



COURSE OVERVIEW SE0462 **Building Sanitary & Stormwater Design**

Course Title

Building Sanitary & Stormwater Design

Course Date/Venue

August 11-15, 2025/Meeting Plus 9, City Centre
Rotana, Doha, Qatar

Course Reference

SE0462

Course Duration/Credits

Five days/3.0 CEUs/30 PDHs



Course Description



This practical and highly-interactive course includes 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 knowledge of Building Sanitary and Stormwater Design. It covers the key differences between sanitary and stormwater drainage; the importance in residential, commercial and industrial buildings, system components and impacts of improper design and failures; the sanitary drainage system components, stormwater drainage system components, flow types, relevant codes and design standards and design goals and principles; the fixture units and load calculations, piping layout and sizing, ventilation system design, drainage stack and building drain design; and the sanitary manholes and inspection points and special installations (grease, sewage, pumping).



During the course, participants will learn the rainfall and runoff calculations, roof and surface drainage systems, site drainage and grading principles and stormwater conveyance system; the underground stormwater infrastructure, flood prevention and water quality, hydraulic principles for drainage design, software tools and modeling techniques and material selection and piping technologies; the installation practices and best guidelines, access and maintenance considerations and fire and building code coordination; the integration with other building systems, green infrastructure and sustainable drainage; the construction challenges and solutions; and the inspection, testing and commissioning.





Course Objectives

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

- Apply and gain an in-depth knowledge on building sanitary and stormwater design
- Define the key differences between sanitary and stormwater drainage as well as identify the importance in residential, commercial and industrial buildings, system components and impacts of improper design and failures
- Recognize sanitary drainage system components, stormwater drainage system components, flow types, relevant codes and design standards and design goals and principles
- Discuss fixture units and load calculations, piping layout and sizing, ventilation system design, drainage stack and building drain design, sanitary manholes and inspection points and special installations (grease, sewage, pumping)
- Determine rainfall and runoff calculations, roof and surface drainage systems, site drainage and grading principles and stormwater conveyance system
- Explain underground stormwater infrastructure, flood prevention and water quality, hydraulic principles for drainage design, software tools and modeling techniques and material selection and piping technologies
- Apply installation practices and best guidelines, access and maintenance considerations and fire and building code coordination
- Develop integration with other building systems, green infrastructure and sustainable drainage as well as identify construction challenges and solutions and perform inspection, testing and commissioning

Exclusive Smart Training Kit - H-STK®



*Participants of this course will receive the exclusive “Howard 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 building sanitary and stormwater design for civil engineers, mechanical engineers, plumbing engineers, design engineers, architects, construction engineers, site engineers, project managers, facility engineers, building services engineers, infrastructure engineers, CAD technicians (with MEP focus), water resource engineers, urban planners, technical inspectors (building and infrastructure), maintenance engineers, environmental engineers (with construction background), engineering consultants, technical supervisors in construction projects and other technical staff.

Course Fee

US\$ 6,000 per Delegate. This rate includes H-STK® (Howard 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

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.



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 **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)**.

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 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: Sunday, 10th of August 2025

0730 – 0800	Registration & Coffee
0800 – 0815	Welcome & Introduction
0815 – 0830	PRE-TEST
0830 – 0930	Introduction to Sanitary & Stormwater Systems Definitions & Key Differences Between Sanitary & Stormwater Drainage • Importance in Residential, Commercial & Industrial Buildings • Overview of System Components • Impacts of Improper Design & Failures
0930 – 0945	Break
0945 – 1030	Sanitary Drainage System Components Soil & Waste Piping • Vent Piping & Traps • Inspection Chambers & Manholes • Grease Traps & Interceptors
1030 – 1130	Stormwater Drainage System Components Roof Drains & Scuppers • Gutters, Downspouts & Splash Blocks • Site Catch Basins & Area Drains • Storm Manholes & Soakaways
1130 – 1215	Understanding Flow Types Blackwater versus Greywater • Rainfall Intensity & Runoff Classification • Peak versus Average Sanitary Flows • Combined versus Separate Systems
1215 – 1230	Break
1230 – 1330	Relevant Codes & Design Standards International Plumbing Code (IPC) • Uniform Plumbing Code (UPC) • ASPE, BS EN & Local Authority Requirements • Sustainable Drainage Guidelines (SUDS, LID)
1330 – 1420	Design Goals & Principles Hygiene & Safety Considerations • Hydraulic Efficiency & Self-Cleansing • Odor Prevention & Ventilation • System Longevity & Maintenance Access
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, 11th of August 2025

