COURSE OVERVIEW SE0031(QP1)
Inspection, Assessment, Repair and Maintenance of Concrete Structure

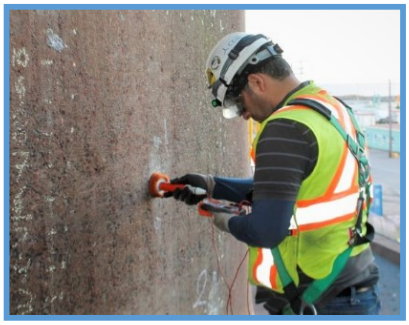
Course Title
Inspection, Assessment, Repair and Maintenance of Concrete Structure

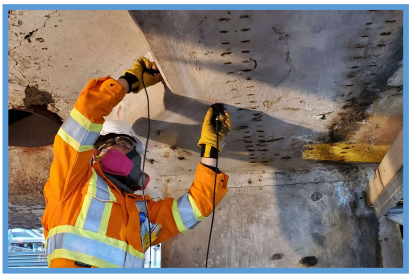
Course Date/Venue
Session 1: April 06-10, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: September 08-12, 2025/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
SE0031(QP1)

Course Duration/Credits
Five days/3.0 CEUs/30 PDHs

Course Description





This practical and highly-interactive course includes real-life case studies and exercises where participants will be engaged in a series of interactive small groups and class workshops.

This course is intended for civil engineers who are interested in the area of inspection, assessment and repair of concrete structure. The course is designed to develop skills of participants in effective specifications and production of concrete. It will cover the basics as well as the advanced concepts of up-to-date technology of concrete structure inspection, assessment and repair.

During this interactive course, participants will learn the concrete structure service life; the structure, properties and causes of concrete and reinforcement of concrete damages; the design of durability, damage assessment, ultrasonic pulse velocity, coring and monitoring movements; the carbonation induced corrosion on building facades and elevated walkways; the surface treatment techniques and additional preventive measures; the assessment of corrosion affected structure; the concrete mixes and specifications; the reinforced concrete monitoring techniques; and the principles of rehabilitation of concrete including the methods of rehabilitation.

Course Objectives

Upon the successful completion of this course, each participant will be able to:-

- Apply and gain an in-depth knowledge on inspection, assessment, repair and maintenance of concrete structure
- Inspect, assess and repair concrete structure
- Recognize the concrete structure service life
- Identify the structure and properties of the concrete as well as the causes of concrete and reinforcement of concrete damages
- Evaluate the design of durability of concrete and corrosion of concrete reinforcement
- Perform damage assessment and discuss ultrasonic pulse velocity, coring and monitoring movements
- Discuss carbonation induced corrosion on building facades and elevated walkways
- Use surface treatment techniques and additional preventive measures and conduct assessment of corrosion affected structure
- Determine concrete mixes and specifications and identify the special types of concrete
- Employ reinforced concrete monitoring techniques and discuss the principles of rehabilitation of concrete including the methods of rehabilitation

Exclusive Smart Training Kit - H-STK®

*Participants of this course will receive the exclusive "Haward Smart Training Kit" (**H-STK®**). The **H-STK®** consists of a comprehensive set of technical content which includes **electronic version** of the course materials conveniently saved in a **Tablet PC**.*

Who Should Attend

This course provides an overview of all significant aspects and considerations of inspection, assessment, repair and maintenance of concrete structure for construction supervisors, civil engineers and inspectors.

Training Methodology

All our Courses are including **Hands-on Practical Sessions** using equipment, State-of-the-Art Simulators, Drawings, Case Studies, Videos and Exercises. The courses include the following training methodologies as a percentage of the total tuition hours:-

30% Lectures
20% Practical Workshops & Work Presentations
30% Hands-on Practical Exercises & Case Studies
20% Simulators (Hardware & Software) & Videos

In an unlikely event, the course instructor may modify the above training methodology before or during the course for technical reasons.

Course Certificate(s)

Internationally recognized certificates will be issued to all participants of the course who completed a minimum of 80% of the total tuition hours.

Certificate Accreditations

Certificates are accredited by the following international accreditation organizations:-

- British Accreditation Council (BAC)

  Haward Technology is accredited by the **British Accreditation Council** for **Independent Further and Higher Education** as an **International Centre**. BAC is the British accrediting body responsible for setting standards within independent further and higher education sector in the UK and overseas. As a BAC-accredited international centre, Haward Technology meets all of the international higher education criteria and standards set by BAC.

