

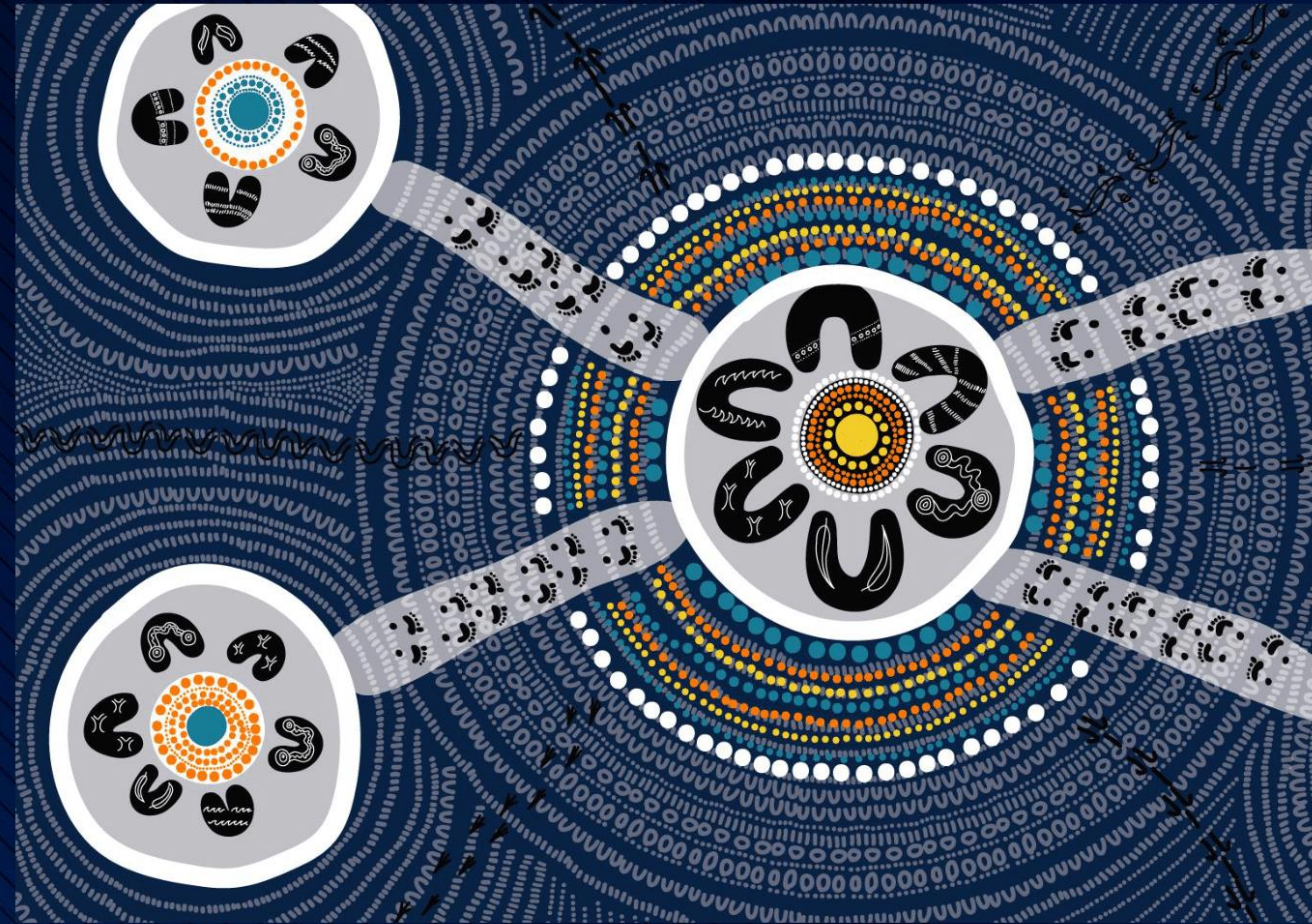


IS Ratings Case Study Webinar

5 December 2024

Acknowledgment Of Country

The Infrastructure Sustainability Council would like to begin by acknowledging the Traditional Custodians of the land on which we meet today. I acknowledge their deep connection to land, water and culture, and pay my respects to their Elders past and present.





