

ITEM SPECIAL - EPOXY PAVEMENT MARKINGS (Continued)

5. The Size I beads shall be coated with a silane-type adherence coating to enhance their embedment in, and adherence to the applied binder film. The coated beads shall emit a yellow-green fluorescence when tested by the Densyl Chloride test procedure. The Size II beads shall be treated with a moisture-proof coating. Both sizes of glass beads shall show no tendency to absorb moisture in storage and shall remain free of clusters and lumps.

They shall flow freely from dispensing equipment at any time when surface and atmospheric conditions are satisfactory for marking operations.

6. The moisture-resistance of the glass spheres shall be determined on the basis of the following test:

Place two pounds (2 lbs.) of spheres in a washed cotton bag, having a thread count of 80 per square inch (warp and woof) and immerse the bag in a container of water for 30 seconds.

Remove the bag and force excess water from the sample by squeezing the bag. Suspend and allow to drain for two hours at room temperature (70-72 degrees F), then mix the sample in the bag shaking thoroughly.

Transfer a sample slowly to a clean, dry glass funnel having

The entire sample shall flow freely through the funnel without stoppage. When first introduced into the funnel, if the spheres clog, it is permissible to lightly tap the funnel to initiate the flow.

D. STRIPING EQUIPMENT

Equipment for applying the epoxy pavement marking shall be capable of mixing the components in proportions recommended by the manufacturer and applying glass beads at the time of line placement. The marking equipment used shall be capable of applying epoxy material at the specified thickness, width, and pattern. The contractor shall provide a calibrated measuring device acceptable to the Engineer to measure the epoxy resin in the striper tanks.

In general, the applying equipment shall be a mobile, truck mounted and self contained pavement marking machine, specifically designed to apply epoxy binder and reflective glass spheres in continuous and skip line patterns. The applying equipment shall be maneuverable to the extent that straight lines can be followed and normal curves can be made in a true arc. In addition, the truck mounted unit shall be provided with accessories to allow for the marking of legends, symbols, crosswalks and other special patterns.

The Engineer and the material manufacturer together may approve the use of a portable applicator in lieu of truck mounted accessories for use in applying special markings only, provided such equipment can demonstrate satisfactory application of reflectorized markings in accordance with these specifications.

The mobile applicator shall include the following features:

1. Individual material reservoirs, for the storage of Part A and Part B of the epoxy binder.
2. Heating equipment of sufficient capacity to maintain the individual binder components at the manufacturer's recommended temperature and produce the required amount of heat at the mixing head & gun tip and maintain those temperatures with the tolerances recommended by the material manufacturer for spray application.
3. Adequate individual tanks for the storage and dispensing of Size I and Size II glass spheres.
4. Individual dispensers for the simultaneous application of Size I and Size II glass spheres respectively. Each dispenser shall be capable of applying spheres at a rate of 10 to 20 pounds per gallon of the epoxy binder. The applied combined total of both sizes of beads should be a minimum of 25 lb./gal. (12 to 13 lb. of each size per gallon).
5. Individual metering devices or pressure gauges, on the proportioning pumps (one indicator per pump) as well as stroke counters to monitor gallon usage. All such devices shall be visible to the Engineer.

6. All the necessary spray equipment, mixers, compressors and other appurtenances to allow for the placement of a reflectorized pavement marking system in a simultaneous sequence of operations.

7. A minimum 24" long static mixer unit as manufactured by Kenes Company or equal for proper mixing of the two components.

8. A completely enclosed flush and purge system to clean the lines and the guns without exuding any of the solution into the environment.

E. CLEANING AND SURFACE PREPARATION

The contractor shall clean the surface to remove all debris, luffance and any other contaminants that may hinder the adhesion of the system to the surface. Whenever grinding, scarifying, sandblasting, shot blasting or other operations are performed, the debris generated must be contained through vacuum type equipment or equivalent and the work shall be conducted in such a manner that the finished pavement surface is not damaged or left in a pattern that will mislead or misdirect the motorist. When these operations are completed the pavement surface shall first be power broomed and then blown off with compressed air to remove residue and debris resulting from the cleaning work. All such debris must be properly contained (especially when removing Yellow paint lines) and disposed of in the appropriate manner.

Removal and cleaning work shall be conducted in such a manner as to control and minimize airborne dust, and similar debris so as to prevent a hazard to motor vehicle operation or nuisance to property.

