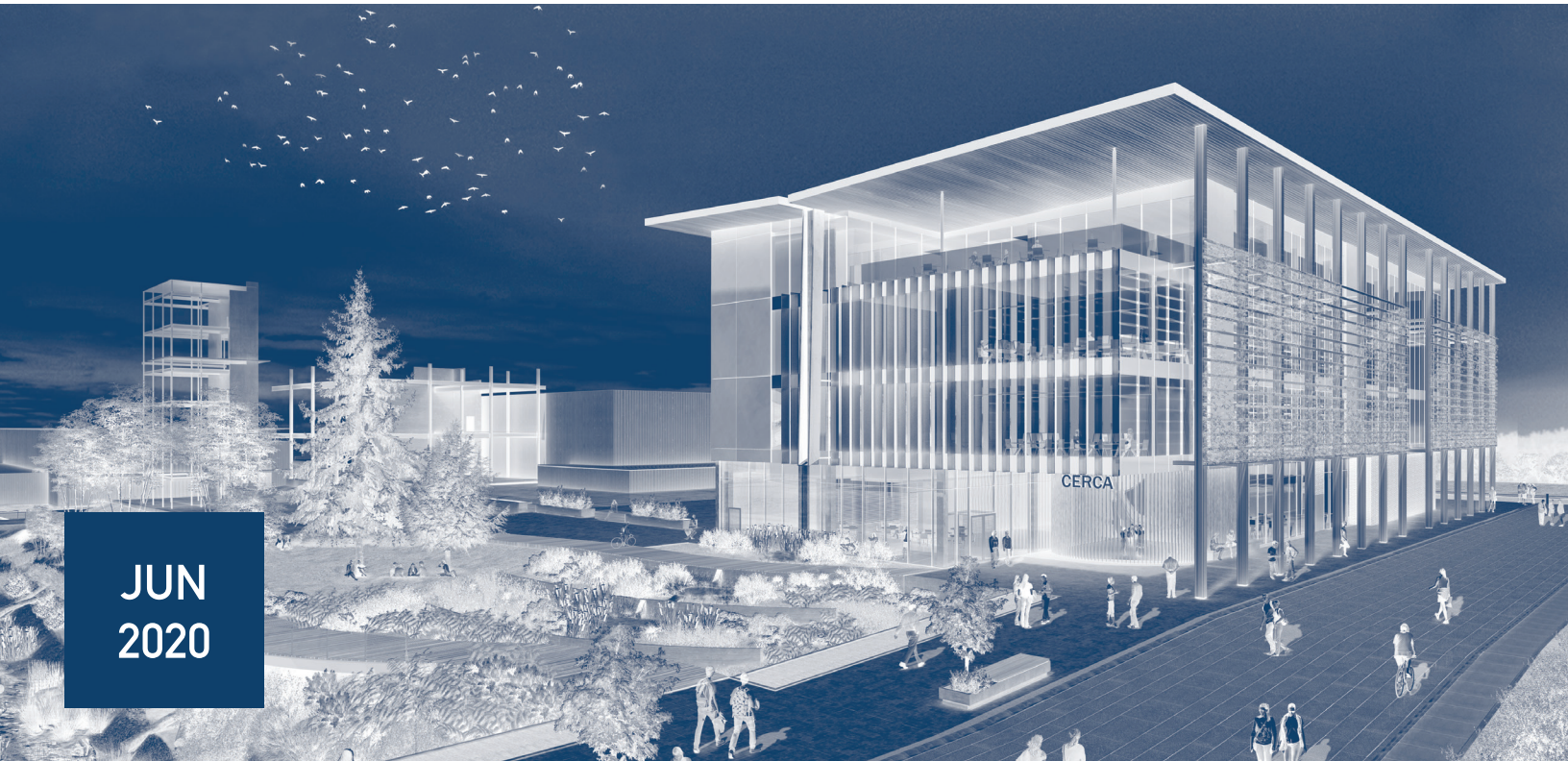
BCIT™

BCITRENEW

Five-Year Capital Plan | 2021 to 2025



JUN
2020


BCIT
TRADES AND TECHNOLOGY

Overview

BCIT has nearly 50,000 students enrolled annually (16,600 full-time, 31,600 part-time) in five schools of study. The Institute offers practical career credentials designed for the workplace, has a major role to play in BC's job training infrastructure, and serves as a catalyst for the provincial economy.

Three projects are presented here in BCIT's ***Capital Plan 2021-2025*** as priorities for financial support by the Province of British Columbia. Two of these projects – the Trades & Technology Complex and the Centre for Ecological Research and Climate Adaptation – are central to supporting provincial jobs, environmental objectives, and the evolving 21st century economy. The third project – South Campus Infrastructure Renewal – reflects the chronic need for investment in the utility systems that underpin the entirety of BCIT's campus operations. All three projects reflect an accumulation of under investment in the Institute's Burnaby Campus over many years, resulting in teaching and learning facilities that are aging, and increasingly are functionally challenged to meet modern standards. Infrastructure renewal will mitigate continuing service interruptions and life safety risk.

The projects outlined in this plan are consistent with BCIT's ***Education Plan 2019-22***. They also align with key Government of British Columbia Ministry Service Plans, and province-wide initiatives that include analysis, strategies, and recommendations that form the *Emerging Economies Task Force 2020* and *CleanBC*. As part of the Trades & Technology Renewal, the proposed use of mass timber construction for three of the new buildings is an example of the emerging sustainable economy.

The three projects address four interlinked strategic objectives:

- Support the training and reskilling of the work force, and the creation of new professions to meet BC's employment needs for an economy that is changing through accelerating technological advancement, and the change to clean energy, ecological restoration, and climate adaptation;
- Renew BCIT's education facilities and basic support servicing and systems infrastructure, much of which is very old and has received relatively little new investment to meet the needs of 21st century education;
- Recognize the needs of the new economy by providing opportunities for collaborative interdisciplinary programming through multiple school involvement, and the creation of shared centres of competence. These centres will provide leadership and best practices; and
- Build on BCIT's external partnerships involving First Nations, industry, local governments, national and provincial agencies, and the third sector.

The THREE priority projects are:

1	Trades + Technology Complex
2	South Campus Infrastructure Renewal Project
3	Centre for Ecological Restoration + Climate Adaptation (CERCA)

Prioritized List of BCIT Proposed Projects

#	CAMPUS	PROJECT DESCRIPTION	PROJECT CATEGORY	ANTICIPATED CONSTRUCTION START DATE	ANTICIPATED OCCUPANCY DATE	TOTAL PROJECT BUDGET	TOTAL CASH FLOW FORECAST (FISCAL YEARS IN MILLIONS)					
							2021/22	2022/23	2023/24	2024/25	2025/26	Ongoing years
1	Burnaby	Trades & Technology Complex	1	April 2022	April 2026	$213 M	$10.74 M	$31.21 M	$37.74 M	$59.65 M	$51.15 M	$23.11 M
2	Burnaby	South Campus Infrastructure Renewal Project	2	January 2022	January 2025	$88.8 M	$6.03 M	$15.70 M	$16.10 M	$20.70 M	$22.70 M	$7.60 M
3	Burnaby	Centre for Ecological Restoration & Climate Adaptation (CERCA)	1	July 2024	January 2026	$39.3 M	$0	$1.50 M	$3.40 M	$17.70 M	$16.70 M	$0
						$341.1 M	**$16.77 M**	**$48.41 M**	**$57.24 M**	**$98.05 M**	**$90.55 M**	**$30.71 M**

NOTE: ALL COSTS INCLUDE TAXES & FIGURES ARE ROUNDED.

