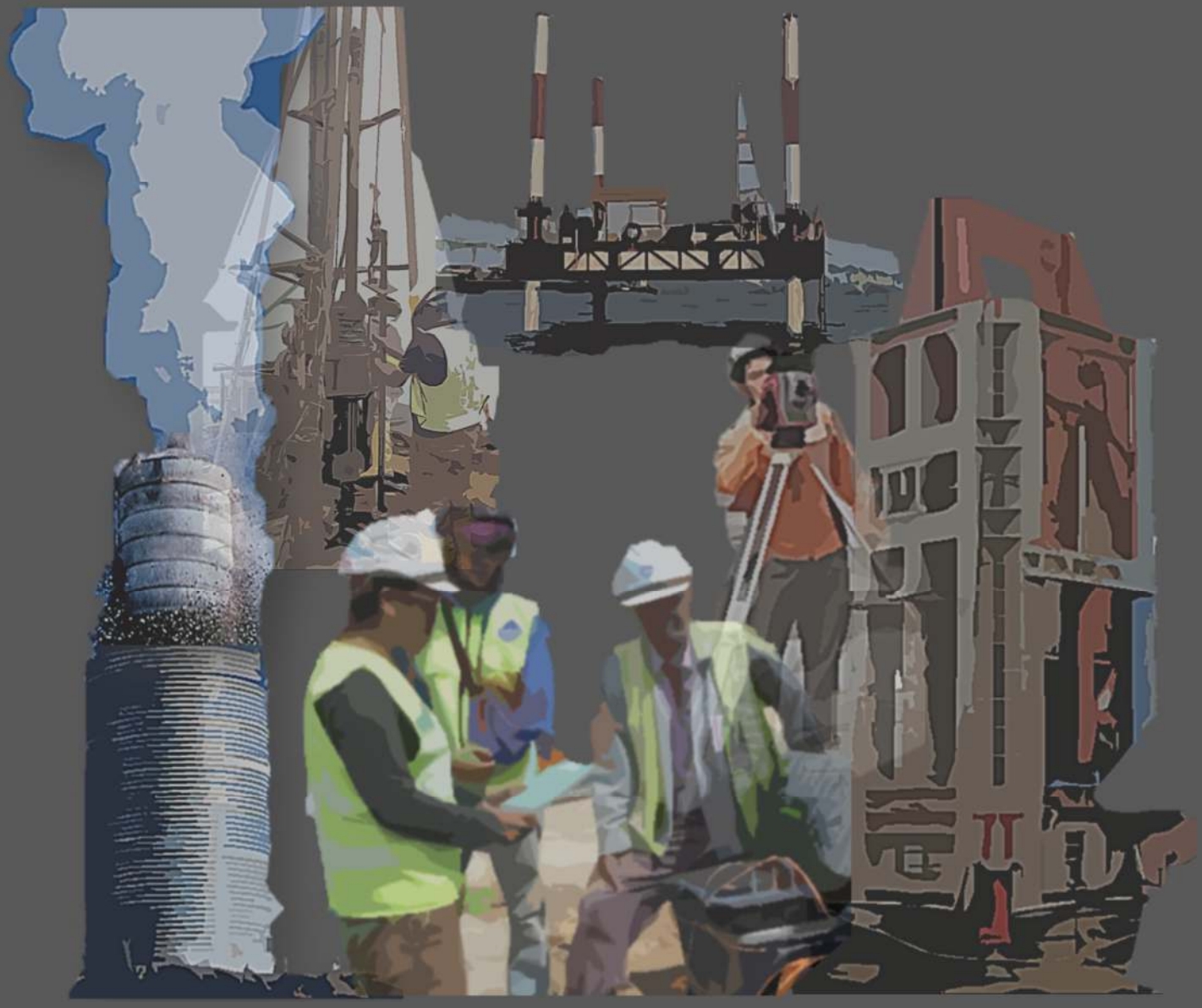
GEONAMICS

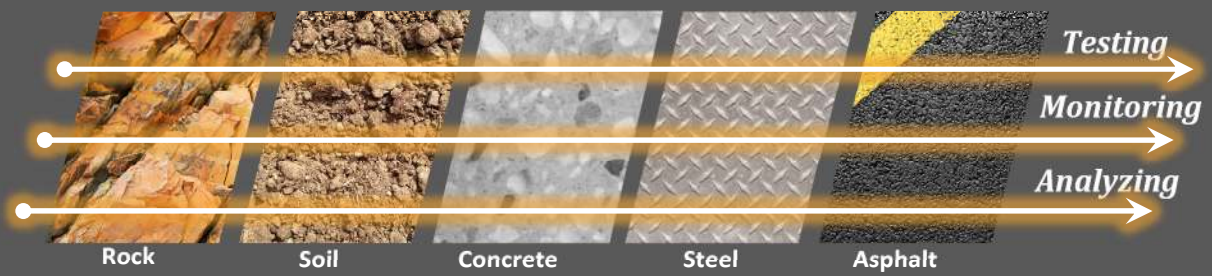
YOUR ONE STOP PROFESSIONAL TESTING CENTRE

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

GEONAMICS (M) SDN. BHD.

TESTING SERVICES OVERVIEW





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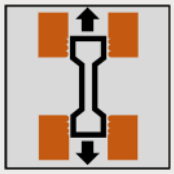
COMPANY PROFILE

Ground Investigation & Geophysical Tests

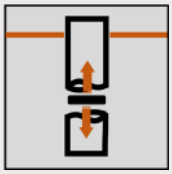


Construction Materials Testing

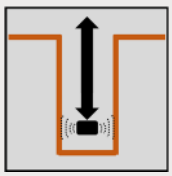
Low-Strain & High-Strain Dynamic Pile Tests

Rapid Pile Load Test

Geotechnical Instrumentation & Monitoring



Bidirectional Pile Load Test



Shaft Area Profile Evaluator (SHAPE)

Geonamics (M) Sdn. Bhd. is founded in 1995, as a subsidiary 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 is more than a company or product; 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).

20220307-100-lf (Company_profile)

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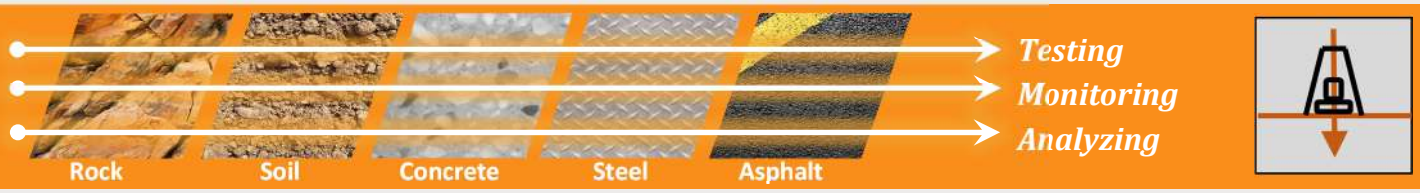

Ground Investigation & Geophysical Tests

Drilling, boring & coring

Geophysical survey

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.

In-situ Sampling Specimen

20220307-100-lf (GI & GT)

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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

20220307-100-lf (CMT)

