

Infrastructure digitalisation and design

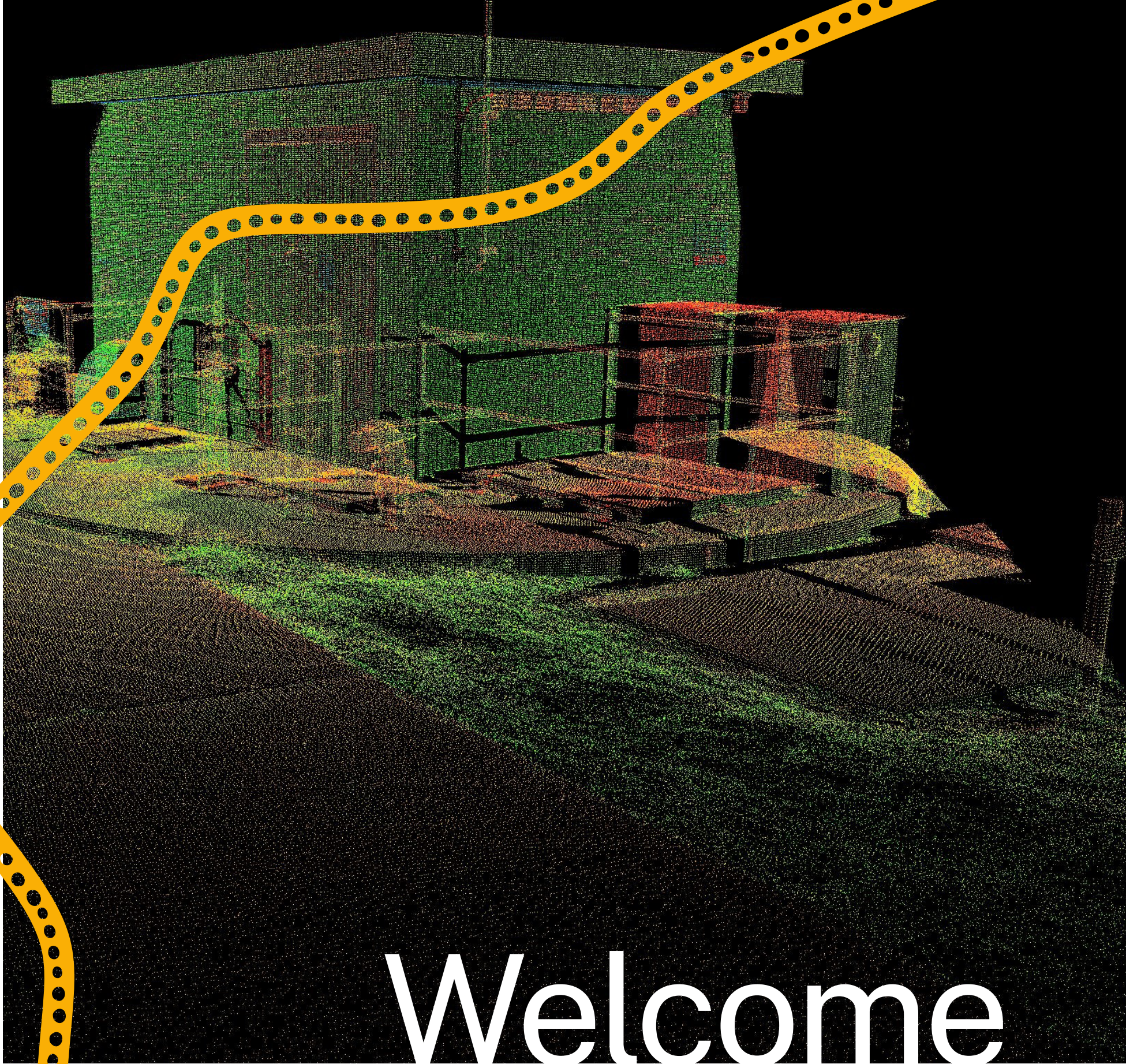


**NSW Public Works acknowledges
that it stands on Country which always
was and always will be Aboriginal land.**

We acknowledge the Traditional Custodians of the land and waters, and we show our respect for Elders past, present and emerging. We are committed to providing places in which Aboriginal people are included socially, culturally, and economically through thoughtful and collaborative approaches to our work.