Project 1: Trades + Technology Complex

Category 1: New Priority Projects				
Institution BCIT	**Campus/City** Burnaby	**Project Title** Trades + Technology Complex	**Project Category** 1	**Project Priority** 1 of 3

1. CURRENT SITUATION

BCIT is the largest provider of trades and technology education in BC, and plays a central role is assisting with the Province's priority of creating a sustainable economy. However, the Institute is challenged in its ability to maintain the quality of education required to serve the province's trades and technology sectors. In BC, the Institute stands out as not having received new investment in its trades education facilities:

- Currently, BCIT is experiencing long waitlists for in-demand trade programs. There is a strong demand for trades training to address industry-driven labour demand;
- BCIT faces challenges with apprenticeship intake capacities. Each year, the number of intake spaces are filled prior to fulfilling the demand by prospective students, causing them to defer enrolment to another year;
- Most Trades & Technology buildings are more than 50 years old, with several over 60 years old – all have high Facility Condition Indexes (FCIs) ranging from 0.31 to 0.91, indicating poor conditions. BCIT has received only nominal new investments in its trades buildings over the last 20 years;
- Many Trades & Technology buildings have high levels of deferred maintenance costs, ranging up to $25 million.
- Many of the buildings and associated yard spaces are too small, or functionally inadequate relative to the requirements of modern trades and technology education;
- The buildings have old structures and systems that do not reflect modern construction and energy efficiency standards. Replacement and renovation of these buildings is needed to reduce greenhouse gas emissions, and to meet current seismic standards;
- Collectively, the condition of the facilities does not meet the expectations of students, industry, or the general public;
- The layout of the existing Trades & Technology buildings does not facilitate inter-disciplinary student interaction and understanding, which is essential for modern trades work; and
- In a number of the Trades programs, teaching space is inadequate for coping with current demand, and lacks flexibility for the future.

TRADES + TECHNOLOGY COMPLEX RENEWAL SUMMARY						
CURRENT OR PROPOSED BUILDING	USE	SIZE	YEAR BUILT	FACILITY CONDITION INDEX	DEFERRED MAINTENANCE	BUILDING OUTCOME
Replacement of Facilities & Corporate Services	Multipurpose Use	3,680 m^2	NA	NA	NA	New Build
NE07 Facilities Management Shops	Maintenance Shops	449 m^2	1965	0.69	$1,429,745	Demolished
NE09 Facilities Management Administration	Multipurpose Use	2,614 m^2	1965	0.71	$5,005,920	Demolished
Trades & Technology Centre	Classroom/ Training	7,440 m^2	NA	NA	NA	New Build
NE06 Pipe Fitting Structure	Classroom/ Training	1,570 m^2	NA	NA	NA	New Build
NE04 Carpentry	Classroom/ Training	2,057 m^2	1959	0.31	$3,717,586	Renovated
NE12 Steel Trades & Marine Fitter Structure	Classroom/ Training	2,900 m^2	1972	0.62	$4,580,380	Renovated
NE21 Classroom	Closed	613 m^2	1958	0.91	$2,335,949	Demolished
NE21 Carpentry Pavilion	Classroom/ Training	715 m^2	NA	NA	NA	New Build
SE01 Electrical Trades Building Renewal	Classroom/ Labs	7,213 m^2	1980	0.47	$11,131,401	Renovated

2. PROJECT DESCRIPTION + SIZE

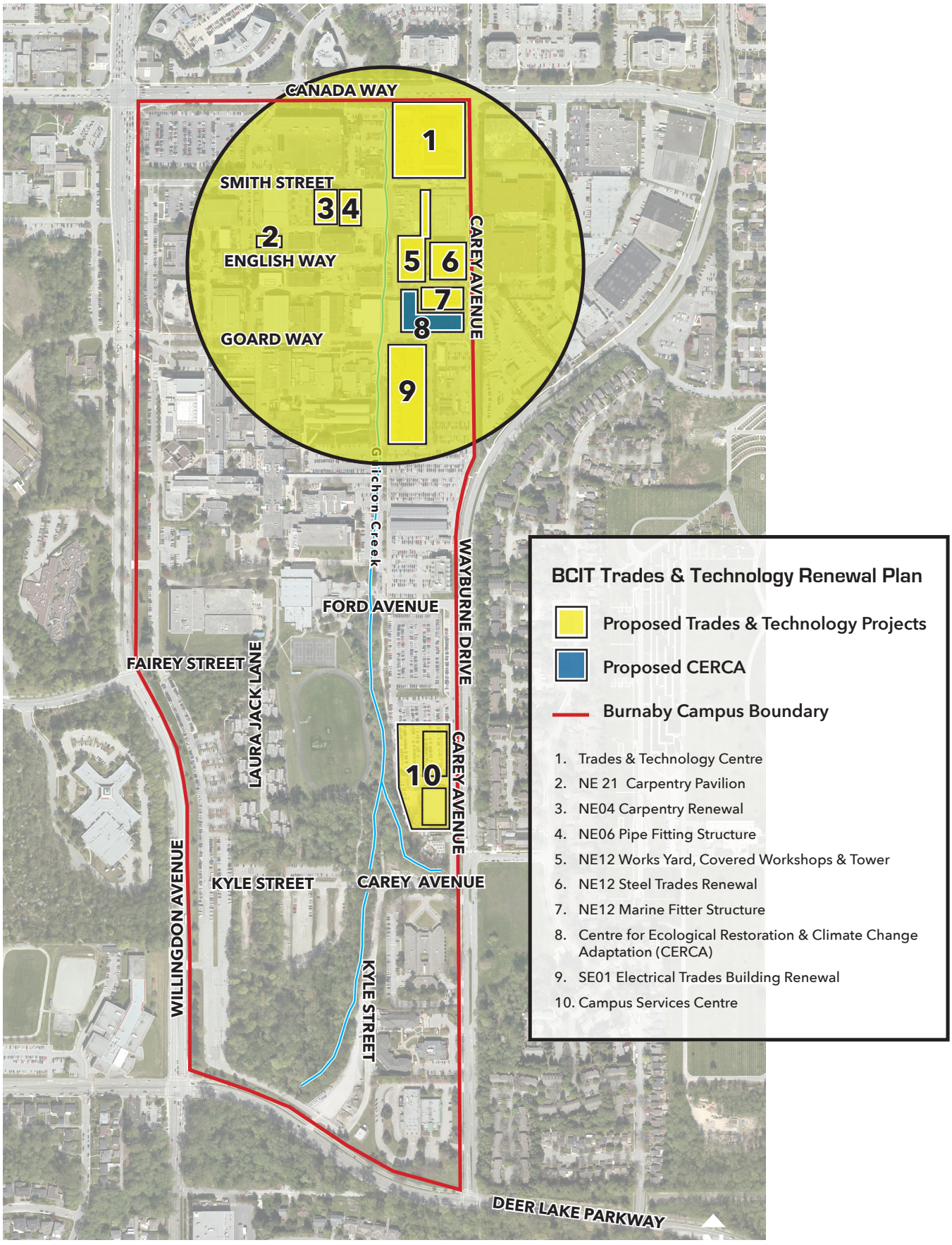
The BCIT Trades & Technology Complex comprises a series of phased projects that will replace and modernize existing functionally inadequate buildings, and enhance and expand the Institute's Trades & Technology teaching space. Figure 1 (at right) shows a map of the projects at BCIT's Burnaby Campus.

