CASE STUDY

LONDON BOROUGH OF MERTON, UK

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Aberconway Road is a busy urban thoroughfare in the London Borough of Merton. In 2002, RHiNOPHALT® was applied to a section of newly resurfaced carriageway. The purpose of this site was to demonstrate that the treated surface would last longer than the areas of the road which were not treated. In order to achieve this only the middle length of the road was treated, with both ends being left untreated to provide an ongoing comparison of condition.

EARLY LIFE PRESERVATION

Aberconway Road is a busy section of urban carriageway which had been resurfaced with an SMA in 2001. The site was chosen as an example of SMA surfacing which at the time was relatively new and it was decided to trial the use of a preservative to ascertain the benefits of early preventative preservation maintenance.

In 2002, 18 months after installation a large section of the site received an application of RHiNOPHALT® preservative. In 2009 part of this section received a further application of RHiNOPHALT®. The whole of the site was not treated however leaving an ideal control section.

SMA DURABILITY

Historically Local Authorities used Hot Rolled Asphalt (HRA) as a surfacing material because it is very durable. HRA is also relatively noisy and therefore, more recently, SMA became the favoured option for surfacing in urban areas.

However, early SMA materials did not meet expectations in terms of durability when compared to HRA. In some Local Authorities SMA is lasting on average 9 years and starts showing signs of distress at around 7 years.

Of further concern was the manner of failure in that there was a rapid deterioration once a defect occurred. Aggregate loss becomes apparent very quickly once the surface course loses its integrity.

PERFORMANCE MONITORING

The site has three sections which are visually inspected and tested on a regular basis:

- Control (untreated), as laid 2001
- Treated once in 2002
- Treated a second time in 2009

In 2018, the treated twice section is still in great condition and this reinforces the need for repeated application at regular intervals. After years of applications, testing and customer feedback, ASI recommends that the road is treated with RHiNOPHALT® whilst it is good condition, which can be anytime up to 1 or 2 years prior to reactive maintenance being required. The benefits of preservation will still be evident with greater resistance to deterioration and extended surface life.

