GEONAMICS

YOUR ONE-STOP PROFESSIONAL TESTING CENTRE

TESTING
INSPECTION
CERTIFICATION
INSTRUMENTATION
CALIBRATION

COMPANY PROFILE

GEONAMICS

YOUR ONE-STOP PROFESSIONAL TESTING CENTRE

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- Who we are
- Vision & Missions & Values
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Message From Managing Director

Dear Valued Partners and Clients,

I am delighted to extend my heartfelt greetings to all of you as the director of Geonamics, a leading provider of geotechnical engineering testing services and now proud to announce our expansion into inspection, certification, and calibration solutions.

Since our establishment, Geonamics has been dedicated to setting the benchmark for excellence, integrity, and innovation in the geotechnical engineering testing industry. As an independent testing agent, we have earned the trust of our clients across diverse sectors by delivering precise and reliable data, vital for informed decision-making and ensuring the integrity and safety of structures and infrastructures.

Today, I am thrilled to share that we have expanded our portfolio to offer comprehensive inspection, certification, and calibration services, further solidifying our commitment to meeting the evolving needs of our clients. With this expansion, we now stand as a one-stop solution provider, offering a full spectrum of services to support your engineering projects from inception to completion.

Our inspection services are designed to provide thorough assessments of equipment, materials, and processes, helping you maintain compliance with industry standards and regulations. Whether you require routine inspections or specialized evaluations, our team of experts is here to ensure the reliability and safety of your assets.

Furthermore, our certification services offer independent verification of quality, safety, and performance, instilling confidence in your products, systems, and processes. With our rigorous certification processes and globally recognized accreditations, you can demonstrate compliance with regulatory requirements and differentiate yourself in the marketplace.

As we embark on this new chapter of growth and expansion, our core values of excellence, integrity, and customer-centricity remain unwavering. We are committed to delivering superior solutions tailored to your specific needs, backed by unparalleled technical expertise, industry-leading technology, and a relentless focus on quality and innovation.

I would like to take this opportunity to express my deepest gratitude to our clients, partners, and employees for their continued trust, support, and dedication. It is through your collaboration and commitment that we have achieved this significant milestone, and it is with your ongoing partnership that we will continue to thrive and make a positive impact in the industry.

Thank you for choosing Geonamics as your trusted partner for geotechnical engineering testing, inspection, certification, and calibration services. We are excited about the opportunities that lie ahead and look forward to serving you with excellence every step of the way.

Warm regards,

Dato Ir. Chuah Lam Siang
Managing Director, Geonamics

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Who We Are

Geonamics is a leading one-stop testing centre for construction and geotechnical works. With a strong commitment to delivering accurate and reliable results accordance to the latest test standards, we offer a comprehensive range of testing services across various departments.

Our commitment to excellence, reliability, and professionalism has made us a trusted partner for numerous clients in the construction industry. We take pride in our ability to deliver accurate results, adhere to strict timelines, and provide cost-effective solutions. Our team of experts is always ready to go the extra mile to meet the unique requirements of each project.

Geonamics is dedicated to playing a pivotal role in the success of our clients' ventures. With our expertise, advanced-calibrated facilities, and commitment to quality, we strive to exceed expectations and contribute to the growth and development of the construction and geotechnical sectors.

Our Mission

To provide testing, inspection, certification, instrumentation, and calibration services fully compliance to the latest test standard.

Our Vision

To safeguard the construction industry with reliable and accurate testing results.

Our Values

Our commitment to keep quality, impartiality, competence and confidentiality of testing services.

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Our Services

Inspection (ISO 17020)

- Scaffold
- Falsework
- Site Investigation Work*
- Geotechnical Borehole*
- Instrumentation & Monitoring*

Calibration

- Strain Transducer (PDI) Calibration
- Single & Multi Jack for PC Strand
- SPT Hammer Calibration

Testing (ISO 17025)

- Site Investigation
  - *On-shore*
  - *Near-shore / Offshore*
- Construction Materials Testing
  - *Soil & Rock Materials*
  - *Aggregate*
  - *Concrete*
  - *Steel (Steel Bar, Plates, Coupler, PC Strand, Pipes)*
  - *Bituminous Materials*
  - *Geosynthetic Materials**
- Non-destructive Testing
  - *Ultrasonic Pulse Velocity (UPV) Test*
  - *Electromagnetic Covermeter Test*
  - *Rebar Scanning & Mapping Test*
  - *Rebound Hammer Test*
  - *Windsor Probe Test*
- Deep Foundation Testing
  - *Static Load Tests*
    - *Kentledge Method*
    - *Bidirectional Load Test*
    - *Lateral Pile Load Test*
  - *High & Low Strain Dynamic Load Test (PDA & PIT)*
  - *Cross-hole Sonic Logging Test*
  - *SHAPE Test*
  - *Rapid Load Test*
- Geophysical Testing
  - *Soil Resistivity Mapping**
  - *Downhole Seismic Test**

Instrumentation & Monitoring

- Geotechnical Engineering Applications
  - *Deformation of Retaining Structures/Slope (via inclinometer, SAA etc.)*
  - *Displacement/Settlement of Greenland or Built Structures*
  - *Excess Porewater Pressure in Soil*
  - *Underground Water Fluctuations*
- Structural Health Monitoring
  - *Temperature monitoring of mass concrete casting*
  - *Deformation of Bridge Structures (via SAA)*
  - *Structure Cracks Monitoring*
  - *Dilapidation Survey*

Certification (ISO 17065)

- Scaffold
- Falsework
- Piling Works Product*
- Ready-Mix Concrete*

Accreditations & Recognition

Geonamics is honored to be recognized for our commitment to excellence and adherence to industry standards. We take great pride in our accreditations and recognitions, as they affirm our dedication to quality, integrity, and continuous improvement. These accolades serve as a testament to our relentless pursuit of excellence in everything we do, providing our clients with the confidence and assurance that they are partnering with a trusted and reputable organization. Allow us to introduce our accreditations and recognitions, each symbolizing our unwavering commitment to upholding the highest standards of professionalism and service excellence.

MALAYSIA
Geonamics (M) Sdn. Bhd.

ilac-MRA

STANDARDS MALAYSIA ACCREDITED
SAMM 999

STANDARDS MALAYSIA ACCREDITED
MIBAS 051

CERTIFIED ISO 9001
BUREAU VERITAS
UKAS MANAGEMENT SYSTEMS 0008

SINGAPORE
Geonamics (S) Pte. Ltd.

Accredited Laboratory
SAC-SINGLAS
LA-2013-0548-B

Accredited Inspection Body
SAC
IB-2019-173-F

Accredited Certification Body
SAC
QS-2019-34

ADVANCED CERTIFICATION
ISO 9001:2015

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Our Partners

Geolab (M) Sdn. Bhd.

Ikram Geotechnique Sdn. Bhd.

We take pride in our collaborative approach to delivering exceptional solutions to our clients. We are honored to introduce "our partner," a trusted ally whose expertise and dedication complement our own, enabling us to enhance the quality and breadth of services we offer. With a shared commitment to excellence and customer satisfaction, "our partner" embodies the same values and principles that define our company. Together, we are dedicated to providing innovative and comprehensive solutions that exceed expectations and drive success for our clients.

Our Clients

Our clients are at the heart of everything we do. We are privileged to introduce "our client," a valued partner whose vision, challenges, and aspirations drive us to excel every day.

JKR JABATAN KERJA RAYA MALAYSIA
PKNS
PTP
IJM
中国交通建设 CHINA COMMUNICATIONS CONSTRUCTION
GAMUDA
SUNWAY CONSTRUCTION
WCT
CANTILEVER
MMC Engineering
GDB
lendlease
EKOVEST
ECOWORLD CREATING TOMORROW & BEYOND
TIONG NAM
HEC 中国港湾 CHINA HARBOUR
REC 中国中铁 CHINA RAILWAY ENGINEERING CORPORATION
CR SEA
KELLER
SAMSUNG SAMSUNG C&T
BAUER
BACHY SOLETANCHE
ECONPILE
Pintaras Jaya Berhad
ak antara koh
JF 地基土木工程 FOUNDATION
SKL PILING & CONSTRUCTION SDN BHD

... and many more.

Recent Key Projects

We are pleased to involve in the impactful projects we undertake. Allow us to introduce some of our key projects, each representing a testament to our expertise, innovation, and commitment to excellence. These projects not only showcase our technical prowess but also highlight our dedication to delivering solutions that meet and exceed the unique needs of our clients. From groundbreaking infrastructure developments to intricate engineering challenges, our key projects demonstrate our ability to turn vision into reality and make a meaningful impact in the communities we serve.

TNB monopole transmission tower Penang

Merdeka 118

Tun Razak Exchange

Johor Bahru–Singapore Rapid Transit System (RTS)

Penang Swettenham Pier

Malaysia-Singapore Second Link

Penang 2nd Bridge Project

Electrified Double Track Project (EDTP)

LRT 3

KVMRT2 Project

ECRL
East Coast Rail Link

DUKE E39 SPE

JKR ECER CSR CENTRAL SPINE ROAD

LEBUHRAYA KAJANG SILK HIGHWAY E18

WCE WEST COAST EXPRESSWAY

E31 DASH
DAMANSARA-SHAH ALAM ELEVATED EXPRESSWAY

E19 SUKE
SUNGAI BESI-ULU KELANG ELEVATED EXPRESSWAY

E12 AKLEH
Ampang-Kuala Lumpur Elevated Highway

Branches

MALAYSIA

Geonamics (M) Sdn. Bhd.

Address: No. 6, Lot 25, Jalan Udang Harimau 1, Medan Niaga Kepong, 51200 , Kuala Lumpur.
Phone: +603 6243 4715
Email: info@geonamics.com.my

Geonamics (Sarawak) Sdn. Bhd.

Address: CJ206, Lorong Andar Baru, Batu Kawah 1H, Batu Kawah New Township, 93250, Kuching, Sarawak
Phone: +6016 723 6491
Email: info@geonamics.com.my

SINGAPORE

Geonamics (S) Pte. Ltd.

Address: 5 Kwong Min Rd, Singapore 628708
Phone: +65 6893 6913
Email: info@geonamics.com.sg

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APPENDIX

Appendix 1 – LEGAL REGISTRATION

CIDB MALAYSIA

PERAKUAN PENDAFTARAN

Adalah dengan ini diperakui bahawa kontraktor yang dinyatakan di bawah ini telah berdaftar dengan Lembaga mengikut Bahagian VI Akta Lembaga Pembangunan Industri Pembinaan Malaysia 1994. Pendaftaran ini adalah tertakluk kepada syarat-syarat yang telah ditetapkan bersama perakuan ini.

No. Pendaftaran	:	1970606-JH034083
Nama Kontraktor	:	GEONAMICS (M) SDN. BHD.
Alamat Berdaftar	:	NO 6, LOT 25, JALAN UDANG HARIMAU 1, MEDAN NIAGA KEPONG, 51200 KUALA LUMPUR WILAYAH PERSEKUTUAN KUALA LUMPUR
Daerah	:	KUALA LUMPUR
Tarikh Mula Berdaftar	:	06/06/2000

GRED	KATEGORI	PENGKHUSUSAN
G3	B	B04
G3	CE	CE21 CE25
G3	ME	M15

Tarikh Mula Berkuatkuasa : **27/11/2023**

Tarikh Habis Tempoh Perakuan : **24/11/2026**

STATUS: AKTIF

Ketua Eksekutif

Lembaga Pembangunan Industri Pembinaan Malaysia

Tarikh: 27/11/2023

Appendix 2 - ISO 9001

Bureau Veritas Certification

GEONAMICS (M) SDN BHD

No. 6 Lot 25, Jalan Udang Harimau 1, Medan Niaga Kepong, 51200 Kuala Lumpur, Malaysia.

Bureau Veritas Certification Holding SAS - UK Branch certifies that the Management System of the above organisation has been audited and found to be in accordance with the requirements of the management system standards detailed below

ISO 9001:2015

Scope of certification

1. PROVISION OF GEOTECHNICAL INVESTIGATION, INSTRUMENTATION MONITORING AND TESTING ON VARIES FOUNDATION, SLOPES, EARTH RETAINING AND UNDERGROUND STRUCTURES

2. PROVISION OF CONSTRUCTION MATERIALS TESTING ON SOIL, ROCK, CONCRETE, STEEL AND ASPHALT/BITUMINOUS MATERIALS

Original cycle start date:	25-11-2017
Expiry date of previous cycle:	24-11-2023
Certification / Recertification Audit date:	10-11-2023
Certification / Recertification cycle start date:	25-11-2023
Subject to the continued satisfactory operation of the organisation's Management System, this certificate expires on:	24-11-2026

Certificate No.: MY009783 Version: 1 Issue date: 24-11-2023

UKAS MANAGEMENT SYSTEMS 0008

Mohd Nizam Abdul Malik - Chief Executive (Malaysia)
Signed on behalf of BVCH SAS UK Branch

Certification Body Address: 5th Floor, 66 Prescot Street, London, E1 8HG, United Kingdom

Local Office: Lot 19.01 & 19.02, 19th Floor, Menara KH, Jalan Sultan Ismail, 50250 Kuala Lumpur, Malaysia.

Further clarifications regarding the scope and validity of this certificate, and the applicability of the management system requirements, please call: +603 2733 7700

UKAS Certificate Template Single Site Rev.4.1 28 Aug 2023

1/1

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Appendix 3 – Accredited Scope (MALAYSIA)

S/N: 1803

STANDARDS MALAYSIA

Certificate of Accreditation

No: SAMM 999

Accredited since: 18 February 2021

This is to certify that

GEONAMICS (M) SDN. BHD.
KEPONG, KUALA LUMPUR
MALAYSIA

Scan this QR Code or visit
www.jsm.gov.my/cab-directories
for the current scope of
accreditation

has been granted accreditation in respect of the scope of accreditation described in the schedule, subject to the terms and conditions governing the *Skim Akreditasi Makmal Malaysia* (SAMM), the Laboratory Accreditation Scheme of Malaysia.

