



TESTING & INSPECTION SERVICES

company

profile

Laboratory Recognition No.: UNBS/LRS/0001



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Pavement
Investigations



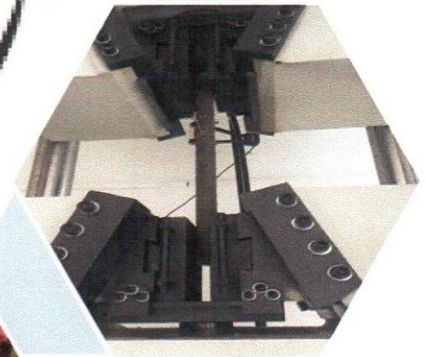
Civil Material
Testing



Geotechnical
Engineering



Soil
Stabilization



Metallurgical
Testing



Construction
Quality Inspections

Foreword

The development in our beloved country, Uganda, is progressing rapidly due to the strategic location of the region, which contributed to increased huge opportunities, as well as indulging in mega projects spanning the entire country in infrastructures, oil & gas industry and tourism. Therefore, the adoption of sustainable development strategy and knowledge-based economy stresses the need for more involvement from the science and technology side. The benefits of knowledge and science can be truly reflected, witnessed and believed when the implementation of the innovations is applied to benefit humanity at different times and places.

With this vision in mind, SMAT Laboratories came into existence in Uganda early 2005 as a third-party independent engineering testing and inspection services company. Since its establishment, we have aimed at being local in identity and international in our standards and quality. Now SMAT Laboratories has become the largest and most diversified lab in Uganda with several specializations including Civil testing, Geotechnical engineering, Metallurgical testing, Environmental testing, Chemical testing and Oil & Gas testing. Our services are reaching all parts of Uganda through full-fledged facilities at four locations: Kampala, Kasese, Gulu, Mbale and many project site-laboratories.

The lab is high-tech, multi-disciplinary testing and investigation facility that can deliver products on time and can stand international scrutiny. Our expertise is made possible by our integrated team of professionals in the field. More than 50 professional engineers, chemists, microbiologists, metallurgists and technicians provide to clients expert laboratory analysis, testing, and inspection services. Our dedication to provide highly accurate results, on time, and with a high degree of support makes SMAT the leading analytical lab in the country. Most importantly, we do all of this accurately, quickly, exceptionally well, and locally within Uganda.

The success of such integrated testing activities with an international dimension cannot be achieved without the involvement of recognized international parties which have long tradition in laboratory business and their dissemination of knowledge and experience. SMAT laboratories is in full association with SMAT Technical Services, a leading engineering company in East Africa. SMAT Technical Services Ltd. are certified by ISO 9001- 2015 and recognized by Uganda National Bureau of Standards as a laboratory implementing a management system in accordance with ISO 17025:2017 which maintains a rigorous QA/QC program, towards chain of custody, sample preparation and analysis.



Paul Nyungwe
Managing Director

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SMAT LABORATORIES
TESTING AND INSPECTION SERVICES

INTRODUCTION



INTRODUCTION

We are pleased to introduce SMAT Laboratories as an advanced multi-disciplinary lab established in Kampala, Uganda. The lab is promoted by Ugandan Engineers in association with East African based SMAT Technical Services Ltd., one of the leading Engineering firms over the East African region. SMAT Technical Services is playing a major role in the growing advancements witnessed in the country by providing technical testing and inspection services in various fields for sustainable development with assured quality in a controlled environment. SMAT conducts its business in a manner, which demonstrates technical competence and reliability and in return provides its clients with cost effective, quality, and on-time services. The management and the technical team of SMAT have thoroughly reviewed the levels of requirements to render quality services and thus have developed the necessary infrastructure to offer a complete range of services and have further proposed to develop the company capabilities in a progressive manner.

SMAT deserves your confident decision to have it as your preferred partner in your Testing and Inspection Services due to the following points:

SMAT is Accredited and certified as operating in accordance with ISO 9001:2015 and is recognized by Uganda National Buruea of Standards (UNBS) for testing in accordance with the recognized international standard BS EN ISO/IEC 17025:2017 for the competence of testing and calibration laboratories.

Four properly designed and full-fledged testing and inspection facilities in Kampala, Kasese, Gulu and Mbale.

Very comprehensive lab with diverse specializations that include Civil Testing, Geotechnical Engineering, Metallurgy, Environmental Testing, Chemical Testing, and Oil & Gas Testing.

Qualified and experienced testing and inspection professionals who have been working in many diverse industrial applications for numerous years in various countries.

Associated with a leading civil engineering Company in East Africa, SMAT Technical Services Ltd., staffed by professionals with several years of work experience in their respective disciplines, in East Africa.



SMAT LABORATORIES
TESTING AND INSPECTION SERVICES

VISION & MISSION





VISION STATEMENT

To be the leader in providing comprehensive, high tech and multi- disciplinary testing & inspection services for the various industries in Uganda & other countries.

MISSION STATEMENT

It is the policy of this company to conduct its business in a manner which demonstrates technical competence, training, quality, reliability and integrity while continuously improving & providing a cost-effective service for the laboratory's clients.



SMAT LABORATORIES
TESTING AND INSPECTION SERVICES

HSE POLICY





HSE POLICY

It is the policy of the Establishment that its operations are executed at all times in such a way to ensure the health, safety and welfare of the employees and other persons including customers, subcontractors and general public.

The establishment accepts the responsibility for health, safety and environment (HSE) and HSE matters are considered in equal importance to other business Objectives. To achieve our objectives SMAT Laboratories maintains a HSE policy integrated in its management system.

HSE OBJECTIVES

The establishment strives to maintain HSE standards through training, encouraging interest and enthusiasm in HSE and by developing personal responsibility for HSE.

The establishment is committed to protect the environment and minimize the waste and emissions to the environment.

SMAT Laboratories shall comply with the HSE legislations and regulations of Uganda and our documented management system requirements.

HSE policy will be communicated to all employees and other concerned parties and will be made available to the public.

SMAT Laboratories is committed to review the effectiveness of the HSE policy and its objectives annually during management review meetings to ensure the compliance and continual improvement of its HSE performances.

The Establishment shall provide all necessary resources to provide the safety of personnel and equipment as per national regulatory requirements.



SMAT LABORATORIES

TESTING AND INSPECTION SERVICES

QUALITY POLICY





QUALITY POLICY

It is the Policy of this Company to conduct its business in a good professional manner, which demonstrates technical competence and reliability while continuously improving and providing high quality testing and cost-effective service for the laboratory's Customers. For this purpose, we have established and implemented a formal quality system. It is our goal that this commitment to quality will result in complete customer satisfaction throughout our service. This will be achieved by:

Maintaining compliance to ISO 9001:2008 and ISO 17025:2005 and the technical requirements.

Continual improvement in the effectiveness of the management system.

Ensuring all staff familiarizes themselves with the content of the Quality Assurance Manual and complies with the policies, procedures and associated documentation and implement them at all times.

Providing a service built on a well-established Quality Management System meeting the requirements of both our clients and current regulations /standards.

Providing accurate and unbiased test results in accordance with the requirement of International or National or Internal or Customer specified test method.

Undertaking assignments only where we have the required competent staff and well maintained calibrated equipment.

Continuous improvement in the key production processes through involvement in applicable Proficiency Testing Programs, Intra-laboratory comparisons between analysts and inter-laboratory programs.

Developing staff skills through training and providing career growth opportunities to all employees.

Improving profitability of the company in accordance with guidelines set by shareholders each year.

Advising the customer, where appropriate, of potential problems detected as a result of tests or investigations in a timely manner.

QUALITY OBJECTIVES

Test Results shall be Accurate, Quick and Reliable.

Accept changes and continuously improve our services to meet Customer needs and expectations to enhance the value to our Customers.

Good Laboratory Practices shall be followed to ensure a suitable environment for the protection of Personnel, Equipment and Customer property.

Continuous improvement and development of competence of personnel through awareness, teamwork, education, training, communication and encouragement.

Advanced methods and practices shall be adopted to enhance customer satisfaction.

Management System is designed to meet the requirements of both Customers and Regulations/Standards.

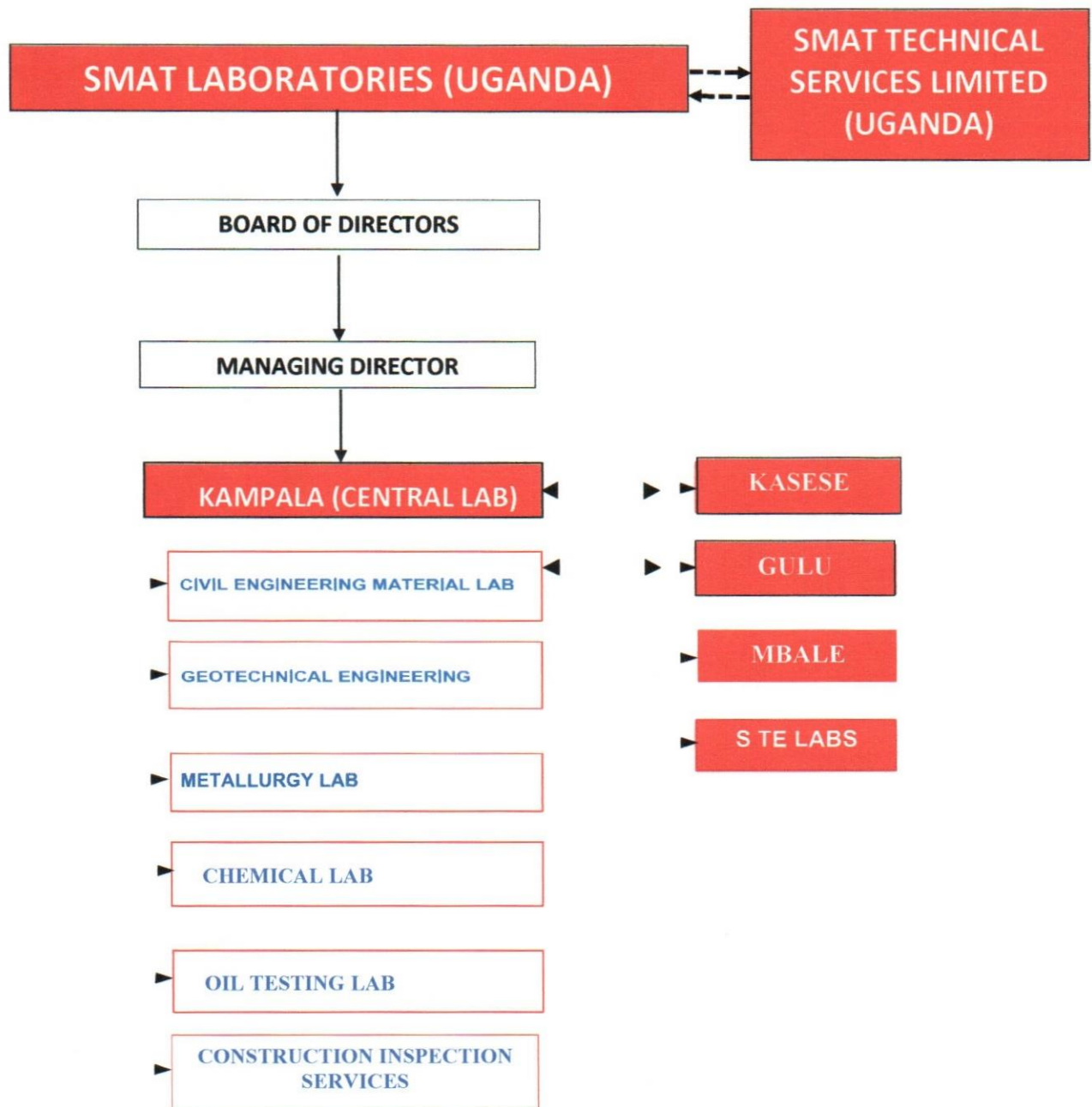
Achieve total Customer Satisfaction.

