APEGS
Association of Professional Engineers & Geoscientists of Saskatchewan

COMPETENCY ASSESSMENT GUIDE

FOR APPLICANTS, VALIDATORS AND ASSESSORS

Version 11 – December 12, 2018
Adapted from Engineers & Geoscientists BC's *Competency Assessment Guide*

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1 INTRODUCTION

This Guide is intended to assist users of the **Engineering Competency Assessment System** of the Association of Professional Engineers & Geoscientists of Saskatchewan (APEGS) for the evaluation of engineering work experience. It aims to assist professional engineering (P.Eng.) candidates in completing their competency submission, as well as to guide Validators and Assessors in verifying, validating and evaluating these submissions. The contents are intended to enhance your understanding of engineering competencies and how they should be met and presented in a **Competency Self-Assessment**.

The P.Eng. designation is a professional licence, allowing you to practice engineering on projects or properties located in the province or territory where it was granted. Only engineers licensed with APEGS, or those practising under the direct supervision of a P.Eng. licensed with APEGS, have a legal right to practice engineering on projects or properties located in Saskatchewan. The competency assessment system is intended to preserve the valued reputation, responsibility, and professionalism of the P.Eng. designation. The **Competency Framework**, Indicators, and **Competency Self-Assessment** form were designed in order to ensure that professional registration requirements uphold and protect the public interest while maintaining an equitable, transparent, consistent and efficient registration process. The **Competency Framework** comprises the required proficiencies to enter the engineering profession and provides clear guidance on the path to registration for applicants, Validators, Assessors, and employers alike.

Competency assessment is conducted in order to determine whether or not applicants have progressed to a professional level of competency in their field during their engineering work experience. To achieve registration as a professional engineer (P.Eng.), applicants must also meet a set of requirements including acceptable academic qualifications. The full list of requirements can be found on the APEGS website under Apply, Professional Member: http://www.apegs.ca/Portal/Pages/Professional-Member.

1.1 APPLICABILITY, COMING INTO FORCE AND TRANSITION

This Guide applies to professional engineer applicants (engineers-in-training) as well as international graduates who have applied for engineer-in-training and have been given the opportunity to submit work experience in lieu of writing confirmatory exams (see section 8 – Academic Review Cases for details).

Competency-based assessment comes into effect on January 1, 2019. Transition from the old experience reporting system to competency-based assessment is as follows:

a. Competency-based assessment shall be used by:
    i. new engineers-in-training registered with APEGS on or after January 1, 2019; and
    ii. engineers-in-training registered before January 1, 2019 who have not submitted any experience reports in the outgoing, paper-based system by January 1, 2019.
b. All engineers-in-training registered before January 1, 2019 who have submitted one or more experience reports in the old system by January 1, 2019 have the choice to continue in the outgoing system or switch to competency-based assessment. These engineers-in-training are encouraged and invited to switch to competency-based assessment.

2 COMPETENCY ASSESSMENT – OVERVIEW

2.1 ELEMENTS AND DEFINITIONS

Competency

Competency can be defined as the ability to perform the tasks and roles of an occupational category to standards expected and recognized by employers and the community at large. The **Competency Framework** outlines the common competencies related to work experience in an engineering environment that are essential for professional engineers in all disciplines to ensure effective practice and public safety. Competency is a measure of ability, and thus examples drawn from actual work experience are required to demonstrate it.

In assessing the competency of an applicant for professional engineering licensure, it needs to be clear that they have not only performed well in the circumstances they have encountered to date, but they have demonstrated the capacity to handle situations likely to be encountered in the future. Thus, a competency-based assessment system requires applicants to demonstrate the ability to apply their engineering knowledge reliably and safely across different circumstances; to recognize their professional limitations; and to be prepared when necessary to either a) extend and develop their expertise or; b) call for assistance from other sources.

Providing detailed examples as part of a **Competency Self-Assessment** allows APEGS's Assessors to have a clear picture of an applicant's knowledge and experience in all areas essential to safe and effective engineering practice.

Competency Category

The **Competency Framework** consists of seven **Competency Categories**, which are groupings of competencies or skills.

1. Technical competence
2. Communication
3. Project and financial management
4. Team effectiveness
5. Professional accountability
6. Social, economic, environmental and sustainability
7. Personal continuing professional development (CPD)

The seven categories represent the essential areas in which professional engineers of all disciplines must demonstrate competence in order to ensure effective practice and public safety. Each **Competency Category** contains a list of the **Key Competencies** required in that area. Applicants must meet the required average level of competence in each **Competency Category** in order to meet the competency requirements.

Key Competencies

Key Competencies are defined as an identified skillset or knowledge base which the candidate must have attained to achieve professional registration. They are behavioural-type descriptions of what an applicant must demonstrate they have done in practice to meet the required level of expertise in each **Competency Category**. A successful candidate must meet each **Key Competency** at a minimum of level one on the **Competency Rating Scale** (a training level) while achieving the required average level for each category as a whole.

Level of Competence

Achievement of each category is measured through a **Competency Rating Scale** that outlines six different levels of competence (0 to 5). Each category has a required minimum overall level of competence which is set at either level two or level three, and the average of an applicant's **Key Competency** scores within each category must meet or exceed the required minimum level. Applicants must also achieve a minimum of level one (a training level) in each **Key Competency**. See sections 2.2 and 2.4 of this Guide for a more detailed description of the **Competency Rating Scale** and a table outlining each level.

Indicators

Indicators are defined as specific examples of activities, actions, skills or behaviours that an applicant could use to demonstrate the existence and achievement of a competency. APEGS provides a list of indicators for each **Key Competency** in order to help applicants to understand what types of examples are needed to meet each requirement, or what specific knowledge base, experience or skill they must develop before achieving professional registration. **Indicators are for guidance and are not absolute requirements**. They help you interpret what you need to describe for your area of practice.

There is one generic indicator list that covers all the **Competency Categories** for all engineering disciplines. There are also discipline-specific indicator lists for the Technical Competence category (Category 1) for several engineering disciplines, including:

- Structural.
- Civil: Municipal/Infrastructure.
- Electrical: Power and Industrial.
- Materials, Metallurgical and Mineral Processing.

Even if your work experience was in one of the above areas, it is your choice as to whether or not you refer to the discipline-specific indicators when completing your entries or if you use the generic indicator list. The indicator lists are found in Appendices 2 to 6.

Engineering Competency Assessment System

The system operates through an efficient, easy-to-use online system. Through the **Engineering Competency Assessment System**, engineers-in-training and applicants can save their work experience information, monitor their progress towards meeting the competency requirements, and submit this information for online validation and assessment.

2.2 COMPETENCY RATING SCALE

The **Competency Rating Scale** is used to determine whether a candidate has achieved the required level of competence to gain registration as a professional engineer. A candidate must attain the minimum defined average level of competence in all **Competency Categories**, with no score lower than level one for any **Key Competencies**.

See Table 1 following for a brief outline of the **Competency Rating Scale**.

TABLE 1 – COMPETENCY RATING SCALE (2 pages)

Compe-tence Level	Short Description: Category 1	Short Description: Categories 2-6	Short Description: Category 7	Direct Supervision Required	Responsibility & Risk	Complexity of applicant's work	Supervision & Development of Others* *Category 1 only
0	Little or no exposure to the competency	Little or no exposure to the competency	No CPD completed and/or planned; no gap analysis	N/A	N/A	N/A	N/A
1	Training Level: A general appreciation and awareness of the competency is required	Training Level: A general appreciation and awareness of the competency is required	Minimal amount of CPD completed and/or planned; CPD completed may not address professional competence; an incomplete gap analysis	Significant	Minimal	Minimal	None
2	Requires knowledge and understanding of objectives; uses standard engineering methods and techniques in solving problems	At a level of limited experience; carries out activities of limited scope and complexity; requires knowledge and understanding of objectives	A marginal amount of CPD completed and planned; a marginal/insufficient gap analysis	Considerable	Some	Some	Limited
3	Carries out assignments of moderate scope and complexity; is typically seen to be prepared to assume professional engineering responsibilities	Approaching a professional level; carries out activities of moderate complexity	Adequate amount of CPD completed and/or planned; an adequate gap analysis	Some	Considerable	Moderate	Some

Compe-tence Level	Short Description: Category 1	Short Description: Categories 2-6	Short Description: Category 7	Direct Supervision Required	Responsibility & Risk	Complexity of applicant's work	Supervision & Development of Others* *Category 1 only
4	Carries out responsible and varied assignments requiring general familiarity with a broad field of engineering and knowledge	Working at a professional level; carries out responsible and varied activities	A good amount of CPD completed and/or planned; a strong gap analysis	Minimal	Significant	Considerable	Some
5	Uses mature engineering knowledge; independent accomplishment, and coordination of difficult and responsible assignments	At a mature professional level; independent coordination of difficult and responsible activities	Provides and demonstrates leadership in Continuing Professional Development (CPD) activities; a superior gap analysis	Autonomous	Total	Significant	Some

2.3 COMPETENCY CATEGORIES

To help cross-reference the **Competency Categories** with the **Competence Levels** shown in the next section, the seven **Competency Categories** are repeated here:

1. Technical competence
2. Communication
3. Project and financial management
4. Team effectiveness
5. Professional accountability
6. Social, economic, environmental and sustainability
7. Personal continuing professional development (CPD)

2.4 COMPETENCE LEVELS

Following is an overview of each **Competence Level**, divided by **Competency Category**.

Competence Level 0

An engineer at **Competence Level** zero:

Categories 1-6:

- Has little or no exposure to the competency.

