



Sixty Years of
Memories and
Perspectives

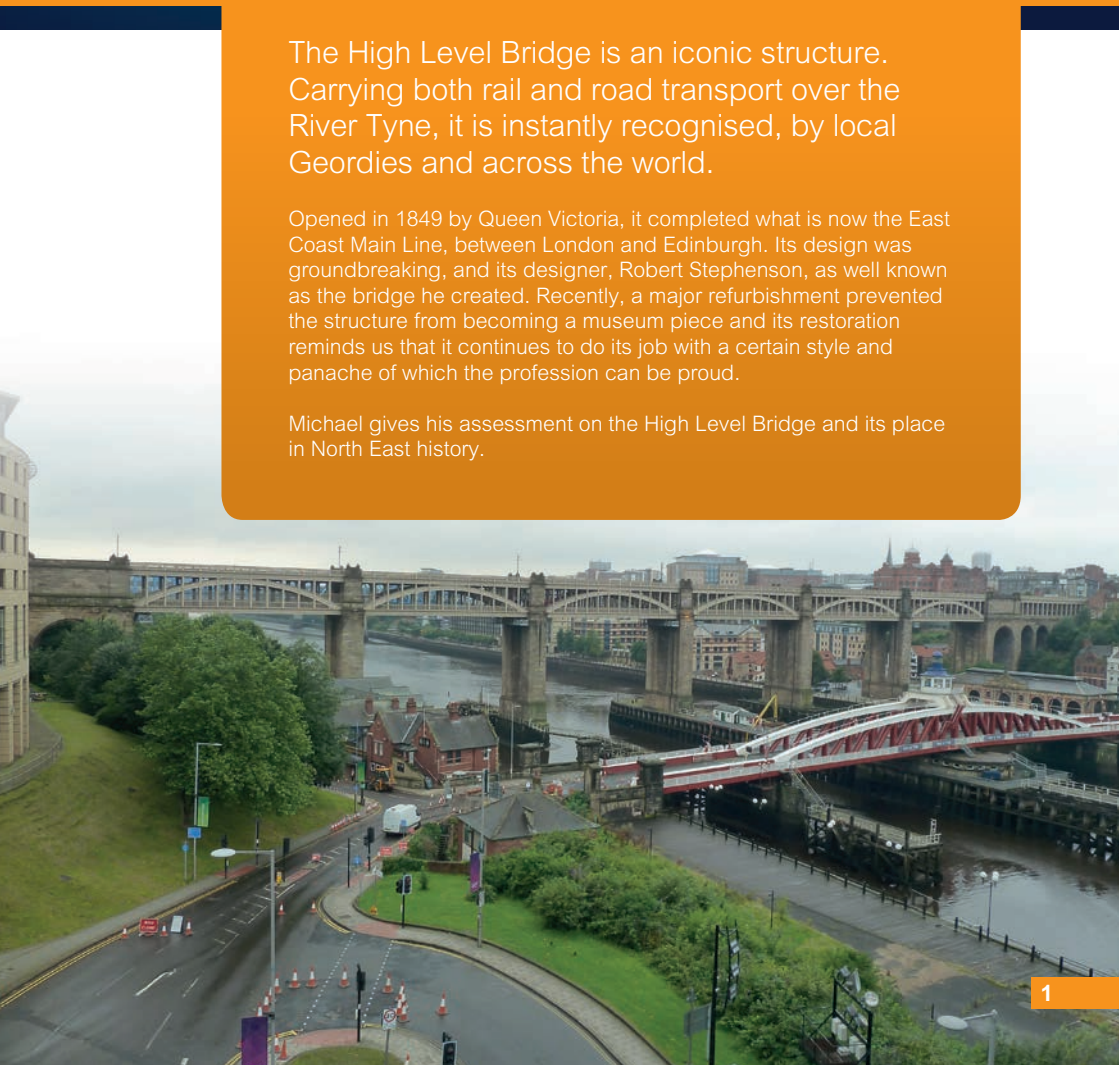
The High Level Bridge A North East Icon

A personal view by J Michael Taylor MBE

The High Level Bridge is an iconic structure. Carrying both rail and road transport over the River Tyne, it is instantly recognised, by local Geordies and across the world.

Opened in 1849 by Queen Victoria, it completed what is now the East Coast Main Line, between London and Edinburgh. Its design was groundbreaking, and its designer, Robert Stephenson, as well known as the bridge he created. Recently, a major refurbishment prevented the structure from becoming a museum piece and its restoration reminds us that it continues to do its job with a certain style and panache of which the profession can be proud.

