

It is important to note that the sub-competencies shown in blue must be demonstrated by CEPs in an engineering experience that they acquired in a Canadian environment.

COMPETENCIES (6)	SUB-COMPETENCIES (28)	INDICATORS (guidance on example content that will demonstrate the competencies)
1. Have the required technical competencies	1.1 Regulations, codes and standards	<ol style="list-style-type: none"> 1. Identify and comply with legal and regulatory requirements for project activities. 2. Incorporate knowledge of codes and regulations into the design. 3. Prepare reports assessing project compliance with codes, standards, and regulations. 4. Recognize the need to design for code compliance while considering feasibility. 5. Be aware of and/or apply any specific sustainability clauses that have been added to practice guidelines that apply to their area.
	Demonstrate knowledge of regulations, codes and standards, including applicable Québec and Canadian engineering regulations, codes, standards and practices.	<ol style="list-style-type: none"> 1. Demonstrate knowledge of materials, operations, project and design constraints, e.g. cost, design, material, labour, schedule, budget, production. 2. Demonstrate an understanding of and coordination with other engineering and professional disciplines. 3. Understand the role and regulations of the various professions whose practices overlap or interact with those of engineering, and also understand the regulations that apply to persons practising these professions.
	1.2 Project and design constraints	<ol style="list-style-type: none"> 1. Demonstrate familiarity with system protection and/or damage/hazard mitigation objectives, underlying principles, practices, procedures, and functions.
	Demonstrate knowledge of materials, or operations as appropriate, project and design constraints, and the optimal design for the intended purpose or use, while taking interdisciplinary impacts into account.	<ol style="list-style-type: none"> 2. Identify risk areas including causes of risks and their impacts. 3. Develop risk management/mitigation plans (elimination, mitigation, prevention). 4. Demonstrate an understanding of the difference between technical risk and public safety issues.
1.3 Risk identification and mitigation	Analyze the technical risks and offer solutions to mitigate them.	

	<p>1.4 Application of theory</p>	<ol style="list-style-type: none"> 1. Prepare technical specifications. 2. Demonstrate use of theory and calculations to arrive at solutions. 3. Demonstrate the development and selection of the preferred/optimal design solution.
<p>Apply engineering knowledge to design solutions.</p>	<p>1.5 Solution techniques</p>	<ol style="list-style-type: none"> 1. Demonstrate an understanding of the engineering principles used in the application of computer design programs and show/describe how the results were verified as correct. 2. Participate in an independent review and verification of solution techniques or analysis methods. 3. Participate in the validation of the design/solution by considering the parameters, criteria, methods of analysis, trials, simulations, etc.
<p>Be able to understand solution techniques and independently verify the results.</p>	<p>1.6 Safety awareness</p>	<ol style="list-style-type: none"> 1. Demonstrate specific knowledge of safety regulations. 2. Identify, incorporate, and/or participate in the review of safety considerations, safety procedures and safety equipment as they apply to system operations and/or maintenance programs. 3. Incorporate explicit human and public safety considerations into the design and all other relevant activities. 4. Understand and take into account safety risks associated with processes. 5. Identify relevant protection equipment and process modifications to mitigate safety risks.
<p>Demonstrate knowledge and awareness of Canadian regulations, codes and standards pertaining to safety. Demonstrate on-site safety awareness and knowledge of applicable safety authorization/certification requirements, and be aware of safety risks inherent in the design.</p>	<p>1.7 Systems and their components</p>	<ol style="list-style-type: none"> 1. Demonstrate an understanding of each element in a process. 2. Demonstrate an understanding of the interactions and constraints in the behaviour of the overall system. 3. Manage processes within the overall system (monitor and, where needed, modify processes to achieve optimum outcomes).
<p>Understand systems and their components.</p>		