Care shall be taken on Bituminous and Portland Cement Concrete surfaces when performing removal and cleaning work to prevent damage to transverse and longitudinal joint sealers.

1. Limits of Work

Cleaning and surface preparation work shall be confined to the surface area specified for the application of pavement marking materials or the surface area of existing pavement markings that are specified for removal on the plans, or as directed by the Engineer.

Surface preparation work includes cleaning for lines or cleaning for words and symbols. Lines will be meant to include: Center Lines, Lane Lines, Dotted Lines, Channelizing Lines, Edge Lines, Stop Lines, Crosswalk Lines, and Transverse Lines.

When lines are cleaned, the area of preparation will be the width of the new pavement marking, or existing line, plus one inch (1") on each side.

When words, symbols, or other miscellaneous markings are cleaned the area of preparation will be sufficiently large to accommodate the new marking, or to remove the existing marking. No new marking shall be applied on any pavement that has not been properly prepared as per this specification.

2. Removal of Concrete Curing Compounds

On new Portland Cement Concrete pavements, cleaning operations shall not begin until a minimum of 30 days after the installation of concrete. The extent of the blasting work shall be to clean and prepare the concrete surface such that:

- a. There is not visible evidence of curing compound on the concrete surface.
- b. There are no heavy puddled deposits of curing compound in the valleys of the textured concrete surface.
- c. All remaining curing compound is intact, all loose and flaking material is removed.
- d. The peaks of the textured pavement surface are rounded in profile and free of sharp edges and irregularities.
- e. The extent of the removal should be as such to insure the luffance is removed on both old as well as new concrete.

3. Removal of Existing Pavement Markings

Existing pavement markings shall be cleaned for the purpose of:

- a. Preparing the pavement surface for the application of new pavement marking in the same location as the existing markings.
- b. To remove existing markings that are in good condition which, if allowed to remain, will interfere with or otherwise conflict with newly applied marking patterns.

It shall be understood that in this context cleaning means the removal of an existing marking. It is not intended that all deteriorated existing pavement markings be removed.

Example: If a new marking is applied to an unmarked 'gap' in a broken line and the existing broken line pattern is worn or deteriorated, as determined by the Engineer, to the extent that it is not misleading or confusing to the motorist, the existing markings do not require removal.

Pavement markings shall be cleaned to the extent that 95 percent to 100 percent of the existing marking is removed. Removal operations shall be conducted in such a manner that no more than moderate color and/or surface texture change results on the surrounding pavement surface.

The cost of cleaning and surface preparation, including removal of concrete curing compounds and removal of existing pavement markings, as indicated above, shall be included in the unit costs for the various items of work listed in the proposal. No separate payment for cleaning or surface preparation shall be made.

F. INSTALLATION

Epoxy marking material shall only be applied when the surface is clean and dry and when the pavement and air temperatures are above 50 degrees F, unless approved in advance by the Engineer and the material manufacturer. The contractor shall transfer the entire contents of each material container to the striper tanks. The material shall be thoroughly mixed at all times during application.

Both components (Part I and Part II) shall be brought to the temperature recommended by the manufacturer prior to mixing and spraying.

Epoxy marking material, plus resin, shall be applied uniformly to the surface to be marked at the following rates in Gallons per Mile of Line:

Line Type	Width of Line (Inches)				
	4	6	8	12	24
Solid Line	22.00	33.00	44.00	66.00	132.00
Broken Line	8.50	8.25	11.00	16.50	33.00
Dotted Line	7.33	11.00	14.67	22.00	44.00
Areas, Symbols, Arrows, or Words	1 gallon per 80 square feet				

Thinning shall not be permitted.

Glass beads shall be applied to the uncured epoxy material in sufficient quantity so that the beads completely fill the epoxy film from the film-pavement interface to the top surface of the film to the extent that there are loose beads on the surface of the uncured line. The rate of application shall not be less than 25 pounds of glass beads per gallon of epoxy material applied.

The Size I and Size II reflective beads shall be dispensed sequentially through individual dispensing guns on the wet material, with the large gradation beads (Size I) applied first, and the smaller gradation (Size II) applied second, in the same pass of the equipment. The combined application rate shall be 25 pounds of glass beads per gallon of epoxy material (25 lb./gal.), with each size ranging between 12 and 13 pounds per gallon (12-13 lb./gal.).

If the epoxy marking does not dry to a no-tracking condition consistently and shows a yellow soft spot, the contractor shall cease marking application until the problem is corrected.