

# Digital engineering and design





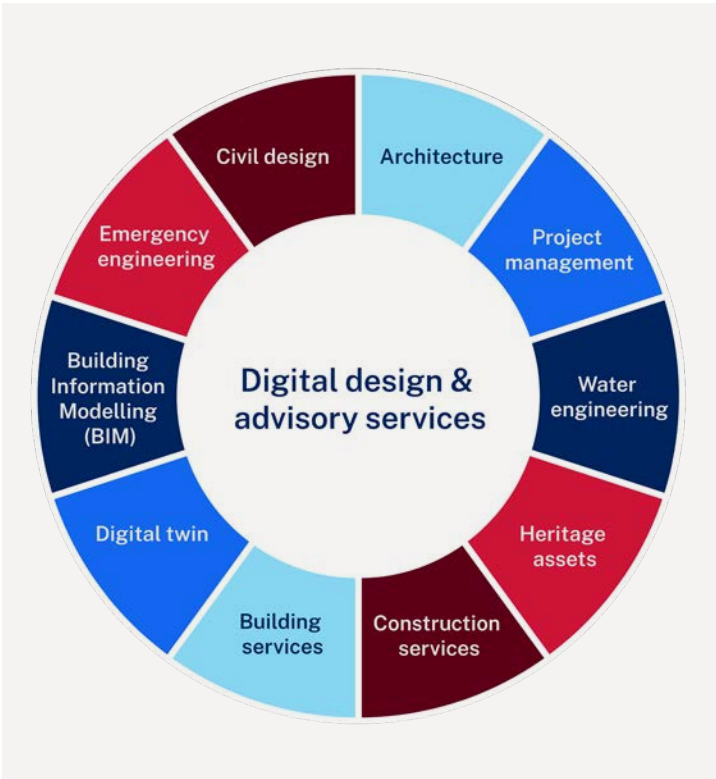
# Overview

We are 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 include the development of project and asset information models using 12D, Autodesk AEC Collection and advanced collaboration platforms such as Autodesk Construction Cloud. We implement digital engineering 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.

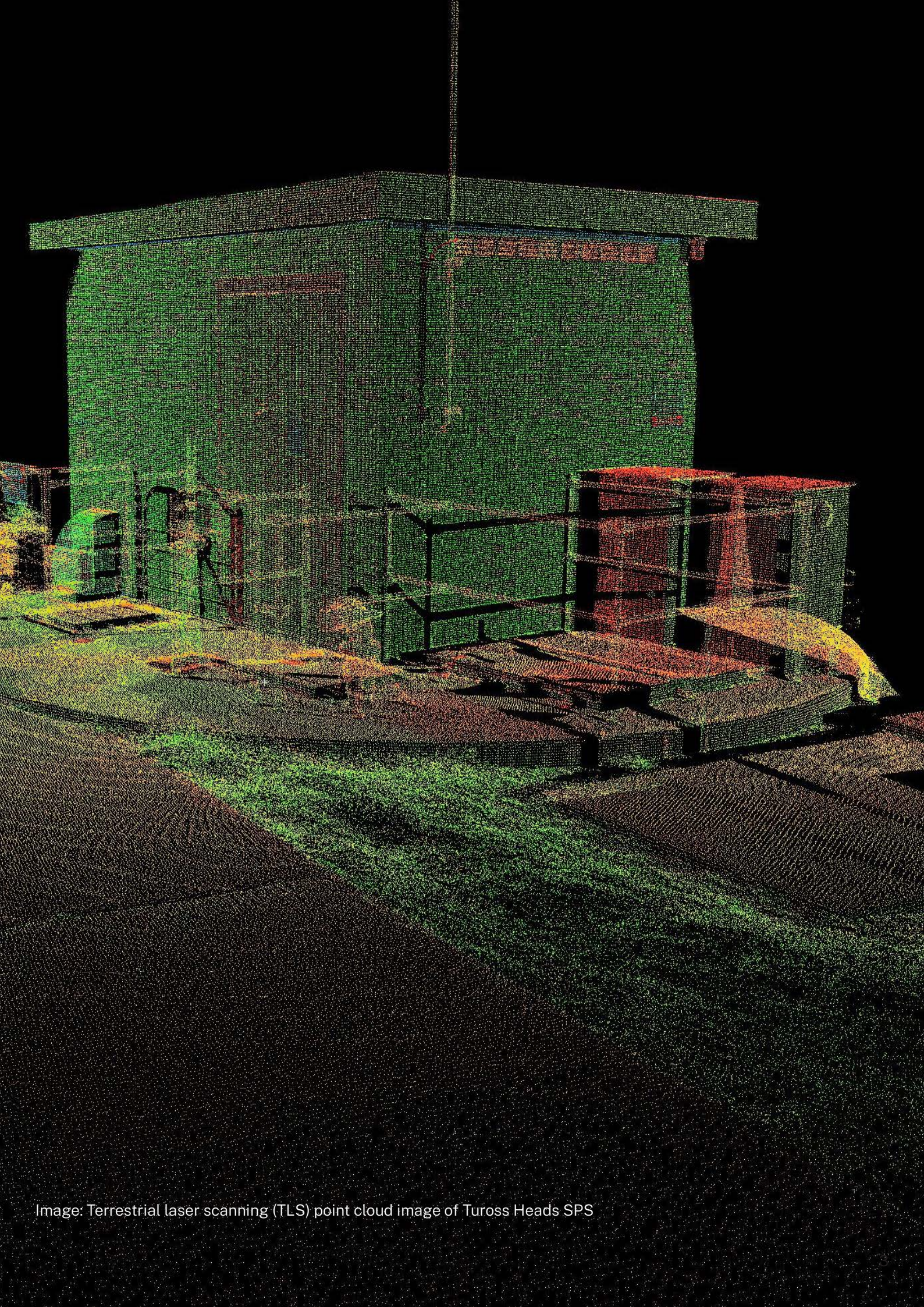
We believe in providing customised digital engineering solutions that are specifically tailored to meet our clients' unique needs and objectives. Our team takes the time to understand project requirements, constraints and desired outcomes, allowing us to develop strategies and designs that optimise results.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