Category 7:

- Has completed no Continuing Professional Development (CPD).
- Has not completed a gap analysis to determine areas of weakness.
- Has demonstrated no plan for future professional development.

Competence Level 1

An engineer at **Competence Level** one:

Category 1:

- Receives training in the various phases of office, plant, field, or laboratory engineering as on-the-job assignments.
- Assigned tasks include: preparation of simple plans, designs, plots, calculations, costs, and bills of material in accordance with established codes, standards, drawings, or other specifications.
- May carry out routine technical surveys or inspections and prepare reports.
- Has no supervisory role.

Categories 2-6:

- Receives training in on-the-job assignments.
- Is at an early/beginner level.
- Carries out activities of low complexity.
- Has no supervisory role.

- Is at a basic level in this area; competency needs substantial development.

Category 7:

- Has completed a minimal amount of CPD activities.
- Gap analysis is incomplete; incomplete assessment of areas of weakness.
- Has developed an inadequate or no professional development plan; many gaps in knowledge are not sufficiently addressed.

Competence Level 2

An engineer at **Competence Level** two:

Category 1:

- Receives assignments of limited scope and complexity, usually minor phases of broader assignments.
- Uses standard engineering methods and techniques in solving problems.
- Assists more senior engineers in carrying out technical tasks requiring accuracy in calculations, completeness of data, and adherence to prescribed testing, analysis, design or combination of methods.
- May assign and check work of one to five technicians or others.
- Is normally regarded as a continuation of an engineer's training and development.

Categories 2-6:

- Carries out activities of limited scope and complexity, usually minor phases of broader assignments.
- Usually relies on predetermined standards and techniques in solving problems.
- Assists more senior engineers in carrying out tasks.
- Is normally regarded as a continuation of an engineer's training and development.
- Has marginal skills in this competency; some training is required to bring skills up to a professional standard.

Category 7:

- Has completed some professional development activities on a sporadic basis.
- Has a marginal gap analysis; insufficient assessment of areas of weakness.
- Has developed a marginal professional development plan; not all key gaps in knowledge are addressed.

Competence Level 3

An engineer at **Competence Level** three:

Category 1:

- Receives assignments of moderate scope and complexity, including standalone phases of major projects.

- Usually solves problems by using combinations of standard procedures, modifications of standard procedures, or methods developed in previous assignments.
- May assign and check work of one to five technicians and technologists.
- Is typically seen to be ready to assume professional engineering responsibilities.

Categories 2-6:

- Carries out activities of moderate scope and complexity.
- Provides significant assistance to more senior engineers in carrying out tasks.
- Usually solves problems by using combinations of standard procedures, modifications of standard procedures, or methods developed in previous assignments.
- Possesses adequate skills in this competency.
- Is typically seen to be ready to assume professional engineering responsibilities.

Category 7:

- Has completed a sufficient amount of CPD activities.
- Has an adequate gap analysis; areas of weakness are adequately assessed.
- Has developed an adequate professional development plan; gaps in knowledge are addressed.

Competence Level 4

An engineer at **Competence Level** four:

Category 1:

- Carries out responsible and varied assignments requiring general familiarity with a broad field of engineering and knowledge of associated effects of the work upon other fields.
- Solves problems by using a combination of standard procedures and devising new approaches.
- Deals with assigned problems by devising new approaches, applying existing criteria in new ways, and drawing conclusions from comparative situations.
- Participates in planning to achieve prescribed objectives.
- May give technical guidance to one or two junior engineers or technologists, and technicians assigned to work on a common project.
- Is typically seen to be working at a fully qualified professional engineering level.

Categories 2-6:

- Carries out responsible and varied activities requiring general familiarity with the area of competency.
- Deals with assigned problems by devising new approaches, applying existing criteria in new ways, and drawing conclusions from comparative situations.
- Participates in planning to achieve prescribed objectives.
- May provide guidance to one or two junior engineers or technologists, and technicians assigned to work on a common project.
- Possesses strong skills in this competency; above average ability is apparent.
- Is typically seen to be working at a fully qualified professional engineering level.

Category 7:

- Has completed a good amount of CPD activities.
- Has a strong gap analysis; areas of weakness are correctly assessed.
- Has developed a strong professional development plan; gaps in knowledge are well addressed.

Competence Level 5

An engineer at **Competence Level** five:

Category 1:

- Applies mature engineering knowledge in planning and conducting projects having scope for independent accomplishment, and coordination of difficult and responsible assignments.
- Deals with assigned problems in a mature, creative and experienced manner by modifying established guides, devising new approaches, applying existing criteria in new ways, and drawing conclusions from comparative situations.
- Participates in short and long-range planning.
- Makes independent decisions for devising practical and economical solutions to problems.
- Assigns and outlines work; advises on and outlines more difficult problems and methods of approach.

Categories 2-6:

- Carries out activities of advanced scope and complexity.
- Independently coordinates difficult and responsible assignments and activities.
- Deals with problems or issues in a mature, creative and experienced manner by modifying established guides, devising new approaches, applying existing criteria in new ways, and/or drawing conclusions from comparative situations.
- Participates in short and long-range planning.
- Makes independent decisions for devising practical and economical solutions to problems or issues.
- Possesses superior skills in this competency; provides mentorship or supervision for others.

Category 7:

- Provides and demonstrates leadership in CPD activities.
- Has excellent gap analysis; areas of weakness are very well assessed.
- Has developed a superior professional development plan to address all gaps in knowledge and maintain currency in field of practice.
- Develops professional development plans with others and may instruct courses as appropriate.

2.5 ROLES & RESPONSIBILITIES

The following is an overview of the roles and responsibilities of each participant in the competency assessment system.

APPLICANT

- Provides work experience details through the **Engineering Competency Assessment System**, including work experience chronology and specific examples to address each **Key Competency**.
- Provides self-assessed **Competence Level** for each **Key Competency** according to the **Competency Rating Scale**.
- Provides contact information for a minimum of four individuals to act as Validators and verify and provide feedback on their competency assessment. For those Validators who were not given specific competencies to validate, they provide an overall assessment. For example, if the candidate provided examples from only one supervisor, that supervisor validates all the examples and the other three Validators provide general comments and answer the general reference questions included in the **Engineering Competency Assessment System**.
- Provides further information as requested.

VALIDATORS (supervisor/employer/colleague/client – ideally P.Eng. supervisor)

- Confirms the work experience information of which they have personal knowledge.
- Provides **Competence Level** scores for **Key Competencies** to which they are assigned by applicants (if applicable).
- Provides overall feedback on the applicant's readiness for professional registration.

ASSESSORS (Qualified APEGS volunteers in the applicant's area of practice)

- Reviews applicant's submission as well as Validators' feedback.
- Provides scores for each **Key Competency**.
- Makes a recommendation on applicant's readiness for professional registration.

3 DOCUMENTATION AND INSTRUCTIONS

3.1 SUBMISSION COMPONENTS

There are two main components that applicants must complete as part of their competency assessment, which are both submitted through the **Engineering Competency Assessment System**:

1. A brief, chronological **Employment History**. This provides a short form overview of an applicant's experience.
2. A **Competency Self-Assessment** using examples drawn from work experience to demonstrate achievement of each **Key Competency**.

Note that competency submissions are not assessed until you are registered with APEGS as an engineer-in-training (with one exception – Academic Review cases where the applicant is given the opportunity to submit work experience to waive confirmatory exams. You will receive written notification from APEGS if this applies to you).

3.2 BEFORE YOU APPLY – INITIAL STEPS

- Ensure that your résumé/CV is kept up to date to include key job roles, projects and achievements over the period of work experience you are claiming (a minimum of four years). This saves you time in completing the Employment History and selecting projects to use as examples in the **Competency Self-Assessment**.
- Ensure you maintain a record of all of your CPD goals and activities.
- Familiarize yourself with the **Competency Framework** and its indicators, including any discipline specific indicators available for your area of practice. They are included in the **Competency Self-Assessment** section of the online system for reference and are also in the appendices of this Guide.
- For key learning activities, take the time to reflect briefly on the key learning that you gained including how it may have impacted your practice and contributed to demonstrating competence within any of the **Competency Categories**.

