AL MAMAAS Co.

COMPANY PROFILE

2023

15 YEARS ANNIVERSARY

حيث الجودة هي المعيار

WHERE IT IS ALL ABOUT QUALITY

REGISTERED	ISO 9001:2015	ISO 14001:2015	OHSAS 18001:2007	ISO17025
GUARDIAN INDEPENDENT CERTIFICATION	UKAS MANAGEMENT SYSTEMS	UKAS MANAGEMENT SYSTEMS	UKAS MANAGEMENT SYSTEMS	نظام الاعتماد العراقي IRAQI ACCREDITATION SYSTEM IQAS
CERTIFICATE NO.:	788611	774638	702757	TL028


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ALMAMAAS COMPANY





CAUTION
DEEP EXCAVATION
حفريات عميقة
PPE MANDATORY
المماس


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FOUNDER'S MESSAGE

The idea and ambition beyond investing at an Engineering Test Laboratory was always part of the search for a unique and classified business where a person can find himself in, enjoy managing the work and setup each single detail regardless of the challenges that were experienced at the beginning. Engineering Laboratory business comes like a reward to me for the years of my study in the same field followed by years of true experience in exclusive quality engineering test services.

With the market knowledge and sense of respect for the standards, our successful business growth continued for more than ten years now. To follow the success, we keep on having staff & teams upgrade regularly, continuously updating testing equipment, maintaining all the ISO standards through accredited reputed third parties, exploring new international business demand and much more.

It blesses me whenever I receive a feedback and hear the customers mention Al Mamaas, those positive results come from the many clients we had the pleasure of working and developing a bond with over the years.

Sincerely,

Mustafa Abbas
Founder & CEO

OUR HISTORY & ACHIEVEMENTS

Al Mamaas Company is a leading Engineering and Environmental Testing company that was founded in 2008 by professional experts who have sheer determination and enthusiasm for organizational success.

The company's expertise in Soil investigation and building materials tests with wide range of NDT has made the corporate entity to be widely known for providing high quality services related to engineering tests for different projects.

Management Office & Lab. are located in the industrial area 15 of the Emirate of Sharjah, UAE, with a very iconic showroom that occupies a space off 300 square meters. Holding a record of 15+ years of experience in in the field, operating in a healthy investment environment with proficient professionals has enabled the company to expand the business in several northern Emirates and also in Dubai. Having an excellent team that is customer oriented, hardworking and well-trained gives us the opportunity to offer exclusive serves to our clients.

In 2014 Al Mamaas Company became a renowned business that has managed to extend its services by established and registered officially at the Ministry of Planning in Baghdad, Iraq. With a proven aptitude and unmatched Excellency in our quality of work the company was able to invest in the demanding market of the Iraq economic capital Basra city.

In 2018 the built and developed a significant and advanced Laboratory for Engineering Test was accomplished, with infrastructure on over 1000 square meters of land based in Basra city.

Our ethos's for Excellency has awarded us the opportunity to be part of helping to match the standards of construction. We are an onward thinking company, who aim for safety and extend structure life.

Our Novel Management Strategies

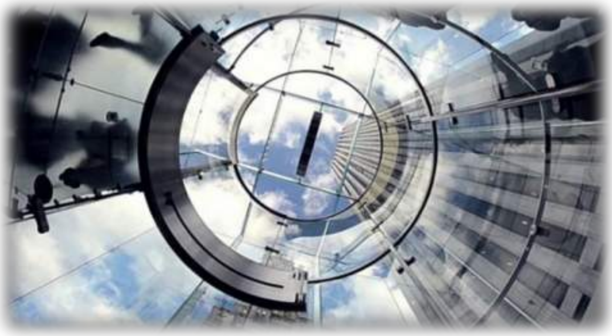
- A highly dedicated workforce that has in-depth knowledge in Engineering Tests
- Premium, branded and high-end testing technology & branded equipment
- Rare in-house talent of professionals who have high clientele, rapid response and reports technical discussion upon request
- Timeous delivery of services
- Competitive pricing
- Transparent, certified and ethical business transaction
- Maintenance of calibration for tools & equipment's
- ISO certified from a well-recognized auditor party in 9001, 14001, 18001 & 17025

OUR VISION

Contribute to the growth and development of construction and infrastructure by providing top-quality testing for all kinds of construction materials and soil. We believe maintaining the highest standards possible with our tests is key for making the most out of the natural resources and contributing to the standards of living in society. Not only do we aim to excel in applying our technical knowledge, we aim for our business practices to be honest, ethical and keep strong bonds with our clients to win the continuous satisfaction.

OUR MISSION

To provide the most value for all the clients involved in our operations. Our consistent growth over the last decade is evidence of our success in that aspect. We aim to maintain that growth and customer satisfaction by continuously improving our staff, equipment, and certification.



To do so:

- ✓ We ensure that as our business grows so does our staff both in number and in expertise to ensure our work is completed in a timely manner.
- ✓ Our staff is always well-trained and qualified to ensure integrity and safety.
- ✓ We diligently follow the world market and ensure our equipment is up to date.
- ✓ We always aim to receive the required accreditation to maintain the highest standards.
- ✓ We ensure our office network between the UAE and Iraq is always functioning efficiently with excellent staff and a well-maintained, globally allocated pool of assets and resources.

PROFESSIONAL SERVICES

1. ENGINEERING CONSULTANCY

Al Mamaas provides a wide range of services to clients in the construction, infrastructure, and industrial sectors. Our team of highly skilled and experienced engineers, designers, and project managers work closely with clients to identify their needs and deliver solutions that meet their specific requirements.

Founded in 2005, the company has quickly become a trusted partner for many of the region's most prominent companies and organizations. Our reputation for quality and reliability has helped us build a large and diverse client base that includes government agencies, private developers, and multinational corporations.

Our consulting services:

A. Architecture

Architecture is the process of designing structures and buildings using both art and engineering principles. We understand that good architecture combines functuality with aesthetics, our team of architects works with clients to ensure that all their aesthectic requirements are met while developing smart solutions to maximize the functionality and sustainability of the building.

B. Structural Engineering

Structural engineering is a vital aspect of the design and construction of buildings, bridges, and other structures. It involves the analysis and design of the structural elements that support and resist loads, such as beams, columns, and foundations. The goal of structural engineering is to ensure that structures are safe, stable, and efficient.

One of the most important roles of structural engineering is to ensure the safety of the public. Our structural engineers at Al Mamaas use advanced mathematical and computational methods to analyze the behavior of structures under various loading conditions, such as earthquakes, wind, and snow. By understanding the potential hazards and designing structures to withstand them, our team of structural engineers will help to protect people and property.

In addition to safety, our team of engineers can help with rehabilitation and preservation of existing structures. By understanding the condition and behavior of existing structures, structural engineers can design repairs and upgrades that will extend the life of the structure while maintaining its safety and performance.

C. Geotechnical Engineering

Geotechnical engineering is a branch of civil engineering that deals with the study of the mechanical properties of soil and rock, and how they interact with the built environment. It is concerned with the design and construction of foundations, slopes, and retaining walls, as well as the analysis and mitigation of natural hazards such as landslides and earthquakes.

At Al Mamaas, we have a team of experienced geotechnical engineers who investigates the soil and rock conditions at a construction site. This includes taking samples of the soil and rock, and conducting laboratory tests to determine their properties, such as strength, compressibility, and permeability. Based on this information, our engineers will provide recommendations for the design of foundations and other structures that will be stable and safe on the site.

Geotechnical Engineering services:

- Soil investigations & factual reporting
- Slope stability analysis and design
- Foundation design
- Assessing and mitigating natural hazards (earthquakes, land slides, sinkholes,..etc)

D. Project Management

project management consulting in construction is an essential service for organizations looking to successfully manage and complete complex construction projects.

Our project management consulting works closely with architects, engineers, and construction managers to ensure that projects are completed on time and within budget, while also meeting all relevant safety and regulatory requirements. Furthermore, we help clients to identify and mitigate potential risks, and to develop strategies for handling any issues that may arise during the course of the project.

Project Management Consulting services :

- Project scheduling
- Cost estimation
- Resource allocation
- Risk management
- Quality control.

2. TRAINING & PROFESSIONAL DEVELOPMENT

Al Mamaas aspires to become a stepping stone for professionals towards development and success. Our vision is to beome a leading provider of professional development and training services for businesses and organizations in Iraq. Our training division offers a wide range of courses and programs designed to help professionals develop new skills, advance their careers, and improve the performance of their organizations.

