

Occupational Safety of Road Users – Re-establishing the Cost-Effectiveness of High Friction Surfacing Systems

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**RoSPA NOSH Committee** 

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### High Friction Surfacing or Antiskid



Linking RoSPA's interests in Road Safety with the occupational safety concerns of the public who have a right to provision of the safest roads possible.



## BACKGROUND

#### Context

- DfT stats indicate a large % of road traffic accidents occur at approaches to junctions, roundabouts, crossings etc caused by vehicles skidding
- HFS was developed as a new road surfacing by TRL in the 1960's to reduce vehicle braking distances and skid related accidents
- However since 2008 local authority cut-backs has resulted in less HFS being used (deemed too expensive), down to zero in some authorities, preferring instead to use asphalts with a high PSV
- There is long established evidence that HFS outperforms any asphalt surfacing because it polishes more slowly under traffic
- So the need to reduce budgets is putting lives at risk www.rsta-uk.org

Durable Micro-texture (**Calcined Bauxite aggregate**), reduced contact points, high contact pressure points and improved hydraulic conductivity are critical for high skid resistance and reduced braking distances (Parry, TRL 1996)



#### Points to consider

- Maximising Durability
- Planning & Early Contractor Involvement
- Specifying correct system
- Installation on a sound substrate
  - Dense, rut resistance, negative texture....etc.
- Time Intervals before treating fresh asphalt
- Application constraints (road closures, opening times)



- 1960s UK saw significant increases in traffic levels
- Corresponding increases in accidents and fatalities
- Fatalities peaked in 1966 at 7,985
- 'Black Spots' identified at bends, junctions and pedestrian crossings

#### GLC Trials

In 1967 the Greater London Council and the Metropolitan Police recognised the need for a durable skid resistant surface tough enough to withstand the harshest traffic environment.

Trials of high friction surfacing started in 1968 – cold applied bitumen extended epoxy resin + calcined bauxite



### Trial outcomes

- Accidents and casualties reduced by 50% in year 1
- Cost of treatment recovered within 1 year
- 10 year programme was instigated
- Programme cost to be covered 8 fold in reduced accident costs
- Effective life of HFS found to exceed **<u>10 years</u>**

 HFS has been found to reduce wet weather accidents by 57% and could reduce the overall number of accidents on our roads by 5.5%

TRL Research – BRF Road fact 1997

 1,700 sites treated in one year with HFS at a cost of £3 million saved us £24 million through accident prevention.
The London Accident Analysis Unit



Source: LoTAG 2009

### Approaches to pelican crossings (LotAG 2009)

RSTA





## **SPECIFICATION & GUIDANCE**

### Specification & Guidance



#### CODE OF PRACTICE FOR HIGH FRICTION SURFACING



Hand Applied Systems

Machine Applied Systems

HD36 and Local Skid Risk policy will

dictate product selection

Clause 924 in MCHW calls for HAPAS

certification

□ RSTA ADEPT Code of Practice

# HFS Length v Vehicle Speed on Local authority

Speed limit		length of HFS <sup>(1)</sup>
Km/h	MPH	(m)
32	20	15 <sup>(2)</sup>
48	30	25
64	40	40
80	50	55
96	60	75
112	70	100

JACOBS

Guidance on the consistent installation of High Friction Surfacing (2009)

Highways England uses at least 50m of HFS

Note 2. HFS should only be provided on 20mph sites when there is a very hazardous location and evidence of skidding accidents



### **SERVICE LIFE**

### Service Life





- Cold applied resin systems typically last longer than hot applied thermoplastics and should be used where traffic volumes are highest
- 12 years average life for Cold and 8 years for hot applied HFS systems

#### Service Life of Surface Treatments

RSTA / ADEPT May 2011





### **CASE STUDIES**

### Cold applied more than 10 years old



### (Trafford Centre M60 off slips & junction installed 1999) Cold applied MMA system

### Another good example



Leading edge after 7 years

- Ladgate Lane, Middlesbrough
- Installed Sept 2001
- Still looks good
- Cold applied Polyurea system + chinese bauxite





### **COMPARATIVE PERFORMANCE**

#### Road Test Machine – Ulster University



Testing was carried out using the Road Test Machine (RTM) for a total of 100,000 wheel passes. The RTM is used to simulate slow speed / high stress trafficking in laboratory controlled conditions.

# Average skid resistance after simulated trafficking



RSTA



- HFS has been proven over time to substantially reduce skid related accidents
- Application should be targeted on risk based approach
- Ensures safety of road users, drivers & pedestrians
- Asset management is key using robust policies to target and maintain HFS
- Promote best practice to maximise service life

- How can RoSPA and RSTA work together to raise concerns that authorities may be putting lives at risk?
- RSTA has already raised this matter with Highways England and local authority bodies such as ADEPT and TAG who default to current engineering standards
- Welcome your initial feedback