

COURSE OVERVIEW SE0098
Advanced Concrete Repair

Course Title

Advanced Concrete Repair

Course Date/Venue

June 28-July 02, 2026/Musandam Meeting Room, Royal Tulip Muscat, Oman

Course Reference

SE0098

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Description

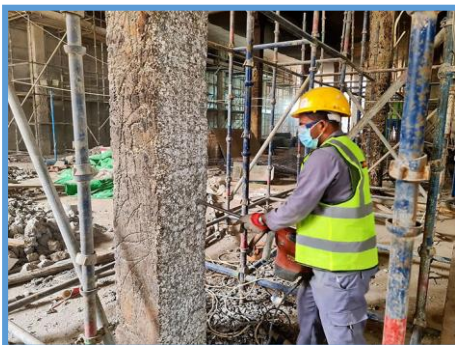


This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using our state-of-the-art simulators.

This course is designed to provide participants with a detailed and up-to-date overview of Advanced Concrete Repair. It covers the performance-based concrete repair philosophy; the ACI 562 framework, repair versus replacement, service-life extension and asset integrity concepts; the concrete durability and material behavior, concrete deterioration mechanisms and concrete cracks and defects; the visual inspection, damage mapping, structural condition rating and digital reporting; the repair standards and specifications; the ACI 546R, EN 1504, ASTM testing standards and ICRI guidelines; and the structural evaluation techniques, advanced NDT techniques and destructive testing methods.



During this interactive course, participants will learn the corrosion assessment, root cause analysis, repair planning and method selection; the repair materials according to EN 1504 and epoxy and resin-based repair systems; the surface preparation techniques, crack repair techniques, concrete replacement and patching; the protective coatings and corrosion protection; the structural strengthening concepts and FRP systems according to ACI 440; the steel plate bonding techniques, jacketing and section enlargement, post-tensioning and external strengthening; the repair of specialized structures and the quality assurance and quality control, health, safety and environmental practices and repair failure analysis; and the preventive maintenance, durability monitoring, asset management and life-cycle planning.



Course Objectives/Outcomes & Benefits for the Participants

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

- Apply and gain an advanced knowledge on concrete repair
- Discuss performance-based concrete repair philosophy covering ACI 562 framework, repair versus replacement, service-life extension and asset integrity concepts
- Identify concrete durability and material behavior, concrete deterioration mechanisms and concrete cracks and defects
- Carryout visual inspection, damage mapping, structural condition rating and digital reporting
- Review repair standards and specifications covering ACI 546R, EN 1504, ASTM testing standards and ICRI guidelines
- Apply structural evaluation techniques, advanced NDT techniques and destructive testing methods
- Carryout corrosion assessment, root cause analysis, repair planning and method selection
- Recognize repair materials according to EN 1504 and epoxy and resin-based repair systems
- Employ surface preparation techniques, crack repair techniques, concrete replacement and patching as well as protective coatings and corrosion protection
- Discuss structural strengthening concepts and FRP systems according to ACI 440
- Carryout steel plate bonding techniques and describe jacketing and section enlargement and post-tensioning and external strengthening
- Repair specialized structures and implement quality assurance and quality control, health, safety and environmental practices and repair failure analysis
- Apply preventive maintenance, durability monitoring, asset management and life-cycle planning

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 advanced concrete repair for civil engineers, structural engineers, project engineers, construction engineers, site engineers, project managers, construction managers, engineering managers, architects, supervision engineers, QA/QC personnel, inspectors, contractors, maintenance professionals, rehabilitation engineers, asset integrity engineers, corrosion engineers, NDT specialists, concrete repair specialists, facility maintenance personnel

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

Haward's 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**. Haward's certificates are internationally recognized and accredited by the British Accreditation Council (BAC). 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.

