BA-PHALABORWA MUNICIPALITY

MEMORANDUM

- BUDGET AND TREASURY _

To : Prospective service provider
From : SCM /stores
Date : 18/06/2024
Enquiries : Procurement Office
Telephone : 015 780 6361/62
Ref : 2025

Kindly furnish this office with a written quotation for supply of goods/ services as detailed below. The quotation must be submitted on the letterhead of your Business and Brought to our offices No.3 Nyala Street, Phalaborwa not later than 27/06/2024 at 12H00

QUANTITY	Description	Price/unit (Inc. Vat)	Delivery Period
1	DRILLING OF TWO BOREHOLES AT PHALABORWA LANDFILL AND TO CONDUCT TESTS		
	➢ ONE BOREHOLE AT THE UPPER STREAM ➢ COMPACTION DENSITY TEST UNDERGROUND WATER TEST		

Please number your quotes (Your Ref no)
The following conditions will apply:

- Price (s) quoted must be valid for at least thirty (30) days from date of your offer.
- The municipality retains the prerogative to reject any quotes it deems to be excessive
- A firm delivery period must be indicated.
- Tax Clearance Pin
- A service provider be registered with central supplier database (CSD)
- Completed MBD4 (Declaration of Interest) Form
- Evaluation criteria: 80/20 (Whereby 80 is for price and 20 is for Objective goals)

20 is further evaluated: 20 for 100% Black owned;
18 for +51% Black owned; and
14 for Less than 51% Black owned

Specification for Drilling of Borehole at the Landfill Site

1. General Overview
This specification outlines the requirements and procedures for the drilling of a borehole at the landfill site. The purpose of the borehole is to monitor groundwater quality and levels, as well as to facilitate the installation of monitoring equipment.

2. Site Preparation
 Site Survey: Conduct a detailed survey to determine the exact location for the borehole, ensuring it is strategically placed to avoid existing infrastructure and sensitive areas.
 Permits and Approvals: Obtain all necessary permits and approvals from local authorities and regulatory bodies before commencing drilling activities.
 Safety Measures: Implement all necessary safety measures, including site fencing, warning signs, and personal protective equipment (PPE) for workers.

3. Drilling Specifications
 Drilling Method: Rotary drilling method is preferred for its efficiency and ability to penetrate various types of soil and rock formations.
 Borehole Diameter: The borehole should have a minimum diameter of 150 mm (6 inches) to accommodate the installation of monitoring equipment.
 Depth: The borehole depth will be determined based on the site survey and groundwater level, with a target depth of approximately 30-50 meters or until groundwater is reached.
 Casing and Screen: Install a PVC casing and screen to prevent borehole collapse and to allow for accurate monitoring of groundwater. The screen section should be placed at the aquifer zone.
 Gravel Pack: A gravel pack should be installed around the screen section to filter out fine particles and maintain borehole stability.

4. Drilling Fluids and Cuttings
 Drilling Fluids: Use biodegradable and non-toxic drilling fluids to minimize environmental impact. Ensure proper management and disposal of drilling fluids to prevent contamination.
 Cuttings Disposal: Collect and properly dispose of drilling cuttings according to environmental regulations. Cuttings should be stored in designated containers and transported to an approved disposal site.

5. Borehole Development
 Cleaning and Development: After drilling, the borehole should be thoroughly cleaned and developed using methods such as air lifting or surging to remove fine particles and drilling fluids from the borehole and screen.

 Pump Testing: Conduct a pump test to determine the hydraulic properties of the aquifer and ensure the borehole is functioning correctly.

6. Monitoring Equipment Installation

 Instrumentation: Install monitoring equipment such as piezometers, data loggers, and water level sensors according to manufacturer specifications and project requirements.

 Calibration: Ensure all monitoring equipment is properly calibrated and tested before installation.

7. Reporting and Documentation

 Daily Logs: Maintain daily logs of drilling activities, including depth, geological formations encountered, drilling fluid usage, and any issues encountered.

