

COURSE TITLE:

Plumbing System Design, Calculation, Estimation, Installation, Assessment & Renovation for High-Rise Building (Basic to Advance Level) as per BNBC 2020, IPC & UPC Codes.

COURSE OBJECTIVE:

Become a Professional Plumbing Expert!

COURSE CONTENT:**Class-01: Introduction to Plumbing**

- Concept of Plumbing.
- Plumbing Practice: Global Perspective.
- Scope of Plumbing Systems.
- Importance of Plumbing System for Buildings.
- Plumbing Practice & Plumbing Practitioners.
- Classification of Plumbing Devices.
- Classification of Pipes and Fittings Materials Detail Discussion with Pictures.
- Accessories and Appurtenances Materials Detail Discussion with Pictures.
- How to Install G.I./PPR/CPVC/UPVC Pipes and Fittings.
- How to select Good Brands of Pipes, Fittings, Fixtures and Major Plumbing Materials.
- BNBC-2020, IPC, UPC and Reference Books Discussion for Installation System of Plumbing Fixtures, Appliances and Fittings.

Class-02: Plumbing Planning

- Introduction of Plumbing Planning.
- Concerns & Considerations in Planning.
- Software's for Plumbing Design.
- Major Planning Systems for High-Rise Buildings.
- Symbols and Abbreviations in Plumbing Systems.
- Discussion of Water Supply Systems for High-Rise Buildings.
- Discussion of Drainage Systems in Buildings.
- Discussion of Rain Water Disposal Systems for High-Rise Buildings.
- Duct/Shaft Sizing Considerations.
- Different Types of System for Pipe Laying for High-Rise Buildings.
- Discussion of Hot Water Supply System for Buildings.

- Building Classification Discussion According to BNBC-2020.
- Plumbing Fixture Requirement According to BNBC-2020, IPC & UPC.
- BNBC, IPC & UPC Important Topics Discussion for Plumbing System Design.

Class-03: Water Supply System Design (Part-01)

- Water Supply Source and Water Supply System in Low, High-Rise & Tall Buildings.
- Population Consumption & Estimation of Daily Water Demand.
- UGWT and OHWT Sizing for Domestic Use.
- Water Supply Fixture Unit (WSFU), Flow, Pressure, Discharge, Velocity Chart Discussion.
- Fixture Demand Calculation (Cold & Hot Water Supply).
- Water Supply Pipe Sizing (Riser, Toilet, Roof).
- Pressure Drop Calculation & Pressure Check For Top Floor.
- Concept of Hot Water Systems
- Types of Water Heaters
- Hot Water Storage Tank Sizing

Class-04: Water Supply System Design (Part-02)

- Introduction of Different Types of Pumps.
- Discussion of Head, Discharge, Efficiency & Power for Pumps.
- Design and Selection of Centrifugal Water Transfer Pump.
- Discussion of PWD Rate Schedule-2022 for Pumps.
- Introduction of Hydro-pneumatic System.
- Types of Booster Pumps and Their Applications.
- Concept of Pressure Vessel Tanks and It's Types.
- Pressurized Water Supply System Design.
- Overhead Booster Pump Sizing.
- Pressure Management in High-Rise Buildings.
- Why & Where Pressure Reducing Valve (PRV) is used & Impact of High Pressure.
- Types of PRV & Their Application.
- Operation & Maintenance for Water Supply Systems.
- Design of Water Supply System for a High-Rise Building. -Examples.

Class-05: Drainage System Design (Part-01)

- Introduction of Drainage System.
- Categories of Sanitary Drainage System.
- Basic Principles and Requirements for a Sanitary Drainage System.
- Understanding Slope of a Pipe Mathematically.
- Classification of Traps & its importance in Plumbing.
- Floor Trap, Gully Trap, Intercepting Trap, Oil & Grease Interceptor, Sand Interceptor Sizing.
- Significance & Selection of a Pipe Slope.
- Sizing of Horizontal Sanitary Branches.
- Design of Sanitary Stack.
- Sizing of Building Drain.

Class-06: Drainage System Design (Part-02)

- Basic of Storm Water Drainage System.
- Collection of Rain Water (Sources & Methods).
- Various Use of Rain Water for Buildings.
- Hourly Rainfall Intensity for Different District of Bangladesh as per BNBC-2020.
- Determining Catchment Area for Buildings.
- What is Roof Gutter & Its Types?
- Design of Roof Gutter & Downspout.
- What is Primary & Secondary Roof Drain?
- Size the Roof Drainage Network.
- Methods of Discharging Storm Water.

Class-07: Drainage System Design (Part-03)

- What is Ventilation & its Importance in Plumbing?
- Sizing of Stack Vent, Trap Vent, Wet Vent, Circuit Vent, Vent Stack, Unit Vent, and Individual Vent.
- Introduction of Active Drainage Ventilation System.
- Understanding Positive Air Pressure Attenuator (PAPA) & it's working.
- Understanding Air admittance Valve & it's working.
- Design Guidelines for Active Drainage Ventilation in High Rise Buildings.
- Introduction to Basement Drainage System.
- Gutter & Sump Pit Drainage System Design.
- Classification & Design of Sump Pumps, Sewage Pumps & Ejector Pumps.

Class-08: Drainage System Design (Part-04)

- Concept of External Foul Drainage System in Buildings.
- Understanding Invert Level of Pipe, Calculate Invert Level of Sloped Pipe.
- Concept of Manhole/Inspection Chamber.
- Location of Manhole/Inspection Chamber.
- Design & Construction of Manhole/Inspection Chamber.
- Discussion of Effluent and Sludge Management.
- Introduction of Septic Tank System.
- Design of Septic Tank According to BNBC, PWD, BR, MES, etc.
- Introduction of Soak Well System.
- Design of Soak Well According to BNBC, PWD, BR, MES, etc.

Class-09: Estimation

- Plumbing Fixtures, Appliances, Fittings, Valves, Equipment's, Water Supply and Sanitary Pipes Quantity Analysis as per Design.
- Plumbing & Sanitary BOQ as per PWD-2022 Rate Schedule.

Class- 10: Advance Plumbing+ Bonus Topics

- Supervision Considerations of Plumbing System.
- Assessment & Checklist Preparation of Existing Building.
- As Built Drawing Preparation for Building Plumbing System.
- Modern Techniques & Trends for Sustainable Plumbing System Design.

Extras:

- Assignment Will Be Provided.
- Course Completion Certification after Assignment submission.
- Various Real Projects CAD file.
- Hand Notes for Design.
- BNBC, IPC, UPC Books PDF file.
- PWD-2022 Rate Schedule.
- Various Internationally Published Books PDF file.
- ASPE Design Hand Books PDF file.
- Lifetime Support in WhatsApp Group.

Course Instructor:**Md. Johirul Islam Raju**

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