

Course Name

Resilient Infrastructure: Design & Adaptation

Sector Name

Civil Engineering

Document Type

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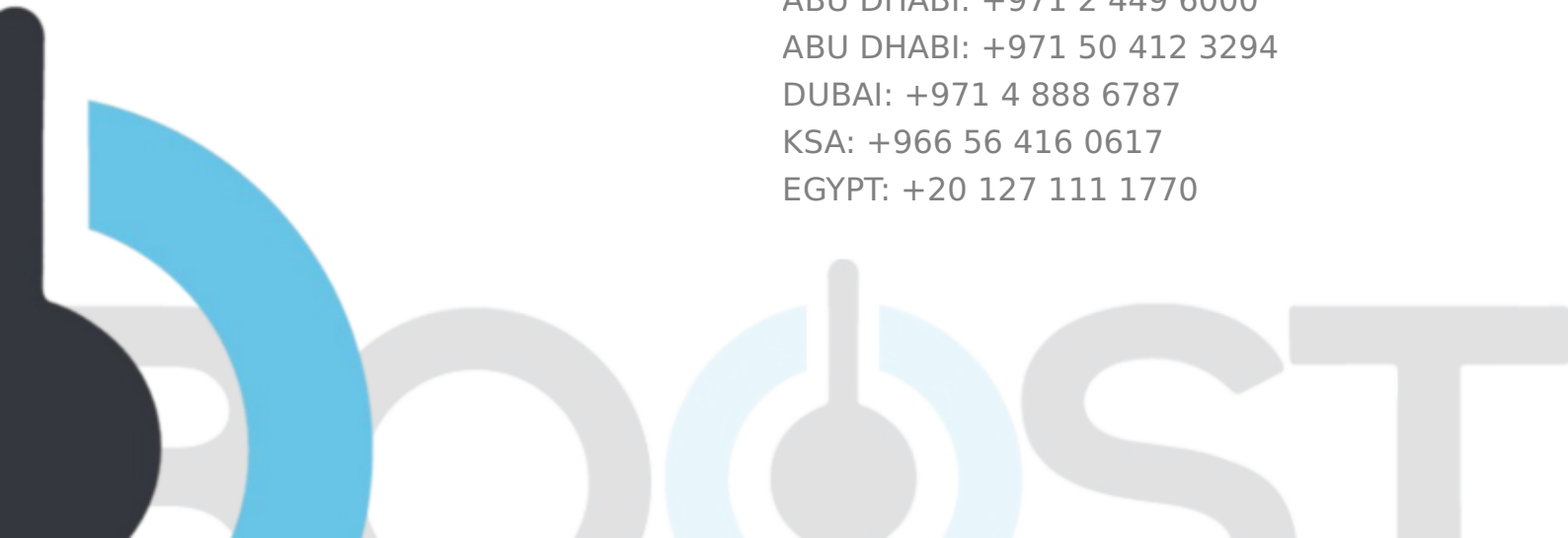
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Resilient Infrastructure: Design & Adaptation

Course Introduction

Infrastructure is expected to perform for decades, yet the conditions surrounding it rarely remain unchanged. Extreme weather, flooding, heat, changing environmental loads, ageing systems, growing demand, and unexpected disruptions can expose weaknesses that were not critical when an asset was originally designed. For civil engineers, resilience therefore requires more than designing for normal operating conditions; it requires understanding how infrastructure responds when conditions move beyond the expected.

Boost Consulting & Training has designed this course to help engineers incorporate resilience into practical infrastructure decisions. Participants will examine vulnerability, critical functions, failure pathways, redundancy, robustness, adaptation options, and recovery considerations across the infrastructure lifecycle. Rather than treating resilience as a broad sustainability concept, the program focuses on tangible engineering choices that can reduce disruption, protect essential functions, and improve the ability of infrastructure to adapt.

The main concept of this course is to design and adapt infrastructure around its ability to withstand disruption, maintain

critical performance, and recover effectively when operating conditions change.

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Target Audience

- ✓ Civil and infrastructure engineers
- ✓ Design and engineering consultants
- ✓ Infrastructure asset and maintenance professionals
- ✓ Project and technical engineering professionals

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Learning Objectives

- ✓ Explain resilience in the context of civil infrastructure performance.
- ✓ Identify hazards, stresses, and changing conditions affecting infrastructure assets.
- ✓ Assess infrastructure vulnerability and potential failure pathways.
- ✓ Determine critical functions and acceptable levels of performance during disruption.
- ✓ Apply robustness, redundancy, adaptability, and recoverability principles to engineering solutions.
- ✓ Evaluate resilience improvement options for existing infrastructure.
- ✓ Incorporate resilience considerations into infrastructure design and upgrade decisions.
- ✓ Develop practical resilience and adaptation measures for infrastructure systems.

