

When stage one of Adelaide's Port Expressway was completed around eight years ago, two more stages were waiting in the wings – two single span bascule drawbridges, sitting side by side over the Port River, one for vehicles and the other for rail. Completed in 2008, landscaping was to provide the finishing touch to this remarkable piece of engineering.

SUCCESS IN THE DRY

As is always the case in a project like this, various factors influenced the landscape design. For safety reasons, sightlines had to be considered and set areas kept clear of obstacles which could exacerbate the degree of damage or injury in the event of a traffic incident. The design also needed to accommodate various urban cultural artefacts. Two plaques identify the bridges: one named for WWII hero Tom 'Diver' Derrick, and the other for Australia's first patron saint, Mary MacKillop; and a sculpture is sited nearby acknowledging the site's First Peoples, the Kaurna.

Then there were the challenges. This is a city where drought prevails and soils are tricky, (ask anyone and they'll go on and on about the clays and variable pH). To top this off, piggy-backing the low rainfall is one of the highest evapo-transpiration rates in Australia. Ouch.

Darren Peter, graduate landscape architect with the Department for Transport, Energy and Infrastructure (DTEI), was on the project team. "As part of the design brief we had no automatic irrigation systems; there was a design prerequisite to use local provenance indigenous plant species; the soils had been cultivated but were heavily compacted in some areas; and the entire site was mulched and therefore weed free, but this also presented issues in terms of planting."

Taking everything into consideration, a plan was drawn which would see stylised groupings set into distinct zones: a sea of ground covers sweeping over the batter slopes; a curved avenue of

River Red gums carpeted with ground covers following the length of the eastern and western approaches.

Planting was completed by mid June 2009, a water cart watered everything in, then again a few days later. "We then had several well-spaced natural rainfall events and so didn't need to use the cart again until the summer months."

"There was very little loss – around one in 15 plants which is very good considering the project overall. Some of that success was probably through planting into 'water bowls', designed to hold ten litres for each tube and 100 litres for the advanced trees. We also used TerraCottem."

The memorable heat wave which struck in November that year was expected to wreak havoc, but the landscape was by then remarkably resilient. "The TerraCottem was an insurance policy to help us get the plants established so we were pretty pleased."

All the plants for the project had been grown on consignment from locally collected seed, and one of the best pieces of praise for the project came from one of the grower/suppliers. "Interestingly, some months later I was talking with the tube stock supplier who'd been on the completed site collecting seed after 12 months. When he saw the plants, he said he would have expected results like this after two to three years."

In a challenging environment like this, getting vegetation established takes good design and best practice implementation as here at Adelaide's Port Expressway.





There's nothing like being forewarned to help you prepare for a tricky moment – like moving a whopper of a tree. Henry Polec, a landscape architect with the South Australian Department for Transport, Energy and Infrastructure, was given roughly nine months' notice. Doubly lucky for the tree, Henry also has years of the type of experience necessary to make this type of project succeed. In other words, he wasn't planning to rock up on the day and hope for the best.

THE KURRAJONG THAT FLEW

"Advance notice meant we could do a better job. To begin with, the tree was growing near a path, so we began by removing the bitumen on one side and the turf on the other. We then set up separate irrigation with a rain sensor, and mulched the area under the canopy with hoops to reduce pedestrian traffic (and therefore compaction)."

Henry then went on to carry out a series of tests to gather as much information as possible about the soil profile and hydrology – not only of the tree's then current location, but also of its future site, 20 metres away. He also went a step further. "I located a similar Kurrajong in a nearby arboretum and began taking leaf samples from both trees, analysing their trace elements to give me some baseline data." The plan was that once the hero tree was moved, any significant shift in levels shown by subsequent testing would give Henry and his team some direction on how to act if necessary.

But why move the tree in the first place? And why only 20 metres?

"This Pink Kurrajong (*Brachychiton discolor*) is about 70 years old and it was growing smack in the path of Adelaide's tram extension in Victoria Square. It's a good tree and it had a long life ahead of it."

Choosing a location close by made sense on every level. Not only were growing conditions more likely to be similar to those to which the tree was accustomed, but it meant there'd be no need for a truck, but rather a straight lift from the old site to the new. And on another level, users of this highly iconic public park would still be able to enjoy a tree which is very much a part of the space.

Nine months after Henry began the tree's pampering and monitoring, Sunday 6th May (2007) – big tree lift day – dawned. With a barrier set up to hold back the usual Sunday crowd (most of whom were thrilled by the prospect of the spectacle), the 170 tonne crane began to set up with 30 truck-loads of counter balance.

"We estimated that the 15 metre high tree, with a canopy roughly 15 metres across and a trunk 1.2 metres in diameter,

would weigh around 35 tonne once we added the root ball which we expected to be about 6 x 6 x 1.2 metres."

