Training course on Green Infrastructure for Stormwater Management

Professional Development Training Course Outline

Category	Civil Engineering and Infrastructure Management	**Duration**	10 Days
Base Fee	$3,000 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

Conventional urban stormwater management systems, primarily relying on grey infrastructure like pipes and culverts, are increasingly overwhelmed by the escalating frequency and intensity of extreme rainfall events driven by climate change. This leads to widespread urban flooding, combined sewer overflows, and significant pollution of receiving waters, posing severe threats to public health, property, and aquatic ecosystems. A paradigm shift towards Green Infrastructure (GI) offers a powerful, multi-functional, and sustainable alternative. GI mimics natural hydrological processes by using vegetation, soils, and natural systems to manage stormwater close to its source, infiltrating, evapotranspiring, and reusing rainwater. This approach not only mitigates flood risks and improves water quality but also provides numerous co-benefits, including enhanced urban biodiversity, improved air quality, reduced urban heat island effect, and increased recreational spaces, fostering more livable and resilient cities. Understanding the principles, design, and implementation of GI is becoming essential for professionals involved in urban planning, civil engineering, landscape architecture, and environmental management. Training Course on Green Infrastructure for Stormwater Management is meticulously designed to equip with the advanced knowledge and practical skills required to design, implement, and manage effective Green Infrastructure solutions for stormwater management. Participants will gain a comprehensive understanding of various GI typologies, such as rain gardens, permeable pavements, bioswales, green roofs, and urban forests, and learn how these systems integrate into the urban fabric. The curriculum will delve into advanced design considerations, including hydrological modeling, soil media selection, plant palette design, and long-term maintenance strategies. Through a blend of theoretical instruction, hands-on design exercises, and in-depth case studies of successful GI implementation globally, attendees will develop the expertise to conduct site assessments, perform hydrological calculations, evaluate ecosystem services, and navigate the complex governance and financing landscapes associated with GI projects. This course is indispensable for professionals committed to building more sustainable, resilient, and aesthetically pleasing urban environments that work with nature to manage water effectively.

Programme Curriculum

Training Course on Green Infrastructure for Stormwater Management

Introduction

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This intensive 10-day training course is meticulously designed to equip urban planners, civil engineers, landscape architects, environmental managers, and policy professionals with the advanced knowledge and practical skills required to design, implement, and manage effective Green Infrastructure solutions for stormwater management. Participants will gain a comprehensive understanding of various GI typologies, such as rain gardens, permeable pavements, bioswales, green roofs, and urban forests, and learn how these systems integrate into the urban fabric. The curriculum will delve into advanced design considerations, including hydrological modeling, soil media selection, plant palette design, and long-term maintenance strategies. Through a blend of theoretical instruction, hands-on design exercises, and in-depth case studies of successful GI implementation globally, attendees will develop the expertise to conduct site assessments, perform hydrological calculations, evaluate ecosystem services, and navigate the complex governance and financing landscapes associated with GI projects. This course is indispensable for professionals committed to building more sustainable, resilient, and aesthetically pleasing urban environments that work with nature to manage water effectively.

Course Objectives

Upon completion of this course, participants will be able to:

1. Define Green Infrastructure (GI) and its core principles for stormwater management.
2. Analyze the limitations of conventional stormwater management and the benefits of GI.
3. Identify various types of GI practices and their applicability in diverse urban contexts.
4. Apply hydrological principles to design GI systems for effective stormwater capture and treatment.
5. Understand the role of soil media, vegetation, and drainage layers in GI performance.
6. Design specific GI elements such as rain gardens, bioswales, and permeable pavements.
7. Explore the design and implementation of green roofs and urban forests for stormwater retention.
8. Evaluate the multiple co-benefits of GI, including ecological, social, and economic aspects.
9. Formulate comprehensive GI master plans for urban and regional stormwater management.
10. Navigate policy, regulatory, and institutional frameworks supporting GI implementation.
11. Utilize relevant software tools for GI design, modeling, and performance assessment.

12. Analyze case studies of successful GI for stormwater management globally.
13. Drive the integration of GI into urban planning, infrastructure development, and climate adaptation strategies.

Target Audience

This course is essential for professionals seeking to implement Green Infrastructure for stormwater management:

1. Urban Planners: Integrating GI into master plans and urban development.
2. Civil Engineers: Designing and implementing stormwater management systems.
3. Landscape Architects: Designing green spaces with hydrological functions.
4. Environmental Managers: Focusing on water quality and urban ecosystems.
5. Architects: Incorporating green roofs and sustainable site design into buildings.
6. Public Works Officials: Managing urban drainage and flood control.
7. Developers & Consultants: Implementing sustainable site development projects.
8. Policy Makers: Developing regulations and incentives for GI adoption.

Course Duration

10 Days

Course Modules

Module 1: Introduction to Green Infrastructure (GI) for Stormwater

- Define Green Infrastructure and its distinction from grey infrastructure.
- Analyze the challenges of conventional stormwater management in urban areas.
- Explore the hydrological cycle and how GI mimics natural processes.
- Discuss the multiple benefits of GI: flood reduction, water quality, biodiversity, urban heat island.
- Overview of global trends and policies promoting GI adoption.

Module 2: Hydrological Principles for GI Design

- Understand fundamental hydrological concepts: runoff, infiltration, evapotranspiration.
- Learn about rainfall-runoff relationships and hydrological modeling for GI.
- Discuss the concept of peak flow reduction and volume control.
- Explore methods for calculating design storm events and sizing GI features.
- Apply hydrological principles to assess the performance of GI systems.

