

ENGINEERING AND GEOSCIENCE

CREATING A SAFE AND RESILIENT BC



ENGINEERS &
GEOSCIENTISTS
BRITISH COLUMBIA



INTRODUCTION

Engineering and geoscience play a key role in our province’s safety, growth, and resilience. While we might not always think about it, the public relies heavily on both professions. From the roads we drive on and the cars we drive in, to the minerals used to make our phones, satellites and other devices that allow information to be shared—most of the everyday conveniences of modern life are made possible by engineers and geoscientists.

Because of their impact on the public and our environment, these professions are regulated; individuals who practise engineering or geoscience require specialized knowledge and experience and are subject to high standards for professional practice and conduct throughout their careers.

ABOUT THIS DOCUMENT

This document is intended to help the public understand more about the professions of engineering and geoscience, qualifications to practice, practice standards, how engineering and geoscience interface with other professions, and what to consider if you want to hire a professional.

ABOUT ENGINEERS AND GEOSCIENTISTS BC

Engineers and Geoscientists BC is the licensing and regulatory body for these professions in BC. To protect the public, we maintain robust standards for entry to the professions, and comprehensive regulatory tools to support engineers and geoscientists in meeting professional and ethical obligations. If these standards are not met, we take action through our investigation and discipline processes.

Engineers and Geoscientists BC and its registrants are governed by the *Professional Governance Act*, which is overseen by the Office of the Superintendent of Professional Governance under the Ministry of the Attorney General, and also applies to the professions of forestry, agrology, biology, and applied science technology.

WHAT ARE ENGINEERING AND GEOSCIENCE?



ENGINEERING

Engineers apply science, math, and engineering principles to solve technical problems. There are many types of engineers who specialize in specific areas of engineering such as civil, electrical, mechanical, software, structural, chemical, and many others. An engineer's work ranges widely, from designing buildings to developing new processes for making plastics, paper, and foods.

GEOSCIENCE

Geoscientists explore the structure and history of our planet and its many different natural geologic systems. Their work includes the study and investigation of Earth's minerals, soil, water and energy resources, how Earth's natural systems work today, how they operated in the recent and ancient past, and how we expect they may behave in the future.

HOW ARE ENGINEERING AND GEOSCIENCE REGULATED?

Engineering and geoscience are regulated professions, similar to law, nursing, medicine, and accounting. In order to practise engineering or geoscience, an individual must be licensed by an appropriate regulatory body and meet certain standards for professional practice and conduct. If these standards are not met, the individual is subject to investigation and discipline.

Individuals practising engineering or geoscience in BC must register with Engineers and Geoscientists BC. They must meet stringent academic, experience, and character entrance requirements, and must uphold ethical and professional standards throughout their careers and are subject to robust audit, complaint, investigation, and discipline processes.

Engineers and Geoscientists BC also regulates firms that engage in the practice of professional engineering or professional geoscience. Firms are required to obtain a permit to practice that indicates the firm meets requirements related to quality management, ethics, and continuing education.



QUALIFICATIONS AND STANDARDS

To protect the public, Engineers and Geoscientists BC regulates the professions of engineering and geoscience by maintaining high standards for entry to the professions, and requires its registrants to adhere to comprehensive regulatory standards for professional practice and conduct.

ENTRY INTO THE PROFESSIONS

Engineering and geoscience require the application of specialized knowledge, which is gained through intensive education, training, and practical experience. In order to be registered to independently practise engineering or geoscience, individuals must:

- Be academically qualified;
- Have at least four years of relevant work experience;
- Be competent in the language of their jurisdiction of practice;
- Be of good character; and
- Understand and apply legal and ethical principles.

Once registered, individuals are licensed with one of the following designations, which can only be used by registrants of Engineers and Geoscientists BC:

- Professional Engineer (P.Eng.)
- Professional Licensee Engineering (P.L.Eng.)
- Professional Geoscientist (P.Geo.)
- Professional Licensee Geoscience (P.L.Geo.)

PROFESSIONAL STANDARDS

Engineers and geoscientists are regulated through high standards for professional practice and conduct. They must maintain their competence through continuing education throughout their careers, adhere to a Code of Ethics, and meet set standards for professional practice.

COMPETENCE

Continued competence is foundational to maintaining public trust and directly relates to each registrant's duty to protect public safety, public interest, and the environment in the practice of their profession. Mandatory continuing education requirements support registrants in their efforts to stay current and adjust to evolving practice standards.

ETHICS

There are thirteen ethical principles in Engineers and Geoscientists BC's Code of Ethics. The overarching foundation is that registrants must act at all times with fairness, courtesy and good faith towards all persons and in accordance with the public interest. The Code of Ethics supports a relationship of responsibility and trust to develop between the professions and the public, while maintaining respect, integrity, and confidentiality between professional, employer, and client.

PROFESSIONAL PRACTICE STANDARDS

Engineers and Geoscientists BC maintains comprehensive regulatory tools to support engineers and geoscientists in meeting their professional obligations. Registrants are required to follow specific standards for quality management which are outlined in Engineers and Geoscientists BC's Bylaws. In order to assist registrants in understanding and implementing these requirements in their practice, quality management guides are published and available for all registrants. Engineers and Geoscientists BC also publishes professional practice guidelines, which set expectations and obligations related to specific professional activities. Registrants must be aware of and apply the professional practice guidelines that apply to their area of practice.

