
Successful Professional Reviews for Civil Engineering Technicians

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Successful Professional Reviews for Civil Engineering Technicians

Malcolm Peake

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Preface

The Institution of Civil Engineers (ICE) requirements for professional qualification are set out in its guidance documents:

- *Technician Professional Review Guidance*
- *Civil Engineering Technician Apprenticeship Level 3 Version 1.1 End Point Assessment Guidance*
- *Civil Engineering Senior Technician Apprenticeship Level 4 Version 1.1 End Point Assessment Guidance.*

As a licensee of the Engineering Council, the ICE is required to follow the *UK Standards for Professional Engineering Competence and Commitment, 4th edition (UK-SPEC)*. This sets out the prescribed standards for competence and commitment required for registration as EngTech.

The Engineering Council have also published *The Approval and Accreditation of Qualifications and Apprenticeships (AAQA), 1st edition*. This sets out the policy, context, rules and procedures for recognising learning and development programmes that help develop competence and commitment to the UK-SPEC standard.

The Attributes (or KSBs) to be demonstrated to the ICE at the conclusion of a trainee's initial period of development reflect those standards demanded by the Engineering Council. This book is written to assist trainee technicians, apprentices and those responsible for their development.

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Acknowledgments

This book has been a long time in the making. After several years of anticipation and dedication, it has finally come to life. The journey has been long and filled with countless challenges, difficulties and many moments of doubt. I am deeply grateful to everyone who has supported the production of this book. Your encouragement and belief in this project have been the driving force behind its completion.

First and foremost, I would like to thank my family for their unwavering support and patience. You have given me the time and space to dedicate myself to bringing this book to life. In addition, I have been fortunate to be able to draw on the help, support and inspiration from an experienced panel of people from across the industry. This support has been invaluable in helping to ensure this book reflects the broad opinions of the industry. I extend my thanks to you all for your ever-present support and the countless advice, anecdotes and challenges you have all provided in the writing of this book. Your insights and enthusiasm have been invaluable.

With this in mind, I would like to offer my thanks and recognition to Ayo Ajayi, Sam Ashman, Steve Byrom, Laura Clegg, Simon Dunbar, Rob Ehren, Jayne Geary, Kate Harrison, Alex Hudson, Steve Hyde, Ibrahim Kapasi, Sebastian Kreft, Jill Mascarenhas, Sean Melody, Jason Nell, Philip Parker, Aaron Passfield, Tom Player, Amy Pledge, Tom Price, Mike Rogers, Hazel Sanders, Jason Shannon, Hannah Shewan-Friend, Annabel Smith, Rich Tournay, Ingrid Valceschini, Jean Venables and George Woods.

Writing this book has been an amazing journey. Special thanks go to Mike Clark (you are an exceptional communicator), Sue Hawkes (your poem is amazing, your passion and drive to see real change for technicians are limitless), Tim Brownbridge (your career reflects a deep commitment to advancing the construction industry through education, training and professional development), Katherine Warner (you have helped me navigate the intricacies of apprenticeships) and to my wife Jo Peake (your attention to detail and strong grammar skills are second to none, your support and patience have been invaluable). I am also immensely grateful to the editors, Cathy Sellars and Michael Fenton, whose keen eye and thoughtful feedback coupled with a consistent enthusiasm have helped shape this book into what it is today.

This book has been inspired by a similar set of books for engineers written by Patrick Waterhouse, who combines a natural enthusiasm for professional development and a deep well of knowledge with a relaxed and engaging communication style. I am grateful for all of Patrick's advice and guidance in helping me to gain the confidence to get this book started. I hope I have produced something that is worthy enough to complement the respected range of books written by him, Mac Steels and Jean Venables.

Although I have benefited from the considerable wisdom, advice and support from a large panel of people, I take full responsibility for any mistakes contained in this book.

Malcolm Peake
November 2024

Prelude

I met Susan Hawkes when she was ‘just’ doing a bit of drawing. Neither of us had any idea what would happen next. Sue not only became a technician member of the ICE, she volunteered as the local branch rep, followed by vice-chair and then chair. Soon afterwards she stood for the ICE Council. She is currently working with the Engineering Council on their vision for change.

Sue is currently a Reviewer, End Point Assessor and Fellow of the ICE.

Shortly after passing her technician professional review, she penned this poem. I am including it here for you all to enjoy.

