

Method statement for labour based construction of:

Tack coat



Definition

A tack coat is a sprayed application of **diluted** bitumen emulsion on a primed granular layer or existing bituminous surface to promote adhesion between this existing surface and a new surfacing layer, especially asphalt.

Application

The tack coat is applied to ensure a strong bond between the two bituminous layers during the construction of the upper layer. It will be required when an existing prime coat has lost its tackiness either as a result of traffic or the result of wind-blown sand or dust having being deposited in a thin film on the primed surface. A tack coat can also be applied to an existing bituminous surface, in order to create the required bonding with the new surface layer.

The application rate for a tack coat will be specified by the client or his agent based on the condition of the road surface, but will it generally be between 0.5 to 1.0 L/m² of diluted product, with the net quantity of bitumen *normally* not less than 0.3 L/m².

Material requirements

Bitumen emulsion: - Anionic or cationic stable grade emulsion (60%) is recommended. The product can be obtained in 200 L drums or in bulk.

Water: - Potable water is required for dilution. However depending on the location of the project and the quantity involved, suppliers will deliver the product to the specified dilution. Generally the dilution is 50% product and 50% water, resulting in 30% emulsion.

Plant and equipment requirements

Item	Number of items
Hand operated spray cart with 210 L emulsion drum holder	1
<i>or</i>	
Spay tanker towed with tractor or bakkie	1
Hand brooms	4
Traffic cones (if required)	10
Stop / Go signs (if required)	2

Labour requirements

Below is the typical composition of a hand spray team required to spray 400 L/hr i.e. 2 drums of diluted emulsion per hour. The sweeping operation needs to be balanced with the correct amount of labourers to ensure the spray operation is not delayed by the sweeping team.

Activity	Number of workers
Loading, diluting of emulsion & spraying operation	2 or 3

Sweeping of surface (75 m ² /labourer/hr)	Min of 4 (depending on area to be prepared)
Traffic control (if required)	2

Construction

Site Preparation

Tack should only be applied during the day in good weather conditions. Care should be taken when spraying on a windy day as the spray may be carried some distance and damage property or passing vehicles down-wind of the operation.

Kerbing and channels, if present, will need to be covered and protected with black plastic, metal or thin timber sheets or other suitable material

The surface on which the tack is to be applied must be swept free of dust and other unwanted material. Sweeping should be done in a down-wind direction so as not to have the dust resettle on the surface. (See *SABITA DVD200 for more detailed information on kerb protection and sweeping operations*)

Loading, diluting emulsion

The emulsion is generally diluted 50:50 with water. This can most easily be achieved by pumping across half of the emulsion from one full drum into an empty drum and refilling the drum with an equal quantity of water.

Note

Make sure that the empty drum contained the same product currently in use i.e. anionic or cationic emulsion. Mixing of the two grades will cause instant setting or coagulation.

The emulsion can be sprayed at ambient temperature and need not be heated. Note that the emulsion will be less stable having been diluted.

Spraying the emulsion by using a hand lance:

Whether using a spray tanker (drawn by either a tractor or bakkie) a hand pulled spray cart with motor driven pump or a hand pulled spray cart with a manually operated pump, the preparation is essentially the same

The piping should be checked for leaks and the motor, where present, for correct operation, having no leaks, with pulley sufficiently tight and having sufficient oil and fuel.

Nozzles should be cleaned with diesel, if necessary, away from the road surface. Care should be taken not to cause spillages that will damage the environment. The trial spray can be done back into the drum to avoid pollution.

When using a hand pulled spray cart one or two additional team workers are required to pull the cart and assist with handling of the equipment on site. When using a spray cart with a manually operated pump a further additional person will be required to operate the pump action to spray the emulsion.

Calculate the area to be sprayed from the quantity of diluted emulsion in the drum. **Example:** A spray application in the region of 1.0 L/m^2 is the accepted norm giving a residual binder application of approximately 0.3 L/m^2 using 60% emulsion diluted 50:50. For such an application 200 L of diluted emulsion (or 1 drum) will cover 200 m^2 at an application rate of 1.0 L/m^2 . Therefore, if the road is 5 m wide, the drum will cover a total length of 40m. The appropriate area should be marked out to assist in obtaining the correct spray rate.

Spraying should be carried out in wide sweeping movements of the hand lance with 1/3 overlaps between successive applications. The actual spray rate should be continuously checked by comparison of the area covered and the area marked. It is preferable to have the same experienced spray operator undertake this operation each time as the correct application is a critically important factor for satisfactory performance of chip seals.

After the completion of the spraying operation spray plant equipment should be cleaned with diesel and all waste products removed from the site. Remember that the environment must be protected at all times!

Due to the highly fluid nature of diluted emulsions, over-application of the tack coat should be guarded against, especially on steep grades or on highly super-elevated sections as the binder will tend to run off the road surface.

Traffic control

Traffic should not be allowed on the freshly sprayed tack coat. The application is to be followed almost immediately by the following layer.

Traffic accommodation, if required, will require that the entire lane or area under construction is closed to traffic. If needed, flagmen will be required to assist with stop-go traffic control

depending on the area in which the work is being undertaken and the volume of traffic experienced. (See *SABITA TRIP Training manual for more details*)

Traffic accommodation needs to be well managed as it places the entire workman team at risk. Training in the correct operation of traffic accommodation at roadworks is vital for the safety of the workmen team as well as allowing safe, free flowing traffic through the construction site.

Quality control

The diluted emulsion should be checked for stability before spraying.

Before loading the drum containing the diluted emulsion, it should be rolled around for about 1 minute to ensure that the contents are properly mixed

The emulsion and the surface on which it is to be sprayed should be checked for compatibility.

Achieving the correct spray rate is critical. Over-application may cause bleeding through the upper layer or result in slippage between the two layers during construction of the upper layer.