COURSE OVERVIEW SE0037
Pipe and Equipment Foundations Design

Course Title
Pipe and Equipment Foundations Design

Course Date/Venue
Session 1: June 29-July 03, 2025/Boardroom 1, Elite Byblos Hotel Al Barsha, Sheikh Zayed Road, Dubai, UAE
Session 2: November 24-28/Fujairah Meeting Room, Grand Millennium Al Wahda Hotel, Abu Dhabi, UAE

Course Reference
SE0037

Course Duration/Credits
Five days/3.0 CEUs/30.0 PDHs

Course Description

This practical and highly-interactive course includes various practical sessions and exercises. Theory learnt will be applied using the "MS Excel" application.

This course is designed to provide participants with a detailed and up-to-date overview of the foundation design for dynamic equipment. It covers the machine types, foundation types and the associated interfaces with piping, cable trays, pipe racks and conveyor systems; the design criteria, static loads, soil mechanics and laboratory and site test for soil samples; the liquefaction and vibration related soil problems; the design of foundations on non-cohesive and cohesive soils; the soil improvement methods, dynamic loads, SDOF systems and MDOF systems; and the free vibration, forced vibration and the response of industrial structures subjected to dynamic loads.

Further, this course will also discuss the earthquake loads, impact loads and machine induced dynamic loads; the equipment structure interaction, modelling and analysis and code provisions including the EQ resistant design of industrial structures; the equipment structure interaction under earthquake loads; and the seismic loads on industrial structures and structural dynamics.

During this interactive course, participants will learn the earthquake resistant design methods, forced based design, displacement-based design and earthquake resistant design methods; the code provisions on EQ resistant design including equipment bearings and seismic isolators against EQ actions; designig base isolators for equipment, vibration bearings for equipment and steel industrial structures; the steel connections in industrial structures, design of steel and concrete industrial structures; the modelling and analysis of EQ resistant steel and concrete industrial structure; the seismic design of non-structural components in industrial plants including the seismic analysis and design of industrial racks, fire sprinkler system, suspended ceilings, electrical equipment and plumbing; the code provisions on EQ resistant steel and concrete structures including the EQ resistant design of non-structural components; and the limitations of computer aided engineering software.

Course Objectives

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

- Apply and gain a fundamental knowledge of dynamic equipment design
- Identify machine types, foundation types and the associated interfaces with piping, cable trays, pipe racks and conveyor systems
- Recognize design criteria, static loads, soil mechanics and laboratory and site test for soil samples
- Interpret liquefaction and vibration related soil problems and Illustrate the design of foundations on non-cohesive and cohesive soils
- Carryout soil improvement methods, dynamic loads, SDOF systems and MDOF systems
- Determine free vibration, forced vibration and the response of industrial structures subjected to dynamic loads
- Recognize the earthquake loads, impact loads and machine induced dynamic loads
- Illustrate equipment structure interaction, modelling and analysis and code provisions including the EQ resistant design of industrial structures
- Discuss the equipment structure interaction under earthquake loads as well as seismic loads on industrial structures and structural dynamics
- Employ earthquake resistant design methods, forced based design, displacement-based design and earthquake resistant design methods
- Describe the code provisions on EQ resistant design including equipment bearings and seismic isolators against EQ actions
- Design base isolators for equipment, vibration bearings for equipment and steel industrial structures
- Illustrate steel connections in industrial structures, design of steel and concrete industrial structures as well as the modelling and analysis of EQ resistant steel and concrete industrial structure
- Describe seismic design of non-structural components in industrial plants including the seismic analysis and design of industrial racks, fire sprinkler system, suspended ceilings, electrical equipment and plumbing
- Discuss the code provisions on EQ resistant steel and concrete structures including the EQ resistant design of non-structural components and the limitations of computer aided engineering software

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 foundation design for dynamic equipment for engineers 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 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 **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 always be met:

Day 1

0730 – 0800	*Registration & Coffee*
0800 – 0815	*Welcome & Introduction*
0815 – 0830	***PRE-TEST***
0830 -0900	***Introduction to Dynamic Equipment Foundation Design***
0900 - 0930	***Machine Types & Foundation Types***
0930 – 0945	*Break*
0945 – 1015	***Associated Interfaces with Piping, Cable Trays, Pipe Racks, Conveyor Systems***
1015 – 1045	***Design Criteria & Static Loads***
1045 – 1115	***Introduction to Soil Mechanics***
1115 – 1145	***Laboratory Tests for Soil Samples***
1145 – 1215	***Site Test for Soil Samples***
1215 – 1230	***Liquefaction & Vibration Related Soil Problems***
1230 – 1245	*Break*
1245 – 1335	***Design of Foundations on Non-Cohesive Soils***
1335 - 1420	***Design of Foundations on Cohesive Soils***
1420 – 1430	***Recap***
1430	*Lunch & End of Day One*

Day 2

0730 – 0810	***Soil Improvement Methods***
0810 – 0850	***Dynamic Loads & SDOF Systems***
0850 – 0930	***MDOF Systems***
0930 – 0945	*Break*
0945 – 1015	***Free Vibration***
1015 - 1045	***Forced Vibration***
1045 – 1115	***Response of Industrial Structures Subjected to Dynamic Loads***
1115 – 1145	***Earthquake Loads***
1145 - 1230	***Impact Loads***
1230 – 1245	*Break*
1245 – 1335	***Machine Induced Dynamic Loads***
1335 - 1420	***Response of Industrial Structures to Dynamic Loads***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Two*

Day 3

0730 – 0810	***Equipment Structure Interaction***
0810 – 0850	***Modelling & Analysis***
0850 – 0930	***Code Provisions***
0930 – 0945	*Break*
0945 – 1015	***Introduction to EQ Resistant Design of Industrial Structures***