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Resilient Infrastructure: Design & Adaptation

Course Outline

✓ DAY 1

Understanding Infrastructure Under Stress

Infrastructure Resilience in Engineering Practice

- ✓ Distinguishing resilience from conventional reliability, durability, and risk management
- ✓ Understanding how infrastructure performance changes before, during, and after disruption
- ✓ Identifying the functions and services that must be protected under adverse conditions

Mapping Infrastructure Stressors

- ✓ Examining extreme weather, flooding, heat, environmental change, ageing, and demand pressures
- ✓ Identifying chronic stresses alongside sudden disruptive events
- ✓ Developing an Infrastructure Stress Map for a selected asset or system

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Course Outline

✓ DAY 2

Finding Vulnerabilities Before They Become Failures

Identifying Vulnerable Components and Interfaces

- ✓ Examining physical weaknesses, dependencies, bottlenecks, and exposed infrastructure components
- ✓ Understanding how failure in one element can affect connected assets and services
- ✓ Identifying concentration points where disruption can produce disproportionate consequences

Tracing Failure Pathways

- ✓ Exploring how initiating events can progress through infrastructure systems
- ✓ Examining cascading and compound effects rather than isolated asset failures
- ✓ Completing a Failure Pathway Analysis for a realistic infrastructure disruption scenario

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Course Outline

✓ DAY 3

Engineering for Resilient Performance

Building Robustness and Redundancy

- ✓ Strengthening critical components against foreseeable stresses and abnormal conditions
- ✓ Introducing redundancy without creating unnecessary engineering complexity
- ✓ Protecting essential functions when individual components become unavailable

Designing for Adaptability

- ✓ Incorporating flexibility into infrastructure expected to face changing future conditions
- ✓ Considering modularity, alternative operating arrangements, capacity margins, and adaptable solutions
- ✓ Completing a Resilient Design Challenge for infrastructure exposed to changing demands

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Course Outline

✓ DAY 4

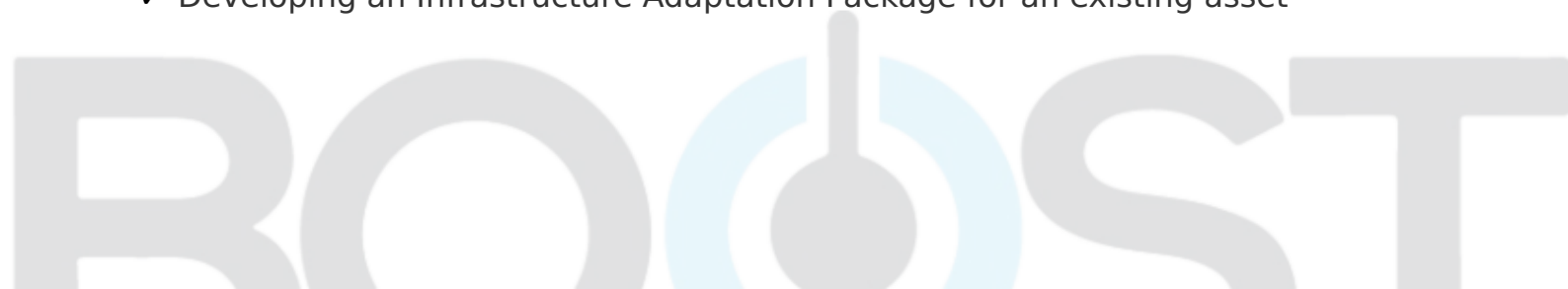
Adapting Existing Infrastructure

Prioritizing Resilience Improvements

- ✓ Identifying existing assets where resilience intervention provides the greatest operational value
- ✓ Comparing physical upgrades, protection measures, alternative configurations, and operational adaptations
- ✓ Balancing resilience benefits against technical constraints, disruption, and available resources

Developing Practical Adaptation Solutions

- ✓ Selecting interventions according to vulnerability, criticality, remaining asset life, and future exposure
- ✓ Combining immediate protective measures with longer-term infrastructure adaptation
- ✓ Developing an Infrastructure Adaptation Package for an existing asset



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Course Outline

✓ DAY 5

From Individual Assets to Resilient Infrastructure Systems

Managing Infrastructure Interdependencies

- ✓ Examining dependencies between transportation, water, energy, communications, and supporting infrastructure
- ✓ Identifying resilience gaps created at interfaces between interconnected systems
- ✓ Coordinating engineering priorities where infrastructure systems share critical dependencies

Turning Resilience into Engineering Decisions

- ✓ Embedding resilience criteria into design reviews, upgrades, rehabilitation, and asset planning
- ✓ Establishing practical indicators for tracking resilience improvements over time
- ✓ Producing a Resilience Action Roadmap for a selected infrastructure system

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Confirmed Sessions

FROM	TO	DURATION	FEES	LOCATION
Dec. 21, 2026	Dec. 25, 2026	5 days	4250.00 \$	UAE , Dubai
Jan. 24, 2027	Jan. 28, 2027	5 days	4250.00 \$	KSA , Jeddah
May 31, 2027	June 4, 2027	5 days	4250.00 \$	UAE , Dubai
Sept. 27, 2027	Oct. 1, 2027	5 days	4950.00 \$	England , London

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