DEGNAN



Transport for NSW



Agenda

- Transport Access Program (TAP) – Overview
- Unanderra and Towradgi Project Achievements
- Innovations & Initiatives
- Aboriginal Design Integration



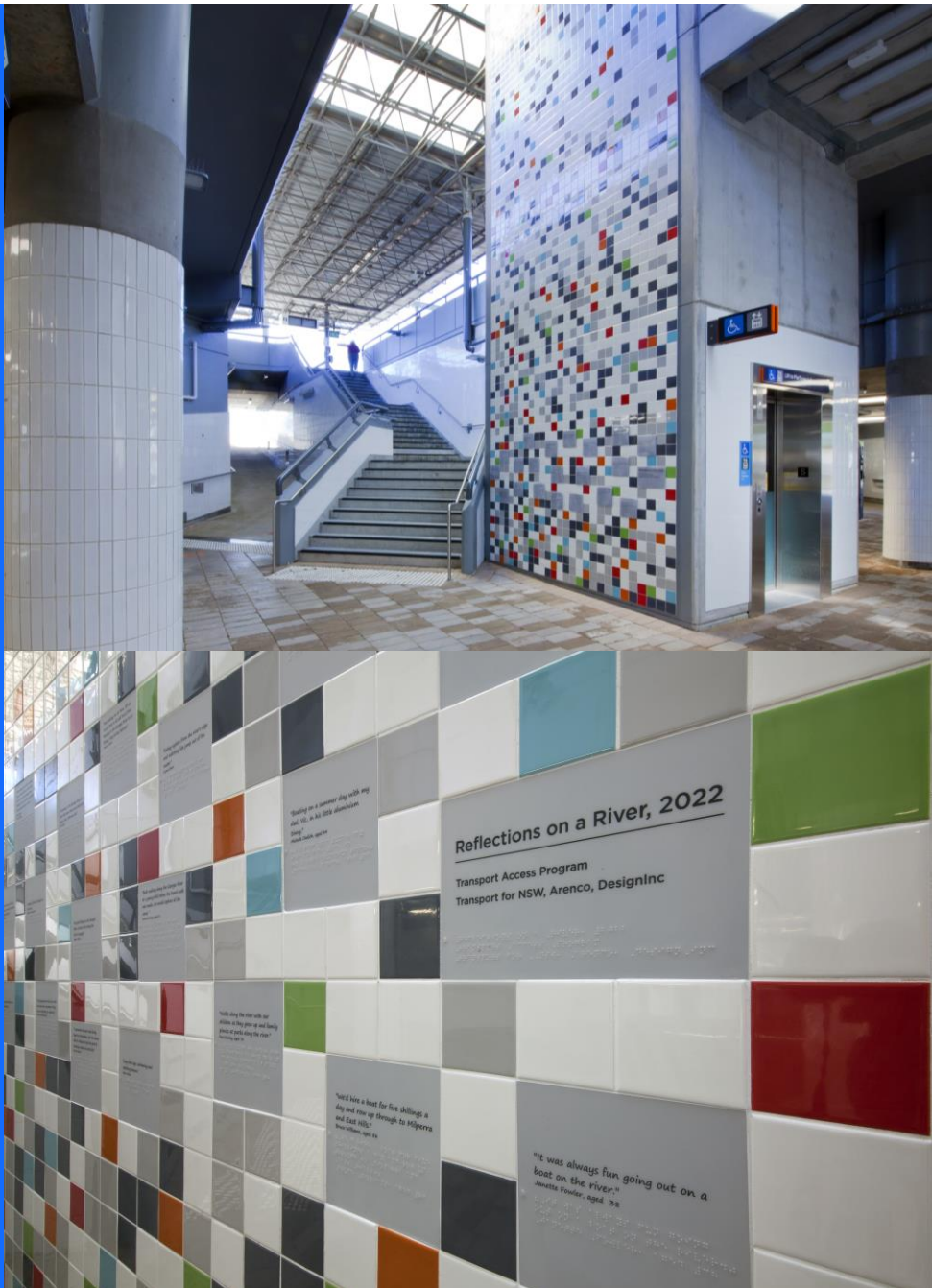
Transport Access Program (TAP) - Overview

Transport for New South Wales
and Degnan



TAP3 ISC Program Rating

- 39 stations combined within 18 ratings under a single Program Rating.
- Ratings used the v1.2 Small Project Pathway (except for Redfern).
- Project ratings ranged from 1 station to 6 stations combined.
- Program Wide TCs (e.g., Dis-2 and Dis-3), and BAU assumptions (individually verified base cases).





