

“where
INNOVATION
meets
CREATIVITY”



**T-SQUARE
ENGINEERS**

“your innovation & creative partner”

Civil Engineering Capabilities





Understanding Civil Engineering

Civil engineering capability refers to the collective knowledge, technical proficiency, practical experience, and innovative mindset required to conceptualise, plan, design, construct, and manage infrastructure projects.

It encompasses both individual competencies and organisational strengths, blending scientific understanding with creativity, analytical thinking, and a commitment to public safety and sustainability.

TECHNICAL KNOWLEDGE: Mastery of mathematics, physics, material science, geology, and hydrology forms the bedrock of civil engineering capability. Understanding how materials behave, how forces act upon structures, and how natural systems interact with the built environment is essential for safe and effective design.

PROJECT MANAGEMENT: Effective civil engineering requires not only technical prowess but also the ability to manage budgets, timelines, resources, and multidisciplinary teams. Strong project management ensures that complex infrastructure projects are delivered on time, within scope, and to the required quality standards.

SUSTAINABILITY AND INNOVATION: The modern civil engineer must embrace sustainable design, incorporating renewable materials, energy-efficient systems, and minimising environmental footprints. Innovation—whether through new construction techniques, digital modelling, or smart infrastructure—is key to meeting the challenges of a changing world



Through our office foot print within South Africa, we provide sustainable engineering solutions across the entire Civil Engineering Industry. We undertake complex projects that shape the structure of society in roads, bridges, dams, airports, water systems, ports and many more. As the world faces new and complex challenges, from climate change to digital transformation, the capabilities of civil engineers must evolve accordingly. By embracing sustainability, leveraging technology, and upholding the highest ethical standards, civil engineering will continue to build a resilient, equitable, and prosperous future for all.

Our Services

Our resource team of elite specialists provide solutions from inception to concept planning stages all the way to project management and project delivery.



Planning

From the Assessment of project & understanding client's brief, we gain an in-depth understanding of the project objectives & develop a proper project scope.



Designing

With our innovative coupled with creative design expertise, we ensure that our project designs meets Clients and most importantly, receiving community's needs.



Project Delivery

With our tailor-make systems, we keep our projects on schedule, within budget, mitigated risk, meet standard specifications and ensure regulatory compliance.



Managing

For all our projects on construction stage we prepare project specific Implementation Plan and Site Management Systems.

Roads and Stormwater



For our road and highway design services we use Civil Designer, Civil 3D, Road Maker and AutoCAD software to ensure visual representation and optimised design solutions. Our capabilities include: design development of rural roads, urban collectors, access roads, primary roads, dual carriageways, freeways, intersections, interchanges, general public transport and non-motorised transport facilities. Our design services includes but not limited to the following:

- Visual Assessment, Planning & design of road & Storm-water network. Preparation of Roads & Storm-water Master Plan. Design of Bridges and Culverts.
- Labour Intensive design & construction methods.
- Maintenance of Road &; Storm-water networks.
- Traffic counting services.
- Preparation of Pavement Design Certificate.
- Transportation Planning and Traffic Engineering.
- Public Transportation.
- Borrow Pit Investigations.
- Geotechnical Investigations.
- Technical Evaluation of roads and highways.
- Traffic calming and Management. Complex Junction and Interchange

Municipal Engineering



Municipal engineering focuses on the planning, design, construction, & maintenance of infrastructure and services within cities and towns, ensuring the smooth operation of urban environments. It's a branch of civil engineering that tackles a wide array of essential systems, including water supply, sewage, roads, and waste management. Essentially, municipal engineers work to create and maintain the infrastructure that supports the daily lives of city residents. Our design services includes but not limited to the following:

- Municipal Water and Sewer Reticulation.
- Bulk Infrastructure and rural water supply.
- Main Water Feeder lines.
- Ring-feed Network System.
- Surfaced, gravel and interlocker paved roads.
- Labour Intensive design and construction methods.
- Maintenance of Roads &; Storm-water networks.
- Traffic Engineering.
- Earthworks and platform designs for buildings and major structural services.