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Testing
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Material	Test	Standard	SAMM 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	√					
Soil	Particle size distribution: Wet sieving, dry sieving and sedimentation by Hydrometer Method	BS 1377-2:1990, Clause 9.2, 9.3 & 9.5	√	√	√			
	Determination of Moisture Content	BS 1377-2:1990, Clause 3	√	√	√			
	Determination of the Liquid Limit: Cone Penetrometer Method	BS 1377-2:1990, Clause 4.3 & 4.4	√	√				
	Determination of the Plastic Limit and Plasticity Index	BS 1377-2:1990, Clause 5	√	√				
	Determination of Maximum Dry Density/ Moisture Content Relationship: 2.5kg Rammer Method, 4.5kg Rammer Method , Vibrating Hammer Method	BS 1377-4:1990, Clause 3.3, 3.4, 3.5, 3.6 & 3.7	√	√				√
	Determination of Particle Density: Small Pyknometer Method	BS 1377-2:1990, Clause 8.3	√	√	√			
	Determination of Density: Linear Measurement Method	BS 1377-2:1990, Clause 7.2	√	√	√			
	Determination of Shrinkage Characteristics: Linear Shrinkage Method	BS 1377-2:1990, Clause 6.5	√	√				
	Determination of California Bearing Ratio (CBR)	BS 1377-4:1990, Clause 7	√	√	√			
	One-Dimensional Consolidation Test	BS 1377-5:1990, Clause 3		√	√			
	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		√	√	√		
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-17 (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	√					√

20220307-100-lf (CMT)

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Testing
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Material	Test	Standard	SAMM 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 1097-6:2013 (Wire Basket Method)	√			√	√	√
	Determination of pH Value	BS 1377-3:2018, 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 Weld and Welded Test Specimens	Steel Bar– 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 15630-2:2019	√			√	√	
	Steel Bar– Bend Performance	MS 145:2014, Clause 7.2.5, MS ISO 15630-2:2012 & BS EN ISO 15630-2:2019	√			√	√	
	Multi Wire Steel Strand (PC Strand)	ASTM A1061/A1061M-2016				√	√	
	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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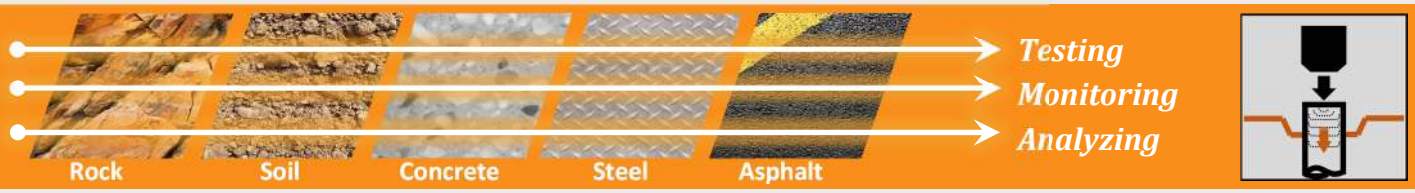

Low-Strain Dynamic Load Test & Cross-hole Sonic Logging Test

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

20220307-100-lf (LS & HS DPT)

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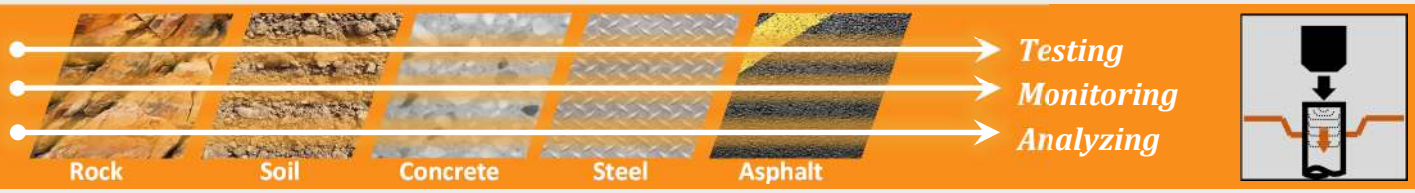
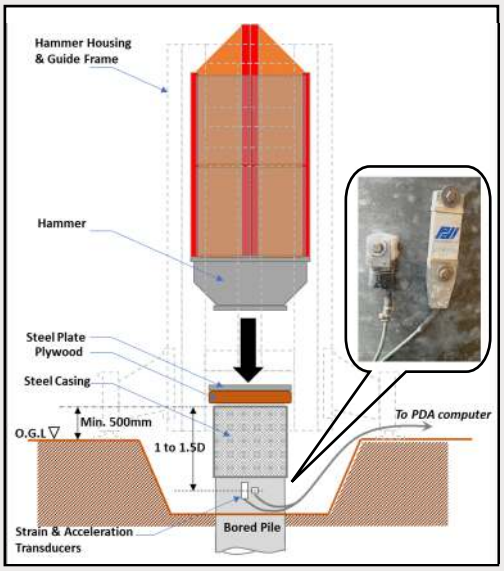