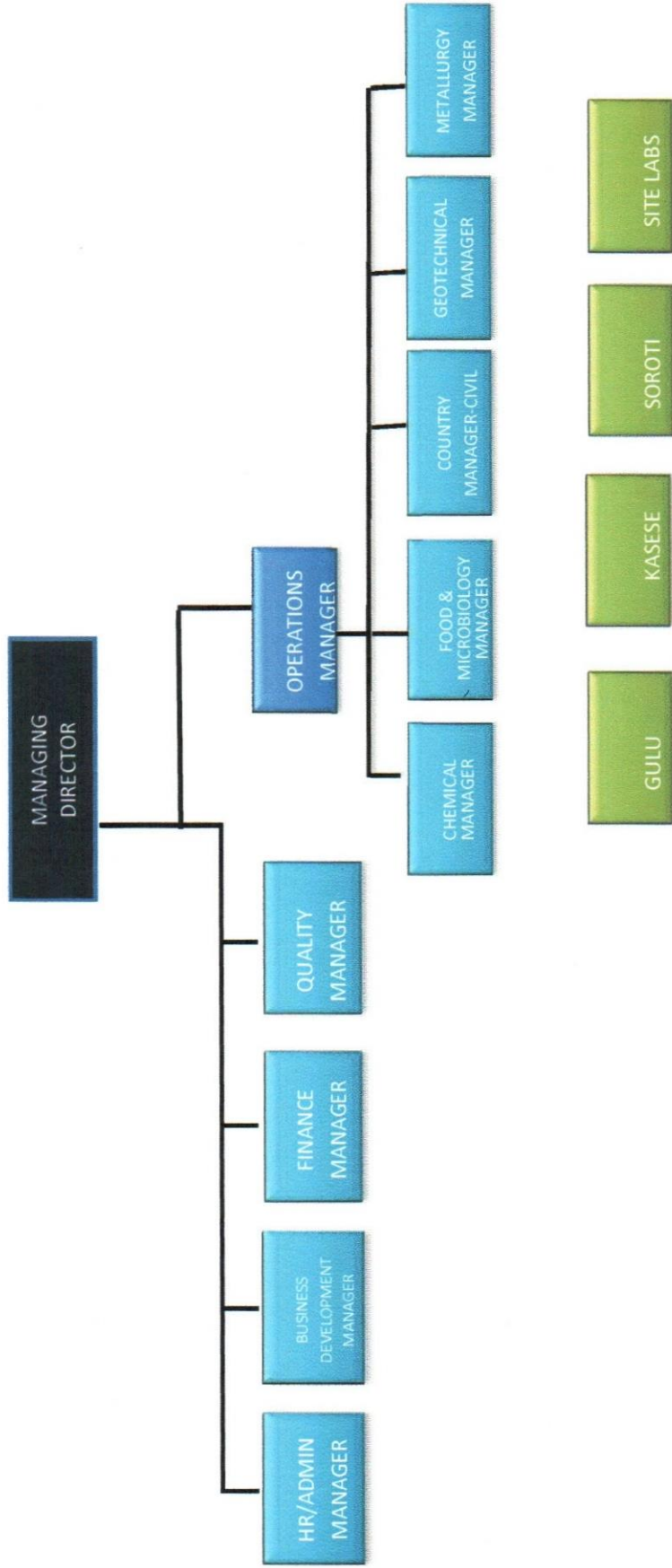


SMAT LABORATORIES
TESTING AND INSPECTION SERVICES

COMPANY HIERARCHY







An ISO certified company



SMAT LABORATORIES
TESTING AND INSPECTION SERVICES

SCOPE OF TESTING



SCOPE OF WORK

Type of Activity	Scope of Tests
Civil Engineering	
Construction Material	Mechanical, Physical and Chemical Testing of Soil, Aggregate, Concrete, Cement, Lime, Blocks, Water and other Construction Materials.
Projects Quality Control	Establishment and Operation of Site Laboratories for Specific Projects. Evaluation and Assessment of Materials Quality for Projects. Supervision of Deep Foundations including backfill compaction control.
Structural Evaluation	Non-destructive Diagnostics of Existing Civil structures & Assessment for Soundness, Strength, Deterioration & Corrosion of reinforcement in the Existing R.C. Structures.
Deep Foundation Testing	Testing Piles by Low Strain Integrity Testing
Geotechnical Engineering	
(Soil Investigations)	Field soil investigations for the purpose of assessing soil suitability for building and civil constructions. Engineering recommendations for the type of foundation and bearing capacity. Settlement analysis and monitoring. Slope stability analysis. Soil and rock permeability tests. Groundwater analysis and monitoring. Soil resistivity testing. Soil dynamics. Geotechnical modelling. Soil borings. Lateral earth pressure calculations. Retaining wall design. Standard Penetration Tests. Cone Penetration Tests. Mackintosh probing. Piezometer installations. Rock classifications. Compression. Density-Moisture relationship determinations .
Highway & Pavements	
	Visual inspection of the asphalt condition (defects assessment). Benkelman Beam deflection measurements. Extraction of cores in asphalt pavement. Saw cut asphalt slabs. Dynamic Cone Penetration (DCP) measurements. Roughness measurements (IRI) by Roughometer. Skid Resistance measurements. Surface regularity measurements. Layer thickness measurements. Levels. CBR (lab & In-situ). Excavation of test pits. Asphalt core laboratory analysis.
Metallurgy	
	Mechanical and metallurgical testing of metals, welds and steel rebars. Chemical & physical properties of metals. Metallography & corrosion testing evaluation. Failure analysis and investigation. Condition, usability and remaining life assessment.
Chemical & Environmental Engineering	
Liquids & Solids	Sample analysis of liquids (domestic water, groundwater, raw and treated wastewater, reverse osmosis, marine discharge, etc.) and solids (soil, sludge, sediment, marine life, plant tissue, etc.). Analysis of trace metals in parts per billion in soil, sludge and water. Analysis of non-metallic inorganic components. Environmental analysis of organic constituents (BTEX, PCB, PAH, Phenols, Volatile organic compounds, Semi volatile organic compounds, etc.) Analysis of Pesticides, Dioxin & Furan by using equipment like GC/GCMS/ FID/ECD etc. in accordance with International Standards.

**Metals & Alloys**

Chemical composition of metals, alloys, corrosion products & scales. Corrosion & Scale Inhibitor Testing & Evaluation. Drilling Fluids Tests. Determination of different grade of Stainless Steel, Carbon Steel, Low Alloy Steel, Cast Iron, brass Nickel Alloy. Analysis of construction Rebar, Zinc Ingot, Aluminium, Cast Aluminium by using equipment ICP/AA/OES/LECO etc.

Environmental Monitoring

Effluent discharges & drinking water compliances. Ambient air & stack emission monitoring. Industrial hygiene monitoring. Commercial and industrial indoor air quality. Measurement of noise in dB in outdoor, workplace and from operating equipment. Monitoring particulates in indoor, outdoor and workplace atmospheres. Determination of Total Hydrocarbon, SO₂, NO₂, VOC, Toxic Metals, H₂S, Microbiological Toxic Metals, Toxic Gas and Total Suspended Matter in Internal Air Quality Monitoring. Moisture, Velocity, Flow, NOX, SO₂, TPH, CO₂, CO, Dioxin, HF, HCl and Particulate in Stack Monitoring.

Gem Analysis

Analysis of Nickel, Iron, Chromite, Copper, Dolomite, Limestone, and Gold, Silver, Copper and other minerals using XRF / ICP or by Wet Chemistry.



SMAT LABORATORIES

TESTING AND INSPECTION SERVICES

**CIVIL ENGINEERING
MATERIALS TESTING**



Our Civil Engineering Departments at Kampala, Kasese, Gulu, and Soroti cover wide range of mechanical, physical and chemical testing of soil, aggregate, concrete, cement, asphalt, blocks, tiles, water, lime and other Construction Materials. The labs also provide laboratory testing support to our geotechnical Engineering Department.

Covering Wide Areas of Uganda

Observing the need to be close to the construction projects that spread all over Uganda, fully-fledged civil engineering material testing labs have been established by SMAT to cover as many regions of Uganda as possible. The presence of more local labs within each region should facilitate providing better services to our clients and better control of work quality on such projects. Our Civil Engineering laboratories are currently in Kampala, Kasese, Gulu, and Soroti. In addition to these four labs, SMAT is capable of providing site labs for major projects that require labs at their sites.

Construction/Civil Engineering Materials Testing Services

Testing and investigation of building and road construction materials

Laboratory and field characterization of soils and rocks

Compliance of aggregate and cement with standards

Design concrete mixes to specific requirements

Testing of control samples for tensile and compressive strengths

Testing existing material using cores and non-destructive tests

Concrete Strength

The compressive strength of concrete is the most common performance measure used by the engineer in designing buildings and other structures. The compressive strength is measured by breaking cylindrical (or cube) concrete specimens in a compression-testing machine. Flexural strength is one of the tensile strength of concrete. Tensile strength, along with elastic modulus and corrosion resistance, is another important strength parameter of engineering materials used in structures.

Concrete Durability

While compressive strength is a good indicator of load resistance, it isn't a major indicator of concrete durability. There is therefore a need for quick, reliable tests for concrete durability that would have to go far beyond reliance on such standard performance measures as 28-day compressive strength. Three forms of water penetration tests are commonly used, namely BSEN 12390/DIN 1048 Water Permeability, BS 1881 Part 208 Initial Surface Absorption (ISAT), and BS 1881 Part 122 Water Absorption. There are two similar, modified chloride diffusion tests, namely ASTM C1202 Chloride Penetration and AASHTO 277 Rapid Chloride Permeability.

Soil Field Density (soil compaction)

Soil compaction is defined as the method of mechanically increasing the density of soil. In construction, this is a significant part of the building process. If performed improperly, settlement of the soil could occur and result in unnecessary maintenance costs or structure failure. Almost all types of building sites and construction projects utilize mechanical compaction / modification techniques. Therefore, regular testing of soil compaction

by independent laboratories is extremely essential and important. Sand Cone Test (ASTM D1556-07 and BS 1377-9:90) typical field tests are performed for measuring the degree of soil compaction.

Investigative Studies

It is often necessary to test concrete structures after the concrete has hardened to determine whether the structure is suitable for its designed use. The tests available for testing concrete range from the completely non-destructive, where there is no damage to the concrete, through those where the concrete surface is slightly damaged, to partially destructive tests, such as core tests, where the surface has to be repaired after the test. The range of properties that can be assessed using non-destructive tests and partially destructive tests is quite large and includes such fundamental parameters as density, elastic modulus and strength as well as surface hardness and surface absorption, and reinforcement location, size and cover.

Deep Foundation Testing (Piles)

Confirmation of satisfactory construction of all pile types has led to the development of practical, inexpensive and reliable dynamic testing techniques. Let our lab be your independent pile testing specialist. Low strain integrity tests examine the response of a pile to a small hammer blow at the pile head. The induced stress wave travels down the pile shaft and reflected waves from significant changes in pile shaft acoustic impedance are registered by a transducer held against the pile head.

Asphalt & Bituminous Binder Testing

New technologies, increased construction liability, and revised building standards have made quality asphalt testing and inspection integral to the successful completion of today's construction projects. SMAT provides asphalt testing services that evaluate asphalt binders, asphalt mixtures and other derivatives of asphalt geared for use in the construction industry.

Site Laboratories & Projects Quality Control

One of the challenges which occur within the construction and civil engineering industry, is the need to test construction materials on site. SMAT has the full capacity to provide site laboratories for big projects. Experienced full-time supervisors, lab technicians, and assistant technicians will be devoted to run daily testing activities of such site labs. We can also furnish the labs with all necessary equipment and tools.

