Do Water Problems Exist in Our Minds?

John Harrison, Managing Director
TecEco Pty Ltd

John Harrison from TecEco thinks the solution to our water problems is to change the way we think about them. Einstein said “We can’t solve problems by using the same kind of thinking we used when we created them.” Porous Pavements are a different way of thinking about roads.

Even though the climate over the last 10,000 years had been relatively mild and predictable, during this period we have been systematically destroying our climate, our aquifers and our land. The sequence: agriculture, irrigation, salinity and destruction of the land has been repeated in too many places and we must change the way with think in order to solve the problem.

In years gone by, forests and grassland covered most of our planet. When it rained, much of the water percolated though soils that performed vital functions of slowing down the rate of transport to rivers and streams, purifying the water and replenishing natural aquifers. Our legacy has been to pave this natural bio filter, redirecting the water that fell as rain as quickly as possible to the sea. Given global water shortages, problems with salinity, pollution, the volume and rate of water run off, we need to change our practices to mimic the way it was for so many millions of years, before we started making so many changes. The key to survival in the future will be learning from nature and mimicking her subtle processes.

Roads are the arteries, veins and lymphatic system to cities. Roads are not only surfaces for our cars to run, they perform many other functions including setting the drainage pattern for an area, carrying sewerage, water and electricity underneath, influencing the climate and defining zones for wildlife. Porous pavements, combined with reservoir structures, address many of these problems. Porous pavements made of Eco-Cement and waste aggregate would sequester carbon dioxide and reduce landfill.

Porous pavements cleanse water before it enters streams and rivers, as they have significant internal surface area allowing the combined effects of oxygenation and bacterial action to locally cleanse water. Porous pavements reduce and control the rate of water flow, reducing the cost of drainage infrastructure and coastal pollution and the overloading of our existing drainage system. Other engineering advantages include improved safety, reduced maintenance of buildings due to seasonal ground movement and reduced costs of watering street trees. Water could also be collected for storage and use. Porous pavements are a strong candidate for roads and footpaths of the future.

Eco-cements set by absorbing significant quantities of carbon dioxide. To the extent that roads are made using eco-cements in porous pavements, significant quantities of carbon dioxide can be sequestered. Tec and eco-cements also allow the greater use of recycled aggregates, mainly because of their low alkalinity and excellent durability.

Given the many detrimental changes to our environment, it is essential we take action. In climax ecologies there is no waste. The solution is to ‘biomimic’ nature using carbon and wastes. What better place to start with than our roads. Natural soils are porous and cleanse water, so too should our roads be.
Porous Pavement
Porous pavements are permeable pavements with subsurface drainage and usually a capacity to store water underneath, or in a reservoir. Surface run off water either soaks into an aquifer, or is captured above an impervious layer and drained preferably to underground storage, or for further use. Before infiltrating into the subsoil or sub-surface drainage, the process improves water quality.

There are many good reasons why councils and road authorities should switch to porous pavement and the use of porous pavements as road surfacing materials has grown considerably in the past 15 years thanks to the material’s hydraulic and acoustic properties.

Porous pavements allow the earth to breathe, take in water and be healthy. The stone and soil underneath acts as a reservoir and they clean the water - a little like the filter on a fish tank. They are quieter and safer to drive on as they do not develop “puddles” and provide a good surface to grip.

There are significant environmental benefits and other advantages in specifying porous pavements including:

**Improved Water Quality and Drainage**
Porous pavements filter water, releasing it slowly to sub-surface drains or aquifers and finally the sea. There is little or no surface run off to carry rubbish into drains and streams.

**Reduced Volume and Rate of Run Off**
Porous pavements allow a gradual evacuation of water into water outlets. Peak flows are limited and the time of discharge is longer. In addition, splashing is reduced as well as wind dispersion and evaporation. Porous pavement would allow the replenishment of aquifers and reduce the cost of infrastructure to carry water out to sea, as the volume and rate of flow would be less.

