



# Presentation to the Select Standing Committee on Finance and Government Services

*By the Association of Consulting Engineering Companies of BC (ACEC-BC)*

## 1 EXECUTIVE SUMMARY

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The Association of Consulting Engineering Companies of BC (ACEC-BC) appreciates the opportunity to present its views to the Select Standing Committee on Finance and Government Services.

ACEC-BC represents BC's consulting engineering companies that provide engineering and other technology-based intellectual services to the public and private sectors. Consulting engineering is at the centre of BC's Knowledge Economy, as engineering services comprise 20% of B.C.'s high technology sector.

ACEC British Columbia represents 84 of BC's consulting engineering companies that collectively employ 10,000 people in the Province of BC. The workforce is comprised of engineers, geoscientists, technicians, technologists and other support staff. The consulting engineering business contributes some \$3.9 billion in annual revenue to the BC economy, 30% of which is earned from clients based outside of the Province of BC. These are revenues that would not find their way to the Province of BC if it were not for the excellent reputation of the BC consulting engineering industry.

Given the role that engineering plays in every aspect of BC's economy, we are pleased to provide our comments on a number of important issues.

### **Procurement**

Many ACEC-BC members express concerns about the procurement process used by government clients. Most federal, provincial and municipal departments hire consulting engineers based on "best value" to the taxpayer. In most cases, firms must submit proposals that list their qualifications and technical expertise, their proposed approach, and the price for their services. However, typically, clients' evaluations of proposals are biased toward the price aspect, rather than giving due weight to expertise and approach. This often results in situations where engineering firms tend to interpret the scope of work narrowly, in order to provide the lowest price and win the job. Such a process effectively penalizes firms that have the foresight to anticipate complications, that propose innovations, or that have a clearer understanding of the client's needs.

ACEC-BC endorses the internationally recognized best practice for the procurement of professional engineering services, commonly known as Qualifications Based Selection (QBS). This best practice has been mandated by law in the USA since the 1970's, and more recently in the province of Quebec. QBS is recommended by the International Federation of Consulting Engineers (FIDIC). It is also the Best Practice recommended by the National Guide for Sustainable Municipal Infrastructure (InfraGuide) – a collaboration between Infrastructure Canada, the National Research Council, and the Federation of Canadian Municipalities.

### **NWPTA**

ACEC-BC has observed a number of unintended consequences arising as a result of the New West Partnership Trade Agreement (NWPTA).



Prior to NWPTA, our members and our profession already had full mobility across Canada allowing participation in the economic activities in each province and across Canada. Today, our members in western Canada are currently subject to the NWPTA and based on our experience thus far, ACEC BC has concerns with the NWPTA. Although we support the spirit of this agreement in principle, we are concerned with a specific aspect of this agreement that is potentially problematic for our industry, our clients and the public that we serve.

We believe that this can be easily resolved by preserving a narrow exemption for provincially regulated professions contained in Annex 502.1B of the existing Agreement on Internal Trade (AIT).

### **Infrastructure**

ACEC-BC believes that a long-term infrastructure plan will further strengthen the economy and enhance Canada's competitiveness. We applaud recent investments in infrastructure by all levels of government that have been successful in improving the quality and capacity of Canada's public infrastructure. Reviewing infrastructure needs should continue since currently committed funds, while very important, are not sufficient to meet all of the historical and emerging demands.

There are currently a number of major infrastructure projects under discussion, including improvements to public transit systems, replacement of the Massey Tunnel and other projects. ACEC-BC is supportive of moving forward with these projects. One key issue that will need to be discussed robustly is that of tolling specific projects versus the adoption of a regional road pricing strategy, as clearly we need to ensure the financial capacity for these changes. While we start to discuss transportation projects, we will also need to engage in rational and objective discussions about financing options and how we as a society pay for these improvements.

It is critical to remember that "Infrastructure" includes social or vertical infrastructure, such as hospitals and education (k-12 and post-secondary). There are many major buildings projects that are critical in the province, including St Paul's and Royal Columbian Hospitals, which need to move forward in order to meet the growing demands of British Columbians. Given the considerable development taking place in northern BC, there will be increasing demand for social or vertical infrastructure projects that will need to be planned, designed and constructed in the years to come.