Michael gives his assessment on the High Level Bridge and its place in North East history.



Choose a favourite road or rail bridge in the north east and you will be spoilt for choice. There are many and readers will all have their favourite. Perhaps it would be the Middlesbrough Transporter Bridge, Stockton and Darlington Railway Bridge, Hounds Gill Viaduct, Kingsgate Bridge at Durham, Tyne and Wear Metro Bridge, Gateshead Millennium Bridge, Telford Bridge at Morpeth, or the Royal Border Bridge at Berwick. The list seems endless but I choose the High Level Bridge over the Tyne Gorge at Newcastle which seems to me to bring so many of the key elements of a “Highways and Transportation icon” together.

By the middle of the 19th Century there had been a number of proposals to cross the Tyne at “high level” between Gateshead and Newcastle but it was the “Railway King”, George Hudson and the need to join his York, Darlington, Gateshead railway with his Newcastle to Berwick railway that caused the formation of the High Level Bridge company. Hudson’s engineer for his schemes in the north of England was Robert Stephenson.

Had the CIHT existed in the middle of the eighteenth century there is no doubt in my mind that he would have been a prominent member of the Institution.

Robert Stephenson was assisted by another eminent engineer, Thomas Elliot Harrison and the bridge was built between 1847 and 1849. It is the first major example of a wrought iron tied arch or bow-string girder bridge, a fine and long standing engineering solution to a difficult problem – the spanning of 1,337 feet (408m) of river valley, including 512 feet (156m) across water.



The High Level Bridge has six river spans of 125 feet (38m) length, sitting on masonry piers 46 by 16 feet (14 by 4.9m) in section and up to 131 feet (40m) height. There are also four land spans on each side, of 36 feet 3 inches (11m). The single carriageway road and pedestrian walkways occupy the lower deck of the spans, 85 feet (26m) above the high water mark, and the railway the upper deck 112 feet (34m) above the high water mark. The total weight of the structure is 5,000 tons.

The bridge completed the line of a London-Edinburgh railway, today known as the East Coast Main Line. It was opened to rail traffic, without ceremony, on 15th August 1849, officially opened on 27th September 1849 by Queen Victoria and brought into ordinary use on 4th February 1850. The bridge was constructed at the same time as Newcastle Central Station which was also opened by Queen Victoria in 1850. A history of the planning and construction of both is given in the book “The High Level Bridge and Newcastle Central Station – 150 years across the Tyne”, published in 1999 by North Eastern Railway Association and supported by the CIHT.

The total cost of the bridge was £491,153, including £112,000 for the metal work, which was produced by Messers Hawks, Crawshay & Co. There were 650 Newcastle and 130 Gateshead families who were relocated when their homes were compulsory purchased to enable the bridge construction.

Currently this cast iron Grade I listed heritage structure is one of Network Rail’s 'Major Structures' and provides a strategic turning loop on the East Coast Mainline.

During the 160 years of the bridge’s life a number of maintenance schemes and alterations have taken place. In May 2008 the bridge reopened following a £42m extensive programme of repair and strengthening to extend the life expectancy of the structure and conserve it as an important piece of national heritage.



The designer for the most recent work was Network Rail and the contractor May Gurney, with Mott MacDonald carrying out detailed inspections, structural assessments and design of all repairs and strengthening works. All structural works were designed to adhere with heritage and conservation engineering principles which were developed by the team in close collaboration with English Heritage, Newcastle City Council and Gateshead Council.

Works included the visual condition inspection and non destructive testing of 57,000m² of cast and wrought iron. Full-scale fatigue testing of structural components was also undertaken in conjunction with the University of Manchester. This research and development work successfully alleviated the need for extensive strengthening of the rail deck that might otherwise have been required by a more conventional design process.

The £42m refurbishment and strengthening works comprised the complete replacement of the suspended road deck including the sympathetic installation of an alternative load path away from 'fatigued' cast iron girders and also replacement of corroded sections of original wrought iron suspension hangers. New drainage and deck waterproofing was also provided.

Other works included extensive metalwork repairs and a complete repaint of the structure in Heritage colours.

When questioned whether a new bridge would have been a cheaper option than the recent refurbishment, the design engineer's response was that a new bridge would have cost about the same. However he also added a new bridge would have meant major demolition in Newcastle and Gateshead together with disruption to the East Coast Main Rail line. His conclusion was that the scheme represented good value for money.