LIST OF TESTS

CONSTRUCTION MATERIAL TESTS

SOIL	AGGREGATE/ROCK
Sampling of Soil samples	Sampling of Aggregate samples
Wet Sieve Analysis	Sieve Analysis
Hydrometer Analysis / Sedimentation	Clay, Silt and Dust particles
Fines percentage	Specific gravity / Particle density
Classification of soils	Water absorption
Liquid Limit & Plastic Limit (Atterberg Limits)	Bulk density (Loose/Rodded)
Plasticity Index	Moisture content
Linear Shrinkage	Clay lumps and Farible particles
Shrinkage limit by wax method	Flakiness Index
Proctor compaction test (Light and Heavy)	Elongation Index
CBR test (Soaked and unsoaked)	Flat and Elongated particles
Specific gravity / Particle density	Shape Index
Moisture content	Crushed broken fractured faces
Maximum and Minimum Index density	Voided shell content
Bulk density	Light weight particles
Direct Shear test (C and ϕ)	Compaction fraction
1-D Odometer test (Consolidation properties Cv, mv, Cc, e0)	Aggregate crushing value
Swell Pressure test	Aggregate Impact value
Free swell index	Ten percent fines value
Permeability (Constant and Falling head method)	Uncompacted void content
Unconfined compressive strength (UCS)	Los angeles abrasion value
Sand Equivalent Value	Drying and shrinkage
Soil resistivity	Sand equivalent value
Electrical conductivity	Petrographic examination
Soundness (Sodium Sulphate/Magnesium Sulphate)	Polished stone value



	Coating and Stripping value
	Alkali reactivity – Mortar bar method (3months, 16days)
Dynamic Cone penetration Test (DCPT)	Alkali reactivity – Rocky cylinder method
Compaction test by Sand replacement method	Alkali reactivity – Chemical method
Rock fill compaction test by water fill method	Organic Impurities

ROCK	ASPHALT
Uniaxial Compressive Strength (UCS)	Bitumen content and grading
Density	Field Core thickness, density and Compaction
Water absorption	Asphalt coring - Insitu
Flexural strength	Marshall stability & Flow
Point load index	Marshall density
Modulus of rupture	Maximum theoretical density G_{mm}
Size & Weight gradation - Insitu	Loss of stability
Sodium sulphate crystallization	CEMENT
Drop test - Insitu	Fineness
Slake durability	Initial and Final setting time
Saturation Coefficient and Porosity	Normal consistency
CONCRETE	Soundness by lechartlier method
Sampling of Fresh Concrete	Compressive and flexural strength
Design mix	Heat of hydration
Trial mix	Complete chemical analysis
Fresh concrete temperature, density & Air content	Microsilica
Workability – Slump cone test, Bleeding	Density
Setting time of concrete	Bulk density
Compressive strength of cubes/Cylinders/Cores	Activity index
Tensile splitting strength	Moisture content



Flexural / Transverse strength

Durability tests on concrete

Rapid Chloride Penetration Test (RCPT)

Initial Saturation Absorption Test (ISAT)

Water Permeability

Water absorption

Chloride Migration test

Modulus of elasticity

Dimensions of Various Concrete Blocks/Tiles

Water Absorption of Concrete Kerbs, Channels

Edgings & Flags

Dimension & Compressive Strength Of Paving Blocks

Complete chemical analysis

STEEL

Tensile and Elongation test

Bend test

Rebend test

Coating thickness

Holiday test

Coating flexibility

Complete chemical analysis

ADMIXTURE

Physical and Chemical test on admixtures

OTHER CIVIL TESTS

Rock Testing	Rock Grading; Breakage Index etc.
Concrete Coring	Drilling of concrete cores from existing structures
Destructive and Non Destructive Tests	Concrete structural evaluation by
	Ultra sonic pulse velocity test
	Rebound Hammer survey
	Half cell potential analysis
	Cover meter survey
	Depth of carbonation
	Bond Strength
	Delamination survey
	Crack mapping
	Reinforcement examination
	Corrosion rate measurement
Electrical resistivity in concrete	
Load test on concrete structure	
Compressive strength determination by drilling and testing core sample	
Coating thickness	
Pull off strength of concrete repair	
Pile Tests	Low Strain Integrity of Piles and witness of pile load test
Rock Fill	Determination of In-Situ Density by water replacement method
Verification	Concrete & Asphalt plant Verification

CHEMISTRY OF CONSTRUCTION MATERIAL

Chemical Analysis of Cement	Chemical Analysis of Lime Powder
Heat of Hydration of cement	Total Alkalies
Chemical Analysis of Micro silica	Chemical Analysis of Ground Granulated Blast Furnace Slag
Sodium Absorption Ratio	Leachability Tests of Metals from Soil
Testing of Concrete making water	Determination of Alkali carbonates & Bi carbonates
Cation Exchange Capacity of Soil	Organic matter content of soil
Mass loss of Ignition of soil	Total Sulfate content of soil
Water soluble Sulfate content of soil	Water soluble Chloride content of soil
Carbonate content of soil	Acid soluble Chloride content of soil
Gypsum content of soil	Ammonia content of soil



Total Sulfate content of Aggregates

Total Chloride content of Aggregates

Potential Alkali – Silica reactivity of Aggregates

Water Soluble Chloride Salts in Aggregates

Acid – Soluble Material in fine Aggregate

Organic impurities in fine Aggregates

Determining the water content of freshly mixed concrete

Determining the Portland cement content of the hardened hydraulic cement concrete

Chemical analysis of hardened concrete	Sulfate content of hardened concrete
Chemical analysis for metals like steel	Chloride content of hardened concrete
In depth carbonation of hardened concrete	In depth chloride penetration on hardened concrete by dust sampling and analysis

LIST OF CIVIL EQUIPMENTS

General Equipments	
Electronic Weighing balances of various capacities	Standard calibration weights
Bouyancy balance system for specific gravity	Desiccators
Digital Thermometers of various range	Dial Thermometers of various range
Max. Min Thermometers	Wet & Dry
Thermometers Pressure Gauges	Digital
Vernier Callipers Hot Plates	
Vacuum Pumps	
Air Compressor	Sand Bath / Water bath
Load Cell for Load measurements calibration	Load Rings of different capacity
Dial indicators of various range	Digital Dial Indicators
Feeler strips	Straight Edges
Magnetic stands	Cube Mould (100*100*100 mm)
Riffle Boxes	Drying Ovens
Soil, Aggregate and Rock Testing Lab.	
BS & ASTM Test Sieves	Sieve Shakers
Cone Penetrometers for Liquid Limit	Casagrande Apparatus for Liquid Limit
Shrinkage Limit Apparatus	Hydrometer test apparatus
Direct Shear Test Apparatus	BS / ASTM Proctor Rammers
BS/ ASTM Proctor Moulds	BS/ASTM CBR Moulds & Apparatus
Multi Speed Compression Machine 50 kN	Field CBR Apparatus

ASTM Sand cone Apparatus	BS large & Small Pouring Cylinder
Plate bearing Test Apparatus	Dynamic Cone Penetrometer (DCP)
Nuclear Density Gauge	Electric Resistivity Meter
Speedy Moisture Apparatus	Bulk Density Containers
Flakiness & Elongation Gauges	Los Angeles Abrasion Machines
Sand Equivalent Test Sets	Jaw Crusher
Rock cutting Saw	Drying Shrinkage Apparatus
Point load Index Tester	Slake Durability Apparatus
Aggregate Impact Value Apparatus	Aggregate Crushing / Ten percent Fines Value Apparatus
1-D odometer for consolidation	Flow Cone
Max. Min. Index density equipment	Mortar Consistency apparatus.

Concrete & Cement Testing lab

Fully Automatic & Semi-Automatic Compression machines of Various Capacities	Fully Automatic & Semi-Automatic Flexural Testing machines of Various Capacities
Density containers for Fresh concrete Density	Air content meters for Fresh concrete Air content
Concrete Mortar Penetrometers for Setting Time of Fresh concrete	Concrete Mixers for Trial Mix
Cube / Beam / Cylinder Moulds	Sulphur compound melting pot
Cylinder capping frame	Rapid Chloride Penetration Test Apparatus
Half Cell Potential Test Apparatus	Concrete Cover meter
Concrete Resistivity meter	Rebound hammer
Pull-Off Strength Tester	Ultrasonic pulse Velocity Tester
Concrete Flow Meter	Specimen Cutting Machine
Core Drilling Machines	Diamond Core Bits of different diameter
Micro-coring equipment	Blaine Air permeability Apparatus
Fly ash fineness Apparatus	Vicat Apparatus
Ultrasonic Coating Cover Meter (DFT)	Le Chatelier Apparatus for Cement Soundness
Calorimeter for heat of hydration	Jolting Apparatus



Cement Mortar Mixer

Initial Surface Absorption Apparatus

Compression & Flexural Testing machine for Cement Strength

Chloride Migration Coefficient Testing apparatus

Water Absorption of Concrete under pressure

Asphalt Testing laboratory

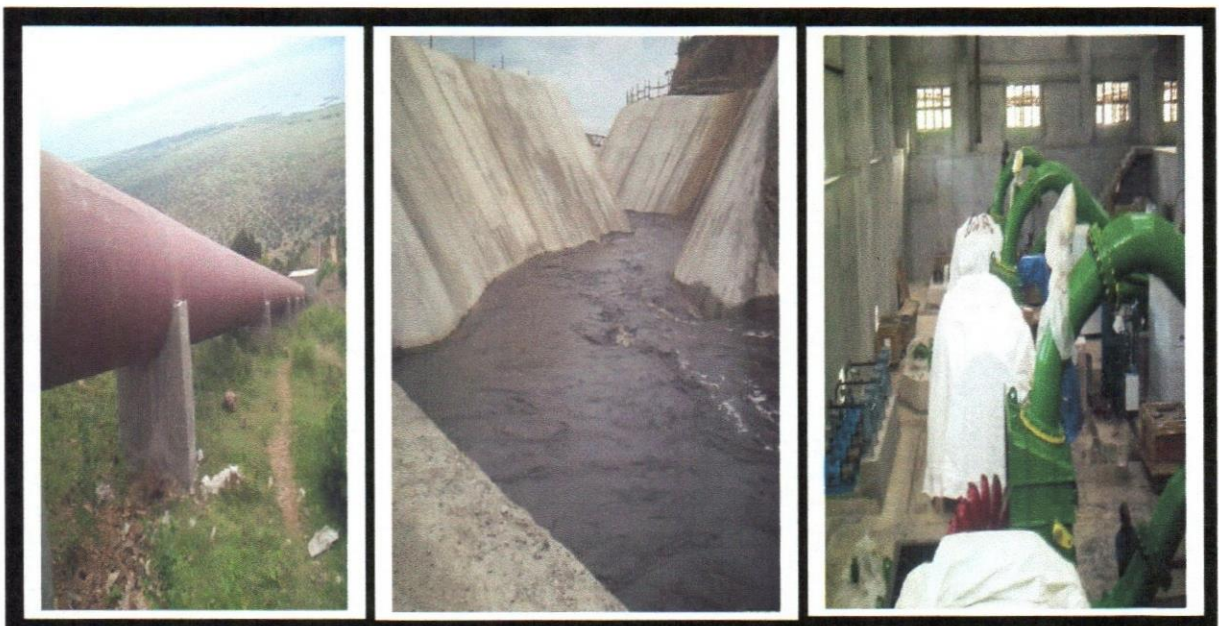
Bitumen Extractor	Theoretical maximum Specific Gravity Apparatus
Marshall Compaction Stand & Rammer	Marshall Moulds
Marshall Stability & Flow Testing machine	Asphalt Coring machine

