Training course on Circular Economy in Road and Pavement Construction

Professional Development Training Course Outline

Category	Civil Engineering and Infrastructure Management	**Duration**	5 Days
Base Fee	$1,500 USD	**Delivery Mode**	Online / On-site Hybrid

Course Introduction

The traditional linear model of "take-make-dispose" has profoundly shaped the road and pavement construction industry, leading to a significant depletion of virgin raw materials, vast energy consumption, and the generation of enormous quantities of waste. Pavement infrastructure, while essential for connectivity and economic growth, is a major contributor to environmental degradation, with millions of tons of asphalt and concrete waste ending up in landfills annually. This unsustainable trajectory necessitates a fundamental paradigm shift towards a circular economy approach, where resources are kept in use for as long as possible, their value is maximized, and waste is minimized or eliminated. Embracing circularity in road and pavement construction means moving beyond simple recycling to designing for longevity, reuse, and the continuous cycling of materials, transforming waste into valuable resources. This approach not only addresses environmental concerns but also offers substantial economic benefits through reduced material costs, lower disposal fees, and the creation of new business opportunities in resource recovery. Training Course on Circular Economy in Road and Pavement Construction is meticulously designed to equip with the specialized knowledge and practical skills required to implement circular economy principles throughout the entire lifecycle of road and pavement projects. Participants will gain a comprehensive understanding of material circularity, advanced recycling technologies, design for deconstruction, and innovative construction practices that prioritize resource efficiency. The curriculum will delve into cutting-edge approaches for utilizing recycled asphalt pavement (RAP), recycled concrete aggregate (RCA), and other waste materials, as well as exploring new business models that support closed-loop material flows. Through a blend of theoretical instruction, hands-on design exercises, and in-depth case studies of pioneering circular road projects globally, attendees will develop the expertise to conduct life cycle assessments, formulate circular pavement management plans, evaluate the economic benefits of circularity, and navigate the complex regulatory and financing landscapes associated with sustainable infrastructure. This course is indispensable for professionals committed to building more resilient, resource-efficient, and environmentally responsible transportation networks for a sustainable future.

Programme Curriculum

Training Course on Circular Economy in Road and Pavement Construction

Introduction

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This intensive 5-day training course is meticulously designed to equip civil engineering, pavement engineering, transportation planning, and environmental management professionals with the specialized knowledge and practical skills required to implement circular economy principles throughout the entire lifecycle of road and pavement projects. Participants will gain a comprehensive understanding of material circularity, advanced recycling technologies, design for deconstruction, and innovative construction practices that prioritize resource efficiency. The curriculum will delve into cutting-edge approaches for utilizing recycled asphalt pavement (RAP), recycled concrete aggregate (RCA), and other waste materials, as well as exploring new business models that support closed-loop material flows. Through a blend of theoretical instruction, hands-on design exercises, and in-depth case studies of pioneering circular road projects globally, attendees will develop the expertise to conduct life cycle assessments, formulate circular pavement management plans, evaluate the economic benefits of circularity, and navigate the complex regulatory and financing landscapes associated with sustainable infrastructure. This course is indispensable for professionals committed to building more resilient, resource-efficient, and environmentally responsible transportation networks for a sustainable future.

Course Objectives

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

1. Define circular economy principles and their specific application to road and pavement construction.
2. Analyze the environmental and economic benefits of adopting circular practices in pavement projects.
3. Identify key waste streams in road construction and opportunities for resource recovery.
4. Apply methodologies for incorporating high percentages of Recycled Asphalt Pavement (RAP) into new mixes.
5. Understand the use of Recycled Concrete Aggregate (RCA) in various pavement layers.
6. Explore design for deconstruction principles for pavements to facilitate future reuse and recycling.
7. Develop strategies for minimizing virgin material consumption and construction waste on site.
8. Understand the role of material passports and digital platforms in enabling circular material flows.
9. Evaluate the performance and durability of pavements constructed with circular materials.
10. Navigate relevant policies, standards, and certifications supporting circular pavement construction.
11. Utilize software tools for life cycle assessment (LCA) and material flow analysis in pavements.

12. Analyze case studies of successful circular economy implementations in road and pavement projects globally.
13. Drive the transition towards a more circular and sustainable road infrastructure sector.