Laboratories accredited under SAMM meet the requirements of MS ISO/IEC 17025. This Malaysian Standard is identical with ISO/IEC 17025 published by the International Organization for Standardization (ISO).

(SHAHARUL SADRI BIN ALWI)
Director General
Department of Standards Malaysia

Date of issue: 18 February 2021

Issuance of this Certificate is governed by Section 16 Subsections (2) and (3) of Standards of Malaysia Act 1996 (Act 549)

Issue date: 8 February 2024
Valid until: 18 February 2029

NO: SAMM 999

LABORATORY LOCATION:
(PERMANENT LABORATORY)

GEONAMICS (M) SDN. BHD.
NO.6, LOT 25, JALAN UDANG HARIMAU 1
MEDAN NIAGA KEPONG
51200 KUALA LUMPUR
MALAYSIA

FIELD OF TESTING: **MECHANICAL**

FIELD OF CALIBRATION: **DIMENSIONAL**

This laboratory has demonstrated its technical competence to operate in accordance with MS ISO/IEC 17025:2017 (ISO/IEC 17025:2017).

This laboratory's fulfillment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and management system requirements that are necessary for it to consistently deliver technically valid test results and calibrations. The management system requirements in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001 (see Joint ISO-ILAC-IAF Communiqué dated April 2017).

SCOPE OF TESTING: MECHANICAL

Materials/ Products Tested	**Type of Test/ Properties Measured/ Range of Measurement**	**Standard Test Methods/ Equipment/Techniques**
Aggregate	**Determination of Loose Bulk Density and Voids for Aggregates	BS EN 1097-3:1998
	Determination of Aggregate Crushing Value (ACV)	BS 812-110:1990
	Determination of Ten Per Cent Fines Value (TFV)	BS 812-111:1990
	Determination of Aggregate Impact Value (AIV)	BS 812-112:1990
	Determination of Shell Content- Percentage of Shell in Coarse Aggregate	BS EN 993-7:1998
	Determination of Clay Lumps and Friable Particles in Aggregates	ASTM C142/C142M-17
	Determination of Potential Presence of Humus (Organics Impurities)	BS EN 1744-1:2009+A1:2012, Clause 15.1

SCOPE OF TESTING: MECHANICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Aggregate (continued)	Determination of Particle Size Distribution: Sieving Method	BS EN 933-1:2012
	Determination of Particle Density and Water Absorption	BS EN 1097-6:2022
	Determination of pH Value	BS 1377-3:2018+A1:2021, Clause 12
	Determination of Particle Shape-shape Index	BS EN 933-4:2008
	Determination of Particle Shape- Flakiness Index	BS EN 933-3:2012 BS 812-105.1:1989
	Elongation Index	BS 812-105.2:1990
	Soundness of Aggregate	ASTM C88/C88M-18
	Organic Impurities in Fine Aggregate for Concrete	ASTM C40/C40M-20
	Determination of the Water Content by Drying in a Ventilated Oven	BS EN 1097-5:2008

Signatories:

1. **Dr. Eng Zi Xun**
2. **Nur Syazwani Md Fadilah (only for **)**
3. **Tan Hui Hock**
4. **Nurul Asyikin Binti Arsad**

SCOPE OF TESTING: MECHANICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Soils	Determination of Water Content (Oven Drying Method)	BS 1377-2:2022, Clause 4.1 BS EN ISO 17892-1:2014+A1:2022
	Determination of the Liquid Limit: Fall Cone Method	BS 1377-2:2022, Clause 5.2&5.3 BS EN ISO 17892-12:2018+A2:2022 Clause 5.3
	Determination of the Plastic Limit and Plasticity Index	BS 1377-2: 2022, Clause 6 BS EN ISO 17892-12:2018+A2:2022 Clause 5.5
	Determination of Shrinkage Characteristics: Linear Shrinkage Method	BS 1377-2:2022, Clause 7
	Determination of Density: Linear Measurement Method	BS 1377-2:2022, Clause 9 BS EN ISO 17892-2:2014, Clause 5.1
	Determination of Particle Density: Fluid Pycnometer Method	BS 1377-2:2022, Clause 8 BS EN ISO 17892-3:2015, Clause 5.1
	Determination of Particle Size Distribution: Sieving, Hydrometer and Combined Tests	BS 1377-2:2022, Clause 10 BS EN ISO 17892-4:2016, Clause 5.2, 5.3 & 5.5
	Determination of Dry Density/ Water Content Relationship: 2.5 kg Rammer Method 4.5 kg Rammer Method Vibrating Hammer Method	BS 1377-2:2022, Clause 11.3 & 11.4 Clause 11.5 & 11.6 Clause 11.7
	Determination of California Bearing Ratio (CBR)	BS 1377-2:2022, Clause 15

Signatories:

1. **Tan Hui Hock**
2. **Dr. Eng Zi Xun**
3. **Nur Syazwani Md Fadilah**
4. **Nurul Asyikin Binti Arsad**

SCOPE OF TESTING: MECHANICAL

SITE:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Soils	In-situ Density Tests: Sand Replacement Method Suitable for Fine and Medium Grained Soils (Small Pouring Cylinder Method)	BS 1377-9:1990: Clause 2.1
	In-situ Density Tests: Sand Replacement Method Suitable for Fine and Medium Grained Soils (Medium Pouring Cylinder Method)	In-house method GEO/CMT/TM/06/014 with Reference to BS 1377-9:1990
	In-situ Density Tests: Sand Replacement Method Suitable for Fine, Medium and Coarse-grained Soils (Large Pouring Cylinder Method)	BS 1377-9:1990: Clause 2.2
	In-situ Density Tests: Core Cutter Method for Cohesive Soils Free from Coarse-Grained Material	BS 1377-9:1990: Clause 2.4
	In-situ Vertical Deformation and Strength Tests: Determination of the In-situ California Bearing Ratio (CBR)	BS 1377-9:1990: Clause 4.3
	Mackintosh Probe Test	In house test method GEO/CMT/06/01 with reference to JKR Specification

Signatories:

1. **Tan Hui Hock**
2. **Dr. Eng Zi Xun**
3. **Nur Syazwani Md Fadilah**
4. **Nurul Asyikin Binti Arsad**

SCOPE OF TESTING: MECHANICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Concrete	Compressive Strength of Test Specimens	BS EN 12390-3:2019
	Density of Hardened Concrete	BS EN 12390-7:2019
	Depth of Penetration of Water Under Pressure	BS EN 12390-8:2019
	Cored Specimen- Taking, Examining and Testing in Compression	BS EN 12504-1:2019
	Determination of Water Absorption	BS 1881-122:2011+A1:2020
	Determination of Secant Modulus of Elasticity in Compression	BS EN 12390-13:2021
	Determination of the Initial Surface Absorption of Concrete	BS 1881-208:1996
	Flexural Strength of Test Specimens	BS EN 12390-5:2019
	Tensile Splitting Strength of Test Specimen	BS EN 12390-6:2009

Signatories:

1. **Tan Hui Hock**
2. **Dr. Eng Zi Xun**
3. **Nur Syazwani Md Fadilah**
4. **Chaw Li Min**

SCOPE OF TESTING: MECHANICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Rocks	Unconfined Compressive Strength of Intact Rock Core Specimens	ASTM D7012-14e1, Method C
	Elastic Moduli of Intact Rock Core Specimen in Uniaxial Compression	ASTM D7012-14e1, Method D
	Determination of the Point Load Strength Index of Rock and Application to Rock Strength Classifications	ASTM D5731-16

Signatories:

1. **Tan Hui Hock**
2. **Dr. Eng Zi Xun**
3. **Nur Syazwani Md Fadilah**
4. **Chaw Li Min**

SCOPE OF TESTING: MECHANICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Bituminous Materials	Marshall Stability and Flow of Asphalt Mixtures	ASTM D6927-22
	Bulk Specific Gravity and Density of Non- Absorptive Compacted Asphalt Mixtures	ASTM D2726/D2726M-21
	Quantitative Extraction of Asphalt Binder from Asphalt Mixtures	ASTM D2172/D2172M-17e1 (Method A- Centrifuge Extraction)
	Thickness of Height of Compacted Asphalt Mixtures	ASTM D3549/D3549M-18 (Method A)

Signatories:

1. **Tan Hui Hock**
2. **Dr. Eng Zi Xun**
3. **Nurul Asyikin Binti Arsad**

SCOPE OF TESTING: MECHANICAL

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Metal & Metal Product (Steel Bar)	Tensile Properties	MS 146:2014, Clause 7.3.3 MS ISO 6892-1:2017 ISO 6892-1:2019 MS ISO 15630-1:2012 BS EN ISO 15630-1:2019
	Bend Performance	BS EN ISO 15630-1:2019
Welds and Welded Test Specimens (Welded Steel Fabric)	Tensile Properties	MS 145:2014, Clause 8.1.3.1 MS ISO 15630-2:2012 BS EN ISO 15630-2:2019 MS ISO 6892-1:2017 ISO 6892-1:2019
	Bend Performance	MS 145: 2014, Clause 7.2.5 MS ISO 15630-2:2012 BS EN ISO 15630-2:2019
	Weld Shear Force	MS 145:2014, Clause 7.2.4 MS ISO 15630-2:2012 BS EN ISO 15630-2:2019

Signatories:

1. **Tan Hui Hock**
2. **Dr. Eng Zi Xun**
3. **Zurfarahin Zulkarnain**

SCOPE OF TESTING: MECHANICAL

SITE:

Materials/ Products Tested	Type of Test/ Properties Measured/ Range of Measurement	Standard Test Methods/ Equipment/Techniques
Other materials (Pile Testing)	Standard Test Method for High-Strain Dynamic Testing of Deep Foundations	ASTM D4945-17

Signatories:

1. **Dr. Eng Zi Xun**
2. **Nor Zuhairi Yaacob**
3. **Tan Hui Hock**
4. **Abdul Muhaimin Bin Ayub**
5. **Muhammad Izzuddin bin Sedek**

*** The uncertainty covered by the CMC is expressed as the expanded uncertainty corresponding to a coverage probability of approximately 95 % and have a coverage factor of *k*=2 unless stated otherwise.**

SCOPE OF CALIBRATION: DIMENSIONAL

Instrument calibrated/ Measurement parameter	Range	Calibration and Measurement Capability expressed as an uncertainty (±)*	Remarks
Strain Transducer Sensitivity (Pile Dynamics, Inc models)	Up to 200 με/V	2.6 με/V	In-house method – "BDI Automated Strain Transducer Calibration System (ASTCS)".

Signatories:

1. **Tan Hui Hock**
2. **Dr. Eng Zi Xun**
3. **Nor Zuhairi Yaacob**

MINISTRY OF INVESTMENT, TRADE AND INDUSTRY
DEPARTMENT OF STANDARDS MALAYSIA

Certificate of Accreditation

Accreditation No: MIBAS 051

Accredited since: 10-Feb-2026
Valid Until: 10-Feb-2031

This is to certify that

GEONAMICS (M) SDN. BHD.
KEPONG, KUALA LUMPUR
MALAYSIA

Scan this QR Code
for the current scope of accreditation

Has been granted accreditation in respect of the scope of accreditation described in the schedule, subject to the terms and conditions governing the Malaysia Inspection Bodies Accreditation Scheme (MIBAS).

Inspection bodies accredited under MIBAS meet the requirements of MS ISO/IEC 17020. This Malaysian Standard is identical with ISO/IEC 17020 published by the International Organization for Standardization (ISO).

Jabatan Standard Malaysia
STANDARDS MALAYSIA
Department of Standards Malaysia

(SEE CHEE KONG)
Director General
Department of Standards Malaysia
Issue Date: 10-Feb-2026

This certificate is made pursuant to subsections 16(2) and 16(3). [Act 549]

*****This certificate is electronically generated. No signature is required*****

Schedule

Issue date: 10 February 2026
Valid until: 10 February 2031

NO: MIBAS 051

INSPECTION BODY:

GEONAMICS (M) SDN. BHD.
NO. 6, LOT 25, JALAN UDANG HARIMAU 1
MEDAN NIAGA KEPONG
51200 KUALA LUMPUR
MALAYSIA

FIELD OF INSPECTION: **BUILDING AND CONSTRUCTION**

The standard used for assessment of this inspection body is MS ISO/IEC 17020:2012.

An inspection body's fulfilment of the requirements of ISO/IEC 17020:2012 means the inspection body meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid inspection results. The **management system requirements** in ISO/IEC 17020:2012 (Section 8) are written in language relevant to inspection body operations and are aligned with the pertinent requirements of ISO 9001. (Joint IAF-ILAC-ISO Communiquè dated September 2013).

