Chartered Engineer (CEng)

via the Experiential Learning Option

Guidance for applicants

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1. Professional Registration with the Engineering Council

The Engineering Council's UK-SPEC (4th edition) defines competence as 'a professional's ability to carry out engineering tasks successfully and safely within their field of practice'. In addition, registered engineering professionals are required to demonstrate an on-going personal and professional commitment to society, the environment and their profession.

CIHT is licensed by the Engineering Council to assess its members against the competence standards for:

- Chartered Engineer (CEng) – applicants must be able to develop solutions to engineering problems using new or existing technologies, through innovation, creativity and change. They may be accountable for complex systems with significant levels of risk.
- Incorporated Engineer (IEng) – applicants must be able to maintain and manage the application of current and developing technology, and may undertake engineering design, development, manufacture, construction and operation.
- Engineering Technician (EngTech) – applicants must be able to apply proven techniques and procedures to solve practical engineering problems and safe systems of work.

Each registration title (EngTech, IEng and CEng) requires demonstration of competence and commitment in the following five broad areas:

- **A** Knowledge and understanding
- **B** Design, development and solving engineering problems
- **C** Responsibility, management and leadership
- **D** Communication and interpersonal skills Commitment
- **E** Personal and professional commitment

The competency and commitment requirements for CEng, IEng and EngTech professional registration are set out in pages 19-45 of the UK-SPEC document.

2. Routes to Professional Registration as a Chartered Engineer

CIHT members wishing to gain Engineering Council professional registration can progress via one of two routes; the Standard Route or the Individual Route.

Applicants may progress to CEng via the **Standard Route** if they hold an accredited MEng, or an accredited BEng(Hons) and an accredited MSc.

CEng applicants who do not hold accredited qualifications may progress to registration via the **Individual Route**, through one of the following CIHT options:

- Experiential Learning option
- Further Learning Report option
- Technical Report option

The Individual Route allows applicants to demonstrate their knowledge and understanding of engineering principles to the required academic level (i.e Bachelors degree level for IEng or Masters degree level for CEng). Applicants who successfully demonstrate their knowledge and understanding through one of the assessment options above may progress to the professional review which is an assessment of practical engineering competence undertaken by both Standard Route and Individual Route applicants.

CIHT applicants are advised of the route and option(s) open to them following an **Initial Assessment**. If you have not applied for Initial Assessment, you should complete the on-line process before starting to put together your application to make sure that you are pursuing the appropriate route and/or option. Completing an Initial Assessment is free of charge. Non-members can access the Initial Assessment form by registering on CIHT's website, however, applicants for professional review must be CIHT members (see CIHT Membership for Individuals for details).

3. Experiential Learning option to Chartered Engineer status

*Note: This guidance document explains the assessment process for applicants who are eligible to pursue the Experiential Learning option to gain registration as a **Chartered Engineer** and assumes that you have been through CIHT's Initial Assessment process to confirm your eligibility. The Further Learning and Technical Report options are explained in separate guidance documents available from education@ciht.org.uk*

The CIHT Experiential Learning option provides members who hold an engineering degree that is partially accredited for CEng, or who are registered with the Engineering Council as an Incorporated Engineer (IEng), with the opportunity to demonstrate Master's level learning as specified in the QAA Engineering Benchmark Statement and the Engineering Council's Accreditation of Higher Education Programmes (4th edition).

Masters' level learning is typically demonstrated through the application of knowledge and critical evaluation of the outcomes. Applicants will require significant technical and managerial experience in their highways/transportation engineering discipline. Merely conveying knowledge and facts, even on highly specialist topics, is unlikely to be sufficient to demonstrate the breadth and depth of knowledge required.

Evidence of Master's level learning should demonstrate:

- a range and depth of engineering knowledge **beyond** that gained at Bachelor's degree level,
- an understanding of the management techniques required to deliver projects,
- a wide appreciation of the economic, legal, social, ethical, and environmental context of engineering,
- an understanding of the importance of professional and social responsibility and ethical codes,
- the ability to exercise independent judgement in a professional context.

4. Eligibility for the CEng Experiential Learning option

Applicants for the CEng Experiential Learning option must:

- be a Member (MCIHT) or Fellow (FCIHT) of CIHT

and

- hold a BEng(Hons) degree which is accredited as partially meeting the academic requirement for CEng registration (confirmed by CIHT at the Initial Assessment stage)

or

- hold a BSc (hons) degree which is accredited as meeting the academic requirement for IEng registration (confirmed by the CIHT Initial Assessment stage)

or

- hold a degree which is recognised as partially meeting the requirements for CEng registration under Washington Accord for intakes after 2015 (confirmed by the CIHT Initial Assessment stage)

or

- hold Incorporated Engineer (IEng) status via CIHT or another relevant professional engineering institution.

In addition, applicants must

- be able to demonstrate extensive engineering experience at a senior level;
- have made a recognisable contribution to transport infrastructure projects during their career to date;
- have responsibility for managing projects, leading and developing teams, and ensuring the safety and well-being of others.

5. Demonstrating Masters Degree Level Learning Outcomes

5.1 CEng Experiential Learning applicants will have previously demonstrated their knowledge and understanding of fundamental engineering principles through successfully completing a partially accredited academic programme (see 5.2 below) or through an assessment carried out by a Professional Engineering Institution to establish

Bachelor's degree level learning as part of a competence assessment for Incorporated Engineer (IEng) status (see 5.2 and 5.3 below).

