Road Safety Audit in Thailand

I have been working in the field of Traffic and Road Safety Engineering for the last 33 years with various Local Authorities and Private Consultancies and for the last 11 years as the Managing Director of my own Consultancy David A Graham Associates, (DAGA) which specialises in Road Safety Engineering and in particular Road Safety Audit.

So when I was on a family holiday to Thailand in September 2013 and with the rain pouring down outside our hotel as it was the rainy season I found myself looking for indoor activities for the family to do on my laptop, museums and temples did not seem to interest my children as they were adamant that they wanted to go swimming! Fortunately, the rain stopped as suddenly as it began as it so often does in this part of the world and my children eventually got their wish. However, that’s another story. In the meantime, and perhaps in some exasperation at my inability to find a suitable activity for the children to do I found myself putting ‘Road Safety Audit in Thailand’ into a search engine. Perhaps this was a bit of an ‘anorak’ thing to do on holiday but as you so often do when you are a travelling Road Safety Engineer I had become subconsciously aware of some, shall we say, colourful local driving techniques on our journey from Suvarnabhumi Airport to downtown Bangkok.

Anyway, my search results kept bringing up the same person ‘Dr Pichai’. It seemed that Dr Pichai an eminent Professor from the Engineering Institute of Thailand had been for many years trying to promote the case for Road Safety in Thailand with limited success. So with my wife and children off to go swimming I asked the concierge at our hotel to call Dr Pichai to arrange a meeting over dinner. This he did and I met Dr Pichai after a long tail boat ride to the other side of the Chao Phraya River (you have to ride a long tail if you are ever in Bangkok as they have just two settings STOP and FAST from an in board chevy V8 engine! and only seem to touch the water occasionally with a thwump). So when I arrived in good time the boatman helped me aboard the pier at the Peninsula Hotel where I was taken to the hotel lounge to be greeted by an elderly gentleman who turned out to be Dr Pichai. We had a very enjoyable hour or so over dinner where it became obvious to me that the situation in Thailand with regard to Road Safety was very bad indeed (more of that later). Another outcome of our dinner engagement was that I also met Lt Colonel Amornchai of The Royal Thai Police and got a real idea of how hard their job is to enforce traffic law in a large metropolitan City such as Bangkok with less than the number of officers at their disposal than they would wish to have. Food for thought indeed and whilst I was intrigued I was already on borrowed time away from the family so whilst I had an idea this might not be the last time Road Safety in Thailand crossed my path professionally I rejoined the family and we had a very enjoyable time in the land of smiles.

Then in July 2014 I received an invitation from Dr Pichai to attend a conference in Bangkok entitled ‘Actions for Road Safety in Thailand’ which would take place in October 2014. Whilst DAGA was very busy at the time I was still intrigued to see where this would lead so I duly accepted the invitation and attended. There were a number of speakers from around the world and some were quite interesting and others seemed more interested in promoting their businesses. However, the keynote speaker was Michael Woodford MBE. Now, Michael is perhaps best known as the ex COO, President and CEO of the Olympus Corporation and was at the centre of world news in 2011 when he exposed the Olympus scandal. Perhaps what is less well known is that Michael has had a life-long interest in Road Safety over more than 30 years and now through his Safer Roads Foundation (SRF) undertakes philanthropy including identifying and personally paying for Road Safety improvements around the world including Thailand. To say that it is difficult not to admire this man is indeed an understatement and when his turn came to speak I was listening. Then he hit the audience with a stunning PowerPoint slide of 52 passenger jets and announced that if these were all that this was the equivalent to the estimated number of fatalities on the Thai Road network each year which equates to 26,000! Would we accept to see this number crashing into the ground each year or indeed at the rate of one per week? I was stunned by this as I had not till that point researched the extent of the road crash problem in Thailand.

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When the presentation was over I went to speak to Michael but was immediately accosted by the organisers who by now had realised there was a British Road Safety Engineer in the auditorium as well as local undergraduate students. They seemed intrigued by this fact so the next thing I knew I was being photographed with the Transport Minister, Michael and the other speakers and then interviewed on local TV for an opinion. It all happened very fast but the one thing I said that I remember was that I would be back and try to help in any way I could to promote better Road Safety in Thailand in the future.

Six months later and after having read Michael’s book ‘Exposure’ to prepare myself my wife Veronica and I met Michael Woodford for dinner at the Athenaeum Hotel in London with a proposition in mind to assist Road Safety in Thailand via Road Safety Audit training (see picture). Michael was as generous as he was charming and vowed to support 50% of the cost of my RSA training which along with my working at local rates made it more affordable to the Thai Authorities. However, things move slowly in Thailand and it was another two years and four months later and after much delicate negotiation that I was invited to write and prepare a three-day Road Safety Audit training course in support of in house training already undertaken following their own Thai Road Safety Manual and also training via ‘Aust Roads’ in Australia.