Transport Planning & Traffic Engineering



We provide specialised Consulting services in Traffic Engineering and Transportation Planning. Our studies focuses on a single mode or multi-modal integration in local, metropolitan and regional jurisdiction. Our team has vast experience in the development of transport plans at national, provincial, district and local authority level. Our areas of expertise include but not limited to the following:

- Transport and Traffic Impact Studies and Data Collection.
- Road Intersection and network capacity analysis.
- Traffic Modelling: Regional & Local
- Traffic Signal and Control Systems Design plus Implementation.
- Road Safety Audits and Design.
- Traffic & Access Management .
- Intelligent Transport Systems (ITS) planning and design.
- Commuter needs Assessments.
- Land use and transportation studies.
- Public Transport Planning &; infrastructure design.
- Transport Policy Developments.
- Transportation Modelling.
- Integrated Transport Plans.
- Non-Motorised Trans Plan &; Design.
- Rural Transport Planning &; Design.
- GIS and Mapping.
- Special needs passenger planning.

Non-Motorised Transport



We specialise in the concept of 'complete streets' by designing safer streets which support the promotion of non-motorised transport (NMT) activities such as walking and cycling as well as considering Universal Access. These Complete Street Designs help create more liveable communities. We have delivered the following Complete Street guidelines:

- Department of Transport NMT Facilities Guidelines, 2014.
- We have been involved with the design of NMT facilities for pedestrians and cyclists in various cities in South Africa.

Water Management Services



Water treatment works involve several processes to make raw water sources safe and potable. These processes typically include coagulation and flocculation, sedimentation, filtration, and disinfection. our design services includes but not limited to the following:

- Water resource planning.
- Design of Bulk water storages.
- Bulk water augmentation.
- Water network reticulation:
 - Hydraulic Modelling of water systems.
 - Leakage & uncounted for water studies.
 - Design of Water Purification Works.
 - Operation & Maintenance of water systems.
- Tunnelling and Geotechnical Services.
- Telemetry and network monitoring.
- Water Quality assessments.
- Advanced Technology Water meter reading services.

Wastewater Management Services



Wastewater treatment works, also known as sewage treatment plants, use a multi-stage process to purify wastewater before it's safely returned to the environment or reused. These processes involve physical, chemical, and biological methods to remove solids, organic matter, nutrients, and pathogens from wastewater. Our design services includes but not limited to the following:

- Status quo investigations of existing plant conditions
- Feasibility Studies & Technical Report preparations.
- Flow and Load Analysis.
- Raw Water intake systems.
- Refurbishment, upgrading & alterations to existing plants.
- Construction of new works & retrofitting of existing works using the evolutionary HYBAC Systems.
- Wastewater recycling and reuse.
- Pump station designs.
- Process design, analysis and modelling.
- Flow and loads analysis.
- Raw Water abstraction systems.
- Double Screening of Inlet works.
- Final Effluent disinfection.
- Health & Hygiene Programmes: Source of Funding & Implementation.

Bulk Water Storage



The increasing scarcity of fresh water necessitates assessment of the quantity and quality of existing water resources. Our expertise covers water and bulk-water resource planning, supply, storage and conveyance and flood risk management with services included:

- Water Demand Forecasting.
- Surface runoff hydrological studies.
- Flow and Load Analysis.
- Reservoir yield determination.
- Preparation of Hydrological data in line with the National Water Act.
- Computerised based Models and geographic information.

Dams



We do Feasibility Studies, design, inspection, monitoring, risk evaluation, refurbishment and remedial works design in all stages of the life cycle of dam projects with following services included:

- Hydraulic Analysis and Design Concepts.
- Structural Analysis and Design.
- Geotechnical and geological analysis and modelling and foundation treatment.
- Topographic Modelling.
- Value Engineering.
- Contract documentation and administration.
- Construction Supervision.
- Rehabilitation and remedial work.
- Final Effluent disinfection.
- Health & Hygiene Programmes: Source of Funding & Implementation.