Our team of expert trainers and consultants have years of experience in a variety of industries, and are dedicated to delivering high-quality training programs that are tailored to the needs of our clients. We use a variety of teaching methods, including lectures, workshops, and hands-on exercises, to ensure that our courses are engaging and effective.

We are committed to helping our clients succeed and grow, and we offer a range of support services to ensure that they get the most out of our training programs. Whether you are an individual looking to advance your career or a business looking to improve the performance of your team, we have a training solution to meet your needs.

Services:

- Leadership development
- Team building
- Communication skills
- Technical skills training
- Project management
- Ports Design
- Non-Destructive Testing (NDT)

Benefits of Professional development:

- **Expanding knowledge base:** Opportunities for professional development and ongoing education can introduce both inexperienced and experienced professionals to new perspectives, reinforce their knowledge, and boost their level of proficiency in a certain industry. The people who are most likely to profit from these learning opportunities are those who actively seek them out.

- **Increases credibility:** Professional growth will help professionals become more knowledgeable, which will boost their confidence in their work. Nobody likes to believe that they are lacking critical abilities in their field. Professionals can increase their credibility and self-assurance when they gain new skill sets and professional designations by taking professional development courses, continuing education, and training opportunities.

- **Boosts employability and earning potential:** Young and experienced professionals can increase their earning potential and future employability by expanding their knowledge and modernizing their skill sets through professional development and continuing education. Professional credentials, certifications, and designations offer additional simple ways to raise a professional's worth. Most of them may be accessible and acquired online. Professionals with the necessary skill sets who look for and seize upskilling chances are unquestionably more employable than those who don't.

Target Audience:

- Professionals who wants to expand their knowledge base and improve their ceditability and employability
- Fresh graduates who wants to gain professional skills to boost their employability and earning potential
- Project Managers or people who aspire to manage projects
- Engineers & managers working in port related projects
- Individuals who wants to gain Non Destructive Testing (NDT) skills
- Individuals who aspire to lead a team or a company effectively

3. TECHNICAL FEASIBILITY STUDIES

Technical Feasibility studies are evaluations that assess the feasibility of a proposed engineering project or venture from a technical and economic perspective. These studies typically involve a detailed analysis of the technical and economic aspects of the project to determine whether it is viable and whether it makes financial sense to pursue.

Our team of highly experienced engineers and analysts works together with clients to provide the highest accuracy in studying the feasibility and best reccommendations to the client.

Key steps involved in conducting feasibility studies:

1. **Define the project scope:** The first step is to clearly define the scope of the project, including the goals and objectives, expected outcomes, and any constraints or limitations.
2. **Assess technical feasibility**: This involves evaluating the technical aspects of the project to determine whether it is feasible from a technical perspective. This may include analyzing the materials and equipment required, assessing the availability of skilled labor and other resources, and identifying any technical risks or challenges that may need to be addressed.
3. **Assess economic feasibility:** This involves evaluating the financial aspects of the project to determine whether it is financially viable. This may include analyzing the costs and potential benefits of the project, assessing the potential market demand for the project's products or services, and evaluating any potential funding sources or financing options.
4. **Develop a project plan**: If the project is deemed technically and economically feasible, the next step is to develop a detailed project plan that outlines the steps and resources needed to complete the project.
5. **Monitor and review progress**: Throughout the project, it is important to regularly monitor and review progress to ensure that the project stays on track and is meeting its goals and objectives. This may include conducting regular progress reports and evaluations to identify any issues or challenges that may arise and taking corrective action as needed.

LABORATORY TESTING

1. CONCRETE TESTS

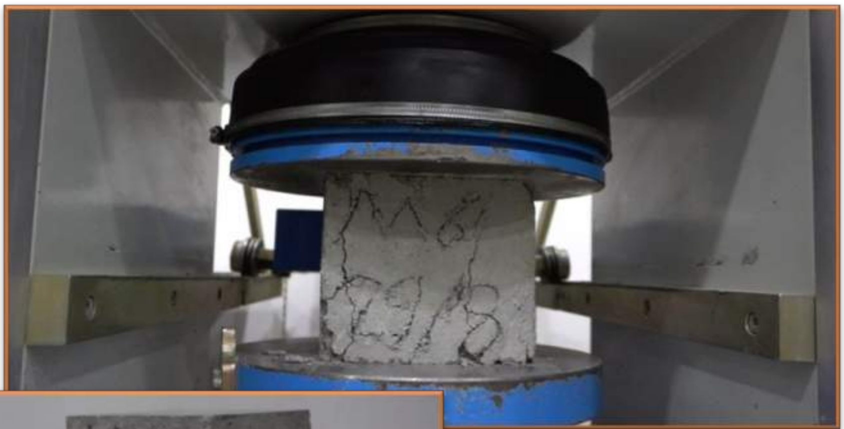
A. Hardened Concrete Tests

I. Concrete Compressive Strength Test

The cubes or cylinders are generally tested at 7 & 28 days unless specific early tests are required, for example to remove a concrete shutter safely prior to 7 days. Usually 3 cubes or cylinders will be tested at 7 days and 3 at 28 days, however this may vary depending of the requirements, check the design first. The cubes or cylinders are removed from the curing tank, dried and grit removed. The cubes or cylinders are tested using a calibrated compression machine. This can be carried out internally by competent personnel or by a certified test house.

The cubes or cylinders are tested on the face perpendicular to the casting face. The compression machine exerts a constant progressing force on the cubes till they fail, the rate of loading is 0.6 ± 0.2 MPa/s (N/mm²/s). The reading at failure is the maximum compressive strength of the concrete. Th standard for cubes is BS EN 12390-2: 2009 / BS EN 12390-3:2009. And for cylinders is ASTM C39

The concrete minimum compressive strength will be specified by the client/designer in a specific format.



II. Ultrasonic Test (Pulse Velocity)

This test method is applicable to assess the uniformity and relative quality of concrete, to indicate the presence of voids and cracks, and to evaluate the effectiveness of crack repairs. It is also applicable to indicate changes in the properties of concrete, and in the survey of structures, to estimate the severity of deterioration or cracking. If used to monitor changes in condition over time, test locations are to be marked on the structure to ensure that tests are repeated at the same positions. This test method covers the determination of the propagation velocity of longitudinal stress wave pulses through concrete. This test method does not apply to the propagation of other types of stress waves through concrete this test is done according to : ASTM C597 , BS EN 12504-4

III. Schmidt Hummer Test (Rebound Number)

This test method covers the determination of a rebound number of hardened concrete using a spring-driven steel hammer .The rebound hammer method could be used for Assessing the likely compressive strength of concrete with the help of suitable correlations between rebound index and compressive strength, Assessing the uniformity of concrete, Assessing the quality of the concrete in relation to standard requirements and Assessing the quality of one element of concrete in relation to another.

This test is done according to : ASTM C805 / C805M , BS-1881-Part-202

IV. Core Test

Concrete cores are usually cut by means of a rotary cutting tool with diamond bits. In this manner, a cylindrical specimen is obtained usually with its ends being uneven, parallel and square and sometimes with embedded pieces of reinforcement.

The cores are visually described and photographed, giving specific attention to compaction, distribution of aggregates, presence of steel etc.

The core should then be soaked in water, capped with molten sulphur to make its ends plane, parallel, at right angle and then tested in compression in a moist condition as per BS 1881: Part 4 or ASTM C42.

B. FRESH CONCRETE

I. Slump Test

This test method covers determination of slump of hydraulic-cement concrete, both in the laboratory and in the field for fresh concrete. The values stated in either SI units or inch-pound units are to be regarded separately as standard. Within the text, the SI units are shown in brackets. The values stated in each system may not be exact equivalents; therefore, each system shall be used independently of the other. Combining values from the two systems may result in non-conformance with the standard.

The test is conducted in accordance with ASTM C143 or BS EN 12350-2

II. Air Content Test

Air is entrained within concrete to provide for expansion and contraction capability, particularly in areas that experience significant swings in outside temperature. Field air content testing of concrete is conducted to determine if delivered concrete is within the air content specifications established by the engineer.

To conduct an air content test, the field technician fills a circular metal base with three lifts of concrete, which are tamped using a metal rod similar to the technique used for concrete slump testing. Once the base is full of concrete, a metal lid with a pressure gauge attached is placed on top and the two parts are locked together. A hand pump is used to pressurize the device to a calibration point and then it is allowed to stabilize. After stabilization, the pressure is released, and the technician can read the concrete air content from a dial attached to the device.