Replacement of the Facilities + Corporate Services Complex

This project will include:

- Demolition of NE07 and NE09, which currently house Corporate Services/Purchasing, the Print Shop, and Facilities & Campus Development offices;
- Construction of a new 3,680 m^2 Campus Services building at the south end of the Burnaby Campus (adjacent to the existing SE30 warehouse) that will create an enlarged, functional, safe ,and secure site for loading, parking, and deliveries. The adjacency of this new building will also extend the life and make best use of the SE30 warehouse building;

Figure 1: Trades + Technology Renewal Plan



- Incorporation of mass timber construction, using the dowel laminated timber technique (DLT); and
- Opening up a prominent site at the Campus' northeast entrance, near existing trades facilities for a new focal point with the new Trades & Technology Centre.

The New Trades + Technology Centre

The Trades & Technology Centre will strengthen trades training, and contribute to a new Trades & Technology identity on the Campus. Features of the new Centre include:

- A prominent building located at the northeast corner of the Burnaby Campus that is close to transit access, and will form a new campus gateway;
- 21st century teaching and learning spaces;
- An innovative four-level building to make best use of land and the economies of shared building services and systems;
- Use of mass timber construction via the cross laminated timber (CLT) technique;
- A Trades Discovery Centre;
- A new Student Learning Commons for facilitating interaction and shared teaching and learning spaces for all trades students;
- A makerspace for inter-disciplinary cooperation;
- Consolidation of existing Construction & Building Science-related programs from functionally inadequate spaces;
- Modeling of sustainable building technologies;

Trades & Technology Centre (Source: HCMA)

- Innovative research:
  - Building Science Centre of Excellence
  - High Performance Building Lab
  - Architectural Ecology
- Renewal of aging storm drainage by daylighting Guichon Creek; and
- Design that allows for future expansion with a second phase.

The new Centre is designed to accommodate future expansion options, and will include construction of a four-storey building at the corner of Canada Way and Carey Avenue, replacing buildings NE09 and NE07, which are set to be demolished.

The Centre will contain the following elements:

- **Level 1.** Workshops, dry and wet laboratories, Trades Discovery Centre, Maker Space, Learning Commons
  - 2,271 m^2
- **Level 2.** Lecture Theatre, classrooms, student project rooms, and computer and simulation labs
  - 1,860 m^2
- **Level 3.** Classrooms, laboratories, and offices
  - 1,624 m^2
- **Level 4.** Classrooms, offices, faculty resource/lounge, and board room
  - 1,685 m^2
- Replacement parking for BCIT use.
- Total area, excluding parking
  - 7,440 m^2

The new Trades & Technology Centre will provide learning space for approximately 460 FTEs.

Trades + Technology Complex Renewal – Other Buildings

NE06 Pipe Fitting Structure work will consist of renovations to the yard adjacent to NE06. The project includes construction of three wood-framed modular structures, a storage structure, racking, a pipe structure, and an overarching canopy. The new structure will provide learners with a covered outdoor teaching area and spaces for new "Mock-Up Training Modules" that simulate real work conditions. The new structure will allow existing programming to be delivered more safely, and may also reduce conflicts that currently hinder program growth.

NE04 Carpentry Building. Interior renovations to the Carpentry Shop will improve workflow, and provide a safer learning environment for students working with carpentry equipment.

NE21 Carpentry Pavilion. The existing NE21 classroom building is clad in asbestos-containing siding. This building will be replaced with the new Carpentry Pavilion that will provide additional outdoor framing instructional areas and classroom facilities. This project will use a mass timber structure.

NE12 Steel Trades Building Renewal will comprise extensive renovations to the existing NE12 building, involving layout upgrades that include renewed and modernized instructional workshops, equipment, classrooms, washrooms, and an administration area. Structural and seismic upgrades are part of the project, as are building envelope upgrades. The NE12 Building Renewal also includes construction of a two-level, freestanding training structure for the steel trades, a new gouging/machine shop structure, relocation of the

rebar teaching wall, and minor site works. The Steel Trades Tower will provide learners with hands-on simulated experiences in erecting structural steel girders and columns to form a complete structure. A new covered workshop will be constructed adjacent to NE12 to support growth in the Marine Fitter steel trades.

SE01 Electrical Trades Building Renewal. SE01 is currently used as classrooms and labs for BCIT's electrical program and houses the main administrative offices for BCIT's School of Construction & the Environment (SoC&E). The building is a 6,770 m^2 two-storey, concrete frame, precast-clad building. SE01 is centrally located on the Burnaby Campus near Roper Avenue and Goard Way (the primary north-south pedestrian connector through the Campus), and is viewed as a key academic facility to be maintained and improved for a new 'life cycle', typically with a more than 30-year horizon.

It is proposed to upgrade the building's structural, mechanical, and electrical systems, enhancing its energy performance, and add a 185 m^2 extension. The building renewal will allow complete electrification of building systems, and achieve "net zero" GHG operating systems.

Marine Trades Covered Works Yard (Source: Stantec)

NE21 Replacement Outdoor Project Area (Source: Thinkspace Architecture)

3. PROJECT OBJECTIVES

- Increase student intake, including Indigenous persons, and reduce waitlists for in-demand trades programs.
- Support programs that align with emerging opportunities for skilled personnel presented by high-tech industries, such as construction, renewable energy, pipelines, mines, and transportation infrastructure.
- Improve the Campus' profile, specifically the Trades program's image and recruitment opportunities.
- Provide industry partnership and journeyman upgrading opportunities.
- Reduce energy use and operating costs.
- Enable renewal or replacement of physically obsolete buildings.
- Modernize to meet new technology requirements.
- Create a flexible 21st century teaching environment for Trades & Technology programs, especially those associated with construction, technology, and other growth industries.
- Develop integrated and collaborative Trades & Technology programming space.
- Create a formal demonstration space and student commons area to showcase the Trades & Technology program, and assist in trades education recruitment.
- Provide safer workshops and laboratories that are more functional and use space more efficiently, including controlled access for delivery trucks.
- Support daylighting of Guichon Creek.
- Support the implementation of the Campus Plan.
- Demonstrate "Living Lab" principles by employing leading edge building science principles in design and construction.
- Design for a future addition as Phase 2.

4. OPTIONS CONSIDERED

- **Status Quo.** This option does not address seismic issues, functional inadequacy, program expansion opportunities, or consolidation requirements.
- **Non-Capital Site Option.** The off-site lease option is also deemed not viable. The programs are an integral part of the overall trades training taught in BCIT. Students need to be in proximity to other shops, structures, and classrooms within the larger Trades' training complex.
- **New & Renewed Facilities.** Preferred. This option best meets project objectives.

5. PROJECT OUTCOMES

Infrastructure Improvements

- This project will make a significant impact in modernizing BCIT's Trades & Technology Complex, creating modern educational environments, and allowing for program expansion.
- The modernization effort will reduce life-safety and occupational health risks, and improve space utilization.
- The phased implementation of BCIT's stormwater management plan will include the daylighting of Guichon Creek.

Cost Effectiveness

- The new and renovated facilities will enable Trades & Technology program integration, and consolidation by creating necessary swing space and program expansion opportunities for in-demand programs.
- The new Centre will provide flexible teaching spaces built to adapt to changes in labour market demand and subsequent program delivery options.
- A cost-effective project delivery schedule will create swing space in the new Centre that will expedite the renewal of NE12.
- The covered works yards will provide flexible and appropriate facilities for trades training at minimal cost.

