



# **‘Road surfacing – latest developments and products’**

**APSE Highways Advisory Group  
Manchester Meeting  
7<sup>th</sup> June 2011**



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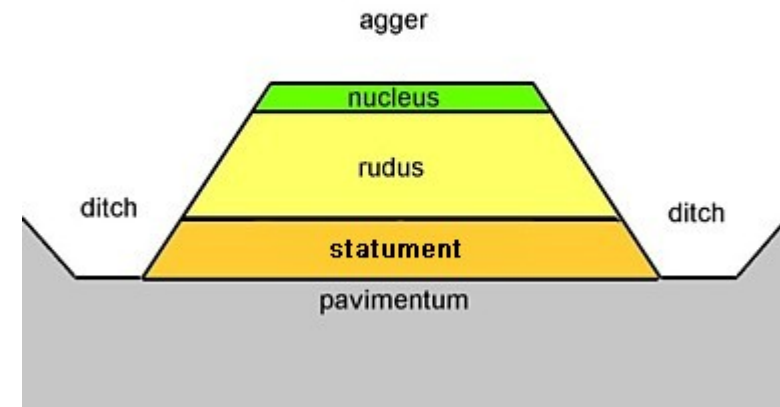
Or

In the last 2000 years how much have the techniques we use to maintain our roads actually changed?

# 'Road surfacing – latest developments and products'

## 400BC Typical Roman road construction

- The main ridge, or **agger**, was formed from material from the two lateral ditches. This gives the road its distinctive profile which we can recognise today on many sections.
- First, a broad ditch, the **fossa**, was dug. The base of the fossa was levelled and tamped down to form the **pavimentum**.
- A foundation layer called the **statument**, consisting of layers of flat stones embedded in earth or clay, was laid on top of the pavementum. This provided a firm foundation for the road as well as allowing drainage.
- On top of the statument was a layer of sand or gravel called the **rudus**. This gave the road its resilience.
- The next stage saw the laying of kerb stones at the outer edges and then surfacing the remaining inner surface (the **nucleus**). A variety of surfacing materials were used, closely fitted stone slabs or heavy gravel being the most common. A stone surface was often given an additional surface of compacted gravel.
- This top layer of gravel, the **nucleus**, formed the road's surface. This may have been bound with concrete or ash, but not necessarily. In towns, the surface may have been paved. All road surfaces were given a cambered surface to shed rain water and to aid drainage.



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- Roman running surface circa 400BC was metalling made up with compacted stone and cinders.
- Then Cobbles and Granite Setts was the next main surfacing material which continued to be used through to the early 1920's
- When Asphalt with it's viscous tar and bitumen binder which allows asphalt concrete to sustain significant plastic deformation, became the main surfacing material of choice (apart from occasional forays into concrete!).
- So how can we effectively maintain this vast network of Asphalt road surfaces?



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**Reseal surfaces with Surface Dressing:**  
In the 1970's Town Gas Tar production ceased with the advent of Natural Gas, then Hydrocarbon Bitumen Emulsions took over' cut-back emulsions were stopped recently.



The RSDA design guide has improved the performance of dressings, with prices from £1.20-£2.50/m<sup>2</sup> it still offers a very economical and if carried out soon enough effective resealing and restoration of deteriorating but not failed road surfaces.

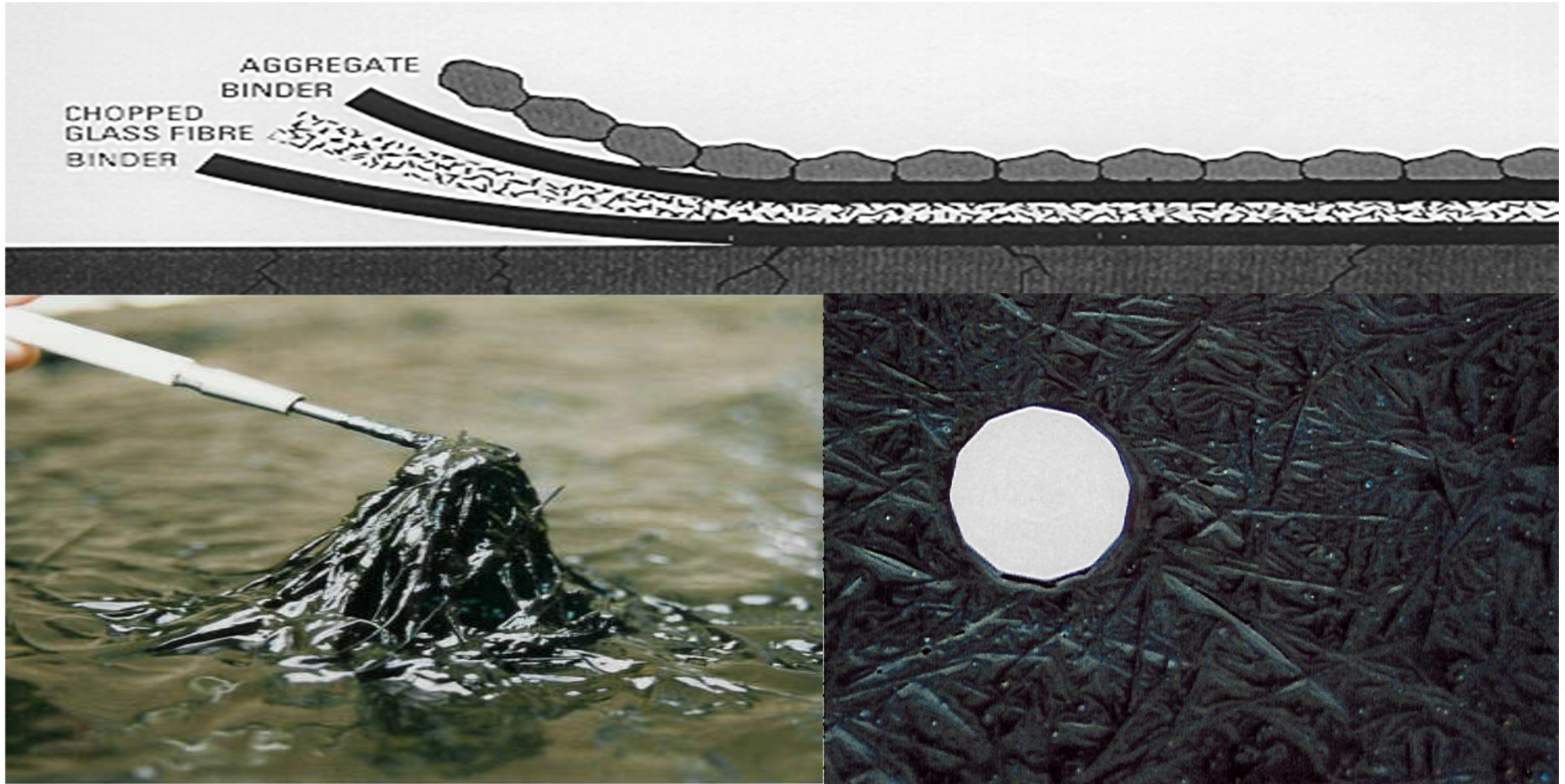
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- Surface Dressing design and investigation techniques have significantly improved; Road note 39.
- Equipment: calibrated sprayers instead of hand lances and Pheonix chippers instead of shovelling chips.
- The quality and consistency of aggregates now available.
- Wider range of emulsions now available from traditional standard grades through to Polymer modified emulsions.
- As always though, good design and proper supervision are the key to successful Surface Dressing.
- But what can you do with already failing road surfaces?