The test done according to ASTM C231 and BS EN 12350-7

III. Design of Concrete Mix

Concrete mix design is the process of selecting the ingredients for a concrete mixture and deciding on their proportions. When designing a concrete mix, you should always consider the desired strength, durability, and workability according to project requirement and specification.

Concrete mixes are designed to follow the guidelines provided by ACI Committee 211 Standard or BS EN 206-1 Practice for Selecting Proportions for Normal, Heavyweight and Mass Concrete (ACI 211.1-91). A concrete mix can be designed using the tables and calculations provided in the standard

2. CONCRETE RAW MATERIALS TESTS

In construction engineering projects, large quantity of different materials is used and it is necessary to test these materials according to certain set patterns within desirable frequency of testing in order that the quality of final product is maintained.

A. Cement Tests

I. Setting Time

The time between the water is added to cement till it starts losing its plasticity is called as initial setting time, The time between which water added to cement till it has come in hardened state is called final setting time, Setting time of cement used in concrete plays an important in fresh and hardened state of concrete, the test done by using Vigat test device this test is perform according to the ASTM C150, BS EN 196, BS EN 197

II. Compressive Strength of Cement Cubes

It's one of the Quality Control measures. It's done to ensure that the product will perform as it should when it's used in concrete. It's performed according to the ASTM C150, BS EN 196, BS EN 197.

III. Fineness Modulus Test

We know that the cement hydrates with the presence of water. When cement is mixed with the water, a thin layer is formed around the particle.

This layer grows bigger and makes cement particles to separate. Due to this, hydration process slows down. Therefore, the smaller particle will react much quicker than the larger particle. A particle with dia. 1µm will react entirely in one day, whereas the particle with dia. 10µm takes about one month. So, the particle size distribution is more critical in attaining the final strength of cement in allowable time.

Too much of smaller particles in cement results in quick setting, leaving no time for mixing, handling and placing. So to increase the setting time of cement, cement is grinded in a different range of particle sizes. The following proportions are usually maintained in Cement: About 10% of the cement of fine particles is smaller than 2 µm, 10% of wt of cement is made of particles larger than 50 µm, and only a few wt% is particles larger than 90 µm.

Fineness test is performed according to the ASTM C150, BS EN 196, BS EN 197

IV. Loss on Ignition

It's a test used in inorganic analytical chemistry, particularly in the analysis of minerals. It consists of strongly heating (“igniting”) a sample of the material at a specified temperature, allowing volatile substances to escape, until its mass ceases to change. This may be done in air, or in some other reactive or inert atmosphere. This test is performed according to the ASTM C150, BS EN 196, BS EN 197

V. Chemical Tests

The procedures used in the chemical analysis of Portland cement are described in this group of tests. (So_3, C_3A, MgO, Fe_2O_3, Al_2O_2, SiO_2); According to the ASTM C150, BS EN196, BS EN197.

B. Aggregate Test

I. Sieve Analysis of Aggregate

This test method is used primarily to determine the grading of materials proposed for use as aggregates or being used as aggregates. The results are used to determine compliance of the particle size distribution with applicable specification requirements and to provide necessary data for control of the production of various aggregate products and mixtures containing aggregates. and from this test result can be get Fineness Modulus which is important to concrete mix design. This test is preformed according to ASTM C136 or BS 812.

II. Bulk Density

This test method is often used to determine bulk density values that are necessary for use for many methods of selecting proportions for concrete mixtures. this test is preformed according to ASTM C29 or BS 812

III. Specific Gravity

It is the ratio of the weight of a given volume of aggregate to the weight of an equal volume of water. Water, at a temperature of 73.4°F (23°C) has a specific gravity of 1. Specific Gravity is important for several reasons. Some deleterious particles are lighter than the good aggregates. Tracking specific gravity can sometimes indicate a change of material or possible contamination. Differences in specific gravity may be used during production to separate the deleterious particles from the good using a heavy media liquid, the test done according with to ASTM C127 or BS 812.

IV. Absorption

It’s the percent of water necessary to add to the aggregate to obtain saturated surface condition (SSD).

Absorption values are used to calculate the change in the weight of aggregate due to water absorbed in the pore spaces. They are also used to calculate the amount of water that is absorbed by aggregates during Portland concrete mix preparation. ASTM C127 or BS 812.

C. Water Tests

Quality of water for construction use is determined in the laboratory. It’s important because of its effect on chemical properties of concrete. This test is done according to ASTM C1602 or BS 1881.

Following are the tests required for quality of water for Concrete construction purpose:

i. PH Value Test
ii. Chloride Test
iii. Sulphate Test
iv. Limits of Acidity Test
v. Limits of Alkalinity Test
vi. Percentage of Solids
vii. Suspended Matters
viii. Organic and Inorganic Solids

3. STEEL BAR AND PLATES TESTS

A. Tensile Test

Provide information on the strength and ductility of materials under axial tensile stresses. This information may be useful in comparisons of materials, alloy development, quality control, and design under certain circumstances.

Elongation is a strong function of volume of material participated in the deformation process (read, gage length) All standard test procedures recommend a preferable gauge length (or gage area) so that % elongation obtained can be compared across.

The test is performed according to the ASTM A615, BS 4449, Iraqi stands I.Q.S 2091

B. Bending Test

Bend testing a material allows for the determination of that materials ductility, bend strength, fracture strength and resistance to fracture. These characteristics can be used to determine whether a material will fail under pressure. The test is performed according to ASTM A370

C. Chemical Tests

These test methods for the chemical analysis of metals and alloys are primarily intended as referee methods to test such materials for compliance with compositional specifications, particularly those under the jurisdiction of ASTM Committees A01 on Steel, Stainless Steel, and Related Alloys and A04 on Iron Castings. It is assumed that all who use these test methods will be trained analysts capable of performing common laboratory procedures skillfully and safely. It is expected that work will be performed in a properly equipped laboratory under appropriate quality control practices such as those described in Guide E882.

The test is performed according to ASTM E350- 18

4. ASPHALT TESTS

A. Asphalt Mix Tests

I. Asphalt Content

The proportion of asphalt in the mixture is critical and must be accurately determined in the laboratory and then precisely controlled on the job. The optimum asphalt content of a mix is highly dependent on aggregate characteristics such as gradation and absorptive. Aggregate gradation is directly related to optimum asphalt content. The test done by washing method (centrifugal) to find asphalt content and it done according to ASTM D6307 or BS 812.

II. Asphalt Specific Gravity

The theoretical maximum specific gravities and densities of bituminous paving mixtures are fundamental properties whose values are influenced by the composition of the mixture in terms of types and amounts of aggregates and bituminous materials.

Maximum specific gravity is used (1) in the calculation of air voids in the compacted bituminous paving mixture, (2) in calculating the amount of bitumen absorbed by the aggregate, and (3) to provide target values for the compaction of paving mixtures, ASTM D2041 BS 812.

III. Marshall Test

The Marshall Stability and flow test provides the performance prediction measure for the Marshall mix design method. The stability portion of the test measures the maximum load supported by the test specimen at a loading rate of 50.8 mm/minute. Load is applied to the specimen till failure, and the maximum load is designated as stability. During the loading, an attached dial gauge measures the specimen's plastic flow (deformation) due to the loading. The flow value is recorded in 0.25 mm (0.01 inch) increments at the same time when the maximum load is recorded. The important steps involved in marshal mix design are summarized next. the test done according with ASTM D6927 and BS 812.

B. Asphalt Compaction Ratio (Core Test)

Compaction is the process by which can be comparing between maximum density of asphalt mix and that density at field to find the quality of pavement. The volume of air in a hot asphalt mixture is reduced by using external forces to reorient the constituent aggregate particles into a more closely spaced arrangement. This reduction of air volume produces a corresponding increase in hot asphalt mix density. It’s typically expressed as “percent air voids”, It is done by getting cores from site (new paved areas) to lab to check it with standards procedure. The test done according with ASTM D3387 or BS 1377

C. Asphalt Raw Materials Tests

I. Tests of Aggregate

Aggregate plays important role in pavement construction. Aggregates influence, to a great extent, the load transfer capability of pavements. it is essential that they should be thoroughly tested before using for construction. Not only that aggregates should be strong and durable, they should also possess proper shape and size to make the pavement act monolithically.