KEY STAFF AT CIVIL ENGINEERING LAB

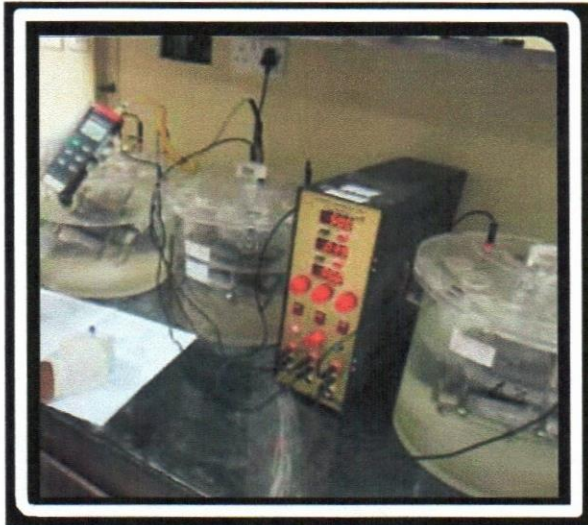
NAME	DESIGNATION	QUALIFICATION	EXPERIENCE
B. S. Kimeze	Country Manager/Senior Materials Engineer	MSc. Civil Eng	33
Simon P. Kisitu	Asst. Manager/Senior Geotechnical Engineer	MSc. Civil Eng. (Geotechnical)	19
Gloria Namugabwe	Laboratory Manager	Bachelor in Chemistry	5
Mary Mbabazi	Asst. Manager - Kampala	MSc. Civil Eng. (Geotechnical)	8
Josephine Nakyeyune	Geotechnical Engineer	BSc. Civil Engineering	3
Annet Businge	Senior Lab Technician/Supervisor	BSc. Civil Engineering	10
Aisha Namuli	Senior Engineering Surveyor	B.Sc. Civil Engineering	5
Richard Mutyabule	Senior Lab Technician/Supervisor (Civil)	B.Sc	10
Michael Gizaza	Senior Lab Technician/Supervisor (Civil)	B.Sc	5
Adolf Tibeyalirwa	Senior Lab Technician/Supervisor (Civil)	B.Sc	26
Shaminah Nantono	Senior Lab Technician/Supervisor (Civil)	B.Sc	3
Jackson Mubangizi	Asst. Manager - Kasese	B.Sc Civil Engineering	5
Godfrey Kasujja	Geo-structural Engineer	B.Sc Civil Engineering	30
Tonny Ocen	Assistant Manager - Gulu	B.Sc Civil Engineering	10
Angella Kagimu	Senior Lab. Technician	Dip. Civil Engineering	6
Brendah Kobugabe	Business Development Manager	B.Sc Civil Engineering	5



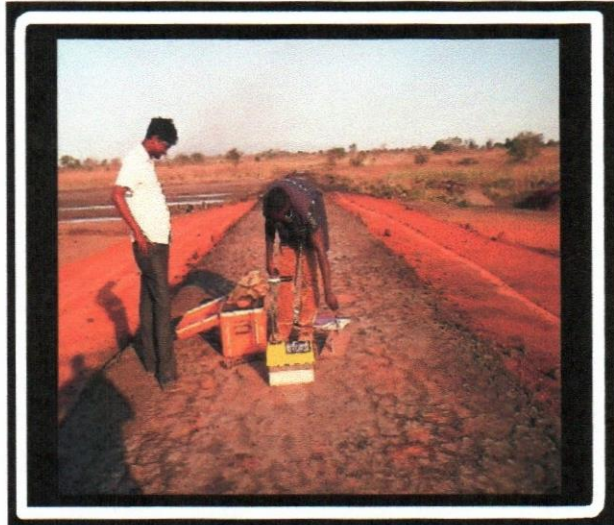
HQ – Building for Uganda Police Force, Naguru. **SMAT** Laboratory was the only nominated authority for all the third party testing requirements.



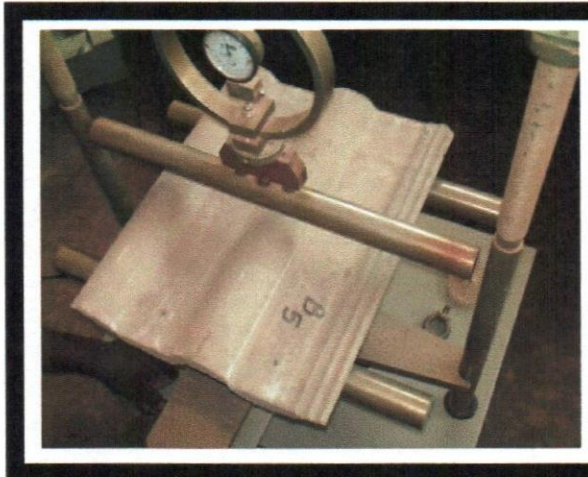
Buseruka Hydro Power Plant. **SMAT** laboratory established a Site based laboratory for Testing soil, Aggregate & Concrete exclusively for this project.



Durability Test of Concrete such as Chloride Migration Test and Rapid Chloride Permeability Test



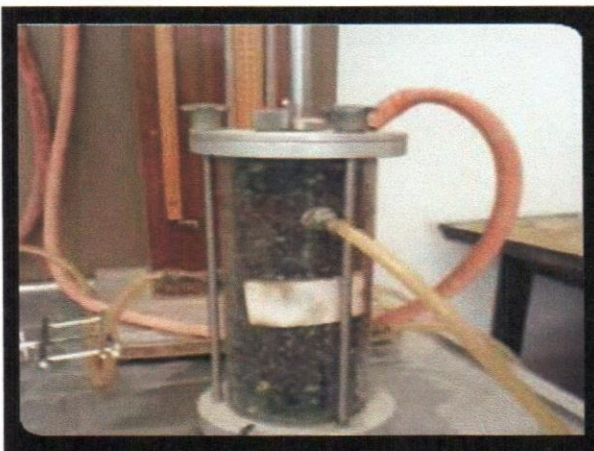
Field Compaction test is used to provide the basis for controlling fill material compaction



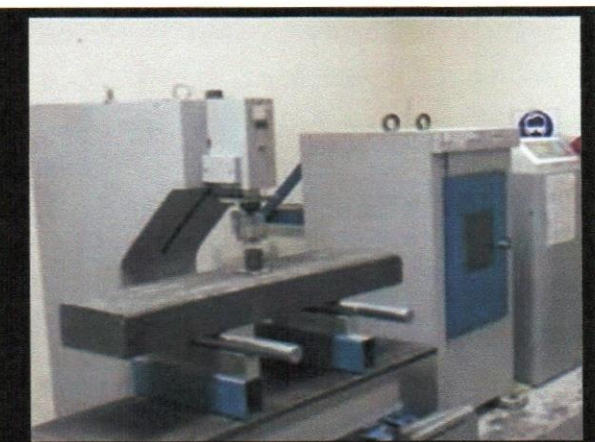
Strength testing to verify the quality of roofing tiles



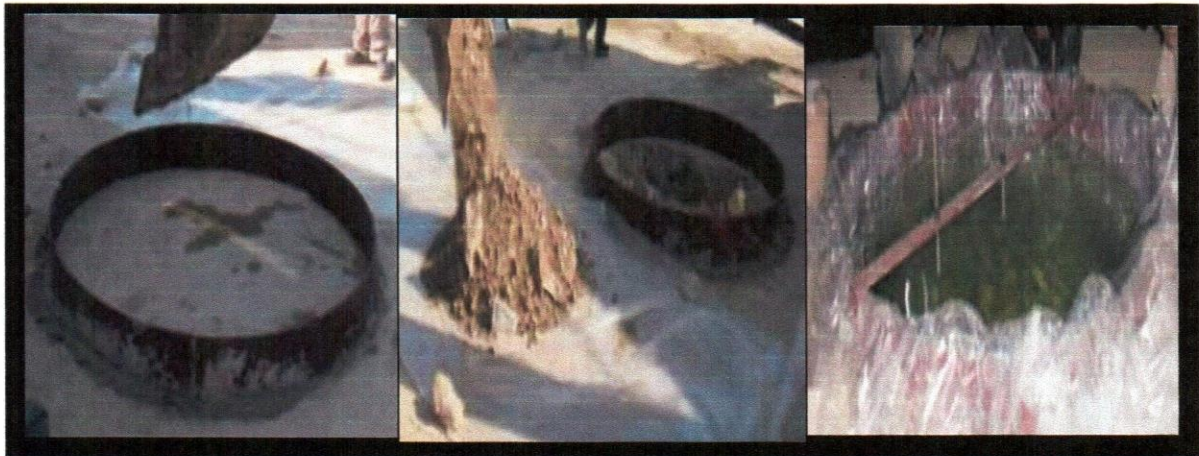
Preparation of concrete cylindrical samples for compressive strength Test.



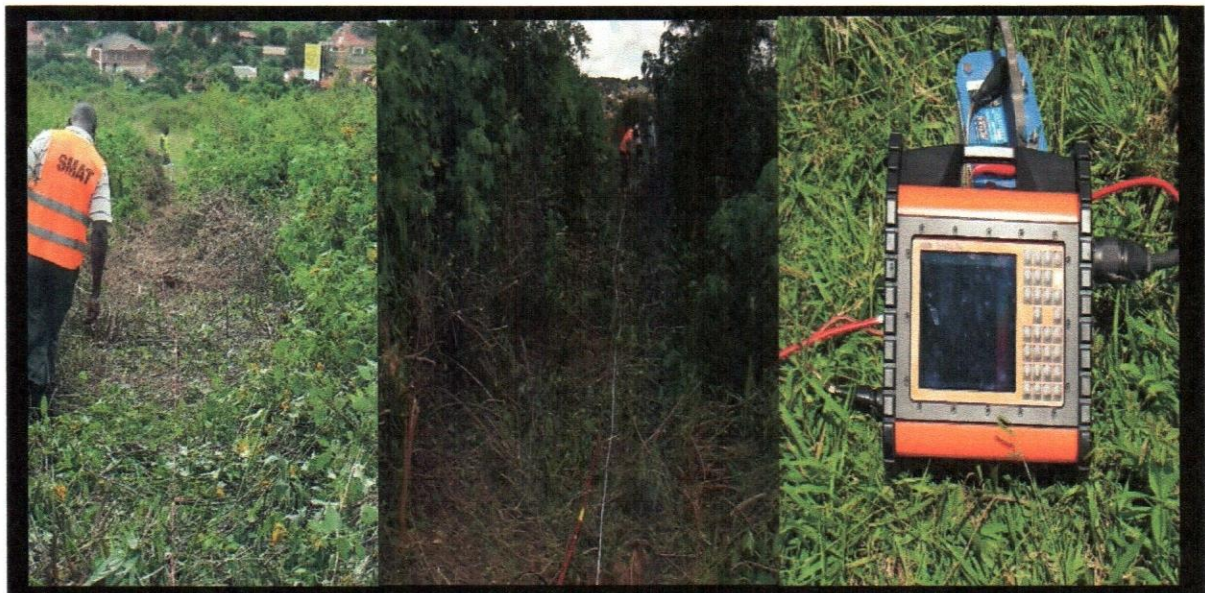
Permeability Apparatus Constant & Falling Head for Granular & Clay/Silt