1015 - 1045	***Equipment Structure Interaction Under Earthquake Loads***
1045 – 1115	***Seismic Loads on Industrial Structures***
1115 – 1145	***Introduction to Structural Dynamics***
1145 - 1230	***Earthquake Resistant Design Methods***
1230 – 1245	*Break*
1245 – 1335	***Forced Based Design***
1335 - 1420	***Displacement Based Design***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Three*

Day 4

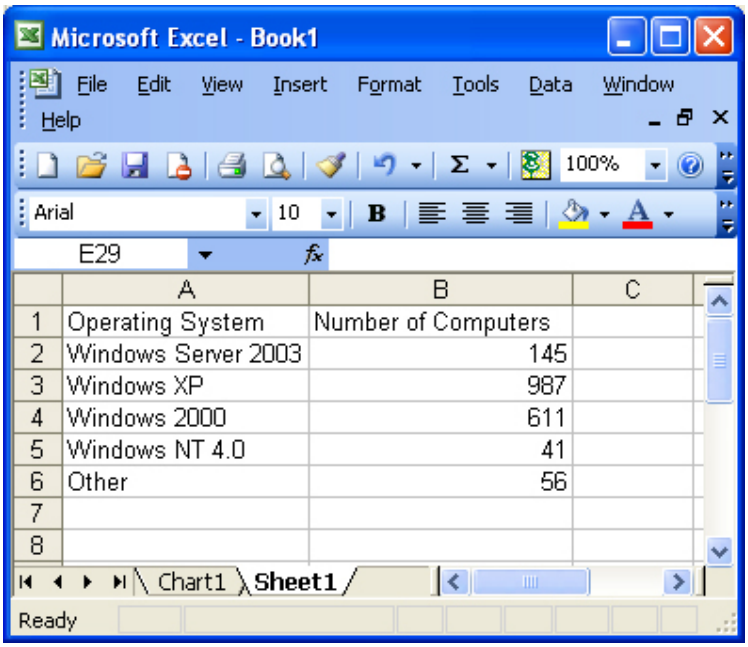
0730 – 0810	***Code Provisions on EQ Resistant Design***
0810 – 0850	***Equipment Bearings & Seismic Isolators Against EQ Actions***
0850 – 0930	***Design of Base Isolators for Equipment***
0930 – 0945	*Break*
0945 – 1040	***Design of Vibration Bearings for Equipment***
1040 – 1135	***Design of Steel Industrial Structures***
1135 - 1230	***Steel Connections in Industrial Structures***
1145 - 1230	***Modelling & Analysis of EQ Resistant Steel Industrial Structure***
1230 – 1245	*Break*
1245 – 1335	***Design of Concrete Industrial Structures***
1335 - 1420	***Modelling & Analysis of EQ Resistant Concrete Industrial Structure***
1420 – 1430	***Recap***
1430	*Lunch & End of Day Four*

Day 5

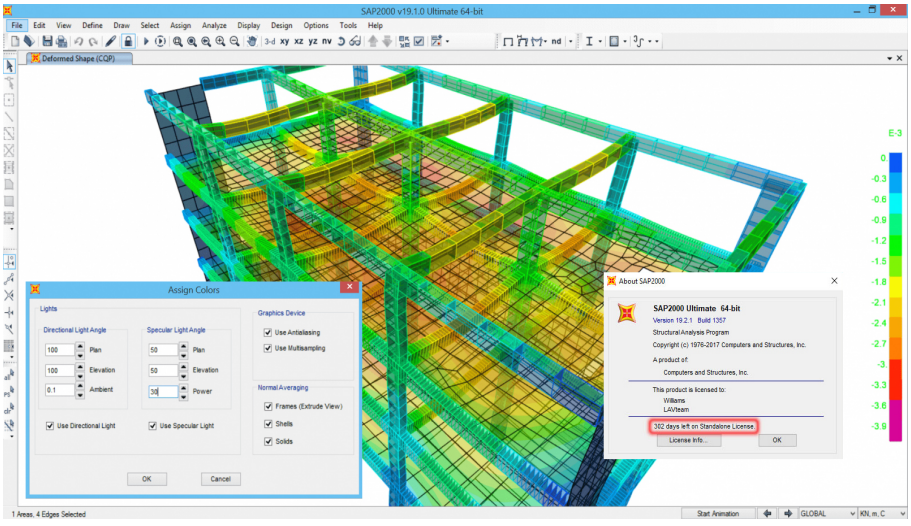
0730 – 0810	***Introduction to Seismic Design of Non-Structural Components in Industrial Plants***
0810 – 0850	***Seismic Analysis & Design of Industrial Racks***
0850 – 0930	***Seismic Analysis & Design of Fire Sprinkler System***
0930 – 0945	*Break*
0945 – 1015	***Seismic Analysis & Design of Suspended Ceilings***
1015 - 1045	***Seismic Analysis & Design of Electrical Equipment***
1045 – 1115	***Seismic Analysis & Design of Plumbing***
1115 – 1145	***Code Provisions on EQ Resistant Steel Structures***
1145 - 1230	***Code Provisions on EQ Resistant Concrete Structures***
1230 – 1245	*Break*
1245 – 1315	***Code Provisions on EQ Resistant Design of Non-Structural Components***
1315- 1345	***Limitations of Computer Aided Engineering Software***
1345 -1415	***Course Conclusion***
1400 -1415	***POST-TEST***
1415 – 1430	*Presentation of Course Certificates*
1430	*Lunch & End of Course*

Simulator (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 our state-of-the-art simulator "Microsoft Excel" and "SAP 2000".



Microsoft Excel



SAP 2000

Course Coordinator

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