NEWSLETTER

INSTITUTION OF INCORPORATED ENGINEERS, SRI LANLA - UAE BRANCH

C/o Consulate General of Sri Lanka, PO Box 51528, Dubai, UAE. Tel: +971507169700, Email: iiesluae@gmail.com Web: www.iiesluae.org. Established on 18th July 2006.

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New Chairman of the Sri Lankan Professionals Association-UAE

With great pleasure we announce the induction by the Sri Lankan Professionals Association-UAE (SLPA-UAE) of its 2nd Chairman, Eng. Dhammika Gamage, at its Annual General Meeting held on 22nd May 2021. IIESL-UAE is one of the founder member associations of the SLPA-UAE and currently having three Executive Board Members in the newly appointed Committee for the session 2021/2022.

Eng. Dhammika Gamage was the Chairman of the IIESL-UAE Branch for the sessions 2009-2010 and 2010-2011 and currently hold the position of the Returning Officer. Eng. Dhammika has been a key stakeholder of the team which paved the way for the formation of the IIESL - UAE Branch. He has been a great strength to the IIESL-UAE, since its establishment in 2006. He is also an asset to the IIESL as well as to many other Professional and Social Organizations in UAE.

IIESL-UAE Executive Committee congratulates Eng. Dhammika Gamage on this appointment and looking forward to working together towards the betterment of the Sri Lankan professionals in the UAE.

New Executive Board of the SLPA-UAE

Three Members of the IIESL-UAE have been elected to the Executive Board of the Sri Lankan Professionals Association in the UAE at the AGM held on 22nd May 2021 for the session 2021-2022.

Eng. Dhammika Gamage – Chairman

Eng. Priyanga De Mel – Assistant Treasurer

Eng. Nalaka Kanthiarachchi – Executive Board Member

Eng. Anura Jagodage, Current Chairman of the IIESL-UAE, together with Eng. Nalaka Kanthiarachchi and Eng. Priyanga De Mel represented the IIESL-UAE in the SLPA's Executive Board during its session 2019-2021. Eng. Jagodage was the Internal Auditor of the Board.

IIESL-UAE is a founder member of the SLPA and devoted a lot of efforts in its establishment in the UAE. Establishment of the SLPA is one of the series of great services rendered by the IIESL-UAE since its formation in the UAE in 2006.

Publication Committee

- **Eng. Sisira Walaliyadde – Past Chairman, IIESL UAE,**
- **Eng. Nishan Karunarathne – Treasurer, IIESL UAE**
- **Eng. Anura Jagodage – Chairman, IIESL UAE,**
- **Eng. Kapila Walaliyadde**

A Member Association of the SRI LANKAN PROFESSIONALS ASSOCIATION UNITED ARAB EMIRATES

Office Suite # 902 I Level 9 I Dubai World Trade Center I Dubai, United Arab Emirates I T: +971 4 311 6387

Association Management Company MCI MIDDLE EAST

IIESL-UAE - 15 Years of Commitment to Professionalism!

IIESL-UAE was established

in the year 2006

and since then, has contributed immensely

towards the benefit of the

Sri Lankan professionals

in the UAE and the ME region

IIESL-UAE

Professionalism Beyond Boundaries….

Our Condolences……

Eng. Nalaka Kanthiarachchi – Secretary, IIESL-UAE Branch

We are saddened by the passing of the Secretary of the IIESL-UAE Branch, Eng. Nalaka Kanthiarachchi.

He will be remembered for his services to the IIESL-UAE Branch and his passion and professional attitude towards his services to professionals at large.

Our deepest condolences to his family.

May his soul Rest in Peace!

Institution of Incorporated Engineers, Sri Lanka
UAE Branch

Webinar Series on Engineering Technology Education in Sri Lanka

By

Dr. Bhadranie Thoradeniya, Vice President, IIESL (2020/21 session)

There appears to be a lack in the clarity of the opinions and views about the different aspects of engineering technology education in Sri Lanka, among the various stakeholders of the sector. The stakeholders include the learners and their parents, education providers, the industry and the Government. These ambiguous views have resulted in various decisions which are mostly detrimental to the healthy growth of the Engineering Technology Education in contemporary Sri Lanka. The Institution of Incorporated Engineers Sri Lanka (IIESL) as the legally enacted professional body for Incorporated Engineers or the Technologists in Sri Lanka needs to take the responsibility to bring in a clear coherent vision to the utterly confused status of Technology Education in Sri Lanka.

Deliberations on the current scenario, especially the discussions and activities by different external parties regarding the conversions of the three diploma programmes (NDT, NDES and HNDE) to 3+ year degree programmes resulted in appointing a separate committee by the Council of Management of IIESL to initiate necessary **urgent** actions to the related issues.