High Strain Dynamic Load Testing of Deep Foundation (HSDLT)



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

20220307-100-lf (LS & HS DPT)

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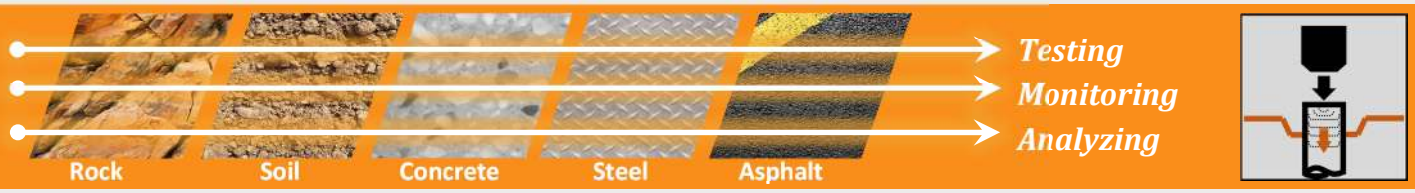
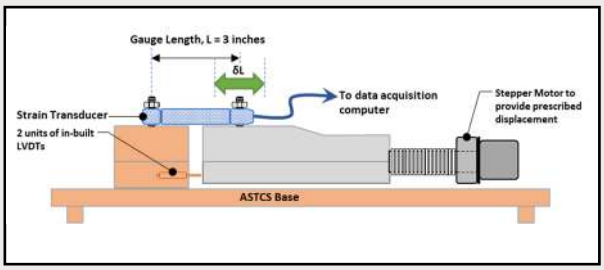


Calibration of PDI Strain Transducer

PDI Strain Transducer.



Schematic diagram of ASTCS calibrator.

The overall view 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.

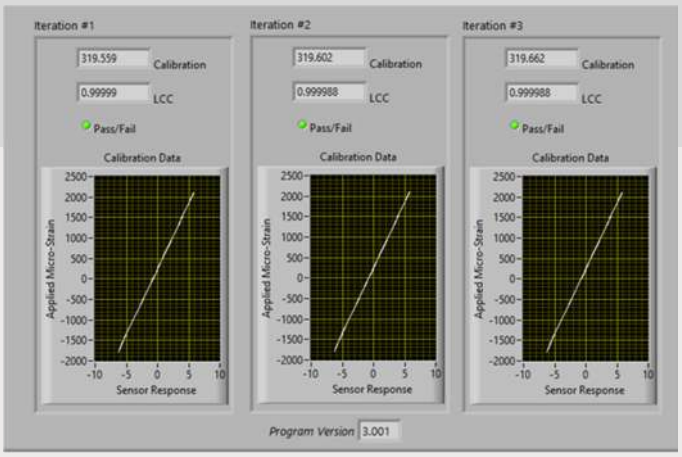
Services Include

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 .



Iteration of multicycle of calibration.

