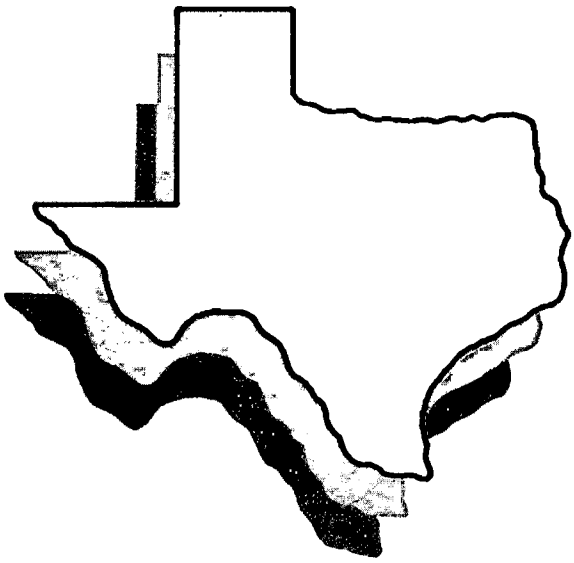
GRAFFITI

DHT-8



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16. Abstract

Graffiti removal and prevention is a multi-billion dollar problem nationwide. It signals a decline in neighborhoods, lowers property values, and discourages businesses. Graffiti is a particularly abhorrent form of vandalism because markings can never be completely removed from the surface of unprotected brick, mortar, concrete, and natural stone.

Modern technology has compounded the graffiti problem. Today's products, more convenient and of better quality, permit individuals to easily apply a long-lasting coating to a wide variety of surfaces in minimum time and at a relatively small cost. When modern materials are used by vandals they are harder to remove. High pressure water blasting, steam cleaning, or using strong detergents, may prove effective with some paints or inks, but these methods are expensive, may not be completely effective, and may do damage to other areas. Relief is available, however. Coatings can be applied to prevent graffiti from penetrating the surface. The coatings are not difficult to clean and the surface is not marred. While these coatings may not be the answer to the graffiti problem, they do help combat it.

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GRAFFITI

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MAY 1988

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Introduction (General Structures)

Graffiti removal and prevention is a multi-billion dollar problem nationwide. It signals a decline in neighborhoods, lowers property values, and discourages businesses. Graffiti is a particularly abhorrent form of vandalism because markings can never be completely removed from the surface of unprotected brick, mortar, concrete, and natural stone.

Modern technology has compounded the graffiti problem. Today's products, more convenient and of better quality, permit individuals to easily apply a long-lasting coating to a wide variety of surfaces in minimum time and at a relatively small cost. When modern materials are used by vandals they are harder to remove. High pressure water blasting, steam cleaning, or using strong detergents, may prove effective with some paints or inks, but these methods are expensive, may not be completely effective, and may do damage to other areas. Relief is available, however. Coatings can be applied to prevent graffiti from penetrating the surface. The coatings are not difficult to clean and the surface is not marred. While these coatings may not be the answer to the graffiti problem, they do help combat it.

Surface Preparation for Coatings

The surface to be coated must be dry, clean, and reasonably free of surface defects such as bugholes, honeycombs, and fins resulting from mortar flowing out between spaces in the formwork. Surface preparation procedures vary depending upon whether the concrete is new or old and whether it is precast or cast in place.

New concrete should be allowed to cure and then dry for at least 4 weeks. Never apply coatings to wet surfaces or when rain is likely. For the best performance and appearance of the coating, grind down protrusions higher than about 1/16 inch. If there are numerous bugholes or honeycombed areas, fill only the holes by tight trowelling the surface with a polymer-modified mortar.