Quality Education + Innovation

- The new Centre will showcase sustainable construction methods (specifically mass timber construction, and new technologies and innovations, such as simulation, into the design of labs and workshops, and provide flexible space programming.
- New and renovated facilities will enable student-centered learning that is adaptable over time to changes in teaching and labour market trends.
- The inclusion of observation galleries and a demonstration/atrium space allow BCIT to showcase Trades & Technology education to students and visitors alike.
- The Centre will provide new research labs to expand BCIT's leadership role in Applied Building Science and Architectural Ecology research.

Strategic Alignments

The project supports the Government of BC's "Focus on sustainable economic growth that strengthens our natural resource sector, continues the development of the emerging economy, supports small business and uses innovation and technology to solve BC problems. A key priority in 2019/20 and beyond will be driving economic growth with cleaner energy and fewer emissions".

- Ministry of Advanced Education, Skills and Training Service Plan 2019/20 – 2021/22
  - Objective 1.1: "Implement the Truth and Reconciliation Commission's Calls to Action and the United Nations Declaration on the Rights of Indigenous Peoples in the post-secondary education and skills and trades training system" with BCIT Indigenous Services promotes education opportunities & skills training for Indigenous people, and the Trades Discovery program that promotes and expands participation of Indigenous workers in trades & technology;

- Objective 2.1 to "Ensure affordable and equitable access to quality post-secondary education and skills training" by providing learners with hands-on experience to explore a variety of careers";
- Objective 2.2 to "Respond and adapt to the needs of under-represented and vulnerable populations to improve educational access and inclusivity in post-secondary education and training, and increase their participation in the skilled workforce" by providing programs, services, tools, and resources for those who are struggling to gain a foothold in the job market through targeted trades programs for youth, Indigenous persons, persons with disabilities, and women to help them to gain needed skills and secure sustainable employment"; and
- Objective 3.1 to "Post-secondary education, skills and trades training that prepares British Columbians for current and emerging opportunities in the BC economy" by:
  - Supporting a wide range of co-op and work experience programs for undergraduates, including programs that support BC's technology-related sector;
  - Partnering with employers and economic sectors to deliver skills upgrading to employees; and
  - Establishing technology and innovation centres in key areas of the economy.

- Ministry of Jobs, Trade and Technology Service Plan 2019/20 – 2021/22
  - Objective 2.1: "Assist BC businesses to take advantage of trade opportunities in existing and new markets, and support communities to attract investment to create resiliency" by supporting growth of the province's manufacturing sector, in particular the aerospace and marine sub-sectors;
  - Objective 3.1: "Support BC communities and Indigenous peoples to increase participation in established and emerging economic sectors" by fostering partnerships between Indigenous peoples and industry to increase Indigenous participation in the economy, strengthen communities, and increase economic diversification.
- CleanBC Plan 2018
  - Initiative: Improve Where We Live and Work with Better Buildings.
    - The new Centre will feature energy efficient HVAC, lighting, and building envelope that will increase energy efficiency and reduce GHG emissions.
    - A 30% reduction in energy, and subsequent green house gas emissions, is targeted for the renewal of NE12.
    - New and renovated buildings will be designed to meet or exceed LEED® Gold design standards.
    - Full electrification of SE01 will achieve "net zero" GHG operating systems.

6. TRADES + TECHNOLOGY COMPLEX PROJECT COST SUMMARY

BUILDING	CONSTRUCTION START DATE	TOTAL COST
Campus Services Building Replacement	Second Quarter 2022	$29.2 million
Trades & Technology Centre	Fourth Quarter 2023	$124 million
NE06 Pipe Fitting/NE04 Carpentry/ NE21 Carpentry Pavilion	Fourth Quarter 2022	$17.1 million
NE12 Steel Trades & Marine Fitter Structure	Fourth Quarter 2025	$19.1 million
SE01 Electrical Training Centre	Fourth Quarter 2025	$23.7 million
TOTAL CAPITAL COST		**$213.2 million**

It is expected that BCIT will contribute $32 million to the capital cost, with the Province contributing $181 million.

The facility operation costs associated with the renovated NE12 and new covered outdoor shop areas will be accommodated within the existing BCIT operations budgets. The new Trades & Technology Centre building will be in addition to baseline operations, and so will likely result in an additional $85/$m^2$ per annum – a net increase of approximately $1,238,,000.

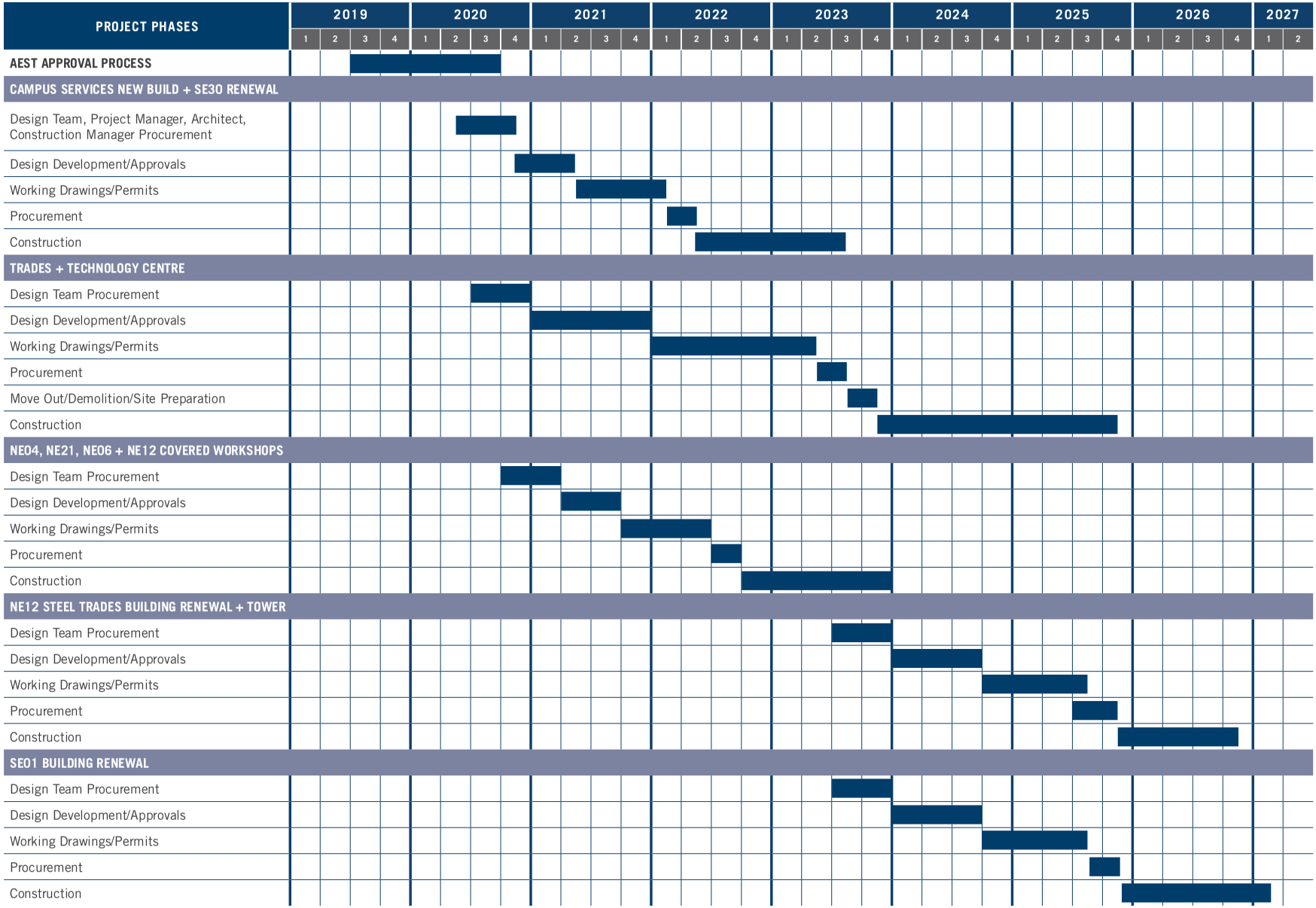
The Trades & Technology Complex will accommodate existing programs, so there will be no specific increase in program operating costs beyond the ongoing organic growth of the identified programs. The Complex also allows for expanded research facilities that are anticipated to be funded through external grants, and not result in additional operating costs.

