



EMPLOYERS REQUIREMENTS:

**APPOINTMENT OF A TURNKEY
CONTRACTOR FOR THE UPGRADE OF
CIVIL ENGINEERING SERVICES AT LENZ
MILITARY BASE JOHANNESBURG**

Report N° –

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1.0 GENERAL REQUIREMENTS

1.1 General Scope and Employer's Bid Document Drawings

The Scope of Work entails Upgrades of Civil Engineering services such as Water Reticulation, Fire, Bulk Water Supply, Sewer Reticulation, Bulk sewer, Stormwater Management and three (3) Pump Stations as outlined below:

1. Water Reticulation

- a) **Assessment of Existing Infrastructure:** Evaluate the current water reticulation system to determine the condition and capacity limitations.
- b) **Design and Engineering Improvements:** Develop engineering designs that incorporate modern materials and technologies to enhance efficiency.
- c) **Pipe Replacement and Installation:** Replace outdated pipes with Unplasticized Polyvinyl Chloride (uPVC) or high-density polyethylene (HDPE) as required.
- d) **Flow Monitoring:** Implement flow measurement devices to monitor usage and identify leaks.
- e) **Quality Control:** Ensure compliance with local standards for water quality throughout the distribution system.
- f) **Upgrade all isolation valves, old water metres, and all other water related structures as required.**
- g) **Design, supply, and upgrade where applicable all fire water tanks, pumps, and associated piping & Fire Hydrants etc.**

2. Secondary Main Water Supply

- a) **Infrastructure Assessment:** Analyse the existing bulk water supply system's capabilities, including reservoir storages (Tanks), treatment facilities, and pumping stations.
- b) **Capacity Expansion:** Design and implement upgrades to increase the overall capacity to meet future demands.
- c) **Storage Solutions:** Evaluate and enhance water storage solutions, including additional tanks or reservoirs.
- d) **Pumping Upgrades:** Upgrade existing pumping infrastructure to improve efficiency and reliability, including the installation of variable frequency drives (VFDs) for energy savings where possible.

3. Sewer Reticulation

- a) **Network Evaluation:** Assess the existing sewer reticulation system to identify bottlenecks and areas needing improvement.



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- b) Pipe Rehabilitation: Use trenchless technology where possible for rehabilitation of existing sewer pipes where applicable, minimising surface disruption.
 - c) New Installations: Install new sewer lines as per the updated design, ensuring adequate capacity for future growth.

4. Secondary Sewer Main

- a) Treatment Plant Analysis: Review and optimize the existing sewer treatment facilities to handle increased volumes and enhance treatment processes.
- b) Infrastructure Design: Upgrade infrastructure to facilitate efficient transport of sewage to treatment plants, including pumping stations if necessary.
- c) Regulatory Compliance: Ensure upgrades comply with environmental and health regulations, including effluent quality standards.

5. Pump Stations (three)

- a) Site Assessment: Conduct a site assessment for the current conditions of the three existing sewer pump stations.
- b) Design and Specifications: Prepare detailed designs for the pump stations, including mechanical, electrical, and structural components.
- c) Upgrades and Installation: Oversee the upgrades and installation of the pump stations, ensuring they are equipped with modern automation and monitoring systems.
- d) Testing and Commissioning: Perform comprehensive testing and commissioning of each pump station before being brought online

6. Stormwater Management

- a) Assessment of Current Systems: Assess existing stormwater management systems to determine current capacity and functioning.
- b) Design Improvements: Create new designs for stormwater management features such as detention basins, swales, and permeable pavements.
- c) Retention Solutions: Implement green infrastructure solutions to enhance stormwater retention and reduce runoff impact.
- d) Clean existing channels and clear trees and rubble and strip & seal joints

The Contractor shall ascertain all local conditions relevant to the works and associated systems. The Contractor shall do and provide whatever is necessary to fulfil his obligations under the Contract.

The Contractor shall be responsible for ensuring that his design complies with all relevant standards,



codes of practice and by-laws including specifications included in the bidding document.

All plant, equipment and material items supplied and/or installed under the Contract shall be well coordinated and be compatible with each other and, where applicable, with existing plant, to form integrated systems. In designing the Works the Contractor shall adopt layouts which will produce efficiency in operation and at the same time make reasonable allowance for optimizing the use of the building for future needs.