3.3 EMPLOYMENT HISTORY

Compiling an Employment History

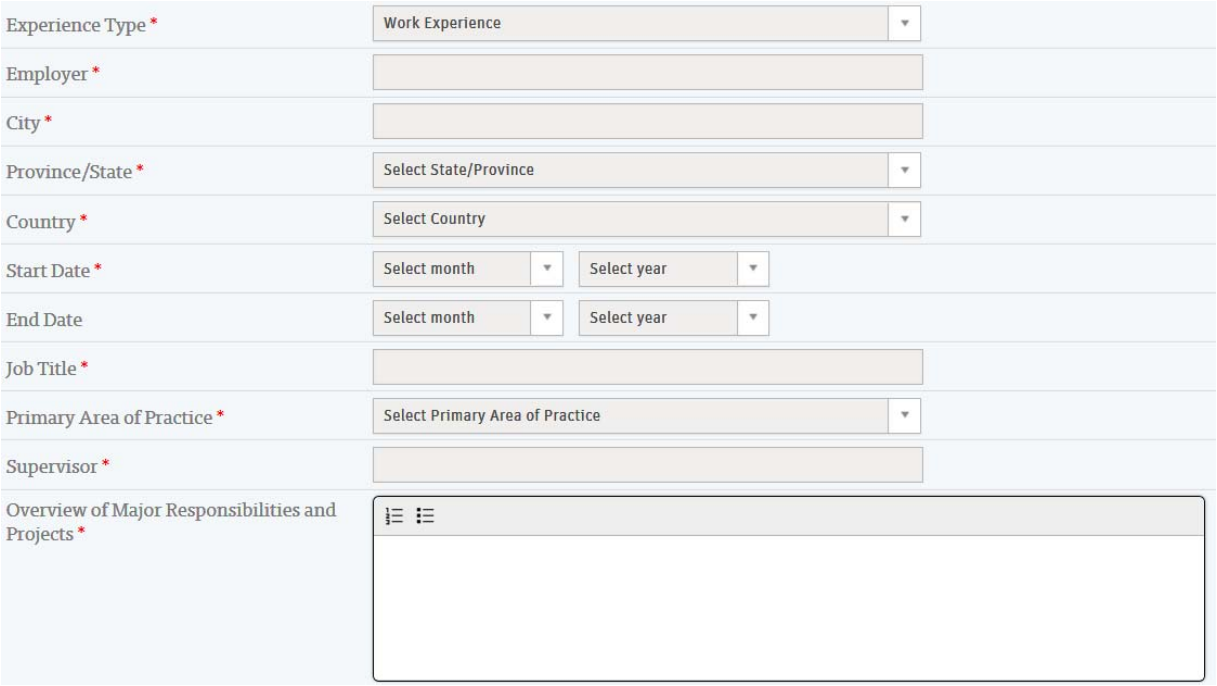
All applicants must complete an **Employment History** summary through the **Engineering Competency Assessment System**. The Employment History section creates a chronological, short-form overview of an applicant's experience, including brief additional detail regarding responsibilities in each position. The summary can be edited at any time before an applicant submits their final **Competency Self-Assessment**.

Remember to:

- Briefly explain any gaps or overlaps in time periods.
- Demonstrate evidence of progression of experience and responsibility throughout your career.

Format and Information

The format of entries in the Employment History section is as follows:



For each item, you select "add employment history" and enter the relevant information. You are asked to classify each item as "work experience", "other/non-engineering" or "thesis." Note that only a thesis-based Masters (M.Sc.) is eligible to count toward the four years of experience required, not a course-based Masters (M.Eng.).

In the "Overview of Major Responsibilities and Projects" section, provide a brief outline of the major projects on which you worked in each position, including a description of your role and the project scope. Point form is permitted.

Four years* of experience requirement

*Academic Review Cases require five years of experience. See section 8 – Academic Review Cases of this Guide, if this applies to you.

It is through the Employment History screen that we determine whether or not you have the four-years of experience required for professional registration. Eligible experience is counted as follows:

Post-bachelors experience – Acceptable full-time engineering experience is counted based on the number of months of experience. If experience was less than full-time then you must indicate the

percentage in the Overview box. You do not need to subtract normal vacation and statutory holidays, however lay-offs and leaves of absence are not counted. The time counted cannot exceed calendar time so if you worked more than 40 hours per week you cannot count that as additional time worked.

Pre-graduation experience – One year maximum can be counted. Experience has to be from after half of the bachelor level university program of study is completed and supervised by (or close professional oversight by) a professional engineer, professional geoscientist, engineering licensee (if the experience is within their scope of practice) or geoscience licensee (if the experience is within their scope of practice) registered anywhere in Canada or the USA. Contact the APEGS office to discuss situations where you worked closely with a professional engineer, professional geoscientist, engineering licensee or geoscience licensee, as it might be eligible. See also "technologist experience" below.

A completed thesis-based Masters degree in engineering (M.Sc.) – One year maximum can be counted. Attach the one-page thesis abstract and list of publications (if applicable) in the online system. A maximum of three years of experience is counted for international experience and graduate studies combined; i.e. Canadian graduate studies does not count toward the one year of Canadian experience requirement. A course-based Masters (M.Eng.) is not eligible to be counted for experience required.

A completed PhD in engineering – Two years maximum can be counted if the PhD program was entered directly after a bachelor program. Only one year can be counted when a Masters was completed; i.e. the maximum allowable experience counted for graduate studies is two years. Attach the one-page thesis abstract and list of publications in the online system.

Engineering work while doing graduates studies – Any engineering or Teaching Assistant / Research Assistant work not related to your graduate degree work is eligible to be counted. Engineering experience gained with an employer outside the university setting also counts. The number of months experience counted cannot exceed the actual calendar time. This experience is entered as separate employment periods from your graduate degree even though the time periods might overlap.

International experience – A maximum of three years can be counted. The remaining year is reserved for the Canadian or equivalent-to-Canadian experience requirement. A maximum of three years is counted for international experience and graduate studies combined because Canadian graduate studies does not satisfy the Canadian experience requirement. International experience reports need to be validated in the same way as Canadian experience.

Teaching of engineering – Examples from this type of experience are eligible for submission. You include the applicable content of what you taught in order to demonstrate the competency. Engineering courses taught must have engineering science and/or engineering design as defined by the Canadian Engineering Accreditation Board. For a particular competency example, include the name of the course you taught as well as details on the applicable part of the course that fulfills the competency and how that content is applied in a real-world situation (the outcome).

Technologist experience prior to completing bachelor degree - One year maximum can be counted in exceptional cases where a candidate has at a minimum a technologist level education prior to going back to university to obtain a bachelor level degree in engineering. This experience needed to be supervised by a professional engineer, professional geoscientist, engineering licensee (if the experience is within their scope of practice) or geosciences licensee (if the experience is within their scope of practice) in order to be considered. The 12-month maximum is reduced by the number of months of pre-grad experience counted for a maximum total of 12 months for any experience gained prior to completing the university level education in engineering that was the basis of registration for engineer-in-training.

3.4 COMPETENCY SELF-ASSESSMENT

3.4.1 Selecting Validators

Through the **Engineering Competency Assessment System**, applicants provide the names and email addresses of Validators. Validators verify and provide feedback on the engineering experience.

Considerations when selecting Validators:

- A **minimum of four Validators** are required.
- Validators are typically the P.Eng. supervisors but may also be colleagues, clients or consultants with first-hand knowledge of your work experience. The supervisor is the person whom you report to or who signs off on your work. A minimum of two should be professional engineers (or equivalent).
- Combined, the Validators' first-hand knowledge should cover as much of your experience as possible but a minimum of four years must be covered (five years for Academic Review Cases, see Section 8).
- Each competency requires one Validator. A Validator can verify multiple competencies.
- There may also be some Validators who are not given specific competencies to verify but provide input in the overall feedback section only. The overall feedback section includes questions on the applicant's readiness for licensure.
- Validators nominated by the applicant to verify specific competency examples must have direct personal and professional knowledge of that experience. This person is the supervisor except in exceptional circumstances where prior approval is obtained from APEGS. At least one Validator must be a direct supervisor and share the same discipline of practice for which you are applying.
- No additional reference forms are required to be submitted for users of the **Engineering Competency Assessment System**; all supervisor feedback is provided through the system's online validation process.

- **The applicant must do their utmost to contact their supervisor(s) to act as Validators.** Contact APEGS's registration staff for assistance if there are issues with making contact or if you are experiencing a delay in the Validator completing their part. A person other than the direct supervisor may be used to validate examples only upon approval by APEGS. Remember that the Validators who are not verifying specific competency examples but are only completing the overall feedback section need not have been one of your supervisors.

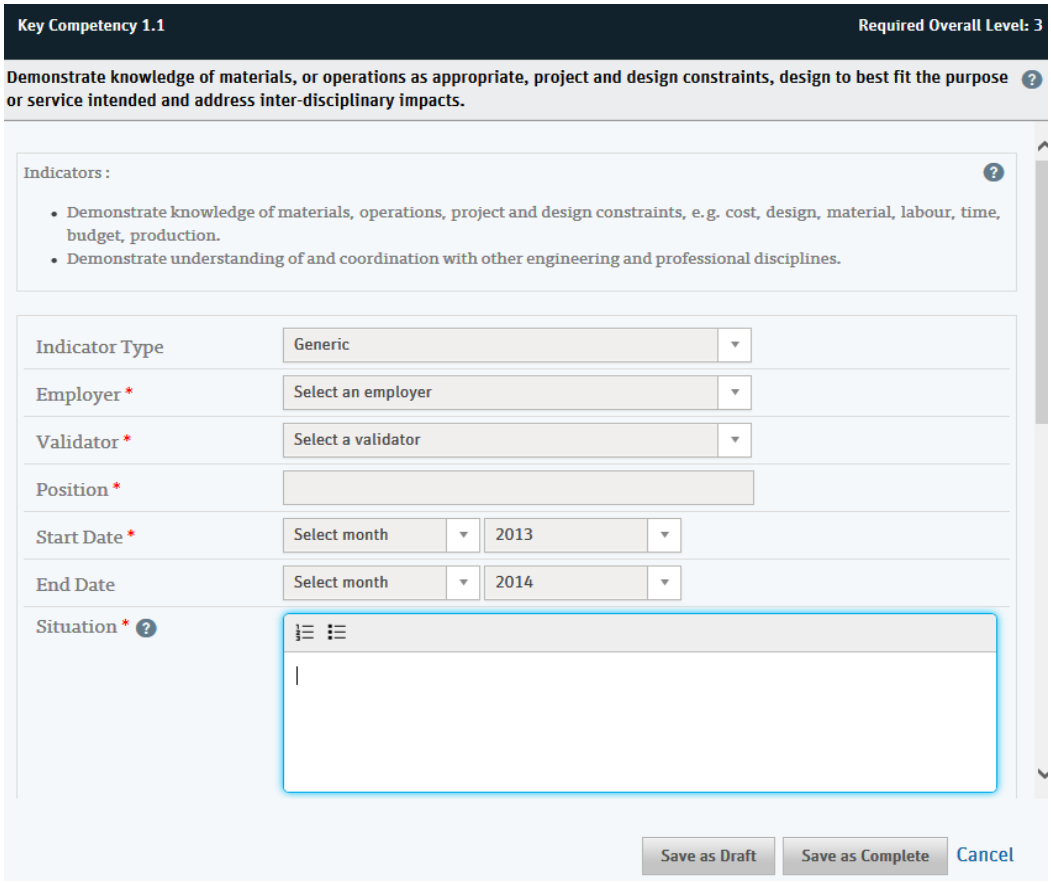
As you complete your **Competency Self-Assessment**, you assign each example to a Validator with first-hand knowledge of the work described and following the considerations above for selecting Validators. This Validator is asked to provide a **Competence Level** score for the example, and has the option of providing a comment. All Validators are also asked to provide overall feedback on your experience and readiness for professional registration. **There is no requirement to assign all of your Validators to a Key Competency; Validators not assigned to any Key Competencies are asked to provide overall feedback.** For example, co-op work term supervisors who do not need to validate any examples may be included as Validators to provide overall feedback, which allows them to comment on and confirm your experience during the co-op period.