### **Site C**

ACEC-BC supports proceeding with the Site C project for a number of reasons. There are a number of major projects that are in the implementation or planning stages that will rely on having access to stable and dependable sources of power. BC is experiencing an exciting period of economic development that is creating opportunities in most regions of BC, which will lead to more jobs, increased government revenues and enhanced prosperity. These major projects demand access to stable and dependable power in order to operate efficiently and to continue to attract investors in future development projects. This project provides a large supply of renewable energy with additional capacity and storage, and can also allow for more integration of new renewable energy resources into the system. Site C is a very important facility to complete as it will provide on-demand and predictable power generation capacity. The construction and ultimate operation of Site C Generating Station is an important economic driver and legacy for our province for future generations.

### **Mining**

Today, the BC government is focused on opening eight new mines and expanding nine others by 2015. The economic benefits to the Province in regards to royalties and job creation are considerable. ACEC-BC recognizes that there are always improvements that can be made in regard to not only the process but also to the regulatory environment in which the mining



industry operates. Our members play an important role in the design and on-going monitoring, and we would be pleased to participate in the further development of regulations and guidelines to ensure safe and environmentally sound mining practices.

### **Pipelines**

ACEC-BC believes pipelines are one of the safest and most widely used means of transporting liquids. Over five million kilometres of oil and gas cross-country pipelines move millions of cubic meters of oil and gas every day throughout Canada and the United States, as well as many other countries in the world. Many of the systems have been in safe operation for decades. In fact, the major transmission systems in Canada are approaching 50-plus years of service.

### **Need for Clarity and Certainty**

ACEC-BC believes BC stands on the cusp of extraordinary prosperity, which will result in enhanced services, improved wages and increased opportunities for all British Columbians. A robust high tech sector, efficient infrastructure and world-wide demand for our resources could further BC's attractiveness for investment, migration and livability.

However, governments at all levels need to take bold and decisive action in order for this to occur on the following public policy issues:

- Aboriginal relations
- Environmental review process
- Regulatory review process

BC's consulting engineering community has the knowledge, expertise and commitment to assist in this imperative. Action needs to be taken in resolving these issues if BC is to reap the full benefits of its potential.



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## 3 INTRODUCTION

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The Association of Consulting Engineering Companies of BC appreciates the opportunity to present its views to the Select Standing Committee on Finance and Government Services.

The Association of Consulting Engineering Companies British Columbia (ACEC-BC) represents BC's consulting engineering companies that provide engineering and other technology-based intellectual services to the public and private sectors.

Consulting engineering companies play an integral role in ensuring the safe, efficient and sustainable planning, development, construction and operations of buildings, highways, bridges, ports, pipelines, mines and key infrastructure projects. ACEC-BC takes a keen interest in monitoring and reporting on major projects that are key to BC's Job Plan success.

ACEC British Columbia represents 84 of BC's consulting engineering companies that collectively employ 10,000 people in the Province of BC. The workforce is comprised of engineers, geoscientists, technicians, technologists and other support staff. The consulting engineering business contributes some \$3.9 billion in annual revenue to the BC economy, 30% of which is earned from clients based outside of the Province of BC. These are revenues that would not find their way to the Province of BC if it were not for the excellent reputation of the BC consulting engineering industry.



Consulting engineering is at the centre of BC's Knowledge Economy, as engineering services comprise 20% of B.C.'s high technology sector. The Knowledge Economy is the source of high value employment, supporting a broad array of business spinoff. A healthy BC consulting engineering industry is critical to building this future economic foundation of British Columbia.

## 4 EFFECTIVE PROCUREMENT

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### 4.1 QUALIFICATION BASED SELECTION (QBS)

For most clients, selecting an engineering firm may be the most important decision in ensuring the success of their projects. For that reason, the procurement process is of specific interest to members of the Association of Consulting Engineering Companies of BC.

