COMPETENCE & COMMITMENT CRITERIA

The Chartered Engineer (CEng) Standard

The PWI competence and commitment criteria fully comply with UK-SPEC. Recognising the risk inherent in railway transport, the PWI requires an enhanced focus on safety and candidates must demonstrate their absolute commitment to the application and improvement of staff and system safety.

Chartered Engineers develop solutions to complex engineering problems in Rail Infrastructure Engineering, using new or existing technologies, and through innovation, creativity and technical analysis.

A Knowledge and Understanding

Chartered Engineers shall use a combination of general and specialist engineering knowledge and understanding to optimise the application of advanced and complex systems.

This competence is about the ability to understand underpinning technical principles relevant to the applicant's area of practice and applying them to develop technical solutions. This could involve technical solutions for novel problems or dealing with significant technical complexity. This may involve the integration of a range of technologies and consideration of other factors. This competence requires that an applicant is maintaining and developing their knowledge in their field of practice and not just that required for specific tasks.

The applicant shall demonstrate they:		Examples of evidence may include:
A1	Have maintained and extended a sound theoretical approach to enable them to develop their particular role	• Formal training related to your role • Learning and developing new engineering knowledge in a different industry or role • Understanding the current and emerging technology and technical best practice in your area of expertise • Developing a broader and deeper knowledge base through research and experimentation • Learning and developing new engineering theories and techniques in the workplace
A2	Are developing technological solutions to unusual or challenging problems, using their knowledge and understanding and/or dealing with complex technical issues or situations with significant levels of risk	• Carrying out technical research and development • Developing new designs, processes or systems based on new or evolving technology • Carrying out complex and/or non-standard technical analyses • Developing solutions involving complex or multidisciplinary technology • Developing and evaluating continuous improvement systems • Developing solutions in safety-critical industries or applications

B	Design, development and solving engineering problems	
Chartered Engineers shall apply appropriate theoretical and practical methods to the analysis and solution of engineering problems. This competence is about the ability to apply engineering knowledge effectively and efficiently to the individual tasks which need to be undertaken in the applicant's role.		
The applicant shall demonstrate they:		Examples of evidence may include:
B1	Take an active role in the identification and definition of project requirements, problems and opportunities	• Identifying projects or technical improvements to products, processes or systems • Preparing specifications, taking account of functional and other requirements • Establishing user requirements • Reviewing specifications and tenders to identify technical issues and potential improvements • Carrying out technical risk analysis and identifying mitigation measures • Considering and implementing new and emerging technologies
B2	Can identify the appropriate investigations and research needed to undertake the design, development and analysis required to complete an engineering task and conduct these activities effectively	• Identifying and agreeing appropriate research methodologies • Investigating a technical issue, identifying potential solutions and determining the factors needed to compare them • Identifying and carrying out physical tests or trials and analysing and evaluating the results • Carrying out technical simulations or analysis • Preparing, presenting and agreeing design recommendations, with appropriate analysis of risk, and taking account of cost, quality, safety, reliability, accessibility, appearance, fitness for purpose, security (including cyber security), intellectual property constraints and opportunities, and environmental impact
B3	Can implement engineering tasks and evaluate the effectiveness of engineering solutions	• Ensuring that the application of the design results in the appropriate practical outcome • Implementing design solutions, taking account of critical constraints, including due concern for safety, sustainability and disposal or decommissioning • Identifying and implementing lessons learned • Evaluating existing designs or processes and identifying faults or potential improvements including risk, safety and life cycle considerations • Actively learning from feedback on results to improve future design solutions and build best practice

C	Responsibility, management and leadership	
Chartered Engineers shall demonstrate technical and commercial leadership. This competence is about the ability to plan the applicant's own work and manage or specify the work of others effectively, efficiently, and in a way which provides leadership at an appropriate level, whether technical or commercial. Leadership is not necessarily about having a formal line management role. In matrix management and other types of organisational structure, where Chartered Engineers are working within complex and varied working relationships, they will provide leadership to achieve objectives. This competence is also about the ability to consider and identify improvements to quality.		
The applicant shall demonstrate they:		Examples of evidence may include:
C1	Plan the work and resources needed to enable effective implementation of a significant engineering task or project	• Preparing budgets and associated work programmes for projects or tasks • Systematically reviewing the factors affecting the project implementation including safety, sustainability and disposal or decommissioning considerations • Carrying out a task or project risk assessment and identifying mitigation measures • Leading on preparing and agreeing implementation plans and method statements • Negotiating and agreeing arrangements with customers, colleagues, contractors and other stakeholders, including regulatory bodies • Ensuring that information flow is appropriate and effective
C2	Manage (organise, direct and control), programme or schedule, budget and resource elements of a significant engineering task or project	• Operating or defining appropriate management systems including risk registers and contingency systems • Managing the balance between quality, cost and time • Monitoring progress and associated costs and cost forecasts, taking appropriate actions when required • Establishing and maintaining appropriate quality standards within legal and statutory requirements • Interfacing effectively with customers, contractors and other stakeholders
C3	Lead teams or technical specialisms and assist others to meet changing technical and managerial needs	• Agreeing objectives and work plans with teams and individuals • Reinforcing team commitment to professional standards • Leading and supporting team and individual development • Assessing team and individual performance, and providing feedback • Seeking input from other teams or specialists where needed and managing the relationship • Providing specialist knowledge, guidance and input in your specialism to engineering teams, engineers, customers, management and relevant stakeholders • Developing and delivering a teaching module at Masters level, or leading a University research programme
C4	Bring about continuous quality improvement and promote best practice	• Promoting quality throughout the organisation as well as its customer and supplier networks • Developing and maintaining operations to meet quality standards eg ISO 9000, EQFM • Supporting or directing project evaluation and proposing recommendations for improvement • Implementing and sharing the results of lessons learned