Recent works did however place restrictions on traffic using the bridge, with vehicles only able to travel across the bridge from Newcastle to Gateshead. One departure from the strict Heritage constraint was the installation of vehicle impact protection to safeguard the structure from impact by road vehicles, as can be seen on the photograph of signing to the bridge. This has reduced the width of an already narrow carriageway.

It is perhaps sad to say that our profession received some criticism over what was widely reported as poorly designed and ineffective signage on the approach to the bridge. To prevent overloading, the only permitted vehicles are local buses, commercial vehicles less than 3 tonnes weight and taxis.

In other words, use by private cars and large goods vehicles is not permitted but there were some 50,000 illegal crossings of the bridge in the three months following reopening indicating all was not clear to the general motorist. It certainly would have been easier to defend the signage scheme, as shown in the photograph, if it had been more effective.

While the bridge remains a working structure, its international recognition is fully exploited. Images appear widely, in opening titles of television news programmes, on tourist brochures and calendars, the list is endless. It remains a popular subject for artists and photographers.



The bridge has caught the public's imagination from very early on in its life. The Gateshead fiddler, composer, James Hill, wrote "The High Level Hornpipe" to commemorate the opening of the bridge in 1850. The music is still played today and used as a test piece for young fiddle players. James Hill is commemorated on Bottle Bank, Gateshead, in an artwork by sculptor Peter Coates.

It is difficult to deny that the High Level Bridge does its job with a certain style and panache of which the profession, and the region, can be proud.

Thanks to J Michael Taylor, MBE, CEng, MICE, FICHT, for preparing this article.

All opinions in this article are the author's own.

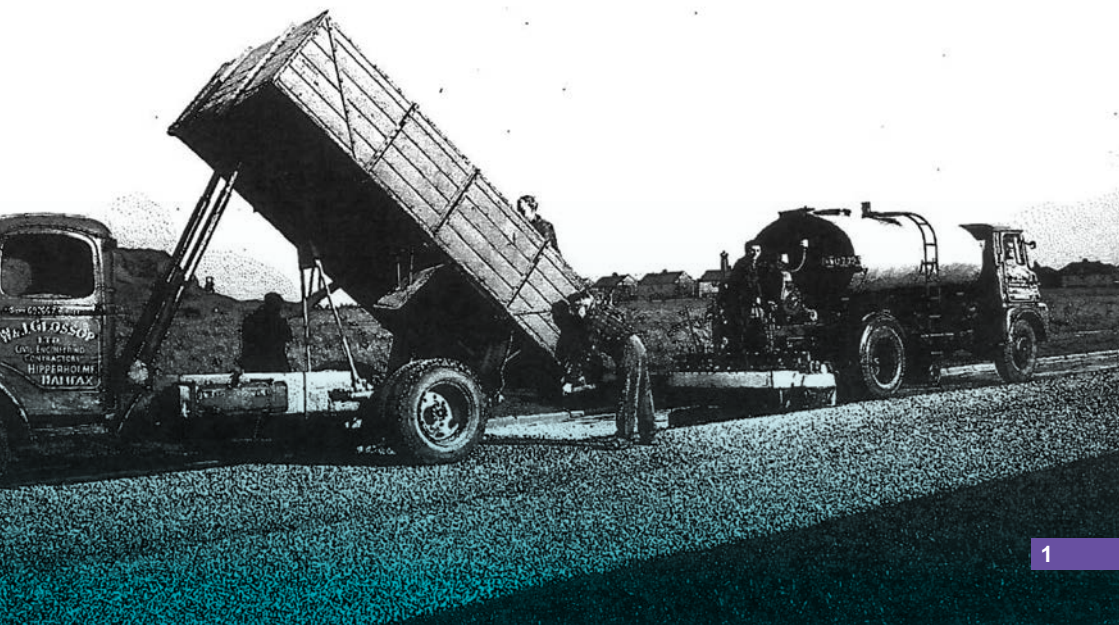


Experiences in Surface Dressing

A personal memory by Arthur Thompson

Surface dressing of roads has been a tried and tested maintenance practice for many decades. It is a cost effective method of increasing the life of a road by restoring skid resistance and sealing the road surface from water ingress.

However the continuing development of new and improved materials and techniques has been an essential part of that process. Arthur describes how surface dressing evolved over his 40 years in the industry.



Surface Dressing

Surface dressing is a cost effective method of increasing the life of a road. It involves the initial spraying of a bituminous adhesive coat onto the existing road surface, followed by the spreading and rolling in of aggregate chippings. It is used to provide the road with a new wearing surface which has increased skid resistance (to aid braking), seals the surface from water ingress and which also arrests disintegration of the old surface.