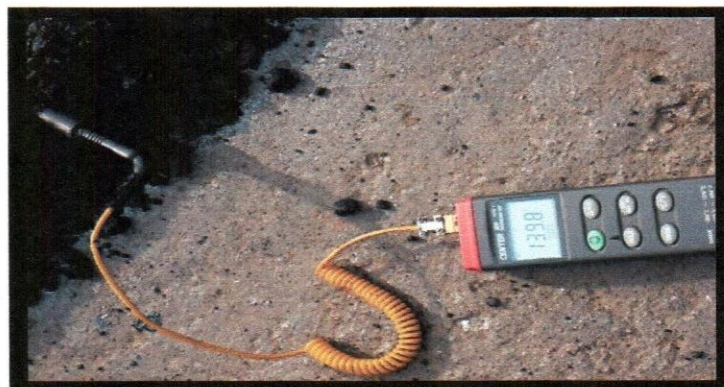
Transverse Strength of Kerb Stone



Rock-fill compaction test by Water Fill Method



Multichannel Analysis Surface Wave (MASW) Measurement

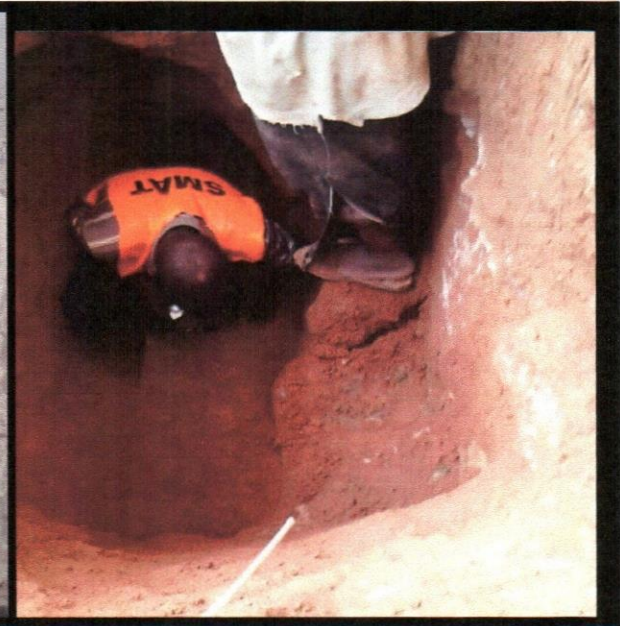


Temperature monitoring in Asphalt concrete

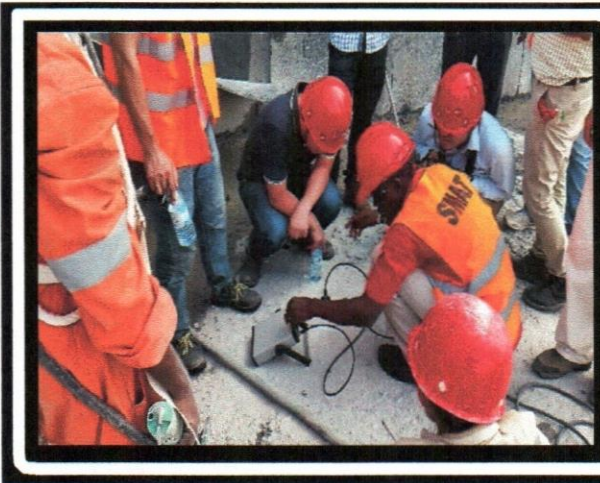
Non Destructive Structural Investigation



Cover meter survey Test indicates position of reinforcement bars in hardened concrete



Exposure of foundation for inspections and NDT

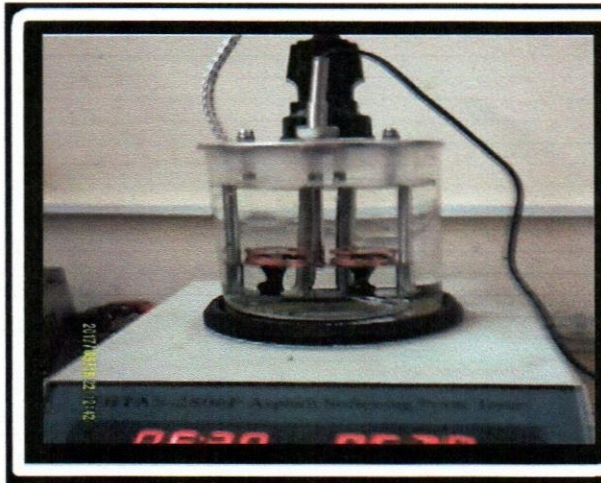


Ultra sonic pulse velocity measurement to assess the uniformity of concrete. Detects internal flaws, cracks and segregation etc



Rebound Hammer test to find the insitu concrete strength/ Surface hardness.

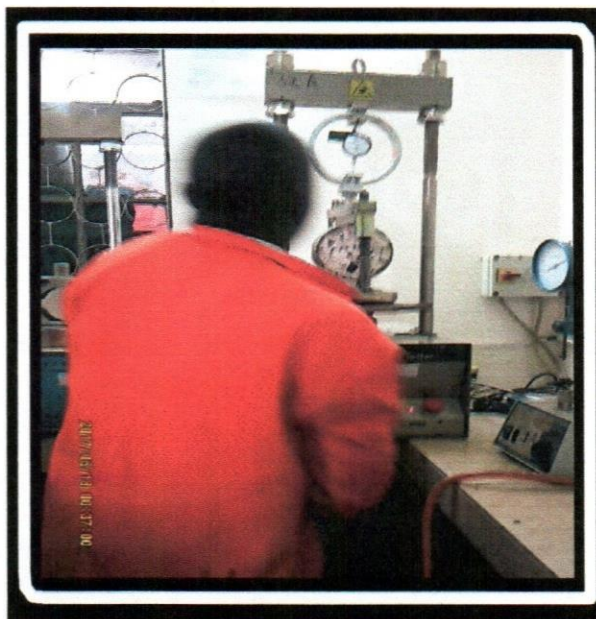
OTHER FIELD AND LABORATORY SERVICES



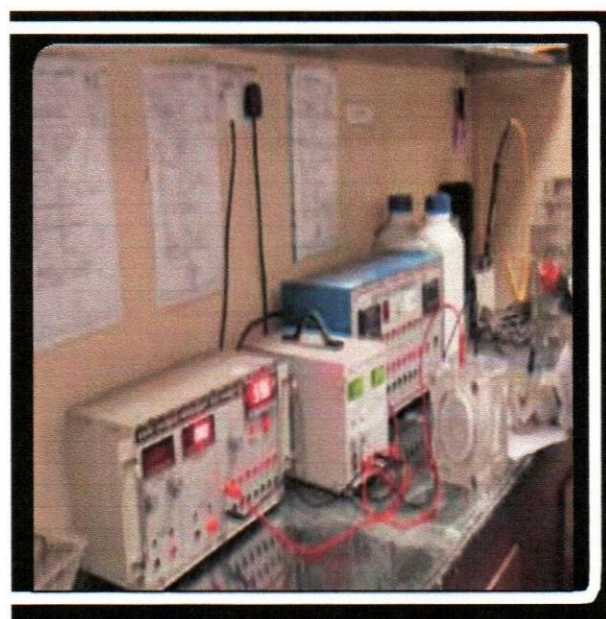
Testing for the Softening Point of Bitumen



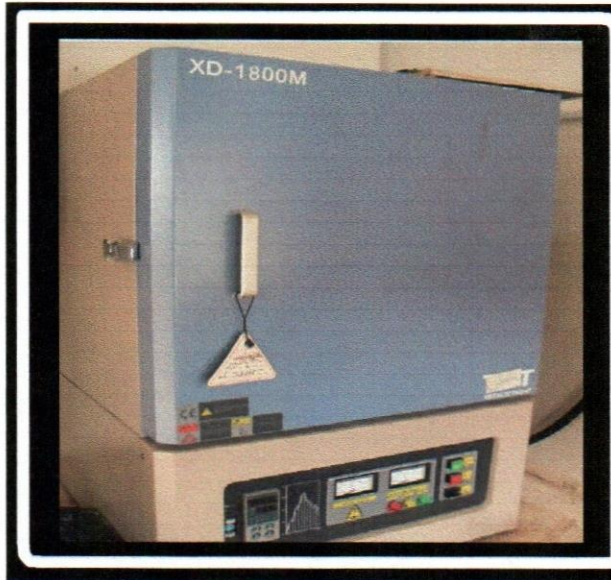
In-situ Asphalt concrete coring to determine the Voids content.



Indirect Tensile Strength test for asphalt mixes.



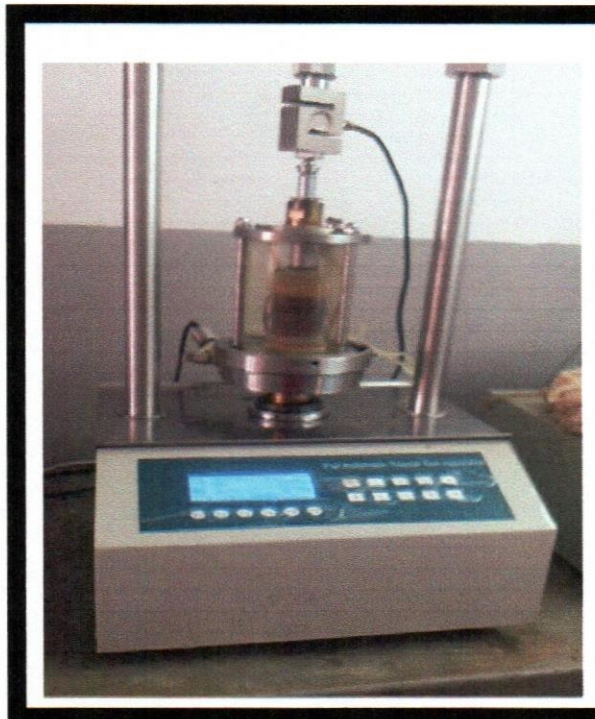
Rapid chloride penetration test for concrete to assess the chloride ion penetration.



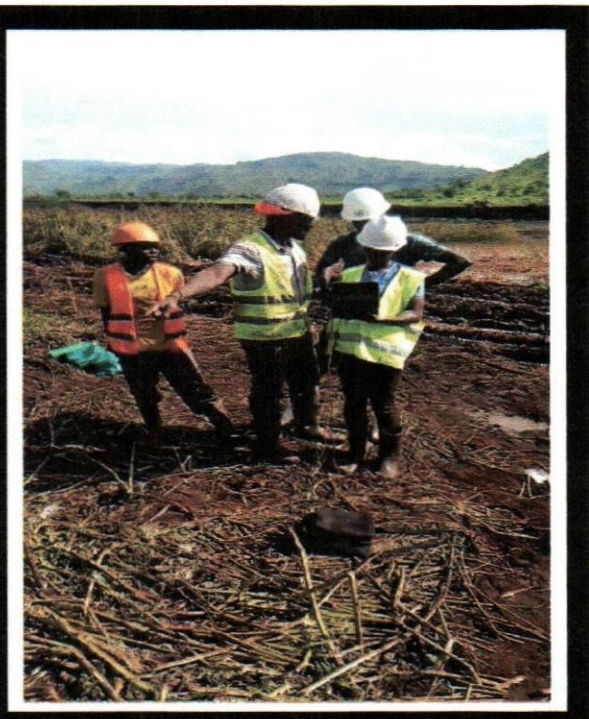
High temperature muffle furnace capable of maintaining temperatures above 1500°C



