



ice

Institution of Civil Engineers

Training

ICE Training

The professional development architecture for modern infrastructure careers

Contents

1	Introduction	page 3
2	Our Learning Architecture	page 4
3	Why Professional Training Matters	page 5
4	Technical Discipline Pathways	page 6
5	Cross Sector Professional Capabilities	page 10
6	Course Catalogue	page 11
7	Training Delivery Options	page 12
8	In House Training Benefits	page 12
9	Trainer Expertise	page 13
10	Professional Development & ICE Membership Support	page 13
11	Getting Started	page 14

1 Introduction

Building capability for the infrastructure challenges of today and tomorrow

Civil engineering is evolving rapidly

Sustainability, safety, digital transformation and changing societal expectations are reshaping how infrastructure is designed, delivered and maintained. In this environment, professional capability is not optional - it is fundamental.

ICE Training provides the structured, modern learning that today's engineers, project managers and construction professionals need to perform with confidence. Our programmes strengthen technical expertise, build leadership and delivery capability and support the behaviours required for successful, future ready infrastructure.

Whether developing foundational knowledge or advancing towards technical authority, ICE Training enables learners and organisations to grow capability with purpose.

To support this mission, ICE Training's learning architecture provides a clear, structured framework that guides development across all technical and professional areas.



2 Our Learning Architecture

A clear, structured pathway for developing the skills modern infrastructure careers demand. Every ICE Training programme is built around two core elements:

Technical Disciplines

- Structures & Buildings
- Ground Engineering
- Transport & Rail
- Energy

Cross Sector Capabilities

- Sustainability
- Health & Safety
- Digital Transformation
- Infrastructure Delivery
- Leadership & Ethics

Together, these define what learners develop throughout their training journey. All cross sector capabilities are embedded across every discipline, ensuring every pathway delivers both deep technical expertise and the wider professional behaviours needed for modern infrastructure delivery.

How progression works

Learning across all disciplines and capabilities is structured through three levels:

- **Foundation** – essential knowledge
- **Intermediate** – applied capability
- **Advanced** – strategic leadership and technical authority

This framework ensures that learning is coherent, progressive and relevant to real-world professional practice. It enables individuals and organisations to build capability in a structured way - from technical fundamentals to advanced decision-making, leadership and professional excellence. **This structured approach is underpinned by clear evidence demonstrating the value of targeted professional development.**

3 Why Professional Training Matters

Evidence consistently shows that structured professional development improves cost efficiency, quality and collaboration across project teams.

A focused investment in professional development leads to measurable improvements across the project lifecycle:

- Improved cost efficiency - 95% of organisations report on improved cost efficiency following investment in structured professional development.
- Reduced disputes and enhanced collaboration - 85% report fewer disputes and enhanced collaboration across teams.
- Measurable quality improvements - 83% experience measurable quality improvements

These benefits come to life through our discipline specific pathways, which set out how professional capability develops across key areas of civil engineering.



4 Technical Discipline Pathways

Each pathway outlines the expected progression of professional competencies, providing clarity on how capability develops across the levels - helping learners understand how their expertise grows over time.

Structures & Buildings

Overview

This pathway outlines the competency progression associated with structural engineering roles, supporting development in materials, design principles, temporary works, retrofit and digital modelling.

What capability looks like at each level:

Foundation

- Understanding of fundamental structural principles
- Awareness of materials, testing and quality
- Ability to interpret drawings and specifications
- Early exposure to structural behaviour and construction sequencing

Intermediate

- Application of design standards
- Integration of temporary works and geotechnical considerations
- Coordination with multi-disciplinary teams
- Assessment and reporting on structural solutions

Advanced

- Leading structural design strategy
- Applying retrofit and adaptation principles
- Ensuring whole life performance and sustainability
- Providing senior technical oversight and assurance



Sector Themes

Retrofit; sustainable materials; digital design and modelling; safety and compliance.

Ground Engineering

Overview

Ground engineering is fundamental to infrastructure safety and resilience. This pathway outlines the progression of competencies and supports confident interpretation of ground conditions, earthworks, geotechnical design and risk management.