TYPE OF INSPECTION BODY: **A**

SCOPE OF INSPECTION: **PRODUCT CONFORMITY**

Items, Materials or Products Inspected	Type and Range of Inspection	Inspection Methods and Procedures
Falsework and Scaffolding in Construction (Used)	1. Document Check & Review 2. Sampling 3. Quantity Check 4. Quality Check (visual) 5. Dimensional/Measurement Check 6. Marking Check	Internal Procedure: GEO/MIT/IM/01/06 Standards: CIS 22 CIS 23

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Appendix 4 – Accredited Scope (SINGAPORE)

SINGAPORE LABORATORY ACCREDITATION SCHEME

Accredited Laboratory SAC-SINGLAS

Schedule

Geonamics (S) Pte Ltd
No 5, Kwong Min Road
Singapore 628708

Certificate No. : LA-2013-0548-B

Issue No. : 9

Date : 8 September 2025

Expiry of Certificate : 15 September 2029

FIELD OF TESTING: Civil Engineering Testing

MATERIALS/ PRODUCTS TESTED	TESTS/PROPERTIES	STANDARD METHODS
A. PILE		
A1.	High-strain dynamic testing of deep foundations	ASTM D 4945-17
A2.	Standard test method for low strain impact integrity testing of deep foundations	ASTM D 5882-16
A3.	Standard test method for integrity testing of concrete deep foundations by ultrasonic cross-hole testing	ASTM D 6760-16
A4.	Measuring inclination and shaft profile of deep foundations (SHAPE Method)	ASTM D8232-18
A5.	Standard test method of energy measurement for dynamic penetrometers	ASTM D4633-16
A6.	Rapid Load Testing	BS EN ISO 22477-10: 2016
B. SOIL		
B1.	Determination of moisture / water content	BS 1377-2:2022#4 BS EN ISO 17892-1:2014+A1: 2022 ASTM D2216-19
B2.	Determination of liquid limit, plastic limit and plasticity index & shrinkage characteristics – linear shrinkage	BS 1377-2:2022 #5,6 & 7 BS EN ISO 17892-12: 2018+A2: 2022 ASTM D4318-17e1

MATERIALS/ PRODUCTS TESTED	TESTS/PROPERTIES	STANDARD METHODS
B3.	Determination of dry and bulk density / unit weight	BS 1377-2:2022 #8 BS EN ISO 17892-2:2014 ASTM D7263-21
B4.	Determination of particle density / specific gravity	BS 1377-2:2022 #9 BS EN ISO 17892-3: 2015 ASTM D854-23
B5.	Determination of particle size distribution	BS 1377-2: 2022 #10 BS EN ISO 17892-4:2016 ASTM D6913/D6913M-17 ASTM D7928-21e1
B6.	a) Determination of one-dimension consolidation properties	BS 1377-2:2022 #16 ASTM D2435/D2435M-11 (2020)
	b) Incremental loading oedometer test	BS EN ISO 17892-5:2017
B7.	Determination of swelling and collapse characteristics	BS 1377-2:2022 #17
B8.	a) Determination of permeability in a triaxial cell	BS 1377-2:2022 #23
	b) Permeability tests	BS EN ISO 17892-11:2019
B9.	Determination of unconfined compressive strength (UCT)	BS 1377-2:2022 #27 BS EN ISO 17892-7:2018 ASTM D2166/D2166M-24
B10.	a) Unconsolidated undrained (UU) triaxial test	BS 1377-2:2022 #28 BS EN ISO 17892-8:2018 ASTM D2850-24
	b) Unconsolidated undrained triaxial test with measurement of pore water pressure (UUpwp test)	K.H. Head Vol 3 Chapter 19.3
	c) Multistage loading (MUU test)	BS 1377-7:1990#9

MATERIALS/ PRODUCTS TESTED	TESTS/PROPERTIES	STANDARD METHODS
B11.	a) Consolidated triaxial compression test on water saturated soil (CIU & CAU tests)	BS1377-2:2022 #29 BS EN ISO 17892-9:2018 ASTM D4767-11 (2020)
	b) Multistage loading (MCU test)	K.H Head Vol.3 Chapter 13.6.5
B12.	a) Consolidated triaxial compression test on water saturated soil (CID & CAD tests)	BS 1377-2:2022 #30 BS EN ISO 17892-9:2018 ASTM D7181-20
	b) Multistage loading (MCD test)	K.H Head Vol.3 Chapter 19.2
B13.	Determination of resistivity test – Wenner probe method	BS 1377-3:2018+A1:2021 #13.5 ASTM G57-20
B14.	Determination of thermal conductivity of soil and soft rock by thermal needle probe procedure	ASTM D5334-22^{ae1}
B15.	Thermal resistivity measurements of soils and backfill materials	IEEE 442-2017
B16.	Determination of maximum and minimum dry densities for coarse soils	BS 1377-2:2022 #12
B17.	Determination of dry density / water content relationship (compaction)	BS 1377-2:2022 #11
B18.	Slaking Test	MPA Annex 2: Section D
B19.	Dispersibility by Pinhole Test Apparatus	BS 1377-2: 2022 # 18 ASTM D4647/D4647M-13 (Reapproved 2020)
B20.	Direct Shear by Small Shearbox	BS 1377-2: 2022 # 25 BS EN ISO 17892-10: 2018 ASTM D3080/D3080M-23

MATERIALS/ PRODUCTS TESTED	TESTS/PROPERTIES	STANDARD METHODS
B21.	Consolidation – One Dimensional Test using Controlled Strain Loading (CSL)	ASTM D4186/D4186M-20e2 BS EN ISO 19901-8 # B.3.3: 2023
B22.	In-situ Plate Load Test	BS 1377: 1990: Part 9: Clause 4.1
B23.	Amount of Material Finer than 75 μm (No. 200) Sieve in Soils by Washing	ASTM D1140-17
B24.	Rapid Determination of Carbonate Content of Soil	ASTM D4373-21
C. GEOTEXTILE		
C1.	(a) Wide-Width Tensile Test of Geotextiles	ASTM D4595 /D4595M-24
	(b) Geosynthetics – Wide Width Tensile Test	BS EN ISO 10319: 2024
C2.	(a) Prefabricated Vertical Drain (PVD) Discharge Capacity Test	ASTM D4716 /D4716M-22
	(b) Geosynthetics – Test Method for the determination of water discharge capacity for prefabricated vertical drains (Index Test)	BS EN ISO 12958-1:2020
	(c) Geosynthetics – Test Method for the determination of water discharge capacity for prefabricated vertical drains (Performance Test)	BS EN ISO 12958-2: 2020
C3.	(a) Prefabricated Vertical Drain (PVD) Discharge Capacity Test with kinks (NUS Method 2)	ASTM D4716/D4716M-22
	(b) Geosynthetics – Test Method for the determination discharge capacity for prefabricated vertical drains with kinks (Index Test) – NUS Method 2	BS EN ISO 12958-1: 2020
	(c) Geosynthetics – Test Method for the determination of water discharge capacity for prefabricated vertical kinks (Performance Test) – NUS Method 2	BS EN ISO 12958-2: 2020

MATERIALS/ PRODUCTS TESTED	TESTS/PROPERTIES	STANDARD METHODS
C4.	(a) Apparent Opening Size of Geotextile	ASTM D4751-21a
	(b) Determination of the Characteristic Opening Size	BS EN ISO 12956: 2020
C5.	(a) Geosynthetics Nominal Thickness of Geotextile	ASTM D5199-12 (Reapproved 2019)
	(b) Geosynthetics – Determination of Thickness at Specific Pressure – Part 1: Single Layers	BS EN ISO 9863-1: 2016 + A1: 2019
C6.	Trapezoid Tearing Test of Geotextiles	ASTM D4533/D4533M-15 (2023)
C7.	Grab Breaking Load and Elongation of Geotextiles	ASTM D4632/D4632M-15a (2023)
C8.	(a) Water Permeability of Geotextiles by Permittivity	ASTM D4491/D4491M-22
	(b) Determination of water permeability characteristics normal to the plane, without load	BS EN ISO 11058: 2019
C9.	(a) In-Plane Permeability of Geotextiles	ASTM D4716/D4716M-22
	(b) Geotextiles and geotextile-related products – Determination of water flow capacity in their plane (Index Test)	BS EN ISO 12958-1: 2020
	(c) Geotextiles and geotextile-related products – Determination of water flow capacity in their plane (Performance Test)	BS EN ISO 12958-2: 2020
C10.	a) Static Puncture Strength of Geotextiles	ASTM D6241-22a
	(b) Geosynthetics – Static Puncture Test (CBR Test)	BS EN ISO 12236: 2006
C11.	(a) Measuring Mass per unit area of Geotextiles	ASTM D5261-10 (Reapproved 2024)

MATERIALS/ PRODUCTS TESTED	TESTS/PROPERTIES	STANDARD METHODS
	(b) Geosynthetics – Determination of mass per unit area of geotextiles and geotextile-related products	BS EN ISO 9864: 2005
C12.	Geosynthetics – Dynamics Perforation Test (Cone Drop Test)	BS EN 918/ISO 13433: 2006
C13.	(a) Geosynthetics – Tensile test for joint / seams by wide-width strip method	ISO 10321: 2008
	(b) Strength of Sewn or Bonded Seams of Geotextiles	ASTM D4884/D4884M-22
C14.	Deterioration of Geotextiles by Exposure to Light, Moisture and Heat in A Xenon Arc-Type Apparatus	ASTM D4355/D4355M-21
C15.	Standard Test Method for Index Puncture Resistance of Geomembrane and Related Product	ASTM D4833/D4833M-07 (Reapproved 2020)
C16.	Standard Test Method for Breaking Force and Elongation of Textile Fabrics (Strip Method)	ASTM D5035-11 (Reapproved 2024)
C17.	Tensile Properties of Geogrids by the Single or Multi-Rib Tensile Method	ASTM D6637/D6637M – 15 (2023)
C18.	Tensile Properties of Rolled Erosion Control Products	ASTM D6818-21
D. ROCK		
D1.	Dimension and Shape Tolerance	ASTM D4543-19
D2.	Water Content of Soil & Rock	ASTM D2216-19 ISRM 1977: Part 1-1
D3.	Point Load Test	ASTM D5731-16 ISRM 1985

MATERIALS/ PRODUCTS TESTED	TESTS/PROPERTIES	STANDARD METHODS
D4.	Compressive Strength Test	ASTM D7012-23 ISRM 1979
D5.	Swelling Pressure Index	ISRM 1977: Part 2-1
D6.	Swelling Strain Index	ISRM 1977: Part 2-2
D7.	Slake Durability of Shales and Other Similar Weak Rocks	ASTM D4644 -16
E. CONCRETE		
E1.	Compressive Strength of Hardened Concrete Cube	BS EN 12390-3: 2019
F. AGGREGATE		
F1.	Moisture Content (Water Content)	BS 812: Part 109: 1990 BS EN 1097-5: 2008
F2.	Bulk Density (“Unit Weight”) and Voids in Aggregate	ASTM C29 / C29M-23 BS 812: Part 2: 1995, CL 6
F3.	Clay Lumps and Friable Particles in Aggregate	ASTM C142 / C142-17 (Reapproved 2023)
F4.	Aggregate Crushing Value	BS 812: Part 110: 1990
F5.	Aggregate Impact Value	BS 812: Part 112: 1990

Approved Signatories

Mr Chong Kean Chew	-	Section A (except A6)
Mr Gilbert Chuah F S	-	Section A6
Mr Tang Kim Chuan	-	Section A6
Dr Henry Tan C Y	-	Sections B, C, D, E & F
Mr Tay Keng Hui	-	Sections B (except B22 and B24), D & E
Mr Htet Wai Myint	-	Sections B, D, E & F

Note :

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025. A laboratory's fulfilment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid tests. The **management system requirements** in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001.

SINGAPORE LABORATORY ACCREDITATION SCHEME

Accredited Laboratory SAC-SINGLAS

Schedule

Geonamics (S) Pte Ltd
Site Laboratory:
Tanah Merah Coast Road T
Supply Lot 04962N(PT) MK31 LP112F
Singapore 490000

Certificate No. : LA-2013-0548-B-1

Issue No. : 6

Date : 8 September 2025

Expiry of Certificate : 15 September 2029

FIELD OF TESTING : Civil Engineering Testing

MATERIALS/ PRODUCTS TESTED	TESTES/PROPERTIES	STANDARD METHODS/ TECHNIQUES
A. SOIL		
A1.	Determination of moisture / water content	BS 1377-2:1990 CL 3 BS 1377-2: 2022 # 4 BS EN ISO 17892-1:2014+A1: 2022
A2.	Determination of liquid limit, plastic limit and plasticity index & shrinkage characteristics – linear shrinkage	BS 1377-2:1990 CL 4 & 5 BS 1377-2: 2022 # 5,6 & 7 BS EN ISO 17892-12: 2018+A2: 2022
A3.	Determination of dry and bulk density	BS 1377-2:1990 CL 7 BS 1377-2: 2022 # 8 BS EN ISO 17892-2:2014
A4.	Determination of particle density	BS 1377-2:1990 CL 8 BS 1377-2: 2022 #9 BS EN ISO 17892-3:2015
A5.	Determination of particle size distribution	BS 1377-2:1990 CL 9 BS 1377-2: 2022 #10 BS EN ISO 17892-4:2016
A6.	(a) Determination of one-dimensional consolidation properties	BS 1377-5:1990 CL 3 BS 1377-2: 2022 # 16
	(b) Incremental loading oedometer test	BS EN ISO 17892-5:2017
A7.	Determination of swelling and collapse characteristics	BS 1377-5:1990 CL 4 BS 1377-2: 2022 # 17
A8.	(a) Determination of permeability in a triaxial cell	BS 1377-6-1990 CL 6 BS 1377-2: 2022 # 23
	(b) Permeability tests	BS EN ISO 17892-11:2019

Schedule

Certificate No. : LA-2013-0548-B-1 Issue No. : 6

Date : 8 September 2025 Page : 2 of 2

MATERIALS/ PRODUCTS TESTED	TESTES/PROPERTIES	STANDARD METHODS/ TECHNIQUES
A9.	Determination of unconfined compressive strength (UCT)	BS 1377-7:1990 CL 7 BS 1377-2: 2022 # 27 BS EN ISO 17892-7:2018
A.10	(a) Unconsolidated undrained triaxial test	BS 1377-7:1990 CL 8 BS 1377-2: 2022 # 28 BS EN ISO 17892-8:2018
	(b) Unconsolidated undrained triaxial test with measurement of pore pressure (UUpwp test)	K.H. Head Vol 3 Chapter 19.3
	(c) Multistage loading (MUU test)	BS 1377-7:1990 CL 9
A11.	(a) Consolidated triaxial compression test on water saturated soil (CIU & CAU tests)	BS 1377-8:1990 CL 4,5,6 & 7 BS 1377-2: 2022 # 29 BS EN ISO 17892-9:2018
	(b) Multistage loading (MCU test)	K.H Head Vol.3 Chapter 13.6.5
A12.	(a) Consolidated triaxial compression test on water saturated soil (CID & CAD tests)	BS 1377-8:1990 CL 4,5,6 &8 BS 1377-2: 2022 # 30 BS EN ISO 17892-9:2018
	(b) Multistage loading (MCD test)	K.H Head Vol.3 Chapter 19.2
A13.	Determination of resistivity test – Wenner probe method	BS 1377-3:2018 CL 13.5 BS 1377-3: 2018+ A1: 2021 # 13.5

Approved Signatories

Dr Henry Tan C Y - All Soil Tests.
Mr Tay Keng Hui - All Soil Tests.
Mr Htet Wai Myint - All Soil Tests.