Module 3: Rain Gardens and Bioretention Systems

- Define rain gardens and bioretention areas and their components.
- Learn about soil media specifications, plant selection, and underdrain design.
- Discuss the principles of filtration, infiltration, and evapotranspiration in bioretention.
- Explore design considerations for various scales and urban contexts.
- Analyze case studies of successful rain garden installations.

Module 4: Permeable Pavements

- Understand the types of permeable pavements: pervious concrete, porous asphalt, permeable pavers.
- Discuss the design components: surface, aggregate layers, underdrain.
- Explore the benefits of permeable pavements for stormwater infiltration and runoff reduction.

- Learn about maintenance requirements and long-term performance.
- Analyze applications in parking lots, sidewalks, and low-traffic roads.

Module 5: Bioswales and Vegetated Filter Strips

- Define bioswales and vegetated filter strips and their role in conveying and treating runoff.
- Learn about channel design, vegetation selection, and check dams for flow control.
- Discuss the pollutant removal mechanisms in bioswales.
- Explore design considerations for different slopes and flow conditions.
- Analyze the integration of bioswales into streetscapes and landscapes.

Module 6: Green Roofs and Rooftop Detention

- Understand the types of green roofs: extensive, intensive, semi-intensive.
- Discuss the components of a green roof system: waterproofing, drainage, growing media, vegetation.
- Explore the benefits of green roofs for stormwater retention, insulation, and biodiversity.
- Learn about structural considerations and maintenance for green roofs.
- Analyze case studies of green roof implementation on various building types.

Module 7: Urban Forests and Tree Trenches

- Explore the role of urban trees and forests in intercepting rainfall and reducing runoff.
- Discuss the design of structural soil cells and tree trenches for enhanced infiltration.
- Understand the benefits of urban trees for shade, air quality, and aesthetic value.
- Learn about species selection and planting techniques for stormwater management.
- Analyze the integration of urban forestry into street design and public spaces.

Module 8: Rainwater Harvesting and Reuse

- Define rainwater harvesting and its components (catchment, conveyance, storage, treatment).
- Discuss the benefits of rainwater harvesting for non-potable uses (e.g., irrigation, toilet flushing).
- Explore design considerations for residential, commercial, and infrastructure-scale systems.
- Understand water quality considerations and treatment options for reuse.
- Analyze the integration of rainwater harvesting into building design and site planning.

Module 9: GI Master Planning and Implementation

- Learn methodologies for developing comprehensive GI master plans for urban areas.
- Discuss site selection criteria and prioritization of GI interventions.
- Explore the integration of GI into existing grey infrastructure systems.
- Understand the importance of phased implementation and adaptive management.
- Formulate a preliminary GI master plan for a selected urban watershed.

Module 10: Economic Valuation and Financing of GI

- Understand methods for valuing the ecosystem services provided by GI.
- Conduct cost-benefit analysis comparing GI with conventional stormwater solutions.
- Explore innovative financing mechanisms for GI (e.g., stormwater fees, green bonds).
- Discuss the role of public-private partnerships and community funding.
- Analyze the economic advantages of GI, including reduced infrastructure costs and increased property values.

Module 11: Policy, Regulations, and Standards for GI

- Review national and local policies promoting GI for stormwater management.
- Discuss relevant building codes, zoning ordinances, and design standards for GI.
- Explore stormwater utility fees and other regulatory drivers for GI adoption.
- Understand the role of permits and environmental impact assessments for GI projects.
- Analyze challenges and opportunities in policy implementation for GI.

Module 12: Case Studies and Future Trends in GI for Stormwater

- Analyze successful global case studies of large-scale GI implementation for stormwater management.
- Discuss emerging trends: smart GI, real-time control, and climate-positive urban design.
- Explore the role of digital twins and AI in optimizing GI performance.
- Examine the integration of GI with smart city initiatives.
- Identify future challenges and opportunities for scaling GI in urban environments.

Training Methodology

- **Interactive Workshops:** Facilitated discussions, group exercises, and problem-solving activities.
- **Case Studies:** Real-world examples to illustrate successful community-based surveillance practices.
- **Role-Playing and Simulations:** Practice engaging communities in surveillance activities.
- **Expert Presentations:** Insights from experienced public health professionals and community leaders.
- **Group Projects:** Collaborative development of community surveillance plans.
- **Action Planning:** Development of personalized action plans for implementing community-based surveillance.
- **Digital Tools and Resources:** Utilization of online platforms for collaboration and learning.
- **Peer-to-Peer Learning:** Sharing experiences and insights on community engagement.
- **Post-Training Support:** Access to online forums, mentorship, and continued learning resources.

Register as a group from 3 participants for a Discount

Send us an email: info@fineskilltrainingcenter.org or call +254769199797

Certification

Upon successful completion of this training, participants will be issued with a globally recognized certificate.

Tailor-Made Course

We also offer tailor-made courses based on your needs.

Key Notes

- Participants must be conversant in English.
- Upon completion of training, participants will receive an Authorized Training Certificate.
- The course duration is flexible and can be modified to fit any number of days.
- Course fee includes facilitation, training materials, 2 coffee breaks, buffet lunch, and a Certificate upon successful completion.
- One-year post-training support, consultation, and coaching provided after the course.

- Payment should be made at least a week before the training commencement to Fineskill Training Center account, as indicated in the invoice, to enable better preparation.

Upcoming Scheduled Sessions

Start Date	End Date	Location	Price
23 Nov 2026	04 Dec 2026	Online	$2,000
23 Nov 2026	04 Dec 2026	Physical	$3,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$6,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$9,000
23 Nov 2026	04 Dec 2026	Physical	$12,000
23 Nov 2026	04 Dec 2026	Physical	$12,000

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