What capability looks like at each level:

Foundation

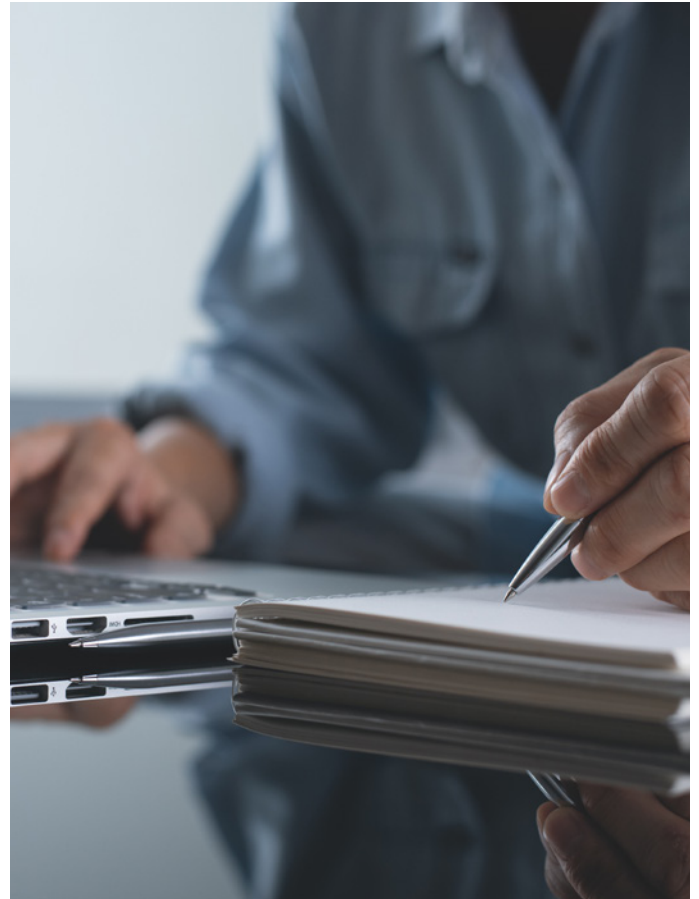
- Understanding of soils, ground behaviour and earthworks
- Awareness of site investigation and data collection
- Basic interpretation of ground risks
- Link between ground conditions and safe construction practice

Intermediate

- Interpreting ground investigation data
- Coordinating geotechnical assessments with design
- Selecting appropriate foundation and earthworks solutions
- Managing risk during construction

Advanced

- Leading geotechnical strategy on complex projects
- Integrating ground behaviour with structural and civil design
- Managing uncertainty and resilience in ground engineering
- Technical leadership and mentoring



Sector Themes

**Systems thinking; active travel;
digital transport tools;
climate-resilience.**

Transport & Rail

Overview

Modern transport infrastructure requires coordinated thinking across movement, safety, systems, active travel and long-term operation. This pathway illustrates how skills and knowledge evolve to support holistic, multi-modal transport planning and delivery.

What progression looks like at each level:

Foundation

- Understanding transport design principles
- Awareness of active travel and network design
- Ability to interpret and apply design standards at an introductory level
- Recognition of user-centred design considerations

Intermediate

- Applying design standards to transport schemes
- Analysing movement data and system interactions
- Supporting integrated transport planning
- Evaluating design options and operational constraints

Advanced

- Leading multi-modal transport strategy
- Integrating technology and systems thinking
- Managing sustainability and climate-resilient mobility
- Providing technical leadership and project assurance



Sector Themes

**Systems thinking; active travel;
digital transport tools;
climate-resilience.**

Energy (Coming Soon)

Overview

This pathway defines the evolving competencies required for civil engineers contributing to the energy transition - from renewable generation to grid infrastructure and energy storage.