**Contact us:**

**Mike Taherian**  
Senior Manager Digital Engineering  
0426 933 997  
mike.taherian@pwa.nsw.gov.au

**Allan Gear**  
Group Director Advisory & Partnerships  
0436 652 648  
allan.gear@pwa.nsw.gov.au



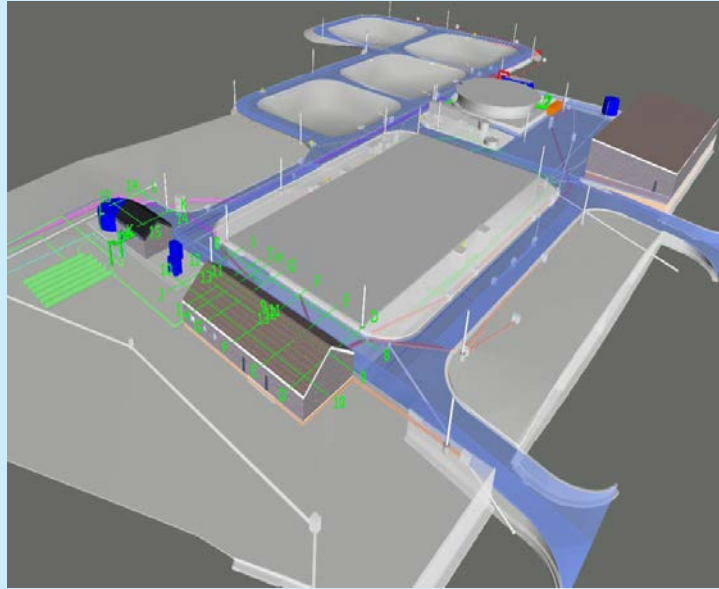
Front page: 3D laser scanning of the former Darlinghurst Police Station