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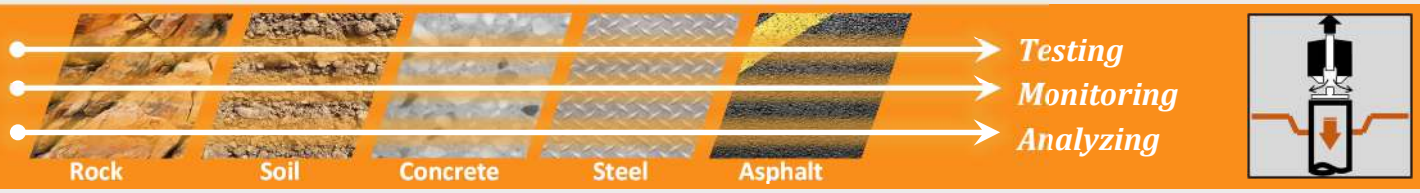
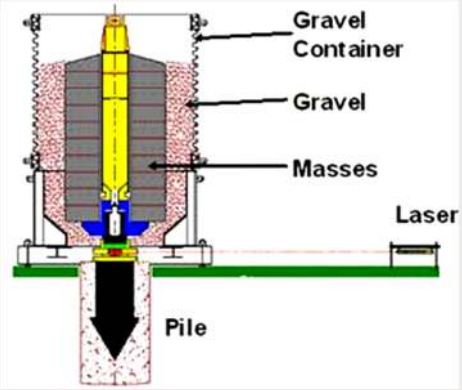


Rapid Pile Load Test



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.

20220307-100-lf (RLT)

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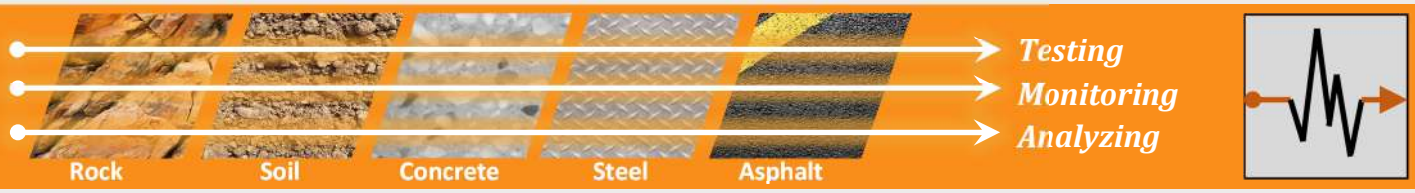

Geotechnical Instrumentation & Monitoring

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.

20220307-100-lf (GI & M)

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CERTIFIED ISO 9001

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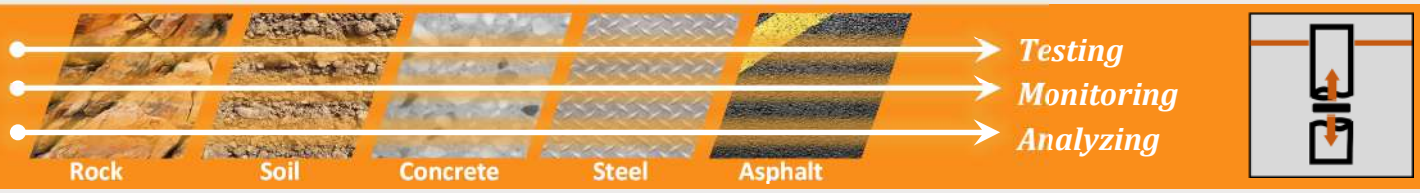
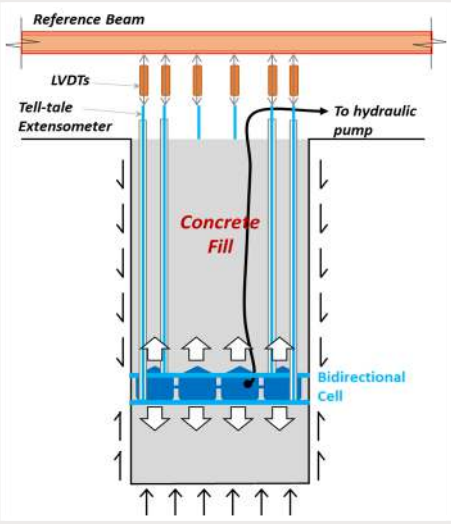


Bidirectional Pile Load Test



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.