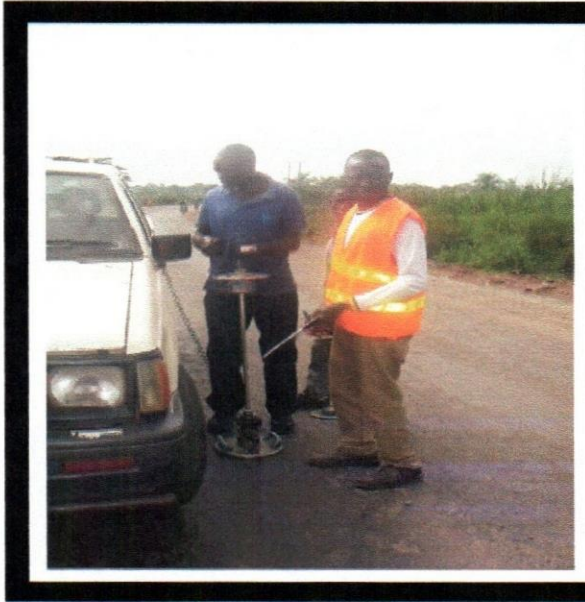
Core Drilling bits for rock sampling



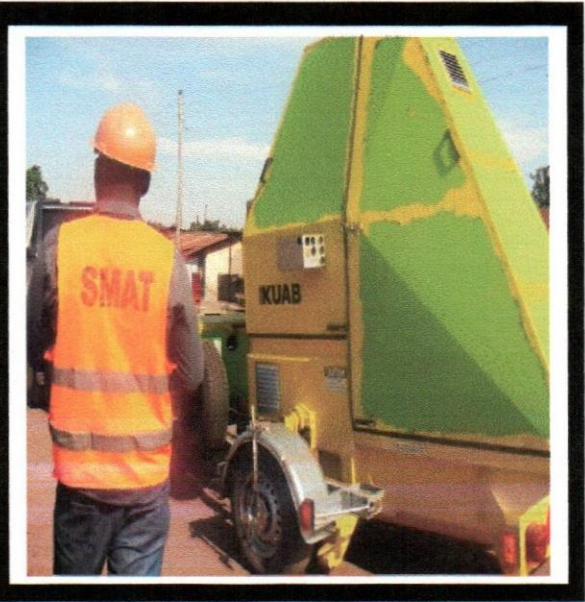
Triaxial Compression Test



Soil Resistivity Test



Light Weight Deflection (LWD) Test



Falling Weight Deflectometer (FWD) Test

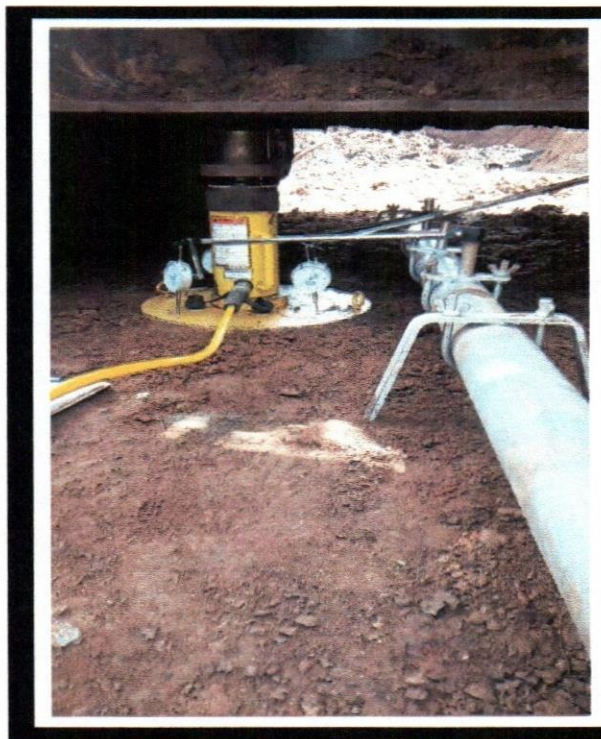
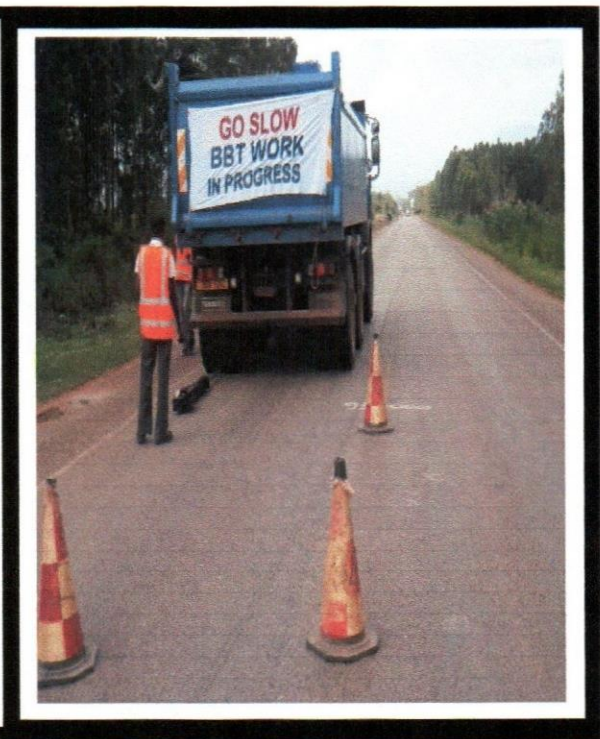


Plate Bearing Test



Benkelman Beam Test



SMAT LABORATORIES
TESTING AND INSPECTION SERVICES

**GEOTECHNICAL
ENGINEERING**



SMAT Lab undertakes onshore & offshore ground investigations for a wide variety of civil and industrial construction, infrastructure and pipeline projects. We pride ourselves in adopting the same professional approach to both large multi-disciplinary investigation projects as well as small simple structures. Our Investigation is supervised by highly qualified & experienced geotechnical engineers and geologists.

General Geotechnical Engineering Services

- ✓ Design and planning of ground investigations
- ✓ Settlement Monitoring
- ✓ Foundation Designs and Proof Checking
- ✓ Design of Reinforced Earth Structures
- ✓ Design of Deep Foundations (Piles, Well) & Mat Foundations
- ✓ Borehole drilling & soil investigations (SPT)
- ✓ Dynamic Cone Penetration Testing (DCPT)
- ✓ Static Cone Penetration Test with pore-pressure measurement (CPTU)
- ✓ Sample coring and analysis
- ✓ Down hole and Cross Hole Seismic Tests
- ✓ Trial pitting and trenching
- ✓ Slope stability analysis & studies
- ✓ Pumping Tests and permeability/ Lugeon Tests
- ✓ Double Ring Infiltrometer Tests
- ✓ Plate bearing Tests and in-situ CBR
- ✓ Electrical Resistivity Test
- ✓ Multichannel Analysis Surface Waves (MASW)
- ✓ Resistivity Profiling & Resistivity Mapping Groundwater Monitoring, Sampling, and Analysis
- ✓ Preparation of factual and interpretative reporting

Soil Investigations

Soil/ Geotechnical investigations are performed by geotechnical engineers to obtain information on the physical and mechanical properties of soil and rock around a site to design earthworks and foundations for proposed structures and for repair of distress to earthworks and structures caused by subsurface conditions. A geotechnical investigation includes surface exploration and subsurface exploration of a site. Our drill rigs are cable to drill vertical holes down to 150m and inclined holes down to 30m below existing ground level.

Soil sampling is done using a variety of samplers to collect disturbed samples, relatively undisturbed samples and undisturbed samples. We use samplers such as Hand Shovel / Machine driven auger, continuous flight auger, Split-Spoon/SPT sampler, Shelby Tube Sampler, Piston Samplers.

Laboratory tests

A wide variety of laboratory tests are performed on soils and rocks to measure different properties. Although a detailed list of laboratory testing is presented in the Civil section, some of the typical tests involved in the investigation are as follows:

- Moisture Content
- Moist Density
- Specific Gravity
- Relative Density
- Particle size Analysis/ Grain Size Distribution
- Sedimentation/ Hydrometer analysis
- Atterberg limits
- California Bearing Ratio (CBR) & swell measurements
- Direct Shear Test
- Compaction/Proctor Test
- Oedometer Test (Consolidation)
- Swelling Pressure Test
- CD Tri-axial Shear Test
- UU Tri-axial Test
- CU Tri-axial Test
- Direct Shear Test
- Unconfined Compressive Strength
- Chemical Analysis of Soil and Water

In-Situ geotechnical tests

Standard Penetration Test (SPT) - in-situ standard penetration test designed to provide information on the properties of soil, while also collecting a disturbed soil sample for grain-size analysis and soil classification.

Dynamic Cone Penetration Test (DCPT) - in-situ dynamic cone penetration test designed to provide information on the properties of sub soil of natural ground or for pavement. DCPT is useful to determine the in-situ CBR and subgrade modulus.

Cone Penetration Test (CPT) – standard Cone Penetration Test is performed using an instrumented probe with a conical tip, pushed into the soil hydraulically at a constant rate. CPT instrument records tip resistance, friction resistance along the sleeve and pore-pressure measurement. For bigger sites, usually the CPTs are performed in combination with drilling of boreholes to correlate, so that the investigation is economical and appropriate. CPT data interpretation is used for correlation of soil properties and also to determine Soil Bearing Capacity (SBC).

Constant head/ Falling head permeability tests - Estimating Hydraulic conductivity (or permeability) of different types of soil is the most important step in designing any groundwater control system. The knowledge of this property is much useful in solving problems involving yield of water bearing strata, seepage through earthen dams, stability of earthen dams, and embankments of canal bank affected by seepage, settlement etc. The falling head method of determining permeability is used for soil with low discharge, whereas the constant head permeability test is used for coarse-grained soils with a reasonable discharge in a given time. For very fine-grained soil, capillarity permeability test is recommended at SMAT Lab.

Lugeon Test or Packer Tests - Estimating Hydraulic conductivity (or permeability) of different types of rocks is a key step in designing any groundwater control system in a rock. We do perform Packer Permeability Tests in Rocks.

Groundwater Monitoring

Our geotechnical field staffs are well trained for installing Piezometers and groundwater monitoring. Piezometers are of two types viz. Type-1 is Standpipe Piezometer and Type-2 is Vibrating-Wire Piezometers. Standpipe piezometer facilitates Groundwater levels measurement using dip meter or water level indicators, while VW piezometers are useful for monitoring Pore-Water pressures continuously using special devices attached to data loggers.

Groundwater Samples can be collected for analysis in the chemical and microbiological lab. Routine drinking water analysis, trace metals, and organic parameters can be tested and evaluated.

Slope Stability Studies

The field of slope stability encompasses the analysis of static and dynamic stability of slopes of earth and rock-fill dams, slopes of other types of embankments, excavated slopes, and natural slopes in soil and soft rock. SMAT can provide slope stability investigation, analysis (including modelling), and design mitigation which can be completed by our well trained and qualified geologists and geotechnical engineers.

Settlement Monitoring

Settlement Monitoring surveys are performed to determine the degree of horizontal and vertical displacement of structures, pavements and embankments over a defined period. Severe pavement damage and structural failure can be a direct result of settlement and therefore it is critical that movement be detected and measured. Our Senior Engineering Surveyors and Geotechnical Engineers are available to assist you with the development and implementation of a monitoring system to suit individual requirements.

Other Geotechnical Field Tests

Plate Load Tests

In-Situ CBR Tests

Soil Electrical Resistivity Tests

Pile Integrity Tests

Infiltration Rate Tests using Double Ring Infiltrometer

Geophysical Field Tests

Geophysical seismic tests are useful to determine dynamic soil/ rock properties, which will be used in design of machine and any other vibrating equipment foundations.

Two typical seismic tests performed as part of the geotechnical investigations are:

Downhole seismic test and

Crosshole seismic test

LIST OF GEOTECHNICAL TESTS

SUBSURFACE SOIL / ROCK / GROUNDWATER	
Soil Investigation	Drilling in Soils and Rocks
Bearing Capacity & Settlement Analysis	Slope Stability Analysis
Trial Pits	Standard Penetration Test - SPT
Permeability in Soil (Falling / Constant Head)	Dynamic Cone Penetration Test - DCPT
Permeability in Rock (Lugeon Packer Test)	Infiltration Rate Tests
Groundwater Monitoring and Sampling	Installation of Inclinometers & Pressure Meters
In-situ CBR Tests	Installation of Piezometers
Soil Swelling Tests	Plate Load Tests
Vane Shear Tests	Soil Electrical Resistivity Tests
Down Hole Seismic Tests	Cross Hole Seismic Tests