7. KEY RISKS

The key risks if the project does not proceed are:

- Retention of existing buildings that do not meet seismic standards, are functionally inadequate, and have high FCIs;
- Progressively widening gap between existing and modern 21st century learning environments;
- BCIT will be constrained in meeting student demand for the Trades & Technology training places;
- Negative impacts on the recruitment of students, faculty, and staff; and
- The Province's ability to successfully implement its strategic priorities and initiatives will be limited.

BCIT Trades + Technology Renewal Schedule



April 15, 2020

Project 2: South Campus Infrastructure Renewal Project

Category 1: New Priority Projects				
Institution BCIT	**Campus/City** Burnaby	**Project Title** South Campus Infrastructure Renewal Project	**Project Category** 2	**Project Priority** 2 of 3

1. CURRENT SITUATION

There is urgent need to renew critical infrastructure at BCIT's Burnaby South Campus. An independent condition assessment shows the majority of the electrical service infrastructure to the southern part of the Campus, including its substations, is past expected serviceable life, and in need of immediate replacement. BC Hydro has initiated a 25 KV conversion project that impacts BCIT on the Willingdon service. The South Campus electrical infrastructure is not able to support this change in its current state as existing infrastructure is rated for 12.5 KV. The BC Hydro conversion is scheduled to start in Spring 2020, which could lead to additional electrical outages, emergency works projects, expensive temporary fixes to maintain electrical service on campus, and (in the worst case), an inability to continue operations as usual.

The same condition assessment indicated much of the underground civil infrastructure (storm, sanitary, water, and gas) that would be impacted by replacing the electrical systems is also past its expected serviceable life, and it is recommended that it also be replaced at the same time as the electrical upgrades. Three sinkholes have recently developed on campus due to failing stormwater infrastructure, including two along the Guichon Creek culvert system. A possible collapse, or flooding resulting from the culvert's current poor condition, poses a significant risk to students and campus operations (Source: BCIT South Campus Infrastructure Renewal, Business Plan, January 2020, Stantec Consulting Ltd).

SE16 sinkhole (left) and Kyle Street sinkhole (right)

2. PROJECT DESCRIPTION

This project involves the replacement of all electrical equipment at the South Campus, and follows other recent campus electrical renewal projects, including the *Canada Way Electrical Service Replacement Project* and the *Goard Way Electrical Service Replacement Project*. These combined projects will create a more reliable and robust electrical North Campus distribution system, which has been stretched over capacity on several occasions.

The proposed *South Campus Infrastructure Renewal Project* will encompass:

- Replacement of critical aged and failing electrical infrastructure;
- Preparation for the BC Hydro 25 kV upgrade;
- Replacement of aged and failing stormwater infrastructure;
- Replacement of other critical civil infrastructure (sanitary, water, and gas); and
- Support for BCIT's short-term and long-range development, as outlined in the *Burnaby Campus Plan*.

This project will also replace the decaying Guichon Creek culvert with an open drainage channel to mitigate risk to campus operations. The existing culvert provides drainage to a large catchment, including a 218-hectare area of Burnaby, upstream from the Campus. The culvert was assessed in May 2015, and found to be in poor condition. Recent sink hole investigation confirmed the culvert requires immediate replacement. Furthermore, its routing extends beneath two major Trades buildings: SE01 (Electrical Training Centre) and NE08 (Welding), posing significant risk to operations. The proposed daylighting will provide an ecologically restorative solution to the situation, and serve as an important north-south pedestrian connection through the Campus. Modernization of this important infrastructure will ensure continued delivery of education at BCIT, and implement a primary feature of the *Burnaby Campus Plan*.

3. PROJECT OBJECTIVES

- Maintain business continuity for the entire South Campus.
- Upgrade critical deferred maintenance conditions related to electrical equipment reaching end of life.
- Create a more modern electrical distribution system.
- Improve fire protection.
- Replacement of other utilities – stormwater, sewer, gas, and water.
- Create electrical distribution redundancy.
- Align future developments with the *Burnaby Campus Plan*, and above-ground master planning by providing a service corridor, or utility spine, for the South Campus.

4. OPTIONS CONSIDERED

Given the risk that electrical failure poses to the Institute's operations, immediate replacement of the electrical distribution system is required. Furthermore, based on recent culvert failures and sinkholes, the Guichon Creek Culvert also requires immediate renewal.

5. PROJECT OUTCOMES

Infrastructure Improvements

The new infrastructure will provide:

- Modernization of the electrical distribution system to accommodate new BC Hydro 25 KV service;
- Mitigation of the risk of electrical service interruption to buildings within the South Campus;
- Increased load capacity and improved fire protection;
- Additional capacity for future campus expansion;
- Redundancy back-up for North Campus electrical service;
- Reduction in future development costs as new utilities are more accessible and strategically located;
- Restored Guichon Creek drainage infrastructure, which will serve as an important north-south pedestrian spine/green space through the Campus, and mitigate risk to culvert collapse under existing buildings;
- Stormwater infrastructure that is more robust and adaptive to changing climatic conditions; and
- New landscaping and pedestrian improvements consistent with the *Burnaby Campus Plan*.

Strategic Alignments

The project supports the Government of BC's "Focus on sustainable economic growth that strengthens our natural resource sector, continues the development of the emerging economy, supports small business and uses innovation and technology to solve BC problems. A key priority in 2019/20 and beyond will be driving economic growth with cleaner energy and fewer emissions".

- Ministry of Environment and Climate Change Strategy's 2019/20 – 2021/22 Service Plan
  - Goal #1: Effective protection and conservation of the environment.
  - Objective 1.2: Healthy and diverse ecosystems, native species, and habitats.
- CleanBC Plan 2018
  - Initiative: Improve Where We Live, support for infrastructure efficiency upgrades
  - Initiative: Cleaner Industry, clean electricity with new transmission line and interconnectivity to existing lines
- BCIT's Strategic Initiative #4 – Stewardship and resource development to ensure that physical facilities and campus infrastructure needs are met through an integrated plan that accounts for teaching space, research facilities, equipment, and information and education technologies.
- Implementation of the Burnaby Campus Plan.

Quality Education

The new infrastructure will provide for:

- The daylighting of Guichon Creek that will act as a "living laboratory" for BCIT students involved in environmental studies programs, and will serve as a demonstration project for other communities considering urban waterway restorations.
- Upgraded electrical and other utility infrastructure that will ensure seamless education delivery, which is currently at risk of interruption due to equipment failure.