 Final Report: Provide a comprehensive final report detailing the drilling process, borehole construction, and initial monitoring results. Include as-built drawings and all relevant data collected during the drilling process.

8. Environmental and Safety Considerations

 Environmental Protection: Implement measures to protect the surrounding environment, including proper waste management and spill prevention plans.

 Safety Protocols: Adhere to all safety protocols and regulations to ensure the safety of personnel and equipment. Conduct regular safety briefings and inspections.

9. Quality Assurance and Control

 Inspection: Conduct regular inspections to ensure compliance with specifications and standards. Any deviations should be documented and corrected immediately.

 Testing: Perform necessary tests on drilling fluids, cuttings, and groundwater samples to ensure they meet environmental and project requirements.

10. Closure and Rehabilitation

 Site Restoration: After completion of drilling and installation, restore the site to its original condition as much as possible. Remove all drilling equipment, waste, and temporary structures.

 Rehabilitation Plan: Implement a rehabilitation plan to address any environmental impacts caused by the drilling activities. This may include soil stabilization, re-vegetation, and monitoring of groundwater quality.

11. Compliance and Regulations

 Standards: Ensure all drilling activities comply with local, state, and federal regulations, as well as industry standards and best practices.

 Documentation: Maintain detailed records of all permits, inspections, and regulatory communications related to the drilling project.

Specification for underground water testing at the landfill site

Conducting underground water testing at a landfill site is crucial for monitoring potential contamination and ensuring environmental safety. The following specifications outline the process:

1. Preliminary Assessment

 Site History Review: Examine past landfill activities, types of waste disposed, and historical monitoring data.

 Hydrogeological Survey: Understand the groundwater flow, aquifer characteristics, and potential contamination pathways.

2. Sampling Plan

 Sampling Locations: Select strategic locations such as upgradient (background) and downgradient (potential impact zones) of the landfill.

 Sampling Depths: Determine the appropriate depths based on the local hydrogeology and depth of the waste layers.

3. Monitoring Well Installation

 Well Design: Install wells with appropriate casing and screens to sample specific aquifers or groundwater zones.

 Well Construction: Use materials resistant to chemical corrosion. Ensure proper sealing to prevent surface water intrusion.

 Well Development: Develop wells to remove drilling-induced fines and ensure representative water samples.

4. Sampling Procedures

 Purge Method: Purge wells to remove stagnant water, ensuring samples are representative of the aquifer. Typically, remove 3-5 well volumes.

 Sample Containers: Use appropriate containers (e.g., glass for organics, plastic for metals) pre-cleaned and preserved as required.

 Sample Preservation: Use preservatives (e.g., acid for metals) and maintain samples at 4°C during transport.

5. Parameter Selection

 Field Parameters: Measure pH, temperature, electrical conductivity, dissolved oxygen, and redox potential on-site.

 Laboratory Analysis: Test for common contaminants including:

- **Inorganics**: Heavy metals (e.g., lead, cadmium, arsenic), nitrates, chlorides, sulfates.
- **Organics**: Volatile organic compounds (VOCs), semi-volatile organic compounds (SVOCs), pesticides, PCBs.
- **Biologicals**: Total coliforms, E. coli.

6. Quality Assurance/Quality Control (QA/QC)

 Blanks and Duplicates: Use field blanks, trip blanks, and duplicate samples to ensure accuracy and detect contamination.

 Calibration: Regularly calibrate field instruments and ensure laboratory instruments are calibrated as per standard protocols.

 Chain of Custody: Maintain a documented trail from sample collection to analysis to ensure sample integrity.

7. Data Analysis and Reporting

 Data Validation: Verify the accuracy and precision of the data through QA/QC checks.

 Comparison to Standards: Compare results to regulatory standards and guidelines (e.g., EPA, local environmental regulations).

 Trend Analysis: Analyze data over time to identify trends or changes in groundwater quality.

 Reporting: Prepare comprehensive reports including methodology, results, QA/QC data, and interpretations. Provide recommendations for further action if contamination is detected.