TAP3 Towradgi and Unanderra

- Accessibility upgrades in the Illawarra, south of Sydney.
- Small projects with limited budget and scope.
- New footbridges, lifts, accessible parking spaces, kiss and ride zones, and accessible toilets.
- Designing with Country to embed stories within the design.
- Partnerships for Innovation.

Unanderra and Towradgi Project Achievements

Unanderra and Towradgi
Station Upgrades

Unanderra and Towradgi Stations

Unanderra Station Upgrade Project

- Leading Design and As Built Rating with 84.06 points

Towradgi Station Upgrade Project

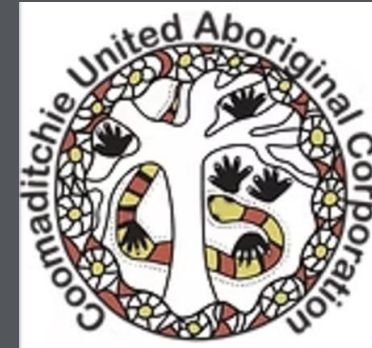
- Leading Design and As Built Rating with 82.66 points



Partners and stakeholders

Transport for NSW and
Degnan

DEGNAN



DesignInc



Unanderra

Energy and GHG emissions reductions

- 59% reduction in whole-of-life energy
- Saving of 275 t CO₂-e

Materials reductions

- 23% reduction in IS EnviroPoints

Water reductions

- 17.7% reduction in whole-of-life water consumption





Towradgi

Energy and GHG emissions reductions

- Level 3 for Ene-1 – 39% reduction in energy consumption over the asset life cycle

Materials reductions

- 12% reduction of IS Enviro Points
- Saving of 140 t CO₂-e over the asset life cycle

Water reductions

- 17.8% reduction over the asset life cycle
- Saving 9,969 kL



Social outcomes – community health, wellbeing and heritage

Innovations & Initiatives

Australian-First Innovations

Australian-First Makinex Container- Top Solar Panels

Prototype developed on
Unanderra Station Upgrade





Degnan partnered with Makinex to develop a prototype container-top re-deployable, expanding solar photovoltaic system with a 5 kWp capacity

Connecting onto existing site containers, the battery-connected system saves space with the battery system only occupying $\approx 1\text{m}^2$.

The compact system reduces construction emissions and was generating $\approx 10\text{-}12$ kWh/day, enough for a 12x3m site office.



Makinex has further refined the prototype trialed at Unanderra and now offers the finished product to the market.

The prototype was repurposed for another Degnan TAP project where it continues to perform well.



Australia-First Foamed Concrete

In partnership with University of
Wollongong (UOW) at Towradgi
Station TAP





This novel foamed concrete was first deployed at the solar decathlon middle east, an international sustainable housing competition in the Desert Rose House, Team UOW, and further developed by the Sustainable Building Research Centre (SBRC) before trialing at Towradgi Station TAP



The foamed concrete façade/cladding panels incorporate crushed glass, carbon fiber C-grid reinforcement, cement and a foaming agent for a density $\approx 1/2$ of normal concrete offering a lower-carbon alternative and waste to resource pathway

There were several challenges involved in the fabrication, installation and technical approvals for this new material in the rail corridor, but these were overcome through collaboration with TfNSW, Degnan and the SBRC.

The deployment of this material highlights the importance of communication with academia and industry to develop new and innovative solutions.