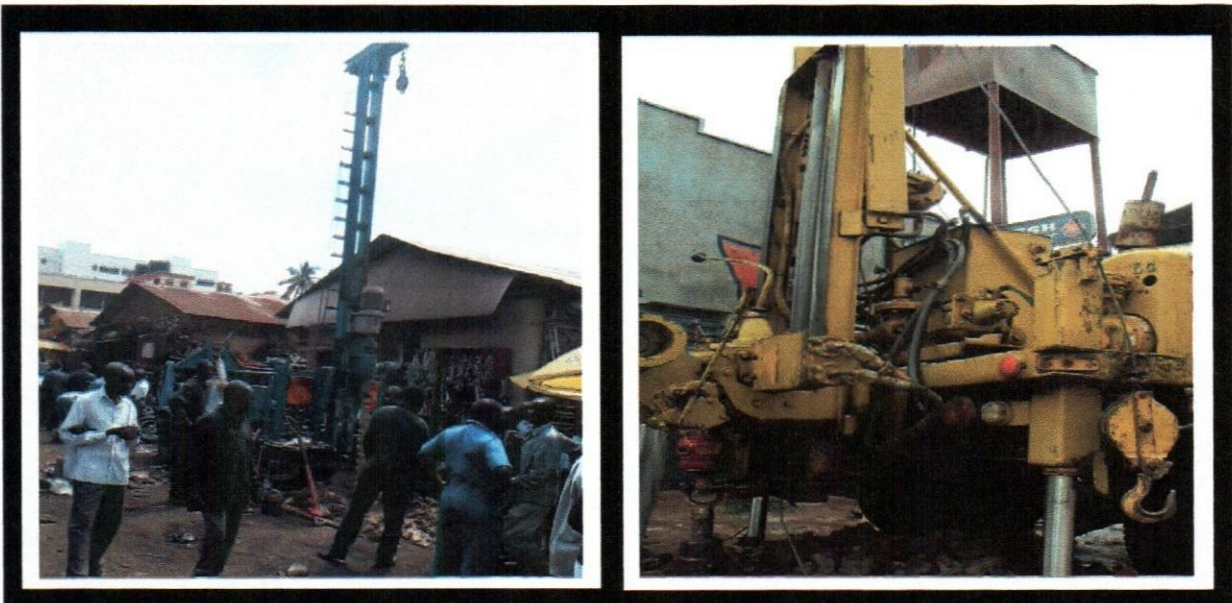
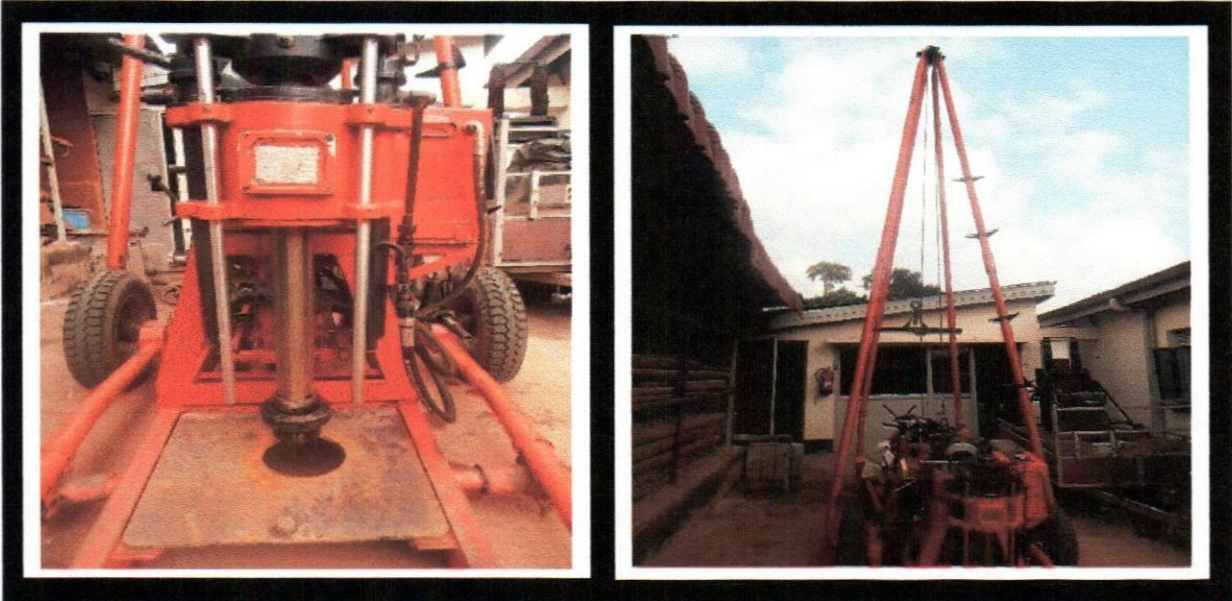
LIST OF GEOTECHNICAL ENGINEERING EQUIPMENTS

Drilling Rigs Desco Inc., 2No. SP4500S & 3No. SP3500S (crawler)	Split-Spoon Sampler
Drilling Rig Ellettari EK100S & EK 200S (crawler)	Piston Type Samples
Drilling Rigs XY – 1B 2No.	Vibrating Wire Piezometers Devices & Loggers
Drilling Rods	Tricone Bits
Standard SPT sets and rods	Tungsten Carbide Drilling Bits (96mm & 101mm & above)
Single, Double & Triple Tube Core Barrels – Conventional & Wireline system	Diamond Bits Surface & Impregnated (96mm & 101mm & above) – Conventional & Wireline system
Shelby Tubes	Automatic Water level Meter
Dynamic Cone Penetrometer Test equipment (DCPT)	Bailers for Groundwater Sampling
Down-The-Hole Hammer (DTH Hammer)	Packer Test Apparatus
Surveying Equipment (Auto Levels, Total Station, GPS, and Accessories)	Variable Geotechnical Softwares (gINT etc.)
Thermal Resistivity Test Apparatus (KD2 Pro)	Electrical Resistivity Test Apparatus (Nillson)

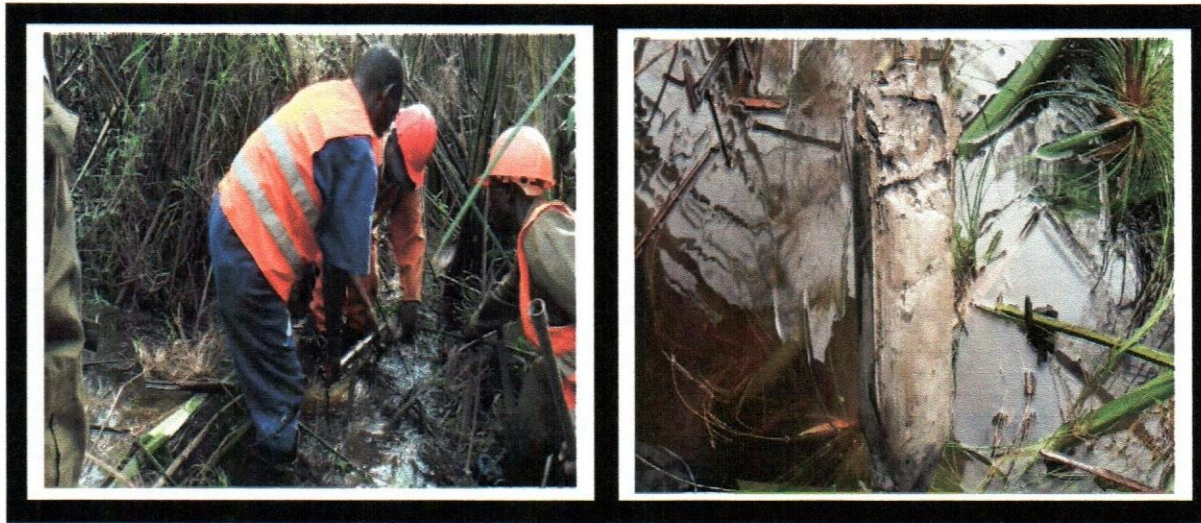
KEY STAFF FOR GEOTECHNICAL ENGINEERING

NAME	DESIGNATION	QUALIFICATION	EXPERIENCE
Simon Peter Kisitu	Geotechnical Manager	M.E. Civil (Geotechnical)	19
Mary Mbabazi.	Project Coordinator/ Geotechnical Engineer	MSc. Civil (Geotechnical)	8
Josephine Nakyeeyune	Geotechnical Engineer	B.Sc Civil	3
David Lubega	Geologist	B.Sc. in Geology	8
Paul Nyungwe	Logistics and Supervisor	B.Sc. Computer Science	10
Peter Ssematiko	Field Coordinator	High School	3
Abdullah Bukenya	Drilling Operator	High School	15
Emmanuel Musisi	Drilling Operator	High School	8
Adrian Ssekamatte	Drilling Operator	High School	16
Ivan Kakooza	Head Drilling Technician	B.Sc	5
Amon Munsimenta	Sr. Mechanic	High School	11

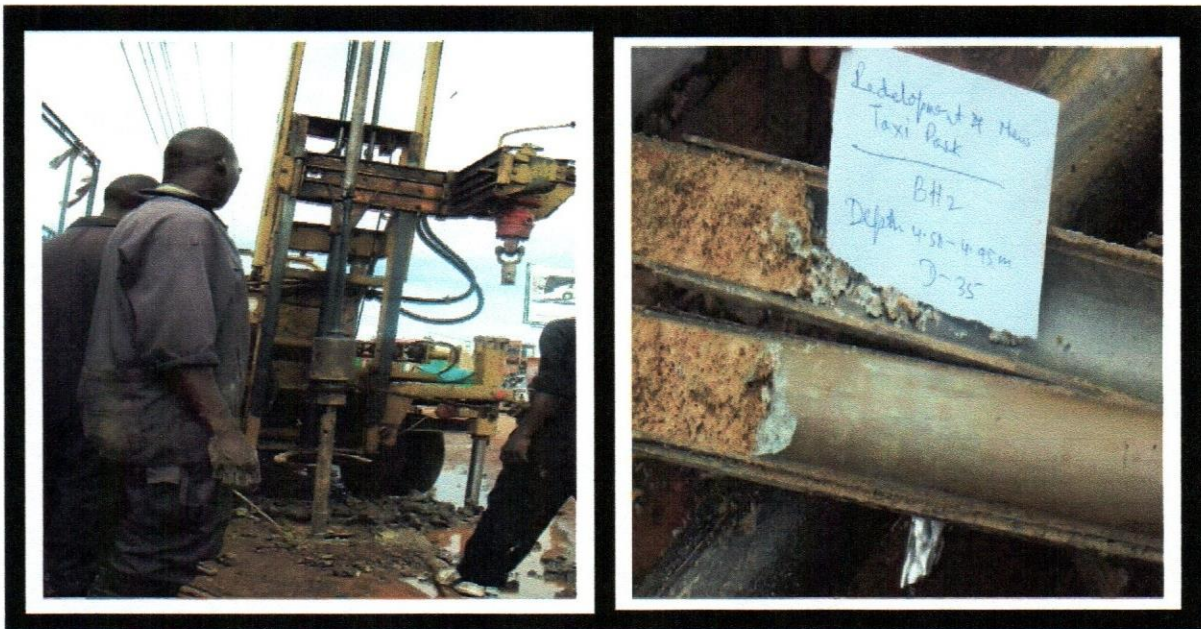
GEOTECH DRILLING RIGS AND ACCESSORIES



Site Work Photographs



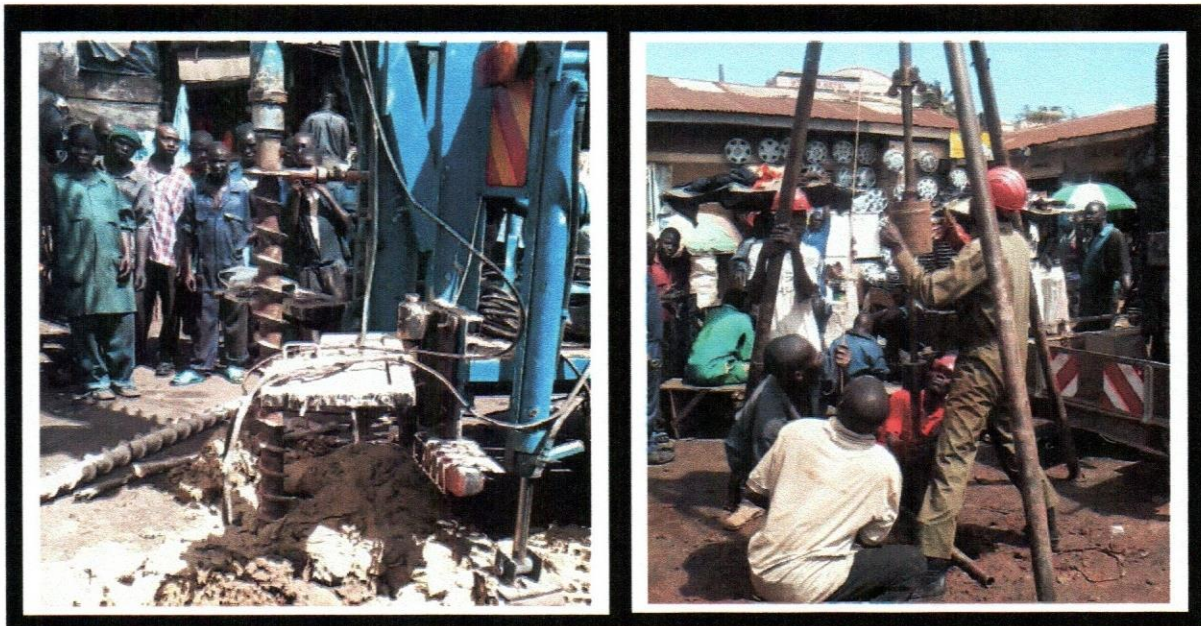
GEOTECHNICAL INVESTIGATIONS – Swamp Crossing along Kagamba – Ishaka Road
Client: LEA Associates South Asia Pvt. Ltd.



