

RML Newsletter round-up

APRIL 2015

SKATEPARKS ARE FUN

Concrete skate parks demand a 'serious' engineering approach but they are fun to design, build and use and are a valuable learning experience too.

The work comes in various packages, all of them creating excitement.

First; there is at least one meeting with the local user group who are usually very well 'up to speed' with what is the latest in the skate park world. I went to my very first user group meeting wearing a suit and a tie. The user group (all young lads) were wearing their hats back to front. Two worlds met for a common purpose. It is especially rewarding when user groups accept that all grades of users must be accommodated, beginners as well as experienced skaters, youngsters and older users.

Local residents are equally concerned to know what is proposed. One of their concerns is usually noise; we are able to show them evidence that concrete skate parks are not noisy. Elderly wheel-chair bound residents have been spotted using them, why not, it must be great fun.

Second; detailed design involves the usual elements such as topographical and geotechnical surveys, service enquiries as well as considering any environmental issues and moves on to combining the quality of the skating experience of a new park with the actual shapes and gradients of the elements. In most cases the loads imposed on the ground are minimal but movement can occur and is usually caused by temperature changes. Shrinkage and movement of the concrete is a serious structural issue which can affect longevity. Movement joints can have a negative impact on the quality of the skating too and need careful design. Rainwater must be shed quickly and requires gradients within the park to be pre-planned in some detail. The surface water must be carried away to a suitable discharge.



Third; building in reinforced concrete is a step by step process; it cannot be hurried and the many distinct shapes that are required have a clear impact on the progress of the work. The concrete surface is the vital element of a park. The surface must be free of blemishes and hard wearing. Curing of the concrete has a significant impact on the quality and durability of the final surface.

Opening day. The opening of the park clearly does not come quickly enough for the users. There is always a frustrating time when everything appears to be ready but the concrete has not hardened sufficiently to be ready for use. Keeping potential users out can be a problem at this stage but all of the frustration is forgotten quite quickly once opening day finally arrives.



Learning. Enjoyment comes in various packages for the locals, many of school age; it comes in early involvement in design, in seeing the park being built as well as in using the skate park. All of these can bring with them an appreciation of gradients, slopes and percentages, curves, radii and circles, of the 3-4-5 rule (Pythagoras thinly disguised), lengths, heights, thicknesses and volumes, the qualities of materials, the importance of timescales and programming, observing team work and the importance making things as a team - oh and the effect of the weather.

Making things depends on mathematics and can be fun.

“Notice that the stiffest tree is most easily cracked, while the bamboo or willow survives by bending with the wind.”

Bruce Lee

Bruce Lee is well known for his philosophical one liners almost as well as he is for martial arts. In the above quote he is highlighting a particular characteristic of most willows, that of being flexible when under load, to illustrate his point. This property makes them ideal for basket weaving, and in our works, for use as spiling in river bank reinforcement. Willows have huge variation among the thousand or so varieties, all exhibiting different properties.



There follows some examples;

- there are willows that grow tall (*Salix alba*),
- there are willows that are short (*S. lapponum*),
- there are willows that are ground hugging (*S. repens*),
- there are willow that break easily (*S. fragilis*),
- there are willows that bend (*S. calendendron*),
- there are willows with grey leaves (*S. cinerea*),
- there are willows with purple stems (*S. purpurea*),
- there are willows with shiny leaves (*S. myrsinifolia*),
- there are willow with ‘fluffy’ leaves’ (*S. candida*),
- there are willows with rounded leaves (*S. aurita*),
- there are willows with pointed leaves (*S. viminalis*),
- some willows grow vigorously (*S. dasyclados*),
- some willows are slow growing (*S. caprea*),
- there are willows that are salt tolerant (*S. repens*),
- Some willows develop wide trunks with a straight grain (*S. alba*), what on earth could they be used for? Reply to me if you know.

We have studied all of the above as part of our research trials, looking at salt tolerance, rooting performance in different substrates, performance when under different management regimes, load testing of retaining structures and more. By the way the term Kung Fu is a Chinese term referring to any study or practice that requires patience, energy and time to complete. These apply well to the practice of Bioengineering.

Have you developed Site Waste Management Plans ('SWMPs') for your construction projects?

SWMPs were introduced in England as a requirement for all construction projects over a £300,000 threshold. In the SWMP the project owner or client must explain what waste the site will produce, how this waste will be recycled or disposed of, who will transport it and where it will be taken to. In Wales, these plans are recommended on a voluntary 'best practice' basis for all projects, whatever the value.