Motorists will recognise the ‘loose chippings’ signs that often accompany surface dressing works. In the settled condition there is a roughness to the surface that reduces the chances of skidding even in very cold, icy conditions. It does generate some tyre noise, meaning it is more often seen on minor rural roads and relatively quiet urban roads,

Having been involved in the surface dressing industry for the past 40 years I have seen many changes, both in operations and design specifications. I’ve also worked with both private sector and highway authority Direct Labour Organisations (DLOs).

In the early 1970s, several DLO’s of county council authorities in the North East, west of England and Scotland, were dominant in the surface dressing industry, due to it being a significant element of their highway maintenance budgets and programmes.

Some of these authorities specified various methods and applications of binders (the adhesive coat) and chippings. For example in the early 1970s such binders used were EV30 tar, which was a by-product from the coke industry. Other products preferred were so-called Cut-back Bitumen or Tar-bitumen blends.

These bitumens were applied at high temperatures. They were heated beyond their flash points, when the vapour released could ignite in the air. Consequently, on application to the road surfaces, there was always an attendant fire risk to the surfacing crews. Their use eventually declined as more robust Health and Safety practices were developed.

Very few designers continued to specify Cut-back Bitumen when an alternative Bitumen Emulsion Binder was introduced to the industry. These new materials were generally 70% binder and 30% water, or occasionally a 80% / 20% mix, which were more suitable with damp surfaces and chippings. The Cut-back Bitumen traditionally required a perfectly dry surface and chippings.

One addition to the bitumen road binders was a revolutionary additive called “Emulcol” produced by Colas Ltd, and which was developed by Colas France. This was an additive sprayed into the jet pattern of the conventional Bitumen Emulsion, as it is applied to the road surface, which gave the application a much faster breaking time – the time the bitumen in the emulsion takes to coalesce and develop an early bonding strength between the chippings and the road surface. This faster process enabled the road to be returned to traffic much sooner.

I applied this system to the Holy Island Causeway in the 1980s. The tidal effect on the original Macadam surface layer was so severe that sections became un-bonded from the base course below. The application of a surface dressing using “Emulcol” additive proved very successful and the treatment remained effective for many years. It proved a cost effective solution for Northumberland County Council for maintaining the causeway’s surface.

The application of chippings during the late 1970s and early 1980s varied between using a single or double application of binder. These used a range of aggregates which were waste products from industrial processes, such as Blast Furnace Slag and Steel Slag, and locally

produced aggregates such as Gritstones and Basalt. Depending on the traffic conditions and stress levels of the carriageway, a single dressing using a 6mm or 10mm chipping would be specified, or alternatively a double dressing using a 14mm or 10mm followed by a 6mm or 3mm chipping.

During a business trip to France in the early 1980s I saw a technique called “Racked-in surface dressing”. It consisted of a single heavier application of Emulsion Binder followed by 14mm chippings which were applied at a much lighter rate of spread and which were infilled with a 6mm or 3mm chipping. This in theory interlocked both aggregates into the binder. The process was generally used on high speed roads in France giving a better combination of a smooth ride but with sufficient surface texture (skid resistance) to aid vehicles braking.

Eager to develop this system in the north of England, I contacted a materials engineer (Jeff Higgins) working for Cleveland County Council (CCC) who confirmed his interest. Working with CCC laboratory facilities, we developed the required quantities of binder and aggregates and, in due course, convinced CCC to carry out a trial where the new technique could be used and monitored over a specific time. The aim was to convince them to introduce the system into their annual Surface Dressing Programme.



The trials proved successful, after which the first “racked-in” system was applied to a major trunk road in Cleveland in 1982. Further development tailored it for highly stressed roads – high speeds and heavy goods vehicles – where conventional surface dressing would have previously been at risk of failure.

Encouraged by the success at Cleveland, I introduced the new system to Durham and Northumberland County Councils as a method to surface dress roads normally unsuitable for conventional dressings. It was referred to as “Proprietary Surface Dressing” as opposed to “Conventional Surface Dressing” – the two terms used to distinguish between products when surfacing work was specified to contractors.

Another innovation I was involved with in its infancy was a system called “Fibredec” – a sealing process developed to treat severely cracked or crazed roads normally unsuitable for conventional surface dressing. Using chopped glass fibres in the Bitumen Emulsion and various sized aggregates provided a deterrent against cracking from failures below the surface. The process proved so successful it was also used on unmade footways and cycleways.