Many ACEC-BC members express concerns about the procurement process used by government clients. Most federal, provincial and municipal departments hire consulting engineers based on "best value" to the taxpayer. In most cases, firms must submit proposals that list their qualifications and technical expertise, their proposed approach, and the price for their services. However, typically, clients' evaluations of proposals are biased toward the price aspect, rather than giving due weight to expertise and approach. This often results in situations where engineering firms tend to interpret the scope of work narrowly, in order to provide the lowest price and win the job. Such a process effectively penalizes firms that have the foresight to anticipate complications, that propose innovations, or that have a clearer understanding of the client's needs.

In addition, we are increasingly finding instances whereby procurement officials either choose not to use or are unaware of the fact that there are standard documents and processes available that clearly delineate roles and responsibilities and effectively allocate risk to the parties to the agreement.

The ideal procurement practice will result in:

- Obtaining the right team for the right job
- Establishing and adhering to realistic schedules and budgets
- Having a project with few change orders and disputes
- Promoting better business relationship between parties
- Providing better service, better quality & better value for taxpayers

ACEC-BC suggests that a good procurement system...

- Clearly defines objectives and scope
- Evaluates what distinguishes proponents
- Meaningfully delineates scores
- Rewards proposals that add value
- Provides equitable contract terms with reasonable liability and indemnification language
- Uses a short list where necessary – Proposals are expensive to prepare and can be time consuming on the part of clients to review.



- Considers project life-cycle. “Engineering design” constitutes approximately 1 to 2 percent of the overall lifecycle cost of a project. The appeal of the lowest-price design solution overrides the value that can be gained from considering lifecycle costs.
- Focuses on best value – not lowest price

The internationally recognized best practice for the procurement of professional engineering services is commonly known as Qualifications Based Selection (QBS). This best practice has been mandated by law in the USA since the 1970’s, and more recently in the province of Quebec. QBS is recommended by the International Federation of Consulting Engineers (FIDIC). As mentioned, it is also the Best Practice recommended by the National Guide for Sustainable Municipal Infrastructure (InfraGuide) – a collaboration between Infrastructure Canada, the National Research Council, and the Federation of Canadian Municipalities.

Simply put, QBS is a systematic and transparent process for selecting the most appropriate engineering firm for any project, and then negotiating a reasonable fee that will protect the public interest over the life-cycle of the project, including design, construction, operations, maintenance and eventual upgrading or de-commissioning. QBS was developed as a response to the alternative of auctioning professional engineering assignments to the lowest bidder, resulting in sub-optimal designs, inadequate construction supervision, increased life-cycle costs, poor value for the taxpayer, and in extreme cases to compromised public safety such as occurred in the Save-On Foods disaster in Vancouver (1988) and the Laval Bridge disaster in Montreal (2006). It is no coincidence that the government of Quebec introduced QBS shortly after the Laval Bridge disaster.

## 4.2 QBS AND INTERPROVINCIAL TRADE

We are also watching the deliberations around internal trade with great interest and share with you our experience with what we believe were unintended consequences of the New West Partnership Trade Agreement (NWPTA).

Prior to NWPTA, our members and our profession already had full mobility across Canada allowing participation in the economic activities in each province and across Canada. Today, our members in western Canada are currently subject to the NWPTA and based on our experience thus far, ACEC BC has concerns with the NWPTA. Although we support the spirit of this agreement in principle, we are concerned with a specific aspect of this agreement that is potentially problematic for our industry, our clients and the public that we serve.

We believe that this can be easily resolved by preserving a narrow exemption for provincially regulated professions contained in Annex 502.1B of the existing Agreement on Internal Trade (AIT).

Based on our experience with NWPTA in British Columbia, Alberta and Saskatchewan, we have found that by removing the exemption for provincially regulated professions contained in the AIT from procurement provisions of the agreement, professional engineering services are being treated as a commodity and not as a value-added professional service. NWPTA language requires government clients to invite submissions from all firms within the trade agreement area for any professional services assignment exceeding \$75,000. Clients now face pressure to either spend a significant amount of time and resources in order to evaluate the technical merits and team qualifications for each submission or to revert to the simple solution of selecting the lowest fee at the expense of other more critical criteria. As a result, if public infrastructure development is based on the lowest possible fee, there are potential consequences to both the economy (higher costs to the taxpayer) and public safety.