II. Gradation Test

The gradation and size is used to determine aggregate particle size distribution. Size distribution is perhaps the single most important aggregate quality associated with the control of Hot Asphalt mixtures. Aggregate gradation and size affect hot mix volumetric properties as well as mixture permeability and workability.

In a gradation and size analysis, a sample of dry aggregate of known weight is separated through a series of sieves with progressively smaller openings. Once separated, the weight of particles retained on each sieve is measured and compared to the total sample weight. Particle size distribution is then expressed as a percent retained by weight on each sieve size. Results are usually expressed in tabular or graphical format.

The standards of gradation and sieve analysis test are AASHTO T 27, ASTM D5444 and BS EN 12697

III. Soundness Test

Soundness test is intended to study the resistance of aggregates to weathering action, by conducting accelerated weathering test cycles. The Porous aggregates subjected to freezing and thawing is likely to disintegrate prematurely. To ascertain the durability of such aggregates, they are subjected to an accelerated soundness test as specified with ASTM C88 or BS 812.

IV. Shape Index Test

The particle shape of the aggregate mass is determined by the percentage of flaky and elongated particles in it. Aggregates which are flaky or elongated are detrimental to higher workability and stability of mixes.

The **flakiness index** is defined as the percentage by weight of aggregate particles whose **least dimension is less than 0.6 times their mean size**. Flakiness gauge is used for this test.

Test procedure had been standardized with ASTM D3398 and BS 812.

The **elongation index** of aggregate is defined as the percentage by weight of particles whose **greatest dimension (length) is 1.8 times their mean dimension**. This test is applicable to aggregates larger than 6.3 mm. Elongation gauge is used for this test. This test is also specified with ASTM D4791 or BS 812.

V. Specific Gravity

It is the ratio of the weight of a given volume of aggregate to the weight of an equal volume of water. Water, at a temperature of 73.4°F (23°C) has a specific gravity of 1000 Kg/m^3. Specific Gravity is important for several reasons. Some deleterious particles are lighter than the good aggregates. Tracking specific gravity can sometimes indicate a change of materials. The test done with ASTM C127, C128 and BS 812.

D. BITUMEN TESTS

I. Flash point Test

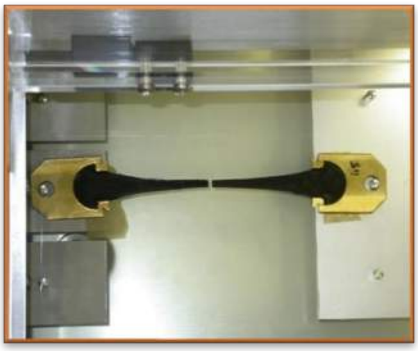
The fundamental reason for the requirement of flash point measurements is to assess the safety hazard of a liquid or semi-solid with regard to its flammability and then classifies the liquid into a group. The lower the flash point temperature, the greater the risk. This classification is then used to warn of a risk and to enable the correct precautions to be taken when using, storing or transporting the liquid. the test done according with ASTM D92 or BS 812.

II. Penetration Test

The penetration test is used as a measure of consistency. Higher values of penetration indicate softer consistency, this test is performed according to ASTM D5/D5M & BS 812.

III. Ductility Test

This test method provides one measure of tensile properties of asphalt materials and may be used to measure ductility for specification requirements. ASTM D113 BS 812.



IV. Separation Tendency of Polymer

This test investigates the tendency of polymers to separate from the polymer modified bitumen (PMB). Using a special ovens, the samples are stored in a vertical position under heating at 163 ± 5 °C for 48 hours. At the end of the procedure, the top and bottom fractions of the sample are extracted and analyzed through additionnal tests such as softening point test. A significant difference between the two extracted fractions may indicated an incompatibility between the bitumen and the polymer.

This test is conducted in accordance with ASTM D7173

V. Softening point test

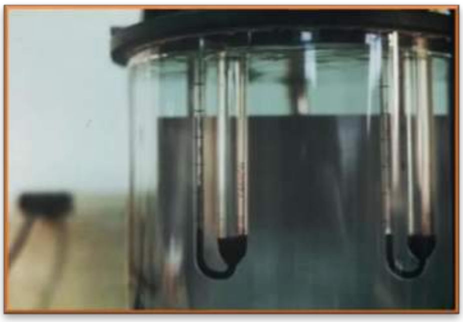
Softening point denotes the temperature at which the bitumen attains a particular degree of softening under the specifications of test. The test is conducted by using Ring and Ball apparatus. In general, higher softening point indicates lower temperature susceptibility and is preferred in hot climates. This test is conducted in accordance with ASTM D36.

VI. Specific gravity test

The specific gravity of bitumen is defined as the ratio of the mass of given volume of bitumen of known content to the mass of the equal volume of water at 27 C. The specific gravity of bitumen is measured using either pycnometer or preparing a cube specimen of bitumen in the semi-solid or solid state. This test is conducted in accordance with ASTM D70.

VII. Viscosity Test

The viscosity of bitumen and tar in road construction practice is based on the test result obtained with orifice type viscometer. This test is carried Out to determine the viscosity of bitumen and tar which remain fluid under the specified temperature of the test. This test is conducted in accordance with ASTM D88.



VIII. Float test

Certain range of bitumen consistencies cannot be measured by penetration test or viscosity test, the float test is used instead. . The apparatus consists of an aluminum float and a brass collar filled with bitumen to be tested. The specimen in the mould is cooled to a temperature of 5 ºC and screwed in to float. The total test assembly is floated in the water bath at 50 ºC and the time required for water to pass its way through the specimen plug is noted in seconds and is expressed as the float value. This test is conducted in accordance with ASTM D139.

IX. Water content test

The water in a bitumen is determined by mixing known weight of specimen in a pure petroleum distillate free from water. The mixture is then heated and distiled, the weight of the water condensed and collected is expressed as the percentage by weight of the original sample. In general, the allowable maximum water content should not be more than 0.2% by weight. This test is conducted in accordance with ASTM D 1461

X. Loss on heating test

When the bitumen is heated it loses the volatility and gets hardened. To conduct this test, about 50gm of the sample is weighed and heated to a temperature of 163 ºC for 5 hours in a specified oven designed for this test. The sample specimen is weighed again after the heating period and loss in weight is expressed as the percentage by weight of the original sample. **Note:** Bitumen used in pavement mixes should not indicate more than 1% loss in weight, but for bitumen having penetration values 150-200 up to 2% loss in weight is allowed.This test is conducted in accordance with ASTM D6

5. GEOTECHNICAL TESTS

A. FIELD TESTS

I. Drilling of Soil Investigation

To get the samples of deep soil layers it has to be by using soil drilling machines, the depth of boreholes depending on project specifications or client request. Samples divides into undisturbed samples (Shelby tube samples), distributes samples and water samples. Sampling method (No. of Samples and sampling distances) depend on project specifications or known standard. The standards of drilling are ASTM D1452, D5783 and BS 5930.

II. CPT (Core Penetration test):

Tests performed using this test method provide a detailed record of cone resistance that is useful for evaluation of site stratigraphy, homogeneity and depth to firm layers, voids or cavities, and other discontinuities. The use of a friction sleeve can provide an estimate of soil classification, and correlations with engineering properties of soils. When properly performed at suitable sites, the test provides a rapid means for determining subsurface conditions.

This test method provides data used for estimating engineering properties of soil intended to help with the design and construction of earthworks, the foundations for structures, and the behavior of soils under static and dynamic loads.

This method tests the soil in-situ and soil samples are not obtained. The interpretation of the results from this test method provides estimates of the types of soil penetrated. Engineers may obtain soil samples from parallel borings for correlation purposes, but prior information or experience may preclude the need for borings. ASTM D5778 , BS EN ISO 22476

III. Standard Penetration Test (SPT)

This test method provides a disturbed soil sample for moisture content determination and laboratory identification. Sample quality is generally not suitable for advanced laboratory testing for engineering properties. The process of driving the sampler will cause disturbance of the soil and change the engineering properties. Use of the thin wall tube sampler may result in less disturbance in soft soils. Coring techniques may result in less disturbance than SPT sampling for harder soils.

This test method is used extensively in a great variety of geotechnical exploration projects. Many local correlations and widely published correlations which relate blow count, or N-value, and the engineering behavior of earthworks and foundations are available. For evaluating the liquefaction potential of sands during an earthquake event, the N-value should be normalized to a standard overburden stress level. Practice provides methods to obtain a record of normalized resistance of sands to the penetration of a standard sampler driven by a standard energy. The penetration resistance is adjusted to drill rod energy ratio of 60 % by using a hammer system with either an estimated energy delivery or directly measuring drill rod stress wave energy.