Target Audience

This course is essential for professionals seeking to implement circular economy principles in road and pavement construction:

1. Civil Engineers: Specializing in pavement design, construction, and materials.
2. Pavement Engineers: Focusing on material circularity and sustainable performance.
3. Transportation Planners: Developing sustainable and resilient road networks.
4. Construction Managers: Overseeing road projects and waste management.
5. Environmental Consultants: Advising on circular economy strategies in infrastructure.
6. Government Officials: From transport and public works agencies.
7. Material Suppliers & Manufacturers: Innovating circular pavement products.
8. Researchers & Academics: Studying circular economy in civil engineering.

Course Duration

5 Days

Course Modules

Module 1: Introduction to Circular Economy in Pavement Construction

- Define the circular economy model and its contrast with the linear model.
- Analyze the environmental and resource challenges of conventional road construction.
- Discuss the core principles of circularity: reduce, reuse, recycle, remanufacture, restore.
- Explore the drivers for adopting circular economy in the pavement sector.
- Overview of global initiatives and frameworks promoting circular infrastructure.

Module 2: Waste Streams and Resource Recovery in Pavements

- Identify major waste streams generated during pavement construction, rehabilitation, and demolition.
- Understand the composition and characteristics of Recycled Asphalt Pavement (RAP) and Recycled Concrete Aggregate (RCA).
- Discuss other potential waste materials for pavement applications (e.g., tires, glass, industrial by-products).
- Explore the hierarchy of waste management applied to pavement materials.
- Learn about the potential for valorization of pavement waste into new products.

Module 3: High-RAP and Cold Recycling Technologies

- Understand the technical considerations for incorporating high percentages of RAP into asphalt mixes.
- Explore hot recycling techniques for asphalt pavements.
- Discuss cold in-place recycling (CIR) and cold central plant recycling (CCPR) for asphalt.
- Learn about full-depth reclamation (FDR) as a pavement recycling method.
- Analyze the performance, energy savings, and emission reductions of high-RAP and cold mixes.

Module 4: Recycled Concrete Aggregate (RCA) in Pavement Layers

- Define Recycled Concrete Aggregate (RCA) and its production from concrete waste.

- Discuss the application of RCA in granular base, subbase, and concrete pavement layers.
- Understand the properties of RCA and its impact on pavement structural performance.
- Explore mix design considerations for concrete pavements incorporating RCA.
- Examine the environmental benefits and quality control for RCA utilization.

Module 5: Design for Deconstruction and Longevity

- Learn principles of designing pavements for ease of deconstruction and material recovery.
- Discuss modular pavement systems that facilitate reuse of components.
- Explore long-life pavement design (e.g., perpetual pavements) to extend service life.
- Understand the importance of material selection for durability and recyclability.
- Apply design for circularity principles to pavement structures.

Module 6: Material Passports and Digitalization for Circularity

- Define material passports and their role in tracking materials and components.
- Explore digital platforms and databases for material exchange and reuse.
- Discuss the use of Building Information Modeling (BIM) for material quantity take-offs and tracking.
- Understand how digitalization can enhance transparency and traceability in the supply chain.
- Learn about the potential of blockchain for material circularity in construction.

Module 7: Circular Business Models and Supply Chains

- Explore new business models supporting circularity (e.g., product-as-a-service for pavement materials).
- Discuss the development of reverse logistics for material collection and processing.
- Understand sustainable procurement practices for circular pavement materials.
- Examine the role of collaboration and partnerships in creating circular supply chains.
- Analyze economic incentives and financial mechanisms supporting circular pavement projects.

Module 8: Policy, Standards, and Future Trends in Circular Pavements

- Review national and international policies promoting circular economy in road construction.
- Discuss relevant industry standards and specifications for recycled and alternative pavement materials.
- Explore green infrastructure certifications and their relevance to pavement circularity.
- Examine emerging technologies: self-healing pavements, carbon-negative materials, energy-harvesting roads.
- Identify future challenges and opportunities for scaling circular economy in the pavement sector.

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	27 Nov 2026	Online	$1,000
23 Nov 2026	27 Nov 2026	Physical	$1,500
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$3,000
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$4,500
23 Nov 2026	27 Nov 2026	Physical	$6,000
23 Nov 2026	27 Nov 2026	Physical	$6,000

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