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:



Prof. Engin Aktas, PhD, MSc, BSc, is an **international expert** with over **25 years** of extensive experience in **Concrete** Inspection, **Repair & Rehabilitation**, **Advanced Concrete** Technology, Structural Health Monitoring of **Concrete** Structures, Reinforced **Concrete** Structures, Durability of **Concrete** Structures, **Concrete** Deterioration, **Repair & Protection**, Non-Destructive Testing for **Concrete** Structures, Structural Reliability & Service Life

Assessment, **Repair & Maintenance of Concrete** Infrastructure, **Structural Reliability**, **Earthquake Engineering**, **Design of Concrete and Steel Structures**, **Structural Damage Assessment & Safety Evaluation** and **Structural Health Monitoring**. He has been a **Senior Professor** to all personnel ranging from students to post graduate students at Universities and industrial clients. He has been teaching in the areas of **Theory of Matrix Structural Analysis**, **Engineering Mechanics**, **Mechanics of Materials**, **Civil Engineering System Analysis**, **Statistics for Civil Engineers**, **Structural Dynamics**, **Operations Research**, **Structural Optimization**, **Design of Reinforced Concrete Structures**, **Design of Steel Structures** and **Structural Reliability**.

During his career life, Professor Aktas performed the design, construction and installation of numerous buildings and industrial structures. Previously, he was the **Structural Design Engineer & Civil Engineer** with an international company handling multi-million design projects. He is renowned for his enthusiasm and tremendous instructing skills. Moreover, he had been a **Post-Doctoral Fellow** of **NRL/ASEE** and the recipient of the **Naval Research Laboratory/American Society for Engineering Education Fellowship** for his dedication and contributions to his field and was engaged with the **US Naval Research** for a project on “**Damage Detection on Composite Wing of Unmanned Air Vehicle using FBG sensors**”.

Professor Aktas has **PhD** and **Master** degrees in **Civil Engineering** from the **University of Pittsburgh (USA)** and **Bachelor’s** degree in **Civil Engineering** from **Middle East Technical University (Turkey)**. Further, he had served as a **Post-Doctorate** in **US Naval Research Laboratory (ASEE/NRL Fellow)** in **Washington DC, USA**. Moreover, he is a **Certified Instructor/Trainer** and a well-respected member of the **Union of Chambers of Engineers and Architects of Turkey**, the **Earthquake Engineering Association of Turkey** and the **International Association for Bridge Maintenance and Safety (IABMAS)**.

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.

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.

Learning Design & Customization

This course can be customized to the exact requirements of clients. Haward Technology is so proud of our huge capabilities in tailoring our courses to the training needs of our valued clients.

Course Program

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

Day 1: Sunday, 28th of June 2026

0730 - 0800	Registration & Coffee
0800 - 0815	Welcome & Introduction
0815 - 0830	PRE-TEST
0830 - 0930	Performance-Based Concrete Repair Philosophy ACI 562 Framework • Repair versus Replacement • Service-Life Extension • Asset Integrity Concepts
0930 - 0945	Break
0945 - 1030	Concrete Durability & Material Behavior Chloride Ingress • Carbonation • Sulfate Attack • Hot Climate Durability
1030 - 1130	Concrete Deterioration Mechanisms Reinforcement Corrosion • ASR • Thermal Cracking • Marine Exposure Deterioration
1130 - 1215	Concrete Cracks & Defects Structural & Non-Structural Cracks • Spalling & Delamination • Defect Prioritization
1215 - 1230	Break
1230 - 1330	Inspection & Condition Assessment Visual Inspection • Damage Mapping • Structural Condition Rating • Digital Reporting
1330 - 1420	Repair Standards & Specifications ACI 546R • EN 1504 • ASTM Testing Standards • ICRI Guidelines
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: Monday, 29th of June 2026

0730 – 0830	Structural Evaluation Techniques <i>Residual Capacity • Load-Rating • Serviceability Assessment • Repair versus Strengthening</i>
0830 – 0930	Advanced NDT Techniques <i>UPV • Rebound Hammer • GPR • Infrared Thermography</i>
0930 – 0945	<i>Break</i>
0945 – 1100	Destructive Testing Methods <i>Core Testing • Pull-Off Tests • Chloride Testing • Carbonation Depth</i>
1100 – 1215	Corrosion Assessment <i>Half-Cell Potential • Corrosion Rate Monitoring • Concrete Resistivity • Risk Interpretation</i>
1215 – 1230	<i>Break</i>
1230 – 1330	Root Cause Analysis <i>Failure Investigation • Construction Defects • Environmental Effects • Durability Assessment</i>
1330 – 1420	Repair Planning & Method Selection <i>Life-Cycle Cost Analysis • Repair Design Documentation • Acceptance Criteria • Repair Specifications</i>
1420 – 1430	Recap <i>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</i>
1430	<i>Lunch & End of Day Two</i>