Note :

This laboratory is accredited in accordance with the recognised International Standard ISO/IEC 17025. A laboratory's fulfilment of the requirements of ISO/IEC 17025 means the laboratory meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid test results. The **management system requirements** in ISO/IEC 17025 are written in language relevant to laboratory operations and operate generally in accordance with the principles of ISO 9001.

ACCREDITATION SCHEME
FOR INSPECTION BODIES

SAC Accredited Inspection Body

Schedule

Geonamics (S) Pte Ltd
5 Kwong Min Road
Singapore 628708

Certificate No. : IB-2019-173-F

Issue No. : 8

Date : 31 March 2026

Expiry of Certificate : 24 January 2027

Inspection Field : Site Investigation

Type A Inspection Body

TYPE OF PRODUCT	TYPE AND RANGE OF INSPECTION	INSPECTION METHOD, CODES OR STANDARDS USED
1. Soil	Site Investigation	BS 5930: 2015+A1:2020 SS EN 1997-2: 2010 (2020) BS EN ISO 22475-1: 2021
	Identification, description and classification	BS EN ISO 14688:2018, Parts 1 and 2
	Under Undisturbed Sampling a) Stationary Piston Sampler	BS EN ISO 22475-1: 2021 BS 5930: 2015+A1:2020
	b) Open Thin Wall Sampler	
	c) Mazier Sampler	
	Under Functional Testing a) Cone Penetration Test (CPT)	ASTM D 5778-20 BS 5930: 2015+A1: 2020, Section 39 BS EN ISO 22476-1: 2023
	b) Standard Penetration Test (SPT)	BS EN ISO 22476-3: 2005+A1:2011 BS 1377: 1990: Part 9, Clause 3.3
	c) Vane Shear Test	BS 1377:1990: Part 9, Clause 4.4 BS EN ISO 22476-9 :2020
	d) Field Permeability Test	BS EN ISO 22282-1: 2012 BS EN ISO 22282-2: 2012 BS 5930: 2015+A1: 2020, Section 48

TYPE OF PRODUCT	TYPE AND RANGE OF INSPECTION	INSPECTION METHOD, CODES OR STANDARDS USED
	e) In Situ Density Test- Sand Replacement method	BS 1377: 1990: Part 9: Clause 2.1
	f) Radio-Isotope Cone Test	ASTM GTJ (2006)
	g) Earth Resistivity / Soil Resistivity Test	ASTM G57-20 (Wenner Four-Electrode Method)
	h) Pressuremeter Test • Pressuremeter Test (Menard)	BS EN ISO 22476-4: 2021
2. Rock	Site Investigation	BS 5930: 2015+A1:2020 BS EN 1997-2:2007 SS EN 1997-2: 2010 (2020) BS EN ISO 22475-1: 2021
	Identification, description and classification	BS EN ISO 14689:2018
	Under Undisturbed Sampling a) Rock Core Barrel	BS EN ISO 22475-1: 2021 BS 5930: 2015+A1: 2020, Section 24.11.3 & 25.7
	Under Functional Testing a) Pressuremeter Test • Pressuremeter Test (Menard)	BS EN ISO 22476-4: 2021
	b) Packer Test	BS EN ISO 22282-3:2012 BS 5930:2015+A1:2020
3. Geotechnical Borehole Instrumentation & Monitoring	Measuring Displacement a) Magnetic Extensometer b) Rod Extensometer c) Inclinometer d) Total Station e) Digital Level f) Tiltmeter	 BS EN ISO 18674-2: 2016 BS EN ISO 18674-2: 2016 BS EN ISO 18674-3: 2017+A1: 2020 BS EN ISO 18674-1: 2015 BS EN ISO 18674-1: 2015 BS EN ISO 18674-1: 2015
	Measuring Pressure a) Vibrating Wire Piezometer b) Casagrande Piezometer c) Total Pressure Cells	 BS EN ISO 18674-4: 2020 BS EN ISO 18674-4: 2020 BS EN ISO 18674-5: 2019
	Measuring Groundwater Level a) Water Standpipes	 BS EN ISO 18674-1: 2015

Schedule

Certificate No. : IB-2019-173-F Issue No. : 8

Date : 31 March 2026 Page : 3 of 3

TYPE OF PRODUCT	TYPE AND RANGE OF INSPECTION	INSPECTION METHOD, CODES OR STANDARDS USED
4. Instrumentation & Monitoring for Struts	Measuring Force a) Load Cells b) Strain Gauges Miscellaneous Instruments a) Geophone Accelerometer b) Vibration Meter	 BS EN ISO 18674-8: 2023 BS EN ISO 18674-1: 2015 BS EN ISO 18674-1: 2015 BS EN ISO 18674-1: 2015

Approved signatories

Er. Yeoh Boon Kang	Rock and Soil
Dr. Henry Tan CY	Instrumentation & Monitoring for Geotechnical Borehole and Struts

Note:

An inspection body's fulfilment of the requirements of ISO/IEC 17020:2012 means the Inspection body meets both the technical competence requirements and **management system requirements** that are necessary for it to consistently deliver technically valid inspection results. The **management system requirements** in ISO/IEC 17020:2012 (Section 8) are written in language relevant to inspection body operations and are aligned with the pertinent requirements of ISO 9001.

ACCREDITATION SCHEME
FOR CERTIFICATION BODIES

SAC Accredited Certification Body

Schedule

Geonamics (S) Pte Ltd
5 Kwong Min Road
Singapore 628708

Certificate No	:	PD-2023-27 (Part 1 of 2)
Issue No	:	3
Date	:	04 May 2026
Expiry of Certificate	:	04 June 2027
Page	:	1 of 1

Product Certification Scheme – Ready Mixed Concrete

ISO/IEC Type 5	Certification scheme consisting of type test of a sample of the product representative of production; initial inspection of production control; and subsequent periodic inspection of production control, quality management system and samples of the product
Supplementary criteria for certification bodies:	SAC CT 05: 2026 SAC Criteria for Certification Bodies (Ready-Mixed Concrete)
Standard used for certification:	SS EN 206: 2014 (2024)+A1:2024 Concrete – Specification, performance, production and conformity SS 544-1: 2024 (including Amendment No.1 - 2021) Concrete – Complementary Singapore Standard to SS EN 206 - Part 1: Method of specifying and guidance for the specifier SS 544-2: 2024 (including Amendment No. 1 – 2021) Concrete – Complementary Singapore Standard to SS EN 206 - Part 2: Specification for constituent materials and concrete SAC CT 06: 2026 SAC Criteria for Ready-Mixed Concrete Producers
Overseas location(s) with key activities:	Nil
Countries where certificates are issued:	Singapore, Malaysia

ACCREDITATION SCHEME
FOR CERTIFICATION BODIES

Accredited Certification Body
SAC

Schedule

Geonamics (S) Pte Ltd
5 Kwong Min Road
Singapore 628708

Certificate No	:	PD-2023-27 (Part 2 of 2)
Issue No	:	1
Date	:	15 October 2025
Expiry of Certificate	:	04 June 2027
Page	:	1 of 1

Product Certification Scheme – Piling Works

ISO/IEC Type 6	Certification scheme consisting of type test of a sample of the product representative of production; initial inspection of production control; and subsequent periodic inspection of production control, quality management system and samples of the product.

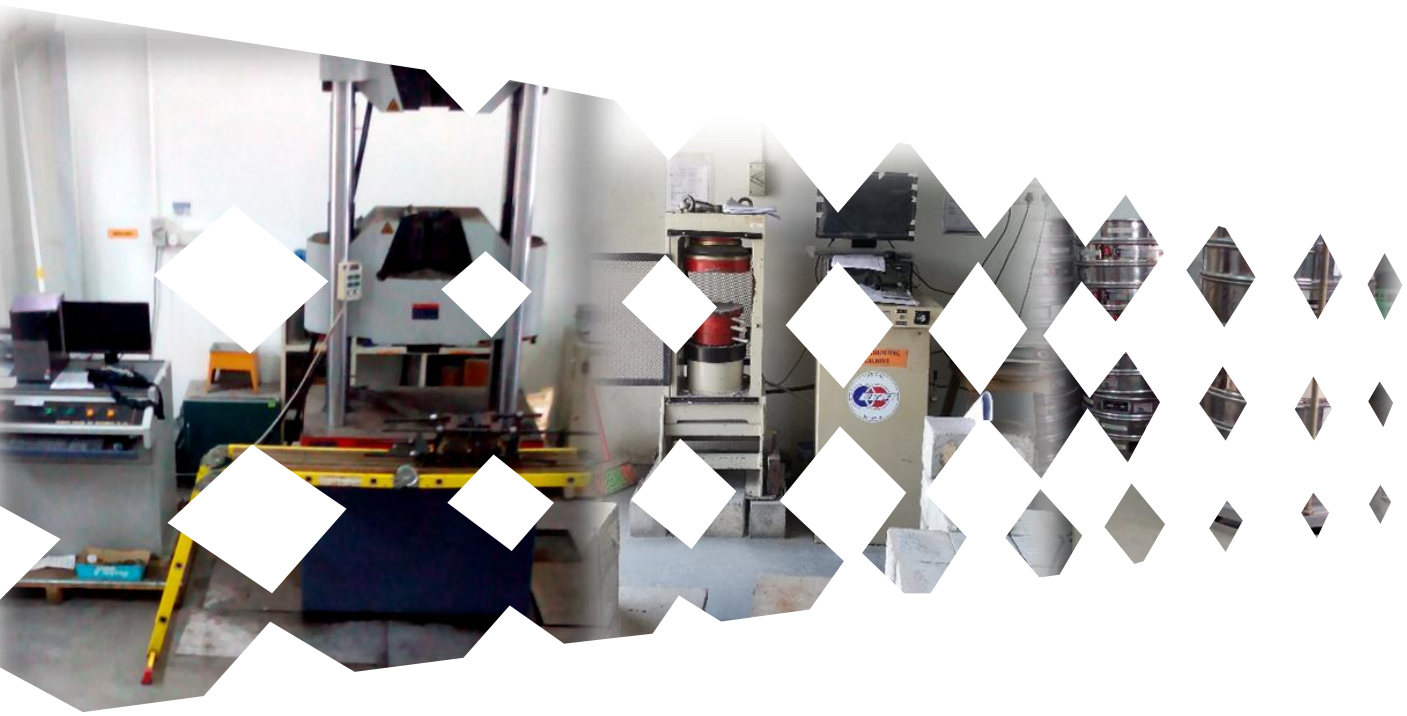
Supplementary criteria for Certification Bodies:	SAC CT 31:2023 – SAC Criteria for Certification Bodies (Piling Works)
Standard used for certification:	SAC CT 32:2023 – SAC Criteria for Certification of Specialist Builders (Piling Works)
Overseas location(s) with key activities:	Nil
Countries where certificates are issued:	Singapore

GEONAMICS

YOUR ONE-STOP PROFESSIONAL TESTING CENTRE

TESTING
INSPECTION
CERTIFICATION
INSTRUMENTATION
CALIBRATION

Appendix 5 – Brochures of Testing Services

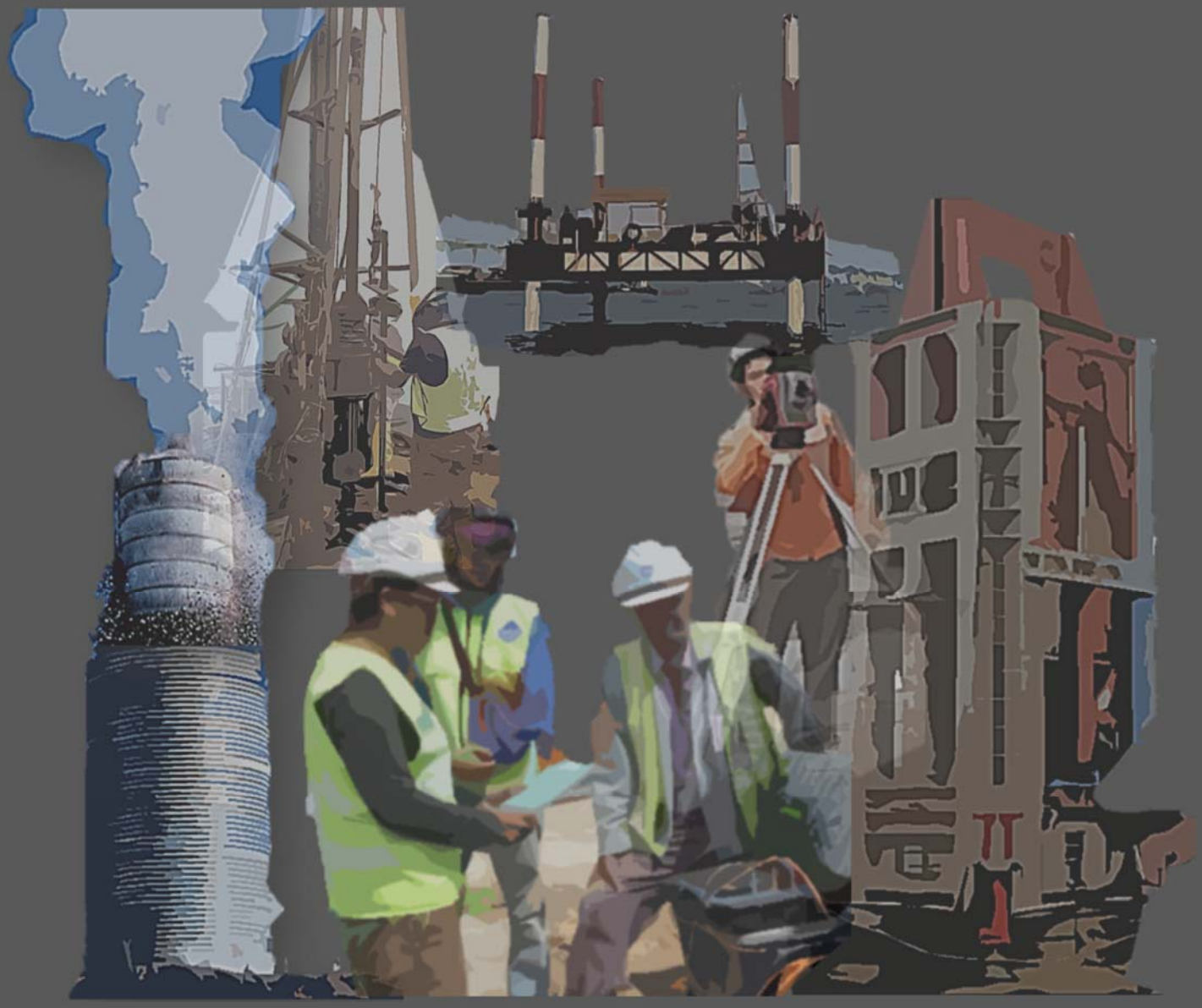


Ground Investigation & Geophysical Tests
Geotechnical Instrumentation & Monitoring
Construction Materials Testing
Shaft Area Profile Evaluator