Construction documents including drawings, designs and design calculations and the like shall be submitted by the Contractor as required by the Employer's Requirements. The Contractor shall test and commission all plant and equipment supplied and installed under the contract and demonstrate to the Employer that they perform to the specified standards and design requirements.

All staff, labour, materials, consumables, electrical power costs shall be provided by the Contractor during the period of testing and commissioning.

1.1.1 Deliverables based on the scope

The following deliverables are expected from the contractor based on the scope of work as outlined in this document.

1.1.1.1 Planning & Design (Phase 1)

- a) Detailed Condition Assessment & Testing of infrastructure
- b) Develop preliminary designs (where applicable)
- c) Detailed Bill of Quantities (in line with Priced Activity Schedule)
- d) Project Implementation Plan (including Subcontractor packages)
- e) Detailed Programme
- f) Contract Documentation (i.e. guarantees, insurances & Indemnity)
- g) Obtain the relevant statutory approvals prior to commencing with the next phase (i.e. Construction Work Permit, Building Plan Approval etc.)

1.1.1.2 Implementation / Construction (Phase 2)

- a) Site establishment
- b) Decanting (where applicable)
- c) Detailed construction documentation i.e. construction drawings, demolition plans, specifications, room data sheets etc.,
- d) Conduct construction activities/ repairs and renovations
- e) Site supervision (Regular inspections and sign-off of completed works)
- f) Contract Administration (Conduct meetings, prepare and submit progress reports, SHE Audits, issue contract instructions)
- g) Progress payment certification.

1.1.1.3 Close-Out (Phase 3)

- a) Final Account (Signed)
- b) Certificates of Compliance (COC's)
- c) Testing & Commissioning
- d) Occupation Certificate
- e) As-Built Drawings



- f) User Manuals
- g) Close-out report.

The Turnkey Contractor to have in its team all the relevant professionals with appropriate registration with the different Built Environment Councils to be able to carry out all the required/necessary/desired Professional Services that are required to deliver successfully the Lenz Military Base Project where such services would be required at various stages of project implementation over the entire duration of the project. These include the Fire Engineer / Inspector, Mechanical Engineer, Electrical Engineer, Geotechnical Engineer and where such work shall include but not limited to provide all professional services such as design, supervision of construction work, sign-off and certification of work done.

The building will be vacated to allow for the works to proceed with no further hindrance.

1.1.2 Employer's Bid Document /Reports

The condition assessment reports provided with the bid documents are intended to show the general condition of the building at the time of assessment to illustrate the required refurbishments to the building. The Employer does not warrant that these capture a definite condition of the building and the Contractor is required to acquaint himself of the prevailing condition and Employers requirements in determining his bid for the works.

1.1.3 Programme of Works

1.1.3.1 Programme

The Programme of Work shall be divided into the following periods:

Milestone 1 – Condition Assessment: Detail assessment of the prevailing condition of the services and associated infrastructure, etc. Contractor to produce a detailed assessment report with Bills of Quantities in line with the priced Activity Schedule.

Milestone 2 – Design & Specification: Design of the works including submission of Construction Documents and construction drawings for review;



Milestone 3 - Construction Period – Decanting and removal of existing components including safe storage, construction works;

Milestone 4 - Commissioning & Handover - Putting Sewer Pump Stations into operation, completion tests, proving the process and initial instruction and training. Provide all necessary Certificates of Compliance for Electrical, Fire and Mechanical Works.

The above periods may overlap as necessary except for the following constraints:

Milestone 3 and subsequent milestones shall not commence until the Contractors detailed construction documentation and detailed drawings have been submitted for review and accepted by the Employer.

1.1.4 Design

1.1.4.1 Design Responsibility

The Contractor shall design the Works in accordance with the Employer's Requirements, including the quality assurance systems specified in the Employers Bid documents. The design shall be based on the proposals submitted with the Contractor's Bid.

For designs, the Contractor shall provide all Civil Engineering and drawings and layouts that present preliminary designs, including details on the proposed styles, finishes, and other specifications for the various services. These drawings and sketches will be reviewed by the Employers Representative.

Detailed design work shall proceed only after the Employers Representative has provided written acceptance of the preliminary Civil Engineering designs. The Contractor must obtain approval from the relevant local authority before commencing construction on-site.

Regardless of any acceptance by the Employers Representative of the Contractor's Design and Construction Documents, or any comments made (or not made) on matters submitted for review, the Contractor remains fully responsible for ensuring that the design, construction, performance, and operation of the Works comply with the Employer's Requirements.