Within the industry we have been guided for designs by TRRL RN 39 for as long as I can recall. Modern designs have proven to be a great success and, while quantities of surface dressing in the UK have declined over the past few years, materials development has meant the process is still economic and practical.

Having now retired, I fondly look back on many memorable years spent in the industry, my involvement with the region’s highway maintenance programmes and, in particular, to the various characters I met and worked with.

Thanks to Arthur Thompson FICHT, at New County Group, for preparing this article.

All opinions in this article are the author’s own.

Managing the Holy Island Causeway

A personal view by J Michael Taylor MBE

A metalled road from the mainland to Holy Island was only constructed in the 1950s. Continuously covered and uncovered by high tides, it needs a special regime of maintenance.

Michael describes his memories of watching the construction take place as a boy then later managing its maintenance during his working life.



In 1953 I enjoyed a holiday at Seahouses with my parents. A day trip to Holy Island, Lindisfarne was certainly a highlight as I recall the journey vividly. My father parked our car in the small car park on the sea shore and we headed for one, of what appeared to a young boy, a vast fleet of rusty black cars which acted as Island taxis.

Between us and the island in the distance appeared to be a forest of poles forming random patterns across the sandbanks stretching out towards the village on Lindisfarne. A fee was duly negotiated and we set off across the sand following one of the routes marked out by the tall poles.

As we progressed we passed close to cranes, bulldozers and men working on the sand. My father told me that they were building a road across the sand to the island. The days of the tourist taxis industry to the island were numbered. Perhaps just as well, there was more rust inside the taxis than outside and you certainly had to watch your feet as the water rose into the car as the journey progressed.

Some 40 years later I was once again travelling to the island. This time it was outside the tourist season and I was the Highway Authority representative going to meet a local Councillor to discuss a maintenance issue. It was a dark, atmospheric February day and as I drove towards the harbour the hair on the back of my neck stood on end as the familiar sight of Lindisfarne, Bamburgh and Dunstanburgh Castle appeared out of the heavy sea and spray. I remember thinking how privileged I was to witness such a sight as part of my daily working life.



The causeway was opened in 1954 much to the relief of the workforce who would have worked under difficult conditions, shift patterns to suit the tides and a cold winter wind un-moderated all the way from Norway. Nevertheless, the tide still renders the road impassable for two hours before high tide and three hours after, when Lindisfarne is again restored to its island status.

The causeway provides an all-dry route onto the island for about seven hours between each high tide. At high tide the road is covered by between 4ft (1.2m) and 6ft (1.8m) of sea water and even more at exceptional tides or severe weather.

The mile and a half long road was laid about 9 inches (225mm) above the sand and, just under half a mile from the mainland, the road crosses the River Low in a low [150ft (46m) long] 10 span bridge which is about 4ft 6in (1.35m) above road level. The bridge approaches are such that most people do not realise they have crossed it for the existence of the wooden pedestrian refuge hut accessed by about 20 steps. At the time of construction the refuge box was described by the workforce as a “chicken coop”.

Although the causeway is generally 18ft (5.5m) wide, the bridge was built to a single carriageway width (10ft) to limit the possibility of debris damage caused during flood conditions on the River Low.

The road was extended in 1965 to ensure that travel across the sands on the island side was on a paved surface. This ensured the three mile journey from the mainland sea shore to Holy Island village is on a metalled road.

The highway has had a profound effect on the village which now receives 500,000 visitors annually, in 70,000 cars and hundreds of coaches. All in all a unique and challenging task for the highways maintenance and management teams.



The choice of limiting the road height above sand level to 9 inches (225mm) has proved very foresighted. On occasions when resurfacing schemes have raised the road above that level, a winter storm restores the status quo. The sea rolls the additional road surface up just like a carpet and deposits it to the carriageway edge. In recent years edge restraints to the carriageway have formed part of resurfacing schemes.

The most effective method of surface maintenance appears to be a regular patching and surfacing dressing regime. Needless to say programming of such works, indeed all works on the causeway, is critical with tide and weather playing an important part.

But effective draining is the number one priority for the efficient operation of the road. The fact that the road surface is generally above adjacent land does help but this natural drainage is frequently compromised by seaweed, sand and other sea born debris following high tide. Indeed removal of sand is a continual task which cannot be removed from the island due to environmental reasons.

Sections of the road where it creeps up the island sea shore are separated from the sea by very low grass covered sand mounds. As water from receding tides cannot run off the road here, highway drainage is achieved through channels cut from the carriageway to the beach. Longer ditches alongside the road have been tried to improve run off as the tide recedes but with limited success, becoming blocked by sea action.

