COMPETENCY ASSESSMENT

CATEGORY	COMPETENCIES (11)	STRUCTURAL INDICATORS (guidance on example content that will demonstrate the competency)
1. Technical Competence (10 competencies)	1.1 Demonstrate your knowledge and awareness of Canadian regulations, codes and standards. This includes local engineering procedures and practices as applicable. Note: This is a mandatory Canadian Work-Environment Competency. The minimum required level for this competency is 3.	1. Identify and comply with legal and regulatory requirements for project activities 2. Prepare Permit Applications 3. Incorporate knowledge of codes and regulations in design materials 4. Prepare reports on standards and project compliance 5. Recognize the need to design for code compliance while achieving constructability 6. Experience with use of applicable Canadian codes and standards for design, construction and testing 7. Ability to research and apply suitable international codes as needed
	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.	• Demonstrate through examples knowledge of: 1. Interaction behaviours of structures with different materials 2. Properties of various materials (e.g. steel, concrete, pre-stressed concrete, reinforced concrete, wood, masonry) 3. Material specifications and selection 4. Constraints imposed on the structural system by requirements of other disciplines 5. Optimal design, and construction economics
	1.3 Analyze technical risks and offer solutions to mitigate the risks.	1. Understanding fundamental structural phenomena of how structures are damaged or fail 2. Understanding structural phenomena responses for preventing failure (structural stability) 3. Understand the various components of the design and how they contribute to the mitigation of risk 4. Understand potential effects of Climate Change

CATEGORY	COMPETENCIES (11)	STRUCTURAL INDICATORS (guidance on example content that will demonstrate the competency)
	1.4 Apply engineering knowledge to design solutions.	• Demonstrate through examples: 1. Knowledge of loads and climactic data 2. Tolerances, concrete placement, reinforcement, embedment, and welded and bolted connections 3. Knowledge of overall design of a structure and its response to the loads and demands 4. Understanding issues of serviceability and long term maintenance and function 5. Selection of structural system, and material to be used for the project 6. Ability to design in more than one material 7. Ability to analyze, design and detail lateral load resisting systems in the horizontal and vertical plane, including variable stiffness systems, geometric and/or mass irregularities 8. Demonstrate design experience (or working knowledge of) the basic elements of a bridge (abutments, piles, piers and pier caps, retaining walls, bridge deck systems) 9. Design to account for effects of elastic shortening, creep, shrinkage, relaxation of pre-stressing strands and differential settlement 10. Design to account for temperature variations 11. Identify and accommodate site-specific logistical issues in design and construction plans 12. Demonstrate seismic knowledge using capacity design principles (mandatory for Engineers and Geoscientists BC applicants)
	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 2. Understand and have the ability to do approximate analysis to independently verify the results of technical software and solution 3. Participate in an independent review process
	1.6 Demonstrate your knowledge and awareness of Canadian regulations, codes and standards pertaining to safety. Note: This is a mandatory Canadian Work-Environment Competency. The minimum required level for this competency is 3.	1. Be aware of safety risks associated with the construction of the structure 2. Demonstrate an understanding of safety regulations for construction, presence of adjacent structures, geotechnical considerations, impact to the environment 3. Demonstrate specific knowledge of safety regulations 4. Understanding of site safety and Workers' Compensation Act 5. Knowledge and experience with use of Work-Safe/Workers' Compensation Board regulations for design of fall arrest and fall protection lanyards, lifelines, anchors etc 6. Incorporate explicit human and public safety considerations in design and all other professional activities
	1.7 Demonstrate understanding of systems as well as of components of systems.	1. Demonstrate an understanding of the interactions and constraints in the behaviour of the overall system 2. Understand the role and responsibility of a specialty structural engineer 3. Understand the integration of components to generate load paths

CATEGORY	COMPETENCIES (11)	STRUCTURAL INDICATORS (guidance on example content that will demonstrate the competency)
	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: ◦ **Identification:** generation of the initial project idea and preliminary design ◦ **Preparation:** detailed design of the project addressing technical and operational aspects ◦ **Appraisal:** analysis of the project from technical, financial, economic, social, institutional and environmental perspectives ◦ **Preparation of specifications and tender documents:** preparation of tender document, inviting and opening of tenders, pre-qualification, evaluation of bids and award of work ◦ **Implementation and monitoring:** implementation of project activities, with on-going checks on progress and feedback ◦ **Evaluation:** periodic review of project with feedback for next project cycle
	1.9 Demonstrate your understanding of the role of peer review and quality management that is essential to engineering practice in Canada. Note: This is a mandatory Canadian Work-Environment Competency. The minimum required level for this competency is 3.	1. Demonstrate Quality Control in the production of structural drawings & engineering calculations and reports, including review by the supervising professional 2. Participate in independent structural concept review by a third party professional engineer 3. Conduct site visits to observe and verify construction process as well to write field reviews for as built structural conformance to construction drawings 4. Review shop drawings for compliance with design 5. Participate in field review and demonstrate an understanding of roles of testing agencies in the field inspection process. Respond appropriately to site changes or work that is not compliant 6. Operate in an ISO9001-certified environment
	1.10 Transfer design intentions to drawings and sketches; Understand transmittal of design information to design documents.	1. Supervise the drafting of their design and produce sketches for the drafters/CAD technicians, and demonstrate document coordination and control 2. Ensure that drawings reflect the design models and required behaviour 3. Produce technical specifications for construction 4. Be able to review and analyze designs of others and communicate findings and suggest alternatives
5. Professional Accountability (4 competencies)	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