Hello, my name is Sue, I’m a CAD technician, how do you do?
Every day, I draw, every day, a little bit more.
I drink coffee, and I drink tea, I talk to people, and they talk to me.
At the end of the month, they give me money, it’s called a salary, ain’t that funny?

I’m an Eng Tech MICE, letters after my name, it makes no difference coz I’m still the same.
But the degree of respect I get from my peers, truly amazing, brings me to tears.
I go to work, I do my bit, all day long, I draw and sit.
Don’t get me wrong, I do work hard, I play my role, I do my part.
I’m part of a team, a wheel in a cog, we all work together, we all do our job.

The design team give me the info I need, I produce my drawings for the client to read.
They give their approval, say it’s alright, then it goes to the pilers who take it to site.
They build the cofferdams and walls of sheet piles, then my drawings get put into their files.

The client then pays us for a job well done, or at least that’s how they say the company’s run.
I’ve been on a course to learn about cranes, but I soon discovered I had to use my brain.
Appointed Person they said I’d be, but I drew the line at the responsibility.

I’d get the knowledge, the info I need, and leave it at that, I said I’d concede.
I’m not an engineer, never wanted to be, I just wanted to draw and to be happy.

Now I get paid for doing a job like this, I really love it, it’s bliss.
I’ve joined a committee part of the ICE, to make a difference, but, I’m still me.
I organise events for learning and fun, and if you get the chance you should book on and come.
A STEM ambassador I’ve also become, to show young people that engineering is fun.
So, don’t forget my name, its Sue, and I’m a CAD technician, thank you.

Sue Hawkes EngTech FICE FWES

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About the author

Malcolm Peake is a professionally qualified chartered civil engineer and a Fellow of the Institution of Civil Engineers (ICE). He has extensive experience in the design, management and delivery of various road, rail and marine engineering projects. Over his career, he has changed his focus from developing solutions to solve civil engineering problems to one helping people to develop their professional careers.

As a membership development officer, he worked for a decade directly for the ICE, developing and implementing initiatives while providing advice and guidance to aspiring members. Since then, he has moved to Tony Gee and Partners where he supports the company's ongoing focus on learning and development while embracing its unique culture. This includes managing the initial professional development of students, apprentices and graduates as they build the foundations for their own careers.

Malcolm has always sought to engage, share and learn about professional development. He is a member of the Civil Engineering Employers' Training Group (CEETG), vice-chair of membership for ICE South East England Regional Committee and a member of the ICE Kent & East Sussex branch. He has been a Reviewer for over 10 years and an End Point Assessor since 2020 and a trainer of new reviewers.

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Introduction

There are several books and guides aimed at supporting engineers who wish to forge a career in civil engineering. There are some well-known, excellent books: *Initial Professional Development for Civil Engineers*, *Mentoring for Civil Engineers* and *Successful Professional Reviews for Civil Engineers*, all authored by Patrick Waterhouse and published by ICE Publishing. But so far there has not been something similar for civil engineering technicians. This book has been written to fill that gap.

This book is for people who can solve practical engineering problems in the civil engineering industry. The aim of the book is to provide a useful guide to show how it is possible to use those skills and experiences to become professionally recognised as a civil engineering technician with the Institution of Civil Engineers.

This book is primarily focused on the ICE reviewing process for people applying directly for recognition as EngTech MICE or using the apprenticeship route. It is an accumulation of years of experience from a diverse pool of knowledge across the civil engineering industry. By reading this book you will gain an understanding of what you need to do to apply and be successful in either your technician professional review or your end point assessment.

REFERENCE

EC (Engineering Council) (2024) *The EngTech eBook*. Engineering Council, London, UK. <https://www.engc.org.uk/engcdocuments/internet/WebsiteEngTech20eBook.pdf> (accessed 05/09/2024).

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Chapter 1

The history of technicians

This book aims to provide a practical guide on how to approach a professional review, offering step-by-step instructions, tips and best practice. Whether you are a seasoned professional or new to the field, this book will give you the knowledge you need to prepare and succeed in your review. However, before diving into the details, it is worth stepping back and briefly looking at the history of technicians.

Alternatively, if you are the type of person who is not great at reading lots of text or simply doesn't have time for unnecessary details and just wants to get things done, skip this chapter and head directly to chapter 5 where you will find some clear steps outlining how to achieve your goals.