3.4.2 Competency Examples

The **Competency Self-Assessment** section is divided into the seven categories of the **Competency Framework**. Under each category heading – such as Technical Competence – the required **Key Competencies** are listed. An example must be provided for all **Key Competencies** prior to final submission. Each **Key Competency** must be achieved at a minimum level of one on the **Competency Rating Scale**, while **achieving the required average level for each category as a whole**. The minimum required scores for each category is either 2 and 3 depending on the category.

When filling in the **Competency Self-Assessment**, use both the competencies and their indicators as guidelines to identify suitable and relevant projects and activities from your engineering experience that best **demonstrates your achievement of each Key Competency**. **Be specific about your individual actions and contributions**. For each example, you are asked to identify a self-assessed **Competence Level** that you believe you have demonstrated. The descriptions of each level of competence in sections 2.2 and 2.4 of this Guide helps you determine which level on the **Competency Rating Scale** you should cite for each **Key Competency**. The descriptions are also provided in the applicable screens in the online system.

An image of the window for entering **Key Competency** examples is included below.



Selecting, Drafting and Saving Examples

Under each **Key Competency** you are asked to describe the example of your recent engineering activities that best demonstrates your achievement of the competency. The examples you select should reflect activities or projects in which you had responsibility. Detail is encouraged; be specific in describing how you have met the **Key Competency**. When selecting examples, it is recommended that you pay close attention to the indicators; they are intended to assist you in identifying typical evidence to submit. **Different aspects of the same project can be used to demonstrate several competencies.**

For each **Key Competency** you have the option of viewing different types of indicators from the "indicator type" drop-down list; the generic indicators are recommended for most situations, but discipline specific indicators are also available in several areas of practice for Category 1. You do not need to demonstrate all indicators listed, although they provide a helpful guide as to what Assessors are looking for. Indicators are **examples to guide you in determining the type of engineering work that satisfies each Key Competency.**

Each example includes the following information:

- **Employer and Position**: Your employer and position at the time of the work described in the example.

- **Validator:** The Professional Engineer or equivalent that has first-hand knowledge of your work who you are asking to validate this example. This is ideally a supervisor, but may also be a colleague or client with prior approval of APEGS.
- **Start Date and End Date (Month/Year)**: The time period covered by your example.
- **Situation**: A brief overview of a specific situation or problem. The same situation can be used to cover multiple **Key Competencies**.
- **Action**: The actions that you took in response to the situation, including engineering judgments made or solutions found. This section is typically the longest portion of the example and should include details about the specific actions that you took that demonstrate completion of the **Key Competency**. **Be specific about your individual work and contributions – use of the word "I" is required in order to show what work you did specifically**. Point form is permitted.
- **Outcome**: The impact that your actions, solutions or judgments generated.
- **Self-Assessed Competence Level**: The level on the **Competency Rating Scale** that you believe that you demonstrated in the example.
- **Canadian environment example**: Whether this experience was gained in a Canadian environment. Canadian or "equivalent-to-Canadian" normally means anything from within Canada or the United States and it does not include Canadian graduate studies. However, if you have international experience with a company that uses Canadian standards, customs and codes, it might be considered equivalent to Canadian. Call the APEGS office and speak to registration staff to help you make that determination.

Examples are valid if:

- They are related to unique problems without obvious pre-determined solutions; and
- You had full or partial responsibility for delivering the outcome; and
- They typically took at least one month* to accomplish (*more on this in section 5.1 of this Guide).

Use "I" statements as opposed to "we"

Depending on the **Key Competency**, it is recommended to include the significance of the project (e.g. an indicator of project size such as dollar value and duration), your role in the project and the key issues and outcomes. Make the technical or managerial complexity of the project clear. Be specific about your role (use "I" statements) and level of responsibility.

Applicants are encouraged to exercise judgement over the level of detail provided with different examples. Less detail may be needed for substantial, obviously complex projects or activities than for smaller scale

projects where the complexities may not be immediately apparent to the Assessors or where the work is in a non-traditional engineering environment. The objective is to supply sufficient information to enable straightforward verification of your evidence by Assessors, and not to leave Assessors with substantive questions or information gaps that require further investigation before they can verify that the required **Competence Level** is met.

Assessors cannot rely on 'implied evidence' – they can only use evidence which clearly shows you are able to do the things required by the **Competency Framework**. For this reason it is important to identify specific examples that best demonstrate your competence. For example, in your **Competency Self-Assessment** it is not acceptable to state: "I am a Project Manager and must be able to communicate clearly to perform my job". You must give specific examples of your communication requirements (e.g. chairing client meetings, managing contractors, reporting to senior management).

When completing your **Competency Self-Assessment** form, **always write in the first-person. Use "I" statements as opposed to "we"** - even if you were working as part of a group. **It is important to identify your personal contribution and those things for which you took responsibility.**

Remember

- Your competencies are assessed as development towards becoming a professional engineer. Your examples should demonstrate experience in an engineering environment or as part of an engineering assignment.
- Be specific about your contributions when describing your experience. Avoid general terms such as "participated in" or "involved with", and **state your exact duties**.
- Always write in the first person **using "I" statements** – even if you were working as part of a group.
- Wherever possible use point form when describing the actions you took to resolve the Situation described in your example.
- As an applicant, it is your responsibility to pick your best evidence for your submission. Do not wait to be asked!
- Assessors cannot rely on 'implied evidence' – you must use specific examples that best demonstrate your competence. For example, for **Competency Category** 2, in which applicants must show that they communicate clearly with others as part of their engineering activities:

  ☒ "I am a Project Manager and must be able to communicate clearly to perform my job."

  ✓ "As a Project Manager I chair client meetings, manage contractors and report to senior management. For example… <<include a specific time you did one of these>>"

- For examples of what could be good evidence to include in the **Competency Self-Assessment** you can refer to the indicators.
- The same situation / project can be used to demonstrate several competencies.

4 VALIDATION OF A SUBMISSION

See section 3.4.1 – Selecting Validators for the requirements on choosing Validators.

4.1 VALIDATION PROCESS

The online validation process proceeds as follows:

1. Validators cited by the applicant receive a link by email which includes login information to complete their validation through the online system. This e-mail is sent when an applicant submits an example through interim validation or a completed **Competency Self-Assessment**. It is recommended that the applicant contact the Validator(s) after releasing the completed submission for validation to confirm they received their link. **Note:** If the Validation e-mail was not received, check the spam filter.

2. Following the link, the Validator enters the **Engineering Competency Assessment System**.

3. The Validator first views the applicant's education and employment history. No input is required from the Validator in these sections, but they provide the Validator with the opportunity to review chronological summaries of the applicant's education and experience.

4. Validators then have an opportunity to decline to complete the process if they are not willing or not able to verify the applicant's experience. A reason must be provided if the validation is declined, and a comment box is provided. The reason, along with all Validator feedback, is confidential and is not visible to the applicant.

5. The Validator is then asked to review the applicant's **Competency Self-Assessment** and provide feedback on any examples that the applicant has assigned to them. Applicants select the appropriate Validator for each example they provide. The selected Validator provides a rating on the **Competency Rating Scale** and is given the option to provide a comment. Descriptions of each level are available in sections 2.2 and 2.4 of this Guide. **Validator comments on the examples are encouraged** and help to provide valuable additional feedback and information to Assessors.

6. Finally, Validators are asked to provide overall feedback on the applicant's readiness for licensure*****. The overall feedback section includes the questions from the APEGS professional reference form so those people are not asked to complete a separate reference again. Also note that if a Validator is not assigned to a specific competency example, s/he is asked to complete this overall feedback section only.

   *****Note – Overall feedback on readiness for licensure is not required for an Interim Submission, however, the question is still there as part of the online system. The Validator can simply leave that blank but if they do not, it will not cause a problem because Assessors will know it is an Interim Submission.

