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Junior engineers acquiring experience: a requirement rewarded with an engineer's title

Imagine for a moment that you are hit by a car while crossing the street. You are rushed to the hospital where you learn that you are haemorrhaging internally and that a young resident will perform the surgery shortly. "Very well, but will an experienced surgeon be present to supervise, assist and guide him?" you ask yourself, worried about your precious organs! Now imagine an individual or a company having to use new technology designed by a junior engineer, fresh out of school and without any work experience... It is possible to provide examples such as this one for every field of engineering and they would all prove the same thing: engineers, like all other professionals, must be supervised for a period of the time before they are granted permits. For a junior engineer, the 36 months usually required before he or she is entered on the Roll as an engineer isn't merely a "rite of passage" nor should it be seen as some sort of "purgatory", it is truly an essential learning process.

A PROVEN METHOD

Much like medicine, engineering is a profession which, if not practised well, can cause serious prejudice to clients, employers and the public. For this reason, the Ordre des ingénieurs du Québec (hereafter the "Ordre") considers that, upon getting his or her title, the engineer must be able to practise with all due autonomy and professional judgement. In other words, the claimant to such title must master every desired competency and already have some experience.

Given that this experience cannot be gained at the public's expense, the Ordre requires that engineering graduates practise as junior engineers at the outset. This idea is not a new one, and it has been tried and tested time and time again. For example, a thousand years ago when cathedrals were being erected, apprentice builders had to work for many years alongside masters and under their guidance before claiming to be professionally independent. Today, a future engineer's academic training must be completed, namely by acquiring relevant experience under an engineer's supervision.

A MOST REWARDING PROCESS

Thus, in order to practise a professional activity reserved for engineers pursuant to the Engineers Act, a junior engineer must work under a seasoned engineer's immediate control and supervision. This "master" assumes quite an important responsibility with respect to his or her pupil's guidance and education. Among other things, he or she sees to the progressing degree of difficulty of the issues that the junior engineer will be called upon to solve.

Throughout this process, junior engineers routinely engage in activities related to topics they studied, participate in administrative, economic, social and legal aspects of the engineering practice and solve problems which require applied engineering sciences in at least one of the following fields: research, development, design, production, construction, installation and maintenance as well as sales and marketing techniques. They can also benefit from their master's experience and competence to take on added responsibilities.

WHAT WE SHOULD KNOW

When looking for employment, junior engineers are responsible for making sure that the job will allow them to acquire worthwhile engineering experience and agree on terms related to supervision with their employer. For their part, those who hire junior engineers must have a working knowledge of the laws and regulations governing the practice of engineering in Québec. They can entrust the duty of supervising junior engineers to engineers who work for them. If there aren't any engineers working for them, those employers can ask engineers in private practice to closely supervise junior engineers during the course of their practice and monitor their work.

Regardless of which option one chooses, it is important to note that an experienced engineer must assist the junior engineer at all times in order to ensure the quality of his or her work and bear witness to it before the Ordre. Such certification is essential to obtain one's engineering permit. Also, engineers are professionally liable for the works performed by junior engineers. It is for this specific reason that engineers must authenticate (sign, or sign and seal) documents prepared by junior engineers. Incidentally, a junior engineer cannot have a seal.

The period for acquiring experience usually lasts three years for Québec graduates; this period will eventually be shorter for foreign graduates who have already accumulated recent and relevant experience. It bears reminding that junior engineers must fill out an experience certification form each time they change employers.

Alternately, junior engineers can also complete this training period through a sponsorship program. This program is voluntary and consists of a series of six meetings designed to ease their integration into the profession. Each meeting lasts at least 75 minutes and allows junior engineers to discuss with engineers and share experiences relating to the core values of the profession as well as the duties and obligations that come with the engineer status. It is up to the junior engineer to find a sponsor and sign up to the program. Once completed, the sponsorship provides a credit of eight months' experience.

AND FINALLY, ONE DAY...

No engineering graduate can claim to be an engineer or contend to have the rights and privileges associated with the title. For example, he or she is forbidden to authenticate engineering documents, provide advice or carry out a consultation without the risk of being exposed to legal proceedings. In short, a junior engineer remains an apprentice, hence the provisional title.

However, once all the required experience credits have been accumulated and recognized by the Ordre and once they have successfully passed the professional exam and fulfilled all other requirements, the Ordre will grant junior engineers their permits as well as their seal and enter them on the Roll as engineers. From then on, they can rightfully practise their profession.

SPECIFIC RULES

Regulation respecting other terms and conditions for the issuance of permits by the ordre des ingénieurs du Québec

Professional Code [(c. I-9, r.1.3)] [R.S.Q., c. C-26, s. 94, subpar. i)] states that:

3. Provided that they are entered on the roll, holders of a junior engineer's permit may use the title of «Junior Engineer» in English or «ingénieur junior» in French.

They may use the abbreviation «Jr. Eng.» in English or «ing. jr» in French.

They may not in any way:

- (1) claim to be an engineer;
- (2) use the title of «engineer» or its abbreviation «Eng.» without it being preceded by the word «Junior» or its abbreviation «Jr.», or use a title, designation, abbreviation or initials which could imply that they are engineers ;
- (3) allow themselves to be advertised or designated by the title «Engineer» or its abbreviation «Eng.» without it being preceded by the word «Junior» or its abbreviation «Jr.», or by a title, abbreviation or initials which could imply that they are engineers.

7. A total of at least 36 months' engineering experience shall be acquired, consecutively or otherwise, at least 12 months of which shall be in Canada to ensure a good knowledge of local Canadian conditions, notably with regard to legislation, standards, economy, climate, resources and technology. Such engineering experience shall be certified in accordance with section 21.

Furthermore, the engineering experience shall have given the candidate or junior engineer the opportunity:

- (1) to carry out on a regular basis activities related to the subject matter covered in the program leading to the degree he holds; and
- (2) to solve problems requiring the application of engineering sciences in at least one of the following areas : research, development, design, production, construction, installation, maintenance and technical sales and marketing; and

(3) to participate in:

- (a) applying the financial, economic, regulatory and legal aspects of an engineer's work;
- (b) managing and leading a technical team; or
- (c) solving industrial or environmental technical problems; and
- (4) to progress to more complex problem-solving activities and take on increasing responsibilities.

8. Candidates or junior engineers shall not perform professional activities reserved by law for engineers except under the immediate control and supervision of an engineer.

21. After each work period during which they have acquired engineering experience, candidates or junior engineers shall have such period certified by the following persons, who complete and sign the certification form provided by the Ordre or a similar document:

- (1) their immediate superior and, if this person is an engineer, another engineer who is personally familiar with the work they have performed; or
- (2) their immediate superior and, if this person is not an engineer, 2 engineers who are personally familiar with the work they have performed.

The aforementioned certification form shall comprise in particular the following parts:

- (a) an identification of the candidate or junior engineer and the person certifying the work period;
- (b) a description of the work experience; and
- (c) an evaluation of the work experience by the person certifying it.

Completed certification forms are then sent to the Ordre for inclusion in the candidate's or junior engineer's files.