Being a member of a professional organisation means you are part of a community of professionals who share similar standards, ethics and goals. It's about sharing knowledge, supporting each other and upholding high standards in your work. It could be worth getting to know the Institution of Civil Engineers to get a sense of whether its values align with your own before taking the plunge and applying to join. This chapter is intended to provide a historical context, demonstrating how technicians have been the backbone of the industry and giving an insight into the evolution of the professional standards and practices.

Civil engineering technicians have always played a vital role in the civil engineering industry. From the very beginning technicians have had key roles in the design and delivery of engineering solutions. They have been an integral part of the industry, translating theoretical knowledge into practical solutions, shaping the built environment of their time.

However, their contribution to the civil engineering industry has often gone unrecognised. For most of the history of science and engineering, technicians have been invisible. Technicians are often the forgotten people. If acknowledged at all, they have been referred to as CAD monkeys, tracers or lab rats. Part of their role involved giving up their independence and giving up on any credit, working instead as nothing more than an assistant to the engineer (University of Bristol, 2023).

The Industrial Revolution

Things started to change during the Industrial Revolution. This arguably changed the whole of civilised society. Beginning in the UK, many technological innovations started to be developed during the late eighteenth century and continued into the nineteenth century. This marked a significant turning point in history. The Industrial Revolution influenced almost every aspect of daily life. The mechanisation of industries and the growth in steam power

brought about new ways of working and living, resulting in a surge in demand for new technical skills.

Technical skills were developed across many areas, starting in the agricultural and textile industries through the mechanisation of power and the invention of new machinery. This industrialisation was boosted by the development, design and construction of ports, canals and roads to help move raw materials and finished products more efficiently. This increased the need for resources and subsequently fuelled and inspired further demands for industrial progress in mining and the generation of new sources of energy. The invention of steam trains and growth of the rail industry continued the need to develop technically capable people. This is also recognisable today as we transition from a digital revolution to a technological revolution.

Did you know?

Industrialisation required people to develop a knowledge and understanding of engineering. Since the eighteenth century there has been an increased need to have people capable of applying proven techniques to solve practical engineering problems. Those problems could be in a variety of situations, including the design, manufacture, maintenance or demolition of various products, equipment, processes or services.

Not only did the Industrial Revolution drive the need to develop technically capable people, but it also brought about a new organisation of work known as the factory system. This required improvements in the need to organise resources to ensure work was done with consideration to cost, quality and safety. This created a need to have managers, foremen and others capable of organising the delivery of work. The factory system enabled the manufacture of goods to consistent, precise specifications. This enabled work to be completed reliably and by following quality processes.

During this time the location of work changed from rural areas and concentrated workers in cities and towns. The increased urbanisation of the population initially resulted in crowded, substandard housing and poor sanitary conditions. The Building Act 1774 drove improvements in the construction of housing, while in 1865 Bazalgette's sewers industrialised the water sanitation industry. The Industrial Revolution also brought about a desire to be ethical alongside the regulation of health and safety.

Did you know?

The first modern piece of health and safety legislation was the Morals of Apprentices Act 1802, which was the first of hundreds of pieces of regulation that led to the implementation of the Health and Safety at Work Act 1974 (HSWA).

The Society of Civil Engineering Technicians

Although the Institution of Civil Engineers was founded in 1818 and is the oldest professional institution in the world, the role of technicians was not recognised until 1968, when the Society of Civil Engineering Technicians (SCET) was established.

SCET recognised that technicians undertook work of a ‘very important nature’ and, because of this, their employers found it necessary for the individuals to undergo formal training (Forester, 1987). They established two formal qualifications: the Technician Engineer, TEng MSCET, and the Technician Fellow, TEng FSCET. Over the next decade this society grew in stature and significance. In the 1980s it looked to merge with the ICE. The full merger came in 1989, bringing over 4000 new members to the ICE (SCET, 1989).

In 1995 the title had evolved to EngTech TMICE before becoming the more familiar EngTech MICE in 2015, which is the title currently in use. The combining of SCET and the ICE has had the benefit of reflecting how technicians are members of the civil engineering community, but perhaps it has also resulted in a partial loss of the independent identity which was achieved through SCET.

This may have given the impression that the qualification of EngTech was subordinate to, or a stepping stone to, status as an engineer as either Incorporated Engineer, IEng, or Chartered Engineer, CEng. While, for some, the opportunity of progressing from a technician to an engineer may be appealing, for many it is not.

In addition, in the late 1990s the industry focus was not on technicians. Educational requirements for IEng were changed and the quantity of people looking to achieve recognition as a technician declined. This, coupled with advances in technology such as CAD, appeared to sound the death knell for the role of technician. But in recent times, like a phoenix rising from the ashes, there has been a renewed focus by the civil engineering industry on technicians and we now have a thriving community of technicians at EngTech MICE and EngTech FICE.