This test method describes the procedure, generally known as the Standard Penetration Test (SPT), for driving a split-barrel sampler to obtain a representative soil sample and a measure of the resistance of the soil to penetration of the sampler.

The values stated in inch-pound units are to be regarded as the standard. ASTM D1586 or BS EN ISO 22476

IV. Electrical Resistivity

The resistivity of the surrounding soil environment is a factor in the corrosion of underground structures. High resistivity soils are generally not as corrosive as low resistivity soils. The resistivity of the soil is one of many factors that influence the service life of a buried structure. Soil resistivity may affect the material selection and the location of a structure.

Soil resistivity is of particular importance and interest in the corrosion process because it is basic in the analysis of corrosion problems and the design of corrective measures. ASTM G187

V. Thermal Conductivity

The thermal conductivity of both intact and reconstituted soil specimens as well as soft rock specimens is used to analyze and design systems used, for example, in underground transmission lines, oil and gas pipelines, radioactive waste disposal, geothermal applications, and solar thermal storage facilities. This test method presents a procedure for determining the thermal conductivity (λ) of soil and soft rock using a transient heat method. This test method is applicable for both intact and reconstituted soil specimens and soft rock specimens. This test method is suitable only for homogeneous materials. This test done according to ASTM D 5334 or BS 874

B. Laboratory Tests

I. Moisture Content (M.C. %)

For many materials, the water content is one of the most significant index properties used in establishing a correlation between soil behavior and its index properties.

The water content of a material is used in expressing the phase relationships of air, water, and solids in a given volume of material. The test is done according to ASTM D2216 and BS 812.

II. Atterberg Limits (L.L, P.L & P.I)

These test methods are used as an integral part of several engineering classification systems to characterize the fine-grained fractions of soils and to specify the fine-grained fraction of construction materials (see Specification D1241). The liquid limit, plastic limit, and plasticity index of soils are also used extensively, either individually or together, with other soil properties to correlate with engineering behavior such as compressibility, hydraulic conductivity (permeability), compatibility, and shear strength.

The liquid and plastic limits of a soil and its water content can be used to express its relative consistency or liquidity index. In addition, the plasticity index and the percentage finer than 2-µm particle size can be used to determine its activity number.

These methods are sometimes used to evaluate the weathering characteristics of clay-shale materials. When subjected to repeated wetting and drying cycles, the liquid limits of these materials tend to increase. The amount of increase is considered to be a measure of shale's susceptibility to weathering.

The liquid limit of a soil containing substantial amounts of organic matter decreases dramatically when the soil is oven-dried before testing. Comparison of the liquid limit of a sample before and after oven-drying can therefore be used as a qualitative measure of organic matter content of a soil, ASTM D4318 and BS 1377.

III. Specific Gravity

The specific gravity of soil solids is used in calculating the phase relationships of soils, such as void ratio and degree of saturation.

The specific gravity of soil solids is used to calculate the density of the soil solids. This is done by multiplying its specific gravity by the density of water (at proper temperature). The test is done according to ASTM D854 and BS 1377.

IV. Grading

Gradation of Fine-Grained: Particle-size distribution (gradation) is a descriptive term referring to the proportions by dry mass of a soil distributed over specified particle-size ranges. The gradation curve generated using this method yields the amount of silt and clay size fractions present in the soil based on size definitions, not mineralogy or Atterberg limit data.

The gradation of a soil is an indicator of engineering properties. Hydraulic conductivity, compressibility, and shear strength are related to the gradation of the soil. However, engineering behavior is dependent upon many factors, such as effective stress, mineral type, structure, plasticity, and geological origin.

The size limits of the sedimentation test are from about 100 µm to about 1 µm. The length of time required to obtain a stable initial reading on the hydrometer controls the upper range of results, and the test duration controls the lower range.

The shape and density of the grains are important to the results. Stokes' Law is assumed to be valid for spherical particles even though fine silt- and clay-sized particles are more likely to be plate-shaped and have greater mineral densities than larger particles. ASTM D7928 or BS 1377.

V. Triaxial Compression Test

Triaxial tests are one of the most widely performed tests in a geotechnical laboratory. The advantages of the test over other test methods used in the geotechnical laboratory used to determine shear strength (such as direct shear) is that specimen drainage can be controlled and pore pressure can be measured. The triaxial test enables parameters such as cohesion (c'), internal angle of friction (ϕ') and shear strength to be determined.

The triaxial test can also be used to determine other variables such as stiffness and permeability with the correct equipment. the standards of this test are ASTM D2850, D4767 , D2166, D7181 (according to test type) or BS 1377.

VI. Direct Shear Test of Soils

This test is performed to determine the consolidated-drained shear strength of a sandy to silty soil. The shear strength is one of the most important engineering properties of a soil, because it is required whenever a structure is dependent on the soil's shearing resistance. The shear strength is needed for engineering situations such as determining the stability of slopes or cuts, finding the bearing capacity for foundations, and calculating the pressure exerted by a soil on a retaining wall. The standards of this test are ASTM D3080 or BS 1377.

VII. Consolidation Test

The consolidation properties determined from the consolidation test are used to estimate the magnitude and the rate of both primary and secondary consolidation settlement of a structure or an earth fill. Estimates of this type are of key importance in the design of engineered structures and the evaluation of their performance. The standards of this test are ASTM D2435 or BS 1377.

VIII. Compaction test

Soil placed as engineering fill (embankments, foundation pads, road bases) is compacted to a dense state to obtain satisfactory engineering properties such as shear strength, compressibility, or permeability. In addition, foundation soils are often compacted to improve their engineering properties. Laboratory compaction tests provide the basis for determining the percent compaction and molding water content needed to achieve the required engineering properties by comparing it with maximum dry density (MDD) and optimum moisture content (OMD), and for controlling construction to assure that the required compaction and water contents are achieved. ASTM D1557, D2937 or BS 1733

Sand replacement method

This test method is used to determine the density and water content of compacted soils placed during the construction of earth embankments, road fill and structural backfill. It often is used as a basis of acceptance for soils compacted to a specified density or percentage of a maximum density

Core cutter test

This test method can be used to determine the in-place density of soils which do not contain significant amounts of particles larger than 4.75 mm ($^{3}/_{16}$ in.), and which can be readily retained in the drive cylinder. This test method may also be used to determine the in-place density of compacted soils used in construction of structural fill, highway embankments, or earth dams. When the in-place density is to be used as a basis for acceptance, the drive cylinder volumes must be as large as practical and not less than 850 cm^3 (0.030 ft^3).

The general principles of this test method have been successfully used to obtain samples of various field compacted fine-grained soils having a maximum particle size of 4.75 mm ($^{3}/_{16}$ in.) for purposes other than density determinations.

6. PILE TESTS

A. STATIC AXIAL COMPRESSIVE LOAD TEST

Test shall be conducted according to ASTM D1143 Standard Test Method for Piles under Static Axial Compressive Load.

The static axial capacity of piles typically changes as time elapses after pile installation, possibly increasing (setup) or decreasing (relaxation), depending on the soil or rock properties and the pore water pressure and soil structure disturbance induced by installation. This behavior may affect both driven piles and cast-in-place piles.

The test method described in the standard measure the axial deflection of a vertical or inclined deep foundation when loaded in static axial compression. These methods apply to all deep foundations (Piles), That function in a manner similar to driven piles or cast-in-place piles, regardless of their method of installation, and may be used for testing single pile or piles group.

B. STATIC AXIAL TENSILE LOAD TEST

Test shall be conducted according to ASTM D3689 Standard Test Method for Piles under Static Axial Tensile Load.

Field tests provide the most reliable relationship between the axial load applied to a deep foundation and the resulting axial movement. Test results may also provide information used to assess the distribution of side shear resistance along the pile shaft and the long-term load-deflection behavior. A foundation designer may evaluate the test results to determine if, after applying an appropriate factor of safety, the pile or pile group has an ultimate static capacity and a deflection at service load satisfactory to support a specific foundation. When performed as part of a multiple-pile test program, the designer may also use the results to assess the viability of different piling types and the variability of the test site.

The test method described in the standard measure the axial deflection of a vertical or inclined deep foundation when loaded in static axial Tension. These methods apply to all deep foundations (Piles), That function in a manner similar to driven piles or cast-in-place piles, regardless of their method of installation, and may be used for testing single pile or piles group.