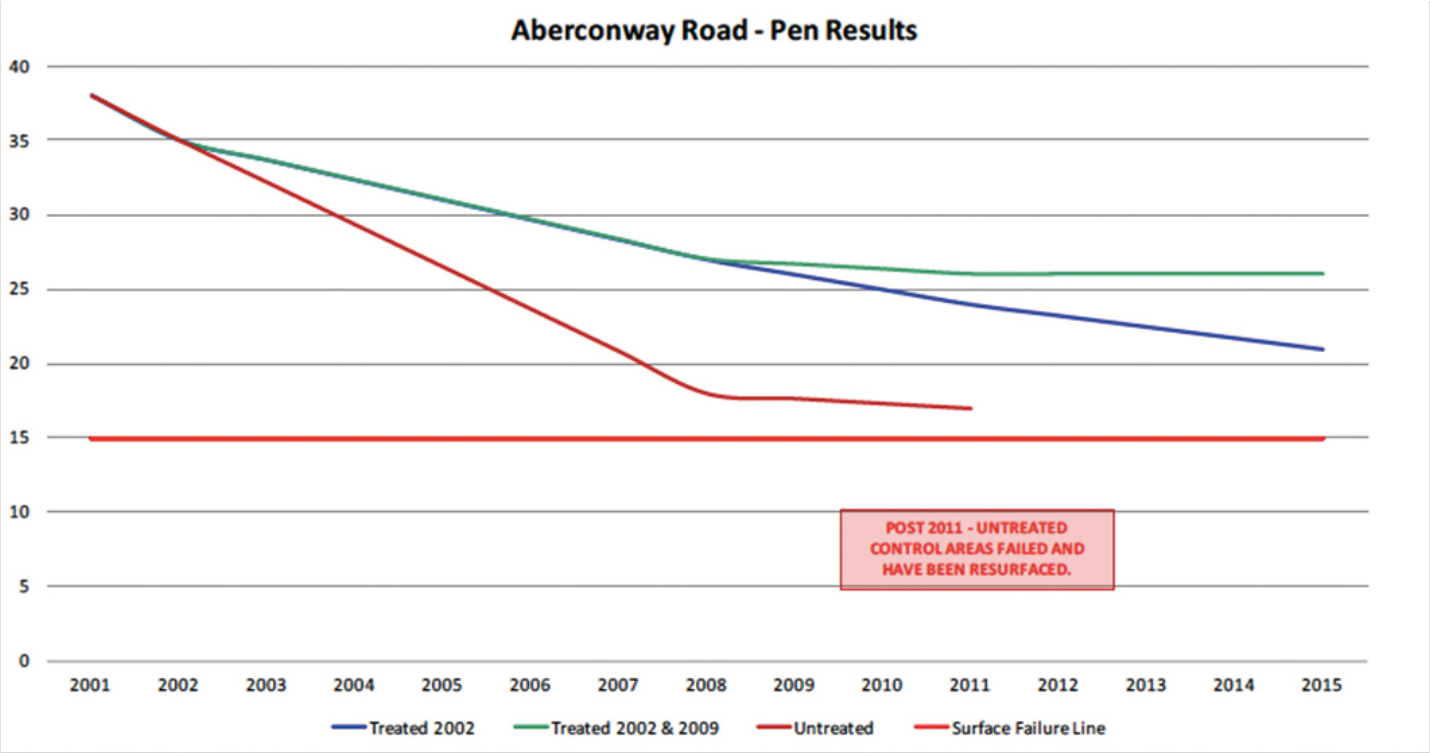
TEST RESULTS

	Control	Treated Once	Treated Twice
2001	37	37	–
2002	35	35	–
2008	18	27	–
2009	18	26	26
2015	–	21	26

BINDER PROPERTIES

It has been reported that once installed, a 40/60 Pen bitumen will drop to around the 30 – 37 Pen range due to the immediate hardening effect of the high temperature required in the asphalt mixing process. Further oxidisation will see this value reduce over time. Cores were extracted during the long-term monitoring to assess the binder properties of treating the fresh asphalt.

The untreated control section follows a typical binder deterioration curve. The treated once section has slowed down the binder ageing process, and with a second treatment it has almost stopped the ageing.



SITE MONITORING

Untreated Control Section
After 8 years, in 2009, the untreated control section was exhibiting signs of distress, hair line cracking and the start of aggregate loss.

Recovered Penetration values from the control section of cores extracted had a figure of 18 Pen. This result is typical of a 7 – 8 year old 40/60 Pen SMA material.

The majority of the control area had deteriorated and was replaced in 2011; no further testing was possible.

Treated Once Section
In 2015, 13 years after treatment, the treated once section was still in good condition, with some minor hair-line cracking. When tested in 2008, it had a Recovered Penetration value of 27 Pen.

This result was much higher than is usual for 7 year old SMA, demonstrating that the lighter oils are still present in this material.

In 2015, Recovered Penetration values from the treated once section of cores extracted had a figure of 21 Pen.

Treated Twice Section
In 2015, the treated twice section was in excellent condition, showing no signs of distress. This SMA was installed in 2001, treated with RHiNOPHALT® preservative in 2002, and again in 2009.

In 2015, the recovered Penetration from the cores extracted had a value of 26 Pen.
Some 6 years after the second treatment, the binder had only aged hardened by 1 Pen when compared to the treated once section.

In 2018, the treated twice section is still in great condition and this reinforces the need for repeated application at regular intervals. After years of applications, testing and customer feedback, ASI recommends that the road is treated with RHiNOPHALT® whilst it is good condition, which can be anytime up to 1 or 2 years prior to reactive maintenance being required. The benefits of preservation will still be evident with greater resistance to deterioration and extended surface life.