Hydraulic Modelling-Water Network Design

Training Program

Description:

The designs of network system require a variety of specialized engineering knowledge. A wide range elements, types, severe environmental conditions, and rapid degradation of materials are there and represent many challenges to the owners and designer. Different demands and consumptions are also there. This course takes you deeply in the scientific approach of how to take care of the complicated process of co-coordinating all of these issues, Water Network Design.

Course Objectives:

This course is aimed to provide the attendants with information on the water network design and its impact on the client, designer and end user, protection of facilities and the design practice utilized. Different software's used to analyze the data will be highlighted. The attendants will be trained to evaluate, identify and use appropriate technologies in order to enhance productivity, efficiency, responsiveness and the quality of service provided. The course will outline some Engineering concepts like Front End Engineering (FEE), Engineering procurement & construction (EPC). It will also highlight the application of Codes and Standards such as ISO, BS, ASME, IEC, AWWA, CEN, ITU, and ESRI. The program will cover an introduction of the basic required materials; types; standards; specifications; testing; application and selection process. It will include the Hydraulic Design of pumps, pumping stations, water network, RO plants, water pipelines, diesel stations; selection of valves, pumps, pipes, ICE, and use of various tools, torque, hydraulic & pretension wrenches, pullers etc… and their application. Measuring tools like micrometer, depth meter, caliper, dial indicators, feeler gauges.

Who Should Attend?

Municipal engineers, engineering and public works directors, city engineers, superintendents of operations, water distribution system managers, infrastructure managers, safety inspectors and procurement officers from municipalities, consulting engineers, technicians and technologists, and contractors and other individuals who need a basic understanding of water distribution system design and are currently employed in the water distribution management field.

Course Contents:

Day 1

- Introduction
- Definitions, concepts and objectives
- Design Factors
- Required flows and pressures
- Per capita demand and variations in demand
- Fir flows
- Pressures
- Pipeline layout
- Watermains
- Materials
- Installation
- Centrifugal Pumps
- Pump characteristics
- Pump head curve
- System characteristics
- System head curve
- Pump operating point
- Parallel operation

Day 2

- Revision of Hydraulics Engineering
- Application Technology (Software Packages)
- Application Technology (Flow measurements)
- Application Technology (GIS Technology)
- SCADA System and Telemetry
- Design Engineering (Water Distribution Systems)
- Data base
- Front End Engineering
- Engineering procurement & construction
- Hydrometery
- Group discussion

Day 3

- Engineering Codes & Standards
- Engineering Materials
- Mechanical Design Engineering
- Mechanical Engineering

Day 4

- Complete Water Main System Design-Workshop

    - ❖ Single and multiple input source system

- Optimal zone size
- General principles of network synthesis
- Software applications
- Cost considerations
- Distribution Storage

    - ❖ Types of Distribution reservoirs

- ❖ Flow in pipe networks

- Pipes in series
- Pipes in parallel
- Pipe network analysis
- Hydraulics of water wells

Day 5

- Pressure Piping Systems and Water Quality Analysis
  - ❖ Pressure systems
  - ❖ Energy loss
  - ❖ Energy gains-pumps
- Control valves
- Pipe network
- Network analysis
- Water quality analysis
- Mechanical Hand & Measuring