As one of the initial actions, the committee planned a series of webinars to educate the leadership at different levels including the council members, past presidents, branch members, executive councils and members of the alumni associations and the student leaders. The series was initially planned to roll out according to the necessity and so far, the committee has been able to conduct three webinars successfully.

The first webinar covered three topics; “Engineering Technology Education of Sri Lanka: Historical perspectives” delivered by Eng. Dr. T A G Gunasekara (Past President, IIESL); “The Role of Incorporated Engineer” delivered Eng. Anton Peiris (Past President, IIESL); and “Graduate Attributes of academic programmes leading to Incorporated Engineer” delivered by Dr. Bhadranie Thoradeniya (Vice President, IIESL).

The second webinar included two relevant topis; “International Engineering Alliance Accords” presented by Eng. Tissa Seneviratne (Past President, IIESL) and (2) “Credit Systems in Tertiary Education” presented by Dr. D D D Suraweera (Former Dean/ Faculty of Eng. Technology, University of Vocational Technology, Sri Lanka)

The third webinar was entirely dedicated to reviewing the ‘Sri Lanka Qualification Framework (SLQF)’, its applicability and impacts to the engineering technology diploma programmes. The very detailed presentation on the topic was delivered by Prof. Gominda Ponnamperuma, Head of Medical Education Department of the Faculty of Medicine, University of Colombo on the invitation of the committee.

Contd....

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The aim of this series of webinars is to empower the members of the institution and the alumni associations to develop effective plans and actions collectively as well as individually to achieve the due recognitions to the engineering technology diploma programmes. Initiation of further necessary actions by the IIESL and alumni associations are critical to firmly establish and safeguard the professional status of 'Incorporated Engineer' within the public and private sector institutions in Sri Lanka.

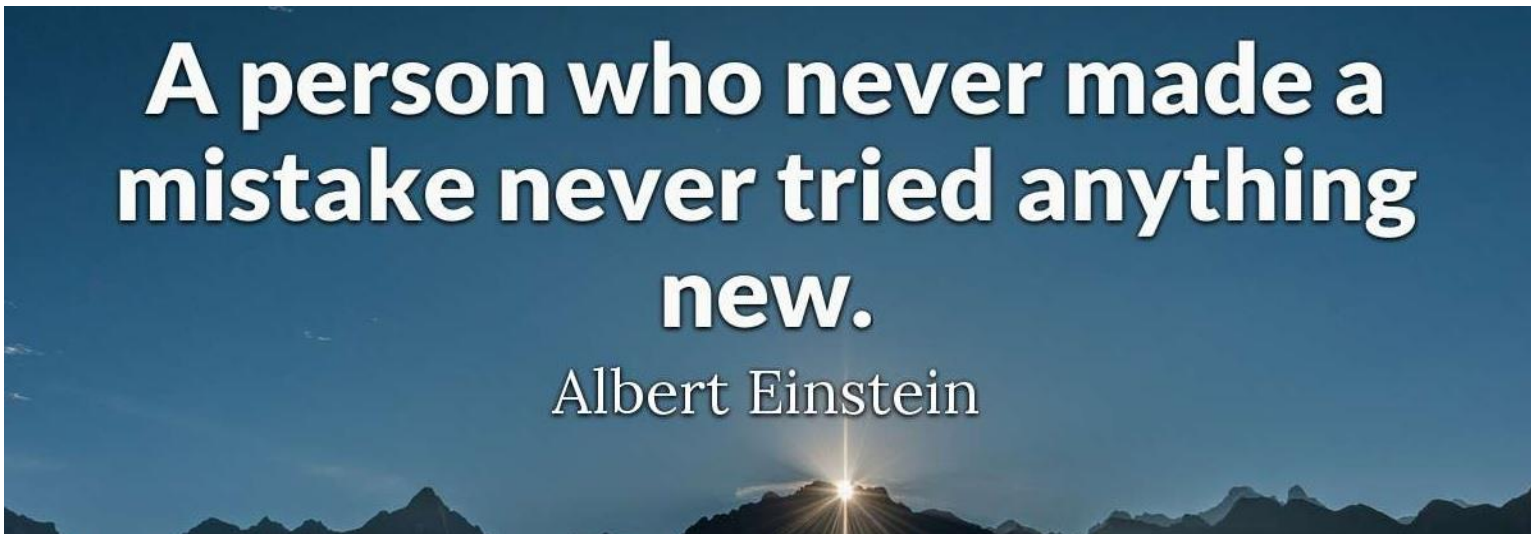
The firmly established professional status of 'Incorporated Engineer' will immensely contribute to enhance the economy of Sri Lanka and its development plans; growth of industries, effective irrigation encompassed agricultural development, public transport, goods and passenger aviation upliftment etc. and most importantly to improve the technology education to undertake future challenges.