C. STATIC LATERAL LOAD TEST

Test shall be conducted according to ASTM D3966 Standard Test Method for Piles under Static Axial Tensile Load.

This test method described in this standard measure the lateral deflection of vertical or inclined deep foundations when subjected to lateral loading. It is applicable to all deep foundation units regardless of their size or method. The actual lateral load capacity of the pile-soil system can test be determined by lateral testing. Such testing measures the response of the pile-soil system to lateral loads and may provide data for research and development, engineering design, quality control, and acceptance or rejection under specifications. Under the iterative elastic method of analysis that considers the nonlinear response of the soil. Lateral testing combined with proper instrumentation can be used to determine soil properties necessary for the structural design of the pile to resist the lateral load to be applied. Reaction system shall also be monitored for movement.

D. DYNAMIC TEST

Test shall be conducted according to ASTM D4945 Standard Test Method for Standard Test Method for high strain dynamic testing of piles.

This test consists of estimating soil resistance and its distribution from force and velocity measurement obtained near the top of a foundation.

This dynamic test method covers the procedure for applying an axial impact force with a pile driving hammer or a large drop weight that will cause a relatively high strain at the top of an individual vertical or inclined deep foundation unit, and for measuring the subsequent force and velocity response of that deep foundation unit. High-strain dynamic testing applies to any deep foundation unit, also referred to herein as a "pile," which functions in a manner similar to a driven pile or a cast-in-place pile regardless of the method of installation, and which conforms with the requirements of this test method.

E. INTEGRITY TEST

Test shall be conducted according to ASM D5882 "Low Strain Impact Integrity Testing of Deep Foundations"

This test method covers the procedure for determining the integrity of individual vertical or inclined piles by measuring and analyzing the velocity (required) and force (optional) response of the pile induced by an (hand held hammer or other similar type) impact device usually applied axially and perpendicularly to the pile head surface. This test method is applicable to long structural elements that function in a manner similar to any deep foundation units (such as driven piles, augured piles, or drilled shafts), regardless of their method of installation provided that they are receptive to low strain impact testing.

The tests measures, Pile length, or depth to anomalies Pile head stiffness Pile shaft mobility-which is dependent on pile section and concrete properties. The software, also produces computer simulation and impedance profile of the test result to analyze in detail any intermediate pile shaft response.

7. NDT Tests

Nondestructive testing (NDT) is the process of inspecting, testing, or evaluating materials, components or assemblies for discontinuities, or differences in characteristics without destroying the serviceability of the part or system. In other words, when the inspection or test is completed the part can still be used.

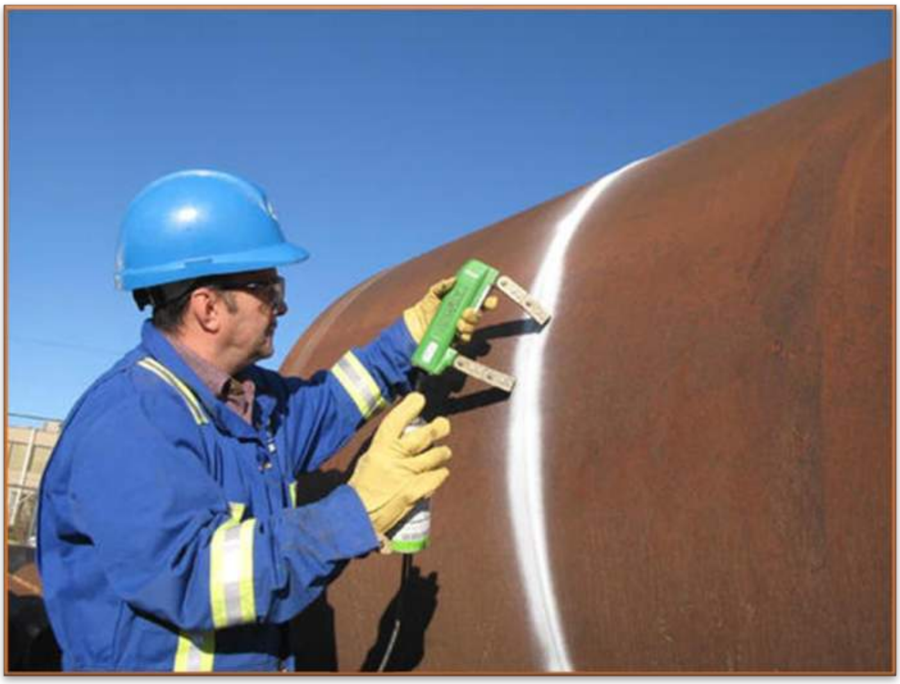
A. MAGNETIC TESTING (MT)

Also known as MPI (Magnetic Particle Inspection). It is a method that can be used to find surface and near surface flaws in ferromagnetic materials such as steel and iron.

The technique uses the principle that magnetic lines of force {flux) will be distorted by the presence of a flaw in a manner that will reveal its presence. The flaw (for example, a crack) is located from the "flux leakage", following the application of fine iron particles to the area under examination. There are variations in the way the magnetic field is applied, but they are all dependent on the above principle.

The iron particles can be applied dry or wet; suspended in a liquid, colored or fluorescent. While magnetic particle inspection is primarily used to find surface breaking flaws, it can also be used to locate sub-surface flaws. But its effectiveness quickly diminishes depending on the flaw depth and type.

Surface irregularities and scratches can give misleading indications. Therefore, it is necessary to ensure careful preparation of the surface before magnetic particle testing is undertaken.



B. PENETRANT TESTING (PT)

Also known as Dye Penetrant Inspection (DPI), Liquid Penetrant Inspection (LPI) or Fluorescent Penetrant Inspection (FPI). It is a method that is used to reveal surface breaking flaws by bleed out of a colored or fluorescent dye from the flaw.

The technique is based on the ability of a liquid to be drawn into a "clean" surface breaking flaw by capillary action. After a period of penetration time, excess surface penetrant is removed and a developer applied. This 'draws' the penetrant from the flaw to reveal its presence. Color contrast (Or "visible") penetrants require good white light while fluorescent penetrants need to be used in darkened conditions with an ultraviolet light (Also known as black light).

Penetrant inspection can be used on almost any non-porous material. It is essential that the material is carefully cleaned first. Otherwise, the penetrant will not be able to enter the defect. If surface penetrant is not fully removed, misleading indications will result.

C. ULTRASONIC TESTING (UT)

Ultrasonic inspection uses sound waves of short wavelength and high frequency to detect flaws or measure material thickness. It is used to test welds, castings and wrought products, e.g. rolled plate or forgings. Manual and immersion techniques are employed.

Manual testing involves sound waves (pulsed beams of high frequency ultrasound) transmitted via a hand-held transducer, which is placed on the specimen. A 'couplant' is used to enable the sound to pass from the transducer to the component under test. Any sound from the pulse that returns to the transducer (echo) is shown on a screen, which gives the amplitude of the pulse and the time taken to return to the transducer. Flaws anywhere through the specimen thickness reflect the sound back to the transducer. Flaw size, distance and reflectivity can be interpreted.

The immersion technique involves placing the component in a tank of water and passing the sound waves through the water into the component.

Because of its complexity considerable technician training and skill is required.

D. RADIOGRAPHIC TESTING (RT)

Also known as x-radiography and gamma radiography. X-rays are produced by high voltage x-ray machines, whereas gamma rays are produced from radioactive isotopes such as Iridium 192 and Cobalt 60. The x-ray or gamma rays are placed close to the material to be inspected and they pass through the material and are then captured on film. This film is then processed and the image is obtained as a series of grey shades between black and white. Gamma sources have the advantage of portability which makes them ideal for use in site working.

X-rays and gamma rays are very hazardous. Special precautions must be taken when performing radiography. Therefore, the operator will use these inside a protective enclosure or with appropriate barriers and warning signals to ensure there are no hazards to personnel.

E. EDDY CURRENT TESTING (ET)

ET is an electromagnetic technique and can only be used on conductive materials. Its applications range from crack detection, to the rapid sorting of small components for flaws, size variations, or material variation. Commonly it is used in the aerospace, automotive, marine and manufacturing industries.

When an energized coil is brought near to the surface of a metal component, eddy currents are induced into the specimen. These currents set-up a magnetic field that tends to oppose the original magnetic field. The impedance of coil in close proximity to the specimen is affected by the presence of the induced eddy currents in the specimen.