Selecting the lowest fee creates pressure to design and supervise the project using less experienced staff and expending the least amount of effort necessary to meet the bare minimum requirements of the project – losing an opportunity to



optimize the design, reduce life-cycle costs and enhance safety. It also discourages innovation and penalizes proponents that anticipate potential complexities or who wish to propose value-added solutions, all to save tax payers money. The results of this will be felt in the years to come.

In effect, we have found that the NWPTA has discouraged public agencies from adopting procurement methods such as Qualification Based Selection outlined above. Adoption of QBS would allow purchasers of engineering services to comply with the requirements of interprovincial trade agreements, while reaping the benefits of selecting the most qualified consultant.

## 5 INFRASTRUCTURE

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Public infrastructure is a core business of government and vital to Canada's prosperity and enhances the economic, social and environmental quality of life of Canadians.

Infrastructure is an investment in our economic, social and environmental quality of life. A recent study by the Canada West Foundation clearly demonstrated the link between infrastructure investment and economic performance. Further, the Conference Board of Canada estimates that in an economy performing below potential, every dollar invested in infrastructure can increase real GDP by as much \$1.20. The impact of recent infrastructure investments on Canada's economy and communities has been significant and meaningful.

ACEC-BC believes that a long-term infrastructure plan will further strengthen the economy and enhance Canada's competitiveness.

Responsible fiscal management will provide governments the opportunity to further improve Canada's prosperity through further investments in infrastructure.

Recent investments in infrastructure by all levels of government have been successful in improving the quality and capacity of Canada's public infrastructure. Reviewing infrastructure needs should continue since currently committed funds, while very important, are not sufficient to meet all of the historical and emerging demands.

Since 2006 infrastructure investment in Canada has averaged 3.4% of GDP, up from 2.5% from 2001-2006. However, even with the recent government programs and initiatives, investments are significantly lower than 6% of GDP in the 1950s and 1960s. Some of Canada's major economic competitors such as China and India invest as much as 9% of GDP towards infrastructure.

ACEC-BC is prepared to continue to work closely with the provincial government and other stakeholders to ensure that infrastructure investments provide value to taxpayers.

### 5.1 TRANSPORTATION

There are currently a number of major infrastructure projects under discussion, including improvements to public transit systems, replacement of the Massey Tunnel and other projects. ACEC-BC is supportive of moving forward with these projects. One key issue that will need to be discussed robustly is that of tolling specific projects versus the adoption of a regional road pricing strategy, as clearly we need to ensure the financial capacity for these changes. While we start to discuss transportation projects, we will also need to engage in rational and objective discussions about financing options and how we as a society pay for these improvements.



## 5.2 SOCIAL/VERTICAL INFRASTRUCTURE

It is critical to remember that “Infrastructure” includes social or vertical infrastructure, such as hospitals and education (k-12 and post-secondary). There are many major buildings projects that are critical in the province, including St Paul’s and Royal Columbian Hospitals, which need to move forward in order to meet the growing demands of British Columbians. Given the considerable development taking place in northern BC, there will be increasing demand for social or vertical infrastructure projects that will need to be planned, designed and constructed in the years to come.

## 6 RESOURCE SECTOR

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Every quarter, the Association of Consulting Engineering Companies of BC publishes the BC Major Project Inventory Review, a report that provides insight and analysis on the Major Projects Inventory, published by the British Columbia Ministry of Jobs, Tourism and Skills Training, a publication that lists all major projects that are proposed, planned or underway in British Columbia. These are projects with a capital cost of at least \$20 million each within the Lower Mainland and projects valued at \$15 million or more apiece in the rest of B.C.

It is interesting to note that resource-based sectors of the economy dominate the Major Project Inventory. The utilities sector accounts for \$48 billion in total dollar value, followed by Oil & Gas Extraction (\$47 billion), Mining (\$38 billion), Manufacturing, which includes projects such as refineries, (\$30 billion) and Pipelines (\$28 billion). Residential mixed use accounts for \$26 billion and Residential accounts for \$25 billion.

### 6.1 MINING

Today, the BC government is focused on opening eight new mines and expanding nine others by 2015. The economic benefits to the Province in regards to royalties and job creation are considerable.

