

List of all key Competencies with Project & Construction Management Indicators

| COMPETENCY CATEGORY | COMPETENCIES (34) (each require an example) | PROJECT & CONSTRUCTION MANAGEMENT INDICATORS (guidance on example content that will demonstrate the competency) |
|---|--|---|
| 1. Technical (10 competencies) | 1.1 Demonstrate knowledge of regulations, codes, standards, and safety - this includes local engineering procedures and practices as applicable | <ol style="list-style-type: none"> 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. | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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. | <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 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. |
| | 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 | <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 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. |
| | 1.7 Demonstrate understanding of systems as well as of components of systems | <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). |
| | 1.8 Exposure to all stages of the process/project life cycle from concept and feasibility analysis through implementation | <ol style="list-style-type: none"> 1. Demonstrate awareness of project concerns and roles of other stakeholders in the project stages: <ol style="list-style-type: none"> 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 documents, inviting and opening of tenders, pre-qualification, perform contract and tender evaluation and analysis in order to award work. Finally, complete the review of chosen vendors' and contractors' drawings to ensure compatibility with other equipment and compliance with final contract documents. v. Implementation and monitoring: review and analyze variations against contract terms and conditions, supervise installation and commissioning, review and document of project outcomes against requirements, and conditions, supervise installation and commissioning, review and document of project outcomes against requirements. vi. Evaluation: Monitor project progress and compare to program/timeline, initiate remedial action where necessary. |
| | 1.9 Understand the concept of quality control during design and construction including independent design check | <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 |

| COMPETENCY CATEGORY | COMPETENCIES (34) (each require an example) | PROJECT & CONSTRUCTION MANAGEMENT INDICATORS (guidance on example content that will demonstrate the competency) |
|---|--|--|
| | and independent reviews of design, field checks and reviews. | <ul style="list-style-type: none"> 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. |
| | 1.10 Transfer design intentions to drawings and sketches; Understand transmittal of design information to design documents | <ul 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. |
| 2. Communication (3 competencies) | 2.1 Oral | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 1. Demonstrate respect for others' responsibility and expertise. 2. Integrate engineering with other professional input. |
| | 4.2 Work to resolve differences | <ul style="list-style-type: none"> 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 | <ul style="list-style-type: none"> 1. Comply with the Code of Ethics in the jurisdiction of practice. 2. Apply professional Ethics in meeting corporate directives. |

| COMPETENCY CATEGORY | COMPETENCIES (34) (each require an example) | PROJECT & CONSTRUCTION MANAGEMENT INDICATORS (guidance on example content that will demonstrate the competency) |
|---|--|---|
| | 5.2 Demonstrate an awareness of your own scope of practice and limitations | <ol style="list-style-type: none"> 1. Ask for help and incorporate input. 2. Demonstrate interaction with your supervisor. 3. Ask questions when needed. |
| | 5.3 Understand how conflict of interest affects your practice | |
| | 5.4 Demonstrate awareness of professional accountability | <ol style="list-style-type: none"> 1. Awareness of the potential professional liability involved in all aspects of the design, construction and inspection process. |
| | 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. | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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, consider how sustainability principles could be applied and promoted in his/her specific work | <ol style="list-style-type: none"> 1. Include sustainability analysis in project descriptions. 2. Provide a list of revisions made during design and implementation period of the project. |
| 7. Personal Continuing Professional Development (3 competencies) | 7.1 Demonstrate completion of professional development activities | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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 | <ol style="list-style-type: none"> 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. |