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As more open urban land is developed and redeveloped, designers are under increasing pressure to use stormwater management options that go beyond the conventional practice of collecting storm run-off and draining it off site.

Current design practise now often incorporates seeking to hold and use the rain where it falls, thereby reducing surface run-off and allowing natural drainage patterns to be maintained. Adbri Masonry introduced Ecoloc® interlocking permeable paving to Australia in 1997 and followed on with the development of Ecotrihex® interlocking permeable paving.

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An ecological paving system provided several solutions for problems associated with the set-down area for a new bus station located at Moore Park, and adjacent to Sydney Cricket Ground, Aussie Stadium and Fox Studios.

Moore Park is a complex and extensively used site, and any development needed to consider the amenity of the parkland, the needs of local residents, sporting facility requirements and conditions laid down by the Centennial Park and Moore Park Trust. The original grassed site bore the scars of its heavy use, with large areas of bare ground, sparse grass and potholes in evidence.

The need to protect the existing stand of nine mature Hills Weeping Figs (*Ficus hillii*) would have created difficulties for any conventional paving system. The use of Ecotrihex® permeable paving provided tree protection and sustainability whilst providing a durable and safe pedestrian surface for large crowd traffic of up to 20,000 people per hour, as well as the capability of taking occasional vehicular loads.

To provide sustainability for the heritage listed trees, both aeration and moisture were required for their extensive root systems that extended well beyond the drip line. Site drainage was complicated by the combination of low natural falls, the need for a flat pedestrian surface, the need to minimise disturbance of the roots and the low capacity of the existing old drainage.

The subgrade was a sandy loam that had good permeability and was stable when saturated, which makes it an excellent site for using the Ecotrihex® permeable paving system. This would enable substantial savings to be made on drainage costs by minimising drainage via pits and pipes, and also would maintain recharge of the Centennial Park aquifer. George Clarke, director of George Clark and Associates explained that "using permeable paving gave a margin to drain surface ponding" that, due to the limited ability to change existing flat levels, would otherwise occur. The basic design consisted of building up a pavement on top of the existing subgrade after minimal trimming so as to leave the tree roots undisturbed. After compaction of the subgrade, a 100mm thick base of crushed recycled concrete was placed. A 50mm thick drainage layer of 14mm crushed aggregate was then placed over the base. This layer connects to two long soaking strips that pass through the base and into the subgrade. A 25mm thick bedding layer of 7mm crushed aggregate was then screeded on top of the drainage layer, and the pavers were placed by hand and compacted with a vibrating plate compactor. The drainage voids and joints were swept with a 2-5mm crushed aggregate and the pavement compacted until the aggregate in the drainage voids was full to the surface.

Combining a drainage layer leading to infiltration trenches, with some infiltration through the base, meant that the design storm

(a 20-year ARI with an intensity of 165mm/hour) could be managed without the need for a large system of pits and pipes. The existing stormwater pits of the adjacent road drainage system drained the remaining surface run-off from the 9000 square metres of paving. The only requirement to maintain the permeability of the pavement will be the occasional vacuum sweeping of the surface to remove contamination from the drainage voids. Experience has shown intervals of 5 years to be adequate in this regard.

Aesthetically, the landscape architect selected segmental pavers to give a softer appearance to the large expanse of pavement. Combining a honed Ebony coloured Ecotrihex® paver with a contrasting white aggregate in the drainage voids enhanced this effect. Using Adbri Masonry Trihex® interlocking pavers for the adjacent bus turning circles in the same Ebony colour has continued the theme. The result is an attractive yet functional pavement. The use of the Ecotrihex® permeable paving system enabled the designers to achieve the environmental requirements for the project with a simple and durable design.

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Fact file

Project:	Bus Station and Forecourt Moore Park, Sydney
Client:	Centennial Park and Moore Park Trust
Project and Construction Manager:	Department of Public Works and Services Sydney Region
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Bus Station Architects:	Bligh Voller Nield, 189 Kent Street, Sydney
Landscape Architects:	Spackman and Mossop
Civil Engineers:	George Clark and Associates, Level 5, 110 Pacific Highway, North Sydney
Civil Contractor:	North Shore Paving Co., 16 Moore Ave, Lindfield.