Excavating one small stand of Japanese Knotweed thoroughly can generate several HGV loads of waste, so on many sites you will find Japanese Knotweed is the biggest single waste stream by weight or volume. Site Waste Management Plans mean that Japanese Knotweed becomes a key issue for waste management – how can builders and developers dispose of it? The issue is particularly acute for residential



development, because current standards expect 30 or 35 residential units per hectare and so every part of the site is to be built on. The answer is the **Klaro** mobile soil treatment system which means the soil can be re-used instead of landfilled. As an 'active' waste, infested soil incurs the £82.60/t landfill tax rate so the likely disposal charge from reputable haulage/disposal company will be well over £100/t. This equals £1500+ per HGV load, so it pays to examine all the alternatives carefully with the help of a specialist such as GroundCoverDBM.

In March ('Legitimate tax avoidance scheme' [click here for the March newsletters](#)) we showed how the **Klaro** mobile soil treatment system avoided a huge quantity of waste and tax on the Athletes' Village site in 2012.

[Click here to see how GroundCoverDBM can solve your Japanese Knotweed problem.](#)

(Cataclysm: Greek term meaning to be “washed down”)

“tis a rich pleasure to look back on anything”

John Ruskin

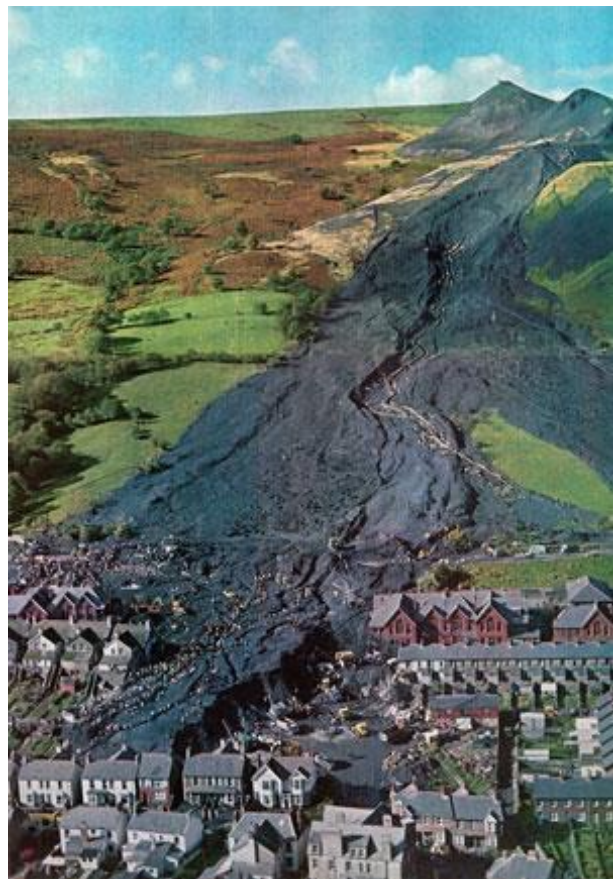
To enjoy a ‘rich pleasure’ in looking back is a privilege and to recognize that events did indeed change the lives of you and your loved one conjures up emotional thoughts.

On Friday 21st October 1966 at about 8.15 my wife Marjorie (Marj) and I were travelling along the A470 through the twin villages of Merthyr Vale and Aberfan on our way to work at the Taf Fechan Water Board in Merthyr Tydfil. Marj was secretary to the Chief Executive and Engineer, I was an engineering assistant with about 5 years of experience in the water Industry. The floor of the valley was filled with an autumn fog that morning.

At about 9.15 Fred Marshal rushed into the office and cried “There has been a bit of a slip at Aberfan we had better get down there!” Colin Jones and Fred left for Aberfan, some 6 miles away. Telephones were ringing, the flow meters at the treatment works in the Brecon Beacons had all gone haywire. We soon learned that meters at the City of Cardiff treatment works, also in the Beacons, were showing the same results. Between them the catchments delivered 28million gallons of water daily.

Colin and Fred returned within the hour, Colin made arrangements to begin closing valves on trunk mains.

What they told us was of an unimaginable horror - the coal tip standing on the hillside had engulfed the school and adjacent houses. Along with the emergency services the villagers were everywhere trying to recover staff and children and residents. Pipes from water mains belonging the Board and the City, 30” and 27” in diameter, were lying about tossed as if straws. A fireman told Colin that “When the water came the whole site rose like bread being proved”. Ray Lewis and I were the next to head for Aberfan. Ray parked outside the village and we walked in until we were standing on the now hardened coal waste and looking down on the school; it was before 11.00am. “Surely they will get people out “I said. Ray shook his head.



Our task was to estimate how much of the trunk mains had been washed away, and how they would be replaced. At this time gangs of waterworks men were closing valves above and below the damaged sections, these closures had to be done carefully and took time, there were cross-sections to other large diameter mains to consider that were now vitally important from the supply point of view. With

each turn of a spindle operated by a gang of four the valves closed by $\frac{1}{4}$ ". The borough engineer kept asking "Please, when will the water stop?" or words to that effect. We estimated that about 2million gallons escaped into the toe of the slide.