Day 3: Tuesday, 30th of June 2026

0730 – 0830	Repair Materials According to EN 1504 <i>Repair Mortars • Micro-Concrete • Grouts • Material Compatibility</i>
0830 – 0930	Epoxy & Resin-Based Repair Systems <i>Epoxy Injection • Bonding Systems • Adhesives • Safety Procedures</i>
0930 – 0945	<i>Break</i>
0945 – 1100	Surface Preparation Techniques <i>ICRI Surface Preparation • Hydrodemolition • Abrasive Blasting • Bond Requirements</i>
1100 – 1215	Crack Repair Techniques <i>Routing & Sealing • Stitching • Flexible Repairs • Structural Crack Repair</i>
1215 – 1230	<i>Break</i>
1230 – 1330	Concrete Replacement & Patching <i>Partial-Depth Repairs • Full-Depth Replacement • Reinforcement Cleaning • Curing Procedures</i>
1330 – 1420	Protective Coatings & Corrosion Protection <i>Anti-Carbonation Coatings • Corrosion Inhibitors • Cathodic Protection • Waterproofing</i>
1420 – 1430	Recap <i>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</i>
1430	<i>Lunch & End of Day Three</i>

Day 4: Wednesday, 01st of July 2026

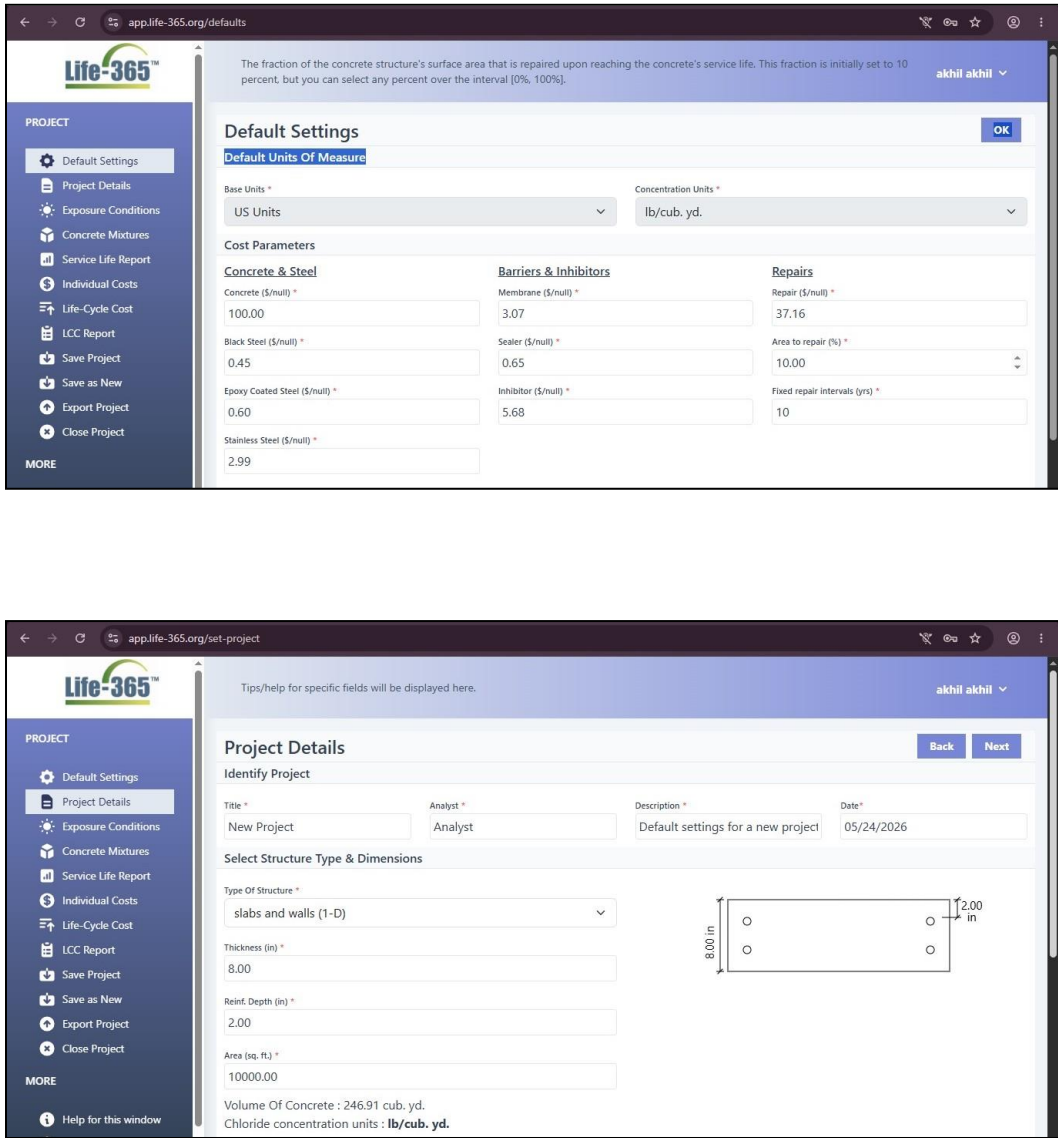
0730 – 0830	Structural Strengthening Concepts <i>Repair versus Strengthening • Load Redistribution • Design Verification • Code Requirements</i>
0830 – 0930	FRP Systems According to ACI 440 <i>FRP Materials • Installation Methods • QA/QC • Failure Modes</i>
0930 – 0945	<i>Break</i>
0945 – 1100	Steel Plate Bonding Techniques <i>Bonding Systems • Anchorage Details • Corrosion Protection • Inspection</i>
1100 – 1215	Jacketing & Section Enlargement <i>Concrete Jacketing • Steel Jacketing • Seismic Rehabilitation • Construction Sequencing</i>