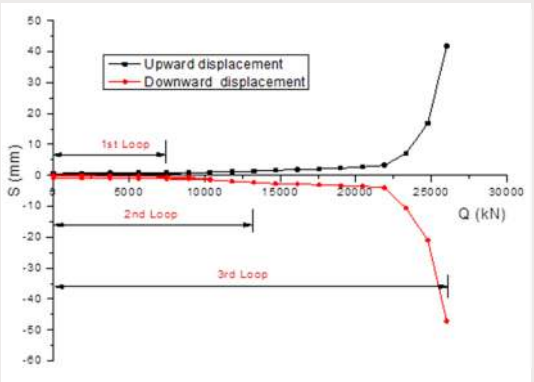
- **Bidirectional Load Test** — is a static pile load test that incorporates single or multiple-layer of sacrificial hydraulic jack-like device that assembled in a symmetrical Bidirectional (BD) Cell. The BD cell will be placed at the depth of equivalent capacity between the upper and lower portion of 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

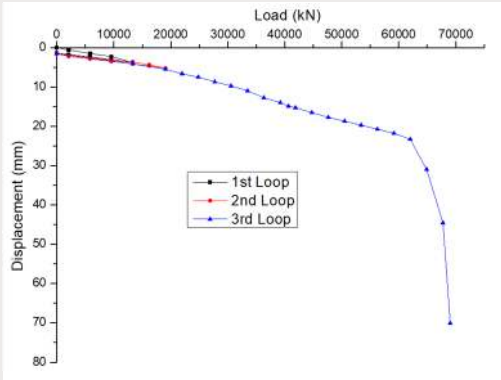
Why Geonamics?

- 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.

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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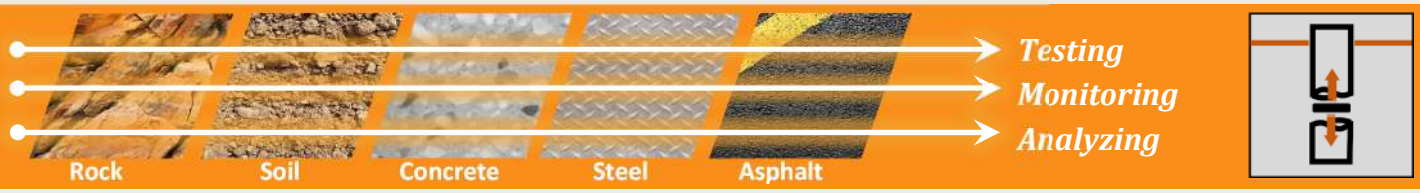

Bidirectional Pile Load Test

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.	Country	Projects	Year	Pile dia. (m)	Length (m)	Max. Test Load (t)
1.	China	HangZhou Cross Bay Bridge	2002	2.8	120	6000
2.	China	ZhouSan Islands Westgate Bridge	2004	2.8	40	13009
3.	Vietnam	Daweng Bridge	2005	1.5	48	1426
4.	Vietnam	Qinyu Bridge	2005	2	49	1884
5.	Indonesia	Suramadu Bridge	2006	2.4	97	4883
6.	Cambodia	New Monivong Bridge	2008	1.5	51	1400
7.	Malaysia	The 2nd Penang Bridge	2008	1.2	74	1454
8.	China	WenZhou Bridge	2008	2.2	122	5000
9.	China	Nanjing QingAou Centre	-	2	69	8374
10.	Vietnam	Phu My Hung Shopping Mall	2009	1.5	66	3112
11.	Sudan	Sennar Bridge	2010	1.5	42	2293
12.	Angola	Soyo LNG	2010	1.2	45	794
13.	China	ShenZhen PingAn International Finance Centre	-	1.8	24	1740
14.	Indonesia	Tayan Bridge	2013	1.5	38	1711
15.	Indonesia	Merah Putih Bridge	2014	1.5	46	2090
16.	Mozambique	Maputo Bridge & Link Roads	2014	2.2	100	5774
17.	Cambodia	Diamond Twin Tower	2015	1.2	43	2388
18.	Brunei	Pulau Muara Besar Bridge	2016	1.5	77	6902
19.	Maldives	China-Maldives Friendship Bridge	2016	3.2	44	28929
20.	Singapore	Changi Airport Terminal 5	2017	1	34	958
21.	Singapore	Private Building	2017	0.8	33	837
22.	Indonesia	Jembatan Pendekat Pulau Kalimantan & Pulau Laut	2017	1.5	32	1769
29.	Indonesia	Jembatan Holtekamp Jayapura	2017	1.2	49	1359
30.	Vietnam	The Sun Project	2017	1.8	92	8893