The Employers Representative may, at any stage of the design, or construction of the Works (prior to the issuance of the Final Certificate), highlight any non-compliance with the Employer's Requirements.



Acceptance, comments, or lack of comments from the Employers Representative do not relieve the Contractor of any of their obligations and responsibilities under the Contract.

Only Construction Documents, including drawings that have been accepted by the Employers Representative, shall be used by the Contractor in carrying out the Works.

1.1.4.2 Criteria for Design Personnel

a) Contractor's Representative

The Contractor's Representative must possess the necessary qualifications and experience that are acceptable to the Employers Representative. They will be responsible for coordinating and overseeing all aspects of the project, from the initiation of investigations and design through to the final completion and commissioning of the Works. Their duties include ensuring that the Works are a well-Employers Representative and cohesive project, in full compliance with the Employer's Requirements.

b) Design Personnel

The Contractor shall have in its team qualified and experienced personnel, acceptable to the Employers Representative, to be responsible for each element of the works listed below. The nominated personnel shall include those specified in the Contractor's Bid for the relevant roles.

- Overall Project Team Lead (OPTL)
- Civil Engineer
- SHE Agent
- Land Surveyor

Once the personnel nominated have been approved by the Employers Representative, no changes to these personnel shall occur unless written approval is obtained from the Employers Representative for the new nominee, who must be at least equivalent to or more qualified than the previously approved nominee. The minimum key requirements are outlined in Section T1.3 – Evaluation and Qualification Criteria.

1.1.4.3 Design Programme

Programme Periods for Review by Employers Representative

The Programme shall allow at least 14 days for review of a submission by the Employers Representative and shall include reasonable provision for re-submission of items for review following comments by the Employers Representative.

The Programme shall allow for at least 7 days for review by the Employers Representative of items re- submitted by the Contractor.

These periods may be extended depending on the quantities drawings/ documentation to be reviewed.

1.1.5 Review of Submissions

Items submitted for review by the Contractor

The Contractor shall submit to the Employers Representative for review two complete draft sets of Operation and Maintenance Manuals and As-built record drawings. The Employers Representative will assess the suitability of the draft manuals and shall within 10 days of receipt of the manuals either Accept or Reject with comments for further revising by the Contractor.

1.1.6 Site Establishment

1.1.6.1 Water Supply

The Contractor shall arrange for an adequate supply of potable water for their own use, including drinking, washing, sanitation, and general cleaning, in addition to the water required for the construction, testing, and commissioning of the Works.

1.1.6.2 Electricity Supply

The Contractor shall make the necessary arrangements to provide sufficient power to sustain the operations and all construction works as may be required to complete the works.



1.1.6.3 Contractor's Accommodation

The Contractor shall set up, construct, maintain, and later remove all temporary offices, ablution facilities, storage areas, workshops, and similar structures required for the efficient execution and supervision of the Works. The location and arrangement of the Contractor's accommodation must be approved by the Employers Representative. The Contractor is prohibited from establishing any camp or temporary living quarters for staff within or near the Works Site. Additionally, the Contractor shall remove any unauthorized squatters or unofficial camps from the site.

1.1.6.4 Amenities to be Preserved

The Contractor shall minimize any disruption to existing amenities and facilities, whether natural or man-made. Trees shall not be removed unless authorized by the Employers Representative, and site clearance shall be limited to what is strictly necessary for the Works and Temporary Works. The Contractor must ensure that no damage or pollution occurs to existing installations and take proactive measures to minimize any inconvenience to nearby residents, tenants, or buildings.

1.1.6.5 Site Notice Board

The Contractor shall not display, nor allow the display of, any advertisement board on the site without the written consent of the Employers Representative. Any advertisement must also be approved by the Employers Representative before being erected, and it must be removed if the Employers Representative requests it.

1.1.7 Safety, Health and Environmental

Contractor to adhere to provisions as set out in the SHE Specification attached to the bidding documents.

1.1.8 Samples

The Contractor shall provide the Employers Representative with samples of all materials and goods intended for use in the Works, as requested by the Employers Representative. The Contractor is responsible for conducting any necessary tests on these samples. No materials or goods for the

permanent Works shall be used unless the Employers Representative has given written approval for the submitted samples.

1.1.9 Progress Reports and Meetings

The Contractor to submit on a monthly basis progress reports for the Works in a format to be approved by the Employers Representative.