ECSL
Ethics Excellence Education

Engineering Council Sri Lanka (ECSL) Registration

Corporate Members and Associate Members of the IIESL who have obtained their registration under Engineering Council of Sri Lanka (ECSL) as Incorporated Engineers and Engineering Diplomates for the year 2019, should renew their registration for the year 2020. Information and the details required for the renewal of the registration can be obtained from: https://ecsl.lk/

If the Corporate Members and Associate Members of the IIESL UAE Branch have not obtained their registration yet, under Engineering Council of Sri Lanka, they should obtain their ECSL registration to enable them to practice as engineering practitioners in Sri Lanka, as defined under Section 15 or 18 of the Engineering Council, Sri Lanka Act No 4 of 2017.



Membership Development

IIESL-UAE Branch has launched a Membership Development Program to recruit new members to the Institution. IIESL-UAE has done a survey and collected the information of potential members, working in the UAE and guiding them to obtain IIESL Memberships. IIESL-UAE has planned to do a presentation for the potential members.

Current members can direct anyone processing an engineering diploma and looking for obtaining IIESL memberships, to this presentation where the potential candidates will be briefed regarding the requirements and advice as to how they should proceed to apply for IIESL memberships:

Date and Time: TBA

Venue: through Zoom platform

For further details, please contact:

Eng. Anura Jagodage-055 7705168

Mr. Ramanathan Arisanan-056 1772578

Email to: iiesluae@gmail.com

Want to Become an Incorporated Engineer

IIESL has made it convenient to obtain the membership of IIESL. Click the three links below.

Online Processing of Membership	**Guidelines for Obtaining Membership**	**IIESL Membership Application**

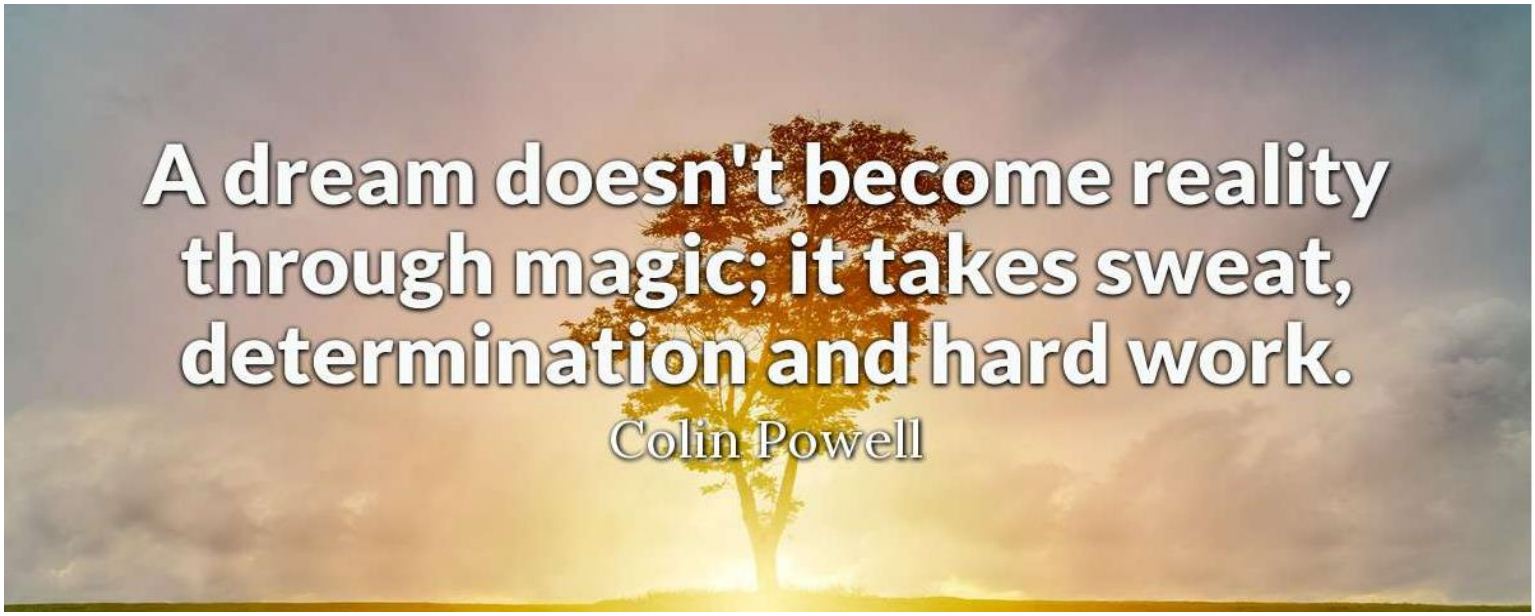
If you require further details and assistance, please contact