10. PROJECT COST/FUNDING

- $88.8 million is the total estimated project cost, including equipment and taxes.
- It is expected that BCIT will contribute $8.8 million to the capital cost, and the Province will contribute $80 million.
- A preliminary phasing plan divides the project into six spatial areas, with the capital cost expenditure spread over a six-year period.
- The new electrical substations and equipment are expected to marginally increase the operating costs for BCIT, however, it is anticipated these costs will be offset by the decreased occurrence of major emergency shutdowns that interrupt daily campus operations. The replacement of end-of-life electrical services should provide operational efficiencies and reduce the number of unplanned equipment failure repairs.

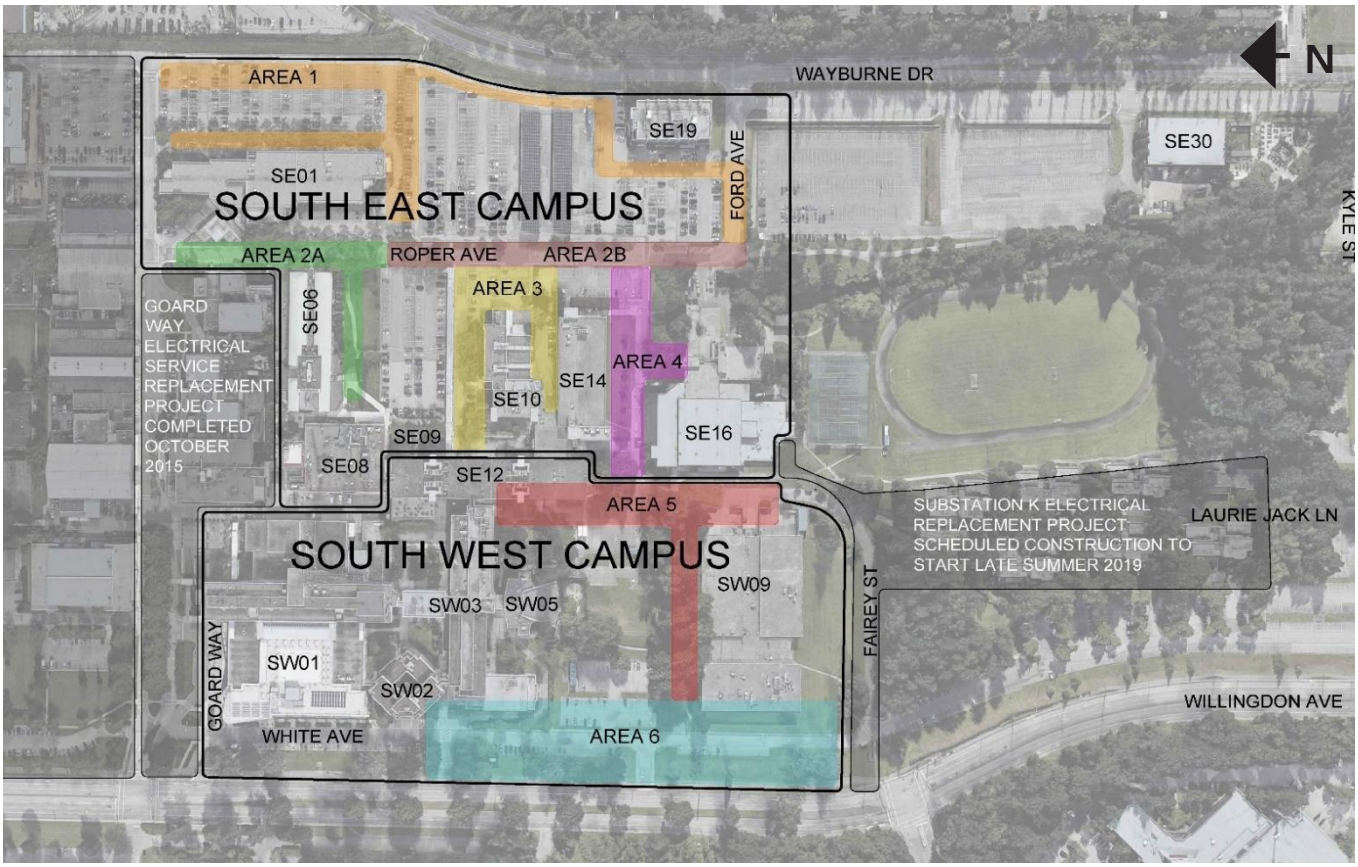
11. KEY RISKS

The key risks if the project does not proceed are:

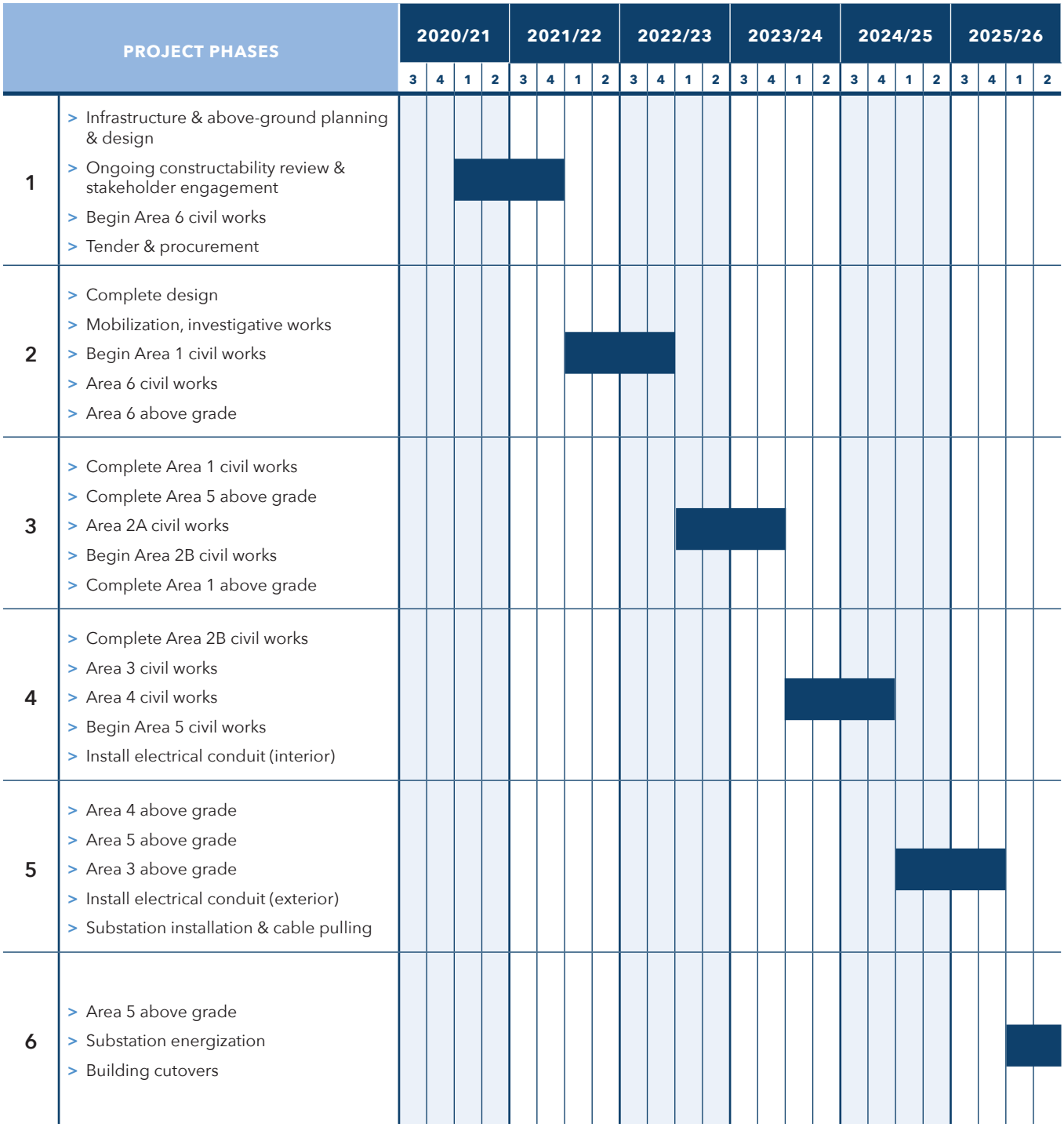
- BC Hydro 25 kV conversion will make the current 12.5 kV electrical distribution system obsolete.
- System failure and costs associated with unplanned disruptions to operations; and
- Continued deterioration of the Guichon Creek culvert, including sink hole collapse under existing buildings.