- The International Accreditors for Continuing Education and Training (IACET - USA)

  Haward Technology is an Authorized Training Provider by the International Accreditors for Continuing Education and Training (IACET), 2201 Cooperative Way, Suite 600, Herndon, VA 20171, USA. In obtaining this authority, Haward Technology has demonstrated that it complies with the **ANSI/IACET 2018-1 Standard** which is widely recognized as the standard of good practice internationally. As a result of our Authorized Provider membership status, Haward Technology is authorized to offer IACET CEUs for its programs that qualify under the **ANSI/IACET 2018-1 Standard**.

  Haward Technology's courses meet the professional certification and continuing education requirements for participants seeking **Continuing Education Units** (CEUs) in accordance with the rules & regulations of the International Accreditors for Continuing Education & Training (IACET). IACET is an international authority that evaluates programs according to strict, research-based criteria and guidelines. The CEU is an internationally accepted uniform unit of measurement in qualified courses of continuing education.

  Haward Technology Middle East will award **3.0 CEUs** (Continuing Education Units) or **30 PDHs** (Professional Development Hours) for participants who completed the total tuition hours of this program. One CEU is equivalent to ten Professional Development Hours (PDHs) or ten contact hours of the participation in and completion of Haward Technology programs. A permanent record of a participant's involvement and awarding of CEU will be maintained by Haward Technology. Haward Technology will provide a copy of the participant's CEU and PDH Transcript of Records upon request.

Course Fee

US$ 5,500 per Delegate + **VAT**. This rate includes H-STK® (Haward Smart Training Kit), buffet lunch, coffee/tea on arrival, morning & afternoon of each day.

Accommodation

Accommodation is not included in the course fees. However, any accommodation required can be arranged at the time of booking.

Course Instructor(s)

This course will be conducted by the following instructor(s). However, we have the right to change the course instructor(s) prior to the course date and inform participants accordingly:

Mr. Steve Magalios, CEng, PGDip (on-going), MSc, BSc, is a **Senior Civil Engineer** with almost **40 years** of extensive **On-shore & Offshore** experience in the **Oil & Gas**, **Construction**, **Refinery** and **Petrochemical** industries. His expertise widely covers in the areas of **Blast** Simulation, **Blast** Resistant & Resilient Design, Building Life Assessment & Retrofit Solutions for **Blast Resistance**, **Seismicity** Modelling, **Seismic Design** for Buildings, Advanced **Seismic & Wind Design** of **Reinforced Concrete**, Industrial Building Design, **Blast Resistance & Resilient** for Oil & Gas Field, **Concrete Structures & Building Rehabilitation**, **Reinforced Concrete Structures Protection**, **Concrete** Structure Inspection & Repair, **Concrete** Inspection & Maintenance, **Concrete Maintenance & Reliability Analysis**, Design and Behaviour of **Steel Structures**, **Advanced Steel Design & Stability** of **Structures Concrete Structural** Design, **Dynamic Analysis** of **Rotating Equipment** Foundations & **Structural Steel Piperacks**, **Concrete** Technology, **Construction** Planning, **Construction & Concrete Works** Maintenance, Advanced **Building Construction** Technology, **Geosynthetics & Ground Improvement** Methods, **Bench** Design, **Benching**, **Land Survey and ArcGIS for Earthworks & Management**, **ArcGIS** for Surveying, Computer Aided Design (**CAD**), **AutoCAD Civil 3D**, **GIS & Mapping**, **Structural Analysis & Design** (**STAAD PRO**), **Land Surveying** & Property Evaluation, **Earth Measurements**, **Earthwork** & **Structural Maintenance**, System Safety Program Plan (**SSPP**) Inspection, **Building & Road** Design Skills, **Civil Engineering Design**, **Structural Reliability** Engineering, **Road** Construction & Maintenance, **Road** Pavement Design, **Road** Maintenance, **Drainage** System Operations & Maintenance, **Blueprint** Reading & Interpretation, **Blue Print** Documentation, Mechanical **Drawings**, **P&ID**, **Flow Diagram** Symbols, **Cartographic** Representation, Soil Classification, **Cadastral Surveying** & Boundary Definition, **Project Engineering** & Design, **Construction** Management, **Project Planning** & Execution, **Site Management**, **Site Supervision**, Effective **Resource Management**, **Project Evaluation**, **FEED** Management, **EPC Projects** Design, **Project Completion & Workover**, Quality Control and Team Management. He is also well-versed in **Pipeline** Operation & Maintenance, **Pipeline** Design & Construction, **Pipeline** Engineering, Scraper Traps, Burn Pits, Risk Assessment, HSE Plan & Procedures, **Construction** Planning, Methods & Management, **Sloping**, **Embankments**, **Construction** Planning, **Construction Quality** Management, **Project Risk** Assessment, **Project Quality** Plans, **Excavation**, **Backfill & Compaction**, **Excavation & Reinstatement**, **Excavation Safety** for Construction, **Groundworks Supervision**, **Construction Quality** Remote Sensing, Construction Materials, Construction Surveying, **Detailed Engineering** Drawings, Codes & Standards Quality Plan & Procedures, Safety & Compliance Management, Permit-to-Work Issuer, ASME, API, ANSI, ASTM, BS, NACE, ARAMCO & KOC Standards, MS Office tools, **AutoCAD**, **STAAD-PRO**, GIS, ArcInfo, ArcView, Autodesk Map and various programming languages and software such as **SHOTPlus**, FORTRAN, BASIC and AUTOLISP. Currently, he is the **Chartered Professional Surveyor Engineer & Urban-Regional Planner** wherein he is deeply involved in providing exact data, measurements and determining properly boundaries. He is also responsible in preparing and maintaining sketches, maps, reports and legal description of surveys.