IIESL-UAE: iiesluae@gmail.com

IIESL UAE - Events and Webinar Log 2021					
#	Date	Topic	Conducted by	Presenter	Venue
1	17/04/2021	Technical and Economical Challenges to Integrate more Renewable Energy to National Grid of Sri Lanka	IIESL-UAE	Dr. Tilak Siyambalapitiya	Webinar on Zoom
2	02/05/2021	The Monthly progress Report & Updated Programmes	CICES/IIESL-UAE/IQSSL	Mr. Gary Beamish and Mr. Mohamed Salah Mohamed	Webinar on Zoom
3	April/May 2021	APC Winter Session- Mock Interviews for RICS Candidates	IIESL-UAE		Zoom App
4	29/05/2021	Efficient Procurement Techniques (Selection by Two Stage Tendering and EPC Approach)	IIESL-UAE	Mr. Lokitha Karawita	Webinar on Zoom
IIESL UAE - Events and Webinar Log 2021 (Upcoming CPD Events)					
5	05/07/2021	Dispute Management in Construction	CICES/IIESL-UAE/IQSSL	Eng. Dhammika Gamage	Webinar on Zoom
6	July 2021	Contractual Letter Writing	IIESL-UAE	Eng. Sisira Walaliyadde Eng. Dhammika Gamage	Webinar on Zoom

Academic / Professional Achievements

#	Name of the Member	Academic/Professional Achievements	Designation/Title	Awarding Body, Institution or University	Year
1	Eng. Jayantha Hettiarachchi	Corporate Member	MIE(SL), C Eng.	Institute of Engineers, Sri Lanka	2021
2	Eng. Ranil Wijesinghe	Corporate Member	MRICS	Royal Institution of Chartered Surveyors, UK.	2021

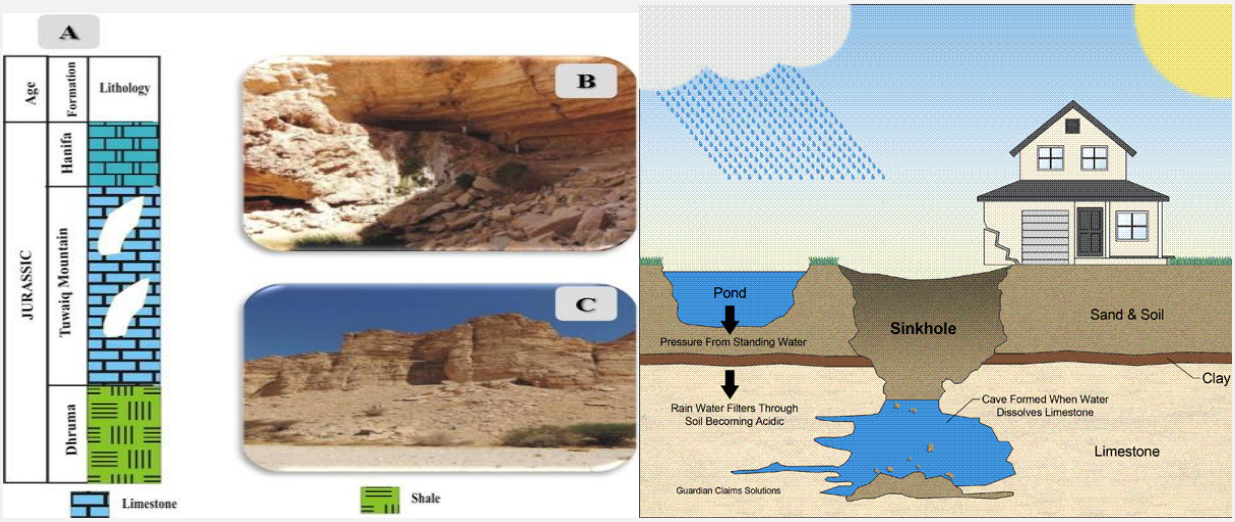


Common Geotechnical Risks due to Cavities in Pre and Post Contract Stage Construction in the UAE and Middle East.

Introduction

Civil Engineers build different types of projects on various soil types that occur in different parts of the world. The geography, literature marks that U.A.E. coastline and the floor of Arabian Gulf importantly consists of wide Carbonate Sediments. These sediments are controlled and distributed by the nature of historical evidence of the past and the structure of the bay. The range of projects includes light and heavy over ground structures, subsurface installations, slender but tall building structures and much more. Ground conditions present a common problem for contractors in the Middle East and elsewhere.

Employers often try to pass all or most of the ground condition risks to contractors, who are often made to a large extent responsible for anticipating ground conditions that may affect the construction of public works and for a time, and the impact on costs that may follow if the default this assessment proved incorrect. As is well known in the region, this is a major area of risk which frequently gives rise to substantial disagreements in practice.