This root ball was created using a back-hoe and water cannon to deftly carve a donut trench four metres out from the trunk. Digging down a metre and a half, the team could see where to cut roots. Then having wrapped the sides and top of the ball, the cutting moved underneath to allow the chain to be slung beneath, ready for the lift. And then it was airborne, the neat ball of clay loam holding well, with a minimum of resistance from the final roots lying directly below.

A rotation of the crane brought the tree over the new hole where each stratum of soil had been kept neatly separate, stock-piled after having been analysed and dosed with any missing trace elements. Organic matter had also been added to this back-fill along with TerraCottem.

"Once it was in the air, we were able to get a good look at the root ball. We could see that it was irregular, so we modified the hole to suit, especially the bottom surface so that when the tree was lowered it would lock in and be stable." The fill was added layer at a time, watered in and compacted. Irrigation, mulch and hoops were set up but no stakes – "If a tree is balanced and back-filled well, then you don't need them. If it didn't fall over that first night, then it was going to be fine."

Henry kept up the monitoring until recently, partly to ensure that the tree thrived – which it has – but also to build a body of data to support and set protocols for moving trees of this magnitude. The leaf analysis has continued along with general inspections, including that of the water table through the four specially constructed inspection points created when the tree was newly sited.

Of course TerraCottem was only one part of a complex performance, but it was there for good reason. "I like the product and I know its history, and if I can use it knowing it would help, that's what I want to use."



TERRACOTTEM X3



Here's some news. There are now three TerraCottem products to choose from. TC Advantage's Russell James walks us through the options

TerraCottem Universal: This is the TerraCottem we all know, probably best described as the 'original recipe' except that the Belgium science that developed it in the first place can't help but continue to tweak that recipe and make it better. In fact, ongoing research has fiddled a bit with the copolymers and growth stimulants, but it's essentially the same beast, designed to do what it does so well: to help plants survive in tough conditions. This is still the TerraCottem to use in most applications – trees, shrubs, revegetation, roof gardens and general turf.

TerraCottem Turf: Now this one's new and it's special because it's been developed specifically for high-end-use turf areas. Developed with input from turf experts it contains a zeolite base, selected from around 50 options following three years of trials. The zeolite has an even better water-holding capacity than the base material used in TerraCottem Universal (a pyroclastic rock) as well as a boosted cation exchange capacity. They've also added in humic acid and turf-specific nutrients among other things, so that the whole product manages to shorten the time it takes to get a high-use playing surface back into action between seasons. This is the product to use for top-shelf reconditioning or establishment following reconstruction, for example, ovals or putting greens.

TerraCottem Complement: Here's a product that has a very specific use. It was developed originally for agricultural users who were losing TerraCottem each time they pulled a crop from the soil. Complement's ingredient ratio is different, so that when it's applied, it doesn't overload the soil with copolymers, but it does make sure the plants get the full benefit of the nutrients and root stimulants.

Tarrant Baguley of TC Advantage (Australia) in Belgium with TerraCottem International's R&D Manager, Dr Davy Ottevaere: here getting the tour of the trials - done in conjunction with independent research - where maize is used to assess the performance of TerraCottem in a range of soils.



product + service TerraCottem is a great product when it's used as specified. And since TC Advantage, who supplies TerraCottem, can't be on site wherever it's being used, it provides the product with support in three stages: at the point of design, for example helping clients and their landscape architects to interpret and respond to soil test results; at installation, running training workshops, and; offering follow-up support, evaluating sites between six and 12 months after planting. Since this support comes with the product, it's worth taking advantage of.

What is TerraCottem?

TerraCottem does a great job because it works on various fronts at the same time...

To start with, TerraCottem uses two main mechanisms to encourage substantial root development – copolymers and root growth precursors. The copolymers are a little like water-holding crystals except that TerraCottem's hydroabsorbent copolymers have been carefully selected and well researched. This means that instead of just one copolymer with a narrow water-holding and water-releasing ability, there is a group of them providing the same function over a wide range, for years. To put it crudely, more water can be stored and released under a broader variety of conditions.

As for the root growth precursors, by definition a precursor is a chemical compound which leads to another. The precursors found in TerraCottem do exactly this, and for a very good reason. If you put growth hormones into soil, they rapidly biodegrade. But if you put precursors into the root zone, the plants get a kick-start by synthesising their own growth hormones. And this conducive environment – for optimum cell division and elongation – stays like this for 12 months.

Then there is a nicely varied collection of plant nutrients – soluble mineral fertilisers, in a format suited to the early growth phase of a plant; slow-release fertilisers, designed to offer a constant source of food over many months; and synthesised organic fertilisers which focus on the soil, stimulating microbiological activity and general soil health.

Add this all together and the result is fast and furious root establishment. This means greater accessibility to water, fewer losses, and, given the reciprocal dynamic between roots and canopy, noticeably vigorous growth. In the longer term, the soil conditioning power of TerraCottem means that plantings are buffered from stress. It's great stuff



TERRACOTTEM®