So then in March 2017 after much planning and negotiation I was invited by the Thai Authorities to assist in the training of Thailand’s first 20 accredited Road Safety Auditors. This was both an honour and quite a daunting task to perform. The three-day course I devised covered all the basic aspects of Road Safety Auditing from how the UK system works through HD 19/15 DMRB to the four stages of Audit, how to write an Audit problem and proportionate recommendation, how to conduct an Audit site visit, the basics of collision investigation, two hands on workshops and a site visit to a problematic ‘U’ turn junction in Ramkamhaeng Road, Bangkok. When I attended the site visit to Ramkamhaeng Road with my students I asked an Engineer from The Engineering Institute of Thailand, also in attendance, if he could tell me how many injury collisions had occurred there and I was informed ‘62, with two fatalities, mostly motorists’, when I retorted that this would be a real cause for concern in the UK over the course of a year he replied ‘oh no, Khun David, that was just last month!’ This was shocking as it was sad, particularly when the problem was easily fixed using traffic signals with two ahead lanes and a ‘U’ turn filter linked to a loop and enforcement cameras which could then be extended to the whole route. In the heat of the day and with my broken Thai I found myself drawing and explaining this solution on a piece of paper for the Engineer there and then!

Whilst the Thai Authorities are definitely beginning to appreciate all the potential benefits of a safer road network, funds for such schemes and training are thin on the ground in country. However, I am meeting Barry Sheerman MP founder of the Parliamentary Advisory Council on Transport Safety (PACTS) next month and hope to secure help from the UN and WHO to assist in Thailand where much can be achieved in the way of improved Road Safety with modest resources including all of the ‘E’s’ Engineering, Education and Enforcement.

Nonetheless, I must say I was impressed by the enthusiasm shown by my first batch of students to learn about Road Safety Engineering and Auditing (see picture) and deeply shocked and saddened by the death toll on the Thai road network which is nothing short of shocking!

Following this course, I was in Thailand again in May 2017 to meet a number of academics from Thammasat University, Bangkok a number of whom will be attending another roll out of my course but this time in London from 1st – 3rd August 2017. I am proud to say that I have now received IHE CPD accreditation for my course which I would like to thank all at IHE for, in particular on behalf of our Thai counterparts in the world of Road Safety to whom this means a great deal!

One thing I am sure about is that in my small way I have started a process that will inevitably lead to some lives saved and serious injuries avoided, and whilst it will take a generation to achieve large scale reductions in fatal and serious collisions in Thailand I hope I will live to see this happen. Furthermore, my experience of the past three years has renewed my enthusiasm in the Road Safety profession which has been part of my life for the last 33 years and where DAGA workload permits I will continue to assist where and when I can in Thailand! Warmest regards and thanks to all who helped me to achieve this, regards, David Graham.

David A Graham IEng, FIHE, CMILT, MCIHT, MSorSA, RegRSA (IHE)

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**IHE Technical News**
Geosynthetics and steel meshes - a cracking solution!

Cracking in asphalt pavements is one of the biggest problems faced by highway maintenance engineers. Geosynthetics and steel meshes, also known as interlayers, are a proven approach for extending the life of pavements that are suffering from reflective cracking. When placed between bituminous bound layers, these products retard the initiation and propagation of reflective cracking which leads to premature pavement failure.

These systems have a long track record of successful use with over 15 million m² used in the UK and more than 100 million m² installed throughout Europe since the 1980s.

The RSTA ADEPT Code of Practice provides essential guidance on the use of geosynthetics and steel meshes, their use, laying techniques and applications. The document covers: material types, QA, site selection and material selection, training, traffic management and it also contains an extensive glossary of terms and references.

Interlayers are installed within the pavement to intercept the path of a crack propagating through the pavement. They are usually supplied as a rolled product in grid form (polymer, glass and steel mesh), non-woven geotextile (polymer and glass) or a composite and non-woven (both glass and polymer).

Benefits

- Significant extension of pavement service life and reduced maintenance
- Reduction in asphalt thickness, in some circumstances, saving on material costs
- Reduced hidden costs to businesses and the general public through delays caused by road closure and traffic restrictions

Performance

Bituminous bound layers crack in situ because of their inability to withstand strain, shear and tensile stresses created by a number of factors resulting in one or more of the following outcomes.

- Reflective cracking
- Fatigue cracking
- Differential settlement (often prevalent in road widening schemes)
- Thermal cracking

To obtain the best performance it is necessary to consider a range of variables and based on these carefully select the correct geosynthetic or steel mesh system.

It is imperative that geosynthetics and steel meshes are installed correctly and efficiently to maximise long term performance against reflective cracking. Improvements have been made to the efficiency of the installation by using trained operatives and the correct laying equipment generally resulting in little or no delays to the road surfacing installation. The Code of Practice has an extensive section on installation techniques to ensure the optimum performance of the selected system. It is recommended that installers are registered to National Highway Sector Scheme 13 (NHSS13).

