



REMR TECHNICAL NOTE CS-MR-1.10
CONCRETE REMOVAL TECHNIQUE: SHOT
BLASTING

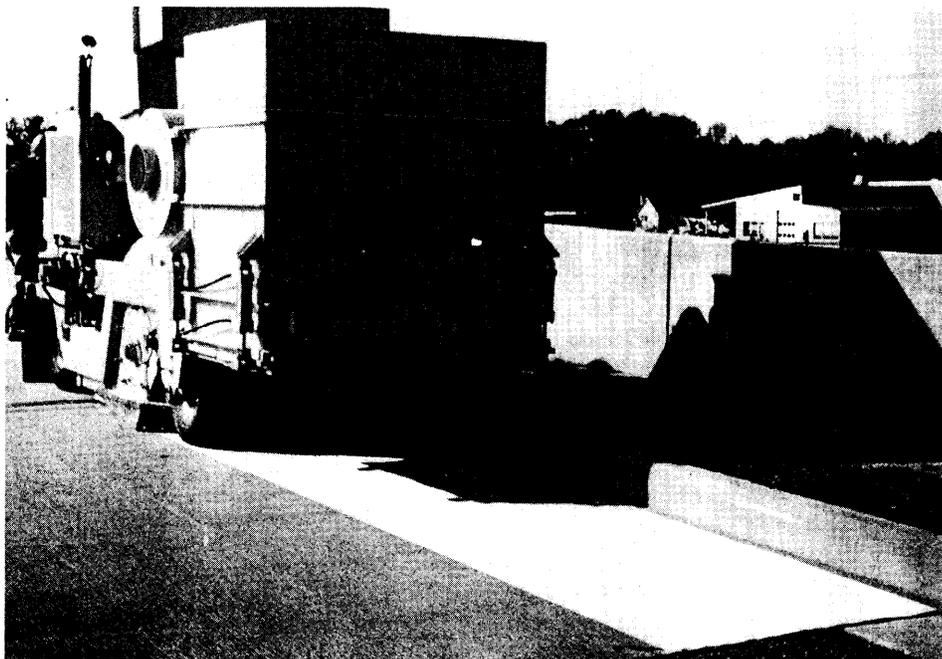


Figure 1. Shot blasting of a bridge deck in preparation for an overlay

PURPOSE: To describe the use of shot blasting as a technique for surface preparation.

APPLICATION: Shot blasting is used to remove large, shallow, horizontal areas of concrete to prepare surfaces for overlays (Figure 1). It has been successfully employed for surface preparation work on highway and airfield pavements, bridge decks, parking garage floors, and factory and warehouse floors.

ADVANTAGES: Shot blasting is an economical means of preparing large horizontal areas of concrete for overlaying. The operation is virtually dust free with the debris vacuumed up and retained by the unit. It requires no water and leaves the surface dry (assuming no other source of water exists) for immediate application of the bonding agent, coating, or overlay.

LIMITATIONS: Operational restraints typically require that the shot blaster be used on surfaces that are within 10 deg of horizontal when the unit is to be operated across the direction of slope. This restraint is not applicable

when the unit is operated in the direction of slope, as is the case with shot blasting of parking garage ramps. Removal at an obstruction, such as a wall, may be possible to within 1 to 2 in. of the obstruction with typical self-propelled units and within 1/8 in. with smaller manually propelled units (Ref a). Removal depths greater than 1-1/4 in. have been reported; however, most are 1/8 in. or less.

A heavy coating of grease or an elastomeric coating will cause the shot to bounce rather than scour (Ref a). Removal in these areas will be less extensive, whereas removal in adjacent areas or areas where surface coating has worn through will be more extensive, resulting in an irregular surface.

The installation of a thin coating as an overlay requires a uniform surface. If the existing coating is 1/8 in. or more thick or uneven wear of coating has occurred, the existing coating should be removed with a scarifier or stripping machine before the surface is shot blasted (Ref a).

PERSONNEL REQUIREMENTS: Trained, experienced personnel are required to operate and maintain blasting equipment.

EQUIPMENT: Shot-blasting units are self-contained, one-piece systems with an integral, onboard dust collector. Models vary in size from self-propelled units that blast a 5-in.-wide path to riding units that blast a 7-ft-wide path. An extra throwing wheel or blades (depending on unit design) should be on hand because these parts are in contact with the abrasive shot and must frequently be replaced (Ref a). Additional shot must also be on hand because shot being used will gradually be pulverized and will need replacing.

ENVIRONMENTAL CONSIDERATIONS: A determination should be made as to whether the area to be removed contains coatings or other materials that are considered to be hazardous or toxic. If these are present, proper handling and disposal under Resource Conservation and Recovery Act regulations may be required (see Technical Note EI-M-1.2, "Handling and Disposal of Construction Debris").

COST: The cost of shot blasting of concrete varies depending on the job. Estimated cost for removing 1/8 in. or less of surface is around \$0.45/sq ft. For each additional 1/8 in. of removal, the estimated cost should be increased by \$0.45/sq ft.

REFERENCE: a. Concrete Construction. 1986 (Nov). "Equipment for Cleaning or Preparing Concrete Surfaces for Repair," p 927.