Artwork: 'On Country', Charmaine Mumbulla, 2022
Image to right: Terrestrial laser scanning (TLS) point cloud image of Tuross Heads SPS

Front page image: PW's infrastructure digitalisation team member demonstrating a water infrastructure 3D model



Infrastructure digitalisation and design

NSW Public Works (PW) is equipped with the latest technologies and tools to deliver high-quality outputs that meet the requirements of our clients. We have an in-depth understanding of current and emerging ISO and Government frameworks and standards, which ensures that the way we service our clients' modelling and advisory needs is aligned to key whole-of-government guidelines.

We offer a comprehensive range of civil, mechanical, electrical, and architectural design services for infrastructure projects. Our team of highly skilled engineers and drafters can provide innovative and cost-effective solutions to meet the unique needs of each project.

Our range of capabilities includes the development of project and asset information models using 12D, Autodesk AEC Collection and advanced collaboration platforms such as Autodesk Construction Cloud. We implement infrastructure digitalisation workflows and methodologies throughout the project lifecycle from design to construction. Our survey team can also provide state-of-the-art site survey data capture services using drone-based LIDAR and aerial photography together with other digital surveying tools to generate accurate 3D reality capture.

We believe in providing customised infrastructure digitalisation solutions that are specifically tailored to meet our clients' unique needs and objectives. Our team takes the time to understand project requirements, constraints and desired outcomes, allowing us to develop strategies and designs that optimise results. We actively engage with clients to gather feedback, incorporate their preferences, and make necessary adjustments throughout the project to ensure client satisfaction.

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Our expertise

NSW Public Works can provide clients with tailored solutions for the delivery of their projects.

- Design management and coordination
- Civil and structural design – for most asset classes
- Water and wastewater treatment plants
- Dam upgrades and spillways
- Pipelines, rising mains and pumpstations
- Earthworks including above-ground storages, flood mitigation levees
- Infrastructure planning and design
- Road geometric design and documentation
- Stormwater drainage with associated structures
- Slope and riverbank stabilisation
- Utilities planning, coordination and clash detection
- BIM consulting and implementation
- 3D modelling and virtual simulation
- 3D terrain mapping with Civil 3D / 12D
- 3D renders and point cloud models



Image: 3D laser scanning of the former Darlinghurst Police Station

Extensive local engineering experience

Our team is a trusted provider of engineering solutions with extensive local and regional engineering experience in NSW.

We bring together a highly skilled and experienced team specialising in different disciplines. Our commitment to excellence and innovative solutions allows us to deliver tailored solutions digitally and resolve unique challenges faced by our clients. With a strong track record of successful regional and rural projects, we have established ourselves as a leading provider of infrastructure digitalisation services.

Benefits of designing to contemporary infrastructure digitalisation standards

Designing to contemporary infrastructure digitalisation standards offers numerous benefits for project delivery and outcomes.

By embracing and implementing these standards, engineering teams can unlock considerable downstream cost savings in the delivery stage of your project.