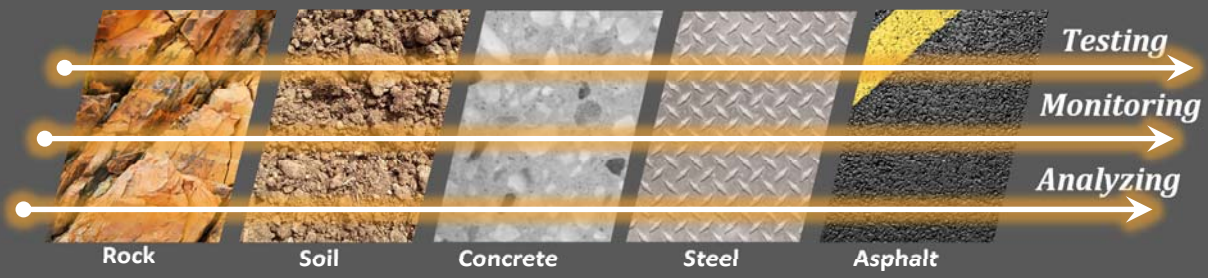
Rapid Pile Load Test
Low-Strain & High-Strain Dynamic Pile Tests
Bidirectional Pile Load Test
Distributed Fibre Optic Sensing (DFOS)

GEONAMICS (M) SDN. BHD.

TESTING SERVICES OVERVIEW



YOUR ONE STOP PROFESSIONAL TESTING CENTRE



GEONAMICS

GEONAMICS (M) SDN. BHD. (Reg. No: 342862-W)
No. 6, Lot 25, Jalan Udang Harimau 1, Medan Niaga Kepong, 51200 ,
Kuala Lumpur, Malaysia
Phone: +603 6243 4715 Fax: +603 6242 6496
Email: info@geonamics.com.my Website: www.geonamics.com.my

ilac-MRA STANDARDS MALAYSIA ACCREDITED SAMM 999

CERTIFIED ISO 9001:2015 BUREAU VERITAS UKAS MANAGEMENT SYSTEMS 0008

Ground Investigation & Geophysical Tests
Geotechnical Instrumentation & Monitoring
Construction Materials Testing
Shaft Area Profile Evaluator
Rapid Pile Load Test
Low-Strain & High-Strain Dynamic Pile Tests
Bidirectional Pile Load Test
Distributed Fibre Optic Sensing (DFOS)

GEONAMICS (M) SDN. BHD.

COMPANY PROFILE

Geonamics (M) Sdn. Bhd. is founded in 1995, as a sister company of Geolab (M) Sdn. Bhd. The group of Geolab (M) Sdn. Bhd. is recognized as a market leader in the construction industry for construction materials, ground investigation and exploration works, geotechnical engineering related instrumentation and monitoring works and various deep foundation testing.

Over the many years of development, Geonamics exposure to needs of industry to integrate various testing services, instrumentation and monitoring work have enabled the company to established a series of testing services specific to local problems and engineering conditions. Geonamics is therefore uniquely placed to provide reliable and cost effective solutions. With that, Geonamics own a chain of branches throughout the major cities in Malaysia and Singapore.

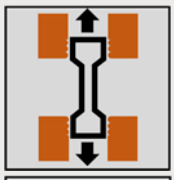
Products and Services

Geonamics provides almost a full range of testing services in geotechnical engineering works. A large spectrum of engineering testing, instrumentation, monitoring services spanned from pre-construction stage, to during-construction stage and the latter post-construction stage are offered by Geonamics. We covers numerous field and laboratory test and instrument monitoring services.

Quality Control Assurance

With our experienced Professional Engineers and qualified engineering staffs, we always strive with one common objective: professionalism and reliability in our testing services. Geonamics is constantly embracing new technologies and innovation and to ensure the test services are fully complied to the each latest test standard. The quality control complies in full to ISO 9001 standards and a range of testing services are also accredited by Standard Malaysia (SAMM).

Ground Investigation & Geophysical Tests

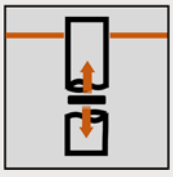


Construction Materials Testing

Low-Strain & High-Strain Dynamic Pile Tests

Rapid Pile Load Test

Geotechnical Instrumentation & Monitoring



Bidirectional Pile Load Test

Shaft Area Profile Evaluator (SHAPE)

Distributed Fibre Optic Sensing (DFOS)

Transducers Calibration

20240228-100-If (Company_profile)

GEONAMICS
GEONAMICS (M) SDN. BHD. (Reg. No: 342862-W)
No. 6, Lot 25, Jalan Udang Harimau 1, Medan Niaga Kepong, 51200 , Kuala Lumpur,
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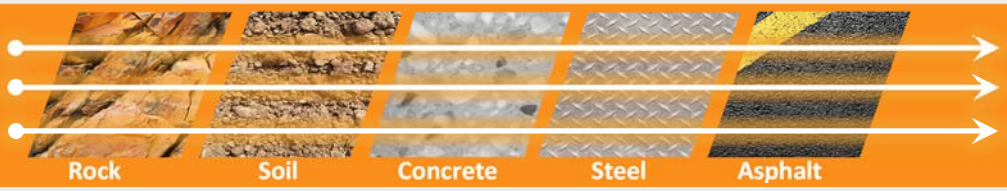
Email: info@geonamics.com.my Website: www.geonamics.com.my

SAMM 999

CERTIFIED ISO 9001:2015



Ground Investigation & Geophysical Tests

Drilling, boring & coring

Geophysical survey

In-situ Sampling Specimen

Ground Investigation & Geophysical Tests develops tailored geotechnical exploration programs in support of each client's specific project. We know what is below the surface can be as crucial and complex as the structure it supports. Our team approach to geotechnical engineering extends beyond simply providing engineering data. We educate our clients about the risks and benefits of the engineering recommendations if needed.

Services Include

- **Drilling, Boring, & Coring** — To penetrate and explore the stratigraphy of ground via drilling, boring , and coring vertically at the specific project location.
- **In-situ Testing** — To perform varies in-situ soil tests at the interested depth according the specification to derive the in-situ soil properties and behavior. The in-situ tests include standard penetration test, vane shear test, field permeability test, cone penetration test, pressuremeter, Mackintosh Probe Test, and etc.
- **In-situ Sampling** — To obtain the disturb and undisturbed samples for soil/rock for subsequent laboratory testing or evaluation study. A few type of sampler are available for in-situ sampling, include Thin-wall Tube Sampler, Piston Sampler and Mazier Sampler.
- **Geophysical Surveys & Subsurface Exploration** — For subsurface exploration with a non-destructive method, geophysical survey is an alternative solution to provide an overview of the ground stratigraphy via resistivity or seismic techniques.

Why Geonamics?

- Expert in the market.
- Advanced on-shore and off-shore exploration capability.
- Industry-leading in-situ testing.
- Advanced geotechnical laboratory testing capability.

20240228-100-If (GI & GT)

GEONAMICS

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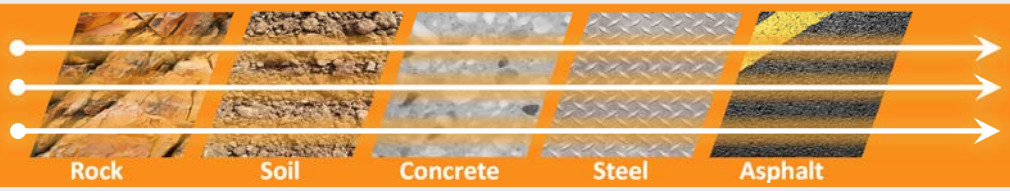

Testing
Monitoring
Analyzing

Construction Materials Testing

Triaxial Tests

Liquid Limit Test

Sieve Test

Hydrometer Test

Tensile Test

Construction Materials Testing Department is primarily running a laboratory and field works that testing structural materials used to construct a project from the ground up, or components used to construct new additions to an existing facility. The scopes include destructive and non-destructive testing and evaluation for earthwork, shallow and deep foundations, concrete, structural masonry, structural steel, and asphalt pavement. We deliver field and laboratory reports rapidly, giving the construction team valuable information on a timely basis. All tests results are reviewed and approved by our test engineer and endorsed by authorized signatory personnel.

Services Include

- **Independent Material Testing** — To provide independent third-party testing results for the verification of construction material specifications.
- **Special Inspections** — To test items that require a construction materials testing and require an inspection program conducted by a third party, specifically for new buildings.

Why Geonamics?

- Certified personnel
- Accredited facilities compliance to MS ISO 17025
- Well-calibrated facilities
- Rapid providers of innovative solutions for earthwork and foundation construction
- Advanced soil and materials testing capability

Concrete Cube Test

UPV test

Asphalt test

20240228-100-lf (CMT)

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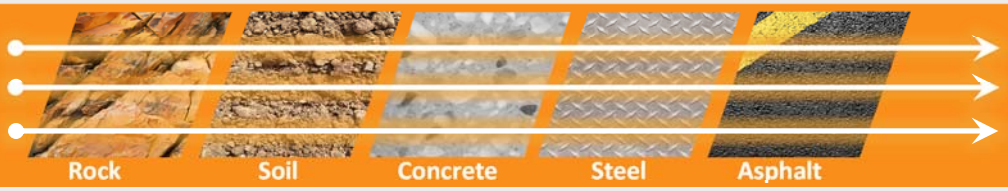

Construction Materials Testing

Material	Test	Standard	SAMM* / SINGLA^ Accredited	Ground Investigation & Exploration	Ground Improvement	Deep Foundation & Excavation	Concrete Structure	Road Construction
Soil	Determine of Particle Size distribution: Sieving, Hydrometer and Combined Tests *^	BS 1377-2:2022, Clause 10 BS EN ISO 17892-4:2016, Clause 5.2, 5.3 & 5.5	√	√	√	√		
	Determination of Water Content (Oven Drying Method) *^	BS 1377-2:2022, Clause 4.1 BS EN ISO 17892-1:2014+A1: 2022	√	√	√	√		
	Determination of the Liquid Limit: Fall Cone Method*^	BS 1377-2:2022, Clause 5.2&5.3 BS EN ISO 17892-12:2018+A2: 2022 Clause 5.3	√	√	√	√		
	Determination of the Plastic Limit and Plasticity Index*^	BS 1377-2:2022, Clause 6 BS EN ISO 17892-12:2018+A2: 2022 Clause 5.5	√	√	√	√		
	Determination of Dry Density/ Water Content Relationship: 2.5kg Rammer Method, 4.5kg Rammer Method , Vibrating Hammer Method*^	BS 1377-2:2022, Clause 11.3, 11.4, 11.5, 11.6 & 11.7	√	√	√			√
	Determination of Particle Density: Fluid Pycnometer Method*^	BS 1377-2:2022, Clause 8 BS EN ISO 17892-3:2015, Clause 5.1	√	√	√	√		
	Determination of Density: Linear Measurement Method*^	BS 1377-2:2022, Clause 9 BS EN ISO 17892-2:2014, Clause 5.1	√	√	√	√		
	Determination of Shrinkage Characteristics: Linear Shrinkage Method*^	BS 1377-2:2022, Clause 7	√	√				
	Determination of California Bearing Ratio (CBR)	BS 1377-2:2022, Clause 15	√	√	√			
	One-Dimensional Consolidation Test^	BS 1377-5:2022, Clause 10	√	√	√			
	Determination of Unconfined Compressive Strength*^	BS 1377-7:1990, Clause 7	√	√	√	√		
	Determination of Undrained Shear Strength in Triaxial Compression^	BS 1377-7:1990, Clause 8 & 9	√	√	√	√		
	Compressive Strength for Cement Mixed Soil	In house Method		√	√			
	Static Modulus of Elasticity for Cement Mixed Soil	In House Method			√	√		
	In-situ Density Tests: Sand Replacement Method (Small and Large Pouring Cylinder)*^	BS 1377-9:1990, Clause 2.1 & 2.2	√		√			√
	In-situ Density Tests: Core Cutter Method*	BS 1377-9:1990, Clause 2.4	√		√			√
	Mackintosh Probe Test*^	In house test method GEO/ CMT/06/01 with reference to JKR Specification	√	√	√	√		√
	In-situ Deformation and strength tests: Determination of the In-situ California Bearing Ratio (CBR)*^	BS 1377-9:1990,Clause 4.3	√	√				√
	Plate Load Test	BS 1377-9: 1990, Clause 4			√			√
	Chemical Test for Soil	BS 1377-3:1990		√	√	√		
	Determination of swelling and collapse characteristic^	BS 1377-6:1990, Clause 6 BS 1377-2:2022 #17	√	√	√			√
	Determination of permeability in a triaxial cell^ Permeability tests^	BS 1377-6:1990, Clause 6 BS 1377-2:2022 #23 BS EN ISO 17892-11: 2019	√	√	√	√		√
	Unconfined undrained triaxial test^ Unconsolidated undrained triaxial test with measurement of pore pressure (UUpwp test)^ Multistage loading (MUU test)^	BS 1377-1:21990, Clause 8 BS 1377-2: 2022 #8 BS EN ISO 17892-8: 2018 K.H. Head Vol 3 Chapter 19.3 BS 1377-7: 1990, Clause 9	√	√	√	√		√
	Consolidated triaxial compression test on water saturated soil (CIU & CAU tests)^ Multistage loading (MCU test)^	BS 1377-8: 1990, Clause 4, 5, 6 & 7 BS 1377-2: 2022 #29 BS EN ISO 17892-9: 2018 K.H. Head Vol. 3. Chapter 13.6.5	√	√	√	√		√
	Consolidated triaxial compression test on water saturated soil (CID & CAD tests)^ Multistage loading (MCD test)^	BS 1377-8: 1990, Clause 4, 5, 6 & 8 BS 1377-2: 2022 #30 BS EN ISO 17892-9: 2018 K.H. Head Vol. 3. Chapter 19.2	√	√	√	√		√
	Determination of resistivity test—Wenner probe method^	BS 1377-3: 2018 Clause 13.5 BS 1377-3 2018 + A1: 2021 #13.5	√	√	√			√