With police permission Ray and I walked the length of the site and made a guess as to how much of the pipelines had been lost. That afternoon our plan took shape; when allowed we would lay twin 18" diameter pipes on the surface as temporary replacements for the lost mains. Replacing the actual mains that had been lost would come later.

We did not start work on site until 1967, shortly after the publication of the Report of the Tribunal into the Disaster; that Report makes grim reading.



I had already telephoned a national supplier of steel pipes. I said to the sales manager that my name was Ivor Richards and that I wanted 1400yds of unlined 18" pipes please. "Mr. Richards", he said, "These will be on a very long delivery where do you want them for?" "Aberfan" I said. There was a moments silence, "Ivor, give me a delivery address, how soon do you want them?" I have never forgotten that conversation, how could one? It still makes me cry.

Marj and I had friends who lived in Aberfan, one lived in a house that was demolished by the slide, he was found entangled in the roof timbers and was lucky to survive.

Time moved on and I became totally involved in clearing and rehabilitating derelict land. In the 1990s I was back in Merthyr Vale preparing the site of the now demolished colliery for development. Trusted by others and driven by emotion I initiated changes in construction techniques involving earthworks, drainage and vegetation that spread into new construction projects too. Marj played her part in visiting sites across Wales, sharing the emotion and the vision. In 1984 we set up our own company intending to bring practical and sustainable ideas into construction. In 1994 the President of our Institution, Professor Edmund Hambley, made a plea for engineers to address the environment and in the same year Marj and I spent a morning at Buckingham Palace where I received an OBE and then had lunch in Great George Street, the headquarters of the Institution of Civil Engineers. The citation on the award said "For services to civil engineering". One never knows but I feel that the President must have had a hand in this. I regret that the President and I never met, we would have had a few things to mull over.

In looking back on what flowed from Aberfan I can find richness as John Ruskin suggests; tinged with a great deal of love, pity, and pride in my work.

LIFE IN AN UPSIDE DOWN WORLD

We have a client who pays regularly on the day he receives our invoice.

‘Standing on our heads’ for this client goes without question.

Cash is king in every business and the construction industry has a reputation for not dealing with its suppliers in a sensible manner. Neither do supermarkets where the terms of business with a supplier are apparently often outrageous. I have never understood the train of thought that “If I screw my suppliers they will be still be around when I want something special done”. I have spoken about integrity before between business associates, in January 2015, and of course it works both ways in a business relationship.

The public sector does throw up problems too when invoices get lost or passed from ‘pillar to post’, or fall foul of annual or maternity/paternity leave with no one left in the office ‘holding the baby’, sorry I could not resist that.

Just what would you do to find a client who pays quickly and without question? A great deal I would think.

In a review of clients one would list several characteristics that the best demonstrate;

- They ask you to do interesting things
- They agree the scope of work
- They give you a written instruction
- They agree costs with which you are comfortable
- They have the money to pay
- They come back for more
- They pay an invoice on the due date
- They use an e-payment method

Life can be good, in general life could be so much better if we had a few more clients that behaved like the one just mentioned at the start, but we recognise that they are the exception. Of course this kind of respect and relationship has to be earned and jealously guarded. Believe me we do just that with clients.

If you think that you measure up to our not so demanding yardstick, try us.

We find standing on our heads is quite pleasant really.



THE WASTE HIERARCHY – PART 1

~Contact.FirstName~ do you apply the Waste Hierarchy when you consider how to deal with waste produced by your organisation?

It's straightforward enough when you choose which recycling bin to put your paper in, but how would you deal with something more complicated - soils containing Japanese Knotweed for example?

'Any Japanese knotweed -contaminated soil or plant material that you discard, intend to discard or are required to discard is likely to be classified as controlled waste' (Environment Agency). The producer of the waste must 'take all such measures as are reasonable in the circumstances to apply the waste hierarchy to prevent waste, and to apply the hierarchy as a priority order when you transfer your waste to another person' (DEFRA / Welsh Government). Before sending waste to landfill, the producer must sign a declaration on the waste transfer note, confirming that this has been done.

The waste hierarchy puts re-use and recycling ahead of disposal, which is generally seen as the last resort in the management of waste. For soils infested with Japanese Knotweed, re-using the soil on site after effective treatment is the only alternative to removal from site.



THE WASTE HIERARCHY - WHAT IT MEANS

Prevention: measures taken before a material becomes waste

Preparing for reuse: operations by which products which have become waste are prepared so that they can be reused without other pre-processing

Recycling: operations by which waste materials are reprocessed into products, whether for the original or other purposes

Other recovery: processes which produce energy from waste; backfilling operations

Disposal: any operation which is not recovery, e.g. landfill or incineration

Find out more about your responsibilities for waste next time.....

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