U.S. General Services Administration

Removing Asphalt Stains from Concrete

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371005S
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Historic Concrete: Investigation & Repair - Pre-Conference Training Course, APT Annual Meeting, 1989.
Division:
Concrete
Section:
Concrete Cleaning
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The cleaning or removal of stains from concrete may involve the use of liquids, detergents or solvents which may run off on adjacent material, discolor the concrete or drive the stains deeper into porous concrete. Use the products and techniques described here only for the combinations of dirt/stain and concrete specified.

PART 1---GENERAL

1.01 SUMMARY

A. This procedure includes guidance on removing asphalt stains from concrete using chemical or freezing agents. The types of asphalt staining addressed here include the following:

1. Molten asphalt - usually does not penetrate the surface.

2. Emulsified asphalt - minute droplets of asphalt in water.

3. Cutback asphalt - an organic, bituminous roof coating or flashing cement in a volatile solvent, applied without heat; also used for damp-proofing and for priming concrete and masonry surfaces; these stains are almost impossible to remove completely but may be attempted using a poultice.

B. **Safety Precautions:**

1. Do not save unused portions of stain-removal materials.

2. Do not store any chemicals in unmarked containers.

3. The organic solvents listed for removing asphalt are poisonous, carcinogenic or flammable. Excellent ventilation must be provided wherever any solvent is used. Use respirators with solvent filters.

4. No use of organic solvents indoors should be allowed without substantial air movement. Use only spark-proof fans near operations involving flammable liquids.

5. Provide adequate clothing and protective gear where the chemicals are indicated to be dangerous.

6. Have available antidote and accident treatment chemicals where noted.

C. Read "General Project Guidelines" along with this specification. 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). The 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)

PART 2---PRODUCTS

2.01 MATERIALS

A. For Molten Asphalt and Emulsified Asphalt Stains:

1. Ice

2. Scouring Powder

B. For Cutback Asphalt Stains:

1. Use one of the following solvents in a poultice (see Section 3.02 below for related procedures):

NOTE: Some of the solvents listed below are known carcinogens and may be banned in some states.

NOTE: Chemical products are sometimes sold under a common name. This usually means that the substance is not as pure as the same chemical sold under its chemical name. The grade of purity of common name substances, however, is usually adequate for stain removal work, and these products should be purchased when available, as they tend to be less expensive. Common names are indicated below by an asterisk (*).

a. Benzene (C_6H_6):

- A colorless, volatile, flammable, toxic, liquid, aromatic hydrocarbon used in organic synthesis, as a solvent and as a motor fuel.
- Other chemical or common names include Benzol; Benzole; Phene; Phenyl hydride; Coal

naphtha*; Motor benzol*.

- Potential Hazards: Flammable.
- Available from automotive supply distributor, chemical supply house, dry cleaning supply distributor, hardware store or paint store.
- Benzene and benzine should not be confused. Benzene is a distinct chemical compound obtained from coal tar. Benzine is a mixture of aromatic hydrocarbons of similar boiling points derived from petroleum.

-OR-

b. Carbon Tetrachloride (CCl4):

- A colorless, nonflammable, toxic liquid that has an odor resembling chloroform and is used as a solvent (as in dry cleaning) and a fire extinguisher.
- Other chemical or common names include Perchloromethane; Tetrachloromethane.
- Potential Hazards: Toxic.
- Available from chemical supply house, dry cleaning distributor, hardware store, paint store or photographic supply distributor (not camera shop).

-OR-

c. Dimethyl Sulfoxide (CH3)2SO:

- A compound obtained as a biproduct in wood-pulp manufacture and used as a solvent and in experimental medicine.
- Other chemical or common names include Methyl sulfoxide; Methylsulfinylmethane.
- Potential Hazards: Toxic and Flammable.
- Available from chemical supply house.

-OR-

d. Kerosene:

- A flammable hydrocarbon oil usually obtained by distillation of petroleum and used for a fuel and as a solvent and thinner.
- Other chemical or common names include Astral oil*; Coal oil*.
- Potential Hazards: Flammable.
- Available from automotive supply distributor, gasoline service station or hardware store.