5.2 Experiential Learning applicants who hold an engineering degree that is partially accredited for CEng (including Washington Accord post 2015) must demonstrate underpinning knowledge and understanding that meets the Master's level learning outcomes below:

Science, Mathematics and Engineering Principles	Apply a comprehensive knowledge of mathematics, statistics, natural science and engineering principles to the solution of complex problems, including critical awareness of new developments and the wider context of engineering.
Problem Analysis	Formulate and analyse complex problems to reach substantiated conclusions, including evaluating available data using first principles of mathematics, statistics, natural science and engineering principles, and using engineering judgment to work with information that may be uncertain or incomplete, discussing the limitations of the techniques employed.
Analytical Tools and Techniques	Select and apply appropriate computational and analytical techniques to model complex problems, identifying the limitations of the techniques employed.
Technical Literature	Select and critically evaluate technical literature and other sources of information to solve complex problems.
Design	Design solutions for complex problems that evidence some originality and meet a combination of societal, user, business and customer needs, as appropriate, including consideration of applicable health and safety, diversity, inclusion, cultural, societal, environmental and commercial matters, codes of practice and industry standards.
Sustainability	Evaluate the environmental and societal impact of solutions to complex problems (to include the entire life cycle of a product or process) and minimise adverse impacts
Teamwork	Function effectively as an individual, and as a member or leader of a team. Evaluate effectiveness of own and team performance.
Communication	Communicate effectively on complex engineering matters with technical and non-technical audiences, evaluating the effectiveness of the methods used

5.3 CEng Experiential Learning applicants who do not hold an accredited degree but who are registered through CIHT or another relevant professional engineering institution as an Incorporated Engineer (IEng) or who hold an IEng accredited degree must demonstrate underpinning knowledge and understanding that meets the Master's level learning outcomes in the table in 5.2 above **plus** the learning outcomes in the table below:

Integrated/Systems Approach	Apply an integrated or systems approach to the solution of complex problems
Ethics	Identify and analyse ethical concerns and make reasoned ethical choices informed by professional codes of conduct.
Risk	Use a risk management process to identify, evaluate and mitigate risks (the effects of uncertainty) associated with a particular project or activity.
Security	Adopt a holistic and proportionate approach to the mitigation of security risks.
Equality, Diversity & Inclusion	Adopt an inclusive approach to engineering practice and recognise the responsibilities, benefits and importance of supporting equality, diversity and inclusion
Engineering Practice	• Use practical laboratory and workshop skills to investigate complex problems. • Select and apply appropriate materials, equipment, engineering technologies and processes, recognising their limitations. • Discuss the role of quality management systems and continuous improvement in the context of complex problems. • Apply knowledge of engineering management principles, commercial context, project and change management, and relevant legal matters including intellectual property rights.

5.4 For each learning outcome, applicants must provide critical analysis of one or two projects in which they have played a significant role, explaining the relevant engineering and management theories and principles applied, the analytical methods and tools used and their limits, and the knowledge that was gained through taking part in the activity.

5.5 There is a total word limit of 4,000 for holders of a partially accredited CEng degree and 8,000 words for IEng applicants (excluding appendices).

5.6 As a guide, appendices should not exceed 50 sides of A4 paper and should be clearly referenced in the application.

5.7 In addition to the application form, all applicants must submit their Continuing Professional Development (CPD) record for each of the two previous calendar years, demonstrating a minimum of 25 hours for each year. Any CPD undertaken for the current year should be included for information purposes. The CPD record may be submitted using the CIHT template, or another format that provides the same information.

5.8 Applicants registered on CIHT's Professional Development Framework may use the evidence recorded on the Framework and signed off by a Mentor to demonstrate CEng underpinning knowledge and understanding.

5.9 All Experiential Learning applications must be signed off by a sponsor who is a current CEng registrant. The sponsor must be able to confirm that the Experiential Learning application is the applicant's own work and that, to the best of their knowledge, the examples provided reflect the work-based learning claimed.

Experiential Learning Application Tips

- Write abbreviations out in full the first time they are used;
- Keep your project introductions/background information brief – concentrate on describing what you learnt from the experience;
- Write in the first person wherever possible to make it clear that you are highlighting your personal competence rather than that of the team;
- Avoid reproducing sections of regulations/guidelines – simply give the name of the document and the section/page reference;
- You may use annotated drawings in your application to convey your knowledge and understanding of a topic. If you are interviewed, be prepared to explain any drawings submitted.

6. Experiential Learning Assessment

6.1 Experiential Learning applicants should apply to CIHT for assessment using the appropriate application form. Submission deadlines are published on the CIHT website.

6.2 The assessment is carried out by two CIHT assessors who are Chartered Engineers. At least one of the assessors will share the specialism declared by the applicant in their application form.

6.3 The Experiential Learning assessment is based on the written evidence provided in the application. Applicants may be required to attend an interview to expand on the examples provided in the application. The interview gives the assessors the opportunity to clarify and/or confirm information provided in the written application and to help them assess the range and depth of your knowledge and your understanding of engineering principles against the relevant learning outcomes. Interviews usually last up to 45 minutes and are normally conducted by two CIHT assessors who reviewed the written application.

6.4 Applicants will normally receive their Experiential Learning assessment result via e-mail approximately 6 weeks after the date the application was submitted, or the interview date if an interview has taken place. Unsuccessful applicants will receive feedback to help them address the shortfalls in underpinning knowledge and understanding identified by the assessors and prepare for a resubmission.

6.5 Assessment outcomes are reviewed and ratified by CIHT's Individual Route Assessor Panel.

6.6 Experiential Learning applicants whose level of underpinning knowledge and understanding is deemed to have satisfied the CEng learning outcomes will be invited to apply for professional review which requires the submission of a Portfolio of Evidence and attendance at a Professional Review interview

7. Help and advice

If you have any queries concerning the CEng Experiential Learning option, please contact education@ciht.org.uk