During his career, Mr. Magalios has gained his expertise and thorough practical experience through challenging positions such as a **Project Site Construction Manager**, **Construction Site Manager**, **Project Manager**, **Deputy PMS Manager**, **Head of the Public Project Inspection Field Team**, **Technical Consultant**, **Senior Consultant**, **Consultant/Lecturer**, **Construction Team Leader**, **Lead Pipeline Engineer**, **Project Construction Lead Supervising Engineer**, **Civil Engineer**, **Lead Site Engineer**, **Senior Site Engineer Lead Engineer**, **Senior Site Engineer**, **R.O.W. Coordinator**, **Site Representative**, **Supervision Head** and **Contractor** for international Companies such as the Penspen International Limited, Eptista Servicios de Ingeneria S.I., J/V ILF Pantec TH. Papaioannou & Co. – Emenergy Engineering, J/V Karaylannis S.A. – Intracom Constructions S.A., Ergaz Ltd., Alkyonis 7, Palaeo Faliro, Piraeus, Elpet Valkaniki S.A., Asprofos S.A., J/V Depa S.A. just to name a few.

Mr. Magalios is a **Registered Chartered Engineer** and has a **Master's** and **Bachelor's** degree in **Surveying Engineering** from the **University of New Brunswick**, **Canada** and the **National Technical University of Athens**, **Greece**, respectively. Further, he is currently enrolled for **Post-graduate** in **Quality Assurance** from the **Hellenic Open University**, **Greece**. He has further obtained a Level 4B Certificates in Project Management from the National & Kapodistrian University of Athens, Greece and Environmental Auditing from the Environmental Auditors Registration Association (EARA). Moreover, he is a **Certified Instructor/Trainer**, a **Chartered Engineer** of Technical Chamber of Greece and has delivered numerous trainings, workshops, seminars, courses and conferences internationally.

Course Program

The following program is planned for this course. However, the course instructor(s) may modify this program before or during the course for technical reasons with no prior notice to participants. Nevertheless, the course objectives will be always met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Concrete Structures Service Life*** *Objectives ● Why this Course in Middle East?*
0930 – 0945	*Break*
0945 – 1100	***Structure and Properties of Concrete*** *Cements ● Aggregates ● Water ● Admixtures*
1100 – 1230	***Causes of Concrete and Reinforced Concrete Damage*** *Causes of Damage*
1230 – 1245	*Break*
1245 – 1420	***Design for Durability*** *Mix Design ● Environmental Aggressiveness ● Concrete Cover ● Mixing ● Handling ● Placement ● Compaction ● Curing*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day One*

Day 2

0730 – 0930	***Corrosion of Concrete Reinforcement*** *Corrosion Principles ● Chemical & Electrochemical Reactions ● Corrosion Rate Expressions ● Passivity ● Carbonation ● Chloride Induced Corrosion ● Chloride Penetration Law ● Stray Currents ● Hydrogen Embrittlement ● Macrocells*
0930 – 0945	*Break*
0945 – 1100	***Damage Assessment*** *Visual Inspection ● Physical Tests ● Chemical Tests ● Electrochemical Tests ● Monitoring Movements*
1100 – 1230	***Ultrasonic Pulse Velocity*** *Type of Measurements ● Ground Penetrating Radar ● Chemical Tests ● Carbonation Test*
1230 – 1245	*Break*
1245 – 1420	***Coring*** *Chloride Profile ● Electrochemical Tests ● Working Grid ● Corrosion Potential Measurement and Interpretation ● Corrosion Rate Measurement and Interpretation ● Concrete Resistivity Measurement and Interpretation ● Electrochemical Techniques*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Two*

