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## TRAINING: WATER DISTRIBUTION DESIGN AND MODELING

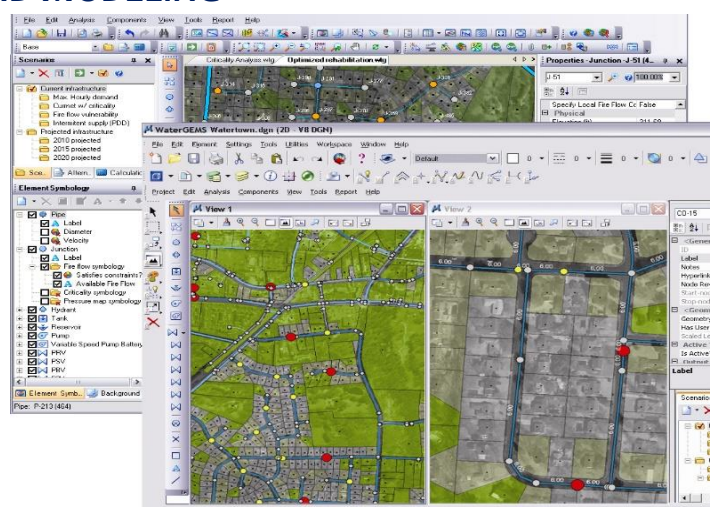
**LEVEL: FUNDAMENTALS AND ADVANCED**

**PLATFORM: WATERGEMS/CAD CONNECT EDITION**

**COURSE TARGET: HYDRAULICS AND HYDROLOGY ANALYSIS & DESIGN ENGINEERS**

**PREREQUISITES: FAMILIARITY WITH WATER DISTRIBUTIONS SYSTEMS WILL BE HELPFUL.**

**CERTIFICATIONS: THIS IS A BENTLEY INSTITUTE ACCREDITED COURSE AND THE PARTICIPANTS WILL BE ISSUED WITH A COMPLETION CERTIFICATE**



This workshop begins with the basics of hydraulics theory as it applies to water distribution modeling, then takes the participants through more advanced topics such as: working with multiple scenarios and alternatives; model calibration; pump selection; energy and cost studies; extended-period simulation; fire flow analysis; and identifying critical links or shortfalls within a water system. Participants will become familiar with WaterGEMS/CAD and use the software to reinforce concepts with case studies. As WaterCAD and WaterGEMS capabilities are the same throughout this course, users will gain an understanding of both software applications.

Participants then roll on to more advanced skills water distribution training, learning to use the software tools used for automating system calibration and design and model analysis. Specific topics will include: developing system demands from geospatial data on land use or population, etc.; importing elevation data from digital elevation models; and pipe renewal planning. Other topics covered during the advanced portion of the class include leveraging the interoperability of WaterGEMS to take advantage of the industry's leading CAD/GIS platforms, water quality modeling and system flushing routines.

Upon successful completion of this course, the participant shall be able to:

- Proficient use of basic WaterGEMS features such use of scenarios, alternatives, extended period simulations, flex tables, and color coding
- Apply the basic principles of water distribution modeling;
- Gain essential knowledge for water system design, operation, and troubleshooting;
- Apply WaterCAD/WaterGEMS models to solve common water distribution system problems;
- Develop a deeper understanding of model creation and analysis using WaterCAD/WaterGEMS;
- Increase productivity by using automated approaches to complete common modeling tasks.





Time	Day 1	Day2	Day 3	Day 4	Day5
8:30	<b>Welcome and Introduction</b>	<b>Model Calibration</b> Calibrating Steady-State models.	<b>Criticality Analysis &amp; Pressure Zones</b> Quickly finding the weak links.	<b>Pipe Renewal Planner</b>	<b>Leakage Detection</b> Use Darwin Calibrator to find leaks in a network.
9:00	<b>Modeling Fundamentals</b> What is a good model?  <b>Demo – Basics</b>	<b>Steady State Calibration of Field Measurements</b> Applying Calibration Techniques	<b>Analysis of Valving &amp; Critical Segments –</b> Find the critical places in your system	<b>Pipe Renewal Planner</b> - Generate & display pipe condition assessment values based on pipe aspects	<b>Piping Optimization</b>
10:00	<b>Building a Network with Fire Flows -</b> Construct/Solve a basic	<b>Model Applications and System Planning</b>	<b>Extended Period Simulation</b> Running water models over time	<b>Automating Skeletonization</b>	<b>Automating Design using Darwin Designer</b> Automatically design pipes using genetic
11:30	<b>Model Data -</b> How do I build a Water Model?	<b>System Design</b> Plan, Develop and Implement a system improvement strategy & compare design costs	<b>EPS Modeling and Energy Costing Analysis</b> Analyze the system's response under time variable conditions	<b>Skeletonizing a Large Model using Skelebrator</b> Skeletonize a model and examine the results from different methods	<b>Pump Selection</b>
12:00	<b>LUNCH</b>				
13:00	<b>Importing Basic Model</b>  <b>Data -</b> Build a simple model with ModelBuilder	<b>Design Improvements -</b> Plan, Develop and Implement a system improvement strategy and compare design costs	<b>Real-time modeling</b> Using operations & SCADA data in models	<b>Modeling Water Distribution System Flushing</b>	<b>Fundamentals of Water Quality Modeling</b>
15:00	<b>Tanks, Pumps, &amp; Valves</b>	<b>Fire Protection and Fire</b>	<b>Geospatial Data-</b> Creating models from external data	<b>Optimal Calibration</b>	<b>Multisource Mixing, Chlorine Residual, and Age Analysis</b>
15:30	<b>Modeling Pumps, Tanks and PRVs -</b> Analyze various system scenarios with pumping, minor losses	<b>Automated Fire Flow Analysis</b> Calculating fire flows for a subset of a distribution system	<b>ModelBuilder, Trex &amp; Load Builder –</b> Create a model from external GIS data	<b>Automating Calibration using Darwin Calibrator –</b> Automatically design pipes using genetic algorithms	Run several water quality analysis on an existing model
17:00	<b>DAY FINISH WITH Q&amp;A</b>				