RESEARCH
Oregon Department of Transportation

Research Notes

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Graffiti Prevention & Removal

Graffiti is a widespread problem faced by public and private agencies throughout the world. In particular, state departments of transportation (DOTs) are being confronted with graffiti on signs and structures such as bridges, retaining walls and soundwalls.

Potential solutions are varied; there is no single tried and true answer that will solve the graffiti problem in every situation. Graffiti removal presents unique challenges, in that numerous types of paints, inks, chalks, and dyes may be used on a variety of surfaces. What will work in one situation to prevent or remove graffiti might not be the most effective choice in another.

The ODOT Research Group recently reviewed current graffiti prevention and removal strategies in response to a question from a maintenance crew.

Graffiti Prevention

The first line of defense against graffiti is prevention. Research has shown that **prompt removal** of graffiti is one of the most effective means to prevent its recurrence. Graffiti that is not promptly removed serves as a magnet for more "tagging." Vandals who mark structures with graffiti are often motivated by a need to have their work seen. If their work is quickly removed, it is less likely that they will do it again at the same location.

The Washington Department of Transportation has placed **physical barriers** around their traffic sign supports and bridge columns to prevent graffiti. Planting thorny shrubs or other landscaping options that make it difficult for a vandal to have access to the surface is another alternative. **Improved lighting** around the structure is a countermeasure that can be used to prevent graffiti.

The use of **textured surfaces** is another means to prevent graffiti. A heavily textured surface can discourage felt tip marker, ballpoint pen, or chalk type graffiti, although it does not deter spray painting.

To supplement these prevention measures other DOTs have implemented proactive and very effective **public awareness and education programs**. Partnerships with law enforcement and community groups to exchange information and coordinate efforts have worked well. A 24-hour graffiti hotline and database was used in Colorado to build awareness of problem areas.

Graffiti Removal from Uncoated Surfaces

A variety of treatments is available for graffiti removal from an uncoated surface. Perhaps the easiest and most efficient method is **repainting**. In a survey of state DOTs conducted by West Virginia University, 90 percent of the respondents indicated they repainted the surface to cover the graffiti. Additionally, repainting was rated by the state DOTs as the most effective removal technique.

Programs have been established that enlist volunteers to help with the graffiti cleanup. The City of Salem has a successful volunteer program staffed by a Graffiti Coordinator who manages crews of volunteers to repaint public areas damaged by graffiti.

Sandblasting may be selectively used if conditions require a large amount of graffiti to be removed and if the surface can be repaired if damaged. This method can be destructive to the substrate and leave markings.

The City of Chicago has had success using **water blasting** with baking soda to scrub painted graffiti from brick, stone and concrete surfaces. This technique does not damage the structure's surface, and it is faster and more environmentally safe than sandblasting or using chemical solvents.

Anti-Graffiti Coatings

Anti-graffiti coatings have widespread use. There are basically two types of coatings used to combat the problem.

"**Sacrificial coatings**" are generally comprised of a wax or polymer base and act as a disposable barrier to protect the surface of a structure. When a treated surface is hit with graffiti, it can be removed with a low-pressure hot water wash. In the process, the protective coating is also removed; so it must be reapplied for continued protection. For this reason, such coatings are not used by ODOT.

"**Permanent resistant coatings**" (non-sacrificial) are typically solvents (or occasionally water-based materials) that form a unified bond with the surface of the substrate. The coating is generally some type of urethane which, after curing, forms a very hard and durable permanent finish. Graffiti is removed through chemical or mechanical cleaning, depending on the material.

The application of anti-graffiti coatings and the cleaning process must be suitable for use from an environmental, health and safety standpoint. If the material or the cleaning process created a danger for employees or the public, then the material would not be suitable for use as a resistant coating.

ODOT Specifications and Testing Program

Graffiti-resistant coatings are generally addressed in section 2210.30 of ODOT's Standard Specifications for Highway Construction. As a further measure, ODOT's Bridge Section developed additional specifications for anti-graffiti coatings. The specifications require the coating system to:

- Be capable of being applied to concrete, masonry block, wood, brick, metal, aggregate, or rock.
- Be permanent (non-sacrificial).
- Facilitate the removal of types of paints and graffiti materials without damaging the substrate.
- Be weather, snow, ice, rain, and UV resistant, non-yellowing, and allow adequate moisture vapor transmission.
- Not significantly change the color of the substrate, if a clear flat finish is used. The system must also be capable of accepting additional paint color pigments to match the color of the surrounding substrate.
- Comply with all applicable air quality standards and have a non-toxic removal product.

Mike Dunning, ODOT's New Product Coordinator maintains the agency's Qualified Products List (QPL). He is developing a new test procedure for anti-graffiti coatings. When the test procedure is adopted, anti-graffiti products that meet the requirements will be added to the QPL. This list is available by contacting Mike Dunning at 503-986-3059.

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