Qualification kart like cavity is a challenging task because, the soil kart is complex and difficult to predict. Subsurface cavities are often a major risk in the areas lying underneath by carbonate rocks. There are many problems associated with sinkholes, such as the collapse of the foundations of buildings and roads collapsed. Limestone kart, sinkholes and fractures open, causing severe damage to buildings all over the world and the main goal of the program, Geotechnical investigation to evaluate the lateral and vertical distribution of these problems and the foundation used in the most economic solution for the treatment.

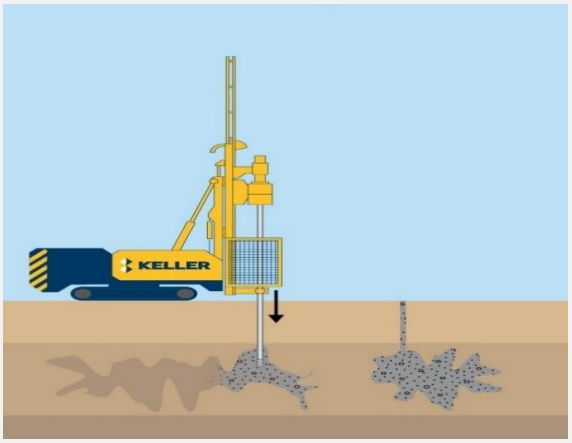
Detecting underground cavities represents nowadays a great challenge in some regions of the world, such as Lorraine, due to the natural hazard they may provoke. A cavity is a big problem in infrastructure works. Cavities gap often risks associated with major engineering construction in the area, supported by carbonate rocks. Several problems related to the cavities underground spaces such as roads and collapsed the building's foundation and leaking dam collapse. Civil Engineering problems include underestimation of foundation dimensions and catastrophic subsidence of building and roads created by the occurrence of sinkholes.

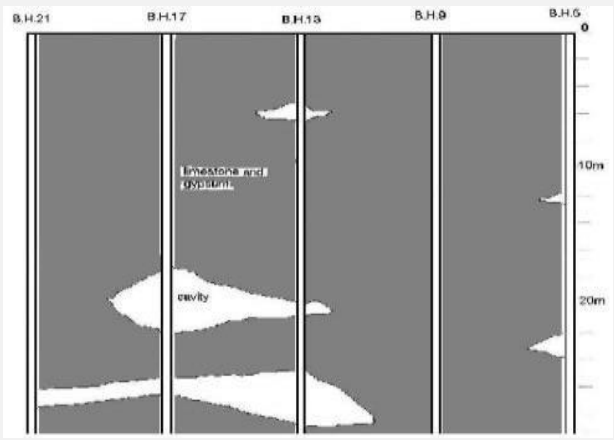
Risks in Cavity Treatment

The treatment of underground cavities will be followed by an evaluation program by drilling control bore holes in the working area. The site investigation is the main important early step to manage the cavity filling operation due to collection and review of the information which will be guide to determine the way of approach during the cavity filling operation. Risks will be there during the site survey and exploration of the items listed below.

- The location of cavity zones
- The approximate depth of cavities
- The information about soil strata up and below the cavity zone

Many engineering methods have been used in numerous projects worldwide, and include complete engineering, concreting and grout injection pressure. The most common techniques are based on concreting and cement grout injection filling. The author has a reservation on the use of concrete and injecting operation for filling the caverns and fractures open in areas with shallow groundwater aquifers. The concreting and injection work will close all underground drainage channels and also will pollute the groundwater aquifer. The studied site is treated using concrete filling and cement grout low-pressure injection. The true foundation of the treatment can be done by the depth of the cavities.





The purpose of the grouting project is to fill the gap, even though it is not a small hole in the rock down to a depth of 20 meters and out to the edge extending from the edge of the excavation at 45 degrees. This grouted mat would distribute the load and prevent the possible loss of material into underlying cavities.

Summary of Filing Procedure risks are,

1. Probe holes/grout holes are drilled using drill rigs.
2. Insert the casing at the specified depth.
3. Pump the design grout mix under pressure until the specified pressure is attained.
4. Remove the tremie and seal balance length of hole.
5.

Risks in Bore Hole Tests

Boreholes can be a quick and economical way to collect soil samples that can be recovered by inserting different lengths of tubes into the soil, generally limited to shallow depths. However, It is suitable for areas with limited access to sloping areas and minimal disturbance. This is particularly advantageous with window sampling, which uses longitudinal cut openings and is inserted using either a handheld capacitor or a continuous capacitor. Dynamic analyzers use similar plants to create ground strength profiles and can be used for various measuring instruments such as instrumentation, gas and groundwater gauges, and more. Rotary drill holes are used for drilling, exploration through rock and other solid geological formations, such as gravel densities up to 100 meters deep. The rock samples can then be inspected by the lab. Borehole test soil sample indicate soil type, soil layer thickness, moisture conduction and ground water level only not cavity location and size so this also more risk for the contractors in the UAE. Borehole test for only particular point (Borehole diameter 102mm/ 152mm) only we can get same diameter soil samples and we *can't* test for area, so this test risk for indicate for cavity below ground on UAE.