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- Arresting reflective cracking is infinitely more economical than carrying out a total reconstruction.
- Fibredec is a very effective SAMI when used under Micro -asphalt layers and other thin surfacing materials without the need for extensive preparatory works.
- On footways it can often eliminate conventional layers as it can be applied directly onto unbound surfaces which makes it very cost effective.
- But what do you do when you can't just cover it up?



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1912 in-situ repaving.

Repave Today



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# 'Road surfacing – latest developments and products'



Repave Hot in-situ process, minimises vehicle movements and disruption.

Surface is scarified, re-profiled & new thin overlay is superimposed all in one pass. Repave only costs £1.70 - £2.80/m<sup>2</sup> plus the cost of the chosen new thin overlay.



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- Any crazed areas or open joints are heat-welded.
- Floating screed improves the final levels of road and re-profiles the finished surface.
- Reduces the need to import new materials, as a new thin 20-25mm overlay finishes the process.
- One third less Greenhouse Gas Emissions compared to conventional re-surfacing all adds up to a greatly reduced carbon footprint.

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1930's retread.



Retread Today

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Down mill to 75mm depth, adding aggregates if required rolled, harrowed, graded then emulsion is harrowed in to ensure penetration and even distribution.



Second binder layer with 14mm chip to close voids then a final emulsion spray. With a 6mm chip layer is applied. Surface dress or overlay the following year.

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- Pulverises reuses and re-profiles all of the existing road material that is already onsite.
- Reduces the amount of vehicle movements as there is much less importation of new materials.
- Over 50% less Greenhouse Gas Emissions compared to a conventional re-surfacing.
- Cost of Retread from £8 - £10/m<sup>2</sup>.



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Cold applied slurry or microasphalt, either machine or hand applied is both economical and quick in use on footpaths, car parks, hard shoulders and urban carriageways and can significantly reduce road noise.

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Although a “low tech” material, cold applied slurry and micro-asphalt is fast economical (machine laid from £ /m<sup>2</sup>) and it is a safe in use material causing minimal disruption to road users and residents, as it sets in an hour.

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Finally and as the last resort if all you can afford is to keep repairing those Potholes!



What's your preferred method?



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Do you cut out and reinstate with a hot permanent Patch?



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Do you Velocity Patch?



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Do you Infra-Red Patch?



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Or how about using a Bulk deferred set pothole repair material?



- Extended storage life of up to two years!
- No wasted material, unlike hot asphalts.
- No heated or special storage requirements.
- Low temperature manufacture makes it a greener option.
- Cut Out not necessary so repairs take less time.
- Heavy compaction equipment not required.
- Solvent free non-hazardous product.
- Colpatch soon to have BBA HAPAS certificate as a Permanent pot hole repair material.

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- The processes as I've shown have not changed much over the years, however the technology used in the manufacture of the emulsion products has.
- Colas makes all of the products used in the processes in this presentation and are continually looking to improve them in partnership with the companies involved.
- We can offer free help and advice to our many Council customers on possible solutions to your problems.
- One of our main Colas Company Missions is “to provide sustainable solutions for our customers”.
- Colas are here to help you maintain your roads whichever way you choose; cost effectively!





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Any Questions ?

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**We don't just stop at roads!**

From supplying a £5.00 aerosol can to managing a £500m PFI project, Colas has the product range and management expertise to deliver a comprehensive range of services.

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For further information visit [www.colas.co.uk](http://www.colas.co.uk) or contact us at:  
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