

A SUCCESSFUL WAY FORWARD

**PURE
ASPHALT**

Ted Holder offers his thoughts on the current state of play in the business of reinstating road surfaces around ironwork inserts.

"Improvement means deterioration", was the theme of a long series of articles written by Patrick Hutber, a respected [Daily Telegraph](#) journalist whose catchphrase, written so many years ago still holds true today.

Observe the bituminous reinstatements surrounding the ironworks on the roads of this country - that insignificant, but vital connection between the rigid ironwork chamber and the ubiquitous flexible road surfacing. No matter where you look, you will discover reinstatement failures, cracking, fretting, deforming and uneven surfaces, providing little or no support for the integrity of the ironwork chamber construction.



We now have a new reinstatement material, Pacopatch, whose 11-year development was based on the knowledge and experience gained from more than a century's use of mastic asphalt. This unique, two-part material will fulfil most of the "transition" requirements identified by the Nottingham Centre for Pavement Engineering in its report on ironwork/pavement systems, one of the latest reports to be completed on the subject.

Following lengthy and painstaking research, more knowledge is now available on the mechanics of good and bad reinstatement practice. Who holds the key to that knowledge, and uses it to help secure consistent, longer lasting reinstatements? The client, the contractor, the ultimate road authority, or does it fall in the void of this virtuous circle?

What was it like then?

Looking back - admittedly through rose coloured spectacles - I recall an age when the local authority controlled perhaps a little leisurely, the highways infrastructure, from the local lengthman to the exalted County Surveyor.

Within that control I can still visualise coke braziers, which amongst other less obvious uses, were used to heat the hot irons that quality contractors employed to seal longitudinal and transverse joints in asphalt wearing courses, and small repairs in uncompacted surfaces. These seemingly insignificant practices, along with a leisurely, or perhaps, a 'do it correctly first time', approach, appeared to create fewer reinstatement problems than is the case today, even allowing for the vast increase in traffic for the current regulated and over-tested manpower and materials.

Think positively

We cannot possibly turn the clock back, so what can we do then to improve the quality and durability of the average reinstatement today? The total cost is no longer simply that of the extra repair. It includes traffic disruption and all that flows from that! Think positively - remove all resistance to change!

Remember we're only discussing bituminous reinstatements. Not the design of Spaghetti Junction nor resurfacing the motorway network! Then ask the question, why is it, other than for an immediate and spurious convenience, that the original materials are generally specified in any subsequent reinstatement?

How big is the problem?

The total area of bituminous reinstatements around UK road ironworks is likely to be less than 0.001 % of the total road surface area. If this is correct, why is it so vital that the original material is replaced in a repair situation, especially when these materials are either impossible to obtain in small quantities or too difficult to lay by hand?

Why not select a product designed specifically for that purpose as every householder does when confronted with his repair needs in the home, on the car, or in the garden!

Some notes

Mechanical Performance of Road Ironwork / Pavement Systems

The final report to LINK Inland Surface Transport Programme. September 2002, made by the School of Civil Engineering University of Nottingham, clearly identifies the need for "improved designs to be developed to reduce the incidence of failures through improvements to the structural continuity between the installation (chamber and ironwork... author's note) and the surrounding pavement."

For "continuity" one could substitute reinstatement materials". The performance characteristics of machine laid materials are well known and include; durability, load spreading, minimal segregation, the importance of product temperature and ensuring adequate compaction. Do all specifiers understand the effect that hand-laying has on these characteristics?

The report also states "Frequently, the work is hurried and not carried out to a high standard, requiring repair after a short period, again with similar materials and costs. A modest improvement in the understanding of the interaction between installation and traffic loading could lead to considerable savings, estimated to be £6 million per year".

"Field observations of manholes on the A1 in Bedfordshire (Brown and Brown, 1997) have shown that extensive cracking, initiated from the corners of the installations, can occur in the

Pacopatch Test Results

Tests carried out on Pacopatch by Nottingham Centre for Pavement Engineering confirmed the robust and flexible nature of this new reinstatement material.

Element Testing" Pacopatch Test.

"The Pacopatch mastic asphalt reinstatement material exhibited a stiffness modulus at 20°C and a load pulse rise time of 0.12 seconds of between 6,750 MPa and 7,170 MPa. Repeated load unconfined axial creep tests were also carried out and the results show less than 1% cumulative creep strain.

One of Nottingham's four overall conclusions stated;

"The use of mastic asphalt for reinstatement of the pavement surface around an installation is beneficial".

asphaltic backfill material... The mechanism for this damage is not fully understood, although it seems likely that it is related to the mismatch between the in-situ stiffness of the road ironwork installation and the surrounding pavement structure. Results from in-situ testing have shown that the vertical stiffness directly over the chamber can be a factor of 2.5 greater than the vertical stiffness away from the installation (Brown and Brown, 1997). This mismatch in stiffness is likely to cause high tensile and shear stresses and strains in the asphaltic materials adjacent to the installation that may lead to premature cracking and damage".

NB The report from Nottingham University is a must-read for all those involved in ironwork construction and repair.

No headaches necessary

The research has been completed, the knowledge on how to effect improvements is readily accessible, the alternative, innovative materials have been developed and they are commercially available. So what is preventing their general use, other than apathy, ignorance or cost? All these reasons may seem valid, but as one engineer recently stated, "Reinstatements represent less than 5% of my budget, but cause me over 90% of my problems!"

Ted Holder is managing director of Pure Asphalt Company Limited. One of Europe's largest manufacturers of mastic asphalt, the company offers a specialist 'supply and apply' contracting service.