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Testing
Monitoring
Analyzing

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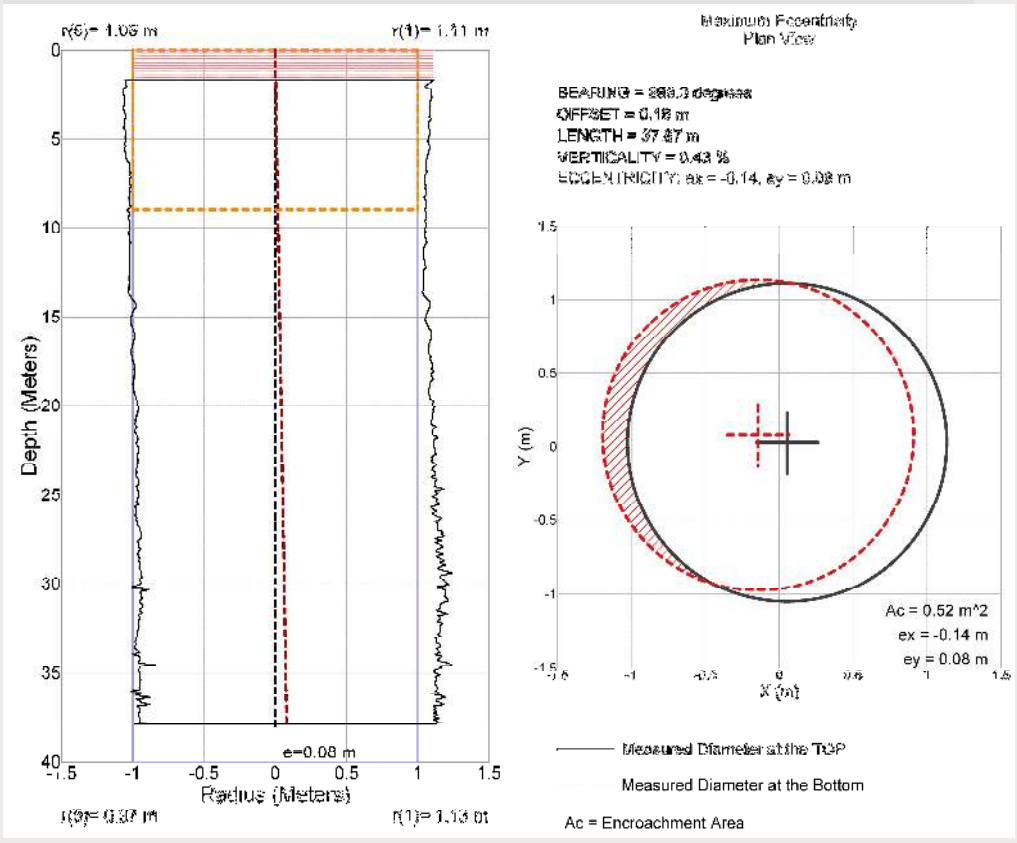
The SHAPE is lowered down into the bored hole with Kelly Bar

The mobile read-up unit of SHAPE



A typical result of SHAPE after the scanning process.

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