Image: Terrestrial laser scanning (TLS) point cloud image of Tuross Heads SPS



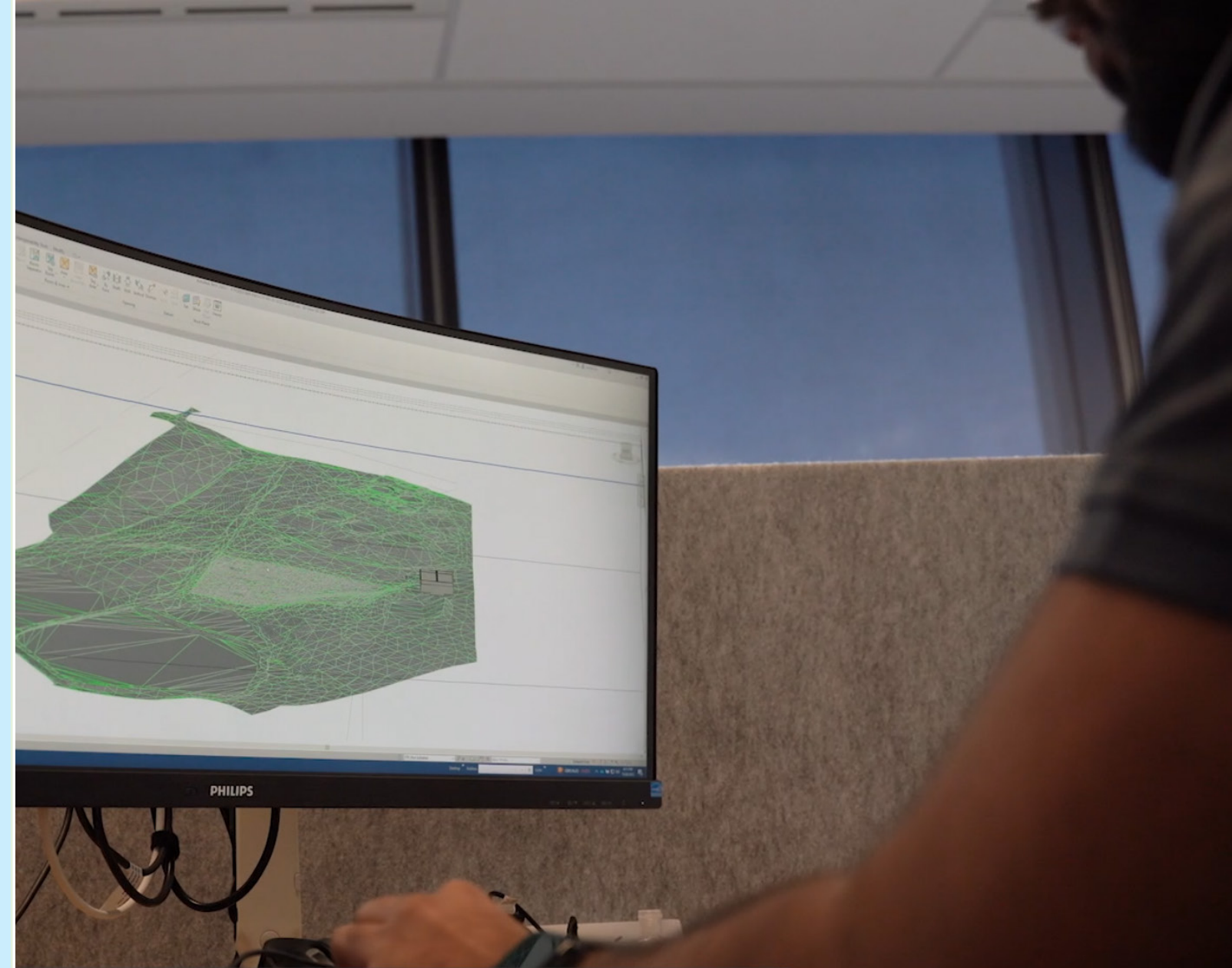
# Our expertise

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 pump stations
- 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 model of North Grafton Sewage Treatment Plant



## Extensive local engineering experience

Our NSW Public Works team is a trusted provider of engineering solutions with extensive local and regional engineering experience in New South Wales.

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 digital engineering services.

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



# Benefits of designing to contemporary digital engineering standards

Designing to contemporary digital engineering 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 digital engineering standards include:

- Efficient access to site survey data in 3D Photogrammetry and Point Cloud
- Enhanced stakeholder collaboration through project hub 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.