A further and unusual highway maintenance problem can occur following winter storms or very high spring tide. Large volumes of sea weed could block the carriageway particularly near the point where the island road leaves the sea shore to enter the village. Removal of the debris frequently could be more likened to a snow clearing operation rather than a street sweeping exercise. Clearing ice and snow from the causeway is not normally needed, but during extremely cold periods areas of the sea have frozen.

The ever increasing number of visitors to the island has necessitated the use of traffic management measures within the historic village. Given the sensitive nature of the Island, parking and waiting restrictions are marked with half normal width, primrose coloured lines, rather than normal width yellow lines.

The highway engineer has brought significant changes via the causeway to this historic island but to the south of it, a series of stakes still marks the old route across to the island called the 'Pilgrims Way' which was used in ancient times by visitors to the great Christian centre of Lindisfarne. Again this could be crossed only at low tide, a situation perfectly described by Sir Walter Scott:

*“For with the flow and ebb, its style
Varies from continent to isle;
Dry shood o'er sands, twice every day,
The pilgrims to the shrine find way;
Twice every day the waves efface
Of staves and sandelled feet the trace.”*

An increasing problem has been the number of people disregarding the published “safe crossing times”. As the number and size of warning signs increased so has call outs to life boat and helicopter in order to rescue motorists stranded in the sea on an incoming time.

Recent trials were conducted to reduce the problem of stranded motorists. A mobile electronic message board was set up on each approach to the causeway, displaying the safe crossing times for that day or warnings to check the tides. It is anticipated that permanent signs will be erected.

Websites and mobile apps have also been developed to keep drivers informed of safe crossing times.

Thanks to J Michael Taylor MBE, CEng, MICE, FICHT, for preparing this article.

All opinions in this article are the author’s own.



In the Dock

Experiences of a Winter Services Manager

A personal memory by J Michael Taylor MBE

The work of a local authority highway maintenance engineer may be viewed as mundane but their decisions can impact the public and actions can be called into account in a court of law.

Michael describes one such event that started on a dark winter's night...





Ask anyone involved in Winter Services and they will tell you that snowstorms always occur at weekends. Indeed it was the consequences of such an event that was to cause me a great deal of distress and heartache over a two year period.

The forecast on Friday afternoon was broadly correct and 50mm to 100mm of snow fell overnight, mainly inland 15 miles from the coast and above 200 metres. In other words, it was a typical winter event for Northumberland.

I telephoned the office early on the Saturday morning to confirm all resources had been deployed. The storm had passed and as the problems were localised, snow clearing would continue as normal until the road network returned to a satisfactory condition. Everything seemed well under control.

A quick listen to the short wave radio in my car and a further telephone call later in the morning confirmed the teams were “on top of the situation” My next major decision would be early afternoon following receipt of the overnight forecast.

On downloading the forecast to the laptop at about 1.45pm it was clear what my actions should be – there was no ambiguity. The weather front had crossed the UK from west to east leaving a beautiful winter’s day, to be followed by a clear starry night and plummeting temperatures.

I telephoned the office to see how things were going and was not surprised to hear that the “great gritter in the sky” had got to work and the snow was clearing from road surfaces by the sun without much effort from the snow ploughs.

I instructed snow clearing to continue for a while longer followed by a precautionary salting of all designated routes and indicated a further overnight treatment would be required to ensure the network remained safe into the Sunday morning. At about 7pm I rang the nightshift controller to update him on the day’s events and confirmed that precautionary routes be salted overnight.

You may have already guessed what happened next – yes, the early morning telephone call we all dread. It came at about 1.30am. The nightshift controller said the police were attending a serious accident on an A class road. There was a great deal of ice on the road and the police were requesting a gritter. The quickest way of actioning this was for the gritter already on its designated route to attend, which arrived within 20 minutes.

The accident location on the rural A class road was at a height of about 350 metres and on part of the published designated salting network.



I'm sure I need not say what soul searching such events lead to. How serious are the injuries? What went wrong? How could the accident have been prevented? What could have been done differently?

Detailed information from site indicated that snow on adjacent farmland had continued to melt causing water to flow onto the adjacent road and wash off any salt before freezing as temperatures dropped after dark.

One person was in hospital with serious injuries and no doubt repercussions would follow as insurance companies pursued claims for damages and personal injury.

In due course, along with the night shift controller and day shift foreman, I drafted out statements for the County Council's Insurers. Copies of weather forecasts, gritting routes, instructions issued and all manner of other things were supplied until "the bundle", as the solicitors called it, amounted to the size of a small filing cabinet.