0730 – 0830	Fixture Units & Load Calculations Plumbing Fixture Classifications • Fixture Unit Conversion & Summation • Estimating Peak Discharge Flow • Design Load versus Connected Load
0830 – 0930	Piping Layout & Sizing Minimum Slopes & Pipe Gradients • Branch & Stack Sizing Methods • Horizontal & Vertical System Integration • Velocity & Flow Rate Considerations
0930 – 0945	Break
0945 – 1100	Ventilation System Design Purpose & Types of Venting • Individual, Common, Loop & Circuit Vents • Air Admittance Valves (AAVs) • Relief Venting for Multi-Storey Systems
1100 – 1215	Drainage Stack & Building Drain Design Stack Offsets & Cleanouts • Building Drain Routing to External Manholes • Coordination with Structural Systems • Expansion & Contraction Allowances



1215 – 1230	Break
1230 – 1330	Sanitary Manholes & Inspection Points Manhole Sizing & Spacing Criteria • Drop Manholes & Benching • Access Requirements & Safety • Integration with External Networks
1330 – 1420	Special Installations (Grease, Sewage, Pumping) Grease Trap Sizing & Location • Lifting Stations & Ejector Pumps • Septic Tanks & Holding Tanks • Backwater Valve Application
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: Tuesday, 12th of August 2025

0730 – 0830	Rainfall & Runoff Calculations Rainfall Intensity, Duration, Frequency (IDF Curves) • Runoff Coefficients & Catchment Areas • Rational Method for Peak Flow • Site-Specific Hydrological Data
0830 – 0930	Roof & Surface Drainage Systems Sizing of Roof Drains & Downspouts • Overflow Provisions & Emergency Routes • Scupper & Parapet Drain Design • Waterproofing Coordination
0930 – 0945	Break
0945 – 1100	Site Drainage & Grading Principles Swales & Open Channel Flow • Minimum Slopes & Ponding Prevention • Grading Plans & Contours • Pavement & Landscaping Considerations
1100 – 1215	Stormwater Conveyance System Trench Drains & Catch Basins • Pipe Material Selection & Slope • Routing Toward Outfalls & Soak Pits • Energy Dissipation & Velocity Control
1215 – 1230	Break
1230 – 1330	Underground Stormwater Infrastructure Storm Manholes & Inspection Points • Soakaways, French Drains & Detention Tanks • Rain Gardens & Bioswales (Sustainable Solutions) • Integration with Municipal Stormwater Systems
1330 – 1420	Flood Prevention & Water Quality Infiltration versus Detention Techniques • Oil/Water Separators & Silt Traps • Use of Permeable Surfaces • Flash Flooding & Overland Flow Routes
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: Wednesday, 13th of August 2025

0730 – 0830	Hydraulic Principles for Drainage Design Continuity Equation & Manning's Formula • Gravity Flow & Pipe Capacity • Velocity Requirements for Self-Cleansing • Head Loss & Surge Conditions
0830 – 0930	Software Tools & Modeling Techniques Introduction to AutoCAD Civil 3D for Drainage • StormCAD & SewerGEMS Overview • EPANET & SWMM for Simulation • BIM Integration with Revit MEP
0930 – 0945	Break



0945 – 1100	Material Selection & Piping Technologies PVC, HDPE, Cast Iron & Vitrified Clay • Jointing Methods & Fittings • Corrosion, UV Resistance & Durability • Cost & Availability Considerations
1100 – 1215	Installation Practices & Best Guidelines Trenching, Bedding & Pipe Support • Connection Techniques & Leak Testing • Sleeving & Crossing with Other Utilities • Safety Protocols During Installation
1215 – 1230	Break
1230 – 1330	Access & Maintenance Considerations Cleanouts & Rodding Points • CCTV Inspection Ports • Maintenance-Friendly Layouts • Access Spacing & Visibility
1330 – 1420	Fire & Building Code Coordination Wet Riser Systems & Proximity to Drains • Fire-Rated Penetrations & Pipe Insulation • Fire Stopping for Vertical Drainage Code Compliance Checklist
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