What capability looks like at each level:

Foundation

- Awareness of energy system components
- Understanding the civil engineering role in energy delivery
- Basic principles of resilience and sustainability

Intermediate

- Applying engineering methods to energy infrastructure
- Interpreting standards and system performance
- Supporting planning and delivery of energy projects

Advanced

- Leading multi-disciplinary energy programmes
- Integrating digital, carbon and resilience strategies
- Supporting net zero commitments through engineering solutions



Sector Themes

Energy transition; grid modernisation; climate-resilience; smart energy systems.

Alongside these technical discipline pathways, cross sector capabilities build the professional behaviours and decision making skills that every engineer needs - whatever their specialism.

5 Cross Sector Professional Capabilities

These capabilities strengthen every discipline and embed the professional behaviours needed for modern infrastructure delivery.

Sustainability

Embedding responsible, low carbon and climate resilient decision making.

You'll gain:

- Understanding of sustainability principles
- Confidence applying carbon management methods
- Awareness of climate resilient approaches

Health & Safety

Building a culture of safe design, risk awareness and professional responsibility.

You'll gain:

- Strong understanding of CDM and safety roles
- Practical risk assessment capability
- Ability to embed safety in design and delivery

Digital transformation

Using digital tools to improve accuracy, collaboration and decision making.

You'll gain:

- Digital fluency and information management skills
- Practical BIM and workflow confidence
- Insight into emerging digital strategies

Infrastructure delivery

Delivering projects effectively across the full lifecycle.

You'll gain:

- Understanding of contract and delivery models
- Coordination and planning capability
- Insight into whole life value and asset thinking

Leadership & ethics

Leading teams with clarity, integrity and professional judgement.

You'll gain:

- Ethical decision making skills
- Leadership and communication confidence
- Ability to mentor, influence and support others

These competencies are supported by a comprehensive portfolio of courses designed to meet learners wherever they are in their development journey.

6 Course Catalogue

Delivery formats

ICE Training provides flexible delivery formats. Many courses are available as trainer led virtual or classroom sessions, while some are also offered as eLearning. Please check individual course pages for format availability.

Foundation Level

- Active Travel Design Principles
- Concrete Appreciation
- Digital Twin – Foundation
- Fundamentals of CDM2015
- ICE BIM for Infrastructure – Foundation
- Introduction to Project Management - APM (PFQ Preparation)
- Introduction to Sustainable Development
- Using Asphalts with Confidence
- ICE BIM for Infrastructure - BIM in Practice
- ICE Law and Contracts and NEC4
- ICE Professional Review Preparation Course
- Management and Leadership for Engineers
- Mentoring for Supervising Civil Engineers and Delegated Engineers
- Principles of Construction Contracts
- Procurement, Contracts and Project Management
- Technical Report Writing
- Temporary Works Design - Above Ground
- Temporary Works Design - Below Ground

Intermediate Level

- APM Project Risk Management (Level 1)
- Carbon Management in Infrastructure
- CDM2015: The Principal Designer and Designer - Demonstrating Capability
- Construction Contract Strategy in an International Market
- Digital Transformation: Implementing a BIM Strategy
- Earthworks: Theory & Practice
- Foundation Design
- Health, Safety, Welfare & Risk Assessment
- Highway Design Using the DMRB

Advanced Level

- BIM Implementation - putting people first
- Carbon in Infrastructure Procurement
- ICE Law and Contracts for Accredited NEC4 ECC Project Managers
- ICE Mini MBA in Infrastructure
- Project Management for Civil Engineering and Construction Professionals + APM PMQ exam
- The Comprehensive CDM2015 Overview

Our training is available in flexible formats, ensuring organisations can access development in the way that best fits their needs.

7 Training Delivery Options

Flexible formats designed for modern learning

- Public Courses – Virtual or classroom
- Virtual Delivery – Live online learning
- In-House Training – Delivered at your offices or sites
- Bespoke Programmes – Tailored content for your organisation
- Multi-Programme Packages – Structured development for teams

Global delivery

Training can be delivered worldwide, with content adapted to local regulations, standards and industry needs.

All programmes are developed and delivered by experienced industry professionals, ensuring high-quality, consistent and practical and industry-relevant learning.

8 In House Training Benefits

For many teams, in house delivery offers the most impactful and cost effective way to build capability at scale.