Before applying a coating, it is best to open a new concrete surface by using either water-blasting (1000 to 2000 psi pressure is recommended) or abrasive blasting (brush blast). This removes foreign matter such as dust, form release agents, and curing compounds. It also removes the cement-paste surface skin and permits better penetration of the first coating layer. Water or sandblasting can also be used to prepare old concrete surfaces. Other methods sometimes recommended include wire brushing, acid washing, and scrubbing with cleaning solutions. These methods, however, will take more time and manpower than others.

Coatings (Application, Types, Properties)

Coatings may be applied in a number of ways. Application methods include spraying, brushing, and/or rolling on the coating material. If a roller is used, it should be tested first to make sure that the glue bonding the nap to the roller is not soluble in the coating. Although an entire structure may be treated with a coating for various reasons, only a limited area need be treated for protection against graffiti markings. Generally, this area is that which is within reach from street level, balcony level, or stair level. In some cases, a matte finish may be needed to prevent glare problems. Matte coatings perform well, but they typically will not resist staining as well as high-gloss coatings.

Because they may be scrubbed with strong solvents or detergents, graffiti-resistant coatings must have good wear resistance and chemical resistance. They must resist impact without cracking or crazing and they must resist color changes and chalking caused by exposure to sunlight. The coating must adhere to the concrete substrate and resist peeling or delamination. Also, coatings should be easy to prepare and apply on the jobsite.

Most graffiti-resistant coatings fall into one of the following three classes:

1) Solvent Acrylics: Solvent acrylics are clear or colored with a decorative pigment to stain the concrete. They have a fair degree of chemical resistance, but many solvents that remove graffiti will remove the coating as well. However, repairing the surface with acrylic material after graffiti removal does not require any special surface preparation such as sandblasting. Acrylics have good color and gloss-retention under outdoor exposure but are not as abrasion resistant as epoxies or urethanes and will not resist staining as effectively.

2) Epoxies: Epoxies form tough, hard films that clean easily and have excellent solvent and abrasion resistance. Sunlight, however, causes clear epoxy coatings to yellow and colored epoxies to fade and chalk. Epoxy coatings are difficult to recoat once they have cured, unless the old coating is sandblasted or abraded.

3) Polyurethanes: Polyurethanes also form tough, hard films that clean easily and have excellent solvent and abrasion resistance. Aromatic urethane coatings are used only for indoor applications because they will yellow, lose gloss, and chalk when exposed to sunlight.

Aliphatic urethanes are for exterior use. These high-performance coatings come in both clear or pigmented formulations with good gloss and color retention.

In summary, not coating is impervious to all types of graffiti. Epoxies and urethanes have the best stain resistance, but a few materials will attack even these coatings. Some users choose acrylic coatings over the rest because they reason that if the coating comes off with a solvent, this guarantees removal of the graffiti as well. Acrylics are a poor choice, however, if you want to minimize maintenance costs. High-performance coatings resist most weapons in the vandal's arsenal, i.e., spray enamels and laquers, felt-tip markers, lipstick, and grease pencils. Cleanup involves applying a cleaning agent, waiting up to 15 minutes, then either rinsing with water or lightly scrubbing the affected area before rinsing.

If a high-performance coating is chosen, an aliphatic urethane is better than epoxy for exterior use because it resists yellowing and chalking. However, a water-insensitive epoxy base coat is sometimes used in combination with a pigmented urethane finish coat.

Other Products and Usage

There are numerous other products for graffiti removal ranging from commercial bleach to high-powered solvents. Many of the chemicals on the market are for removal of graffiti only from signs because the solvent action of the products will stain the concrete even further due to runoff. Product listings are easily obtainable from chemical companies and directions for usage are frequently included.

Various methods of graffiti removal used throughout the state of Texas are listed by their respective districts in the Appendix at the end of this report.

Signs Introduction

Repairing or replacing vandalized roadway signs can cost from $50 million to $2 billion per year nationally. Not only does it cost money to replace or repair signs, but additional tort claims are being generated due to missing or damaged traffic control signs. Vandalism has contributed to a number of serious traffic accidents involving the injury or death of highway users.