1215 – 1230	<i>Break</i>
1230 – 1330	Post-Tensioning & External Strengthening <i>External PT Systems • Anchorage Systems • Monitoring • Structural Performance</i>
1330 – 1420	Repair of Specialized Structures <i>Marine Structures • Industrial Facilities • Parking Structures • Aggressive Environments</i>
1420 – 1430	Recap <i>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</i>
1430	<i>Lunch & End of Day Four</i>

Day 5: Thursday, 02nd of July 2026

0730 – 0830	Quality Assurance & Quality Control <i>Repair Inspection • Acceptance Criteria • Documentation • Reporting</i>
0830 – 0930	Health, Safety & Environmental Practices <i>Site Safety • Hazardous Materials • Environmental Protection • Sustainability</i>
0930 – 0945	<i>Break</i>
0945 – 1100	Repair Failure Analysis <i>Bond Failures • Debonding • Material Incompatibility • Lessons Learned</i>
1100 – 1230	Maintenance & Durability Management <i>Preventive Maintenance • Durability Monitoring • Asset Management • Life-Cycle Planning</i>
1230 – 1245	<i>Break</i>
1245 – 1345	Practical Case Studies & Workshops <i>Oil & Gas Rehabilitation Examples • Marine Structure Case Studies • Group Repair Planning Exercises • Methodology Evaluation</i>
1345 – 1400	Course Conclusion <i>Using this Course Overview, the Instructor(s) will Brief Participants about the Course Topics that were Covered During the Course</i>
1400 – 1415	POST-TEST
1415 – 1430	<i>Presentation of Course Certificates</i>
1430	<i>Lunch & End of Course</i>

Simulators (Hands-on Practical Sessions)