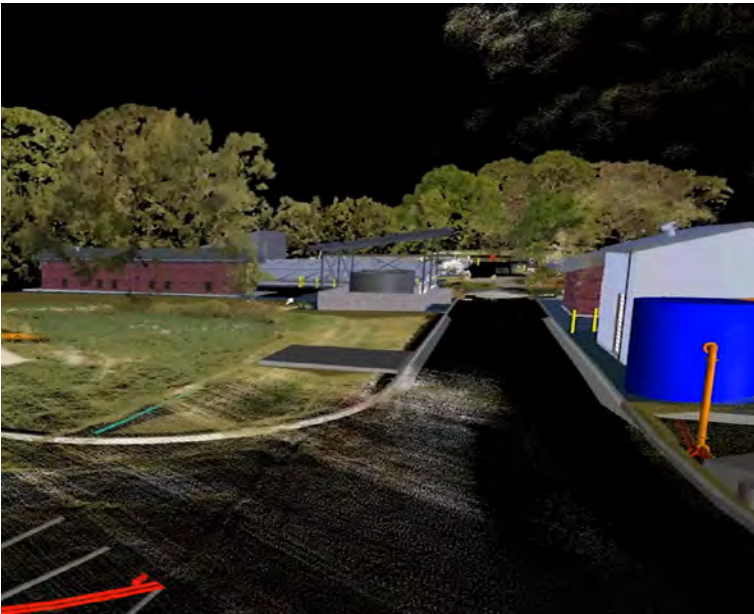
Some key benefits of designing to contemporary infrastructure digitalisation standards include:

- Efficient access to site survey data in 3D photogrammetry and point cloud
- Enhanced stakeholder collaboration through Common Data Environment (CDE) with dynamic visualisation and communication
- Digital information management compliant to ISO 19650
- Sustainability and resiliency improvements in design
- Improved safety, particularly for the construction stage, and reduced site visits for engineers
- Reduced variation orders, improved efficiency and productivity of construction
- Increased accuracy and completeness of project delivery.

Tomakin STP

The scope of this project was for the design of a brownfield Sewage Treatment Plant for Tomakin STP Augmentation Project from a surveyed reality capture 3D Model. The scope included underground pipework, drainage, electrical, structures, buildings, and civil works. The existing design data and any updates were included and modelled by the project team from PW.

The modelling was completed to LOD 300, using Revit, Civil 3D, and Plant 3D. A clash-free federated model will be generated at the 100% Design Delivery stage using new automated cloud-based clash detection features.



