Method statement for labour based construction of:

Cold mix asphalt (in bags)

Definition

Bagged cold mix asphalt is a mixture of aggregates, filler and cutback bitumen.

Application

Cold mix asphalt is ideal for applications of limited area and light traffic volumes such as sidewalks and driveways and repair works. It is not cost-effective for extensive works.

Material requirements

**Bagged Cold mix asphalt**: - the product is best ordered through an established supplier who can offer advice where needed. Fine graded mixes (6 mm nominal maximum aggregate size) are the norm to allow for ease of application using LIC methods.

**Bitumen emulsion**: - Anionic stablemix grade bitumen 60% emulsion is recommended when a tack coat is required should the prime have lost its normal required properties.

**Diesel**: - used to keep the rakes and shovels clean of asphalt build-up for the emulsion based cold mix asphalt. Wheelbarrows used for this purpose should not have any leaks as diesel leaks on the surface will adversely affect the durability of the layer.

Plant and equipment requirements

<table>
<thead>
<tr>
<th>Item</th>
<th>Number of items</th>
</tr>
</thead>
<tbody>
<tr>
<td>Layer of Cold mix asphalt</td>
<td></td>
</tr>
<tr>
<td>Existing substrate</td>
<td></td>
</tr>
</tbody>
</table>
Brooms | 4
Shovels | 6
Wheel bars | 3
Rakes | 3
Pedestrian double drum vibratory roller of weight 0.6 t or more | 1
Hand stampers | 2

The number of each item will need to be balanced for each operation depending on production rate and area to be covered.

**Labour requirements**

Below is the proposed composition of the team. It is difficult to give a production rate for this type of operation given the limited areas normally covered using this high cost product.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Number of workers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Broom team</td>
<td>2</td>
</tr>
<tr>
<td>Wheelbarrow team</td>
<td>3</td>
</tr>
<tr>
<td>Wheelbarrow loading team</td>
<td>3</td>
</tr>
<tr>
<td>Rakemen</td>
<td>2</td>
</tr>
<tr>
<td>Roller operator</td>
<td>1</td>
</tr>
<tr>
<td>Hand stamping team</td>
<td>2</td>
</tr>
</tbody>
</table>

**Construction**

**Tack coats**

The area to be covered with cold mix asphalt needs to be swept clean of all dust and unwanted materials on the surface.

In most cases a light tack coat of dilute emulsion spray is applied to assist in bonding the cold mix asphalt to the underlying layer.
Determining the qualities to be ordered

An initial rough estimate of the compacted volume (in m³) can be obtained by multiplying the area(s) to be covered by the specified thickness. This volume is converted to mass (tons) by multiplying the volume obtained by the bulk relative density of the cold mix asphalt. The value of the bulk relative density can be obtained from the supplier.

Once on site a more accurate assessment of the quantity of cold mix asphalt required can be made by using dip measurements as described in the next section. Deviations from the measured quantities may occur due to undulations in the substrate. To prevent damage to the kerbing during compaction an additional thickness of 2 – 5 mm above the final kerb edge should be allowed for.

Setting up level controls

The area to be paved needs to be surveyed to ensure the required levels are achieved. This is especially critical where the drainage is paramount. Normally work will commence at the lowest point working up towards the highest point. Cold mix asphalt layer will iron out all the undulations on a poorly constructed base course layer. The more even the basecourse layer, the better the final finish of the cold mix asphalt layer will be.

Cold mix asphalt delivery

The Cold mix asphalt will be delivered to site or can be collected from the supplier. Although the material has a shelf life, it is better to buy and use as needed.

Placing cold mix asphalt

The bags should be placed out on the area required. Cutback based cold mix asphalt will need to be left in the sun for a short time to assist in increasing its workability. The bags should be opened as close to their place of use as is possible to assist the rakeman in spreading the mix to the correct level quickly and effectively. Minimal movement of the cold mix asphalt by the rakemen will assist in a higher productivity rate and less risk of mix segregation. Allowance should be made for 20% reduction in height due to consolidation of the material during compaction

Compaction

Proper compaction is critical to achieving a quality final product. Compaction should follow as soon as possible after spreading to the correct level. The first roller pass should be in static mode to bed down the material. This pass will also allow the rakeman to check that there is sufficient material and that there are no low or high spots. Subsequent passes of the roller should be in vibration mode until the mat is at the required density. The final pass should be in static mode to give a smooth finish without any visible roller lines.
No turning movement should be allowed on the mat as it is being compacted. Compaction should take place in straight lines from the lowest point to allow for a compacted edge to support the next pass. Roller direction should not be changed while still moving as this may result in the gears kicking into place resulting in the mat being shoved unnecessarily. Such undulations can result in a poor finish as well as possible ponding of water. Vibration should be switched off while changing direction to prevent excessive vibration on the area where the roller comes to a complete stop.

A 3 m straight edge should be used to ensure that the final level of the finished mat is correct and that the water will drain from the surface as intended.

**Edge treatment**

A heavy hand stamper should be used to ensure all the edges are well compacted and sealed off from any possible water ingress. This is particularly important in corners or areas where the roller cannot get to due to its size. Care should be taken not to damage any of the edging with the stamper.

**Traffic control**

Cold mix asphalt should preferably be left for at least a day to allow the cutter or water to evaporate and the mix to lose its tenderness. Warmer weather will speed up this process.

**Quality control**

A number of aspects need to be borne in mind when dealing with cold mix asphalt and laying it by hand

- Allowing sufficient time for the cutter or water to evaporate is critical in ensuring that the layer performs as expected once exposed to traffic action.
- The level control must be carefully controlled to ensure an even a surface.
- The edges need to be well compacted to ensure no moisture seeps in leading to premature failure.
- Kerbed edges giving lateral support to the edge of the cold mix asphalt layer tend to prolong its life by preventing edge breaks from occurring.