

Climate Resilient Materials for Infrastructure Assets

COUNCIL NAME

Northern Beaches Council & Dubbo Regional Council

WEB ADDRESS

northernbeaches.nsw.gov.au

dubbo.nsw.gov.au

SIZE

Northern Beaches: 254km²

Dubbo: 7,536km²

POPULATION

Northern Beaches Council: 252,878

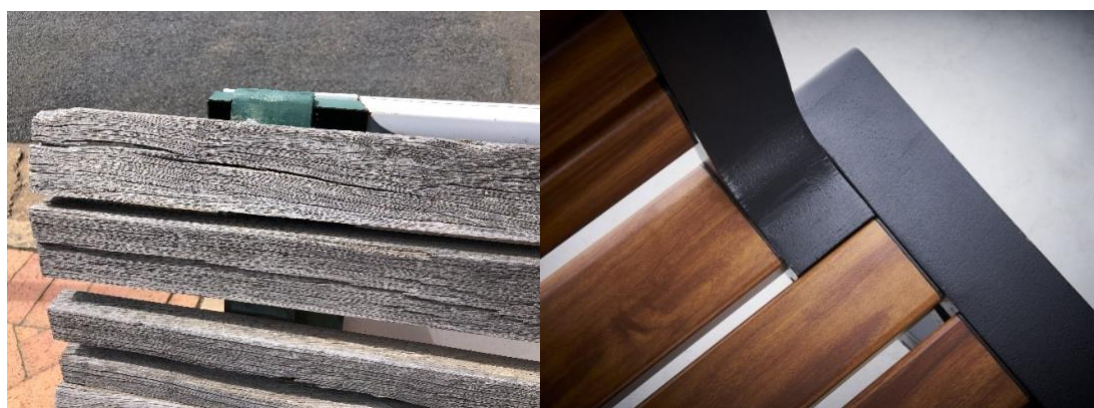
Dubbo Regional Council: 50,077

PROJECT PARTNERS

Institute of Public Works Engineering Australasia (IPWEA)

Overview of the project

New South Wales (NSW) has recently experienced extreme drought, bushfires, coastal erosion events and flooding. Future climate projections point to more intense and frequent weather events that will impact council's infrastructure further. The Northern Beaches Council, Dubbo Regional Council, the Institute of Public Works Engineering Australasia (IPWEA) and consultants BMT collaborated to develop *IPWEA Practice Note 12.2: Climate Resilient Materials for Infrastructure Assets* (Practice Note 12.2). This will assist infrastructure managers and developers to select construction materials that are more durable to the impacts of climate change. This Practice Note considers the likely impacts of high rainfall and floods, low rainfall and drought, increased temperatures and heatwaves, sea level rise and more extreme bushfire weather. The vulnerability of the five most commonly used materials for assets is examined (concrete, bitumen, steel, wood and PVC).



Images 1 & 2: Comparison of existing and new materials, Boundary Road Shop Upgrade case study, Dubbo Regional Council

How the project was carried out

Northern Beaches Council, Dubbo Regional Council and IPWEA collaborated to engage consultants BMT to develop a Climate Resilience Design Guide which formed Practice Note 12.2. This built on the *IPWEA Practice Note 12.1: Climate Change Impacts on the Useful Life of Infrastructure* (Practice Note 12.1) released in 2018. The draft Practice Note underwent an IPWEA technical peer review and specific sustainability technical review by external consultants to ensure that the detailed materials information provided by BMT in conjunction with chemical engineering university researchers was robust. Case studies were also developed by councils from around NSW to illustrate real-world examples using alternate construction materials and feature under each of the asset material chapters. Images 1 & 2 displays the Boundary Road shop upgrade case study prepared by Dubbo Regional Council which presents the existing wooden seats to be replaced with a timber-look aluminium to extend the useful life of street furniture. Local Government NSW (LGNSW) Increasing Resilience to Climate Change (IRCC) grant funded councils were then approached to test the Practice Note and supporting Decision Tree Worksheet and provide additional feedback that was incorporated into the final draft.

REFERENCES

IPWEA e-Book
library - Practice
Note 12.1: Climate
Change Impacts on
the Useful Life of
Infrastructure &
IPWEA Practice Note
12.2: Climate
Resilience Materials
for Infrastructure
Assets

Outcomes now and in the future

The new Practice Note provides detailed engineering level information on climate resilient and sustainable options for concrete, steel, bitumen, wood, polyvinyl chloride (PVC). This will assist asset managers to increase the useful life of infrastructure whilst also considering other sustainability criteria.

The key objectives of Practice Note 12.2 are to:

- Introduce asset managers to construction materials and practices that can increase resilience to different hazards;
- Provide a decision framework for material selection that considers their effectiveness and sustainability; and
- Provide case studies that demonstrate the application of resilient construction materials and practices.

The work also informed the Technical Guidelines for Sustainable Design being prepared by Northern Beaches Council to assist asset managers to select materials for new infrastructure and renewal capital works projects and will inform sustainable procurement material selection.

Benefits and lessons learned

Practice Note 12.2 provides national guidance on materials durable to climate change impacts and considers carbon emissions, waste, water and energy requirements for each alternative.

Lessons learned include:

- that there are gaps in our knowledge about the environmental credentials and sustainability ranking of many materials and more work is needed in this area; and
- feedback from reviewers and councils requested additional information on green infrastructure, an area that was out of scope for this project but much in demand.

More information

A complimentary version of the IPWEA Practice Note 12.1 and IPWEA Practice Note 12.2 are available to all local government staff in NSW. They are accessed by creating an account on the IPWEA website and requesting the e-Books via the IPWEA Publications Bookshop then accessing them in your individual e-Book Library: <https://www.ipwea.org/publications/bookshop>

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Funded by the NSW
Government in
association with LGNSW