LCIBSE Competence Framework: Digital Engineering Evidence Examples

Licentiate members and Engineering Technicians contribute to the design, development and maintenance of products, processes or services. They apply proven techniques and procedures to the solution of practical engineering problems.

A. Knowledge and understanding

Licentiates shall use engineering knowledge and understanding to apply technical and practical skills.

This competence is about having knowledge of the technologies, standards and practices relevant to the applicant's area of work and having evidence of maintaining and applying this knowledge.

Objective	Evidence Examples	Digital Evidence Examples
A1. Review and select appropriate techniques, procedures and methods to undertake tasks.	- Evaluating potential methods of carrying out an engineering task and selecting the most appropriate solution. - Recognising a difficulty and then identifying an approach to resolve it. - Identifying an improvement in a technique, procedure, process or method. - Interpreting and carrying out test procedures.	- Describe how you have advised a team on the best way to set up a model or federate multiple models. This may include advice on zoning or splitting models, modelling building elements, naming or classification standards, use of appropriate coordinate systems, etc. - Demonstrate how you have used learning from previous projects in the setup or federation of project models in subsequent projects. - Show awareness of relevant quality management procedures and best practice advice. - Include the BIM Execution Plan and show which sections you contributed to.
A2. Use appropriate scientific, technical or engineering principles.	- Drawing on your technical knowledge to complete a task. - Performing calculations using standard formulae. - Analysing performance or test data or comparing performance information with published material.	- Give examples of your research including how you deploy digital tools carrying out calculations in specific jobs and demonstrate outcomes. - Show how your own work contributed to the success of a project or process improvement. - Use manual or computer-assisted calculations. - Research manufacturers' sales literature and assess costs and benefits associated with various purchase/manufacture decisions about components.

Objective	Evidence Examples	Digital Evidence Examples

		- Use and assist in the evaluation of computer software packages:
		  ▪ Produce calculations for plant and fabric selection.
		  ▪ Collect and analyse energy consumption.
		  ▪ Analyse data from BMS to optimise efficient operation of systems.
		- Describe the core software that you use, what its features, capabilities and limitations are, and how you apply it to your tasks.
		- Show a model that you have set up and illustrate why you chose to set it up that way.

B. Design, development and solving engineering problems

Licentiate Members shall contribute to the design, development, manufacture, construction, commissioning, decommissioning, operation or maintenance of products, equipment, processes, systems or services.

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.

Objective	Evidence Examples	Digital Evidence Examples
B1. Identify problems and apply appropriate methods to identify causes and achieve satisfactory solutions.	- Using knowledge to identify a problem or an opportunity for improvement. - Investigating a problem to identify the underlying cause. - Identifying a solution to a problem or an improvement opportunity. - Contributing to the design of an item or process.	- When you had issues with models, e.g. corrupt, slow or crashing, impacting the project; explain how you were able to identify the problem and present a solution. - Describe the process you used to identify the source of the problem and work out a solution. Include screenshots where possible. - Example could be a clash review and then review this with the design team and coordinate with them to

Objective	Evidence Examples	Digital Evidence Examples
		resolve the issues. Describe how you included both hard and soft clashes and how you resolved the issue. - Explain how you investigated erroneous output from a coded solution and investigated the causes. - Describe the processes you used to identify the code or inputs responsible for the problem and how you devised a solution.
B2. Identify, organise and use resources effectively to complete tasks, with consideration for cost, quality, safety, security and environmental impact.	- Balancing these factors in selecting appropriate materials. - Identifying precautions as a result of evaluating risks and other factors. - Considering how waste can be minimised, recycled or disposed of safely if recycling is not possible. - Contributing to best practice methods of continuous improvement. - Improving the quality of an operation or process.	- Record specific examples of actual installations derived from models you have been responsible for managing or from digital tools you have created or managed. - Give examples of differing approaches used for selection of products or equipment to meet project or stakeholder objectives. - Identify how decisions can influence the environmental impact. - Discuss the consequences of neglect or error, for example in the design of digital tools, processes, selection of equipment, use or maintenance choices. - Give examples of contributing to continuous improvement. - Appreciate cost/benefit calculations and whole life costing. - Show why you do things in a certain way. - Include images of 3D models and explain the methods you used, and why. - Show how you have included data in a model to link schedules to drawings. - Provide an example of where you have compared methods for a specific task (e.g. setting up sheets, issuing a model, modelling objects, etc.) to ascertain the benefits and drawbacks of each method.

Objective	Evidence Examples	Digital Evidence Examples
		- Outline where you found a quicker way of modelling something and introduced it on a project to save overall time and cost.

C. Responsibility, management and leadership

Licentiate members shall accept and exercise personal responsibility.

This competence is about the ability to plan and manage the applicant's own work effectively and efficiently. It is also about the ability to consider and identify improvements to maintain quality in their work.