Most Appropriate Methods which Perceive as Most Effective in Reducing Uncertainty on Ground Condition.

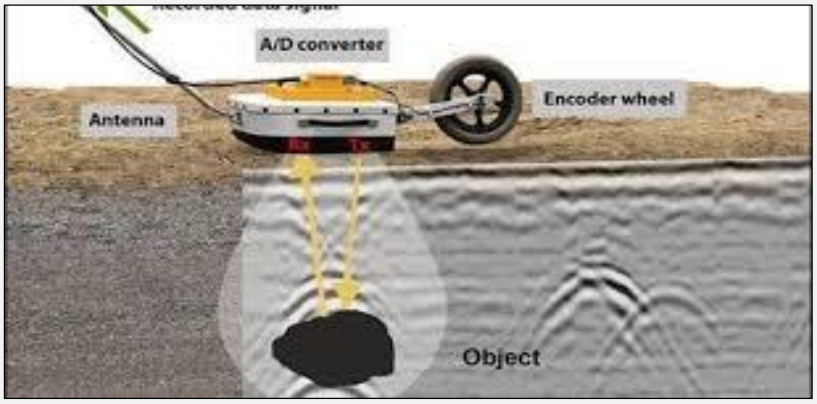
Some of the common geophysical techniques that can be used to detect caves and karstic voids are electrical resistivity tomography **(ERT)**, ground penetrating radar **(GPR),** and electromagnetic **(EM).** All these methods have their strengths and weaknesses, so the choice of method depends on many factors, such as the size and depth of the expected gap, the reason for separating the gap, the desired resolution of the characteristic gap of the background material or the surrounding stone slabs. Each of these parameters associated with one or more physical properties of soils and their spatial distribution.

❖ Electrical Resistivity Tomography (ERT)

Electrical Resistivity Tomography (ERT) has proven to be an effective geotechnical and environmental engineering tool and a timesaver. Widespread use has been made by determining the depth to bedrock, cavity, sinkholes, finding contaminated feathers, finding information on the altitude of groundwater tables, etc. Electrical Resistivity Tomography (ERT) can provide more accurate information about the ground conditions between drilling sites.

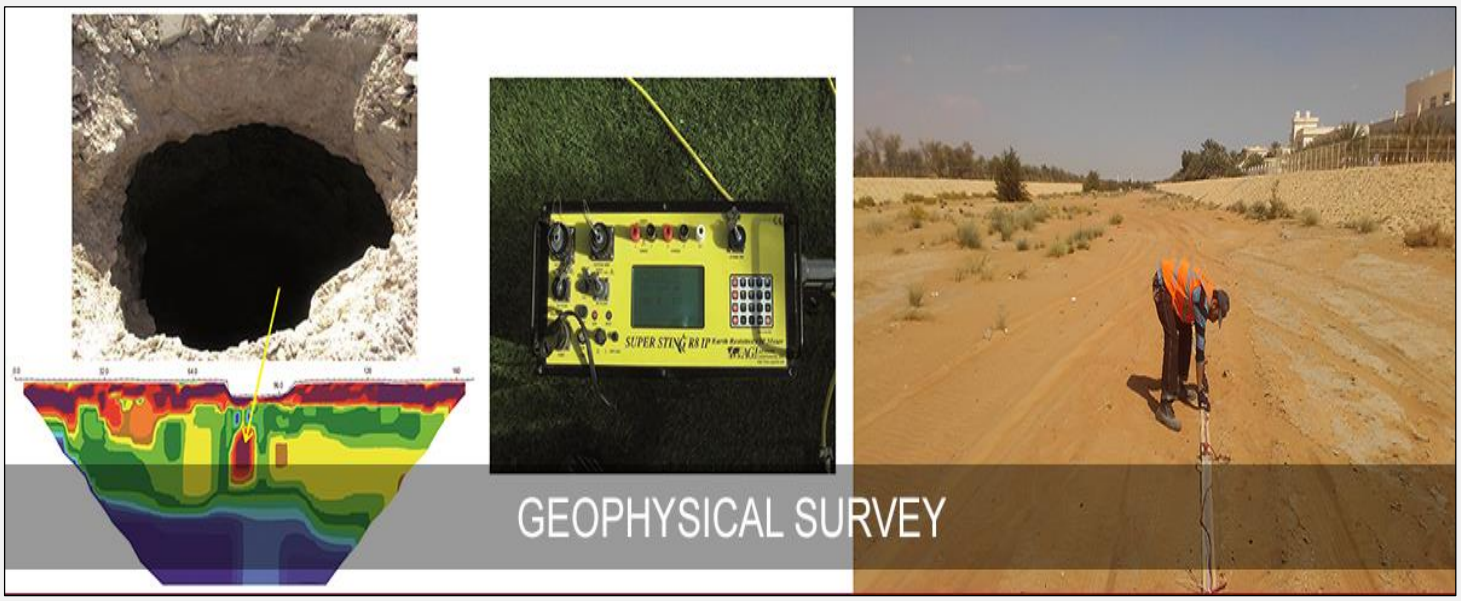
❖ Ground Penetrating Radar (GPR)

