COURSE OVERVIEW SE0461
Equipment, Tanks & Pipe Supports Foundation Construction Techniques

Course Title
Equipment, Tanks & Pipe Supports Foundation Construction Techniques

Course Date/Venue
please see page 3

Course Reference
SE0461

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 designed to provide participants with a detailed and up-to-date overview of Equipment, Tanks and Pipe Supports foundation construction Techniques. It covers the various types of foundations and key factors influencing foundation design; the materials used for foundation construction, soil investigation, site analysis and types of foundation for equipment and tanks; the concrete types, mix proportions, foundation load considerations, design principles and pile foundations; the reinforced concrete design and precast versus cast-in-situ foundations; the foundation detailing and seismic design considerations; the types and design foundations of pipes supports; and the pipe support foundations for elevated systems;

During this interactive course, participants will learn the thermal expansion and movement of piping, corrosion protection for pipe support foundations, anchor points and load distribution; the site preparation and excavation, formwork design and installation and reinforcement installation in foundation works; the concrete pouring and curing techniques, installation of tanks and equipment on foundations and inspection and quality control; the post-installation maintenance of foundations, troubleshooting foundation problems and safety protocols during foundation work; and the regulatory standards and codes for foundation construction and sustainable construction practices.

Course Objectives

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

- Apply and gain an in-depth knowledge on equipment, tanks and pipe supports foundation construction techniques
- Discuss various types of foundations used in industrial construction, key factors influencing foundation design, materials used for foundation construction and safety considerations in foundation works
- Carryout soil investigation and site analysis and identify types of foundation for equipment and tanks, concrete types and mix proportions
- Explain foundation load considerations, foundation design principles, design of tank foundations and pile foundations for tanks and equipment
- Recognize reinforced concrete design for equipment foundations, precast versus cast-in-situ foundations, foundation detailing for tanks and equipment and seismic design considerations
- Identify types of pipes supports and their functions, design of pipe support foundations and pipe support foundations for elevated systems
- Discuss thermal expansion and movement of piping, corrosion protection for pipe support foundations, anchor points and load distribution in pipe supports
- Carryout site preparation and excavation for foundation works, formwork design and installation and reinforcement installation in foundation works
- Employ concrete pouring and curing techniques, installation of tanks and equipment on foundations and inspection and quality control
- Implement post-installation maintenance of foundations, troubleshooting foundation problems and safety protocols during foundation work
- Discuss regulatory standards and codes for foundation construction and sustainable construction practices

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 equipment, tanks and pipe supports foundation construction techniques for civil engineers, structural engineers, construction and project managers, mechanical and piping engineers, design consultants, site supervisors and other technical staff.

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 Date/Venue

Session(s)	Date	Venue
1	May 11-15, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
2	July 14-18, 2025	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE
3	September 14-18, 2025	Tamra Meeting Room, Al Bandar Rotana Creek, Dubai, UAE
4	November 10-14, 2025	Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

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 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 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 **30 years** of extensive **On-shore & Offshore** experience in the **Oil & Gas**, **Construction**, **Refinery** and **Petrochemical** industries. His expertise widely covers in the areas of **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 workshop for technical reasons with no prior notice to participants. Nevertheless, the course objectives will always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 – 0930	***Overview of Foundation Construction*** *Types of Foundations Used in Industrial Construction • Key Factors Influencing Foundation Design • Materials Used for Foundation Construction • Safety Considerations in Foundation Works*
0930 – 0945	*Break*
0945 – 1030	***Soil Investigation & Site Analysis*** *Importance of Soil Testing • Types of Soil Tests for Foundation Construction • Geotechnical Properties & their Impact on Foundation Design • Site Preparation & Clearance Procedures*
1030 – 1130	***Types of Foundation for Equipment & Tanks*** *Slab-on-Grade Foundations • Pile Foundations • Raft Foundations • Shallow & Deep Foundations*
1130 – 1215	***Concrete Types & Mix Proportions*** *Types of Concrete Used in Foundation Work • Selecting Appropriate Concrete Mix for Different Conditions • Impact of Weather Conditions on Concrete Curing • Mixing & Testing Procedures*
1215 – 1230	*Break*
1230 – 1330	***Foundation Load Considerations*** *Understanding Loads from Equipment, Tanks & Pipes • Load Distribution & Calculation Techniques • Dead Load, Live Load & Dynamic Load Considerations • Foundations for Dynamic & Rotating Equipment*
1330 – 1420	***Foundation Design Principles*** *Principles of Foundation Load-Bearing Capacity • Importance of Settlement & Differential Settlement Control • Dealing with Uneven Soil Settlement • Design Standards & Codes*
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 – 0830	***Design of Tank Foundations*** *Types of Tank Foundations (e.g., Floating, Slab, Ringwall) • Design Criteria for Large Storage Tanks • Settlement & Bearing Capacity Calculations for Tanks • Tank Design & Its Relation to Soil Conditions*
0830 – 0930	***Pile Foundations for Tanks & Equipment*** *Selection of Pile Types Based on Soil Conditions • Design & Installation of Pile Foundations • Load Transfer Mechanism in Pile Foundations • Pile Driving Equipment & Methods*
0930 – 0945	*Break*