The operations of the mining industry have historically left undesirable environmental impacts, primarily in the form of raw tailings. While past projects stand as monuments that constantly remind us of the historical shortcomings of the industry, regulation has come a long way in terms of closure bonds to ensure that the costs of reclamation and closure of mines are accounted for, even if the mining company has ceased to exist. In addition, the mining industry today has developed sound environmental stewardship and practices that are constantly advancing, and current technology allows for tailings to be treated to “clean water” quality more than suitable to be discharged back into waterways.

Compared to many value add industries, manufacturing and other industrial sectors which can create environmentally dangerous waste in the form of fumes, chemical dumping and landfill refuse, the mining industry has been a leader in terms of environmental innovation and advancement, and many of these advancements are being developed right here in British Columbia.

As an example, using a solution designed by a BC-based consulting engineering firm the impact at one mine was reduced.

This was achieved by designing a filtered tailings disposal method, which is a “dry-stack” process that eliminates water-filled tailings ponds by removing water, and leaving tailings in a soil-like consistency. This solution allows these de-watered tailings to be stored in a dense, dry arrangement eliminating most environmental risks, and allowing bears, deer and eagles to regularly come in contact without any danger to them.

Since the process began in 1989, the dry-stack process has been refined to accommodate how these filtered tailings react during an earthquake.



There are also two additional, wide-ranging legacies. The tailings are preserved in a stable form for possible future extraction, should the industry develop a cost-effective process to squeeze additional valuable minerals from the tailings. In addition, the environmental stewardship demonstrated by mining companies and their consulting engineers has resulted in increasingly more mine operations meeting the conditions of the environmental assessment process.

Another example is the design of a single, integrated water and waste management facility right at the work site, to reduce the project footprint at the Mount Milligan copper and gold mine north of Prince George, again designed by a BC based consulting engineering firm. This saves on clearing trees, building roads and pipelines and reduced hauling distances for mining equipment – all lessening the impact on the environment. 96 per cent of waste now has to be moved just once, and even the embankment for the tailings dam itself was made from waste rock.

ACEC-BC recognizes that there are always improvements that can be made in regard to not only the process but also to the regulatory environment in which the mining industry operates. Our members play an important role in the design and on-going monitoring, and we would be pleased to participate in the further development of regulations and guidelines to ensure safe and environmentally sound mining practices.

## 6.2 SITE C CLEAN ENERGY PROJECT

ACEC-BC supports proceeding with the Site C project for a number of reasons.

There are a number of major projects that are in the implementation or planning stages that will rely on having access to stable and dependable sources of power. BC is experiencing an exciting period of economic development that is creating opportunities in most regions of BC, which will lead to more jobs, increased government revenues and enhanced prosperity. These major projects demand access to stable and dependable power in order to operate efficiently and to continue to attract investors in future development projects. This project provides a large supply of renewable energy with additional capacity and storage, and can also allow for more integration of new renewable energy resources into the system. Site C is a very important facility to complete as it will provide on-demand and predictable power generation capacity. The construction and ultimate operation of Site C Generating Station is an important economic driver and legacy for our province for future generations.

Site C provides tremendous opportunities for job creation and regional economic development. The construction and operation of Site C will not only create significant employment for engineers and construction workers while it is being built, the provision of stable and dependable power will create employment opportunities throughout Northern BC, as the various resource-based projects proceed.

ACEC-BC supports BC Hydro issuing Calls for Power on a regular basis and a Standing Offer Program. In BC we have developed an IPP industry consisting of developers, First Nations, constructors, and consulting engineers to develop and build the renewable power sources. Notwithstanding this, ACEC-BC believes that Site C is integral to the future provision of stable and dependable power for British Columbia.

Site C presents an opportunity to build on BC's reputation for expertise in engineering and can contribute to creating a centre of excellence for engineering services. British Columbia's consulting engineering companies are well placed to play a key role in particular to support generation projects that will fill the net increase in load demand over the next 20 years, and beyond. While we recognize that there are some risks and uncertainties with Site C, ACEC-BC believes there are opportunities to mitigate the risks; we remain committed as an industry to assisting BC Hydro and the BC government in meeting its goals for prudent energy supply and management, and economic growth and prosperity. BC's



consulting engineers are recognized as being among the best in the world, as evidenced by the extent to which the industry is engaged in the export market. Site C has the opportunity to showcase the work done by BC engineers.