1.2.1 Specifications

1.2.1.1 Technical Specifications

The infrastructure as highlighted earlier shall conform to the following design guidelines, ensuring the development meets the highest standards of functionality, safety, and sustainability.

a)	SANS 1200	A	- 1986 :	GENERAL
b)	SANS 1200	AB	- 1986 :	ENGINEERS OFFICE
c)	SANS 1200	AH	- 1986 :	GENERAL (STRUCTURAL)
d)	SANS 1200	C	- 1980 :	SITE CLEARANCE
e)	SANS 1200	DB	- 1983 :	EARTHWORKS (PIPE TRENCHES)
f)	SANS 1200	G	- 1984 :	CONCRETE (STRUCTURAL)
g)	SANS 1200	L	- 1983 :	MEDIUM PRESSURE PIPELINES
h)	SANS 1200	LB	- 1983 :	BEDDING (PIPE)
i)	SANS 1200	LD	- 1982 :	SEWERS
j)	SANS 0400		- 1990 :	NATIONAL BUILDING REGULATIONS
k)	SANS 0100		- 1992 :	CONCRETE (BUILDING WORKS)
l)	SANS 0161			FOUNDATIONS
m)	SANS 0164			PLASTERING

In addition to the above, the successful bidder is to also take note of the below specifications where they apply.

- a) SANS 2001 Construction Works (Construction Standard Specifications)
- b) CDC Planning Specification for Contractors
- c) PW371 Department of Public Works Specification: Specification of Materials and Methods to be used
- d) PW350 Department of Public Works Specification: Facilities for Disabled Persons
- e) PW347 Department of Public Works Specification: Civil Engineering Manual
- f) SANS 0400 National Building Regulations
- g) SANS (various) South African Bureau of Standards: National Standards
- h) All other applicable Public Works Specification.

1.2.1.2 Performance Standards

The contractor is hereby expected to conform with the following standards but not limited to;

- a) **SANS Standards:** The South African Bureau of Standards (SABS) which publishes the South African National Standards (SANS) which cover various aspects of construction, from material specifications to safety practices.
- b) **Construction Regulations:** The Occupational Health and Safety Act (OHSA) and its associated regulations set performance standards for health and safety on construction sites. It mandates risk assessments and safety measures to protect workers and the public.
- c) **Quality Assurance:** Implement ISO 9001 standards for quality management systems, ensuring consistent quality in construction processes and outputs.
- d) **Environmental Management:** Compliance with the National Environmental Management Act (NEMA) and other environmental regulations is crucial. This includes assessing the environmental impact of construction projects and implementing sustainable practices.
- e) **Project Management Standards:** The Project Management Institute (PMI) and Association for Project Management (APM) standards are often referenced for effective project management, including scope, time, cost, quality, and stakeholder management.
- f) **Client Requirements:** Performance standards may vary depending on the client's specific requirements, which can include timelines, budget, safety, and quality expectations.
- g) **Training and Competency:** All professional work to be undertaken by a professionally registered individual in each discipline in respect to this project.

In addition to the above standards the contractor is to also meet the standards listed below for performance.

- a) **Design Standards:** Compliance with local regulations and building codes (e.g., zoning laws, fire safety). Architectural and engineering quality to meet client specifications and aesthetic preferences. Sustainable design principles, including energy efficiency and environmental impact.
- b) **Quality Standards:** Specifications that construction materials and workmanship must meet. This includes compliance with local building codes and SANS standards (South African National Standards).



- c) **Time Standards:** Timelines set for different phases of construction, including project start and completion dates. This involves adherence to scheduling tools like Gantt charts and critical path methods.
- d) **Cost Standards:** Budgetary constraints that dictate spending on labor, materials, and other project expenses. Cost control measures and estimates are critical to avoid overruns.
- e) **Safety Standards:** Regulations that ensure the safety of workers and the public, including adherence to the Occupational Health and Safety Act and specific construction regulations.
- f) **Environmental Standards:** Guidelines for sustainable construction practices, including waste management, resource conservation, and minimizing environmental impact. Compliance with NEMA is essential.
- g) **Client Satisfaction Standards:** Metrics to assess how well the project meets the client's expectations regarding aesthetics, functionality, and overall project outcomes.
- h) **Productivity Standards:** Benchmarks for productivity levels, often evaluated by comparing outputs against inputs, measuring labor efficiency, and tracking project milestones.