When the eddy currents in the specimen are distorted by the presence of the flaws or material variations, the impedance in the coil is altered. This change is measured and displayed in a manner that indicates the type of flaw or material condition.

F. VISUAL TESTING (VT)

Also known as Visual Inspection, VT is the one NDT method used extensively to evaluate the condition or the quality of a weld or component. It is easily carried out, inexpensive and usually doesn't require special equipment.

It is used for the inspection of welds and other components where quick detection and the correction of flaws or process related problems can result in significant cost savings. It is the primary evaluation method of many quality control programs.

VT requires good vision, good lighting and the knowledge of what to look for. Visual inspection can be enhanced by various methods ranging from low power magnifying glasses through to borescopes. These devices can also be used with television camera systems. Surface preparation can range from wiping with a cloth to blast cleaning and treating with chemicals to show the surface details.

It can identify where a failure is most likely to occur and identify when failure has commenced. VT is often enhanced by other methods of inspection which can identify defects that are not easily seen by the eye.

G. CATHODIC PROTECTION (CP) ACTIVITIES

Cathodic Protection (CP) activities are essential to protect different structures from corrosion along with structure coating. According to the design concepts sacrificial CP system or impressed current CP system (ICCP) maybe used. All steel structures must be protected from corrosion by both efficient coating system and CP system

- Off shore structures (platforms, vessels, terminals and jetties, pipelines)
- On shore structures (pipelines, tanks, tank farm, well casing, refineries & petrochemical plants, power stations & desalination plants, steel in concrete, internal protection)

8. ENVIRONMENTAL TESTS

A. Heavy Metal Testing

Heavy metals testing can detect metals that are harmful in both small and large amounts, such as lead, mercury, arsenic, and cadmium which if undetected can lead to heavy metals in food products. If consumed, these chemicals can lead to a range of health problems, increasing the risk of a number of diseases and damaging vital organs, such as the kidneys, liver, and brain. Heavy metal detection methods in water and soil are the only reliable ways to determine whether there are dangerous levels of heavy metals present.

B. PCBs Testing

PCBs are a group of man-made organic chemicals consisting of carbon, hydrogen, and chlorine atoms. The number of chlorine atoms and their location in a PCB molecule determines many of its physical and chemical properties. PCBs have no known taste or smell, and range in consistency from an oil to a waxy solid.

C. Dioxin Presence in Food Tests

Dioxins are a group of toxic chemical compounds these materials are not created intentionally but are produced as a result of human activities like the backyard burning of trash and the production of a few herbicides. Dioxins are highly toxic and can cause cancer, reproductive and developmental problems, damage to the immune system, and can interfere with hormones.

D. Fertilizers & Pesticides Tests

Fertilizers are a combination of potentially harmful chemicals which can be absorbed by plants and possibly enter the food chain through cereals, vegetables and can even make its way through our drinking water. Chemical fertilizers can cause problems with the heavy metals that can be found in it. These include Lead, Mercury, Cadmium, and Uranium, which can have a negative impact on the kidneys, liver, and lungs. These heavy metals are also associated with other human health hazards.

OUR QUALITY PLAN

AT A GLANCE

The main aim of Al Mamaas Engineering Lab is to ensure the highest possible standard of tests and to ensure integrity of test results, maximum fulfillment of customer requirements for quality of service and its price and meeting test dates. This quality policy statement was created by management of the Testing Laboratory to achieve those main objectives.

To fulfill as stated above, we have implemented a quality management system in the Testing Laboratory according to ISO standards for activities related to testing the tensile strength of construction materials and soil.

We have established the following key points of the quality policy of Testing Laboratory to meet the requirements of the quality management system:

- Ensuring high quality and accuracy of performed tests.
- Continually improving professional competence of employees of Testing Laboratory incl. evaluating the effectiveness of education, thereby creating the conditions for proper testing.
- All our employees are and will be impartial when performing activities related to the operation of Testing Laboratory. They are regularly acquainted with the quality management system documentation whose requirements they apply in their work.
- Tests are and will always be carried out in accordance with established procedures and requirements of our customers.
- This policy aims to maintain and continually improve the quality management system of the Testing Laboratory according to ISO standards.

Top management of the Testing Laboratory hereby undertakes that the effectiveness of the planned measures will include validation by comparing the results achieved with the experiment compared with the theoretical calculation. Top management of the laboratory will continuously take steps to ensure the necessary level of resources for the implementation of this quality policy.

OUR HSE PLAN

AT A GLANCE

Our Company recognizes that one of its primary duties is to ensure the health and safety of all its employees and always focusing to environment concerns.

We accept the responsibility for providing a safe and healthy workplace, both at our own facility and when employees work in or around other facilities. We are striving for the elimination of any and all occupational related injuries and illnesses. Health hazards and personal injuries are preventable through worker awareness, training and safe work practices.

All employees must accept responsibility to comply with such measures if they are to attain the quality of working life they are entitled to.

The objective of a health and safety program is to implement measures to reduce and/or eliminate potential health hazards and personal injury in the workplace. A health and safety program is not initiated to lay blame or fault should an incident occur.

The ongoing active involvement and support of both employees and management, in the workplace health and safety program, is essential for its success. In order for our work environment to be safe, each of us must do our part.

The company can help to create a safe working environment by doing such things as providing adequate training and encouraging safety awareness. However, each of us, employees and management alike, as individuals, must actively take safety seriously each and every day for our work environment to be truly safe.

Ministry of planning
Iraqi Organization for Accreditation
IQAS

ACCREDITATION CERTIFICATE

No.TL 028

نظام الاعتماد العراقي
IRAQI ACCREDITATION SYSTEM
IQAS

Iraqi Accreditation System Certify that:

Al- Mamaas Company for Engineering Testing

Iraq –Barsa- Kut Al-Hijaj

Is accredited according to the requirements of the standard ISO/IEC17025:2017
(General Requirements for the Competence of Testing and Calibration Laboratories)

In the field of:

- Construction Materials Testing
- Metallurgical Materials Testing
- Polymers Materials Testing

This accreditation is subject to with the above standard & IQAS requirements
The scope of accreditation is attached to the certificate & considered as part of it
The most recent issue of the accreditation scope is available on IQAS website
http://www.iqas.gov.iq

Accreditation is valid From 26/1/2022 To 25/1/2024
Initial accreditation date
2/9/2018

Dr. Mohammed Lateef Ahmed
General Manager of IQAS

Prof. Dr. Khalid Battal Al-Najim
Minister of Planning

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استمارة مجال الاعتماد Scope of Accreditation form	نظام الاعتماد العراقي IQAS
Organization address: Iraq –Barsa- Kut Al-Hijaj	**Organization name :** Al- Mamaas Company for Engineering Testing	**Accreditation no.:** TL 028
Signature : Abdulwahid M.	**Accreditation is valid:** From 13/4/2022 To 25/1/2024	**Issue no. :** 005

Testing field	Type of test	Test object or product	Reference to standardized method
Mechanical	Determination of ultimate tensile strength	Steel reinforcing bars	ASTM A370 - 19e1
Mechanical	Determination of yield strength	Steel reinforcing bars	ASTM A370 - 19e1
Mechanical	Determination of elongation	Steel reinforcing bars	ASTM A370 - 19e1
Physical	Determination of compressive strength	Concrete cube	BS EN 12390-3:2009
Physical	Determination of compressive strength	Concrete cube	Iraqi Reference Guide No. 348:2017
Physical	Bulk specific gravity and density of non-absorptive compacted asphalt mixtures	Asphalt	ASTM D2726– 19
Physical	Standard Test Method for Marshall Stability and Flow of Asphalt Mixtures	Asphalt	ASTM D6927 – 15
Physical	Determination of water (Moisture) content by mass	Aggregate	ASTM D2216 – 19
Physical	Determination of water (Moisture) content by microwave oven heating	Aggregate	ASTM D4643 – 17
Physical	Determination of water (Moisture) content by microwave oven heating	Aggregate	ASTM D2216 – 19 ASTM D4643 – 17
Physical	Sieve analysis	Fine aggregate	ASTMC136-19
Physical	Sieve analysis	Coarse aggregate	ASTM C117-17
Chemical	Determination of SO_3 content	Aggregate	BS EN 1744-1:2009+A1:2012
	Determination of Cl content	Aggregate	BS EN 1744-1:2009+A1:2012
Physical	Density and unit weight of soil in place by sand-cone method	Sub Base	ASTM D1556-15e1
Physical	Determination of laboratory compaction characteristics using modified effort (2,700 KN-m/m3)	Soil	ASTM D1557-12e1
Physical	Density in place by the drive-cylinder method	soil	ASTM D2937-17e2