### 6.3 PIPELINES

The goal of reducing the world's reliance on carbon fuels is laudable and, in fact, achievable. However, the fact remains it will take many years for this happen. The world still relies on fossil fuels to drive economies and create jobs worldwide. Canada is truly fortunate to have an abundance of resources: we are the third largest producer of natural gas, the fifth largest energy producer and the sixth largest producer of crude oil in the world. While many other energy producing countries have less environmental oversight and public accountability -- as well as worrisome human rights and worker safety issues -- Canada can ensure safe operations to international standards and environmental scrutiny.

If Canada is to help meet the growing global demand for fuel, we need to carefully consider the optimal method of transporting the resource from the well head to shipping facilities. Currently, there are only a few options: pipelines, rail cars, and tanker trucks -- all of which have inherent risks and benefits.

We believe pipelines are one of the safest and most widely used means of transporting liquids. Over five million kilometres of oil and gas cross-country pipelines move millions of cubic meters of oil and gas every day throughout Canada and the United States, as well as many other countries in the world. Many of the systems have been in safe operation for decades. In fact, the major transmission systems in Canada are approaching 50-plus years of service.

There is risk in all aspect of life as well as projects. Pipelines are no different. Oil and gas pipeline design is continually being enhanced by improvements in standards, regulations, construction methods and monitoring. The pipelines being planned for B.C. will be engineered to be among the world's safest and most environmentally sound. The ships used for transport will be double hulled. In addition, the Canadian government recently unveiled new legislation for "absolute liability" of pipeline operators. This new legislation enacts unlimited liability if pipeline operators were negligent or at-fault, and enforces \$1 billion in liability even when operators are not at-fault. This legislation will encourage safe operation once pipelines are constructed.

The successful completion of the federal environmental review process of the Northern Gateway project satisfies one of the Province of B.C.'s five conditions for approval. B.C.'s engineering community will play a key role in addressing two of the remaining four conditions: development of world-leading marine oil-spill response, prevention and recovery systems for B.C.'s coastline and ocean to manage and mitigate the risks and costs of heavy oil pipelines and shipments, and the development of world-leading practices for land oil-spill prevention, response and recovery systems to manage and mitigate the risks and costs of heavy-oil pipelines.

The Canadian consulting engineering sector has expertise to support the social and economically responsible transport of energy resources. In addition, Canadian engineers possess extensive knowledge and familiarity with domestic and international standards that govern the design and construction of oil and gas installations all over the world. This comprehensive understanding encapsulates decades of industry lessons and technical innovations: knowledge and experience that will directly apply to the work they will perform on projects such as Northern Gateway.

Pipeline construction has benefited from the application of engineering in many areas, from improved pipeline materials (pipe, coatings, valves) and enhanced welding, to non-destructive examination of welds and coatings.

Operations of the pipeline systems are being enhanced by the use of real-time strain monitoring; satellite monitoring of slope stability; and, testing and installation of real-time, in-place external leak detection.



Ongoing maintenance of pipelines are benefitting from the use of advanced in-line inspection tools, including high-resolution ultrasonic tools. This technology can identify more anomaly types such as stress corrosion and cracking – and even smaller indications -- than previously possible. Other new in-line tools are being tested to “listen” for signatures of very small pipeline leaks.

The application of engineering to the pipeline industry ensures both innovation and reward, in particular the contribution to safe and efficient development of Canada’s natural resources.

## 7 NEED FOR CLARITY AND CERTAINTY

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BC stands on the cusp of extraordinary prosperity, which will result in enhanced services, improved wages and increased opportunities for all British Columbians. A robust high tech sector, efficient infrastructure and world-wide demand for our resources could further BC’s attractiveness for investment, migration and livability.

However, governments at all levels need to take bold and decisive action in order for this to occur on the following public policy issues:

- Aboriginal relations
- Environmental review process
- Regulatory review process

BC’s consulting engineering community has the knowledge, expertise and commitment to assist in this imperative. Action needs to be taken in resolving these issues if BC is to reap the full benefits of its potential.