If the Validator rates an applicant lower than the applicant rates themselves

If a Validator rates an applicant lower than the applicant self-rates, we look at several things:

- If it is one competency and the category averages to an acceptable level, it is normally not considered to be a problem. Validators whose rating is below the applicant's will often comment on why, although it is not mandatory. Assessors tend to accept the Validator's rating, especially if it is below that of the applicant, as it normally is accompanied by a concern articulated by the Assessors.
- We look at the Validator's overall additional feedback at the end to see if the Validator considers the person ready for registration or licence.
- We do not automatically fail the competency, as it may be that the applicant did an unacceptable job of reporting an acceptable example. If there is an overall Validator assessment that the applicant needs improvement or additional experience, Assessors will comment on this and the applicant will normally be given the opportunity to re-submit the competency in question if it is necessary.
- Upon assessment of the re-submission, either the competency is accepted or the applicant will have to use another example from other work experience or gain additional experience to satisfactorily complete a **Competency Category**.

Although we are ensuring that the applicant has an understanding of all of the competencies and can demonstrate an overall average minimum level achievement in each category, at the end of the day, we are looking at other factors including the peer recommendations to determine if the applicant is ready for professional registration.

Disagreement with Validator's Evaluation

All members-in-training, professional members and licensees are obligated to adhere to the Code of Ethics of the Association with which they are registered. The Code of Ethics for APEGS is contained in section 20 of the Regulatory Bylaws which can be found on the APEGS website www.apegs.ca under About Us, Act and Bylaws.

Section 2(e) of the Code of Ethics states "members and licensees shall conduct themselves with fairness, courtesy and good faith towards clients, colleagues, employees and others; give credit where it is due and accept, as well as give, honest and fair professional criticism". If a Validator includes a negative comment in an experience report it does not necessarily mean that the experience will not be approved. It is essential that future and current professionals are aware of areas they need to make improvement.

A member-in-training may not agree with the evaluation of a Validator. If that is the case, it should be discussed with the Validator and if necessary, an additional letter submitted to APEGS stating the concerns.

Should negative comments be included in an experience submission, the Experience Review Committee identifies the area of concern (competence or conduct) and attempts to identify personality conflicts to eliminate them from the assessment where they exist. If necessary, further information from the

member-in-training, supervisors, mentors, Validators, co-workers and other references is gathered for the committee's consideration.

5 ASSESSMENT

Each competency submission is reviewed by two Assessors in the applicant's field. The online assessment process proceeds as follows:

1. Two Assessors are assigned by APEGS staff, then notified by email once the submission is ready for review, and log in to the **Engineering Competency Assessment System**. Each Assessor performs their review independently.

2. Each Assessor examines the candidate's education and employment history. No input is required from the Assessor in these sections, but they provide the Assessor with the opportunity to review chronological summaries of the applicant's education and experience.

3. Each Assessor then reviews the candidate's **Competency Self-Assessment** and determines for each **Key Competency** whether the example(s) provided represent sufficient evidence that it is met. While reviewing each example, Assessors note the **Competence Level** claimed by the applicant and Validator for each **Key Competency**. Based on the breadth, depth and quality of the example provided they determine the **Competence Level** demonstrated for each **Key Competency**. Descriptions of each level are available in sections 2.2 and 2.4 of this Guide. Assessors also have the option of providing a comment for each **Key Competency**; these comments are confidential to the assessment process and are not viewable to the applicant or Validators.

4. The system calculates the average **Competence Level** achieved for each category according to each Assessor.

5. In the "Supporting Documents" section, Assessors may review any supporting documents uploaded by the applicant. The inclusion of supporting documents is optional, however applicants who want to count a thesis-based Masters or PhD in the four years of experience requirement must upload the one-page thesis abstract.

6. In the "Validator Overall Feedback" section, Assessors review the feedback of the applicant's Validators.

7. Each Assessor is then asked to confirm their final recommendation on whether the applicant has met the competencies at the required level for professional registration.

5.1 RATING AN EXAMPLE

Assessors grade an applicant's **Competency Self-Assessment** by rating the examples provided for each **Key Competency** according to the **Competency Rating Scale**. An Assessor's role is to examine the examples provided for each **Key Competency** and determine the **Competence Level** demonstrated; applicants must have met the required average **Competence Level** for each category to be approved.

Example Review Process – Category 1

An evaluation of **Competency Category** 1, Technical Competence, serves as an example of the review process. Ten **Key Competencies** (1.1 to 1.10) are included in this category.

The Assessor reads and assesses the examples for each **Key Competency**, keeping in mind the following:

- Examples must be related to unique problems without obvious pre-determined solutions. Original thinking is used in the analysis and/or synthesis of problems.
- The candidate must have had full or partial responsibility for delivering the outcome.
- Examples must typically have taken at least one month to accomplish.
    - Note - the length of time it takes to perform a task is not indicative of complexity. A complex example can take a short amount of time and a simple example can take an extended period of time. The typical minimum of one month is for guidance and is not an absolute. For instance, for working well in a team, a significant difference of opinion could be resolved within a week and be an excellent example. The quality of the example is more important than the time it takes to complete it.
- Examples must be **clear and specific** and demonstrate the candidate's competence in a particular area. Assessors cannot rely on implied evidence.

Based on the evidence provided in the examples, the Assessor assigns the applicant a score on the **Competency Rating Scale** for each **Key Competency** in the category – in this case, the ten **Key Competencies** under Technical Competence. The applicant's self-assessed score as well as the Validator's feedback are available for reference, as well as the detailed descriptions of each **Competence Level** included in sections 2.2 and 2.4 of this Guide.

The online system calculates the average that the applicant has achieved for each **Competency Category** based on the scores assigned by the Assessors. For the Technical Competence category, if the average score is equal to or higher than the required minimum overall **Competence Level** of 3 for this category, then the applicant has satisfied the requirements for Technical Competence. If this number is below 3, the applicant has failed to satisfy the requirements for Technical Competence.

A successful submission requires that a candidate attains, at a minimum, the required average level of competence in all **Competency Categories**, with no score lower than level one for any **Key Competency**.

- Assessors may look to the **Competency Rating Scale** and indicators for guidance in determining whether a candidate has met the required standard for each **Key Competency**. **Meeting one indicator may be sufficient to demonstrate a Key Competency; they are intended as examples of good evidence for an applicant to submit.**

When Assessors Do Not Agree or When Any Competencies Do Not Pass

A consensus meeting is held if either one of these two situations occurs:

a) the two Assessors do not agree on the rating of one or more competencies, or;
b) the two Assessors are in agreement that one or more competencies do not pass.

If it is confirmed that the Assessors do not come into agreement or if it is confirmed that one or more competencies do not pass, the submission goes to a group of three additional Assessors called the re-Assessors. If the re-Assessors do not come to consensus, the submission goes to the next meeting of the Experience Review Committee for discussion and decision. If the re-Assessors come into agreement that any of the competencies do not pass, then the decision is confirmed and the applicant is notified of the result.

This process applies to the first submission as well as any re-submissions.

5.2 Communication of Results

Within approximately three months of submission you should receive feedback as to whether or not the experience is acceptable. If you have not heard from the APEGS office by that time, contact us to check on the status. If staff at APEGS or the Experience Review Committee identifies concerns with a submission or the work experience itself, one or more of the following may occur:

1. The member-in-training may be contacted by email or phone and asked to provide missing or further information.
2. The member-in-training may be contacted by letter, with copies sent to the Validator outlining the concerns and action required, if any.
3. The member-in-training and/or Validator may be asked to attend an interview at the place of employment.
4. The member-in-training and/or Validator may be asked to attend a meeting with Experience Review Committee representatives.

There are four possible outcomes of experience review:

- Approval.
- Coaching letter which states that experience is approved but there are improvements required for the final submission (for Interim Submissions).
- Request to re-submit the insufficient competencies because they did not contain the information necessary in order for the Assessors to make a decision. You are provided with specific feedback on what the issues are.
- Denial of experience counted for professional registration. Specific reasons for the denial are provided as well as the path forward.

The opportunity for appeal exists if the result is re-submit or denial.

5.3 Re-submission of Insufficient Competencies

In cases where one or more competencies are assessed as insufficient (after the standard re-assessment

outlined at the end of section 5.1 of this Guide), the applicant is informed with specific comments on the competencies that are not met and is given an opportunity to re-submit. The specific competencies are made available on the **Engineering Competency Assessment System** for the applicant to re-enter information. Once completed, those competencies are released for the Validator(s) and Assessors to review again using the same process as before.

Interviewing to Assess Competency

In cases where further clarification or detail is required after re-submission(s) are exhausted, applicants may be asked to attend an interview. Interviews are conducted in rare situations where an impediment is identified in adequately explaining the experience in writing. These interviews provide applicants with an opportunity to present in person a summary of their experience, to further expand on their project work, and/or to better explain how they apply engineering theory in their everyday working life. The interview helps to determine whether a candidate has satisfied all of the experience requirements and has demonstrated a progression of experience and responsibility to a professional level. **Competency Categories** or **Key Competencies** in which an applicant is rated below the required **Competence Level** may be areas of focus for the interview.

5.4 APPEALS

There are three levels of appeal explained in detail below:

a) to the Experience Review Committee;
b) to Council;
c) to the Court of Queen's Bench.

The Experience Review Committee's decision on satisfactory experience is a recommendation to the Registrar, who is an APEGS staff person appointed by Council. If the experience is not approved because of a negative assessment by the Experience Review Committee, the engineer-in-training is given the opportunity to re-submit one or more times to the Experience Review Committee. Note that a re-assessment is part of the standard process for all cases where re-submission is flagged by the original two Assessors, as outlined at the end of section 5.1 of this Guide.