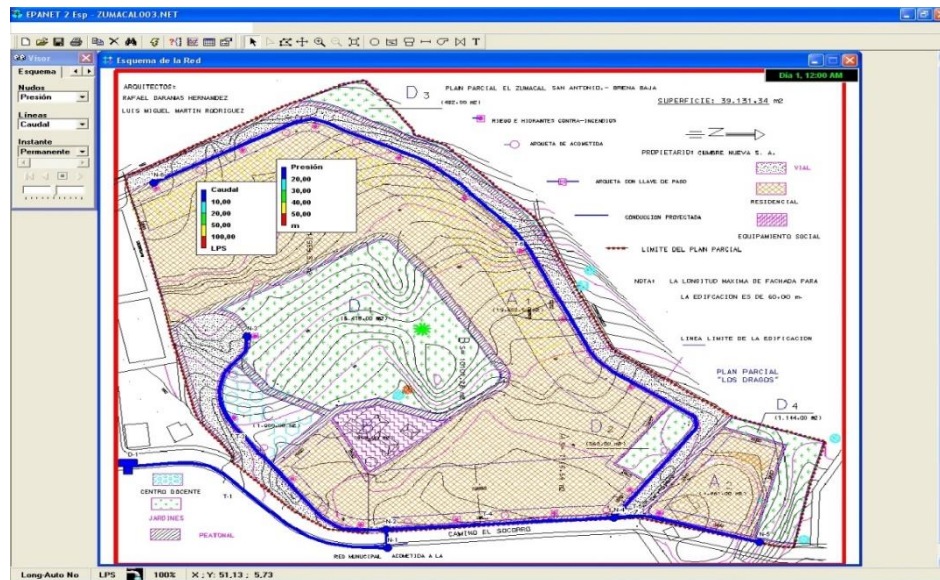
Day 5: Thursday, 14th of August 2025

0730 – 0830	Integration with Other Building Systems Coordination with HVAC, Electrical & Structural • Drainage Near Elevator Pits & Equipment Rooms • Plant Room & Sump Design • Rainwater Harvesting & Reuse Systems
0830 – 0930	Green Infrastructure & Sustainable Drainage Sustainable Urban Drainage Systems (SUDS) • Green Roofs & Vegetated Swales • Rainwater Reuse & Stormwater Harvesting • LEED & Estidama Considerations
0930 – 0945	Break
0945 – 1030	Construction Challenges & Solutions Unforeseen Obstructions During Trenching • Groundwater Management & Dewatering • Misalignment & Slope Corrections • Handling Storm Events During Construction
1030 – 1130	Inspection, Testing & Commissioning Water & Air Pressure Tests • CCTV & Flow Testing Procedures • Inspection Checklists • Handover & Certification Documentation
1130 – 1230	Real-World Case Studies Commercial Complex Drainage Design • High-Rise Sanitary System Coordination • Stormwater Control in Industrial Facilities • Lessons Learned from Failed Installations
1230 – 1245	Break
1245 – 1345	Final Review, Workshop & Assessment Design Exercise: Complete Layout for a Sample Building • Drainage Load & Pipe Sizing Challenge • Q&A & Discussion • Certificate Distribution & Wrap-Up
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

