

Asphalt Riding Quality

pavement work tips - No 3

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INTRODUCTION

Smooth riding asphalt pavements don't just happen. There are at least five major areas of influence:

- JOB PLANNING
- LEVEL CONTROL
- UNIFORM SPREADING
- JOINTS
- COMPACTION.

JOB PLANNING

Shape Correction

Asphalt placed over an irregular surface will reflect some of the existing shape through differential compaction. Significant irregularities should be removed using a regulating layer or profiling prior to overlay.

New Pavements

On new pavements, thick layers are good for achieving density, but tend to move more under rolling and make it more difficult to maintain the required shape.

On the Job

Plan the location of joints to keep them to a minimum and out of the wheel paths. Plan asphalt delivery rates to maintain steady, continuous paving without excessive standing of mix prior to laying. Lay outwards from fixed levels.

LEVEL CONTROL

The Floating Screed Paver

The paver is designed to provide a smooth surface behind the screed with the least amount of interference by the operator. Constantly adjusting the screed height, such as chasing levels, can cause roughness in the finished surface.

Automatic controls

Greatest precision is obtained from fixed string lines and laser lines, although these should only be used when appropriate to the job conditions.

Travelling beams are useful for taking out

local irregularities and improving the ride quality of existing surfaces. Joint matching devices can be used to follow a kerb line or adjoining asphalt mat.

Manual control

The operator must anticipate the depths required and make smooth, progressive adjustments without the need for over-correction. Anticipation and smooth screed adjustment are key operator skills.

UNIFORM SPREADING

Continuous Paving

The key to uniform spreading is a continuous, steady, forward speed of the paver. Paver speed should be matched to plant production and delivery rates. Stopping the paver allows the screed board to settle slightly and can leave a small transverse ridge in the pavement. This becomes more pronounced the thinner the mat being paved.

If the paver is stationary for any length of time, the asphalt in front of the screed can cool. The extra resistance of the cooled asphalt causes the screed to rise as it moves forward again. Where there is a long delay between trucks, the screed should be lifted and a proper transverse joint constructed.

It is, therefore, essential that a sufficient number of truckloads of asphalt are on site before paving is commenced to avoid stop-start problems, but not so many that the mix can go cold before being used.

Asphalt Delivery Trucks

Delivery trucks must not be allowed to bump the paver by directly reversing onto it.

The truck should stop short of the paver, in neutral, with just enough brake pressure necessary to prevent the truck rolling downhill, and allow the paver to push onto the truck and propel it forward while asphalt is tipped slowly into the paver hopper. Spillage between the truck and paver should be avoided.

continued on reverse

Key Summary

This issue of "pavement work tips" discusses some of the factors that affect riding quality, and how to ensure a smooth riding asphalt pavement.



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A materials transfer vehicle (see photo) may be used to ensure paver speed is continuous, and removes the need for trucks to load directly into the paver. The transfer vehicle also avoids spillage between the paver and delivery trucks.

Asphalt Flow through the Paver

The paver must maintain a constant uniform amount of asphalt in front of the screed.

Asphalt Temperature

Variations in asphalt temperature will also affect flow under the screed.

Mechanical Condition

A paver in poor condition will not spread smoothly.

Hand Spreading

Slightly more compaction allowance must be made for areas of handwork, compared to machine laid work. Hand spreading and shaping must also be uniform and require skilled workmanship.

JOINTS

Proper construction of joints is essential. Transverse joints should be kept to a minimum and staggered between layers. They must be completed correctly the first time, as correction is difficult and tends to increase the problem by creating more joints. Profiling of existing surfaces may be required in some cases to ensure a smooth transition at the ends of work.

COMPACTION

As with spreading, smoothness and uniformity of rolling is the aim.

Initial compaction is done with a steel roller.

Excessive speed of the steel roller can push the material out of shape. Five km/h is considered a suitable maximum speed for steel rollers.

If the mix is too hot or particularly tender, a bow wave may be created in front of the roller.

Rollers with only one driven roll should be operated with the driving roll nearest the paver.

Rolling normally commences with the first pass on the low side of the mat to avoid lateral movement of uncompacted asphalt downhill away from the roller, except that joints should always be compacted first.

Each forward pass of the steel roller should be in a straight line, reversing in the same path, with changes of direction or lateral position only done on mix that has already been compacted by a previous pass. Each pass should overlap the previous run and finish at a different point to avoid a continuous dent being formed across the surface.

On deep lift paving, a strip of about 300 mm along the unsupported edge can be left to be rolled last.

Rollers should not remain stationary on a warm mat, as they may leave dents.

SUMMARY

Remember

- Plan the job properly
- Apply the most suitable level control system
- Maintain smooth, steady paving
- Set up joints properly
- Compact the surface evenly.

For more information on any of the construction practices discussed in "pavement work tips", please contact either your local AUSTROADS representative, or AAPA:
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A complete list of "pavement work tips" issues is available on AAPA's website:
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Asphalt paving with a Materials Transfer Vehicle.