ENGINEERS & GEOSCIENTISTS BRITISH COLUMBIA

List of all key Competencies & Generic Indicators

COMPETENCY CATEGORY	COMPETENCIES (34) (each require an example)	GENERIC INDICATORS (guidance on example content that will demonstrate the competency)
1. Technical Competence (10 competencies)	1.1 Demonstrate knowledge of regulations, codes, standards, and safety - this includes local engineering procedures and practices as applicable	*1. Identify and comply with legal and regulatory requirements for project activities.* *2. Incorporate knowledge of codes and regulations in design materials.* *3. Prepare reports assessing project compliance with codes, standards, and regulations.* *4. Recognize the need to design for code compliance while achieving constructability*
	1.2 Demonstrate knowledge of materials, or operations as appropriate, project and design constraints, design to best fit the purpose or service intended and address inter-disciplinary impacts.	*1. Demonstrate knowledge of materials, operations, project and design constraints, e.g. cost, design, material, labour, time, budget, production.* *2. Demonstrate understanding of and coordination with other engineering and professional disciplines*
	1.3 Analyze technical risks and offer solutions to mitigate the risks	*1. Demonstrate familiarity with system protection and/or damage/hazard mitigation objectives, philosophies, practices, procedures, and functions.* *2. Identify risk areas including causes of risks and their impacts.* *3. Develop risk management/mitigation plans.* *4. Demonstrate an understanding of the difference between technical risk and public safety issues.*
	1.4 Apply engineering knowledge to design solutions	*1. Prepare technical specifications.* *2. Demonstrate use of theory and calculations to arrive at solutions.* *3. Demonstrate the development of a unique design solution which could not be accomplished with a standard design solution.*
	1.5 Be able to understand solution techniques and independently verify the results.	*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*.
	1.6 Safety awareness: be aware of safety risks inherent in the design; and Demonstrate Safety Awareness – on-site and possible safety authorization/certificate as appropriate	*1. Identify, incorporate, and/or participate in review of safety considerations, safety procedures and safety equipment as they apply to system operations and/or maintenance programs.* *2. Demonstrate specific knowledge of safety regulations.* *3. Incorporate explicit human and public safety considerations in design and all other professional activities.* *4. Understand and account for safety risks associated with processes. Identify relevant protection equipment and process modifications to mitigate safety risks.*
	1.7 Demonstrate understanding of systems as well as of components of systems	*1. Demonstrate an understanding of each element in a process.* *2. Demonstrate and understanding of the interactions and constraints in the behavior of the overall system.* *3. Manage processes within the overall system (monitor and, where needed, modify processes to achieve optimum outcomes).*
	1.8 Exposure to all stages of the process/project life cycle from concept and feasibility analysis through implementation	*1. Demonstrate awareness of project concerns and roles of other stakeholders in the project stages:* i. ***Identification****: generation of the initial project idea and preliminary design* ii. ***Preparation****: detailed design of the project addressing technical and operational aspects* iii. ***Appraisal****: analysis of the project from technical, financial, economic, social, institutional and environmental perspectives* iv. ***Preparation of specifications and tender documents:*** *preparation of tender document, inviting and opening of tenders, pre-qualification, evaluation of bids and award of work* v. ***Implementation and monitoring****: implementation of project activities, with on-going checks on progress and feedback* vi. ***Evaluation****: periodic review of project*
	1.9 Understand the concept of quality control during design and construction including independent design check and independent reviews of design, field checks and reviews.	*1.Conduct checks, including field checks, to verify the validity of design.* *2. Follow Quality Management Principles in Practice* *3. Prepare quality control plans, including frequency and test parameters, for specific processes or products.* *4. Evaluate test results, determine adequacy, and develop recommended action.* *5. Demonstrate peer review.* *6. Demonstrate completed project, systems or sub-systems meet project objectives in terms of functionality and operational performance*
	1.10 Transfer design intentions to drawings and sketches; Understand transmittal of design information to design documents	*1. Ability to review designs of others and communicate findings and issues, including suggested alternatives.* *2. Demonstrate communication of ideas and concepts to project team members.* *3. Demonstrate understanding of value of project completion reports and lessons learned reports to application in future projects by self or others.* *4. Produce sketches, notes, documentation and design documents to prepare proposals, preliminary, and final design drawings for acceptance by the client and approval by regulatory authorities.*
2. Communication (3 competencies)	2.1 Oral	*1. Communicate in a simple and concise manner.* *2. Communicate official project data with team members, clients, contractors* *3. Ability to express both technical and non-technical issues and ideas clearly to both technical and non-technical personnel.* *4. Presentations to technical and non-technical groups; presentations to superiors and subordinates; internal (colleagues) and external (clients) presentations* *5. Presentation of project parameters to the public* *6. Demonstrate active participation in and contribution to meetings*
	2.2 In Writing	*1. Tailor communications to the intended audience.* *2. The ability to write and review technical documents* *3. Ability to write clear memos and reports to both technical and non-technical personnel.* *4. Use drawings and sketches to demonstrate key points and concepts* *5. Demonstrate a written report on a technical subject* *6. Demonstrate a written report on field observations*