-OR-

e. Toluene (C7H8):

- A liquid, aromatic hydrocarbon that resembles benzene but is less volatile, flammable and toxic.
- Produced commercially from light oils from coke-oven gas and coal tar and from petroleum.
- Used as a solvent, in organic synthesis and an antiknock agent for gasoline.

-OR-

f. Trichloroethylene (highly refined solvent):

- CAUTION: Trichloroethylene is highly toxic and may react with strong alkalis such as fresh concrete to form dangerous gases.
- Other chemical or common names include Ethinyl trichloride.
- Potential Hazards: Toxic.
- Available from automotive supply distributor, chemical supply house (both commercial and scientific), dry cleaning supply distributor, paint store, photographic supply distributor (not camera shop), or printer's supply distributor.

2. Filler material such as diatomaceous earth, talc, undyed cloth or cotton batting

3. Mineral water

4. Plastic sheeting

5. Clean dry towels for blotting the area after treatment

6. Masking tape

C. Clean, potable water

D. Accessible source of water, soap and towels for washing and rinsing in case of emergencies associated with the use of chemicals

2.02 EQUIPMENT

A. For Poulticing Cutback Asphalt Stains:

1. Glass or ceramic container for mixing the solution

2. Wooden utensil for stirring the ingredients

B. Wood or plastic spatula

C. Stiff bristle brush (non-metallic)

PART 3---EXECUTION

3.01 PREPARATION

Protection:

A. Provide adequate wash solutions (i.e. water, soap and towels) before starting the job.

B. Whenever acid is used, the surface should be thoroughly rinsed with water as soon as its action has been adequate. Otherwise it will continue etching the concrete even though the stain is gone.

3.02 ERECTION, INSTALLATION, APPLICATION

NOTE: Do not try more than one treatment on a given area unless the chemicals used from prior treatment have been washed away.

A. **For Molten Asphalt Stains:**

1. Chill the asphalt with regular ice (not dry ice) and then scrape or chip using a wood or plastic spatula while it is cold and brittle.
2. Using a stiff, non-metallic bristle brush, scrub the surface with scouring or abrasive powder and clean water to remove any remaining discoloration.
3. Thoroughly rinse the area with clean, clear water and allow to dry.

B. **For Emulsified Asphalt Stains:**

NOTE: Do not apply solvents to emulsified asphalt stains. Emulsified asphalt does not penetrate deeply into concrete. Solvents will carry the emulsions deeper into the concrete, making stain removal virtually impossible.

1. Remove any asphalt blobs from the surface of the concrete. Remove molten asphalt stains as described in Section 3.02 A. above.
2. Using a stiff, non-metallic bristle brush, scrub any residual staining with scouring powder and clean water.
3. Thoroughly rinse the area with clean, clean water and allow to dry.

C. **For Cutback Asphalt Stains:**

1. Mix one of the solvents listed under Section 2.01 B. above with diatomaceous earth or talc to form a paste having the consistency of oatmeal.
2. Thoroughly wet the concrete surface to be treated with clean, clear water.
3. Apply the mixture to the stained area using a wood or plastic spatula and allow to dry. Be sure to spread the poultice well beyond the stained area. The liquid portion of the paste will migrate into the concrete where it will dissolve some of the staining material. Then the liquid will gradually move back beyond the concrete surface and into the poultice, where it will evaporate, leaving the dissolved staining material in the poultice.
4. When the poultice has dried, brush or scrape it off with a wooden scraper.
5. Using a stiff bristle brush, scrub the surface with scouring powder and clean water to remove any residual staining.
6. Thoroughly rinse the area with clean, clear water and allow to dry.
7. Repeat the process as necessary to sufficiently remove the stain.

-OR-

1. Soak a bandage of undyed cloth or cotton batting in dimethyl sulfoxide.
2. Apply the treated bandage to the stained surface and allow to sit for one hour.
3. Remove the bandage and scrub the surface with a stiff bristle brush, scouring powder and clean water.
4. Thoroughly rinse the area with clean, clear water and allow to dry.
5. Repeat the process as necessary to sufficiently remove the stain.

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