12. PHASING + PROJECT SCHEDULE

South Campus Infrastructure Renewal Phasing Plan (Stantec)



South Campus Infrastructure Schedule (Stantec)



Project 3: Centre for Ecological Restoration + Climate Adaptation (CERCA)

Category 1: New Priority Projects				
Institution BCIT	**Campus/City** Burnaby	**Project Title** Centre for Ecological Restoration + Climate Adaptation (CERCA)	**Project Category** 1	**Project Priority** 3 of 3

1. CURRENT SITUATION

BCIT is an early leader in Canada for providing post-secondary education in ecological restoration and climate adaptation, which is a new and rapidly developing industry. In 2009, BCIT initiated the first of only two Bachelor of Science (B.Sc.) programs in Canada for Ecological Restoration and, in 2015, developed Canada's only Master of Science (M.Sc.) program in Ecological Restoration as a joint program with Simon Fraser University. BCIT also provides world-class Applied and Natural Sciences programs that include Fish, Wildlife and Recreation; Forestry and Natural Areas Management; Environmental Engineering Technology; Geographic Information Systems; and Geomatics.

Ecological restoration and climate change adaptation have become international priorities as it has become widely recognized that natural areas around the world have been severely impacted by habitat destruction, urban development, invasive species, and directly damaged by the industrial contamination of soils and aquatic environments. There is also a need to prepare for, and address, climate change, developing responses to expected changes in weather patterns, elevated temperatures, increased incidence of extreme climatic events, and higher sea levels. Worldwide, restoration impacts are estimated at over $3 trillion per year.

Across Canada, federal, provincial, and municipal governments; First Nations communities; non-governmental organizations; and private industry in urban and rural settings are engaging in ecological restoration, and climate adaptation. Existing BCIT programs already include collaborative projects, such as those with the independently-financed Rivers Institute.

BCIT has responded to this emerging demand for training and research, but has been challenged to accommodate these programs with existing space constraints. Programs are currently scattered in separate locations, with small and functionally inadequate spaces. The proposed Centre for Ecological Restoration & Climate Adaptation (CERCA) building is part of a larger effort to redevelop the northeast precinct of BCIT's Burnaby Campus, where most of the buildings are more than 50 years old.

2. PROJECT DESCRIPTION

The proposed building will be competed in two phases. Phase 1 will establish CERCA, allow for expansion of the Department's M.Sc. and B.Sc. programs, and provide opportunities to support Indigenous learners in the field of Environmental Stewardship.

Phase 1 comprises a four-storey building arranged around a central atrium. The developed site will include an example of urban ecological restoration through the replacement of an aging culvert, resulting in the "daylighting" of Guichon Creek. The building layout is designed to provide a 21st century teaching and learning environment that incorporates collaborative and informal learning spaces throughout, and flexibility in program space to allow for future change. The structure of the building will include the extensive use of wood, be built to exceed LEED® Gold standards, and incorporate numerous sustainability features. The building's layout will be as follows:

- Level 1. Indigenous Student Liaison, The Rivers Institute/Research, Computer Lab (advanced data visualization), Equipment Storage, and Classrooms | 976 m^2
- Level 2. Classrooms, Computer Labs, Project Rooms, and Learning Commons in central atrium | 1,136 m^2
- Level 3. Offices/Research | 1,159 m^2
- Level 4. Student Laboratories | 962 m^2

Phase 1 will be designed to efficiently add Phase 2 to the eastern elevation, and will include additional labs, classrooms, offices, equipment storage, and a 100-seat lecture theatre.

Centre for Ecological Restoration & Climate Adaptation(Stantec)

Supported Programs

PHASE 1 will accommodate academic and research programs, including:

- Ecological Restoration (ER);
- The Rivers Institute;
- Fish, Wildlife & Recreation (FWR); and
- Forestry & Natural Areas Management (FNAM).

PHASE 2 will accommodate additional academic and research programs, including:

- Environmental Engineering Technology (EET);
- Geographic Information Systems (GIS); and
- Geomatics.

Project Size

- Phase 1 | 1,859 m^2
- Phase 2 | 2,374 m^2
- **Total | 4,233 m^2**

FTEs

- Phase 1 | 180
- Phase 2 | 320

3. PROJECT OBJECTIVES

Overall, CERCA will be a global Centre of Excellence that will advance the quality and quantity of skilled environmental technicians, biologists, and land managers responsible for analyzing, monitoring, and restoring lands waterways and climate. The Centre will:.

- Provide an integrated and innovative learning centre, in partnership with industry and government agencies, that focuses on climate adaptation, and restoration of ecosystems and environmentally sensitive areas, including rivers, lakes, estuaries, wetlands, and terrestrial and wildlife systems.
- Ensure the program mix supports labour market demands for emerging and growing industry professionals.
- Consolidate School Department locations to provide a focal point for Ecological Restoration and related programs, together with industry partners, in order to create a strong sense of place and identity in a facility that encourages inter-professionalism and inter-departmental cooperation.
- Provide a variety of functional spaces, such as wet and dry laboratories, computer labs, digital learning spaces, formal and informal spaces for collaborative learning and research, and project-based learning spaces that ensure flexibility for future change.
- Enhance digital learning capabilities through a technologically advanced building.
- Create more opportunities for public and private partnerships and alignments, including with all three levels of government (e.g., Environment Canada, the Department of Fisheries and Oceans), the Vancouver Aquarium, and the Hakai Institute.

- Create modern building services and technologies in a sustainable facility that reduces energy use and operating costs (Net Zero ready), and that is functionally and financially viable.
- Implement components of the *Burnaby Campus Plan*.

4. OPTIONS CONSIDERED

- **Status Quo.** This option does not address program expansion opportunities, or the consolidation of existing functionally inadequate, seismically at-risk buildings.
- **Non-Capital Site Option.** The off-site lease option is also deemed not viable. Students and faculty need to be in proximity to other classrooms and resources within the BCIT Campus.
- **New Centre.** Preferred.

Rendering of daylighted Guichon Creek (HCMA)

5. PROJECT OUTCOMES

Infrastructure Improvements

The proposed project is aligned with the provincial government's priorities and strategies, and will:

- Provide flexible 21st century teaching spaces that are built to modern design and materials standards.
- Enable program integration and collaboration among BCIT's Applied and Natural Sciences programs.
- Allow for the phased implementation of BCIT's stormwater management plan, which includes the daylighting of Guichon Creek.