Should the re-submission(s) to the Experience Review Committee not be successful and the applicant is in disagreement with the results, that effectively means one component of a professional member application is being denied and the applicant has the opportunity to appeal the decision of the Registrar directly to Council as per section 24 of *The Engineering and Geoscience Professions Act*. Section 19 of the *Regulatory Bylaws* requires that an appeal to Council must be launched within 30 days and the applicant must set out the grounds on which he or she alleges that the Registrar's decision is in error, together with any documentation necessary to support the allegation. The Bylaws also provide the right to make a verbal presentation to Council.

Should Council uphold a decision of the Registrar, then the applicant subsequently has the opportunity to appeal to the Court of Queen's Bench for membership or licence being refused as per section 25 of *The Engineering and Geoscience Professions Act*. The assessment of qualifications is the aspect of self-regulation that the Courts typically defer to the expertise of the profession (i.e., the Experience Review

Committee). The Court's role in an appeal is to review the process followed to make sure the Association followed the correct process.

6 APPLICANT STAGES

6.1 WHEN TO START ENTERING YOUR COMPETENCIES

You can create an account for the **Engineering Competency Assessment System** when you are eligible to start using the system which is in one of these two circumstances:

1. You are approved as an engineer-in-training with APEGS, or;
2. You are an engineer-in-training applicant **and** you are an international graduate who has been given the opportunity to submit work experience in order to waive confirmatory exams (see section 8 – Academic Review Cases of this Guide).

You access the system online here: https://competencyassessment.ca/

Once you have followed the instructions to set up an account, APEGS will be notified automatically to approve your account, then you are ready to begin entering your competencies. When that is complete and you have clicked the button to notify APEGS that your submission is ready for assessment, your experience will be reviewed through the competency assessment process to determine whether it meets minimum requirements.

6.2 TRACKING PROGRESS OF YOUR ASSESSMENT

Once you have submitted your **Competency Self-Assessment** through the **Engineering Competency Assessment System**, you are able to log back into the system at any time to track the progress of your Validators in verifying your submission. This information is available in the **Competency Self-Assessment** section of the system.

6.3 WHEN TO APPLY FOR PROFESSIONAL MEMBERSHIP

Once you are notified that your competency assessment is passed and you have also written the Professional Practice Exam (anticipating that you passed), you can apply for professional membership. More information about this application is available on the APEGS website under Apply, Professional Member:

http://www.apegs.ca/Portal/Pages/Professional-Member

7 INTERIM SUBMISSION

An interim submission is not mandatory but is **strongly recommended** to applicants at the two years of experience mark (including one year of pre-grad experience, if applicable). The interim submission is for the benefit of the applicant.

For applicants who are submitting later than that, such as international graduates who have at least four years of experience, an interim submission should still be done to confirm you are writing your examples correctly prior to completing all of their competency entries. Also, if you are an Academic Review Case as outlined in section 8 of this Guide, you should do an interim submission so we can check to ensure you are completing the competency entries correctly prior to you sending all of them all for validation.

The engineer-in-training completes a minimum of three competency entries for the interim submission, at least one of which is from Category 1 – Technical Competence.

How the Interim Submission Process Works

This process is slightly different than the final submission in that some of the process is done manually as indicated below:

1. The applicant enters a minimum of three competency examples, at least one of which is a technical competency from Category 1.
2. The applicant indicates when each entry is ready to be sent to the Validator(s) for validation. The system allows for Validator feedback to the applicant until there is agreement on the example.
3. **Manual step**: Once validation is complete, **the applicant notifies APEGS by email** at apegs@apegs.ca that they have an Interim Submission ready for assessment.
4. APEGS staff provides the pdf extract to the Assessors.
5. Assessors review and provide written feedback to APEGS staff.
6. APEGS staff provides the feedback to the applicant via email.

8 ACADEMIC REVIEW CASES

This section applies to international graduates who obtained their bachelor degree outside Canada and are not yet approved as an engineer-in-training. This section does not apply to you if you are already registered as an engineer-in-training.

If you are an engineer-in-training ***applicant*** who received your engineering **bachelor** degree outside of Canada and you have more than five years of engineering experience according to your resume, the Academic Review Committee (ARC) may give you the opportunity to submit work experience in order to waive confirmatory exams. If you are given this opportunity, you are informed in writing and provided details on next steps.

Member-in-training ***applicants*** who do not have an accredited engineering degree that is recognized by the APEGS Council and who are being assessed to determine if they have at a minimum a bachelor level education in engineering by the Academic Review Committee (ARC) are assigned three confirmatory exams. The confirmatory exams are used as a tool to assess whether or not the ***level*** of the education is at least the equivalent to Canadian bachelor level. The theory behind using experience assessment as an alternative to confirmatory exams is that the bachelor level education had to be in place in order for the person to perform engineering work at the minimum standard expected of a Canadian professional engineer. If the candidate appears to have at least five years of engineering work experience (according to their resume) from anywhere in the world, they are given the opportunity by the ARC to have confirmatory exams waived by submitting five years of experience for the Experience Review Committee (ERC) to assess. The ERC is looking i for evidence that the experience demonstrates that the applicant has a bachelor level education in order to do the engineering work described in the CBA submission. The level of experience required for the purpose of waiving confirmatory exams is the same as the level required for professional registration. Keep in mind that these are member-in-training ***applicants*** so APEGS is still evaluating their ***academics***.

If it can be determined from the experience submission that the candidate appears to have an education at a sufficient level in order to perform acceptable engineering work at the minimum standard for professional registration and confirmatory exams can be waived, then the ERC also grants experience credit toward professional registration. This is the same assessment as is done for all engineers-in-training who are submitting work experience for the purpose of professional registration. The number of months of experience credit granted depends upon how much of the five years of experience listed in the online CBA system is international experience. For example:

- If all five years in the Employment History table of the online CBA system is international experience, then a maximum of three years of experience can be counted toward professional registration (because one year is reserved for the Canadian or equivalent-to-Canadian experience required).
    - If this situation applies to you and your confirmatory exams were waived, then once you obtain a minimum of one year of Canadian or equivalent-to-Canadian work experience, then you will re-submit specific competencies as communicated to you with your CBA

assessment result. The competencies that have to be re-submitted in a Canadian or equivalent-to-Canadian environment will be re-opened in the online system and you will be able to insert new examples. The new examples will be run through the ERC through the regular process, similar to how a re-submission is processed.

- If at least 12 months of the five years of experience shown in your Employment History table is Canadian or "equivalent to Canadian" then up to four years of experience can be counted toward professional registration and experience review may be complete. The results are communicated to you in writing.

No matter which category you fall into, ***you should do an Interim Submission as outlined in section 7 – Interim Submission of this Guide so we can check to ensure you are completing the competency entries correctly prior to completing all of them for validation.***

All experience reporting requirements detailed in this Guide are the same for academic review cases as for engineers-in-training seeking experience approval for professional registration with <u>two exceptions</u>:

1. One additional year of experience is needed for academic review cases for a minimum total of five years of experience that needs to be listed in the Employment History table of the online CBA system;
2. Strictly project management experience is not acceptable in order to waive confirmatory exams. The majority of the experience submitted for academic review cases has to include direct experience in application of theory. In the case of applicants with strictly project management experience, there is normally no application of theory present in the applicant's work directly. A lack of direct experience in application of theory, specifically engineering design and engineering analysis prevents the committee from judging if confirmatory exams can be waived. That type of experience cannot be used in isolation to judge the university level, technical learning required in order to waive confirmatory exams.

Note that after an applicant has become an engineer-in-training, s/he can submit project management focused examples for review if that applicant still needs to submit 12 months of Canadian or equivalent-to-Canadian experience.

9 Frequently Asked Questions about the Competency Assessment Process

How much information am I required to submit as part of my submission?

On the **Engineering Competency Assessment System**, applicants are required to submit two main components:

- An **Employment History**: This section is essentially a "résumé builder" in which you provide a brief description of your periods of employment.
- A **Competency Self-Assessment:** This section asks you to select examples from your entire work experience history to demonstrate how you have achieved each **Key Competency**. There are character limits for each example, with 300 characters permitted for the "Situation" and "Outcome" sections and 1200 characters permitted for the "Action" section.

How many hours will it take to put together my submission?

This will vary, but you can make it easier for yourself by maintaining records of your work history, the projects that you were involved in and your CPD records. If you wish, you can use the **Engineering Competency Assessment System** to record your employment history and examples in draft form and build your self-assessment as you gain further experience.

My work conditions are confidential. How do I get around this in submitting my Competency Self-Assessment?

Where project details are required to be kept confidential, indicate so with a statement to that effect within the reporting system. Provide as much detail as you are permitted with the goal to provide sufficient evidence that you are able to practice competently as a professional engineer. This could be demonstrated by documentation that describes the nature of your work and its complexities without disclosing confidential details about solutions, business processes, client names or locations. You may use surrogate names such as "Project X" in "City/Town Q" then inform the Validator separately which project you are referring to by "Project X" and "City/Town Q". Note that although all APEGS Assessors are bound by confidentiality, it is wise not to disclose proprietary or confidential information because Assessors may work in the same industry or sector as you.

I have only worked on two major projects over my four years of experience. Do I need to use a different project for each Key Competency?

It is acceptable to reference the same major project in multiple **Key Competency** examples as long as you describe the specific actions that you took to demonstrate each **Key Competency**. Portions of the "Situation" section may be repeated, but entire examples may not be. The "Action" section in particular should be specific to each **Key Competency**.

Do I need to spread out my examples from all four years of my work experience, or can I focus on the most recent and highest level experience?

There is no requirement to cover the entire four years of experience through competency examples. Applicants are encouraged to select their strongest examples for each **Key Competency**, therefore focusing on recent experience is acceptable.