GEOTECHNICAL INVESTIGATIONS – Redevelopment of New Taxi Park in Kampala
Client: The New Taxi Park Lock-Up Owners Association (TNLOA) Limited



GEOTECHNICAL INVESTIGATION – Construction of Irrigation Dam in Oyam District
Client: D. Thakkar & Ambitious Construction Company Ltd. (JV)



GEOTECHNICAL INVESTIGATIONS – Redevelopment of Kiseka Market
Client: Infrastructure Design Forum (IDF) Limited



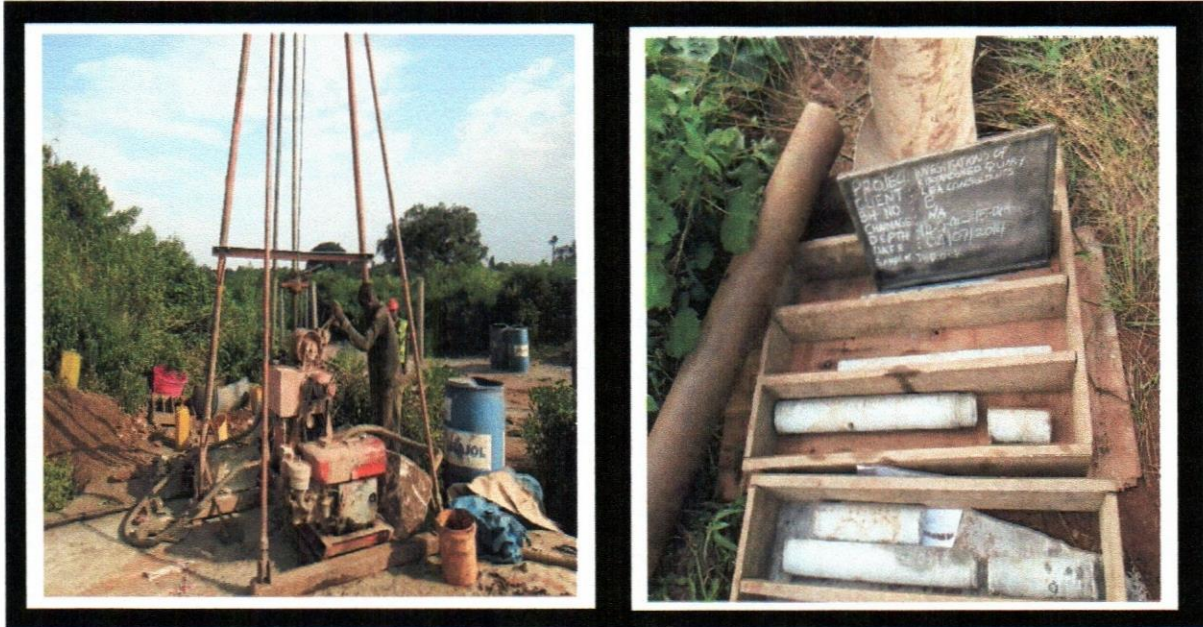
GEOTECHNICAL INVESTIGATIONS – Reconstruction of Strategic Bridges in Eastern and Central Regions - Lot (3), Seretiyo Bridge and Construction of Ngenge Irrigation Scheme in Kween District respectively

Client: Multiplex Limited and Ambitious Construction Company Ltd. respectively



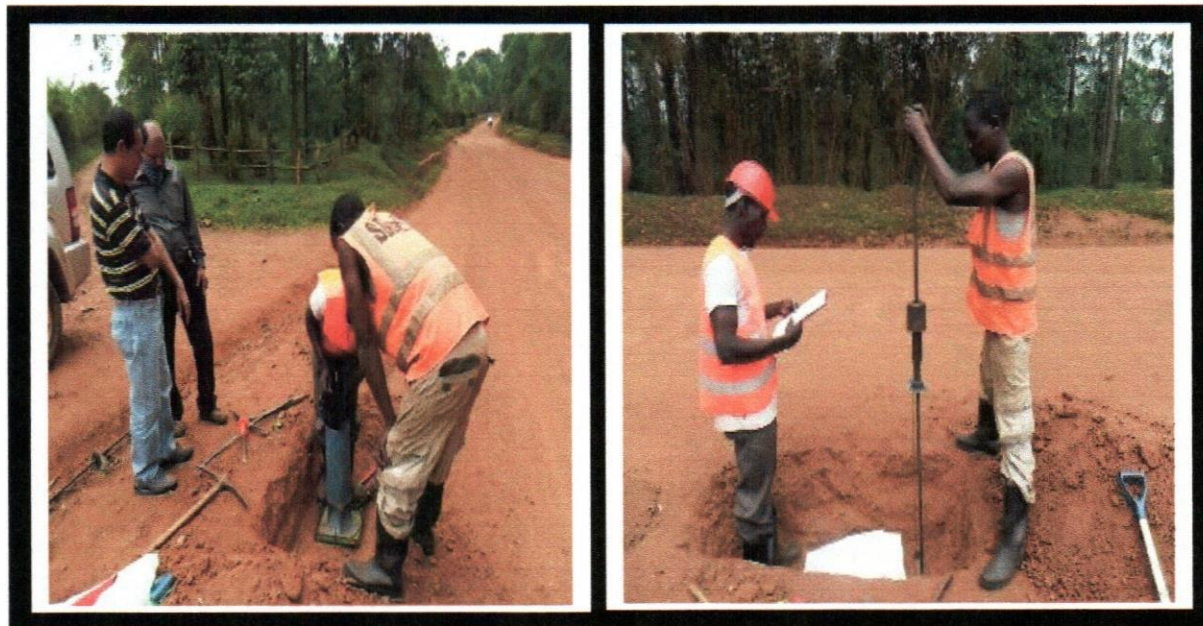
GEOTECHNICAL INVESTIGATIONS – Rehabilitation of Kafu – Karuma Road

Client: LEA Associates South Asia Pvt. Ltd.



GEOTECHNICAL INVESTIGATIONS – Rock coring for determining the suitability of the proposed Kiryandongo Quarry
Client: LEA Associates South Asia Pvt. Ltd.

OTHER INVESTIGATIONS



ROAD SUBGRADE INVESTIGATIONS – Subgrade investigations along Ishaka – Kagamba Road
Client: LEA Associates South Asia Pvt. Ltd.



SMAT LABORATORIES

TESTING AND INSPECTION SERVICES

**BRANCHES &
CONTACTS**

SMAT LABORATORIES
BRANCHES & CONTACTS

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SMAT LABORATORIES

TESTING AND INSPECTION SERVICES

OUR CLIENTS

LIST OF CLIENTS

• Dott Services Ltd	• Uganda National Roads Authority	• Aarvee Associates Ltd
• Apcon Company Ltd	• Crown beverages Ltd	• Multiple Industries Ltd
• Wina Classic	• Sikoot Builders	• Pre-School Express
• Seyani International	• Beime (U) Ltd	• Paint Factory Ltd
• Afcan Construction Materials	• East African Roofings Ltd	• Coral Construction Company
• YASH Poles Ltd	• Eng. Dorothy Kobel	• The Kampala Industries & Infrastructure Ltd
• Datam Engineering (U) Ltd	• Bolt Construction Company Ltd	• Jayshree Hasmukh Kanani
• Jesani Construction Company Ltd	• Pearl Engineering Company	• Proman Consult Ltd
• Premier Distilleries Ltd	• Destiny Civil Engineering Co. Ltd	• Mr. Mwesigwa Joseph
• Dr. Tamale Edward Ssali	• Uganda Road Fund	• Egiss Engineering Contractors
• PAN Modern Consult Ltd	• CATIC	• SIMBA Oil Ltd
• Yamasec (U) Ltd	• Emburara Safaris Ltd	• Balaji Group of Companies
• Property Development Management	• NEC Elsewedy Industries	• Deyanka Investments Ltd
• Rwenzori Commodities	• National Water & Sewerage Cooperation	• Lead Telecom
• VIVO Energy	• Ulto Engineering Ltd	• Total (U) Ltd
• Mr. Peter Kakembo	• ARS Construction Ltd	• Hawa Construction Co. Ltd

• TOTO-THALIA contractors ltd	• Seyani Brothers And Co. Ltd	• Armpass Technical Services
• Tiross Manufacturers Ltd	• Uganda Red cross Society	• Soleco Construction Co. Ltd
• The Brand Concept Ltd	• Bana Construction Company	• Baleke Technical Services
• Makerere University	• Kyambogo University	• China State Engineering Contracting Co. Ltd
• Office Of The Auditor General	• Kraft Construction Ltd	• Pavers World
• Sr Afro Chicks and Poultry Breeders	• Ministry Of Water	• Rock Eng. (U) Ltd
• NETIS (U) Ltd	• Christone Contractors Ltd	• Egypro Uganda Ltd
• SUZI FASHIONS	• African Conmat Industries Ltd	• Network Civil Engineering Contractors Ltd
• Horus Telecom	• Kato Contractors Ltd	• Amazon Consults Ltd
• ATC Uganda	• GAZEBO Ltd	• STRAT GROUP
• Mr. Igibolu Peter	• Bullen Construction Company	• Kampala City Council Authority
• Ms. Alice Kansiime	• Muga Services Ltd	• Updeal (U) Ltd
• Coronation Developers Ltd	• Mr. Banura Patrick	• Rova Construction Co. Ltd
• Eng. Mukiibi Ismail	• Concord Enviro FZE	• Nasr General Contracting Co. Ltd
• Fakruddin Properties Ltd	• Plan Technical Services Ltd	• Canaanze Construction Company
• I-Engineering (U) Ltd	• House of Prayer Ministries International	• ATX Technologies Ltd

• CAMUSAT	• QTE (U) Ltd	• Ambitious Construction Co. Ltd
• Symbion (U) Ltd	• Coil (U) Ltd	• Sobetra (U) Ltd
• Afro build (U) Ltd	• Armstrong Consulting Engineers	• ATEK Projects
• Nova Enviro Consult	• Tata Consulting Engineers	•
• Eng. Paul Ochieng	• Global International	• Ms. Akello Fatumah
• US NAVY	• National Laboratory Association	• Ministrerry of Works and Transport
• Eaton Uganda	• US Embassy	• National Housing Company
• Hands (U) Ltd	• Mr. Kawooya Mark	• Zhonghao Overseas Engineering Construction Co. Ltd
• Grain Bulk Handlers	• Café Javas	• TRIO Consults Ltd
• CMD Investments Ltd	• Arab Consulting Engineers	• Samhee Construction Co. Ltd
• COMICO International Limited	• BISONs Consult Limited	• GUMAK Associates Co. Ltd
• M&M Networking Solutions	• Abubaker Technical Services Ltd	• Zhongmei Engineering Group
• Zenitaka Hundai JV	• Yanijan Co. Ltd	• Wazo Design Lab
• Techno Three (U) Ltd	• Huawei	• Ssentongo and Partners
• SUE For construction and Water resources	• Seroma Ltd	• M&E Engineering Co. Ltd
• Gat Consult (U) Ltd	• Infrastructure Projects Ltd	