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		7. Take training in technical report writing *8. Work with common office programs (e.g. Excel, Word, Outlook, internet browsers)*
	2.3 Reading and Comprehension	*1. The ability to review technical documents, to understand the implications and to summarize key points.*
3. Project and Financial Management (5 competencies)	3.1 Awareness of project management principles	*1. Awareness of resource planning, budgeting, change management, scope management, schedule and unforeseen issues in managing a project from start to end.* *2. Understand the impacts that benefits and risks of various design solutions have on a project* *3. Understand the needs and expectations of internal and external clients*
	3.2 Demonstrate increasing level of responsibility for project planning and implementation	*1. Follow and contribute to development of project management plans* *2. Be aware of future improvements and demands as well as other ongoing projects.* *3. Demonstrate increasing responsibility for client contact and management* *4. Demonstrate how project planning activities and interaction with others has increased over the training period.* *5. Participate in managing and adapting a schedule.* *6. Demonstrate awareness of issues related to other disciplines that might affect the project, maintaining contact and communication to discuss and resolve issues.*
	3.3 Manage expectations in light of available resources	*1. Update schedule and budget on regular basis and communicates status* *2. Provide market assessment and availability of materials for a project.* *3. Meet deadlines*
	3.4 Understand the financial aspects of their work	*1. Demonstrate cognizance of project budget during design and construction* *2. Provide technical/financial report and compare the options.* *3. Demonstrate the understanding of the place of finance in business decisions* *4. Understand principles of budgeting and financing* *5. Understand the relevant business processes* *6. Demonstrate an understanding of working with and developing contracts*
	3.5 Ask for and demonstrate response to feedback	*1. Demonstrate implementation of lessons learned, and performance reviewed in meetings* *2. Show willingness to accept comments and criticism* *3. Identify situations where you received feedback and how you responded to that feedback.* *4. Demonstrate appreciation of the scope of a project and an appropriate response when a project varies beyond the scope.*
4. Team Effectiveness (2 competencies)	4.1 Work respectfully and with other disciplines/people	*1. Demonstrate respect for others' responsibility and expertise.* *2. Integrate engineering with other professional input.*
	4.2 Work to resolve differences	*1. Demonstrate leadership in achieving team goals and resolving conflict.* *2. Work to facilitate beneficial conflict resolution.* *3. Exposure to training in conflict resolution.*
5. Professional Accountability (Ethics & Professionalism) (6 competencies)	5.1 Work with integrity, ethically and within professional standards	*1. Comply with the Code of Ethics in the jurisdiction of practice* *2. Apply professional Ethics in meeting corporate directives*
	5.2 Demonstrate an awareness of your own scope of practice and limitations	*1. Ask for help and incorporate input* *2. Demonstrate interaction with your supervisor* *3. Ask questions when needed* *4. **Structural applicants only**: Understand the role of the StructEng (this indicator only shows if an applicant chooses to report against the structural indicators)*
	5.3 Understand how conflict of interest affects your practice	
	5.4 Demonstrate awareness of professional accountability	*1. Awareness of the potential professional liability involved in all aspects of the design, construction and inspection process.* *2. **Structural applicants only:** Understand the role of the StructEng and Independent Peer Reviews of work (this indicator only shows if an applicant chooses to report against the structural indicators)*
	5.5 Demonstrate an understanding of appropriate use of the stamp and seal	*Please note that understanding and awareness is what is required for this Key Competency.*
	5.6 Understand own strengths/weaknesses and know how they apply to one's position.	*1. Prepare a self-criticism list and the ways to mitigate or eliminate the weaknesses*
6. Social, Economic, Environmental and Sustainability (5 competencies)	6.1 Demonstrate an understanding of the safeguards required to protect the public and the methods of mitigating adverse impacts	*1. Prepare public safety regulations and advice during design and implementation of a project*. *2. Understand potential effects of Climate Change*
	6.2 Demonstrate an understanding of the relationship between the engineering activity and the public	*1. Recognize the value and benefits of the engineering work to the public* *2. Prepare a report regarding the impact of a project to public.*
	6.3 Understand the role of regulatory bodies on the practice of engineering	*1. Recognize the importance of respecting the regional traditions and native regulations towards a project.* *2. Understand the role and regulations of other professions whose practices overlap or interface with the practice of professional engineering.*
	6.4 Be aware of any specific sustainability clauses that have been added to practice guidelines that apply to their area	
	6.5 To the extent possible, recognizing the applicant's position of influence,	*1. Include sustainability analysis in project descriptions.* *2. Provide a list of revisions made during design and implementation period of the*

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	consider how sustainability principles could be applied and promoted in his/her specific work	*project.*
7. Personal Continuing Professional Development (3 competencies)	7.1 Demonstrate completion of professional development activities	*1. Participation in Community, Technical, Industry and/or professional association committees and task forces* *2. Engagement in a variety of self-directed and formal professional development activities to learn and maintain currency in field of practice and report progress to applicable parties*
	7.2 Demonstrate awareness of gaps in knowledge and areas requiring further development	*1. Gap analysis of knowledge and skills; highlight the 'gaps' that exist* *2. Identification of areas of weakness where additional training is needed*
	7.3 Develop a professional development plan to address gaps in knowledge and maintain currency in field of practice	*1. Plan to pursue training in areas of weakness and remedy gaps in knowledge* *2. Planned activities may include in a variety of self-directed and formal professional development activities to learn and maintain currency in field of practice*