Objective	Evidence Examples	Digital Evidence Examples
C1. Work reliably and effectively without close supervision, to the appropriate codes of practice.	- Completing challenging tasks successfully within your area of work. - Identifying issues which fall outside of your current knowledge and seeking advice. - Identifying standards and codes of practice relevant to a new task.	- Give an example of a project that you have worked on with challenges that you overcame. Example could be a complex coordination area or development of a digital tool or workflow relevant to a construction project. - Demonstrate where you have learnt a new skill on a project and how you have asked for assistance to learn this skill. - Show your understanding of required standards on projects you have worked on, e.g. ISO19650 series.
C2. Accept responsibility for the work of themselves or others.	- Fully understanding drawings, permits to work, instructions or other similar documents after appropriate checking, and identifying issues. - Inspecting work carried out by others. - Checking the status of equipment, the work environment and facilities and taking appropriate actions before commencing work.	- Understand the design & BIM requirements and show how you have checked your own work to make sure you have aligned to these requirements. - Demonstrate how you have assessed the work of others.
C3. Accept, allocate and supervise technical and other tasks.	- Ensuring that the scope of a task is clear before accepting and/or allocating it to others. - Querying any aspect of a task which is not clear and/or providing an explanation if a query is raised by others.	- Explain how you demonstrate your understanding of a task to ensure requirements are clear. - Give examples where you have questioned part of the task. An example could be, you found part of the design

Objective	Evidence Examples	Digital Evidence Examples
	- Learning from your own experience and/or providing constructive feedback when supervising or working with others.	which is not working while you have been working in the model, and you have raised this and worked through it with the team to find a solution. - Have you been part of a project lessons learnt and given you feedback. Demonstrate this.

D. Communication and interpersonal skills

Licentiate members shall use 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.

Objective	Evidence Examples	Digital Evidence Examples
D1. Communicate effectively with others, at all levels, in English.	- Contributing to meetings and discussions. - Preparing communications, documents and reports on technical matters. - Exchanging information and providing advice to technical and non-technical colleagues.	- Show how you have contributed to team or design meetings. They could be coordination, design reviews etc. - Show how you have assisted team members, this could be how to use software or designing systems. - Describe how you communicated all these effectively to your team.
D2. Work effectively with colleagues, clients, suppliers or the public.	- Contributing constructively as part of a team. - Successfully resolving issues in discussions with team members, suppliers, clients and/or others. - Persuading others to accept suggestions or recommendations. - Identifying, agreeing and working towards collective goals.	- Demonstrate how you have worked with both internal and external teams. - Show how you have helped another person work towards the right outcome. - Demonstrate how you have interacted with an engineering team to enable them to understand the digital or development aspects of your task and how this relates to the work they do.
D3. Demonstrate personal and social skills and awareness	- Knowing and managing own emotions, strengths and weaknesses.	- Have you taken any courses to develop your soft skills? This could include emotions, strengths, and weaknesses.

of diversity and inclusion issues.	- Being confident and flexible in dealing with new and changing interpersonal situations. - 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.	- Explain where you have had to deal with a challenging situation. This might be a difficult client or a problem with a staff member. Explain how you approached and overcame this. - How have you supported the different needs and requirements of your team? - Describe how you have brought people from diverse backgrounds and with distinct types of relevant experience together to achieve a positive outcome on a project. - Describe how you have helped to overcome the challenges faced when bringing people with different perspectives together.

E. Personal and professional commitment

Licentiate Members shall demonstrate commitment to CIBSE's Code of Professional Conduct, recognising obligations to society, the profession and the environment.

This competence is about ensuring that the applicant is acting in a professional and ethical manner in their work and in their dealings with others. A Licentiate Member should set a standard and example to others with regard to professionalism.

Objective	Evidence Examples	Digital Evidence Examples
E1. Understand and comply with relevant codes of conduct.	- Demonstrating compliance with CIBSE's Code of Professional Conduct. - Working within all relevant legislative and regulatory frameworks, including social and employment legislation.	- Demonstrate that you have read and agree with the code of professional conduct. - Explain how the code of conduct relates to your role? - How do you keep up to date with these standards?
E2. Understand the safety implications of their role and apply safe systems of work.	- Providing evidence of applying current safety requirements, such as risk assessment and other examples of good practice you adopt in your work.	- How have you implemented health, safety and welfare into your projects. This could be a process or development of systems.

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	- A sound knowledge of health and safety legislation, for example: HASAW 1974, CDM regulations, ISO 45001 and company safety policies.	- Demonstrate how your knowledge of health, safety and welfare and the related standards is kept up to date. This could be online or site training, Certifications. - Do you manage or review these standards? Explain how. - Are you applying health, safety and welfare to your models, drawings or documents? Outline how.
E3. Understand the principles of sustainable development and apply them in their work.	- Recognising how sustainability principles, as described in the Engineering Council's Guidance on Sustainability, can be applied in your day-to-day work. - Identifying actions that you can and have taken to improve sustainability.	- Explain how you have applied sustainability principles to your role. - Explain how you act in your day-to-day life to ensure you behave responsibly, consider environmental, social and economic outcomes. - What action do you take to reduce environmental impact? This might be different approaches to design, implementing software or reduction of materials.
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 and recording planned and unplanned CPD activities. - Maintaining evidence of competence development. - Evaluating CPD outcomes against any plans made. - Assisting others with their own CPD.	- Explain how you are progressing your development? CPD activities or training, attending conferences, research etc. - How are you recording evidence of this development? - How have you set goals and worked toward these goals? - Explain how you have supported your team to achieve their goals. - Are you part of any industry groups? Outline your roles and activities.
E5. Understand the ethical issues that may arise in their role and carry out their responsibilities in an ethical manner.	- Understanding the ethical issues that you may encounter in your role - Giving an example of where you have applied ethical principles as described in the Engineering Council's Statement of Ethical Principles. - Giving an example of where you have applied or upheld ethical principles as defined by your organisation or company.	- Explain what the ethical issues mean to you and how this is applied in your work. - Select a few of the principles and demonstrate how you have applied them in your professional or personal life. - Demonstrate how you have stood by your design decisions, even if pressured to take shortcuts.