	<p>1.8 Peer review and quality control</p>	<ol style="list-style-type: none"> 1. Conduct checks, including field checks, to verify the validity of the design. 2. Follow quality management principles in practice. 3. Verify the conformity of the work with plans and specifications. 4. Prepare quality control plans, including frequency and test parameters, for specific processes or products. 5. Evaluate test results, determine adequacy, and develop recommended actions. 6. Participate in peer reviews. 7. Demonstrate that completed projects, systems or sub-systems meet project objectives in terms of functionality and operational performance.
	<p>1.9 Engineering documentation</p>	<ol style="list-style-type: none"> 1. Review the designs of others and communicate findings and issues, including suggested alternatives. 2. Communicate your ideas and concepts to project team members. 3. Understand the value of project completion reports and lessons learned reports that you or others will apply to future projects. 4. Produce sketches, notes, documentation and design documents to prepare proposals, preliminary and final design drawings/documents for acceptance by the client and approval by regulatory authorities.
	<p>1.10 Sustainable, social, economic and environmental development</p>	<ol style="list-style-type: none"> 1. Follow public safety regulations and advice during design and implementation of a project. 2. Prioritize public protection by taking into account customer issues, health and safety issues, environmental protection issues and sustainable development principles.
	<p>Understand the safeguards required to protect the public and the methods of mitigating adverse impacts.</p>	

2. Communicate effectively	2.1 Verbal communication	<ol style="list-style-type: none"> 1. Communicate in a simple and concise manner. 2. Communicate official project data to team members, clients, contractors. 3. Express both technical and non-technical issues and ideas clearly to both technical and non-technical personnel. 4. Give presentations and/or training sessions to technical and non-technical groups; presentations to superiors and subordinates; internal (colleagues) and external (clients) presentations. 5. Present the project parameters to the public. 6. Actively participate in meetings. 7. Take training in verbal communication.
	Communicate verbally in a Canadian environment (in English or French). Note: Even if they are able to demonstrate this competency in English, candidates must also demonstrate appropriate knowledge of the French language in accordance with the Charter of the French Language.	
	2.2 Written communication	<ol style="list-style-type: none"> 1. Tailor communications to the intended audience. 2. Draft and review technical documents 3. Draft clear memos and reports to both technical and non-technical personnel. 4. Use drawings and sketches to demonstrate key points and concepts. 5. Prepare written reports on a technical subject. 6. Prepare written reports based on field observations. 7. Take training in technical report writing. 8. Work with common office programs (e.g. Excel, Word, Outlook, internet browsers).
	Communicate in writing with team members, clients, contractors and members of the public in a Canadian environment (in English or French). Note: Even if they are able to demonstrate this competency in English, candidates must also demonstrate appropriate knowledge of the French language in accordance with the Charter of the French Language.	
	2.3 Reading and comprehension	<ol style="list-style-type: none"> 1. Review technical documents to understand the implications and summarize key points.
	Communicate effectively in a Canadian environment (in English or French). Note: Even if they are able to demonstrate this competency in English, candidates must also demonstrate appropriate knowledge of the French language in accordance with the Charter of the French Language.	

3. Manage projects	3.1 Project management principles	<p>1. Be aware of resource planning, budgeting, change management, scope management, schedule and unforeseen issues in managing a project from start to end.</p> <p>2. Understand the impacts that benefits and risks of various design solutions have on a project.</p> <p>3. Understand the needs and expectations of internal and external clients.</p>
	Awareness of project management principles.	
	3.2 Level of responsibility	<p>1. Follow and contribute to the development of project management plans.</p> <p>2. Be aware of future improvements and demands as well as other ongoing projects.</p> <p>3. Demonstrate increasing responsibility for client contact and management.</p> <p>4. Demonstrate how project planning activities and interaction with others has increased over your practical development.</p> <p>5. Participate in managing and adapting a schedule.</p> <p>6. Demonstrate awareness of issues related to other disciplines that might affect the project, maintaining contact and communication to discuss and resolve issues.</p> <p>7. Include sustainability analysis in project descriptions.</p>
	Demonstrate an increasing level of responsibility for project planning and implementation.	
	3.3 Expectations versus resources	
	Manage expectations based on available resources.	<p>1. Update the schedule and budget on a regular basis and communicate status.</p> <p>2. Provide market assessment and/or availability of resources for a project.</p> <p>3. Meet deadlines without undermining other impacts on the project (e.g. health and safety, environmental impacts, quality, financial, etc.)</p>