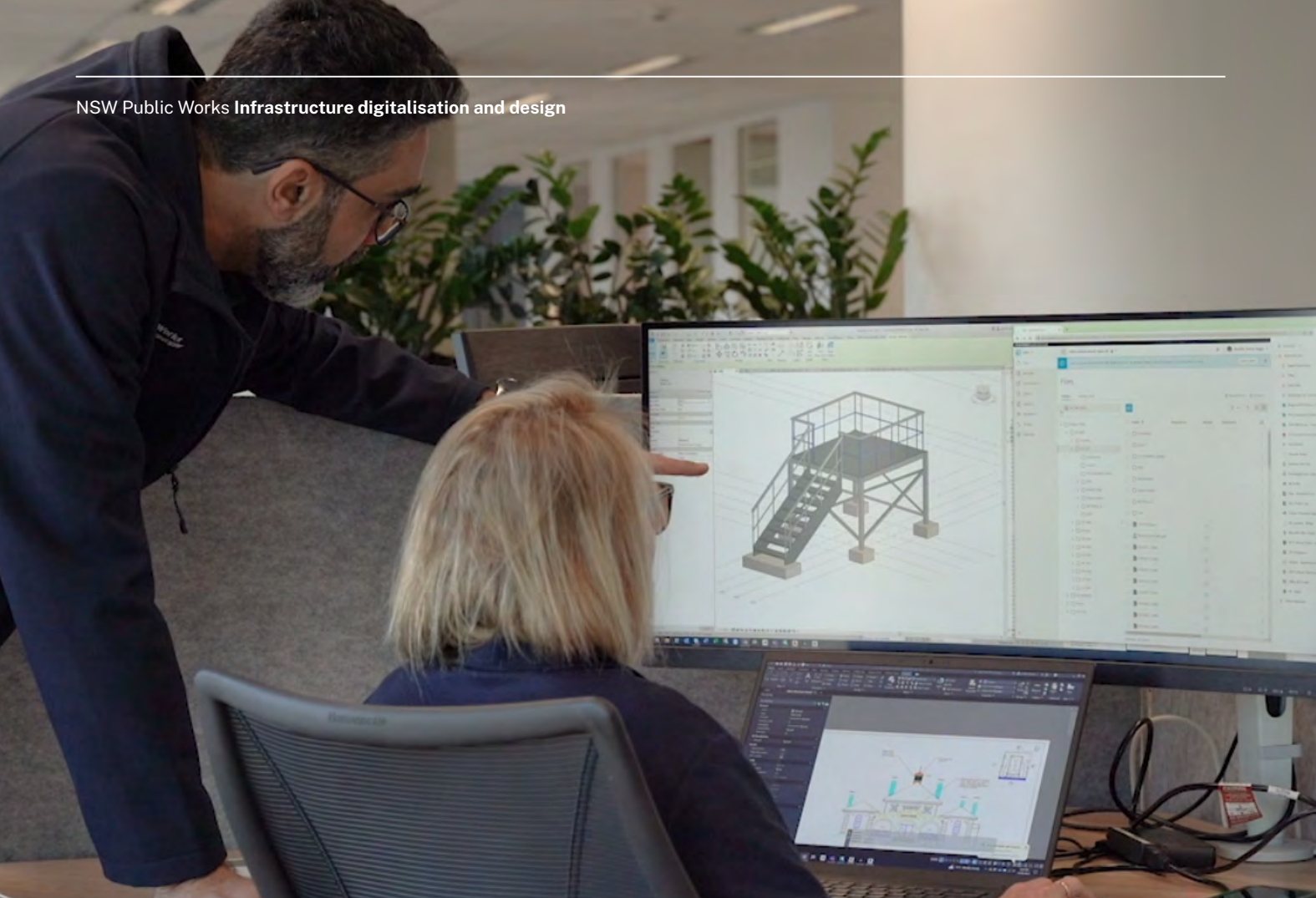
Barraba Courthouse

PW specialises in providing comprehensive advisory services for heritage assets. We combine advanced reality capture technologies, such as laser scanning and photogrammetry, with our expertise in architectural surveying and drafting to create accurate and detailed digital representations of heritage buildings. Our team is committed to preserving historical significance while enabling efficient documentation, restoration, and maintenance of these architecturally significant assets.

The goal of this project was to deliver drawings containing the internal and external building dimensions to our Heritage Asset Advisory team and to create a new workflow for them with updated software packages such as Revit. We utilised state-of-the-art reality capture technologies to capture precise measurements and detailed imagery of the courthouse heritage building. Laser scanning captures millions of points to create a highly accurate 3D point cloud, while photogrammetry employs high-resolution photographs to reconstruct detailed 3D models using Revit. This process ensures a comprehensive and precise digital representation of the building.



Image: Barraba Court House 3D model



Software and platforms

We are equipped with the latest technologies and tools to deliver high-quality outputs that meet the requirements of our clients.

- Autodesk Construction Cloud
- Revit
- Plant 3D
- Civil 3D
- AutoCAD
- Inventor
- Recap
- Navisworks
- Infracore
- Advanced Steel
- Robot Structural Analysis
- Tekla Tedds
- Microtran
- ESRI ArcGIS

Image: PW staff developing a 3D model for an electrical switchboard platform

Infrastructure digitalisation advisory & capability uplift services

In addition to our engineering services, we can provide various consulting services including:

- Procurement advice for design services
- 3D library and parametric families setup and maintenance advice
- Procurement and implementation of 3D software and collaboration platforms
- Consultancy services for ISO 19650 implementation
- Document and business process development for digital transformation
- Collaboration and integration workshops
- Advisory services for digitising engineering workflows
- Preparation of Infrastructure digitalisation standards and contractual documents.