20241216-100-lf (CMT)

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Construction Materials Testing

Material	Test	Standard	SAMM* / SINGLA^ Accredited	Ground Investigation & Exploration	Ground Improvement	Deep Foundation & Excavation	Concrete Structure	Road Construction
Aggregate	Determination of Loose Bulk Density and Voids for Aggregates*	BS EN 1097-3:1998	√					
	Determination of Shell Content-Percentage of Shell in Coarse Aggregate*	BS EN 933-7:1998	√			√	√	
	Determination of Clay Lumps and Friable Particles in Aggregates*	ASTM C142/C142M-17	√			√	√	
	Determination of Potential Presence of Humus (Organic Impurities)*	BS EN 1744-1:2009+A1:2012, Clause 15.1	√			√	√	
	Determination of Particle Size Distribution-Sieving Method*	BS EN 933-1:2012	√			√	√	√
	Determination of Particle Density and Water Absorption*	BS EN 1097-6:2022 (Wire Basket Method)	√			√	√	√
	Determination of pH Value*	BS 1377-3:2018+A1:2021, Clause 12	√			√	√	
	Determination of Particle Shape-Shape Index*	BS EN 933-4:2009	√			√	√	√
	Determination of Particle Shape of Flakiness Index*	BS EN 933-3:2012, BS 812-105.1:1990	√			√	√	√
	Soundness of Aggregate*	ASTM C88/C88M-18	√			√	√	
	Elongation Index*	BS 812-105.2:1990	√			√	√	√
	Determination of Aggregate Crushing Value (ACV)*	BS 812-110:1990	√			√	√	√
	Determination of Ten Per Cent Fines Value (TFV)*	BS 812-111:1990	√			√	√	√
	Determination of Aggregate Impact Value (AIV)*	BS 812-112:1990	√			√	√	√
	Determination of Sand Equivalent Test*	BS EN 933-8:2012+A1:2015, ASTM D 2419-14				√	√	√
	Chemical Tests for Aggregate*	BS EN 1744-1:2009+A1:2012				√	√	
Concrete	Compressive Strength of Test Specimens*^	BS EN 12390-3:2019	√		√	√	√	
	Density of Hardened Concrete*	BS EN 12390-7:2019	√					
	Depth of Penetration of Water Under Pressure*	BS EN 12390-8:2019	√				√	
	Determination of Carbonation Depth in Hardened Concrete by the Phenolphthalein Method*	BS EN 14630:2006					√	
	Determination of Secant Modulus of Elasticity in Compression*	BS EN 12390-13:2021	√			√	√	
	Cored Specimen– Taking, Examining and Testing in Compression*	BS EN 12504-1:2019	√				√	
	Determination of Water Absorption*	BS 1881-122:2011+A1:2020	√				√	
	Determination of the Initial Surface Absorption of Concrete*	BS 1881-208:1996	√				√	
	Flexural Strength of Test Specimens*	BS EN 12390-5:2019	√				√	
	Tensile Splitting Strength of Test Specimen*	BS EN 12390-6:2009	√				√	
	Penetration Resistance of Hardened Concrete using Steel Probe (Windsor Probe)*	ASTM C803-C803M-18				√	√	
	Ultrasonic Pulse Velocity (UPV)*	BS EN 12504-4:2021				√	√	
	Determination of Rebound Number*	BS EN 12504-2:2021					√	
	Electromagnetic Covermeter*	BS 1881-204:1988					√	
	Magnetic and Non-magnetic Coatings*	ASTM B499-09, ASTM B530-09 (2014)					√	
	Concrete/Rock Core Drilling*	In house method			√	√	√	
Metal and Metal Product	Steel Bar– Tensile Properties*	MS 146:2014, Clause 7.3.3, MS ISO 6892-1:2017, ISO 6892-1:2019 MS ISO 15630-1:2012, BS EN ISO 15630-1:2019	√			√	√	
	Steel Bar– Bend Performance*	BS EN ISO 15630-1:2019	√			√	√	
	Multi Wire Steel Strand (PC Strand)*	ASTM A1061/A1061M-2016				√	√	
Weld and Welded Test Specimens	Welded Steel Fabric– Tensile Properties*	MS 145:2014, Clause 8.1.3.1, MS ISO 15630-2:2012, BS EN ISO 15630-2:2019, MS ISO 6892-1:2017 & ISO 6892-1:2019	√			√	√	
	Bend Performance*	MS 145:2014, Clause 7.2.5, MS ISO 15630-2:2012 & BS EN ISO 15630-2:2019	√			√	√	
	Weld Shear Force*	MS 145:2014, Clause 7.2.4, MS ISO 15630-2:2012, BS EN ISO 15630-2:2019	√			√	√	

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Construction Materials Testing

Material	Test	Standard	SAMM* / SINGLA^ Accredited	Ground Investigation & Exploration	Ground Improvement	Deep Foundation & Excavation	Concrete Structure	Road Construction
Pile	High-strain dynamic testing of deep foundations*^	ASTM D4945-17	√			√		
	Low-strain impact integrity testing of deep foundations^	ASTM D5882-16	√			√		
	Integrity testing of concrete deep foundations by ultrasonic cross-hole testing^	ASTM D6760-16	√			√		
	Measuring inclination and shaft profile of deep foundation (SHAPE Method)^	ASTM D8232-18	√			√		
	Standard test method of energy measurement for dynamic penetrometers^	ASM D4633-16	√	√		√		
	Rapid Load Testing^	BS EN ISO 22477-10:2017	√			√	√	√
Geotextile	Wide-width Tensile Test of Geotextile Geosynthetics—Wide Width Tensile Test^	ASTM D4595-23 BS EN ISO 10319:2015	√		√			√
	Prefabricated Vertical Drain (PVD) Discharge Capacity Test^ Geoysnthetics—Test Method for the determination of water discharge capacity for prefabricated vertical drains (Index Test)^ Geoysnthetics—Test Method for the determination of water discharge capacity for prefabricated vertical drains (Performance Test)^	ASTM D4716 / D4716M-22 BS EN ISO 12958-1: 2020 BS EN ISO 12958-2: 2020	√		√			√
	Prefabricated Vertical Drain (PVD) Discharge Capacity with kinks (NUS Method 2)^ Geoysnthetics—Test Method for the determination of water discharge capacity for prefabricated vertical drains (Index Test) - NUS Method 2^ Geoysnthetics—Test Method for the determination of water discharge capacity for prefabricated vertical drains (Performance Test) - NUS Method 2^	ASTM D4716 / D4716M-22 BS EN ISO 12958-1: 2020 BS EN ISO 12958-2: 2020	√		√			√
	Apparent Opening Size of Geotextile Determination of the Characteristic Opening Size^	ASTM D4751-21a BS EN ISO 12956: 2020	√		√			√
	Geosynthetics Nominal Thickness of Geotextile Geosynthetics—Determination of Thickness at Specific Pressure—Part 1: Single Layers^	ASTM D5199-12 (Reapproved 2019) BS EN ISO 9863-1:2016 + A1:2019	√		√			√
	Trapezoid Tearing Test of Geotextiles^	ASTM D4522 / D4533M-15 (2023)	√		√			√
	Grab Breaking Load and Elongation of Geotextiles^	ASTM D4632 / D4632M-15a (2023)	√		√			√
	Water Permeability of Geotextiles by Permittivity^ Determination of water permeability characteristic normal to the plane, without load^	ASTM D4491 / D4491M-22 BS EN ISO 11058:2019	√		√			√
	In-Plane Permeability of Geotextile^ Geotextiles and geotextile –related products—Determination of water flow capacity in their plane (Index Test)^ Geotextiles and geotextile-related products—Determination of water flow capacity in their plane (Performance Test)^	ASTM D4716 / D4716M-22 BS EN ISO 12958-1: 2020 BS EN ISO 12958-1: 2020	√		√			√
	Static Puncture Strength of Geotextiles Geosynthetics—Static Puncture Test (CBR Test)^	ASTM D6241-22a BS EN ISO 12236: 2006	√		√			√
	Measuring Mass per unit area of Geotextiles^ Geosynthetics—Determination of mass per unit area of geotextiles and geotextile related products^	ASTM D5261-10 (Reapproved 2018) BS EN ISO 9864: 2005	√		√			√
	Geosynthetics—Dynamic Perforation Test (Cone Drop Test)^	BS EN 918 / ISO 13433: 2006	√		√			√
	Geosynthetics—Tensile test for joint / seams by wide-width strip method^ Strength of Sewn of Bonded Seams of Geotextiles^	ISO 10321: 2008 ASTM D4884 / D4884M-22	√		√			√
	Deterioration of Geotextiles by Exposure of Light, Moisture and Heat in A Xenon Arc-Type Apparatus^	ASTM D4355 / D4355M-21	√		√			√
	Standard Test Method for Index Puncture Resistance of Geomembrane and Related Product^	ASTM D4833 / D4833M-07 (Reapproved 2020)	√		√			√
	Standard Test Method for Breaking Force and Elongation of Textile Fabric (Stip Method)^	ASTM D5035-11 (Reapproved 2019)	√		√			√
	Tensile Properties of Geogrids by the Single or Multi-Rid tensile Method^	ASTM D6637 / D6637M-15 (2023)	√		√			√

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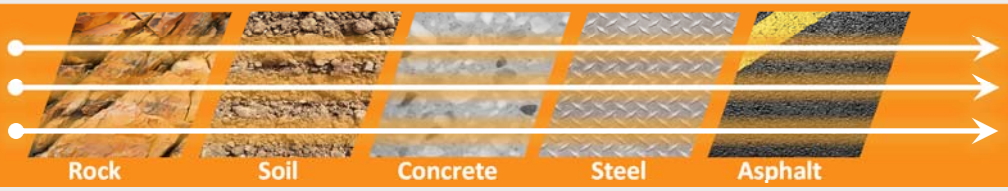

Testing
Monitoring
Analyzing

Construction Materials Testing

Material	Test	Standard	SAMM* / SINGLA^ Accredited	Ground Investigation & Exploration	Ground Improvement	Deep Foundation & Excavation	Concrete Structure	Road Construction
Rock	Unconfined Compressive Strength of Intact Rock Core Specimens*^	ASTM D7012-14e1, Method C	√	√		√		
	Determination of the Point Load Strength Index of Rock and Application to Rock Strength Classifications*^	ASTM D5731-16	√	√		√		
	Elastic Moduli of Intact Rock Core Specimen in Uniaxial Compression*	ASTM D7012-14e1, Method D	√			√		
	Dimension and Shape Tolerance^	ASTM D4543-19	√	√				
	Water Content of Soil & Rock^	ASTM D2216-19 ISM 1977: Part1-1	√	√				
	Swelling Pressure Index^	ISRM 1977; Part 2 –1	√	√				
	Swelling Strain Index^	USRM 1977 Part 2–2	√	√				
	Slake Durability of Shales and Other Similar Weak Rock^	ASTM D4644-16	√	√				
Bituminous Mixtures & Asphalt	Marshall Stability and Flow of Asphalt Mixtures	ASTM D6927-15	√					√
	Bulk Specific Gravity and Density of Non-Absorptive Compacted Asphalt Mixtures	ASTM D2726/D2726M-21	√					√
	Quantitative Extraction of Asphalt Binder from Asphalt Mixtures	ASTM D2172/D2172M-17e1 (Method A– Centrifuge Extraction)	√					√
	Thickness or Height of Compacted Asphalt Mixtures	ASTM D3549/D3549-18 (Method A)	√					√
	Rate of Spray Prime/Tack Coat	In House Method with reference to JKR Specification						√

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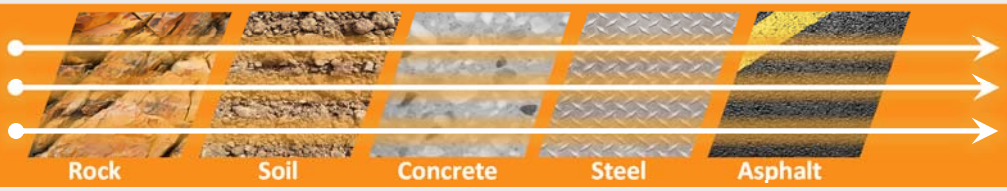

Low-Strain Dynamic Load Test & Cross-hole Sonic Logging Test

The Low Strain Dynamic Test Apparatus

Low strain dynamic pile test

The ultrasonic cross-hole (CSL) Test Apparatus

A typical ultrasonic cross-hole testing.