0945 – 1100	***Reinforced Concrete Design for Equipment Foundations*** *Reinforcement Requirements in Equipment Foundations • Concrete Mix & Curing Considerations • Structural Analysis & Load-Bearing Capacity • Design of Foundation for Heavy Rotating Equipment*
1100 – 1215	***Precast versus Cast-In-Situ Foundations*** *Advantages & Disadvantages of Precast Concrete Foundations • Design & Installation Processes for Precast Units • Cost Comparison & Site-Specific Considerations • When to Use Precast versus Cast-In-Situ Foundations*
1215 – 1230	*Break*
1230 – 1330	***Foundation Detailing for Tanks & Equipment*** *Detailing of Foundation Connections with Tanks & Equipment • Considerations for Nozzle Load Bearing & Anchorage • Foundation Connections for Piping & Mechanical Equipment • Integration of Utilities into Foundation Design*
1330 – 1420	***Seismic Design Considerations*** *Importance of Seismic Design in Foundation Construction • Seismic Load Analysis for Tank & Equipment Foundations • Foundation Reinforcement for Seismic Resilience • Seismic Code Requirements & Standards*
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 – 0830	***Types of Pipe Supports & Their Functions*** *Basic Types of Pipe Supports: Hangers, Brackets & Anchors • Functional Purposes of Different Pipe Support Systems • Load Considerations in Pipe Support Design • Pipe Support Installation Methodologies*
0830 – 0930	***Design of Pipe Support Foundations*** *Basic Principles of Pipe Support Foundation Design • Material Selection for Pipe Support Foundations • Load Distribution in Pipe Support Foundation Design • Foundation Details for Horizontal & Vertical Supports*
0930 – 0945	*Break*
0945 – 1100	***Pipe Support Foundations for Elevated Systems*** *Special Considerations for Pipe Supports in Elevated Systems • Design Challenges in Supporting Pipes in Tall Structures • Integration of Supports into the Overall Structure Design • Safety Protocols for Elevated Pipe Support Construction*
1100 – 1215	***Thermal Expansion & Movement of Piping*** *Effects of Thermal Expansion on Pipe Supports • Designing Foundations to Accommodate Thermal Movement • Expansion Joints & their Role in Pipe Support Foundations • Monitoring & Maintaining Support Foundations Under Thermal Stress*
1215 – 1230	*Break*
1230 – 1330	***Corrosion Protection for Pipe Support Foundations*** *Importance of Corrosion Resistance in Pipe Support Foundations • Coatings & Materials to Prevent Corrosion • Cathodic Protection Techniques • Maintenance Practices for Long-Term Durability*

1330 – 1420	***Anchor Points & Load Distribution in Pipe Supports*** *Importance of Secure Anchor Points for Pipe Supports • Load Transfer from Piping Systems to Foundation Supports • Anchor Design for Dynamic Systems • Pipe Support Inspection & Testing*
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 – 0830	***Site Preparation & Excavation for Foundation Works*** *Excavation Procedures for Equipment & Tank Foundations • Ensuring Proper Drainage & Soil Compaction • Temporary Shoring & Protection During Excavation • Site Safety Practices During Excavation Works*
0830 – 0930	***Formwork Design & Installation*** *Types of Formwork Used in Foundation Construction • Selecting Formwork Materials for Large Foundations • Formwork Installation Techniques • Ensuring Accurate Dimensions During Formwork Setup*
0930 – 0945	*Break*
0945 – 1100	***Reinforcement Installation in Foundation Works*** *Rebar Placement & Tying Techniques • Ensuring Proper Cover & Spacing in Reinforcement • Handling Large Reinforcement Structures • Quality Control During Reinforcement Installation*
1100 – 1215	***Concrete Pouring & Curing Techniques*** *Concrete Pouring Techniques for Large Foundations • Ensuring Uniform Curing Across Foundation Sections • Temperature & Humidity Control During Curing • Methods to Ensure High-Quality Concrete Strength*
1215 – 1230	*Break*
1230 – 1330	***Installation of Tanks & Equipment on Foundations*** *Rigging & Lifting Procedures for Large Equipment • Positioning & Aligning Tanks on Foundation Pads • Ensuring Correct Anchorage & Support During Installation • Final Checks for Installation Accuracy & Safety*
1330 – 1420	***Inspection & Quality Control*** *Inspection Procedures for Tank & Equipment Foundations • Non-Destructive Testing Methods for Foundation Integrity • Quality Assurance Processes for Pipe Support Foundations • Final Acceptance Criteria for Foundation Works*
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*