GPR is used to explore deep geological conditions, rock depth, water table depth and thickness, soil and sediment layers of ground and underwater, and location of tooth decay and broken bones in the ground stone. This is the most accurate method, easy, no much manpower is required to operate and saves time. In Ground penetrating radar (GPR), electromagnetic waves penetrate the ground and reflect some or all of the boundaries of rocks or soils with different electrical properties.



❖ Electromagnetic (EM)

Electromagnetic waves that penetrate the ground are also being used. Where the waves meet with electrical conductors in the ground, they energize these conductors, which generate electromagnetic waves that can be collected at the surface by means of an antenna. It can be useful in clay and water filled with gaps. Its limitation is that gaps or cracks filled with air are transparent to electrical signals and difficult to detect.



Conclusions

Normally in UAE, the employer/ client provides only borehole test report to the design team and the contractor and therefore, the design and tender shall be based on that. This leaves more risk to the consultant's desinger and the contractor because the borehole report does not provide adequate details and also borehole test covers a certain area of the test. A borehole-diameter 102mm can get only same diameter sample from ground and this will not provide adequate information regarding large construction projects.

In the UAE, there is a serious problem in cavity and snake hole or void under soil, so this type of problem would not provide proper data from a borehole test. A different technique is used in detecting underground spaces during the tender stage to reduse risks such as ETR, EM and GPR. Any one of these tests should be conducted before the the tender stage, as borehole method is only suitable for data collection for ground water level, moisture contains, thick of soil layer and soil type.

Therefore, other tests like electromagnetic wave techniques should be conducted to receive better results. The electromagnectic technique providesmore accurate information for underground soil resuting less risks for construction. This is more accurate and most suitable method to avoid or reduce risks for a Construction Project. The employer/ client is responsible for soil data and information which are stated in the contract as being immutable.

REFERENCES

Roberts, T. (2017). *Typical Geotechnical Risks in the Middle East.* Abudhabi: Hyder.

Smith, H. (2011). *Bearing the risk of the unexpected in the ground.* Tokyo: Wong Yang Lai v Chinachem Investment Co Ltd.

Ahmed Abd, E. A. (2016). Identification and characterization of near surface cavities in Tuwaiq Mountain Limestone, Riyadh KSA, ‘‘detection and treatment”. *Egyptian Journal of Petroleum*, pp (1 - 9).

Larson, J. A., & Richards, D. P. (1988). Support over Cavities of Unknown Depth for an Underground Facility. *International Conference on Case Histories in Geotechnical Engineering*, PP 215 - 220.

Putiska1, R., Nikolaj, M., Dost´al, I., & Snir´ak, D. K. (2012). Determination of cavities using electrical resistivity tomography. *Contributions to Geophysics and Geodesy*, PP 201 - 211.

Pez1, J. N.-L., Rey2, J., Duen, J., Hidalgo, C., & Benavente, J. (2013). electrical tomography Applied to the detection of subsurface cavities. *Journal of Cave and Karst Studies*, PP 28 - 37.

Obi, J. C. (2012). *The use of electrical resistivity tomography (ERT) to delineate water-filled vugs near a bridge foundation.* us: Missouri University of Science and Technology.

Daniels, D. J. (2004). *Ground penetrating rader.* London: The Institution of Electrical Engineers,.

Lucius, J. E., Langer, W. H., & Ellefsen, K. J. (2007). *An Introduction to Using Surface Geophysics to Characterize Sand and Gravel Deposits.* Virginia , us: U.S. Geological Survey, Reston, Virginia.

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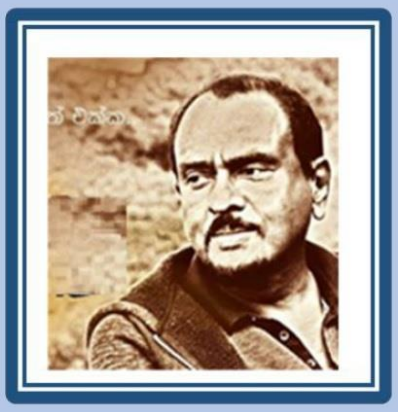

Late Eng. Nayanasena Wanninayake

Member of the IIESL-UAE Branch

May He Attain Supreme Bliss of Nibbana!

