

SPRAY PATCHING

PROCESS DESIGN OVERVIEW

1 SCOPE

Spray Patching is a quick and cost effective way to patch cracked and damaged pavement. If cracks and potholes are not repaired water will have direct access to the pavement and the underlying layers. Water can cause stripping and eventual failure of the pavement and could damage the underlying base structure.

1.1 DEFINITIONS

Spray Patching:

Spray patching is a very effective pavement maintenance treatment. It can be placed using a wand and shoveling the cover aggregate over the sprayed emulsion but in most cases spray patching is done by using an integrated spray patching machines. The machine uses high volume air to blow out the loose debris from the area to be patched. This is followed by an emulsion tack. The aggregate and emulsion are blended and sprayed into the pothole.

2 MATERIALS

2.1 Asphalt Emulsions:

A number of different types and grades of asphalt emulsions can be used in spray patching. The proper emulsion to be used is based on a number of factors; environmental conditions (temperature and humidity), traffic volume and type, type of cover aggregate and the existing road surface conditions. All these conditions affect the emulsion to be used. Typically the most common emulsions used are CRS-1, CRS-2, CRS-2P, RS-1, RS-2, RS-2P. There could be specialty type emulsions used for specific conditions as well.

2.1 Cover Aggregate:

The type of cover aggregate used in spray patching must meet certain requirements of shape, size, cleanliness and surface properties. The aggregate (typically 4 – 7 mm) should be single sized and cubical in shape. The number of flat and elongated particles should be kept to a minimum so that the proper quantity of asphalt emulsion can be applied to hold the stone in place. The aggregate should be as clean as possible so that there is a good adhesive bond between the aggregate and the asphalt residue. Also the asphalt emulsion to be used and the aggregate must be compatible to ensure the asphalt-aggregate bond is effective.

3 DESIGN CRITERIA

When designing a patching seal a number of factors have to be examined and assessed to ensure a proper surface will be placed that will perform for its service life. The following factors can have a tremendous effect on the performance of a spray patch; traffic, aggregate shape, residual asphalt content and the surface texture of the existing surface. If these factors are addressed the chances of a good spray patch being placed are greatly increased. The compatibility of the aggregate and the emulsion used is critical to the whole integrity of the seal.

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4 RECOMMENDED PERFORMANCE GUIDELINES

In order to construct a proper well designed spray patch the following guidelines should be followed:

- Design a spray patch with aggregate to be used on job.
- Use clean dust free aggregate.
- Ensure compatibility of aggregate and emulsion
- Calibrate and inspect all equipment.
- Follow proper construction techniques.
- Use roller if necessary
- Work only in weather suitable for type and grade of emulsion being used.

5 RESOURCES

1. "Basic Asphalt Emulsion Manual", Fourth Edition, Asphalt Institute and Asphalt Emulsion Manufacturers Association, 2008
2. "Recommended Performance Guidelines", Second Edition, Asphalt Emulsion Manufacturers Association, Annapolis Maryland, 2006
3. "Chip Seal Best Practices" NCHRP Synthesis 342, Transportation Research Board, Washington DC, 2005



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