Day 3

0730 – 0930	***Monitoring Movements*** *Periodic Monitoring ● Accelerometers ● Continuous Monitoring ● Monitoring System ● Electrical Resistance Strain Gages ● Extensometers ● Vibrating Wire Strain Gages ● Optical Fibres ● GPS ● Wireless Sensors ● MEMS*
0930 – 0945	*Break*
0945 – 1100	***Carbonation Induced Corrosion on Building Facades and Elevated Walkways*** *Bridge Deck Monitoring from the Soffit ● Side Walls of a Tunnel ● Floor Slab in an Underground Car Park ● Potential Mapping as a Tool to Assess the Success of Rehabilitation Measures*
1100 – 1230	***Surface Treatments*** *Impregnation ● Coating ● Surfacing ● Commonly Used Materials ● Elastomeric Membranes Application ● Cathodic Protection ● Protection Criteria*
1230 – 1245	*Break*
1245 – 1420	***Additional Preventative Measures*** *Controlled Permeability Formwork (CPF) ● Corrosion-resistant Reinforcement ● Stainless Steel Rebar ● Carbon Steel-Stainless Steel Coupling ● Galvanized Steel Rebar ● Epoxy Coated Rebar ● Mixed-in Corrosion Inhibitors*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Three*

Day 4

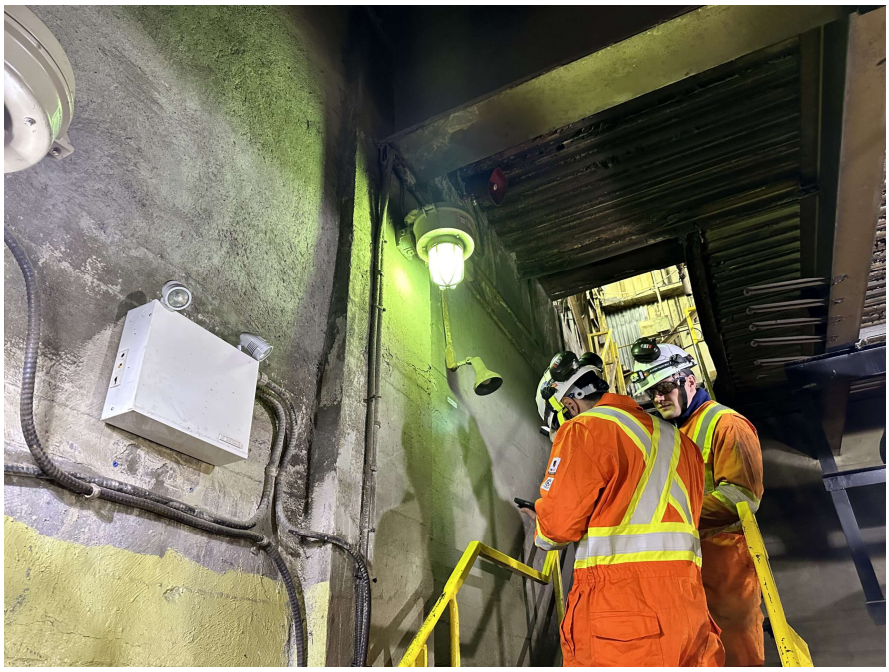
0730 – 0930	***Assessment of Corrosion-Affected Structures Practical Cases***
0930 – 0945	*Break*
0945 – 1100	***Mix Design*** *The Right Mix ● Proportioning ● Absolute Volume ● Determine Strength Requirements ● Coarse Aggregate Requirements ● High-Strength Concrete ● Fineness Modulus of Sand ● Air Content ● Workability Requirements ● Water Content ● Cement Content ● Cement Type ● Admixture Effects ● Moisture Corrections*
1100 – 1230	***Special Types of Concrete*** *Structural Light Weight Concrete ● Guidelines for Pumping ● High Strength Concrete ● Very High Strength Concrete ● Self Consolidating Concrete ● The Choice of Mixture ● Self Compacting Concrete*
1230 – 1245	*Break*
1245 – 1420	***Reinforced Concrete Monitoring Techniques*** *Monitoring Objectives ● Sensors ● Practical Cases*
1420 – 1430	***Recap*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Topics that were Discussed Today and Advise Them of the Topics to be Discussed Tomorrow*
1430	*Lunch & End of Day Four*

Day 5

0730 – 0930	***Principles of Rehabilitation*** *Durability of Reinforced Concrete Structures Principles of Rehabilitation*
0930 – 0945	*Break*
0945 – 1100	***Principles & Methods for Rehabilitation of Damaged Concrete***
1100 – 1230	***Principles & Methods for Rehabilitation of Damaged Concrete Due to Reinforcement Corrosion***
1230 – 1245	*Break*
1245 – 1345	***Rehabilitation of Reinforced Concrete Structures Practical Cases***
1345 – 1400	***Course Conclusion*** *Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course*
1400 – 1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Practical Sessions

This practical and highly-interactive course includes real-life case studies and exercises:-



Course Coordinator

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