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



Image: Terrestrial laser scanning (TLS) jetstream image of Tuross Heads SPS





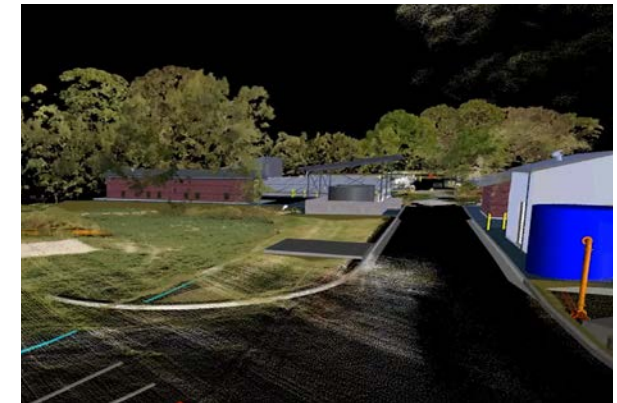
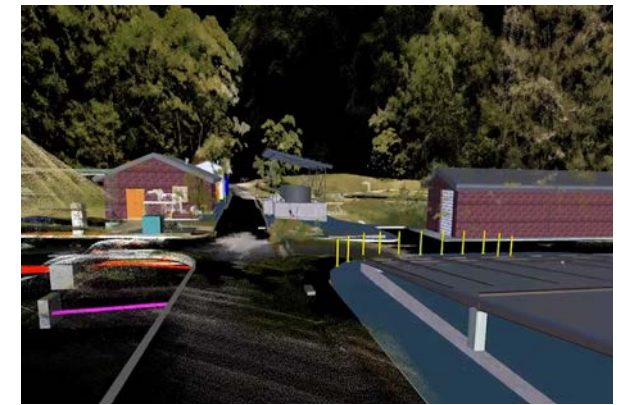
## Projects in profile

We have a strong track record in delivering effective digital engineering and advisory services.

### 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 NSWPW.

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

NSWPW 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.





# 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
- Navisworks
- Robot Structural Analysis
- Revit
- Infracore
- Tekla Tedds
- Plant 3D
- Advanced Steel
- Microstran
- Civil 3D
- Robot Structural Analysis
- ESRI ArcGIS
- AutoCAD
- Tekla Tedds
- Inventor
- Microstran
- Recap
- ESRI ArcGIS

## Digital engineering 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 Digital Engineering Standards and Contractual Documents.



## In-house survey and spatial capability

Our Digital Engineering 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. In summary, 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
- 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 Implementing Digital Engineering Standards
- Preparation of Digital Engineering Execution Plans



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



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



# Why choose NSW Public Works?



**Accredited  
for planning  
and delivery of  
capital works**

NSW Public Works 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 NSW Public Works under the provision of NSW Government Procurement Board Direction PBD 2020-04 and Section 55 of the Local Government Act 1993, providing efficiencies and cost savings.



**Strong focus  
on quality,  
environmental  
and safety  
management**

NSW Public Works operates under triple certification for quality, occupational 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. NSW Public Works' 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. NSW Public Works' 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 NEW ENGLAND REGION

**Newcastle**  
117 Bull Street  
Newcastle West NSW 2302

**Tamworth**  
155-157 Marius Street  
Tamworth NSW 2340

**Inverell**  
240 Byron St  
Inverell NSW 2360

**Armidale**  
85 Faulkner St  
Armidale NSW 2350

## NORTH COAST REGION

**Lismore**  
120 Dally 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

## SYDNEY METRO REGION

**Parramatta**  
4 Parramatta Square  
12 Darcy Street  
Parramatta NSW 2150

**The Rocks**  
66 Harrington Street  
Sydney NSW 2000

## SOUTH COAST REGION

**Wollongong**  
Level 3, Block E  
84 Crown Street  
Wollongong NSW 2500

**Goulburn**  
Suite 5, 167 Auburn Street  
Goulburn NSW 2580

**Moruya**  
66 Campbell Street  
Moruya NSW 2537

**Queanbeyan**  
Ground Floor East  
11 Farrer Place  
Queanbeyan 2620

**Nowra**  
5 O'Keefe Avenue  
Nowra NSW 254

## RIVERINA/WESTERN REGION

**Bathurst**  
Level 1, 346 Panorama Avenue  
Bathurst NSW 2795

**Dubbo**  
34 White Street  
Dubbo NSW 2830

**Broken Hill**  
Level 1, 32 Sulphide Street  
Broken Hill NSW 2880

**Griffith**  
104 - 110 Banna Avenue  
Griffith NSW 2680

**Wagga Wagga**  
2-6 Coleman Street  
Wagga Wagga NSW 2650

**Dareton**  
1998 Silver City Highway  
Dareton NSW 2717





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**T** 1300 00 88 88

**E** [publicworks@pwa.nsw.gov.au](mailto:publicworks@pwa.nsw.gov.au)