Can I provide a Validator who will not be verifying any specific Key Competencies to comment on my overall readiness for licensure, such as a co-op experience supervisor?

Yes; you can name additional Validators who are asked to provide overall feedback on your readiness for professional licensure without asking them to verify any **Key Competencies**.

How long should my Competency Self-Assessment example descriptions be?

While there is no required minimum number of characters required, examples must be sufficiently detailed to provide the Assessor with a clear picture of the nature and level of the work performed and how it pertains to the **Key Competency** being addressed. The "Situation" and "Outcome" sections are intended to be brief; both have 300 character limits in the online system. The "Action" section is where the Assessors are looking for a detailed description of the specific actions taken that demonstrate the **Key Competency**, and it has a 1200 character limit. Point form is optional in all three sections and is recommended for the "Action" section.

Appendix 1 – Competency Framework

1. Technical Competence (minimum overall competence level: **3**)

Key Competencies

- **1.1** Demonstrate knowledge of regulations, codes, standards, and safety - this includes local engineering procedures and practices as applicable.
- **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.
- **1.3** Analyze technical risks and offer solutions to mitigate the risks.
- **1.4** Apply engineering knowledge to design solutions.
- **1.5** Be able to understand solution techniques and independently verify the results.
- **1.6** Safety awareness: Be aware of safety risks inherent in design; and demonstrate safety awareness – on-site; possible safety authorization/certificate as appropriate.
- **1.7** Demonstrate understanding of systems as well as of components of systems
- **1.8** Exposure to all stages of the process/project life cycle from concept and feasibility analysis through implementation.
- **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.
- **1.10** Transfer design intentions to drawings and sketches; Understand transmittal of design information to design documents.

2. Communication (minimum overall competence level: **3**)

Key Competencies

- **2.1** Oral.
- **2.2** In writing.
- **2.3** Reading and comprehension.

3. Project and Financial Management (minimum overall competence level: **2**)

Key Competencies

- **3.1** Awareness of project management principles.
- **3.2** Demonstrate increasing level of responsibility for project planning and implementation.
- **3.3** Manage expectations in light of available resources.
- **3.4** Understand the financial aspects of their work.
- **3.5** Ask for and demonstrate response to feedback.

4. Team Effectiveness (minimum overall competence level **3**)

Key Competencies

4.1 Work respectfully and with other disciplines/people.

4.2 Work to resolve differences.

5. Professional Accountability (Ethics & Professionalism) (minimum overall competence level: **3**)

Key Competencies

5.1 Work with integrity, ethically and within professional standards (Indicators: Comply with the Code of Ethics; Apply professional ethics in meeting corporate directives).

5.2 Demonstrate an awareness of your own scope of practice and limitations.

5.3 Understand how conflict of interest affects your practice.

5.4 Demonstrate awareness of professional accountability.

5.5 Demonstrate an understanding of appropriate use of the stamp and seal.

5.6 Understand own strengths/weaknesses and know how they apply to one's position.

6. Social, Economic, Environmental and Sustainability (minimum overall competence level: **2**)

Key Competencies

6.1 Demonstrate an understanding of the safeguards required to protect the public and the methods of mitigating adverse impacts.

6.2 Demonstrate an understanding of the relationship between the engineering activity and the public.

6.3 Understand the role of regulatory bodies on the practice of 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.

7. Personal Continuing Professional Development (minimum overall competence level: **3**)

Key Competencies

7.1 Demonstrate completion of professional development activities.

7.2 Demonstrate awareness of gaps in knowledge and areas requiring further development.

7.3 Develop a professional development plan to address gaps in knowledge and maintain currency in field of practice.

Appendix 2 – Competency Indicators – All Disciplines

Competency Category 1 – Technical Competence

KEY COMPETENCIES (each require one example)	INDICATORS (suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)
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 design; and demonstrate safety awareness – on-site; 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*

KEY COMPETENCIES (each require one example)	INDICATORS (suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)
	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.*

Competency Category 2 – Communication

KEY COMPETENCIES (each require one example)	INDICATORS (suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)
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* *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.*

Competency Category 3 – Project and Financial Management

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
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.*

Competency Category 4 – Team Effectiveness

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
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.*

Competency Category 5 – Professional Accountability (Ethics & Professionalism)

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
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*

Continued…

Competency Category 6 – Social, Economic, Environmental and Sustainability

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
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.	*No indicators. Be aware of any guidelines for sustainability that apply to your discipline or area of practice.*
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.	*1. Include sustainability analysis in project descriptions.* *2. Provide a list of revisions made during design and implementation period of the project.*

Competency Category 7 – Professional Continuing Professional Development

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
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*

Appendix 3 – Competency Indicators for Structural – Category 1 only

You may choose to use the generic indicators for Technical Competence Category 1 shown in Appendix 2 or you may use the discipline-specific indicators when completing your entries. Categories 2 through 7 are the same for all disciplines.

Competency Category 1 – Technical Competence for Structural Engineering

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
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. 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, constructions 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.*
1.4 Apply engineering knowledge to design solutions.	*Demonstrate through examples, knowledge of:* *1. Loads and climactic data.* *2. Tolerances, concrete placement, reinforcement, embedment, and welded and bolted connections.* *3. Knowledge of overall design of structure and its response to the loads and demands.* *4. Understand issues of serviceability and long term maintenance and function.* *5. Selection of structural system, 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 (not mandatory for APEGS registration like it is for BC)*
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.*

KEY COMPETENCIES (each require one example)	INDICATORS (suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)
1.6 Safety awareness: Be aware of safety risks inherent in design; and demonstrate safety awareness – on-site; possible safety authorization/certificate as appropriate.	*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 worker compensation act.* *5. Knowledge and experience with use of WCB 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 and understanding of the interactions and constraints in the behavior 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.*
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 with feedback for next project cycle.* *2. Prepare feasibility reports and proposals.* *3. Demonstrate an understanding of how the different disciplines interact for a particular structural project; and how the structural engineers needs to obtain information from all these disciplines.* *4. Demonstrate an understanding of the progression in design and economics from concept through to decommissioning.*
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. 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 his/her 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. The production of technical specifications for construction.* *4. Be able to review and analyze designs of others and communicate findings and suggest alternatives.*

Appendix 4 – Competency Indicators for Civil: Municipal/Infrastructure – Category 1 only

You may choose to use the generic indicators for Technical Competence Category 1 shown in Appendix 2 or you may use the discipline-specific indicators when completing your entries. Categories 2 through 7 are the same for all disciplines.

Competency Category 1 – Technical Competence for Civil: Municipal/Infrastructure Engineering

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
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. 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. Interpret and apply regulations that affect the handling, transportation and disposal of waste materials.*
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 and/or operations: Cost, Storage, Quality & Handling problems.* *2. Develop and implement evaluation, maintenance or rehabilitation programs for infrastructure and operations.* *3. Coordination with other disciplines.*
1.3 Analyze technical risks and offer solutions to mitigate the risks.	*1. Demonstrate familiarity with system protection objectives, philosophies, and functions.* *2. Identify risk areas.* *3. Develop risk management plans.* *4. Demonstrate an understanding of the difference between technical risk and public safety issues.*
1.4 Apply engineering knowledge to design solutions.	*1. Collect, record, and analyze information from sources such as geological reports, subsurface investigations, and in situ testing.* *2. Calculate material quantities and volumes using mathematical formulae, measurements and data from construction drawings and specifications.* *3. Preparation of technical specifications.* Water & Wastewater Treatment: *1. Conduct inventories of water supplies and assess impact of projected population growth on water supply demands. (Design water supply systems from wells, rivers, or lakes; Sample/analyze source water for purity and human suitability; Determine physical, chemical, and bacteriological characteristics of available water).* *2. Design sanitary sewer systems.* *3. Conduct model and flow analysis for public sewer facility design.* *4. Demonstrate knowledge of lift station design.* *5. Conduct inflow/outflow infiltration studies.* *6. Design water treatment facilities (e.g. operations for sedimentation, flocculation and coagulation, filtering, disinfection and chlorination).* *7. Apply methods of alternate technology (e.g. precipitation, absorption oxidation and ion exchange to remove metals and soften water).* *8. Use standard methods for the treatment of waste water (Sample and assess waste water for physical, chemical and microbiological characteristics using tests; Select treatment processes for septic tanks and tile beds).* *9. Select tertiary treatments for waste water.*
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. Participate in an independent review process.*

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
1.6 Safety awareness: Be aware of safety risks inherent in design; and demonstrate safety awareness – on-site; possible safety authorization/certificate as appropriate.	*1. Identify and incorporate safety procedures, processes, and equipment.* *2. Review and incorporate safety or system operating procedures.* *3. Demonstrate specific knowledge of safety regulations.* *4. 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. Calculate and assess current or projected infrastructure needs according to their area of practice (include assessment for projected population growth). [a) Water supply and distribution networks, b) Sanitary sewer networks, c) Traffic systems (city, highway, lighting), d)Waste and waste water treatment, e) Solid waste management and disposal, f) Underground services].* *2. Demonstrate an understanding of each element in the process, and the infrastructure required.*
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:* vii. ***Identification**: generation of the initial project idea and preliminary design.* viii. ***Preparation**: detailed design of the project addressing technical and operational aspects.* ix. ***Appraisal**: analysis of the project from technical, financial, economic, social, institutional and environmental perspectives.* x. ***Preparation of specifications and tender documents:** preparation of tender document, inviting and opening of tenders, pre-qualification, evaluation of bids and award of work.* xi. ***Implementation and monitoring**: implementation of project activities, with on-going checks on progress and feedback.* xii. ***Evaluation**: periodic review of project with feedback for next project cycle.*
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 Field Checks to verify the validity of design.* *2. Complete Quality Management Plan Checklist, and follow Quality Management Plan.* *3. Prepare quality control plans, including frequency and test parameters, for specific construction processes or products.* *4. Evaluate test results and determine adequacy.* *5. Carry out or supervise field testing of materials or construction processes.*
1.10 Transfer design intentions to drawings and sketches; Understand transmittal of design information to design documents.	*1. Demonstrate familiarity with CAD software and techniques for specific design requirements.* *2. Demonstrate knowledge of capture and validation of as-built information.* *3. Prepare complete drawings with sufficient cross sections and details and eliminate any discrepancies; Provide technical specification; Refer to the related items of the specification on each part and detail on the drawings.* *4. Prepare rough sketches for the drafter and explain your intentions.* *5. Ability to review designs of others and communicate findings and issues, including suggested alternatives.*

Appendix 5 – Competency Indicators for Electrical: Power and Industrial – Category 1 only

You may choose to use the generic indicators for Technical Competence Category 1 shown in Appendix 2 or you may use the discipline-specific indicators when completing your entries. Categories 2 through 7 are the same for all disciplines.