8. Health and Safety

 Risk Assessment: Conduct a risk assessment to identify potential hazards and implement safety measures.

 Personal Protective Equipment (PPE): Ensure the use of appropriate PPE (e.g., gloves, safety goggles) during sampling and handling of contaminants.

 Training: Provide training for personnel on safe sampling techniques and emergency procedures.

9. Regulatory Compliance

 Permits and Approvals: Obtain necessary permits and approvals from relevant authorities.

 Record Keeping: Maintain detailed records of all activities, findings, and communications with regulatory bodies.

10. Remediation and Mitigation

 Contingency Plans: Develop contingency plans for immediate action if significant contamination is detected.

 Remediation Measures: Plan and implement remediation measures (e.g., pump-and-treat, bioremediation) if necessary.

Specification for compaction density test at the landfill site

A compaction density test at a landfill site is conducted to ensure that waste materials are being properly compacted, which is crucial for maximizing the use of available space, reducing settlement, and minimizing environmental impacts. Below is a detailed specification for conducting a compaction density test at a landfill site:

1. Purpose

To determine the in-situ density and compaction level of the waste materials at the landfill site, ensuring compliance with regulatory requirements and design specifications.

2. Scope

This specification covers the procedures, equipment, and standards to be used for conducting compaction density tests on municipal solid waste (MSW) at a landfill.

3. Applicable Standards

- ASTM D1556/D1556M: Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method
- ASTM D6938: Standard Test Method for In-Place Density and Water Content of Soil and Soil-Aggregate by Nuclear Methods (Shallow Depth)
- ASTM D5231: Standard Test Method for Determination of the Composition of Unprocessed Municipal Solid Waste

4. Equipment

- Sand-cone apparatus (for sand-cone method)
- Nuclear density gauge (for nuclear method)
- Shovel or auger (for excavating the test hole)
- Balance (for weighing materials)
- Moisture content determination equipment (oven, moisture cans, etc.)
- Standard compaction mold and rammer (for reference tests)

5. Test Methods

A. Sand-Cone Method

1. **Preparation**: Select a test location and clear loose material. Place the base plate on the test site.
2. **Excavation**: Dig a test hole with known dimensions. Collect the excavated material for moisture content determination.
3. **Filling**: Fill the hole with calibrated sand using the sand-cone apparatus.
4. **Calculation**: Calculate the volume of the test hole by measuring the amount of sand required to fill it.

5. **Density Determination**: Determine the in-situ density by dividing the weight of the excavated material by the volume of the hole.
6. **Moisture Content**: Determine the moisture content of the excavated material.

B. Nuclear Density Method

1. **Calibration**: Calibrate the nuclear density gauge according to the manufacturer's instructions.
2. **Testing**: Place the gauge on the test site and take the density and moisture readings as per the standard procedures.
3. **Validation**: Conduct reference tests to validate the gauge readings periodically.

6. Data Recording and Reporting

- Record all measurements including the weight of excavated material, volume of the test hole, and moisture content.
- Calculate the dry density of the waste material.
- Compare the obtained density with the specified compaction requirements.
- Document any deviations from the specified density and recommend corrective actions.

7. Quality Control

- Ensure that all equipment is calibrated and in good working condition.
- Perform tests at randomly selected locations to obtain a representative assessment.
- Conduct a sufficient number of tests to ensure statistical reliability.

8. Safety Precautions

- Follow all safety guidelines for handling and operating testing equipment.
- Ensure that personnel are trained in the use of nuclear density gauges and aware of radiation safety protocols.
- Use personal protective equipment (PPE) as required.

9. Environmental Considerations

- Minimize disturbance to the landfill cover and surrounding areas during testing.
- Properly dispose of any waste materials generated during the testing process.

10. Acceptance Criteria

- The achieved compaction density should meet or exceed the design specifications, typically expressed as a percentage of the maximum dry density determined from laboratory compaction tests (e.g., Proctor test).

11. Documentation

- Prepare a comprehensive report including test locations, methodology, results, and any corrective actions taken.
- Maintain records for regulatory compliance and future reference.