The type of damage mechanism causing the cracks to appear at the pavement surface depends on the properties and nature of the pavement structure (e.g. thickness, stiffness etc), the properties of the underlying soil, the traffic characteristics, the climatic conditions and also whether it is new construction or maintenance in the form of relatively thin asphaltic overlays.

Product Types

Key product types available are listed below:

- Steel meshes
- Glass grids (may be coated with polymer or bitumen)
- Polymer grids
- Composites (combining polymer or glass grids and non-woven textiles)
- Non-woven textiles

Steel mesh is typically galvanised steel wire, double twisted to form a mesh with reinforcing bars at intervals.

Glass grids typically knitted and may be coated with polymer or bitumen or a combination. Some of these materials have self-adhesive backing.

Polymer grids typically punched and stretched propylene or knitted woven polyester. Other polymers are also available but less prevalent.

Composites typically a combination of polymer or glass grids and non-woven textiles combined by lamination or stitching.

Non-woven fabrics typically needle punched propylene but polyester and combination using glass fibres are also available.

Geosynthetics and steel meshes must be compatible with the asphalt to ensure the integrity of the system. They must be stable and durable both to withstand the rigors of the paving operation and provide functionality for the desired design life.

All the material types listed above should be CE marked in accordance with BS EN 15381:2008 to ensure long term performance.

A new HD design document covering geosynthetics and steel meshes is currently being produced by Highways England with help from RSTA for inclusion in the revised Design Manual for Roads and Bridges (DMRB). A new specification clause 936 is also under development for inclusion in the next revision of the 900 series.

Howard Robinson, RSTA
Ritherdon Atlas Retention Socket: an alternative solution to traditional installation of poles and columns

Ritherdon is a family business based in Darwen, Lancashire. We have been manufacturing stainless steel sheet metal products for over 120 years. We have always been driven by innovation and are passionate about design and manufacturing. Our appetite for problem solving has created not only an unmatched product range but also a leading-edge capacity for bespoke work. At Ritherdon, we pride ourselves on listening to our customers’ needs and meeting them, through our passion for Clever Metalwork.

The Atlas Retention Socket is one of the latest examples of Ritherdon’s clever metalwork. Manufactured completely out of stainless steel, the Atlas Retention Socket is a secure foundation system that allows for the reinstall of posts or columns following a knock down without the need to excavate.

Using the Atlas also makes the process of replacing a pole simple, reducing installation time resulting in less disruption for road users.

Street furniture is being designed with new needs in mind, such as passively safe poles or columns being installed on trunk roads with no need for crash barriers. The passively safe street furniture absorbs shock upon impact and conforms to Passive Safety Standard EN12767:2007. The quick and easy replacement process of a pole installed in an Atlas Retention Socket is an ideal solution for the installation of passively safe columns.

Ritherdon also provide an electrical disconnection system for use with the Atlas Retention Socket for electrical disconnection. The Ritherdon PolePlug electrical isolation system work together with an illuminated Atlas Retention Socket for use on lighting columns or traffic signals. This provides the necessary electrical isolation to prevent equipment from becoming live in the event of impact and conforms to the National Annex to EN 12767, that states the requirement for electrical disconnection.

The Ritherdon Atlas Retention Socket is an 100% stainless steel construction, making it robust, highly resistant to corrosion and abrasion, durable and low maintenance.

The Atlas Retention Socket firmly holds the pole in place with the specially designed clamping mechanism, providing a high strength grip. The testing performed in house for a 115 mm diameter Atlas Socket recorded a maximum torque figure of 1400 Nm. This represents the clamping capacity to prevent a post with a 3 aspect RAG head on a 600 mm D bracket from turning in a 136 mph wind. Ritherdon also performed a torsion test on a 115 mm diameter Atlas Retention socket which resulted in a maximum weight before failure recorded at 97.5 kg.

The clamping mechanism doesn’t pierce or damage the pole when tightening during installation. This is especially useful when installing a passively safe pole, typically made of softer material. The Atlas is available in various diameters to fit most applications. For feeding electrical or data cables, two different cable ducting options are available (duct foot and swept bend).

The Atlas Retention Socket has a distinct circular design. This is especially useful when installing a series of poles where no electrical connections are necessary. Due to the circular foot print, core cutting installation may be used to make installation even more cost effective.

Ritherdon has designed and tested the Atlas Retention Socket to meet and exceed our customer’s expectations. Easy removal and replacement of poles, an ideal solution for passively safe street furniture and allows flexibility to meet future road demands. The Atlas features a robust stainless steel construction with its distinct circular design. It’s a solution that will extend the life of your poles and columns and once installed is topped off with a high shine, stainless steel finish.

Call us with your requirements on 01254 819 100 and visit ritherdon.co.uk for more information or email us at info@ritherdon.co.uk

Clever metalwork from Ritherdon, a family business based in Lancashire driven by our passion to innovate and provide solutions for the industries we supply.

Ritherdon