Months later, on a summer's evening, the "traffic expert witness" employed by the County Council's insurer came to discuss the circumstances surrounding the event. I recall that it was about 4pm on a Friday evening when he arrived and I was still at my desk at 8pm. Who says that a job in highway maintenance is 9am to 5pm?

Nearly 2 years after the incident a date was set for a court hearing. The County Council's insurers had set aside quarter of a million pounds against the possible liability. The County Council witnesses were to be the night shift controller and myself.

On arrival at the court we were briefed on the process by the County Council's insurance barrister who indicated that the trial was likely to last for 4 days.



I have to say my heart sank when I saw the claimant who walked with a stick and was clearly not fully recovered.

The first witnesses were people who had been in the locality near the time of the accident. One indicated that conditions were treacherous and they had to drive very slowly. Another said they thought the road was very rarely gritted.

Each 'side' called their experts who differed in opinion as to the collision speed and other mechanical details of the claimant's vehicle.

On the evening of the third day, during the barrister's debriefing, I was asked if it would be possible for the driver of Saturday's precautionary route to attend the court. This I put in motion and he attended the court, accompanied by his union representative, the following morning. It was clear he had no recollection of the day preceding the accident and the barrister thanked him for attending but confirmed, much to his relief, that he would not be called.

By day three it was clear the case's progress was slower than originally planned and the judge asked barristers of both sides for their anticipated programmes. As the judge had other commitments on the following Monday the case might have to be adjourned.

It was Friday morning when I was called. There is no logic to the way a barrister cross examines a witness – they seem to probe for a weakness, asking about a detail on one document, while at the same time, referring to another elsewhere in the 'bundle'.

One question that stood out in my mind was “why was an A class road not treated before others”? I explained the objective in pre-treatment was to ensure the salt was in place before the anticipated event and that indeed the 'A' road in question carried far less traffic in winter than some urban estate roads – road classification not necessarily reflecting traffic usage.

Another question was “How could I be sure the pre-salting had been carried out on the Saturday evening prior to the accident”? My reply was somewhat robust when I indicated that all staff realised the importance of their work, that they lived in the local community and many of their children attended local schools – there was no way, in my opinion, they would not undertake the allocated task.

Questioning, or should I say probing, continued and I was asked, in what appeared random fashion, about thermal mapping, road side weather stations, salt spread rates, gritting routes and other things in an unending stream.

However, by Friday they were still not finished with me! The Court stood adjourned for an indefinite time. In the barrister's debriefing I was told that, technically speaking, I was still in the dock and should not speak to anyone about the case, which would resume within 3 to 10 weeks time.

The case resumed in just over 3 weeks but this time we travelled to Teesside where the judge was sitting. I took the box, being reminded I was still on oath. “No further questions”, the claimant’s barrister said. What a let-down, but also genuine relief, given my previous experience with cross-examination.

The case was quickly concluded and the judgement followed a few weeks later.

The judge found in favour of the County Council, and whilst I have utmost sympathy for the accident victim, I take some comfort in one of the judge’s conclusions, in which he said he was most impressed with the “efficiency of the winter services operation”.

Thanks to J Michael Taylor MBE, CEng, MICE, FICHT, for preparing this article.

All opinions in this article are the author’s own. The events recalled are not contemporary.



The Yellow Circus Surface Dressing in Northumberland

A personal view by J Michael Taylor MBE

Surface dressing is an essential low cost method of maintaining roads in a safe, usable manner in rural counties such as Northumberland.

Michael describes some of the work he undertook in the industry, giving an insight into the daily problems and decisions of a highways' maintenance engineer.

And if you never thought you'd hear a song dedicated to the shovel and pick welders keeping our roads safe in all weather, then stand by for the 'Yellow Circus'.



One of the best training courses I ever attended was about surface dressing as it convinced me this relatively inexpensive way of sealing a road surface and restoring skid resistance had merit.

In essence, surface dressing is the spraying of bitumen material onto a road surface with chippings rolled into it. In north Northumberland the chippings used to come from a quarry once owned by the County Council near the River Breamish at Powburn. Their distinctive colour gave the area's roads a pleasant light brown appearance, of which I was particularly fond. However the skid resistance (to aid braking) of the chippings fell below the modern standards usually required. Together with the increasing dust content of the Breamish gravel samples, their use sadly declined.

Chippings used in the south and the west of the county tended to be of the indigenous grey limestone which is won from the many quarries on the Whin Sill. Better skid resistance than Breamish but to my eye far less pleasing.