D	Communication and interpersonal skills	
Chartered Engineers shall demonstrate effective communication and interpersonal skills. This competence is about the ability to work with others constructively, to explain ideas and proposals clearly and to discuss issues objectively and constructively.		
The applicant shall demonstrate they:		Examples of evidence may include:
D1	Communicate effectively with others, at all levels, in English	• Preparing reports, drawings, specifications and other documentation on complex matters • Leading, chairing, contributing to and recording meetings and discussions • Exchanging information and providing advice to technical and non-technical colleagues • Engaging or interacting with professional networks
D2	Clearly present and discuss proposals, justifications and conclusions	• Contributing to scientific papers or articles as an author • Preparing and delivering presentations on strategic matters • Preparing bids, proposals or studies • Identifying, agreeing and leading work towards collective goals
D3	Demonstrate personal and social skills and awareness of diversity and inclusion issues	• Knowing and managing own emotions, strengths and weaknesses • Being confident and flexible in dealing with new and changing interpersonal situations • Knowing protected characteristics and employer and employee duties under the Equality Act 2010 • Having an awareness of the risk of unconscious bias and how this can be managed • Identifying, agreeing and working towards collective goals • Creating, maintaining and enhancing productive working relationships, and resolving conflicts • Being supportive of the needs and concerns of others, especially where this relates to diversity and inclusion

E	Personal and professional commitment	
Chartered Engineers shall demonstrate a personal commitment to professional standards, recognising obligations to society, the profession and the environment. This competence is about ensuring that the applicant is acting in a professional manner in their work and in their dealings with others. A Chartered Engineer should set a standard and example to others with regard to professionalism.		
The applicant shall demonstrate they:		Examples of evidence may include:
E1	Understand and comply with relevant codes of conduct	• Demonstrating compliance with the PWI's Code of Professional Conduct • Identifying aspects of the Code which are particularly relevant to your role • Being aware of the legislative and regulatory frameworks relevant to your role and how you conform to them • Leading work within relevant legislation and regulatory frameworks, including social and employment legislation
E2	Understand the safety implications of their role and mange, apply and improve safe systems of work	• Identifying and taking responsibility for your own obligations and ensuring that others assume similar responsibility for health, safety and welfare issues • Ensuring that systems satisfy health, safety and welfare requirements • Developing and implementing appropriate hazard identification and risk management systems and culture • Managing, evaluating and improving these systems • Applying a sound knowledge of health and safety legislation, for example: HASAW 1974, CDM regulations, ISO 45001 and company safety policies • Having a clear understanding of railway system safety and its management, particularly at subsystem interfaces • Specifying safe systems of work • Putting safety first during the design, construction, operation or maintenance of equipment and assets • Sharing knowledge, findings and experiences with the supply chain and industry • Leading the industry in terms of innovating and implementing with new safety related technology • Identifying and challenging unsafe activities, assets or equipment • Assessing teams' performance on safety behaviours and work to improve it • Demonstrating a leadership commitment to safety, with clear expectations and success measures.
E3	Understand the principles of sustainable development and apply them in their work	• Operating and acting responsibly, taking account of the need to progress environmental, social and economic outcomes simultaneously • Providing products and services which maintain and enhance the quality of the environment and community, and meet financial objectives • Recognising how sustainability principles can be applied in your day-to-day work in the rail infrastructure industry – Recognise the challenges of decarbonisation and climate change adaptation in contributing to building a sustainable society, present and future – Apply professional and responsible judgement and take a leadership role

		– Do more than just comply with legislation and codes – Use resources efficiently and effectively – Seek multiple views to solve sustainability challenges – Manage risk to minimise adverse impact to people or the environment • Understanding and securing stakeholder involvement in sustainable development • Using resources efficiently and effectively in all activities • Taking action to minimise environmental impact in your area of responsibility
E4	Carry out and record the Continuing Professional Development (CPD) necessary to maintain and enhance competence in their own area of practice	• Undertaking reviews of your own development needs • Planning how to meet personal and organisational objectives • Carrying out planned and unplanned CPD activities and maintaining evidence of competence development • Evaluating CPD outcomes against any plans made • Assisting others with their own CPD • Attending PWI meetings, seminars or technical courses
E5	Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner	*Examples could be drawn from safety, diversity and inclusion, or sustainability* • Understanding the ethical issues that you may encounter in your role • Giving an example of where you have applied ethical principles – Honesty and integrity – Respect for life, law, the environment and public good – Accuracy and rigour – Leadership and communication • Giving an example of where you have applied or upheld ethical principles as defined by your organisation or company