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5 July 2012

TO: **Andrew Fowler-Tutt, Manager Development Services**
CC:

SUBJECT: KALAMUNDA OLD ROAD BOARD DEVELOPMENT PROPOSAL

Dear Sir,

The Nature Reserves Preservation Group of Kalamunda appreciates the opportunity to make late comment on the proposed redevelopment of the "Old Road Board" block, as follows:

- The plan shows the major large portion of total block as parking areas and other impervious hard-stand which will result not only in more stormwater runoff to cause further problems in erosion of our streams (where it typically is discharged), but also reduce the recharge of our local aquifers. NRPG suggests the use of water sensitive urban design principles such as; reducing the area of impervious surfaces by minimising parking and driveways, by the use of compacted hills gravel, 'Permpave' (Ref attmt) or other method which absorbs water to some extent, rather than the continued use of asphalt. Any remaining runoff should be contained within the boundary as much as possible.

- The plan calls for the bus terminus which is presently a cul-de-sac, to be made into a thoroughfare. The additional roadway not only takes additional space, displacing parking, and other uses such as the original bushland in the area, but adds further impervious. In our Committee members' experience using the bus station, there does not appear to be justification to change the cul-de-sac arrangement, and as we understand from your recent presentation to the Lesmurdie and Districts Community Association, neither does Transperth see reason to do so.

- The plan calls for the expanded parking area East of the bus terminus to retain as many trees as possible, however, the loss of any of the trees in the area will further reduce Kalamunda's already small amount of shaded

areas and further asphalt will add to the 'heat island effect' which results in higher localised summertime temperatures, and consequently higher airconditioning loads and costs. (Ref: "Tree Guidelines for San Joaquin Valley Communiites" by Western Center for Urban Forest Research and Education, USDA Forest Service, Mar 1999).

- Finally, the proposed displaced & increased parking area east of the bus terminus means the loss of an area which was bushland and has been degraded by the lack of protection from vehicles driving and parking on it. This area, if protected would likely regenerate largely on its own (possibly with the help of some weed control) and would remain a small pleasant spot for local residents and visitors to enjoy, in an area of increasingly concrete built environment. This is an opportunity to regenerate the existing bush area to make it a feature of the Road Board redevelopment.

Yours faithfully,

Tony Fowler
Acting President
Nature Reserves Preservation Group

Attmt: Permpave Article, Weekend Australian Feb 23-24 2008.

WEEKEND AUSTRALIAN FEB 23-24, 2008.

Contaminated run-off from roads and carparks mustn't be allowed to pollute groundwater, writes **Rebecca Weisser**

THE driest state in the driest continent on Earth is home to some of the world's most advanced research on sustainable water management. Scientists at the University of South Australia's Centre for Water Management and Reuse may well be able to turn our cities into huge storm water and roof water catchments. Not only will revolutionary pavers be able to filter and harvest stormwater, they can allow rainwater to infiltrate paved areas, reducing urban heating, replenishing groundwater and reducing flash flooding.

"This technology has the potential to revolutionise the way we build cities," says Simon Beecham, professor of sustainable water resources engineering and director of the centre, sponsored by SA Water, the state water utility for South Australia.

Instead of cities being concrete deserts, porous pavers will create breathable roads, car parks and pedestrian pavements that allow trees to breathe, and, therefore, to thrive in urban environments. "Tree roots need air as well as water, which is why street trees are often so stunted," he explains.

Most of Australia's cities are located on coastal fringes that get more rain than inland areas, but stormwater run-off from roads is contaminated. Vehicle oils, heavy metals from brake linings and tyre wear are highly toxic and need to be removed before stormwater contaminates groundwater.

The porous pavers being developed allow stormwater run-off to filter through ferric oxide, precipitating out heavy metals such as lead, zinc and cadmium. Organic matter produced from leaf litter or wood pulping can also be removed.

But the masterstroke is that the area under the pavers can be excavated half a metre, only 20 cm deeper than for traditional pavers, lined with a waterproof membrane and filled with coarse gravel to create an enormous, inexpensive underground rainwater tank. A thermally expanded clay, which holds onto nutrients, is mixed with the gravel that either strips nutrients to purify the water or creates a fertile bed for a tree.

Water can be accessed using a small pump which, if solar powered, would be carbon neutral and almost cost free. But if trees are planted in such a bed, they will pump up the water and never require watering.

"If you imagine porous pavements over the average suburban driveway or patio, the water storage capacity would be much greater than installing large, above-ground tanks," says Beecham.

Moreover, because there is no light there is no algae, and the treated water is almost of drinking quality. It could certainly be used for all outdoors purposes, and for flushing toilets and washing clothes.

Although the pavers are not suitable for high-traffic roads they are perfect for footpaths and car parks, and are already in use in supermarket carparks.

Beecham estimates that just the water that could be harvested from footpaths, driveways and shopping centres in Adelaide would dramatically increase water storage and should be able to provide for most outside water usage.

Beecham, Yan Zhuge and David Pezzaniti have been developing PERMPAVE software for porous pavement design. Best of all, the porous pavers only cost about 10 to 25 per cent more than normal pavers and the excavation costs are the same — yet the potential to harvest water and transform the urban environment is dramatic.

Before rain hits roads and is contaminated it can be harvested from roof tops in an almost pristine condition, and when the roof is very large so is the quantity of water captured. Making use of that water is difficult because it is captured in small quantities using a large number of inefficient downpipes.

But using a siphonic drainage system, also developed by Beecham, water is sucked off the roof at speeds of up to 7 metres per second and piped at roof level to almost any point in the building. Then it is brought to ground level in a single collection pipe that discharges at a very high flow rate.

Having the water all in one place means that it can then easily be recycled for any number of purposes such as toilet flushing, airconditioning, industrial use, irrigation or garden watering. But the advantage is not just that the water can used. Because they collect so much rainwater, the rooftops of large buildings are one of the major causes of urban flooding. Syphonic roof drainage would prevent this happening.

The technology is already in use at the Telstra Stadium in Sydney and at the Sydney, Hong Kong and Adelaide international airport terminal buildings. Not only are buildings more water efficient, they are more elegant because they are uncluttered by multitude of downpipes.

Another area of research at the centre is vegetated stormwater systems, or bioretention systems. Beecham says that in Australia we have had the good sense to separate our stormwater and sewerage systems, unlike in most of Europe. However, rather than collecting stormwater in drains and running it through pipes which allows all the contaminants to concentrate, it is far better for stormwater to flush through an above-ground biofiltration system which naturally removes contaminants before its enters groundwater or the sea.

Biofiltration systems which are being developed by the centre can be created in traffic islands more attractive than concrete, and which can purify collected stormwater. Vegetation around a commercial building or in large carparks can serve the same purpose.

David Pezzaniti has also developed "smart' water metering technology that can improve irrigation efficiency by up to 30 per cent by making it easier to know the amount of water being used, and where. The new approach is being tested in Queensland and South Australia and has received funding from the National Water Commission.

The groundbreaking research at the centre has attracted attention around the world. The centre has been commissioned by South African Concrete Manufacturing Association to develop an international version of its PERMPAVE software to be launched in Johannesburg in April.

A group of 18 future leaders of China's Yellow River Conservancy Commission have just a completed a special course at the centre to manage water scarcity and allocation and environmental degradation along the Yellow River.

Clean water: Simon Beecham has pioneered a way to filter pavement and carpark run-off

Picture: Brenton Edwards