

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)
<b>1. Have the required technical competencies</b>	<b>1.1 Regulations, codes and standards</b>	<ol style="list-style-type: none"> <li>1. Identify and comply with legal and regulatory requirements for project activities.</li> <li>2. Incorporate knowledge of codes and regulations into the design.</li> <li>3. Prepare reports assessing project compliance with codes, standards, and regulations.</li> <li>4. Recognize the need to design for code compliance while considering feasibility.</li> <li>5. Be aware of and/or apply any specific sustainability clauses that have been added to practice guidelines that apply to their area.</li> </ol>
	Demonstrate knowledge of regulations, codes and standards, including applicable Québec and Canadian engineering regulations, codes, standards and practices.	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of materials, operations, project and design constraints, e.g. cost, design, material, labour, schedule, budget, production.</li> <li>2. Demonstrate an understanding of and coordination with other engineering and professional disciplines.</li> <li>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.</li> </ol>
	<b>1.2 Project and design constraints</b>	<ol style="list-style-type: none"> <li>1. Demonstrate familiarity with system protection and/or damage/hazard mitigation objectives, underlying principles, practices, procedures, and functions.</li> </ol>
	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"> <li>2. Identify risk areas including causes of risks and their impacts.</li> <li>3. Develop risk management/mitigation plans (elimination, mitigation, prevention).</li> <li>4. Demonstrate an understanding of the difference between technical risk and public safety issues.</li> </ol>
<b>1.3 Risk identification and mitigation</b>	Analyze the technical risks and offer solutions to mitigate them.	<ol style="list-style-type: none"> <li>2. Identify risk areas including causes of risks and their impacts.</li> <li>3. Develop risk management/mitigation plans (elimination, mitigation, prevention).</li> <li>4. Demonstrate an understanding of the difference between technical risk and public safety issues.</li> </ol>

	<p><b>1.4 Application of theory</b></p>	<ol style="list-style-type: none"> <li>1. Prepare technical specifications.</li> <li>2. Demonstrate use of theory and calculations to arrive at solutions.</li> <li>3. Demonstrate the development and selection of the preferred/optimal design solution.</li> </ol>
<p>Apply engineering knowledge to design solutions.</p>	<p><b>1.5 Solution techniques</b></p>	<ol style="list-style-type: none"> <li>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.</li> <li>2. Participate in an independent review and verification of solution techniques or analysis methods.</li> <li>3. Participate in the validation of the design/solution by considering the parameters, criteria, methods of analysis, trials, simulations, etc.</li> </ol>
<p>Be able to understand solution techniques and independently verify the results.</p>	<p><b>1.6 Safety awareness</b></p>	<ol style="list-style-type: none"> <li>1. Demonstrate specific knowledge of safety regulations.</li> <li>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.</li> <li>3. Incorporate explicit human and public safety considerations into the design and all other relevant activities.</li> <li>4. Understand and take into account safety risks associated with processes.</li> <li>5. Identify relevant protection equipment and process modifications to mitigate safety risks.</li> </ol>
<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><b>1.7 Systems and their components</b></p>	<ol style="list-style-type: none"> <li>1. Demonstrate an understanding of each element in a process.</li> <li>2. Demonstrate an understanding of the interactions and constraints in the behaviour of the overall system.</li> <li>3. Manage processes within the overall system (monitor and, where needed, modify processes to achieve optimum outcomes).</li> </ol>
<p>Understand systems and their components.</p>		

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

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

<b>3. Manage projects</b>	<b>3.1 Project management principles</b>	<ol style="list-style-type: none"> <li>1. Be aware of resource planning, budgeting, change management, scope management, schedule and unforeseen issues in managing a project from start to end.</li> <li>2. Understand the impacts that benefits and risks of various design solutions have on a project.</li> <li>3. Understand the needs and expectations of internal and external clients.</li> </ol>
	Awareness of project management principles.	
	<b>3.2 Level of responsibility</b>	<ol style="list-style-type: none"> <li>1. Follow and contribute to the development of project management plans.</li> <li>2. Be aware of future improvements and demands as well as other ongoing projects.</li> <li>3. Demonstrate increasing responsibility for client contact and management.</li> <li>4. Demonstrate how project planning activities and interaction with others has increased over your practical development.</li> <li>5. Participate in managing and adapting a schedule.</li> <li>6. Demonstrate awareness of issues related to other disciplines that might affect the project, maintaining contact and communication to discuss and resolve issues.</li> <li>7. Include sustainability analysis in project descriptions.</li> </ol>
	Demonstrate an increasing level of responsibility for project planning and implementation.	
	<b>3.3 Expectations versus resources</b>	<ol style="list-style-type: none"> <li>1. Update the schedule and budget on a regular basis and communicate status.</li> <li>2. Provide market assessment and/or availability of resources for a project.</li> <li>3. Meet deadlines without undermining other impacts on the project (e.g. health and safety, environmental impacts, quality, financial, etc.)</li> </ol>
	Manage expectations based on available resources.	

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

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

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