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نظام الاعتماد العراقي IRAQI ACCREDITATION SYSTEM IQAS	استمارة مجال الاعتماد Scope of Accreditation form	نظام الاعتماد العراقي IQAS
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Physical	Soil investigation Thin- walled tube sampling of soil for geotechnical purposes	Soil	ASTM D1587:2012
Physical	Soil investigation Determining sub surface liquid level in a borehole or monitoring	Soil	ASTM D4750
Physical	Soil investigation Wet preparation of soil samples for particle size analysis and determination of soil constants	Soil	ASTM D2217
Physical	Soil investigation Soil exploration and sampling by auger boring	Soil	ASTM D1452
Physical	Soil investigation sieve analysis	Soil	ASTM C136, C117
Physical	Soil investigation density on site	Soil	ASTM D1556, D2937
Mechanical	Soil investigation Standard penetration test (SPT) and spilt –barrel sampling of soil	Soil	ASTM D1586
Mechanical	Determination of external loading characteristics	Plastic pipe	ASTM D2412
Physical	Determination of wall thickness	Plastic pipe and fitting	ASTM D2412 ASTM D2122
Physical	Determination of diameter	Plastic pipe and fitting	ASTM D2412 ASTM D2122
Mechanical	Determination of external loading characteristics	GRP pipe	ASTM D2412
Physical	Determination of wall thickness	GRP pipe	ASTM D3517 ASTM D3567
Physical	Determination of diameter	GRP pipe	ASTM D3517 ASTM D3567
Non-destructive	Magnetic Particle Test	Piping Pipelinestructures	ASME B31.1 API 1104 AWS D1.1
Non-destructive	Ultrasonic Test	Piping Pipeline structures	ASME B31.1 API 1104 AWS D1.1

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نظام الاعتماد العراقي IRAQI ACCREDITATION SYSTEM IQAS	استمارة مجال الاعتماد Scope of Accreditation form	نظام الاعتماد العراقي IQAS
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Non-destructive	**Radiographic Test**	**Piping** **Pipeline structures**	**ASME B31.1** **API 1104** **AWS D1.1**
Non-destructive	**Penetrant Test**	**Piping** **Pipeline structures**	**ASME B31.1** **AWS D1.1** **AWS D1.1**
Mechanical	**Standard Test Method for High-Strain Dynamic Testing of Deep Foundations**	**Piles**	**ASTM D4945**
Mechanical	**Standard Test Method for Low Strain Impact Integrity Testing of Deep Foundations**	**Piles**	**ASM D5882**
Mechanical	**standard Test Methods for Deep Foundation Elements Under Static Lateral Load**	**Piles**	**ASTM D3966**
Mechanical	**Standard Test Method for California Bearing Ratio**	**Soil**	**ASTM D1883**
Physical	**Standard Test Methods for Maximum Index Density and Unit Weight Using a Vibratory Table**	**Soil**	**ASTM D4253** **ASTM D4254**
Physical	**Standard Test Method for Repetitive Static Plate**	**Soil**	**ASTM D1195** **ASTM D1196**

وزارة التخطيط
الهيئة العراقية للاعتماد

Date: 01/07/2019	F15. Ver05	Page 3 of 3

CERTIFICATE OF REGISTRATION

The Quality Management Systems of

AL MAMAAS COMPANY FOR ENGINEERING TEST

156/67, Kout, Al-Hejaj, Basrah, Iraq

has been audited and found to conform to

ISO 9001:2015

for the following activities

Provisions of Construction Material, Metallurgical Material, Polymers Material, Non-Destructive, Piles and Soil Testing

Date of Issue: 03 February 2021 **Date of Expiry: 21 January 2024**

Initial Certification: 23 January 2018

Certificate No. 788611

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Sovereign House 212-224 Shaftesbury Avenue London England WC2H 8HQ

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The Environmental Management Systems of

AL MAMAAS COMPANY FOR ENGINEERING TEST

156/67, Kout, Al-Hejaj, Basrah, Iraq

has been audited and found to conform to

ISO 14001:2015

for the following activities

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ISO 45001:2018

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Date of Issue: 09 February 2021 **Date of Expiry: 21 January 2024**

Initial Certification: 23 January 2018

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REPUBLIC OF IRAQ
MINISTRY OF ENVIRONMENT
General Directorate of Legal
Division of Consulting Offices

جمهورية العراق
وزارة البيئة
الدائرة القانونية
شعبة المكاتب الاستشارية

No :
Date:

العـدد : ق / م / ش / ٤٠٥٤
التاريخ : ٤ / ٩ / ٢٠٢٢

وزارة البيئة
الدائرة القانونية

إلى / شركة المماس للفحص الهندسي / في محافظة البصرة

م/ إجازة اعتماد مختبر بيئي

تحية طيبة

بناء على توفر الشروط اللازمة بالمختبر العائد الى شركتكم وبالكادر العامل فيه والمدرجة أسماءهم أدناه وفقا لتعليمات شروط اعتماد المكاتب الاستشارية والمختبرات في مجالات حماية البيئة رقم (٣) لسنة ٢٠١٤ واستنادا لمصادقة السيد وزير البيئة على محضر اللجنة الوزارية الخاصة بأعتماد المكاتب الاستشارية والمختبرات المشكلة بموجب الامر الوزاري ذي العدد (م . و / ١١ المؤرخ في ٢٠٢١/٨/٣) وملحقه الامر الوزاري ذي العدد (م . و / ٣ / ٤٢٧ والمؤرخ في ٢٠٢٢/٤/٢١)
تقرر اعتماد المختبر العائد الى شركة المماس للفحص الهندسي كمختبر بيئي في مجال التحاليل المختبرية البيئية لمدة (٣) ثلاث سنوات من تاريخ كتابنا هذا على ان يكون التجديد قبل (٦٠) يوم من تاريخ انتهاء مدة الإجازة استنادا إلى المادة (٦/ثانيا) من التعليمات أعلاه ،
مع مسؤولية المختبر عن جميع المعلومات والبيانات المقدمة في التقارير والدراسات ونتائج القياسات في مجال حماية البيئة وعلى ان يكون خاضع للرقابة البيئية من قبل الوزارة وبشكل دوري .

للتفضل بالإطلاع ... مع الشكر والتقدير

وزارة البيئة
الدائرة القانونية

أسماء الكادر العاملين في المختبر البيئي :-

١- م. [redacted]

٢- د . [redacted]

٣- م. [redacted]

أحمد عبد الكاظم

REPUBLIC OF IRAQ
MINISTRY OF ENVIRONMENT
General Directorate of Legal
Division of Consulting Offices

جمهورية العراق
وزارة البيئة
الدائرة القانونية
شعبة المكاتب الاستشارية

No :
Date:

العـدد : ق / م / ش / ٥٨٦٦
التاريخ : ٢٤ / ١١ / ٢٠٢٢

وزارة البيئة
الدائرة القانونية

إلى / شركة الماس للفحص الهندسي / في محافظة البصرة

م/ إجازة اعتماد مكتب استشاري

تحية طيبة

بناء على توفر الشروط اللازمة بمكتبكم وبالكادر العامل فيه وفقا لتعليمات شروط اعتماد المكاتب الاستشارية والمختبرات في مجالات حماية البيئة رقم (٣) لسنة ٢٠١٤ ،

تقرر اعتماد شركتكم كمكتب استشاري في مجال تقديم تقارير الاثر البيئي لمدة (٣) ثلاث سنوات من تاريخ كتابنا هذا على ان يكون التجديد قبل (٦٠) يوم من تاريخ انتهاء مدة الإجازة استنادا إلى المادة (٦/ثانيا) من التعليمات أعلاه ، مع مسؤولية المكتب عن جميع المعلومات والبيانات المقدمة في التقارير والدراسات ونتائج القياسات في مجال حماية البيئة وعلى ان يكون خاضع للرقابة البيئية من قبل الوزارة وبشكل دوري .

... مع التقدير

عدنان جري لوتي
المدير العام
عدنان جري لوتي
المدير العام
٢٠٢٢/١١/٢٤

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العنوان – بغداد – شارع فلسطين

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MINISTRY OF ELECTRICITY

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نفخر بثقتكم

THANK YOU FOR YOUR TRUST

شركة المماس

AL MAMAAS GROUP OF COMPANIES

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