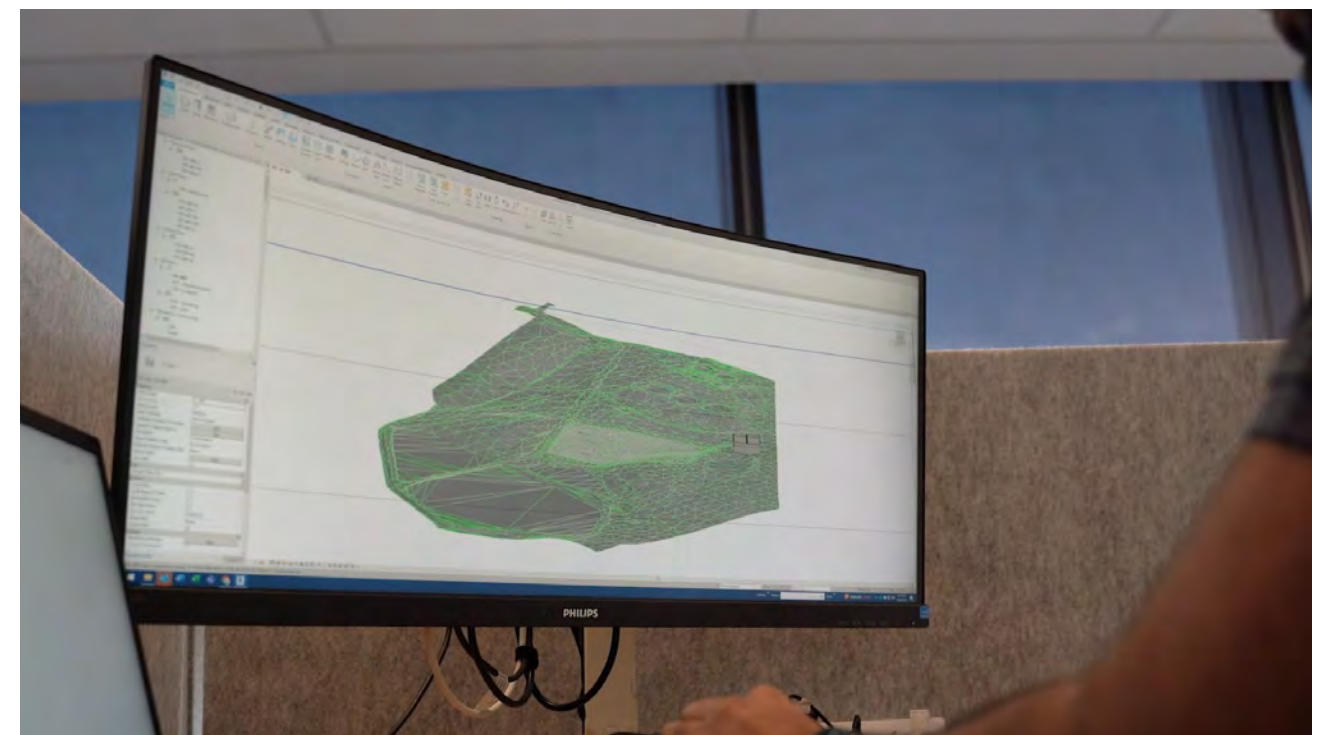


Image: PW staff generating a 3D model of site terrain for use in planning and engineering design phases



Image: Photograph of Malpas Dam (top) and a 3D colourised point cloud image captured by drone based LIDAR system (bottom)

In-house survey and spatial capability

Our Infrastructure Digitalisation team works closely with our Survey and GIS team to use their reality capture models where applicable for efficient digital delivery. This enables us to provide more efficient solutions for projects with easy access to site data and reduced site visits. Our Survey team is fully integrated into our digital design group with the following services:

- 3D laser scanning and photogrammetry
- Survey management
- Survey preparation
- Laser scanning
- Photogrammetry
- Data processing
- Survey QA processes and data checks
- Digital file and report preparation for delivery.

