



COMPETENCY ASSESSMENT

COMPETENCY CATEGORY	COMPETENCIES (10)	PROJECT AND CONSTRUCTION MANAGEMENT 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. Ensure incorporation of codes and regulatory requirements in design materials 3. Prepare reports assessing project compliance with codes, standards, and legal/regulatory requirements 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. actual cost vs budgeted cost, design, material, labour, time, 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 as applicable, with system protection, security and/or damage/hazard mitigation objectives, philosophies, practices, procedures, and functions 2. Analyze and manage project risk as it might affect successful completion of a project regarding cost, schedule and performance and/or scope objectives 3. Identify risk areas including causes of risks and their impacts 4. Develop risk management/mitigation plans 5. Demonstrate an understanding of the difference between technical risk and risk to the public interest/public safety issues
	1.4 Apply engineering knowledge to design solutions.	1. Oversee and review the specifications and drawings for the project. Develop the project requirements for the selection of the designer 2. Demonstrate use of theory and calculations to arrive at solutions 3. Demonstrate the development or management of a unique design solution that could not be accomplished with a standard design solution 4. Carry out design and shop drawing reviews
	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 either by the applicant or by the applicant in collaboration with others 2. Participate in an independent review and verification of solution techniques or analysis

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	<p>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.</p>	<ol style="list-style-type: none"> 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. Conduct Job Hazard Analysis (JHA) for all scheduled activities in collaboration with all professionals involved in the construction project (architect, structural engineering firm, entrepreneur, etc.), produce safe job practices for JHA activities and manage prevention of accidents 3. Demonstrate specific knowledge of safety and Work-Safe/Workers' Compensation Board regulations and verify safety and environmental certifications 4. Conduct regular safety meetings 5. Ensure compliance with safety requirements including documented on-site safety inspections 6. Incorporate explicit human and public safety considerations in design and all other professional activities 7. Understand and account for safety risks associated with processes. Identify relevant protection equipment and process modifications to mitigate safety risks 8. Understand the principles of "behavior based safety" and ensure it has been adopted through demonstration of its application
	<p>1.7 Demonstrate understanding of systems as well as of components of systems.</p>	<ol style="list-style-type: none"> 1. Demonstrate an understanding of each element in a process and an understanding of the desired engineered solution (e.g. building, transportation solution, electrical installation, etc) 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>1.8 Exposure to all stages of the process/project life cycle from concept and feasibility analysis through implementation.</p>	<ol style="list-style-type: none"> 1. Demonstrate awareness of project concerns and roles of other stakeholders in the project stages: <ul style="list-style-type: none"> ◦ 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 ongoing checks on progress and feedback ◦ Evaluation: periodic review of project with feedback for next project cycle

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	<p>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.</p>	<ol style="list-style-type: none"> 1. Draft, develop and implement a master quality plan for the project, including site verification, quality control verification/testing and sampling plan, etc. 2. Arrange for and obtain performance tests, witnessing of said tests and other reviews as necessary to ensure that material and equipment meet quality and performance requirements 3. Evaluate test results, determine adequacy, and develop recommended action 4. Conduct checks including field checks to ensure commissioning is done properly, approved and signed off 5. Ensure all quality management principles or practices are followed during the course of the project 6. Prepare quality control plans, including frequency and test parameters, for specific processes or products 7. Ensure that independent peer review and validation of design has been completed 8. Produce quality control and quality inspection and non-conformance and corrective and preventive action (CAPA) reports 9. Demonstrate completed project, systems or sub-systems meet project objectives in terms of quality and operational performance
	<p>1.10 Transfer design intentions to drawings and sketches; Understand transmittal of design information to design documents.</p>	<ol style="list-style-type: none"> 1. Demonstrate the 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, schedules, documentation and design documents to prepare proposals, preliminary and final design drawings for acceptance by the client and approval by regulatory authorities