Pile Dynamic & Integrity Testing Department provides a full range of pile tests that used to evaluate the structural integrity and geotechnical capacity of varies pile foundation. We deliver qualified testing engineers for field testing, and the subsequent post-analysis and interpretation of the test results if required. All tests results are reviewed by authorized signatory personnel and endorsed by our professional engineer.

Services Include

- **Low Strain Impact Integrity Testing (ASTM D5882-16)** — The top of the pile is tapped with a lightweight hammer to generate wave in the pile and record the reflected wave by an accelerometer. The reflected wave signal or reflectogram is used to evaluate the continuity of the tested pile.

- **Ultrasonic Cross-hole Testing (ASTM D6760-17)** — A direct transmission integrity testing method to evaluate the concrete homogeneity in a bored pile. A piezoelectric transducer (i.e. Transmitter) is used to generate an ultrasonic signal that propagate as sound/compression wave crosses the concrete section and recorded by another transducer (i.e. Receiver) in the pre-installed tubes.

Why Geonamics?

- Certified testing personnel
- Well-calibrated equipment
- Well-compiled local case references

202428-100-lf (LS & HS DPT)

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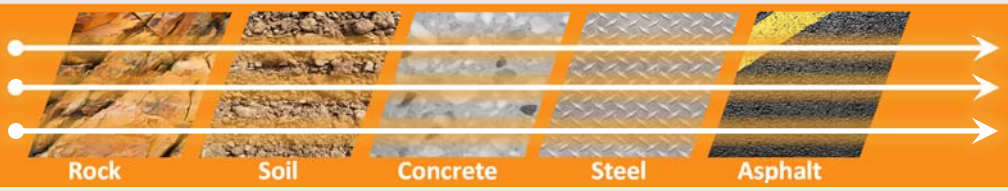
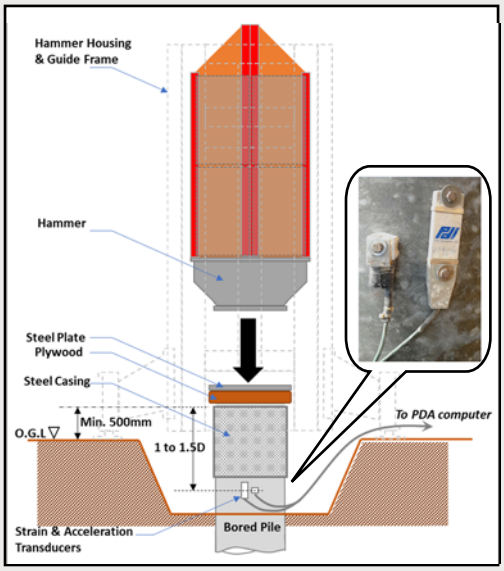


High Strain Dynamic Load Testing of Deep Foundation (HSDLT)



Schematic diagram of HSDLT

HSDLT with 60tonnes of hammer

Pile Dynamic & Integrity Testing Department provides High Strain Dynamic Load Testing of Deep Foundation with the field work compliance to ASTM D4945-17 which under accreditation of SAMM. We deliver qualified testing engineers for field testing, and the subsequent post-analysis and interpretation of the test results if required. All tests results are reviewed by authorized signatory personnel and endorsed by our professional engineer.

Services Include

- **Pile Driving Monitoring Test** — In the monitoring test, the soil resistance, driving hammer performance, maximum driving stresses, and pile integrity of each hammer blow are continuously monitored and evaluated. With that, HSDLT helps to establish the driving criterion and contributes to safe and economical production pile installation.

- **Driven Pile Restrike Test** — The soil strength changes as a function of time, that the calculated capacities correspond to the time of testing (i.e. End of Drive (EOD) or Begin of Restrike (BOR)). Therefore restrike tests are important., especially to correlate the dynamic test and a static load test.

- **Bored Pile Strike Test** — After the installation of bored pile with achievement of adequate compressive strength, HSDLT can be performed on bored piles to estimate the pile capacity and integrity at field. It is followed by a post-analysis verification work with signal matching process via CAPWAP.

Why Geonamics?

- Accredited by SAMM (work accordance to ASTM D49450-17).
- Traceability of Measurement Results.
- Certified testing personnel
- Well-calibrated equipment
- Well-compiled local case references
- Testing equipment especially for large diameter of pile

20240228-100-lf (LS & HS DPT)

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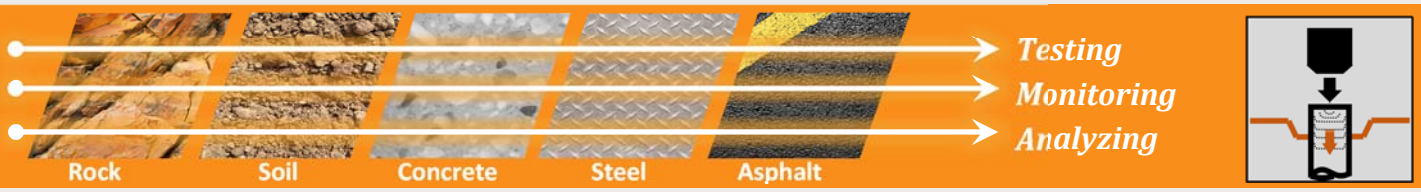
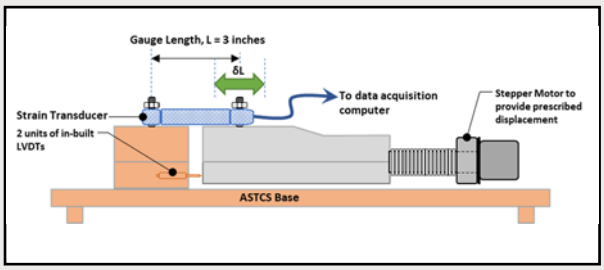


Calibration of PDI Strain Transducer for HSDLT

PDI Strain Transducer.



Schematic diagram of ASTCS calibrator.

Strain transducer is the key sensor in High Strain Dynamic Load Test (HSDLT) to measure the mobilized strain at the pile head to deduce the dynamic forces. According to ASTM D4945-17, the transducers shall be calibrated prior to installation or mounting to an accuracy of 3% throughout the applicable measurement range. The need for calibration arises frequently in the use of strain transducer instrumentation. Periodic calibration is required to assure the accuracy and linearity of the instrument itself.

Services Include

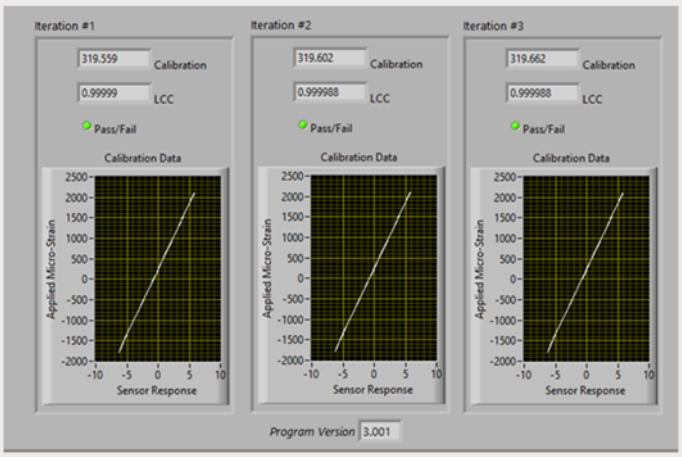
Calibration* — BDI Automated Strain Transducer Calibration System (ASTCS) machine offer a "direct" calibration method of PDI strain transducer. By given a known accurate excitation voltage and a known prescribed displacement of the transducer, a calibration factor/sensitivity of strain transducer in term of με/mV can be deduced.

**Geonamics offer a calibration of PDI Strain Transducer with SAMM accredited scope accordance to an in-house method.*

Why Geonamics?

- Accredited by SAMM based on ISO/IEC 17025.
- Traceability of Measurement Results.
- Established of Measurement of Uncertainty.
- Well-calibrated equipment .

The overall view of ASTCS calibrator.



Iteration of multicycle of calibration.

20240228-100-lf (LS & HS DPT)

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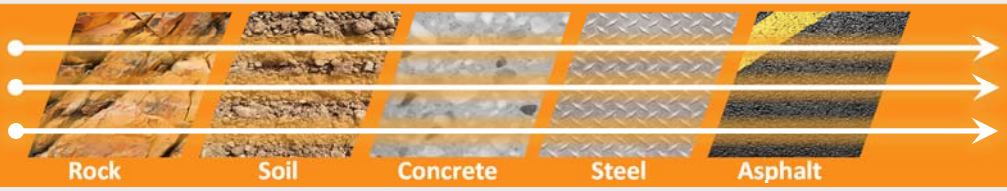
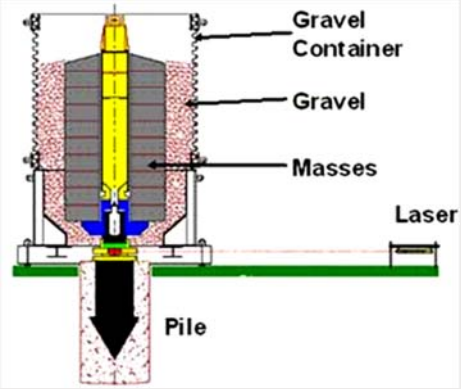


Rapid Pile Load Test



Schematic diagram of Statnamic Test

Setup of Statnamic Test

Launching of Statnamic Test

Rapid Load Test Department is specialized in performing one of the Rapid Load Tests called *Statnamic Test.* The pile load testing is a critical step to evaluate a pile foundation, to verify design parameters as well as to evaluate pile performance. Statnamic Test offers a more efficient, quicker, and/or cost effective pile load test than the conventional Static Load Test (SLT).

Services Include

- **Rapid Load Test (Statnamic Test)** — It launches a reaction mass from the pile head with fast-expanding and high-pressure gases in a confined cylinder. The high-pressure gases are produced by the burning of a solid propellant fuel within the piston cylinder assembly. Typically, the reaction mass is accelerated upwards at 20g, thus a downward force in the order of 20 times the reaction mass will be generated. Therefore, the required reaction mass is only 5% of the static mass equivalent to the final test load. This salient feature of STN has become one of the key advantages over the conventional SLT. It saves the required amount of reaction mass in the pile load test, and hence time and effort in setting up.

- **Preinstallation of Instruments in Pile** — To capture the mobilization of skin friction, end-bearing component, or elastic shortening of a pile, we offer the installation of instruments such as strain gauges or extensometer and monitoring works during the Statnamic Test.

Why Rapid Load Test with Geonamics?

- Suitable for On-shore and Off-shore pile foundation.
- Significant reduction of setting-up time for a pile load test.
- Less space requirements.
- Less logistic hassle, less carbon footprint, environmental friendly.
- Consistent and user-independent results that correlate well with static load testing (SLT) results.
- Accepted in international relevant codes (ASTM, Japan, Eurocode etc.).
- Higher productivity.

20240228-100-lf (RLT)

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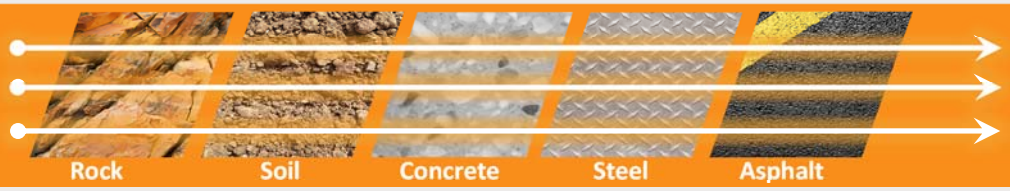

Geotechnical Instrumentation & Monitoring

Instrumentation and monitoring for deep excavation

Lateral pile load test monitoring

Shape Accel Array (SAA) system

Instrumentation and monitoring for slope stability

Geotechnical Instrumentation & Monitoring Department is specialized in performing the installation of instrumentation and the subsequent monitoring works on the specified construction activities by the client. There is a need to raise the alarm for the impact of the construction activities to the surrounding existing structural or the environment by a consistent monitoring scheme. We cover the instrumentation and monitoring that are required in the deep excavation, backfilling activities, reclamation, slope stability, meteorological study, tunneling, as well as the environmental effect of construction.

Instrumentation Services Include

- **Tilt Meter** — A tiltmeter is a sensitive inclinometer designed to measure very small changes from the vertical level, either on the ground or in structures.
- **Standpipe Piezometer** — Pore pressure of soil is importance to evaluate the ground behaviour, before—during—and after construction. The piezometer is suitable choice of instrument for this purpose.
- **Settlement Marker** — Settlement markers are installed on the columns of existing structures or buildings to determine any inherence settlement or heave.
- **Inclinometer** — Portable vertical inclinometer probe is used to obtain segment inclination through vertically installed inclinometer casing which make gradual displacement with subsoil movement.
- **Shape Accel Array (SAA)** — SAA is an advanced innovative instruments that can be installed near vertical to track the magnitude and direction of lateral deformation, or near horizontal to track vertical deformation. It can also be installed along the cross-section of tunnels to measure convergence. The SAA is also able to monitor 3D vibration data and temperature if required with special built-in sensors.
- **Noise & Vibration Monitoring** — The assessment of impact from noise and vibration due to industrial activities can be measured and monitored over periods of duration.
- **Others** — There are many other geotechnical instruments offered by this department and kindly contact us for details.