Did you know?

Technicians are defined as:

worker[s] trained with specialist skills, especially in science or engineering.

(Cambridge English Dictionary, 2024)

Revival

This desire to identify and recognise technicians started to build slowly in 2009. It was given a boost by Prime Minister David Cameron when he launched the EngTechNow campaign in June 2013. EngTechNow was led by the Institution of Civil Engineers (ICE), the Institution of Mechanical Engineers (IMechE) and the Institution of Engineering & Technology (IET),

in conjunction with the Engineering Council. It was further supported in 2014 by Lord Sainsbury's Gatsby Charitable Foundation ([New Civil Engineer, 2014](#)).

In 2011, the Institution of Civil Engineers introduced the Jean Venables Medal. The aim of the award is to promote awareness of the role and achievements of newly qualified engineering technicians. Jean Venables (144th president of the ICE) has significantly contributed to raising the profile of technicians. Her efforts have left a lasting impact, ensuring that the contributions of technicians are acknowledged and celebrated within the engineering community.

This newfound recognition, coupled with a growth in college-based apprenticeship courses such as civil engineer technician and civil engineer senior technician, has fuelled a dramatic enthusiasm for recognising the considerable value technicians bring to the industry. Since 2009 the number of people achieving technician membership of the ICE has increased from an average of 50 per year to 400 per year. Although there is still work to be done, there has clearly been a positive shift towards making technicians more visible and better supported.

“I'm delighted to see technicians getting their own guide to help them prepare for the technician review. This is a class of membership that did not exist when I wrote *Preparing for the Professional Examinations of the Institution of Civil Engineers* in 1989.

Technicians are an integral part of a project team and being a Technician Member of the ICE demonstrates your competence and observance of professional standards.”

Jean Venables CBE FREng FICE FCGI, 144th President of the ICE (2008/2009)

The technician community must be respected and valued within a supportive and inclusive environment. The need for the civil engineering industry to grapple with and define the difference and commonality between technicians and engineers is crucial. This will inevitably improve how the industry professionally develops in the future. Professional recognition and the commitment that comes with it will visibly raise the status of technicians and show the vital role they play in the successful delivery of civil engineering projects.

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Chapter 2

Technicians

Who are technicians?

It may seem strange to start the chapter with ‘Who are technicians?’ in a book that is for technicians. But for some people working in the civil engineering industry, it is difficult to pinpoint just who the technicians are. To define all the roles and job titles of a technician is impossible. A booklet written by Hannah [Shewan-Friend *et al.* \(2023\)](#) is an excellent guide and goes a long way to explain things.

This is not a story book. It is not intended for you to read it cover to cover. If you are eager to get started with your application, then don’t delay; jump to chapter 5 and get the information you need so you can put your application together.

This chapter is aimed at giving you some further detail and information to provide you with clarity and confidence, if confidence is needed, that the work you do and the experiences you have are right for someone looking to become qualified as a technician member of the Institution of Civil Engineers. There are some case studies and personal testimonies included at the end of this chapter. They provide some real-world examples to help make the application process more approachable.

Technicians and engineers are two career options that share many similarities. Some people use the terms technician and engineer interchangeably. This creates confusion. There are differences in these roles. In this book we will attempt to capture some of the differences and technical expertise that technicians from across the civil engineering industry undertake.

Engineers and technicians have different responsibilities. Civil engineering projects are completed successfully when engineers and technicians work together side-by-side to identify problems and devise solutions to fix those problems together.

Technician members work in a wide variety of roles within the civil engineering industry. Not everyone is the same; they work at a variety of levels including technical, supervisory, management and in some cases are the directors of their own companies.

Civil engineering technicians contribute in many ways to different infrastructure projects, such as highways, railways, surveying, water resources, buildings, structures and geotechnical. They work in different types of employment, including as consultants, in construction companies, for infrastructure owners and at academic institutions.

Did you know?

