**Project Name:** NorthLink WA Southern Section  
**Location:** Perth  
**Proponent:** Main Roads WA | **Contractor:** John Holland Group  
**Certified Rating:** Leading IS Design rating

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**Project Description**

NorthLink WA is a state and federally funded initiative being built in three sections and will provide a non-stop transport route between Morley and Muchea:

- Southern section: upgrading Tonkin Highway to a freeway standard between Guildford Road and Reid Highway. Construction is well underway and is expected to be complete by early 2018.
- Central and northern sections: a new 37 km freeway link extending Tonkin Highway from Reid Highway to Muchea. Works will be completed by mid-2019.

**Key Achievements**

**First Leading Rating** for Western Australia, under the ISCA (Infrastructure Sustainability Council of Australia) Rating Scheme

The score of 93 points is the highest WA score ever and the second highest ISCA rating score in Australia ever for a transport infrastructure project

Sustainability was embedded in the Project Trademark and behaviours which were developed by the team as part of the partnering process with John Holland/Main Roads/Independent Certifier (APP).

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John Holland held a **Supply Chain Sustainability Day** to raise awareness of sustainability expectations and opportunities among potential suppliers early in the project.

Pedestrian tunnel to Hampton Park Primary School minimises walking distance and has much improved visibility by using a 3-pin arch structure instead of a conventional design

**Innovation** was demonstrated across several areas, achieved by cultivating a good working relationship with the Main Roads project team and specialists.

Costs and benefits have been calculated and show significant benefits from the sustainability initiatives included, both for construction costs and in operational savings over the life of the project.
**Highlights**

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<th>21% decrease in materials lifecycle impacts</th>
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<td><strong>Lifecycle assessment in decision making:</strong> eTool life cycle assessment (LCA) model was used instead of the Materials Calculator. The tool was used early in detailed design to identify the highest impact materials so these could be prioritised.</td>
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<td><strong>10% RAP</strong> (reclaimed asphalt pavement) has been used throughout the project, and the team is working with suppliers and Main Roads to increase this to 25%. Although Main Roads encourages use of RAP, currently most projects in WA use no recycled asphalt and stockpiles continue to grow.</td>
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<td><strong>A trial of high modulus EME2</strong> asphalt will be undertaken. EME2 is approximately 24% thinner, using less material than other formulations. EME2 is to be applied to a 700m section of the project in spring 2017. In addition to material reduction, EME2 is more tolerant of moisture than the traditional product, which should result in fewer rain delays and lower costs.</td>
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| 40% reduction in water use across construction and operation | 40% reduction in water use in construction and operation through a reduced delivery period and by designing out reticulated areas from the landscaping design. |

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<th>9% reduction in energy use</th>
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<td><strong>Shared path light-dimming</strong> through the quietest hours of the night provides sufficient light for cyclists with 15% less energy overall.</td>
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<td><strong>Adaptive lighting trial</strong> for highway lighting – designed to achieve required light levels using 10% less energy, while increasing the life of luminaires by 50%. Importantly, it provides remote connectivity and fault correction which reduces cost and energy for maintenance, and can be retrofitted in other parts of the network if successful.</td>
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<th>Community Benefits</th>
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<td>Community priorities such as tree canopy cover, walking and cycling were recognised, and addressed.</td>
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<td>A 4 metre-wide Principle Shared Path (PSP) will provide better connectivity across, and along the alignment (PSP width is usually 3 metres).</td>
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<td>Pedestrian tunnel to Hampton Park Primary School minimises walking distance and has much improved visibility by using a 3-pin arch structure instead of a conventional design.</td>
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Innovations

Australian Firsts

✓ The use of life cycle assessment by a contractor in decision making during detailed design
✓ Implemented a tightened asphalt specification to improve water resistance and durability to increase Pavement Design Life.
✓ High modulus asphalt (EME2) trial on 700m section of the highway is the heaviest traffic loading section of a highway in Australia

Western Australia State Firsts

✓ Grade-separated roundabout demonstrated to be the preferred solution with regard to congestion and road safety.
✓ Adaptive lighting trial.
✓ Dimming of PSP lighting for 50% of each night.
✓ EME2 asphalt on trial section of freight route carriageway
✓ Plans to use up to 25% recycled asphalt (RAP) content.
✓ Design of pedestrian underpass using 3-pin arch structure.
✓ Supplier Sustainability Day in collaboration with Supply Chain Sustainability School.
✓ Principal Shared Path width increased to 4 metres for length of NorthLink WA.
✓ Solar powered variable message sign (VMS) trial.

Acknowledgements

It is acknowledged that this achievement has been the result of multiple stakeholder input including:

- Leadership by Main Roads and an aspiration to reach a Leading rating
- Foundations built by Main Roads and the NorthLink WA consultant team towards the rating during project development (consortium led by BG&E, and including Upthink, Estill & Associates, Coffey, Golders, Landscape Planners, Urbsol and Pracsys)
- Strong delivery by John Holland who have worked closely with their design (Aurecon) and construction team, with suppliers and key subcontractors (eTool, Boral, Big Spoon, Humes and IC Energy), Main Roads and ISCA.

This is Main Roads' third ISCA rating, and it builds on what was learned in earlier ratings for the City East Alliance project and Gateway WA.