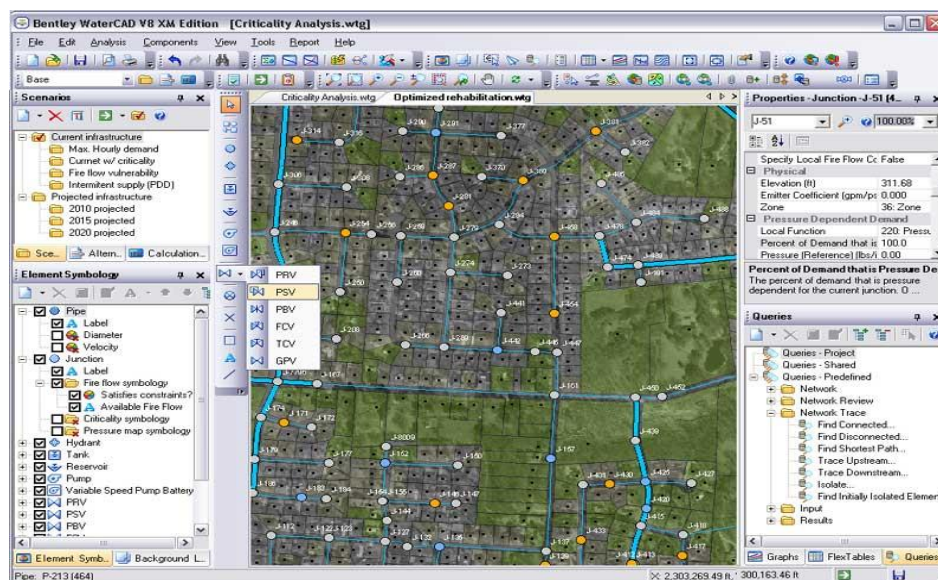


Simulator (Hands-on Practical Sessions)

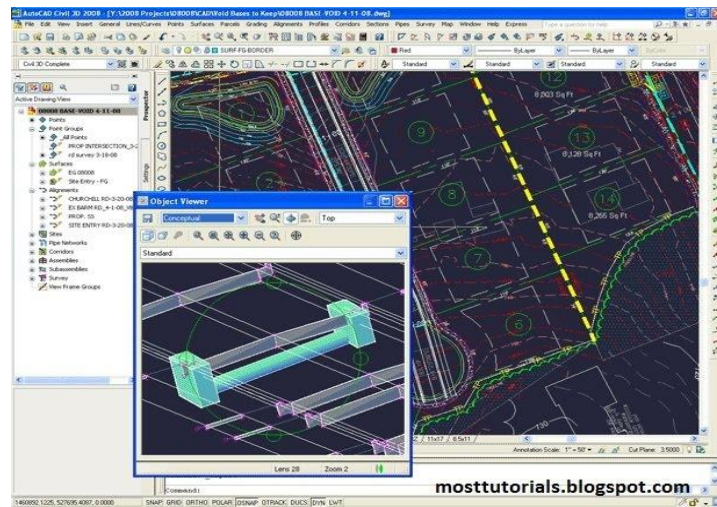
Practical sessions will be organized during the course for delegates to practice the theory learnt. Delegates will be provided with an opportunity to carryout various exercises using the latest revision of “EPANET”, “WATERCAD”, “AutoCAD” and “Building Information Modeling Software” Simulators.



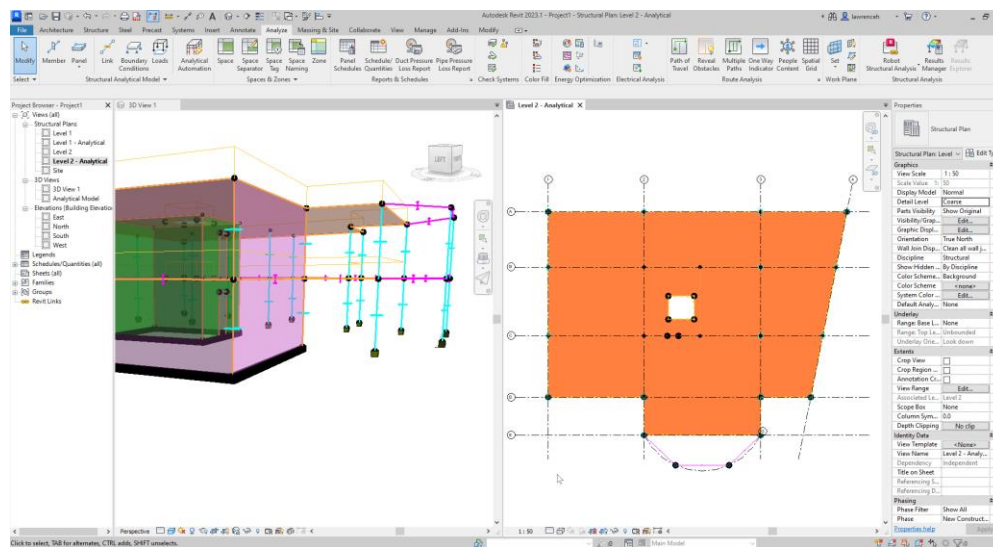
EPANET Simulator



WATERCAD Simulator



AutoCAD



Building Information Modeling Software

Course Coordinator

Reem Dergham, Tel: +974 4423 1327, Email: reem@haward.org