	<p>3.4 Financial and budgetary aspects</p>	<ol style="list-style-type: none"> 1. Become familiar with the project budget during design and construction. 2. Provide a technical/financial report and compare the options. 3. Understand the place of finance in business decisions. 4. Understand the principles of budgeting and financing. 5. Understand the relevant business processes. 6. Understand how to work with and develop contracts. 7. Develop financial risk management/mitigation plans (elimination, mitigation, prevention).
	<p>Understand the financial aspects of the work.</p>	
	<p>3.5 Response to feedback</p>	<ol style="list-style-type: none"> 1. Apply the lessons learned and performance reviews in meetings. 2. Understand the scope of a project and know how to respond appropriately when a project exceeds its scope.
	<p>Ask for and respond to feedback.</p>	
	<p>3.6 Project and process life cycle</p>	<ol style="list-style-type: none"> 1. Identification: Come up with the initial project idea and preliminary design. 2. Preparation: Provide a detailed design of the project that addresses technical and operational aspects 3. Appraisal: Analyze the project from the technical, financial, economic, social and environmental perspectives. 4. Preparation of specifications and tender documents: prepare documents for tenders, invitations to tender and opening of tenders, pre-qualification, evaluation of bids and award of work. 5. Implementation and monitoring of the solution: carry out project activities, with on-going checks on progress and feedback. 6. Support operation.
	<p>Gain exposure to the various stages of the process/project life cycle, from the design and feasibility analysis to implementation.</p>	

4. Work on a team	4.1 Working effectively	<ol style="list-style-type: none"> 1. Demonstrate respect for others' responsibility and expertise. 2. Integrate engineering with other inputs. 3. Demonstrate leadership in achieving team goals. 4. Actively collaborate. 5. Adhere to objectives, decisions and priorities.
	Work effectively with other disciplines/people.	
	4.2 Conflict resolution	<ol style="list-style-type: none"> 1. Demonstrate leadership in resolving conflict. 2. Work to facilitate beneficial conflict resolution. 3. Take training in conflict resolution. 4. Demonstrate a positive attitude. 5. Show willingness to accept comments and criticism. 6. Identify situations where you received feedback and how you responded to that feedback.
	Work to resolve conflicts.	
5. Act professionally	5.1 Code of ethics	<ol style="list-style-type: none"> 1. Comply with Quebec's Code of Ethics and/or with the code in the jurisdiction where you practice. 2. Apply professional ethics in meeting corporate directives. 3. Understand how conflict of interest affects your practice.
	Work with integrity, ethically and according to professional standards.	
	5.2 Awareness of personal limitations	<ol style="list-style-type: none"> 1. Ask questions, ask for assistance and incorporate input. 2. Interact with your supervisor, colleagues and others. 3. Recognize your level of expertise and its limits.
	Know your field of practice and expertise.	
	5.3 Professional responsibility	<ol style="list-style-type: none"> 1. Be aware of the potential professional liability involved in all aspects of your work. 2. Demonstrate personal skills with judgment, rigour, analytical skills and resourcefulness.
	Understand professional responsibility.	
5.4 Seal and signature use	<ol style="list-style-type: none"> 1. Fully understand appropriate use of your seal and signature. 2. Document your activities, decisions and work in a registry. 3. Maintain of the traceability your documents. 4. Protect the security, sustainability and confidentiality of information. 	
Master the guidelines for engineering documents.		

6. Manage your professional development	6.1 Professional development activities	<ol style="list-style-type: none"> 1. Participate in community, technical, industry and/or professional association committees and task forces. 2. Participate in a variety of self-directed and formal professional development activities to learn and stay up to date in your field of practice and report your progress to applicable parties.
	Demonstrate completion of professional development activities.	
	6.2 Identify training needs	<ol style="list-style-type: none"> 1. Gap analysis of knowledge and skills; highlight the gaps that exist. 2. Identify areas of weakness where additional training is needed. 3. Prepare a self-criticism list and the ways to mitigate or eliminate the weaknesses.
	Demonstrate awareness of knowledge gaps and areas where you require additional training.	
	6.3 Professional development plan	<ol style="list-style-type: none"> 1. Plan to pursue training in areas of weakness and remedy knowledge gaps. 2. Stay up to date in your field of professional practice by participating in planned activities such as self-directed and formal professional development activities. 3. Keep up to date with developments and new technologies in your field. 4. Apply new skills in your practice.
	Develop a professional development plan to address knowledge gaps and stay up to date on advances in your field of practice.	