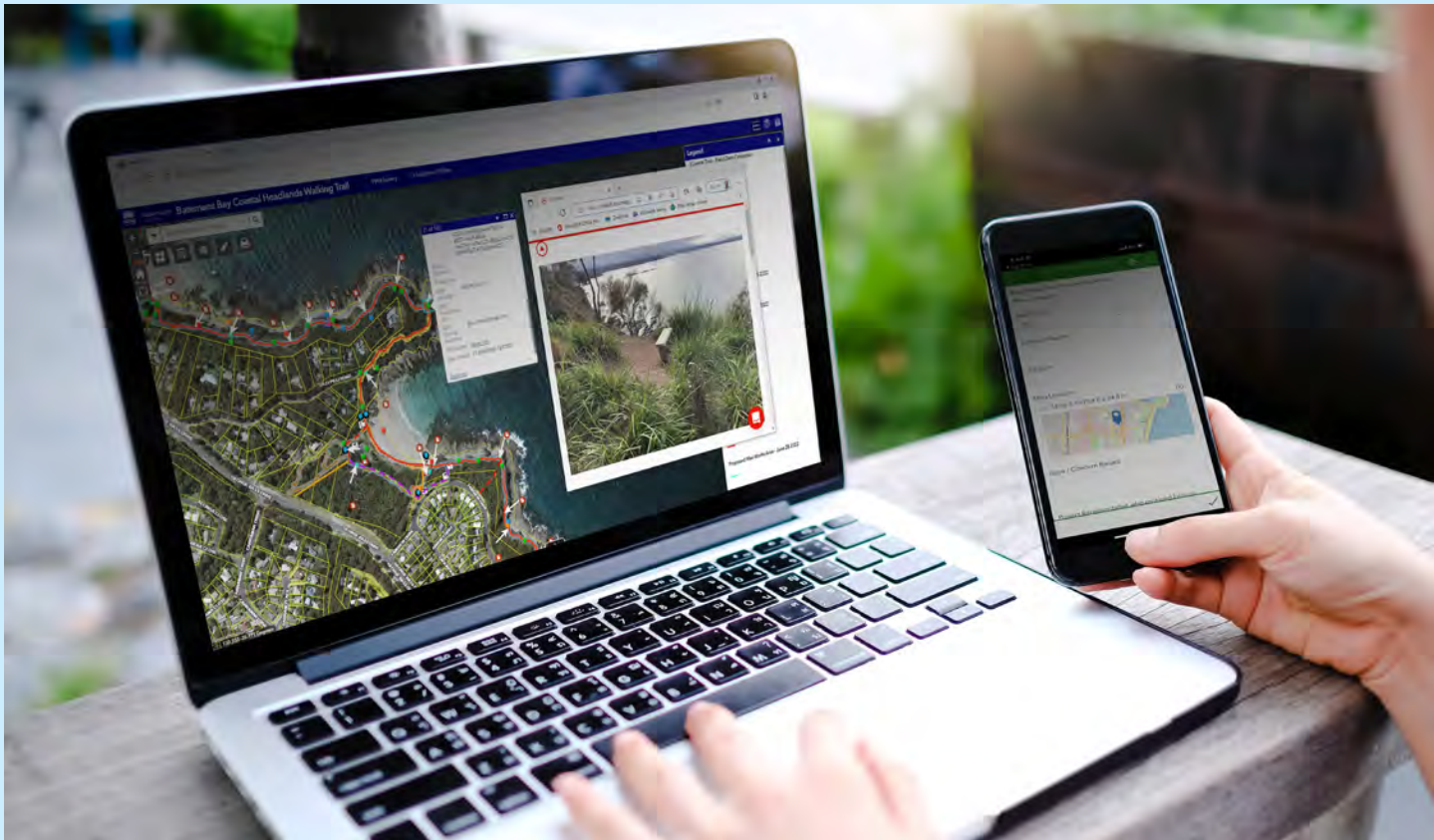


Image: Interactive map of the Batemans Bay Coastal Headlands Walking Trail

Our role on your projects

Depending on client requirements, we can accept different roles on each project. Our strong preference is to be involved early on projects from proposal stage – this is critical to ensure accurate scope and pricing. We typically support construction projects by:

- Assisting to manage cloud platforms
- Providing cloud services for clients
- 3D model checking and verification
- Federated 3D model preparation & project coordination
- Design and 3D modelling development for various disciplines
- Design management of infrastructure projects
- Setup clash detection and model coordination
- Building out preconfigured workflows
- Preparation and implementation of infrastructure digitalisation standards
- Preparation of infrastructure digitalisation execution plans.



