PREPARATION

A. Surface Preparation: Repoint any open mortar joints to prevent water and chemicals from entering the wall structure.

3.03 ERECTION, INSTALLATION, APPLICATION

A. Paint Removal:

1. Manually scrape all loose paint and efflorescence using paint scrapers, putty knives or stiff bristle brushes. If the

mortar and bricks are quite crumbly, use a softer brush.

2. Apply an off-the shelf methylene chloride-based paint remover (for small surface areas):
 - a. Thicken stripper with cornstarch as necessary.
 - b. Apply stripper to the surface by brush.
 - c. Cover with plastic wrap or keep misted to prevent chemical from drying out before it has had time to soften paint film.
 - d. When paint film is softened, rinse surface completely using a garden hose or pressure washing equipment. Use the lowest pressure which will remove paint and paint remover - usually about 300 to 500 psi, but no higher than 800 psi and only on approval of RHPO. HIGH PRESSURE WATER BLASTING IS NOT RECOMMENDED. Supplement rinsing as necessary with a wood or plastic scrapper. Repeat if required to remove all paint.

-OR-
3. Apply a proprietary chemical paint remover (for large surface areas):
 - a. Apply chemical paint remover with a brush, roller or appropriate spray equipment as directed by manufacturer. Pressure application of paint stripping materials shall not be done as it tends to drive the chemicals too far into the brick and mortar making it impossible to remove all residue. Final dilution ratio to be determined by test patches done prior to removal process.
 - b. Allow the stripper to stay on the brick as directed by the manufacturer and as determined by test patches.
 - c. Rinse completely with clean, fresh water using pressure washing equipment to remove all paint and residue. Maintain water pressures as recommended by chemical manufacturer and RHPO.
 - d. Apply a second coat of paint stripper if necessary to remove remaining paint, again following manufacturer's instructions.
 - e. Rinse completely again and apply afterwash as recommended by chemical manufacturer.
4. After paint has been removed, but before brick dries, apply neutralizer such as white vinegar, or a proprietary chemical neutralizer. A neutral Ph (7 pH) should be achieved before repainting.
5. Allow neutralizer to stand on wall about three minutes before rinsing. DO NOT LET IT DRY!
6. Thoroughly rinse the surface with clean, clear water.
7. Test the pH with litmus paper or phenolphthalein:
 - a. Dissolve a 2" piece of phenolphthalein in denatured alcohol.
 - b. Brush the solution onto the surface. If it turns a shade from pink to magenta there is still chemical residue.
8. Continue to neutralize the surface and test until there is no color change in the phenolphthalein solution or the litmus paper registers neutral.

B. Repainting:

1. If walls are to be repainted, allow them to dry completely before priming.
2. Make sure all mortar joints and brick are sound, making any necessary repairs before priming.
3. Select an acrylic or vinyl latex masonry primer or undercoat - one that is mildew and alkali resistant and made to be used on brick.
4. After the primer has dried according to manufacturer's instructions apply two top coats of finish paint compatible with primer. Allow adequate drying time between coats.
 - a. Primer and top coats shall be from the same manufacturer and compatible with one another.
 - b. If the brick surface is badly pitted because of previous sandblasting, cement-based paints may be used. Consult paint manufacturers for appropriate use. See also 04211-01-P "Sealing Sand-blasted Brick Masonry".
5. Apply paint with a brush to insure complete coverage. A long nap roller for use on brick may also be used for the top coats but great care must be used to ensure adequate coverage.

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