Why Geonamics?

- Well-calibrated equipment.
- Well-trained engineers.

20240228-100-If (GI & M)

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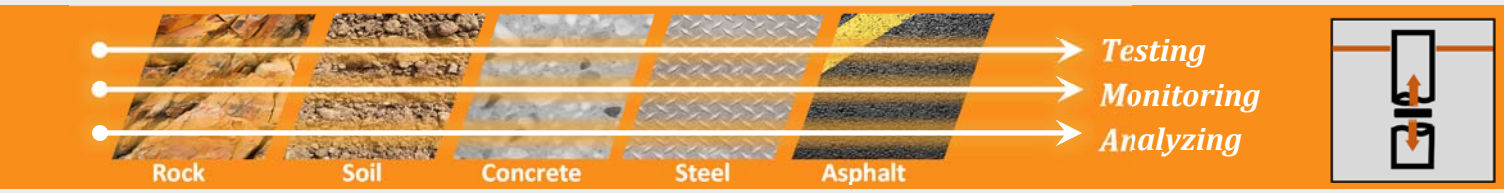
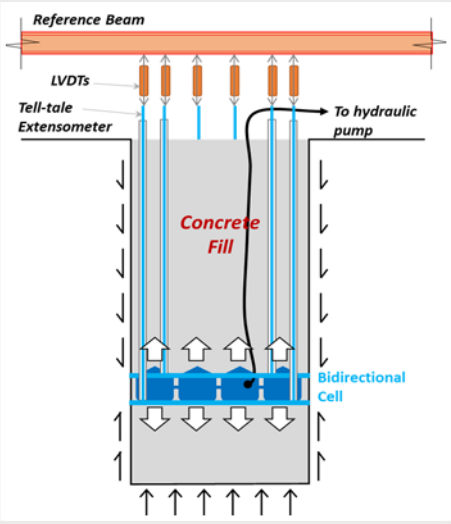


Bidirectional Pile Load Test



Schematic diagram of Bidirectional Test

Bidirectional Load Test is to examine the pile performance in accordance with the design, to verify the soil parameters used in the design conformed to the ground condition. The design of the bored pile will be evaluated if any discrepancy found from the pile load test regarding to the bearing capacity and the soil parameters. With our synergy partner who is one of the pioneer of Bidirectional Test in China, we are pleased to provide this professional testing service.

Services Include

- **Preinstallation of Instruments in Pile** — To capture the mobilization of skin friction, end-bearing component, or elastic shortening of a pile, we offer the installation of instruments such as strain gauges or extensometer and monitoring works during the Bidirectional Load Test.

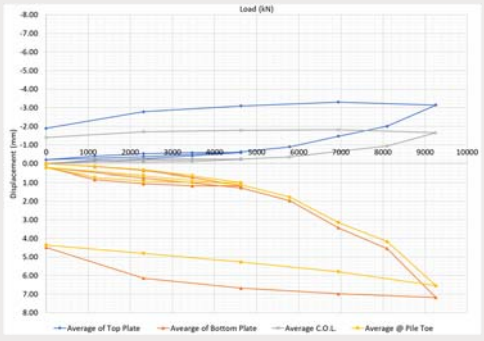
- **Bidirectional Load Test** — is a static pile load test that incorporates single or multiple-layer of sacrificial hydraulic jack-like device that assembled in a symmetrical Bidirectional (BD) Cell. The BD cell will be placed at the depth of equivalent capacity between the upper and lower portion of the pile. The Equivalent Top-loaded Load Settlement curve can be derived by measuring the displacement of upward and downward movement of the BD cell corresponding to the loading step.

A typical bidirectional cell for bored pile

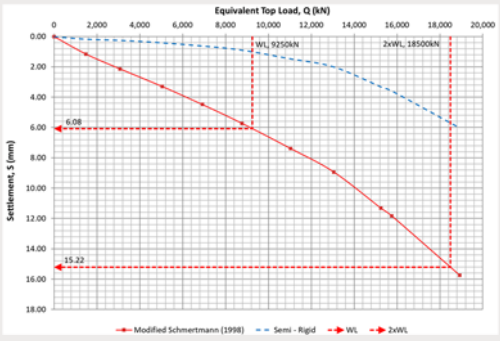
Why Geonamics?

- Well-calibrated hydraulic jacks by ILAC-MRA accredited laboratory before assembly to a BD cell.
- Well QA/QC record on leakage etc. before delivery of BD cell.
- Experienced installer.
- Well-trained engineers.

Installation of bidirectional cell inside the reinforcement cage



A typical upward and downward displacement in a bidirectional test



The equivalent top-loaded load settlement curve

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Load Cell for Bidirectional Pile Load Test

A typical load cell for bored pile

Our cutting-edge load cell, designed and manufactured in China, is the ideal solution for bidirectional pile load testing, offering unparalleled precision and reliability. Engineered with an annular shape, this innovative load cell incorporates multiple hydraulic jacks to deliver the necessary mobilization force required for accurate pile load assessments. Each hydraulic jack is meticulously calibrated by an accredited laboratory with ILAC-MRA recognition, ensuring the highest standards of accuracy and performance.

- **Key Features and Design** — The annular design of our load cell is central to its functionality, providing a robust and adaptable framework for various testing scenarios. Within this annular structure, several hydraulic jacks are strategically positioned and connected in series through a system of inlet and outlet hoses. This configuration allows for precise control and distribution of force during testing, making it possible to tailor the load cell's total capacity to meet the specific requirements of the test and the estimated resistance of the surrounding soil.

- **Customizable Capacity** — One of the standout features of our load cell is its customizable capacity. By adjusting the number of hydraulic jacks based on the required testing load and soil resistance, we can configure the load cell to suit a wide range of testing conditions. This flexibility ensures that our load cell can provide accurate and reliable results, no matter the complexity of the testing environment.

- **Precision Placement** — The performance of a bidirectional pile load test is heavily dependent on the precise placement of the load cell. Our load cell is positioned at the depth corresponding to the equivalent capacity between the upper and lower portions of the pile, ensuring balanced and accurate measurements. The exact positioning is determined according to a detailed method statement, which outlines the necessary calculations and steps for optimal placement.

- **Integration and Installation** — To streamline the installation process, our load cell is designed to be seamlessly integrated into the steel reinforcement cage of the test pile. This integration not only simplifies installation but also enhances the stability and accuracy of the test. The entire installation procedure is meticulously documented in a specified method statement, providing clear and concise instructions to ensure correct setup and operation.

- **Reliability and Accreditation** — Reliability is a hallmark of our load cell, underpinned by rigorous calibration and quality control processes. Each hydraulic jack undergoes calibration by an accredited laboratory recognized by ILAC-MRA, guaranteeing that our load cell meets the highest international standards for accuracy and consistency.

20240805-100-lf (BDSLT)

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Bidirectional Pile Load Test

Penang 2nd Bridge, Malaysia

Suramadu Bridge, Indonesia

Shenzhen – PingAn International Finance Centre, China

The Sun Project, Vietnam

Case References

Our Bidirectional Load Test has been successfully used to evaluate the capacity of varies foundation in many countries. These foundations are built for high-rise buildings, bridges, railway, and varies infrastructure. The capacity of the foundation is vital to be verified through a competence test. Several remarkable case references of Bidirectional Test is listed as below:

No.	Projects	Year	Pile dia. (m)	Length (m)	Max. Test Load (t)
1.	HangZhou Cross Bay Bridge	2002	2.8	120	6000
2.	ZhouSan Islands Westgate Bridge	2004	2.8	40	13009
3.	Daweng Bridge	2005	1.5	48	1426
4.	Qinyu Bridge	2005	2	49	1884
5.	Suramadu Bridge	2006	2.4	97	4883
6.	New Monivong Bridge	2008	1.5	51	1400
7.	The 2nd Penang Bridge	2008	1.2	74	1454
8.	WenZhou Bridge	2008	2.2	122	5000
9.	Nanjing QingAou Centre	-	2	69	8374
10.	Phu My Hung Shopping Mall	2009	1.5	66	3112
11.	Sennar Bridge	2010	1.5	42	2293
12.	Soyo LNG	2010	1.2	45	794
13.	ShenZhen PingAn International Finance Centre	-	1.8	24	1740
14.	Tayan Bridge	2013	1.5	38	1711
15.	Merah Putih Bridge	2014	1.5	46	2090
16.	Maputo Bridge & Link Roads	2014	2.2	100	5774
17.	Diamond Twin Tower	2015	1.2	43	2388
18.	Pulau Muara Besar Bridge	2016	1.5	77	6902
19.	China-Maldives Friendship Bridge	2016	3.2	44	28929
20.	Changi Airport Terminal 5	2017	1	34	958
21.	Private Building	2017	0.8	33	837
22.	Jembatan Pendekat Pulau Kalimantan & Pulau Laut	2017	1.5	32	1769
29.	Jembatan Holtekamp Jayapura	2017	1.2	49	1359
30.	The Sun Project	2017	1.8	92	8893

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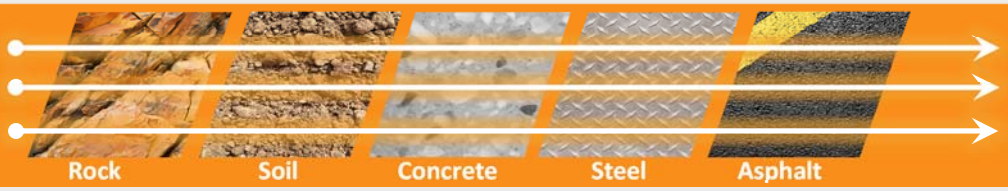

Shaft Area Profile Evaluator

The SHAPE equipment .

Shaft Area Profile Evaluator (SHAPE), manufactured by Pile Dynamics Inc. (PDI), is a cost-effective quality assurance testing device used for deep foundations such as drilled shafts, slurry walls, barrettes and more to determine the excavation dimensions and verticality. Drilled shafts are rarely ideal cylinders and irregularities can affect capacity and design. SHAPE better characterizes the shape of drilled shafts and other excavated deep foundation elements. SHAPE provides a fast, economical visual representation of the foundation excavation and verticality prior to placing concrete in wet conditions.

Why SHAPE?

- A continuous scanning profile along the depth.
- Quick connection to Kelly bar or can be used with an optional winch system.
- Multi-channel ultrasonic device to scan the sidewall condition of wet pour drilled shafts .
- Data acquisition at a rate of approximately one (1) scan per second.
- Data acquisition calculations of shaft profile to determine shaft radius, volume and verticality at field after the scanning process.

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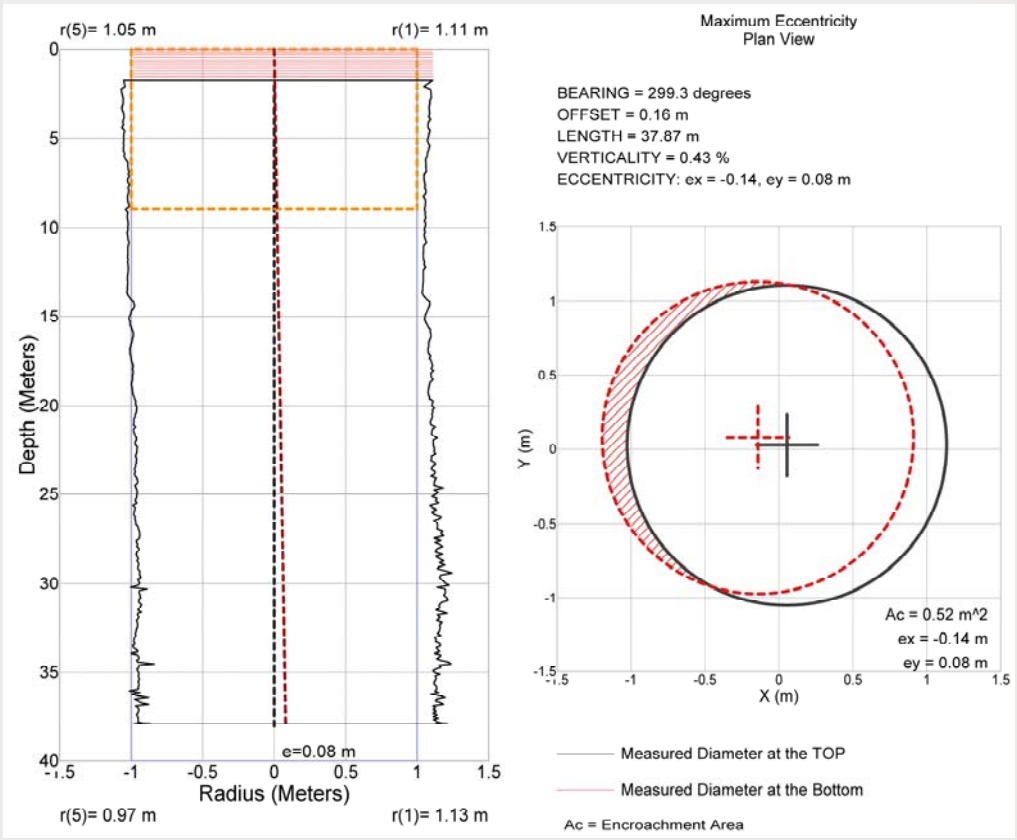
The SHAPE is lowered down into the bored hole with Kelly Bar

The mobile read-up unit of SHAPE equipment



A typical result of SHAPE after the scanning process.

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