Civil engineering technicians work in:

- bridges
- environmental planning / engineering
- airports
- geology
- geotechnical and ground engineering
- tunnelling
- offshore engineering
- transportation planning
- regeneration and development
- dams
- reservoirs
- building
- structures
- water supply
- sewerage treatment
- drainage and networks
- railway systems and infrastructure
- river
- coast, marine
- docks, harbours
- highways and traffic engineering
- energy services

(ICE, 2024c)

Technicians undertake many different roles. Some are involved in constructing roads, inspecting rail infrastructure or working on 2D/3D CAD models alongside engineers. Other technicians are independent specialists working in laboratories or provide other trade services, such as specialist skills in material testing or scaffolding design. Technicians may be directly involved in the delivery of civil engineering projects on site as a manager, supervisor or in an appointed role.

Civil engineering technicians work on a wide variety of infrastructure projects. They undertake independent technical work and, at times, provide support to engineers and other construction professionals in the *construction process*. They may work in a range of specialist areas; they can work independently or as part of a team of civil engineering technicians, working alongside or at times reporting to senior civil engineers to coordinate the delivery of components of complex projects.

Did you know?

The construction process could include:

- conception
- design
- construction
- commissioning
- maintenance
- decommissioning
- removal
- management and procurement.

Experienced technicians often hold significant and influential roles, leading not just to the physical delivery of projects but also checking the quality of work done and developing professional abilities in others. If in doubt about your suitability you can always contact one of the membership recruitment team at the ICE and they will be happy to help.

“From starting as an apprentice to now mentoring our future EngTechs, I have gained a great appreciation for the work that goes into our development. I am glad to be a part of helping grow the future engineering workforce.”

Alex Hudson EngTech MICE

Academic qualifications

Some technician positions require you to hold a secondary school certificate or the equivalent. Typically, this refers to education provided to GCSE level (General Certificate of Secondary Education). Commonly, people will then go on to develop their academic knowledge through further education (FE) colleges with a BTEC and on to higher education (HE) courses such as level 4 diplomas, HNC, HND or similar qualifications. Increasingly there are opportunities to develop careers using level 3 or level 4 apprenticeships.

Other technician positions require a Bachelor’s (BSc or BEng) degree from a university or college. There are other ongoing educational opportunities that technicians can pursue to maintain their expertise and keep up with the latest trends in the industry. For example, this could include level 6 NVQ in Construction Site Management, MSc in Building Information Modelling (BIM) or level 7 NVQ in Construction Senior Management.

Did you know?

To apply for EngTech MICE at the ICE, ordinarily you will need one of:

- National Certificate/Diploma in Civil Engineering (inc. NVQ level 3 in technical or construction subjects)
- HNC/HND in Civil Engineering
- Level 3 or level 4 apprenticeship in Civil Engineering.

Professional qualifications

Becoming professionally qualified as a technician is a worthwhile goal. It allows people to become more visible within their organisation. You become role models for your peers and coworkers. Others will take notice that you have reached a recognised professional level. It demonstrates to prospective clients the level of skills and professionalism that a company has when they are bidding for work.

Depending on the specific roles and responsibilities, technicians can use a blend of creative technical and suitable mathematical skills. The engineering technician qualification is for anyone in the construction industry who carries out technical work competently, safely and independently.

“Professional technicians are skilled individuals. They are active members of the team. Their input and feedback are essential to delivering efficient, high-quality engineering solutions either during construction activities on site or when building engineering content in the design office.”

Tom Price EngTech FICE ACI Arb

Routes to professional qualification

There are three primary routes to achieve the technician qualification. The first two pathways are the direct application for technician professional review (TPR), which reflects on the work-based development that often takes place after completing academic studies, and the modern apprenticeship through an end point assessment (EPA) which combines an assessment of practical work experience alongside academic knowledge. But you don't need to have been to college or have any academic or vocational qualifications to apply. The third pathway places value on work-based learning where skills are gained through a combination of training, experience and learning on-the-job. This is commonly known as 'experiential learning'. The review is sometimes known as the 'technical technician professional review'. But more commonly it is simply referred to as the technician professional review (TPR).

“As someone who took a hands-on practical route rather than a formal educational one when leaving school, to be professionally recognised by ICE as EngTech FICE was a highlight of my career thus far and something I'm immensely proud of.

Gaining professional recognition has given me opportunities that I'm convinced would otherwise have not been available to me. It has allowed me to show and promote my particular field (scaffolding) for the engineering discipline that it is.”

Steve Byrom EngTech FICE

Technician professional review (TPR)

As a part of the review, you will be assessed against seven Attributes. These set out the types of behaviours expected of a professional technician. These are described below. To find out more about the Attributes, turn to chapter 4; putting your submission together, go to chapter 5 and for details about the day of the review, turn to chapter 6.