New methods of sign construction and installation which may reduce the opportunity or adverse effects of vandalism are being tried. Some methods with regard to graffiti are: (1) removing unnecessary signs or reducing the number of sign assemblies, (2) applying protective coatings or overlays to sign faces to aid in the removal of contaminants and extend the useful life of the sign, (3) increasing sign

height and distance from the roadway, (4) sign ownership identification that specifies penalties, rewards, inventory numbers, installation dates, and vandalism hotlines, and (5) law enforcement personnel speaking at school programs, juvenile delinquency adjudication, and driver education programs.

Sign Cleaning

Sign cleaning is intended to restore or improve sign legibility through general cleaning and removal of foreign substances from the sign face. General sign cleaning involves the removal of dirt, road grime, etc. through the use of mild, nonabrasive cleaners and detergents suitable for highway quality painted or enameled surfaces. Severely contaminated sign cleaning involves removal of paint, ink, crayon, etc. through the use of commercial paint removers, solvents, and other chemicals. Caution should be exercised in the use of these chemicals, since they may affect the performance life of the sign sheeting.

Sign Face Treatments

Sign face treatments consist of the application of protective coatings or film overlays to the sign face to enhance removal of contaminants and extend the useful life of the sign. Protective coating, or clear coating, can extend the useful life of traffic signs with low reflectivity by 1 to 2 years and aids in avoiding degradation of sign reflectivity. However, high intensity signs should not be clear coated. Figure 1 demonstrates a procedure for clear coating reflective signs.

Transparent film overlays can be used to protect both new and in-place signs from loss of reflectivity and contamination by paint, ink, crayon, etc. The preservation of reflectivity is a distinct advantage because direct application of strong solvents to the sign face normally tend to reduce its reflectivity.

Conclusion

Currently, there is no completely effective method of preventing graffiti damage. The only feasible method of attack is to accept the fact that graffiti damage will be done and to utilize any method that will simplify cleaning and removal. Clear coatings seem to be the best deterent to a never ending, ever increasing graffiti problem.

APPENDIX

APPENDIX

DISTRICT	METHODS TO REMOVE OR CONCEAL
2	Sandblasting White paint
3	Chemical - Wipe Out (by Zep Chemicals)
5	Chemical - Zep Eraser (by Zep Chemicals)
6	Chemicals used on signs only- 1. Vandal Varnish 2. Mark Off 3. Aerace (most effective) 4. Wipe Out (From Wagner Chemical & Supply Co., Inc. 3708 Kermit Highway P.O. Box 1766 Odessa, Texas 79764 For concrete - sandblast or use concrete colored paint
7	White enamel paint
8	Paint
9	Use black and white paint blend Chemical - On Your Mark (by Kermite Company)
10	Chemical - Misty Vandalism Mark Remover (by AMREP, Inc. 990 Industrial Park Drive Marietta, Georgia 30062)
11	Paint or asphalt
12	Soap Structural paint called Preston Shield
13	Mix mortar and roll it on
14	Spray paint Hydroblaster (waterblaster)

15
Concrete paint
Sign paint

16
Cement or grout

17
Sandblasting
Cement and water paste
Chemical - Vandal Mark Remover

18
Sandblast
Waterblast
Paint

19
White paint

20
Sandblasting
White paint
Best to date - 3 sacks of pure cement mixed with water in a 55-gallon drum and pumped onto the graffiti
Chemicals -
1. Write Away (by Zep Manufacturing Company P.O. Box 2015 Atlanta, Georgia 30301
2. Write Off (phone 1-800-442-7950)

21
Paint

23
Paint
Overseal on concrete
High pressure water

24
Sandblast
Concrete colored paint

25
Paint over graffiti with a lime paste of 2 parts cement and 1 part lime
Hydroblasting
Structural paints -
1. Preston Shield
2. Sea Code W (black concrete) (by Secure Inc., Texas)

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