A particularly interesting visit was to the Bitumen Plant at Warrington to see the manufacturing process. The viscosity of bitumen is an important factor in the success of surface dressing and this is measured in a laboratory test measuring penetration of a standard weight at standard temperature.

Bitumen used in surface dressing becomes soft on a sunny summer day but can get brittle during winter. This is measured as a 'pen' number, with a higher number meaning a softer mix of bitumen. The "200 pen" bitumen was less prone to brittle failure in cold winters, but it was also prone to bleeding in above average hot summers similar to those of the late 1980s.



It was around that time manufacturers stopped producing the softer “200 pen” bitumen, perhaps more suited to the cooler Northumberland and Scottish summers, in favour of stiffer “150 pen” variety. The increasingly hot summers were a factor in the switch but one could ask if the more brittle material could have contributed to many roads losing surface chippings during recent harsh winters.

During manufacturing the bitumen goes through a process to mix it with a small amount of water to enable it to be sprayed onto the road surface. This evaporates as part of the curing process. However given the fickle nature of the UK climate, spring and summer rain showers can have a detrimental effect on the process. Fortunately that happened rarely during my time employed in Northumberland, but I do remember vividly a couple of occasions when unexpected rain rendered the recently sprayed road unusable, necessitating an expensive clean up.

There is no doubt the public tend to be adverse to any sort of “road works” but surface dressing can be especially disliked by the road user due to chippings or tar damaging paintwork. Despite efforts in recent years to minimise the problem through advisory speed limits on newly surface dressed roads, complaints are still received.

Overall, however, the process is used extensively in Northumberland, with a great deal of success, resulting in the labour force building up a substantial expertise in the field. Few residents cannot have failed to be impressed on seeing the speed and efficiency of the surface dressing.

Northumberland folk singer, composer and highway department employee, Terry Conway, wrote a song which, I think, sums up the variety of work, including surface dressing, carried out by the direct labour force. It's a rather tongue-in-cheek, self deprecating view of a highly skilled and sometimes undervalued workforce.

Thanks to J Michael Taylor MBE, CEng, MICE, FICHT, for preparing this article.

All opinions in this article are the author's own.

'The Yellow Circus' © Terry Conway. Reproduced with kind permission.

THE YELLOW CIRCUS



In the winter of the year
Gallant men, who know not fear,
Sing in happy chorus

“Up the workers”

Like a merry little imp,
With a shuffle and a limp,
Down the highway goes’
The Yellow Circus

[Off to earn their daily bread,
And eager for promotion:
What’s to dae, and Where’s
Tae gan,]
There’s not the faintest notion,
Like a merry little imp,
With a shuffle and a limp,
Down the highway goes’



The Yellow Circus

When the Spring is in the air,
Porteuts of the coming year,
From the winter’s hibernation
Jerk us

April showers please the best,
Hear the cry “Mae rain, mae rest!”
That the motto of
The Yellow Circus

[Off to earn their daily bread,
And eager for promotion:
What’s to dae, and Where’s
Tae gan,]

April showers please the best,
Hear the cry “Mae rain, mae rest!”
That the motto of
The Yellow Circus

When the sun is overhead,
Darkie-brown and beetroot red,
Don’t believe them when they say
We’re shirkers
Waving shovels, wielding picks,
Going topless, just for kicks,
Bronzed Apollo’s of the yellow circus

[Off to earn their daily bread,
And eager for promotion:
What’s to dae, and Where’s
Tae gan,]
Waving shovels, wielding picks,
Going topless, just for kicks,
Bronzed Apollo’s of the yellow circus

Autumn leaves fall thick and fast,
The fighting spirit wanes at last,
All the bosses try to over-work us
Autumn is a cruel beast
When that wind comes from the east
Up the armpit of the
Yellow Circus

[Off to earn their daily bread,
And eager for promotion:
What’s to dae, and Where’s
Tae gan,]
Autumn is a cruel beast
When that wind comes from the east
Up the armpit of the
Yellow Circus

When the snow lies on the ground
None of us can e’er be found,
Up the quiet lay-bys hide
The Lurkers
Snow-bound traffic in the Wars
But salt’ll fix your motor-cars
Had your gobs, you’ll wake the
Yellow Circus

[Off to earn their daily bread,
And eager for promotion:
What’s to dae, and Where’s
Tae gan,]
Snow-bound traffic in the Wars
But salt’ll fix your motor-cars
Had your gobs, you’ll wake the
Yellow Circus