Cost Effectiveness

The new Centre will provide:

- Flexible learning spaces that can adapt to changes in labour market demand, and subsequent program delivery options; and
- More cost-efficient building and teaching technologies.

Innovation

The new Centre will showcase:

- Research in the Applied and Natural Sciences programs;
- Modern laboratories and computer labs, as well as classroom spaces that will allow flexible space programming;
- The building will be designed with energy efficient HVAC, lighting, and other systems that will increase energy efficiency and demonstrate "Net Zero" ready building design
- The daylighting of Guichon Creek as a living laboratory for students to perform field experiments and testing, while also serving as a demonstration project for restoring waterways in urban areas; and
- BCIT's leadership position in ecological restoration by providing new modern research labs.

Strategic Alignments

The new Centre supports:

- Environment & Climate Change Canada's objectives for investing in green infrastructure, protecting communities from challenges of climate change, ensuring watershed protection, and protecting endangered species; and
- Fisheries & Oceans Canada's objectives to protect the health of fish stocks, monitor contaminants/pollution in oceans, and support responsible and sustainable aquaculture industries.

The project also supports the Government of BC's "Focus on sustainable economic growth that strengthens our natural resource sector, continues the development of the emerging economy, supports small business and uses innovation and technology to solve BC problems. A key priority in 2019/20 and beyond will be driving economic growth with cleaner energy and fewer emissions".

- Ministry of Advanced Education, Skills & Training 2019/20 – 2021/22 Service Plan
  - Objective 1.1: "Implement the *Truth and Reconciliation Commission's Calls to Action* and the *United Nations Declaration on the Rights of Indigenous Peoples* in the post-secondary education and skills and trades training system.
  - Objective 2.1: "To ensure affordable and equitable access to quality post-secondary education and skills training".
  - Objective 2.2: "Respond and adapt to the needs of under-represented and vulnerable populations to improve educational access and inclusivity in post-secondary education and training, and increase their participation in the skilled workforce".
  - Objective 3.1: "Post-secondary education, skills and trades training prepares British Columbians for current and emerging opportunities in the BC economy".
- Ministry of Jobs, Trade & Technology 2019/20 – 2021/22 Service Plan
  - Objective 3.1: "Support BC communities and Indigenous peoples to increase participation in established and emerging economic sectors".
- Ministry of the Environment & Climate Change Strategy 2019/20 – 2021/22 Service Plan
  - Goal 1: Effective protection and conservation of the environment.
    - Objective 1.1: Clean and safe water, land and air.
    - Objective 1.2: Healthy and diverse ecosystems, native species and habitats.
  - Goal 2: A sustainable, resilient low-carbon economy.
    - Objective 2.1 Implement a climate action strategy that provides a pathway for BC to prosper economically while significantly reducing our carbon pollution.
    - Objective 2.2: Effective management of the risks and consequences associated with a changing climate.
- Ministry of Forests, Lands & Natural Resource Operations 2019/20 – 2021/22 Service Plan
  - Objective 1.1: Revitalize BC forests and the forest sector.
  - Objective 1.2: Improve community resilience through proactive and collaborative natural hazard management.
  - Objective 2.1: Strengthen partnerships and increase engagement with Indigenous peoples in the management of BC's natural resources.
  - Objective 3.1: Improve wildlife management and support the recovery of species at risk.
  - Objective 3.2: Expand and strengthen climate change mitigation and adaptation activities.
- CleanBC Plan 2018
  - Initiative: Improve Where We Live and Work
    - Better buildings
    - Support for better buildings

- Initiative: Helping People Get the Skills They Need
- Initiative: Measuring Our Progress
- Make sure British Columbians can lead the clean transition

Quality Education

The new Centre will:

- Serve as a collaborative hub and research centre in the emerging ecological restoration industry;
- Link associated BCIT programs, and provide the opportunity for Faculty and students to collaborate on research initiatives related to marine, mining, forestry and fish, and wildlife and recreation; and
- Create training for in demand jobs with the ability to respond to expanding needs.

6. PROJECT COST/FUNDING

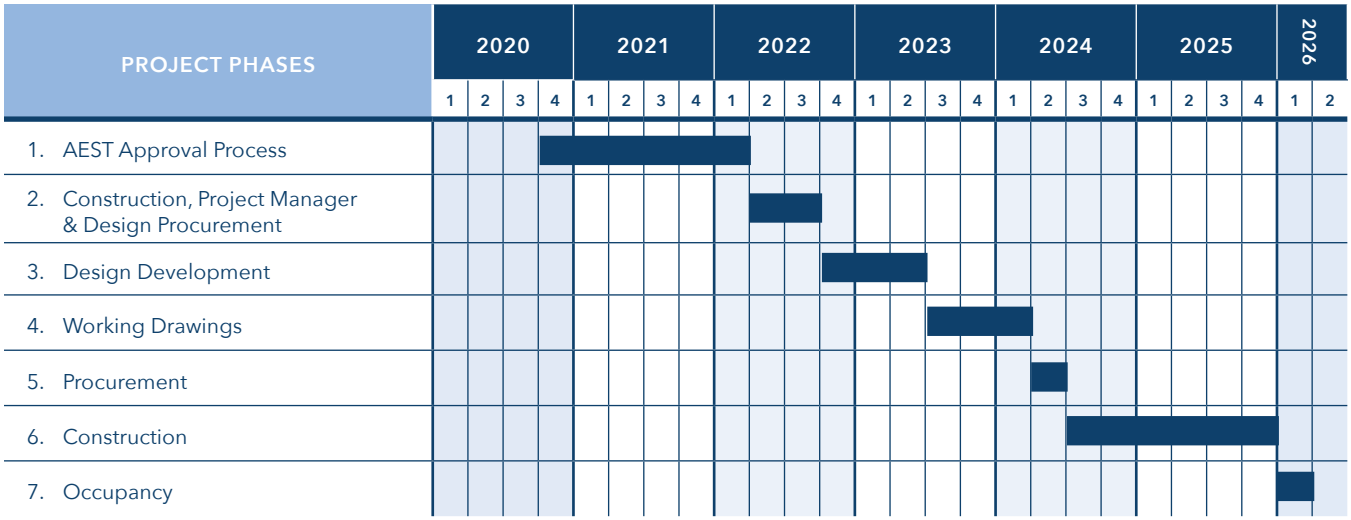
- The total estimated project cost for Phase 1 is $39.3 million, including equipment, taxes, and escalation based on tendering in the fourth quarter 2020.
- It is expected that BCIT will contribute $15 million to the capital cost, and the Province will contribute $24.3 million.
- The new CERCA building will be in addition to baseline facilities operations, and so it will likely cost an additional $85/$m^2$ per annum, for a net increase of approximately $160,000 for basic building operation services.
- The CERCA will accommodate existing programs, so there will be no specific increase in program operating costs beyond the ongoing organic growth of the identified programs. The building will also allow for expanded research facilities that are anticipated to be funded through external grants, and not result in additional operating costs.

7. KEY RISKS

If the project does not proceed:

- There will be an impact on the recruitment of students, faculty, and staff – a loss of market share to other ecological restoration and climate adaptation research institutions.
- The Province's ability to successfully implement its priorities and initiatives identified in the "Strategic Alignments" section will be limited.
- The Province will lose its lead role in training and research, depend on out-of-province training, and/or lose students to other jurisdictions
- There will be continued deterioration of the Guichon Creek culvert.

8. PROJECT SCHEDULE

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