Competency Category 1 – Technical Competence for Electrical: Power and Industrial Engineering

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
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 on standards and project compliance.* *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. Have knowledge of plant layout and operations.* *2. Preparation of technical specifications.* *3. Coordination with equipment vendors and other discipline engineers.* *4. Demonstrate involvement with feasibility studies.*
1.3 Analyze technical risks and offer solutions to mitigate the risks.	*1. Demonstrate familiarity with system protection objectives, philosophies, and functions.* *2. Identify risk areas.* *3. Develop risk minimization plans.*
1.4 Apply engineering knowledge to design solutions.	*Note: Each example should demonstrate a different design solution or facet of your application of knowledge.* *1. Demonstrate an understanding of the engineering principles used in the application of computer design programs.* *2. Demonstrate use of theory and calculations to arrive at solutions.* *3. Demonstrate why a unique design solution could not be accomplished with a standard design solution.* *4. Ability to calculate fault levels and select equipment to withstand the available fault current.* *5. Understanding ground currents and potential rise and designing grounding system that would protect life and property.* *6. Perform load calculations for sizing service and distribution equipment including future provisions.* *7. Design circuits and systems with consideration for efficiency and power quality.* *8. Using engineering principles, determine voltage level, transformation and distribution methods that provide the most economic and sustainable system.* *9. Understand source and cause of harmonics and methods used to minimize the effects of harmonics on the system.* *10. Design electrical control and protection schemes for transmission and distribution systems.*
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. Perform Field Checks.*
1.6 Safety awareness: Be aware of safety risks inherent in design; and demonstrate safety awareness – on-site; possible safety authorization/certificate as appropriate.	*1. Identify and use relevant safety procedures, processes, and equipment.* *2. Develop maintenance programs.* *3. Design test plans and equipment.* *4. Implement inspection results.* *5. Review and alter safety or system operating procedures when necessary.* *6. Demonstrate specific knowledge safety regulations.*

KEY COMPETENCIES (each require one example)	INDICATORS (suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)
1.7 Demonstrate understanding of systems as well as of components of systems.	*1. Demonstrate a working knowledge of the basic components of power generation -- Including: generators, switchgears, transformers, electronic drives, capacitors/reactors, voltage regulators, high and low voltage switches, cables/trays and conduits, overhead lines, protection and control equipment, fault protection/isolation devices and their coordination, specification of power grid interfaces, grounding systems.* *2. 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 with feedback for next project cycle.*
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. Demonstrate peer review.* *2. Demonstrate completed project, systems or sub-systems meet project objectives.* *3. Participate in regular meetings and discussions with project members, both electrical and other disciplines, to ensure quality, scheduling, deadlines and budgeting are not compromised during both design and construction stages.* *4. Review designs, procedures and manuals to ensure design guidelines are adhered to.* *5. Consult with and seek input, including design and field review, from other project members throughout the project design and construction.* *6. Perform testing and commissioning upon completion of the product/project to ensure all design criteria, terms and conditions and applicable safety standards and regulations have been met.* *7. Demonstrate understanding of ISO 9000.*
1.10 Transfer design intentions to drawings and sketches; Understand transmittal of design information to design documents.	*1. Demonstrate communication of ideas and concepts to project team members.* *2. Demonstrate produced design documents required minimum additional interaction with other designers, contractors and commissioning personnel.* *3. Demonstrate the value of project completion reports and lessons learned reports to application in future projects by self or others.* *4. Understand established and acceptable symbols and terminology used in preparation of design drawings.* *5. Create sketches, notes and documentation to prepare proposals, preliminary, and final design drawings for acceptance by the client and approval by regulatory authorities.*

Appendix 6 – Competency Indicators for Materials, Metallurgical and Mineral Processing – Category 1 only

You may choose to use the generic indicators for Technical Competence Category 1 shown in Appendix 2 or you may use the discipline-specific indicators when completing your entries. Categories 2 through 7 are the same for all disciplines.

Competency Category 1 – Technical Competence for Materials, Metallurgical and Mineral Processing Engineering

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
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 your area of practice.* *3. Understand regulations that affect the handling, transportation and disposal of waste materials.* *4. Experience using standards (e.g. ASTM) for testing.* *5. Demonstrate awareness of safety documents, standards and regulations (e.g., WorkSafe, ASHRAE, material safety data sheets).*
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 application, usage and/or operations: cost, storage, quality and handling problems.* *2. Develop and implement evaluation, maintenance or rehabilitation programs for facilities and operations.* *3. Coordination with other disciplines.* *4. Materials selection and design for specific applications (e.g. biomedical, automotive, aerospace, electronics).*
1.3 Analyze technical risks and offer solutions to mitigate the risks.	*1. Demonstrate familiarity with metallurgical system protection objectives, philosophies, and functions.* *2. Identify risk areas.* *3. Demonstrate an understanding of the development of risk management plans.* *4. Demonstrate an understanding of the difference between technical risk and public safety issues.* *5. Demonstrate awareness of Statistical Process Control and its role in detecting process deviations and associated risks.*
1.4 Apply engineering knowledge to design solutions.	*1. Perform heat and mass balance calculations including data reconciliation.* *2. Report on metallurgical accounting in a plant.* *3. Circuit design and selection. Equipment sizing including throughput, residence time, and chemical kinetics calculations.* *4. Failure analysis using microstructural and analytical characterization techniques (OM, SEM, TEM, XRD, AA). Demonstrate understanding of failure modes (e.g. creep, fatigue, corrosion, hydrogen cracking).* *5. Use of equilibrium phase diagrams (Temperature-Composition, eH-pH, and Evans Diagrams) or non-equilibrium diagrams (TTT diagrams), or experimental determination of phase equilibria.* *6. Perform alloy composition calculations. Demonstrate understanding of effects of alloying ingredients and strengthening mechanisms.* *7. Pilot-scale testing of new processes.* *8. Design and implementation of environmental control technologies for gas, liquid, and solid waste streams. Demonstrate understanding of strategies for tailings disposal.* *9. Demonstrate understanding of mechanical properties and testing: stress-strain behaviour, fracture mechanics, fatigue, creep, toughness.* *10. Design for corrosion prevention (coatings, thin films, materials selection).* *11. Design weld parameters and prepare welding procedures.*
1.5 Be able to understand solution techniques and independently verify the results.	*1. Participate in an independent review process.* *2. Demonstrate an understanding of the engineering principles used in the application of computer design programs.*

KEY COMPETENCIES **(each require one example)**	**INDICATORS** **(suggestions (not mandatory) on example content that is appropriate to demonstrate the competency)**
1.6 Safety awareness: Be aware of safety risks inherent in design; and demonstrate safety awareness – on-site; possible safety authorization/certificate as appropriate.	*1. Use of non-destructive evaluation techniques for weld evaluation.* *2. Review and assess results for equipment and material evaluation.* *3. Understand and account for safety risks associated with processes. Identify relevant metallurgical processes and personal protection equipment to mitigate safety risks.* *4. Review, identify and incorporate safety procedures, system operating procedures, processes and equipment.* *5. Demonstrate specific knowledge of safety regulations.* *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 understanding of complex Process Flow Diagrams and of each unit operation in the process.* *2. Development of process improvement initiatives. Demonstrate understanding of continuous improvement philosophy and practice.* *3. Demonstrate understanding of effects of process modifications on downstream processes and final product.* *4. Demonstrate familiarity with control systems and strategies. Demonstrate understanding of limitation of process control.*
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 with feedback for next project cycle.*
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 Field Checks to verify the validity of design and fabrication.* *2. Complete Quality Management Plan Checklist, and follow Quality Management Plan.* *3. Prepare quality assurance plans, including frequency and test parameters, for specific construction processes or products.* *4. Evaluate test results and determine adequacy.* *5. Carry out or supervise field testing of materials or welds.* *6. Carry out or supervise implementation of new processing equipment.*
1.10 Transfer design intentions to drawings and sketches; Understand transmittal of design information to design documents.	*1. Demonstrate communication of ideas and concepts to project team members.* *2. Demonstrate understanding of value of project completion reports and lessons learned reports to application in future projects by self or others.* *3. Ability to review designs of others and communicate findings and issues, including suggested alternatives.* *4. Development of welding data cards.*