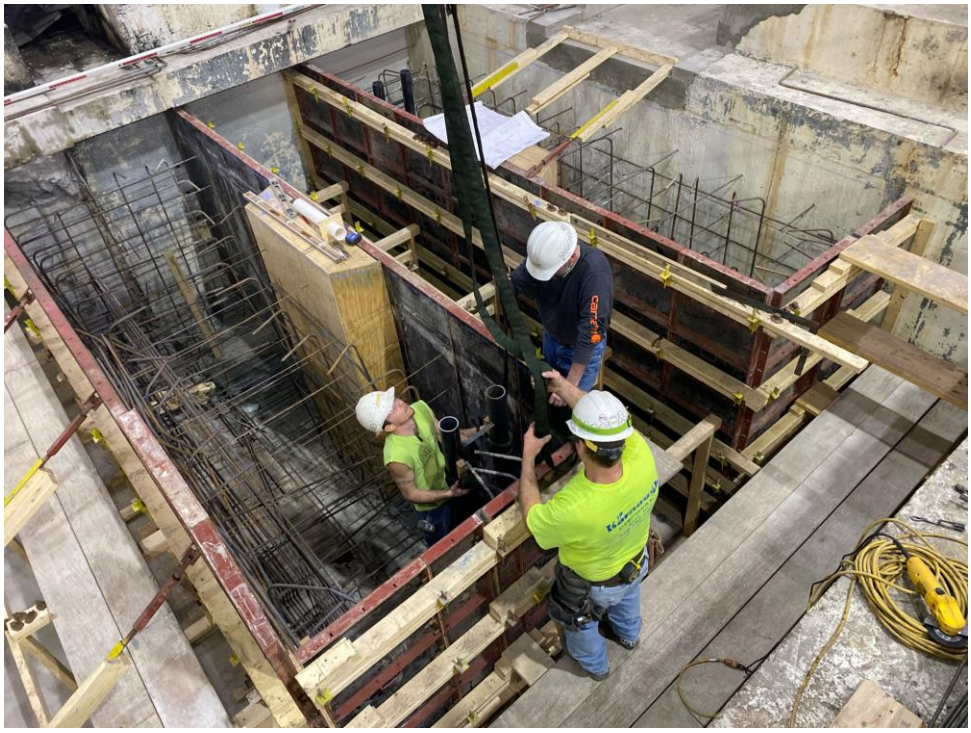
Day 5

0730 – 0830	***Post-Installation Maintenance of Foundations*** *Regular Inspection & Maintenance Protocols • Identifying Early Signs of Foundation Damage • Corrosion Prevention & Repairs • Ensuring Long-Term Stability & Safety of Foundations*
0830 – 0930	***Troubleshooting Foundation Problems*** *Common Foundation Issues (e.g., Settlement, Cracking) • Methods for Diagnosing & Rectifying Foundation Issues • Structural Repairs for Cracked or Damaged Foundations • Temporary & Permanent Solutions for Foundation Problems*

0930 – 0945	*Break*
0945 – 1100	***Safety Protocols During Foundation Work*** *Site Safety Measures During Foundation Construction • Personal Protective Equipment (PPE) for Construction Workers • Emergency Procedures for Hazardous Foundation Work • Safety Checks Before Starting Work on Foundations*
1100 – 1230	***Regulatory Standards & Codes for Foundation Construction*** *Overview of International Standards & Codes • Compliance with Local Regulations in Foundation Work • Environmental Impact Considerations • Certification Processes for Foundation Construction*
1230 – 1245	*Break*
1245 – 1345	***Sustainable Construction Practices*** *Reducing Environmental Impact in Foundation Construction • Use of Eco-Friendly Materials in Foundation Works • Recycling & Reusing Construction Materials • Sustainable Techniques in Tank & Equipment Foundation Design*
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

Mari Nakintu, Tel: +971 2 30 91 714, Email: mari1@haward.org