**Improved Pavement Safety**
Water penetrates through porous pavements quickly leaving drier and safer surfaces with no standing water. As water does not collect, sheet ice problems would be minimised in winter.

**Less Maintenance**
Aquifers would be more regularly replenished, resulting in less variable ground moisture content, reduced ground movement with wet-dry cycles, and less maintenance on buildings and infrastructure.

**Less Watering**
A permeable surface will allow water to penetrate to the roots of street trees, reducing the need for watering during dry periods and saving money.

**Durability**
Porous pavements made with TecEco Eco-Cements would not be attacked by salts and would last considerably longer than conventional binders such as bitumen and Portland cement.

**Transpiration Cooling - Hot City Syndrome and Porous Pavement**
‘Hot City Syndrome’ is one of a number of man-made phenomena that the use of porous Eco-Cement pavements will reduce. Porous pavements will allow the ground to breathe and cool down through the process of evaporation - the principle behind many cooling systems. Porous pavements provide many benefits and, with TecEco’s innovation, waste utilisation and sequestration, this may be one road worth travelling.

**To find out more, visit www.tececo.com.**

John Harrison is the Managing Director and Chairman of TecEco Pty Ltd. and is known around the world for the invention of Tec, Eco and Enviro-Cements. He is an authority on sustainable materials for the built environment and is committed to finding ways of “materially” improving the sustainability of the built environment.
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Marine Corrosion Seminar Heads to Hobart

The persistent and destructive force of corrosion is well known. In a marine environment, these forces intensify and so ships, marinas, pipelines, bridges, offshore structures, desalination plants and other structures in marine environments are all highly susceptible to marine corrosion.

On 7 August, a one-day Marine Corrosion Seminar will be held at The Old Woolstore Apartment Hotel in Hobart for engineers, asset owners, maintenance managers, designers, managers, ship builders and anyone who has contact with marine corrosion. Delegates will gain an understanding of the most commonly used methods for providing marine corrosion protection including:

- Protective coatings cathodic protection
- Galvanizing material selection
- Design application
- Environmentally-friendly methods, marine
- Corrosion case studies and more

The following corrosion specialists and experts will provide insight into controlling corrosion in a marine environment:

Fred Salome - 2007 President of the Australasian Corrosion Association Inc
Paul Taylor - Denso Australia
Wayne Burns - Managing Director of Anode Engineering
Emmanuel Pimentel - Galvanizers Association of Australia

Representatives from GHD, Savor, Australian Submarine Corporation and other organisations. Local asset owners will provide their own perspective and experiences of marine corrosion and there will also be an open forum and discussion.

The Australasian Corrosion Association Incorporated (ACA), a membership based, not-for-profit organisation, was established in 1955 to service the needs of Australian and New Zealand companies, organisations and individuals involved in the fight against corrosion.

For further details, visit www.corrosion.com.au or phone (03) 9890 4833.
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Local Roads Database Provides Timely Solution

A National Local Roads database has been developed to provide relevant and timely, high-level information about the nation’s local roads.

The National Local Roads Data System (NLRDS), funded by DoTARS, has been developed over several years by ALGA and the state Local Government Associations. The NLRDS has eight performance measures for the local roads system in each state and territory:

1. Sealing of gravel roads
2. State of the asset
3. Expenditure on roads and bridges
4. Expenditure on roads and bridges per km for unsealed roads
5. Expenditure on roads and bridges per km for unsealed roads
6. Road asset consumption
7. Road asset sustainability
8. Road safety

The performance measures reported in the NLRDS were agreed by the Roads and Transport Advisory Committee.

The data set can be viewed at www.jr.net.au/nlrds/.

Correction - LGAT News March edition

In the previous edition of LGAT News, an article ‘CRSP to Spread its Wings’ incorrectly reported the level of funding that has been allocated to support Community Road Safety Partnerships program. The State Government has committed $795,000 over the next three years to support the existing partnerships and to extend the program to new communities.
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