



BCIT North Campus Infrastructure Project

Project Management – Owners Representative

Category G – Project Management

Location: Burnaby, BC

Owner/Client: British Columbia Institute of Technology

Other Consultants: Stantec, Pinchin, Prime Engineering, PFS

Member Firm Submitting:

R.F. Binnie & Associates Ltd

300-4940 Canada Way, Burnaby, BC V5G 4K6

Jhonathan Martinez, P.Eng., PMP

778-945-6201 / jmartinez@binnie.com

Richard Bush, P.Eng., PMP, MBA

778-945-6075 / rbush@binnie.com

Scott Campbell, P.Eng., PMP

778-945-6080 / scampbell@binnie.com

Table of Contents

G. PROJECT MANAGEMENT	2
Q.6 Project Introduction and Complexity.....	3
Q.7 Meeting Client's Needs.....	6
Q.9 Innovation	7
Q.8 & Q.10 Environmental, Economic, and Social Benefits	8

G. PROJECT MANAGEMENT



Q.6 Project Introduction and Complexity

With student enrolment at approximately 50,000 students annually, the British Columbia Institute of Technology (BCIT) is one of BC's largest post-secondary institutions and has ambitious plans for future growth. In 2015, BCIT underwent a condition assessment of all its underground utilities and found that much of the existing electrical infrastructure at the Burnaby campus was at critical risk of failure and needed to be replaced. To address the findings of the assessment, the BCIT North Campus Infrastructure Project (NCIP) set out to deliver a \$50M electrical and civil infrastructure upgrade with the goal to support growing demand and establish the necessary foundation for future campus development. The project would address risks of potential power interruptions associated with end-of-life electrical infrastructure and improve resiliency and reliability for the future. The key objectives included:

- Replace the aging power receiving substation.
- Replace all aging substation units at campus buildings north of Goard Way.
- Replace three substation units in the south campus.
- Establish a new BC Hydro connection at the corner of Carey Avenue and Canada Way with three major electrical services: high voltage (HV -12.5/25kV), low voltage (LV - below 750V), and telecommunications.
- Replace associated water, gas, stormwater, and sanitary pipelines that service the campus.
- Improve landscaping along English Street to align with the Campus Plan.
- Create fully accessible and pedestrian focused streetscapes.

Considering the scope of work, atypical at BCIT, and the amount of stakeholder engagement needed, BCIT identified at an early stage that a project management team with infrastructure delivery experience was necessary to lead the project on behalf of the Owner. Binnie was selected to provide project management services during procurement, construction and close-out of the project.

With the complexity of the BCIT NCIP project and the volume of stakeholders, project management played a key role in addressing the following challenges:

- Business continuity – completing the required construction and major electrical cutovers, without impacting scheduled campus programs, courses, and services over the project period



BINNIE 4

- Safety – prioritizing matters impacting student and public safety and coordinating with BCIT safety and security regarding impacts to campus safety systems.
- Risk management – a significant portion of the project involved underground infrastructure and the need to quickly manage unknown conditions and their affect to scope, schedule, and project costs.
- Stakeholder management – extensive management and monitoring of communications were required to effectively manage the project team, and numerous BCIT and third-party stakeholders.

As a significant portion of the NCIP improvements took place underground, the project faced many unexpected challenges. These challenges involved a great deal of risk management – continually mitigating the impact to project scope, and delivery schedule. The project team faced many instances of this specifically where newly installed infrastructure connected to old existing underground utilities or where existing utilities not part of project scope, once exposed, were in worse condition than anticipated.



Photo 2: Carey Avenue electrical duct bank and manholes

On a regular basis, the Binnie project management team needed to balance the benefit of carrying out additional, maintenance-deferring improvements against scope creep and increasing project costs. Risk items impacting scope, budget and schedule were tracked throughout the project's life. Binnie kept BCIT's key stakeholders apprised of all meaningful developments, sought alternate solutions and presented option rationale to ensure that

project budget would be maintained, unexpected value-add improvements could be carried out, and construction could continue uninterrupted. Due to the project's footprint occupying the northern half of BCIT's Burnaby campus, these issues were prevalent, and risk management became a complex exercise in balancing scope, improving upon project objectives where possible, and deferring maintenance where necessary.

Where possible, the Binnie project management team worked with stakeholders for agreement on project impact schedules so that the contractor would benefit from being able to carry out preferred, and more efficient construction sequencing. Binnie engaged with stakeholders to ensure the many utility interruptions necessary for water, sanitary, gas and electrical cutovers were executed while minimizing the impact to day-to-day operations.