The Foamed Concrete is an ISC-verified Australian-First Innovation for the Towradgi Station Upgrade Project

Solar-powered street lighting

Operational energy savings for
the Towradgi Station Upgrade



Installing solar-powered street lighting reduced energy and operating costs over the asset lifetime



Aboriginal-inspired design

Unanderra and Towradgi
Aboriginal Design integration



Towradgi Station

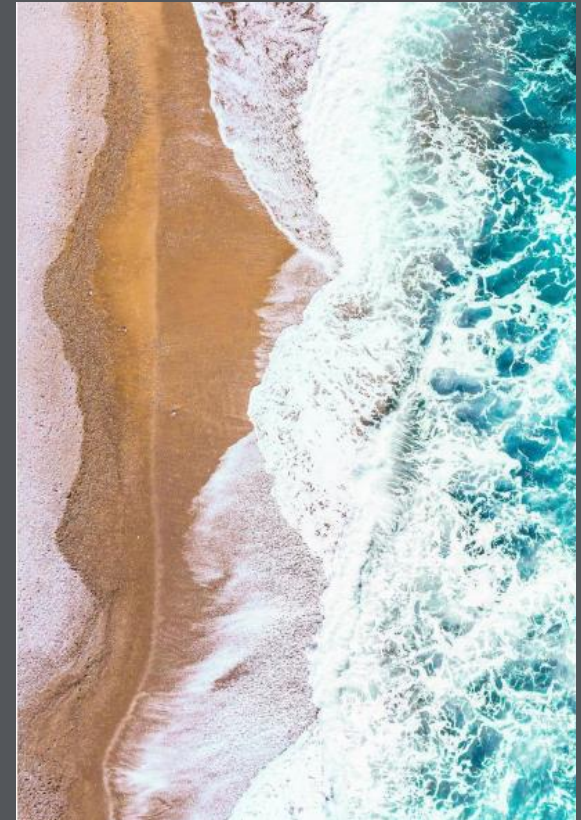
Aboriginal design



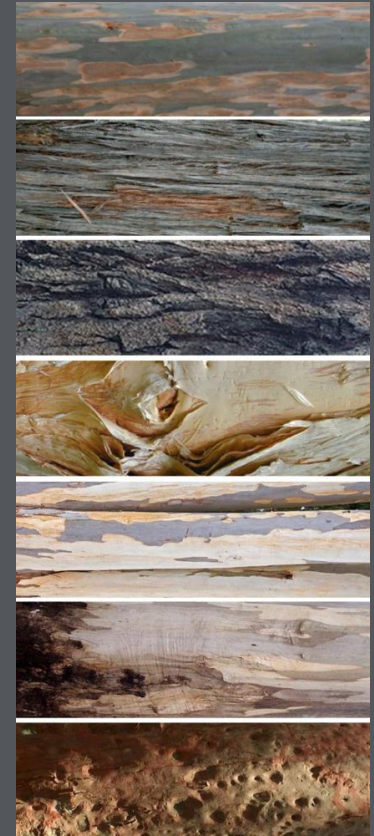
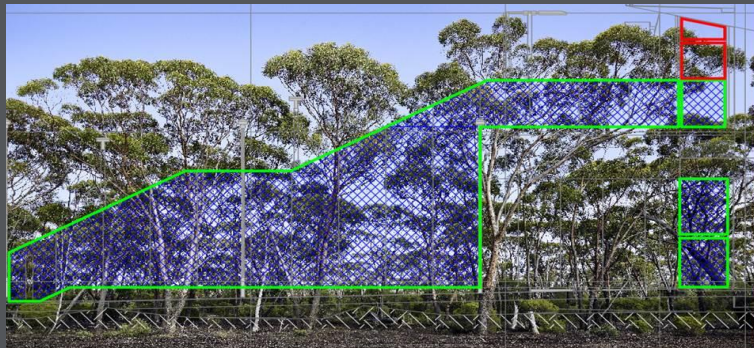


Towradgi is within the Dharawal Nation and its traditional custodians are the Wodi Wodi – Saltwater People.