Why organisations choose in house training

- Contextualised learning based on your projects and standards
- Consistent skill uplift across teams
- Cost effective for group delivery
- Flexible scheduling around operational priorities
- Safe and confidential environment for discussing challenges

Whichever delivery option you choose, the quality of the learning experience is driven by our expert trainers.

9 Trainer Expertise

All ICE Training programmes are delivered by experienced engineers, project managers and industry specialists. Our trainers are selected and approved by ICE Training for their expertise, industry experience and ability to deliver high-quality, practice-focused learning.

10 Professional Development & ICE Membership Support

Our programmes also support professional progression, aligning closely with ICE's development pathways and membership requirements.

ICE Training supports

- **CPD** – Continuing Professional Development
- **IPD** – Initial Professional Development
- **Professional Review** preparation for ICE membership
- Development of knowledge and skills that contribute to UK-SPEC competence areas

APM Qualifications

ICE Training delivers APM (Association for Project Management) recognised PFQ and PMQ programmes **in partnership with 20/20 Project Management Training**, an accredited APM training provider. These qualifications provide structured project management capability recognised across the infrastructure and construction sector.

With this structure in place, it's easy to begin building capability where it matters most.

11 Getting started

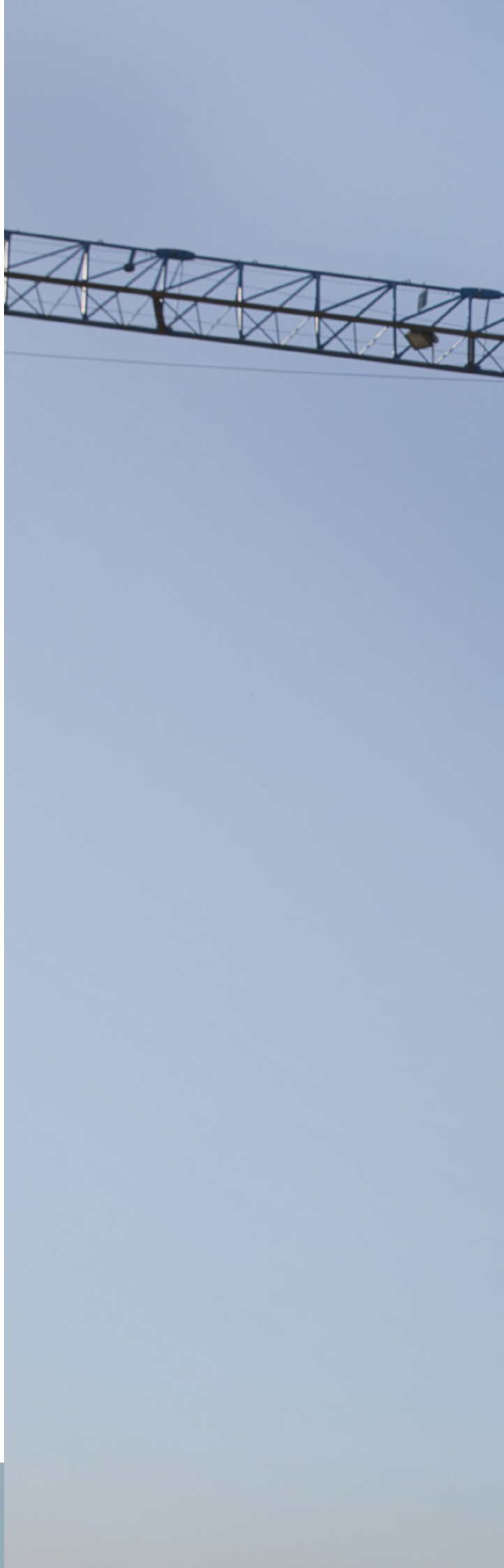
Begin your learning journey and build the capability needed for today's infrastructure challenges.

For proposals, tailored programmes or booking enquiries, please contact our team to discuss your training requirements.

Visit: icetraining.org.uk

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Transform
your team.

Transform
your projects.

Transform
your career.

**Invest in ICE
Training today.**

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