Photo 3: Raingardens and seating areas for students located along the new English Walk

Q.7 Meeting Client's Needs

As the Project Manager representing BCIT, Binnie was at the center of all communications between the project team and the many BCIT and third-party stakeholders. Binnie worked with a mandate from BCIT to maintain full Burnaby Campus operations during construction without impacting any scheduled courses or activities. This could not be achieved without an extensive and comprehensive communications management plan and monitoring program.

Binnie understands the value of relationships and for the NCIP, our project managers focused on creating personal connections with key BCIT stakeholders, including meeting with each of them at the start of the project to understand their priorities, constraints, and requirements that would mitigate impacts to their individual buildings/programs. Binnie prioritized the communication of these to the project team to inform and support design strategies, construction schedules and methodologies. This became an iterative process that was maintained throughout the project lifecycle. Collaborating as an integrated team improved all other standard communications ensuring project details were accurate and reliable which helped increase their effectiveness.

Binnie carried this same approach with the project team, fostering a collaborative working environment where sharing information was effective and efficient. This was crucial in ensuring the successful implementation of an Integrated Design and Construction team, and directly contributed to the success of the project.

Maintaining constant, and relevant communications with individual BCIT Schools, Faculty, Students and tenants allowed Binnie and the project team to successfully complete the project several months ahead of schedule and on budget. The project successfully installed nine (9) new electrical substations, 5.5 km of new linear infrastructure including duct bank, water, sanitary, storm and gas, as well as new streetscape and landscape improvements.

Another goal that was just as important to BCIT was to ensure the project had a positive impact on BCIT Staff, Students, and all BC communities through providing the necessary infrastructure upgrades that would allow for long term sustainable growth. To achieve this Binnie worked collaboratively with BCIT, the Prime Consultant and the General Contractor to ensure goals established through the Institute for Sustainable Infrastructure's (ISI) Envision framework were tracked and reported. The project was awarded by the ISI for having achieved Envision Gold level certification. BCIT is the first educational institute in Canada to earn this award at any level.

Q.9 Innovation

BCIT recognized early on the high degree of difficulty that this project posed in terms of completing the necessary scope within a short timeline while trying to maintain the campus fully open and without impacting scheduled courses or activities. To address this, BCIT and Binnie worked together to successfully assemble and implement an Integrated design team to deliver this project.

The goal of employing this model was to be able to accelerate the design process while mitigating constructability challenges by having early involvement from the General Contractor. Binnie first worked with BCIT to prepare a detailed RFP to ensure that the right General Contractor was brought onboard based on expertise, capacity, innovation and value.

Binnie was at the centre of the integrated design team and created a collaborative environment that allowed BCIT to realize the full potential of this delivery model. Binnie extended their collaborative approach to the various BCIT Stakeholders and prioritized the communication of their priorities, constraints and requirements to the integrated design team to support design strategies, schedules and methodologies.

Q.8 & Q.10 Environmental, Economic, and Social Benefits

Sustainability was front and centre throughout all phases of the project and acted as a major driver in all decisions. The objective of the NCIP was to improve economic and operation resiliency through the delivery of a reliable power supply and distribution that would maintain existing infrastructure and allow for future growth for the long-term benefit of BC communities.

Project accountability with regards to achieving the project objectives in a socially and economically sustainable and responsible manner was important for BCIT and the project team, so they looked to the Institute for Sustainable Infrastructure (ISI) to have the project verified against the Envision framework. Envision sets the standard for what constitutes sustainable infrastructure and provides Owners and Project teams with a framework and design tools to identify sustainable approaches through all phases of a project. The framework measures sustainability and resilience indicators organized around the following categories:

- Quality of Life
- Leadership
- Resource Allocation;
- Natural World
- Climate and Resilience

In 2019, the BCIT NCIP was awarded the Envision Gold award for sustainable infrastructure by the ISI. BCIT is the first educational institution in Canada to earn an Envision Award at any level. Key elements that contributed to the award included:

Environmental

- Implementation of efficient lighting and transformer technology
- Innovative stormwater infrastructure, including integration of rainwater gardens

Social

- Increased campus walkability through the construction of covered walkways, creation of new green spaces, and outdoor activity/event space for faculty and students through the transformation of English Street to English Walk
- Improved streetscape which accommodates pedestrians, cycling and vehicle traffic on Carey Avenue and Smith Street

Economical

- Improved operational efficiencies and reduction in unplanned maintenance costs
- Alignment with BCIT Business Plan, BC Jobs Plan, and BC's Skills for Jobs Blueprint

"The continuous community engagement throughout the North Campus Infrastructure Project has allowed BCIT to fully understand the needs of its community and to guide development and renewal opportunities that provide long-term benefits. This award further recognizes BCIT for its strong commitment and leadership in sustainability," - Kathy Kinloch, President of BCIT.



Photo 5: Improved Cycling route along Carey Avenue