Towradgi Station was designed to bring the stories and symbolism of the Wodi Wodi Dharawal to life

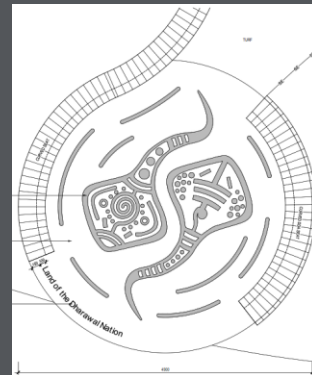
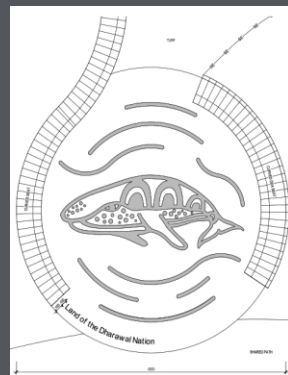
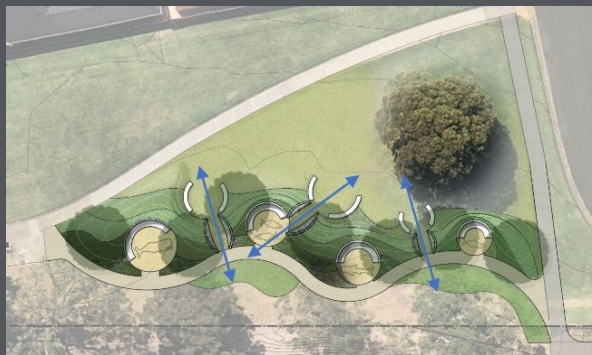


Forest Canopy and Seven Trees



← Forest canopy imagery in footbridge steel structure

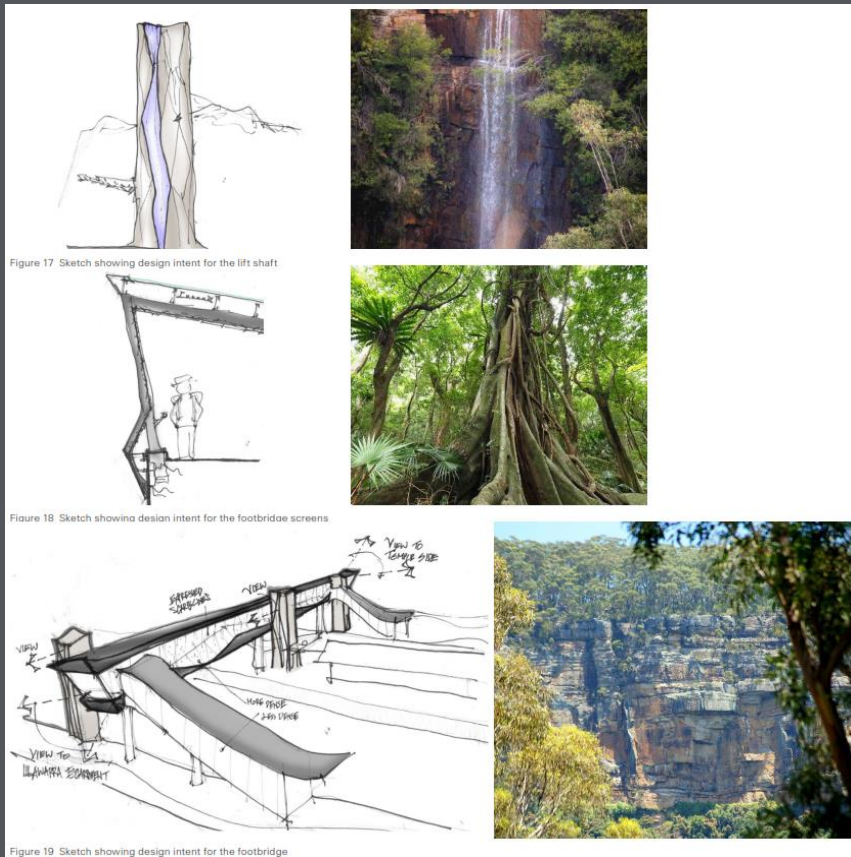
Sperm Whale and the Waters



Unanderra Station

Aboriginal design





Mount Kembla Escarpment - Biophillic design

Unanderra, like Towradgi, is also within the Dharawal Nation and its traditional custodians are the Wodi Wodi – Saltwater People.



Sandblasted
concrete with
Indigenous art



Biophillic design
in physical
elements



Summary

- Incorporating indigenous artwork and culture into design needs to be carefully done and takes time
- Finding the right stakeholders for engagement can be challenging
- Needs to be part of an overall urban design
- Needs to remain compliant to technical standards and achieve the required design life
- Can have a significant positive outcome when done correctly



DEGNAN



Transport for NSW

Question & Answer