IIESL-UAE

Institution of Incorporated Engineers, Sri Lanka - UAE Branch

Condolences…..

Our deepest condolences to Mr. Nalinga Handapangoda, Asst Treasurer, IIESL UAE for the sad passing of his beloved father on 4th June 2021, in Sri Lanka.

May he Attain Supreme Bliss of Nibbana!

INCO ON-LINE EXHIBITION

INCO PREMIER INDUSTRIAL EXHIBITION

INCO Industrial Exhibition is the flagship event of IIESL. INCO has made the IIESL name popular among the public including the business community.

Due to some unavoidable circumstances in the country we were not able to conduct the INCO in 2019 & 2020 but, the INCO committee maintained its relationship with our customers (Stall Holders) unbroken by having several meetings with the key persons. At these meetings it came to light that they never wanted to part from INCO. They kept on encouraging us by giving many constructive proposals to make INCO the best Industrial Exhibition in SL.

Considering this continuing relationship we feel that we (IIESL) have a responsibility towards the industrialists and other entrepreneurs in the country. As a professional organization we should be able to continue our service to the business entrepreneurs and industrialists by introducing alternative methods.

As a solution to the prevailing situation, we have proposed to create an **INCO Interactive Website named as INCO ON-LINE EXHIBITION** with all our Stall Holders details and their Products / Services details included. This website will include the following details for any person logging in to obtain more details:

(a) INCO details
(b) Name of the company with logo
(c) Details of Products and Services with images
(d) Link to website of the company
(e) Contact Details
(f) Shopping cart to buy various products at once **from different stores of vendors**
(g) Searching for products in various supplier stores by Product / Supplier name
(h) On-Line buying facility with delivery facilities **from the vendor**
(i) Payment Gateway **by the vendor.**
(j) Delivery details **by the vendor.**
(k) Publishing of Reviews by the customers.
(l) On-Line Technical & Commercial inquiries
(m) Hit Counter
(n) Link to IIESL Website
(o) Separate tab for Inco Innovators' competition winners with patent details and Commercializing facilities for innovations.

The above ON-LINE commercial platform would keep our customers (stall holders) connected with INCO throughout and encourage new companies also to join upon application to INCO. While maintaining this ONLINE EXHIBITION we could continue with the physical exhibition, when the situation comes back to normal. This website would give a huge publicity for INCO and IIESL in SL as well as overseas. Also, this web portal would create avenues for product exports. This web portal would attract more number of visitors too to the physical exhibition. As a result it will generate more sales to Stall Holders.

INCO ONLINE EXHIBITION WILL SOON BE A REALITY.

Engineering Quotes

If we just tell you the broad definition of engineering, that won't exactly inspire you to go create stuff straight away, right?

So we thought, what do famous people have to say about engineering? How do they understand it? We compiled a list of 10 engineering quotes to inspire you and make you go build something you thought you never could!

1. ***"Design is not how it looks like and feels like. Design is how it works"*** *– Steve Jobs (Apple co-founder and former CEO)2.* ***"A good scientist is a person with original ideas. A good engineer is a person who makes a design that works with as few original ideas as possible. There are no prima donnas in engineering"*** *– Freeman Dyson (theoretical physicist and mathematician)*

3. ***"I have been impressed with the urgency of doing. Knowing is not enough; we must apply. Being willing is not enough; we must do."*** *– Leonardo da Vinci (engineer, inventor, artist, mathematician)*

4. ***"There is nothing I believe more strongly than getting young people interested in science and engineering, for a better tomorrow, for all humankind."*** *– Bill Nye (science educator, former mechanical engineer)*

5. ***"Engineering stimulates the mind. Kids get bored easily. They have got to get out and get their hands dirty; make things, dismantle things, fix things. When the schools can offer that, you'll have an engineer for life."*** *– Bruce Dickinson (airline pilot, musician)*

6. ***"The way to succeed is to double your failure rate."*** *- Thomas J. Watson (pioneer in the development computing equipment for IBM)*

7. ***"One man's "magic" is another man's engineering. "Supernatural" is a null word."*** *– Robert A. Heinlein (Sci-Fi writer)*

8. ***"Failure is the opportunity to begin again more intelligently."*** *– Henry Ford (founder of the Ford Motor Company)*

9. ***"If I had nine hours to chop down a tree, I'd spend the first six sharpening my axe."*** *– Abraham Lincoln (16th President of the United States)*

10. ***"At its heart engineering is about using science to find creative practical solutions. It's a noble profession."*** *– Queen Elizabeth II*