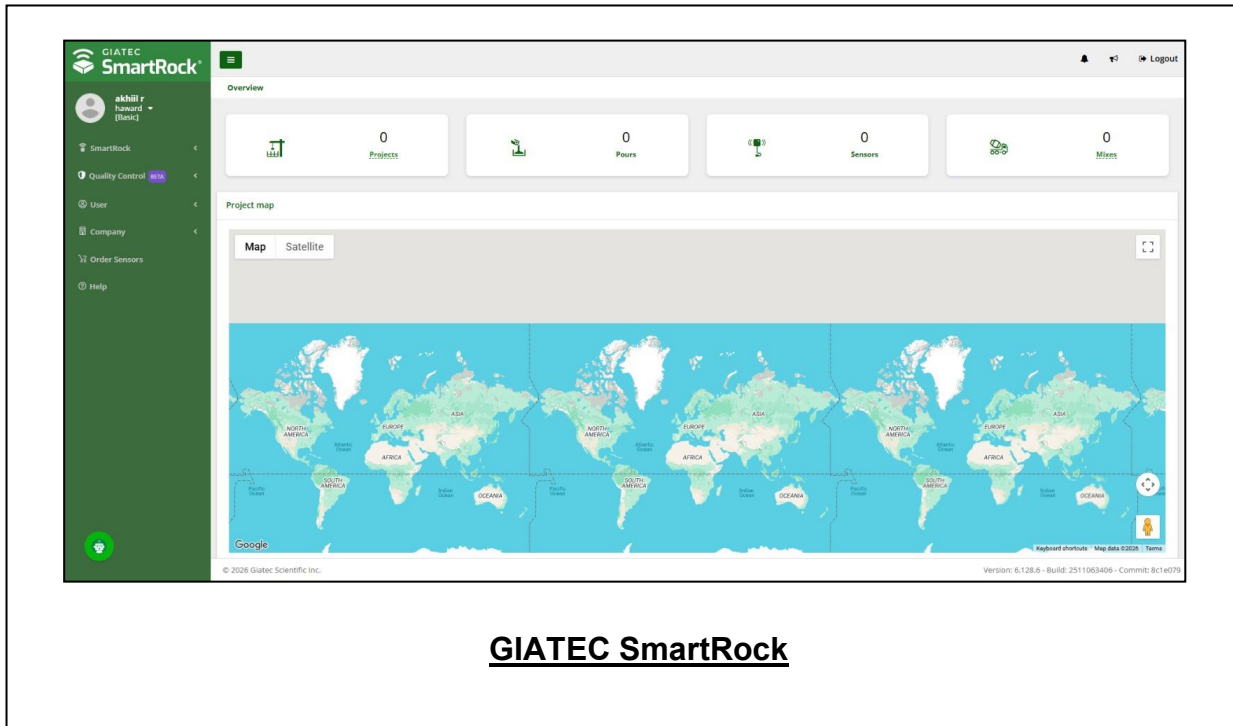
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using software tools, digital platforms and practical demonstrations.



The image displays two screenshots of the Life-365 software interface. The top screenshot shows the 'Default Settings' screen, which includes a sidebar menu with options like 'Default Settings', 'Project Details', 'Exposure Conditions', 'Concrete Mixtures', 'Service Life Report', 'Individual Costs', 'Life-Cycle Cost', 'LCC Report', 'Save Project', 'Save as New', 'Export Project', and 'Close Project'. The main content area is titled 'Default Settings' and contains sections for 'Default Units Of Measure' (Base Units: US Units, Concentration Units: lb/cub. yd.), 'Cost Parameters' (Concrete & Steel, Barriers & Inhibitors, Repairs), and a 'MORE' section.

The bottom screenshot shows the 'Project Details' screen, titled 'Identify Project'. It includes fields for 'Title' (New Project), 'Analyst' (Analyst), 'Description' (Default settings for a new project), and 'Date' (05/24/2026). Below this is the 'Select Structure Type & Dimensions' section, which includes a dropdown for 'Type Of Structure' (slabs and walls (1-D)), 'Thickness (in)' (8.00), 'Reinf. Depth (in)' (2.00), and 'Area (sq. ft.)' (10000.00). A diagram shows a rectangular slab with dimensions 8.00 in by 2.00 in. The bottom of the screen displays 'Volume Of Concrete : 246.91 cub. yd.' and 'Chloride concentration units : lb/cub. yd.'.

Life - 365



Course Coordinator

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