Image: PW staff using a virtual reality headset to explore 3D models in reality

Why choose NSW Public Works?

With more than 400 dedicated staff across our network of 17 regional offices, we are able to quickly and efficiently take on new projects or programs, tailoring the approach to achieve optimal outcomes for the client.

➤ Accredited for planning and delivery of capital works

PW is accredited under the NSW Government Agency Accreditation Scheme for Construction to manage the planning and delivery phases of construction and capital works procurement. NSW State and Local Government entities can directly engage the services of PW under the provision of NSW Government Procurement Board Direction PBD 2021-04 and Section 55 of the Local Government Act 1993, providing efficiencies and cost savings.



➤ Strong focus on quality, environmental and safety management

PW operates under triple certification for quality, work health and safety (WHS) and environmental (QSE) management systems. These systems and processes provide the foundation for delivering quality projects and a continuous improvement culture, that embraces QSE leadership at all levels and integrates QSE into all activities. PW's Project Management Framework is the backbone of our quality system and is used to manage our projects and ensure we deliver to agreed requirements.



➤ State-wide resources

Regional clients benefit from our state-wide network of offices enabling them to source expert project management personnel familiar with the conditions and construction industry issues in their area. This proximity reduces servicing costs, facilitates improved stakeholder communications and enables us to respond quickly to your needs, providing a single point of contact for all services.



➤ Government relationships and knowledge

Successful delivery of complex infrastructure projects relies on effective interaction with stakeholders and regulatory government agencies. PW's unique position within NSW Government enables us to bridge the gap between our clients and Government stakeholders to ensure necessary consultations and approvals are undertaken efficiently and effectively.



➤ Managed risks

We place considerable emphasis on advising clients of their risks on projects, including the options and costs to manage these risks. Wherever possible, risks are identified early and inform our planning and procurement strategy development processes. Risks are continuously monitored and updated as projects progress and discussed and managed with clients and contractors.

Working across NSW



Hunter North West Region

- Newcastle**
117 Bull Street
Newcastle West NSW 2302
- Tamworth**
155-157 Marius Street
Tamworth NSW 2340
- Armidale**
85 Faulkner Street
Armidale NSW 2350
- Dubbo**
209 Cobra Street
Dubbo NSW 2830
- Broken Hill**
Level 1, 32 Sulphide Street
Broken Hill NSW 2880

Greater Sydney & Central West Region

- Parramatta**
6 Parramatta Square
10 Darcy Street
Parramatta NSW 2150
- Sydney CBD**
52 Martin Place
Sydney NSW 2000
- Bathurst**
Level 1, 346
Panorama Avenue
Bathurst NSW 2795

South Coast Riverina Region

- Wollongong**
Level 3, Block E
84 Crown Street
Wollongong NSW 2500
- Moruya**
66 Campbell Street
Moruya NSW 2537
- Queanbeyan**
257 Crawford Street
Queanbeyan NSW 2620
- Wagga Wagga**
4 Coleman Street
Wagga Wagga NSW 2650
- Griffith**
200 Murray Road
Hanwood NSW 2680
- Dareton**
1998 Silver City Highway
Dareton NSW 2717

North Coast Region

- Lismore**
120 Dalley Street
Lismore NSW 2480
- Coffs Harbour**
359 Harbour Drive
Coffs Harbour NSW 2450
- Port Macquarie**
Level 2, 41-47 Horton Street
Port Macquarie NSW 2444

NSW Public Works

- PROJECT MANAGEMENT
- ADVISORY & ENGINEERING
- ENVIRONMENT & PLANNING
- SUSTAINABILITY
- ASSET MANAGEMENT
- SURVEY & SPATIAL



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