



Stormwater Drainage Study and Design Course

12 – 16 September 2027
Manama

Stormwater Drainage Study and Design Course

Ref: 562_143444 **Date:** 12 – 16 September 2027 **Location:** Manama **Fees:** 6500 Euro

Overview

Stormwater Drainage Study and Design Course is a five-day intermediate course for civil and drainage engineers, infrastructure planners, reviewers, consultants, project engineers, and technical-office teams who leave with a Stormwater Drainage Design Package. Participants connect catchment delineation, rainfall data, design storms, runoff estimation, conveyance sizing, open channels, storage routing, outfalls, flood pathways, water quality, modeling assumptions, checks, and drawings. The course turns disconnected calculations into a reviewable drainage basis. Agile Leaders Training Center presents stormwater drainage study and design through practical engineering artifacts.

Who Should Attend

- Teams responsible for catchment studies, rainfall criteria, runoff estimates, and drainage planning
- Functions sizing inlets, pipes, manholes, culverts, channels, and outfalls
- Personnel modeling hydrologic and hydraulic performance and documenting assumptions
- Groups coordinating drainage networks with roads, utilities, sites, flood routes, and receiving systems
- Reviewers responsible for calculations, drawings, design checks, and technical comments

The course assumes participants can use engineering calculations and interpret survey information and drawings, and it leaves out introductory fluid mechanics, software instruction, field surveying, and jurisdiction-specific approvals.

Departments and Industries

The course supports departments and industries responsible for stormwater studies, drainage infrastructure, flood coordination, and design assurance.

- Civil engineering, drainage, hydrology, hydraulics, and infrastructure planning
- Roads, transport, municipal works, utilities, and land development
- Industrial sites, energy facilities, logistics areas, and commercial developments
- Environmental, water-quality, resilience, and flood-risk functions
- Engineering consultancy, project delivery, technical offices, and design review

Learning Objectives

By the end of this course, participants will be able to:



- Analyze catchments, rainfall sources, design storms, and runoff characteristics
- Apply hydrologic methods and build peak-flow and hydrograph calculations
- Evaluate inlet, pipe, culvert, open-channel, and outfall capacity
- Use detention, retention, routing, and overflow criteria
- Diagnose model assumptions, flood interactions, water-quality controls, and design risks
- Develop a Stormwater Drainage Design Package

Course Agenda

Day 1: Catchments and Rainfall Basis

- Catchment Delineation and Flow-Path Map
- Land-Cover and Imperviousness Schedule
- Rainfall Data Source and Quality Register
- Design-Storm Selection Decision Matrix
- Drainage Design Criteria and Assumption Log

Day 2: Runoff and Hydrologic Analysis

- Rational Method Peak-Flow Worksheet
- Time-of-Concentration Component Check
- Loss, Infiltration, and Runoff Parameter Table
- Design Hydrograph Development Method
- Hydrologic Sensitivity and Calibration Review

Day 3: Conveyance and Surface Drainage

- Inlet Capture and Bypass-Flow Calculation
- Pipe and Manhole Capacity Schedule
- Culvert Flow-Control and Headwater Check
- Open-Channel Geometry and Manning Review
- Outfall Tailwater and Erosion-Control Assessment

Day 4: Storage, Modeling, and Flood Coordination

- Detention and Retention Storage Sizing Method
- Level-Pool Routing and Outlet-Control Table
- SWMM Network Model Assumption Register
- Surcharge, Ponding, and Exceedance-Path Map
- Water-Quality and Green-Gray Control Matrix

Day 5: Stormwater Drainage Design Practice

- Exercise: Establish Catchments, Rainfall, and Design Criteria
- Exercise: Calculate Runoff and Test Hydrologic Assumptions
- Exercise: Size Conveyance, Channels, Storage, and Outfalls
- Exercise: Review Model Results, Flood Routes, and Drawings
- Capstone Exercise: Stormwater Drainage Design Package

Practical Exercises

The course uses suggested activities to connect hydrologic evidence, hydraulic calculations, model review, and design documentation.

- Suggested activity: delineate catchments and flow paths, classify surfaces, select rainfall inputs and a design storm, and document criteria and assumptions.
- Suggested activity: estimate peak flow and hydrographs, test concentration time and runoff parameters, and record sensitivity conclusions.
- Suggested activity: size representative inlets, pipes, culverts, channels, storage, outlet controls, and outfall protection under defined conditions.
- Suggested activity: integrate model assumptions, surcharge and flood pathways, water-quality controls, calculations, drawings, comments, and resolutions in a Stormwater Drainage Design Package.

FAQs

Who suits the stormwater drainage study and design course and what does it assume?

It suits engineering teams responsible for drainage studies, design, coordination, or review, and assumes they can use engineering calculations and interpret survey information, site plans, and infrastructure drawings.

How does stormwater drainage study and design differ from flood-risk training?

Stormwater drainage study and design focuses on rainfall-runoff inputs, network conveyance, storage, outfalls, surface exceedance, models, and drawings, while general flood-risk training usually places greater emphasis on hazard assessment, exposure, consequences, and risk management.

How are design storms selected for stormwater drainage?

Design storms are selected from applicable rainfall-frequency information, project criteria, catchment response, duration, temporal pattern, receiving conditions, uncertainty, and the consequences of capacity exceedance.



Why are detention and overflow routes both needed in stormwater design?

Detention controls the timing and rate of discharge within defined criteria, while overflow routes provide a planned surface pathway when inflow exceeds storage or conveyance capacity.

What belongs in a Stormwater Drainage Design Package?

The package records catchments, rainfall basis, design storms, runoff parameters, calculations, network and channel sizing, storage routing, outfall conditions, model assumptions, flood pathways, water-quality controls, drawings, review comments, and resolutions.

Conclusion

Participants take back a Stormwater Drainage Design Package linking hydrologic inputs, hydraulic capacity, storage, outfalls, flood pathways, model assumptions, calculations, and drawings. It changes isolated drainage checks into a traceable design and review sequence. The package supports engineering decisions without replacing project-specific data, professional judgment, field verification, or applicable approval processes.