

HIGH PRESSURE WATER RETEXTURING

INTRODUCTION

High Pressure Water Retexturing was introduced into Australia as an alternative treatment to improve the surface texture and skid resistance of:

- Flushed or bleeding sprayed seals; and
- Full or fatty asphalt surfaces.

The items of plant and operating procedures are different to that described in VicRoads Technical Note No. 19 (which used a single head walk behind water blasting machine with no water or solids collection capability).

HIGH PRESSURE WATER RETEXTURING PROCESS

The purpose built equipment is truck mounted and applies high-pressure water to the pavement surface via jets on a series of rotors. The water and any loosened bitumen and fines are then immediately removed from the road surface by a powerful suction head.

This process has considerable merit in improving the macrotexture of bituminous surfaces. The finished surface after retexturing is dependant on the macrotexture of the existing surface. Larger sized aggregate seals and asphalts are likely to have better results with this process than surfaces with small sized aggregates. Similarly, a large sized flushed seal which has been extensively gritted, will result in a lower texture than if no grit had been applied because the small aggregate is retained between the larger sized aggregate.

High Pressure Water Retexturing is best undertaken during cooler temperatures, and can be used when the road surface is damp (not wet or with free water on the surface). This is because the binder is harder at cooler temperatures and the water-blasting component of the process is more effective. This treatment provides advantages during colder periods when surface temperatures are unsuitable for resealing or asphalt treatments.

FACTS ABOUT THE MACHINERY

Some typical operating facts of machines that are currently in use in Australia are:

- Units are based on a 3 or 4 axle truck of total load mass of approximately 22 tonnes;
- Units typically have three separate rotating heads of approximately 700mm diameter giving a potential width of treatment of about 2 metres;
- Units use approximately 4500 litres of clean water, and are capable of collecting all of this plus the solids removed from the pavement as part of the one pass operation using powerful suction heads;
- Units have external control at the rear of the truck controlling water pressure, truck steering, speed control, emergency braking, side shift for the heads, on/off for the pumps and the raising and lowering of the water blasting heads. This enables the operator to work from the rear of the vehicle and to constantly control the quality of the workmanship and reduce the chance of damage to the surfacing;
- Water pressure is variable with a maximum operating water pressure is up to 800 bar (11000 psi) with a flow of 100 litres per minute.



PERFORMANCE

High Pressure Water Retexturing machines are capable of treating up to 4500m² per day at a maximum pass width of about 2 metres (depending on the equipment used).

The removal of bitumen can be in excess of 1kg per square metre which equates to the removal of approximately 1 litre per sq.metre of bitumen. During a day's operation, the machine can remove approximately 2-3 cubic metres of bitumen using up to 40,000 litres of water, which is all collected and subsequently disposed.

These figures are an example only and will vary considerably depending on site conditions and the type of machine being used.

LIFE EXPECTANCE OF TREATMENT

These types of machines have been operating in New Zealand for several years and experience there indicates a reflushing rate of approximately 10 per cent.

On works performed in Victoria to date, there has been a range of success rates partly due to the nature of works attempted.

Some sites treated were in extremely poor condition and the after treatment textures were at least satisfactory, or better, over a period of approximately one year. Other sites are likely to last another year or so before further treatment will be required. The next treatment could range from High Pressure Water Retexturing to a reseal or asphalt overlay.

At this stage it is not practical to predict the life expectancy from this treatment but High Pressure Water Retexturing is an effective way of immediately treating a problem area with the potential for the return of several years of satisfactory skid resistance. It also offers the ability to retreat the surface at a later date with a sprayed seal with substantially reduced risk of the treatment flushing quickly.

VicRoads is undertaking further research into the long term performance and cost effectiveness of this form of treatment.

PRECAUTIONS AND SAFETY ISSUES

Some of the things that need to be considered when using the High Pressure Water Retexturing process are:

- Exercise care when working over weak or previously patched pavements to avoid any damage. Before commencing work, patching of possible damaged areas needs to be considered and contingency plans made if any pavement damage occurs;
- Disposal of liquids and solids generated by the

process. Liquids need to be disposed of in an approved environmental manner such as an approved water treatment plant. Solids can generally be taken to land fill but it is suggested that the requirements be checked before commencing works;

- Traffic management procedures for the safety of road users, and works and operators on site;
- Noise management procedures if working at night near private residences;
- Exercise caution and wear protective apparatus when working near machine because small stones and grit can be flicked around during the process;
- Exercise care when working on freshly flushed surfaces during hot weather to avoid pick up of bitumen on the tyres of the truck, which can cause additional problems at the site.
- Treatment should NOT be used on initial seals and primerseals where only a thin layer of bitumen exists as the high pressure water may remove too much bitumen and expose the pavement layer underneath resulting in surfacing failures. The treatment is best used at locations where there are two or more seals or on a seal with an asphalt surface underneath;

SUMMARY

High Pressure Water Retexturing is an effective way of regaining surface texture and skid resistance. It should be considered along with other existing surface rejuvenation practices.



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