REGULATED AND RESERVED PRACTICE

The regulatory landscape in BC is unique in that it views professions like engineering and geoscience through two lenses: reserved practice and regulated practice.

Under the *Professional Governance Act*, a reserved practice is a practice that may only be carried out by or under the supervision of a registrant. It is a reserved practice to provide any engineering or geoscience advice or services that have the potential to impact the safety, health and welfare of the public or the environment. Further, it remains a reserved practice to engage in any activity that previously fell within the definitions of the practice of professional engineering or professional geoscience under the former *Engineers and Geoscientists Act*.

For professional engineering, the former definition included any carrying on of chemical, civil, electrical, forest, geological, mechanical, metallurgical, mining or structural engineering, or a number of other disciplines that had been designated by Engineers and Geoscientists BC's Board, and activities like reporting, designing or directing the construction of a long list of works, projects and other specific undertakings.

For professional geoscience, the former definition included any reporting, advising, acquiring, processing, evaluating, interpreting, surveying, sampling or examining that was directed towards the discovery or development of oil, natural gas, coal, metallic or non-metallic minerals, precious stones, other natural resources or water, or the investigation of surface or sub-surface geological conditions, and required the professional application of principles of geology, geophysics, or geochemistry.

The *Professional Governance Act* also creates a category of practice called regulated practice, which are practices that are not reserved to registrants of one specific regulatory body. Regulated practice may overlap among regulatory bodies. Regulatory bodies have oversight over their registrants when they engage in activities within their respective regulated practices, but those same activities may also be carried out by non-registrants.



DISCIPLINES

Engineering and geoscience are very broad and complex professions; in BC, there are a total of 30 unique disciplines of engineering or geoscience. Due to their broad nature, engineering and geoscience rarely operate in isolation.

ENGINEERING

- agricultural
- biomedical
- bioresource
- biosystems
- building
- chemical
- civil
- computer
- electrical
- engineering physics
- environmental
- food
- forest
- geological
- geomatics
- industrial
- marine
- mechanical
- mechatronics
- metallurgical
- mining
- naval architecture
- nuclear
- petroleum
- software
- structural

GEOSCIENCE

- environmental geoscience
- geochemistry
- geology
- geophysics

WORKING TOGETHER TO PROTECT BC

Multi-disciplinary teams are common, and registrants often work with other professionals and other specialists in their work. Utilizing a team approach has many benefits and can lead to a more successful outcome given the variety of perspectives and expertise the various individuals bring to the project.

The legal framework in BC allows for certain levels and areas of practice overlap, intersection and alignment between professions. This means that certain boundaries exist around which professionals can undertake reserved and regulated practice, and this will vary depending on the type of work being undertaken and the type of professionals involved in the work. However, what should always be first and foremost is that regardless of the individual's professional designation, they must only undertake the work if they are competent and have the training, experience, and educational background to carry out the work professionally and ethically. Additionally, professionals should be registered with the regulatory body responsible for oversight of their area of practice, where applicable.



OVERLAP WITH TRADITIONAL KNOWLEDGE AND PRACTICES OF INDIGENOUS PEOPLES

The United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) reinforces the right of all Indigenous peoples to protect their traditional knowledge, including manifestations of their sciences and technologies (Article 31). Traditional knowledge

and practices are diverse and may overlap with some engineering and geoscience activities. While Indigenous knowledge systems may differ from engineering or geoscience practices, both are knowledge-based systems of inquiry that can be complementary to one another. Above all, it is critical for engineers and geoscientists to understand the perspectives of Indigenous peoples and Nations, and to work together towards a shared goal of public and environmental protection.

For example, engaging with Indigenous peoples on development projects (e.g., a mining operation) is not only an opportunity for reconciliation, but also allows for the integration of traditional knowledge and practices, which is vital in better understanding the land, ecosystems, history and culture of a given area.

CONSIDERATIONS WHEN ENGAGING ENGINEERING OR GEOSCIENCE SERVICES



CONSIDERATIONS FOR HIRING

If you are seeking the expertise of an engineer or geoscientist, start by determining the type of expertise you are looking for to identify a qualified registrant, or ask trusted individuals for referrals.

You should consult Engineers and Geoscientists BC's Registrant Directory (egbc.ca/registrant-directory) to confirm that any individual or firm you engage to provide engineering or geoscience advice or services is in good standing and is practising within their declared industry and area of practice.

Some additional tips:

- Don't base your selection decision on price alone; consider their qualifications.
- Consider contracting directly with the professional, as opposed to allowing a third party to develop the contract. This can assist in avoiding contractual disputes that may arise.
- Define a clear scope of services at the outset of the project. This will assist with the project running smoothly.
- Ensure the scope of services includes field reviews, as this allows the registrant to ascertain whether the implementation or construction of work substantially complies with their design concept or intent.
- Ensure there is a clear and open means of communication between yourself and the professional.

FOR MORE INFORMATION

For questions related to the practice of engineering or geoscience in BC, including professional practice, ethics, and practice guidelines, contact our Practice Advisors at practiceadvisor@egbc.ca.

For more information on Engineers and Geoscientists BC, visit egbc.ca.



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