BCIT Capital Plan 2023-2027 Overview

With nearly 50,000 students enrolled annually (16,600 full-time and 31,600 part-time) in five Schools of study, BCIT plays a central role in province's economy by offering practical career credentials for key employment sectors. BCIT's *2023/2027 Capital Plan* will support our leadership role in demonstrating best practices in sustainable building design and infrastructure.

The *2023-2027 Capital Plan* contains five projects that closely align with Provincial development goals, including the pathways identified in the CleanBC, and the *Climate Preparedness and Adaptions Strategy* for 2022-2025.

Provincial Goals

- A strong sustainable economy
- A better future through climate preparedness and adaption
- A resilient public education system
- Lasting and meaningful reconciliation

The five projects are presented here in BCIT's *2023-2027 Capital Plan* as priorities for financial support:

1. TRADES & TECHNOLOGY COMPLEX – PHASE 2 ($62 MILLION)

This phase will complete the overall renewal and expansion of trades education facilities that form the northern precinct of the Burnaby Campus. The already approved Phase 1 of the project ($162.6 million) will begin design development work in September 2022.

Phase 2 project components have a combined value of $62 million, and include a blend of renovation and new construction of the following trades education facilities instrumental to building a strong provincial economy:

- Provision of a new Piping Structure (NE06);
- Renewal of the Steel Trades building (NE12) and provision of a new Steel Trades tower (NE12);
- Renewal and addition of the Carpentry Building (NE04); and
- Renewal of the Electrical Trades building (SE01).

As Phase 1 is underway and the BCIT fundraising target for Phase 2 has already been reached, there is an opportunity to gain significant design efficiencies by ensuring the Phase 2 scope of work follows closely after Phase 1 moves from the design phase to construction.

2. SOUTH CAMPUS INFRASTRUCTURE RENEWAL - PHASE 2 ($41.2 MILLION)

Phase 1 of this infrastructure work has already been approved by the Province and construction is now in progress.

The Phase 2 scope of work includes replacement of a variety of underground utilities (electrical, water, storm, sanitary, and gas) between the Library (SE14) and the Recreation Centre (SE16), as well as major pedestrian accessibility improvements to replace the stairs adjacent to the Recreation Centre (SE16) with a ramped walkway. This project also involves installing replacement service lines along Carey Avenue near the Electrical Trades building (SE01) and Discovery Park (SE19).

Phase 2 has a project value of $41.2 million, and needs to be completed prior to Phase 3 in order to reposition utilities in the planned alignment for the Guichon Creek daylighting component.

3. CENTRE FOR INDIGENOUS LEARNING, ECOLOGICAL RESTORATION & CLIMATE ADAPTATION – CILERCA ($88.2 MILLION)

Through its design and location adjacent to the proposed daylighted Guichon Creek, the new building will serve as an innovative teaching and research centre. CILERCA's design will exemplify its educational purpose, and bring existing courses and teaching spaces into one building to serve as a living lab for sustainable design. CILERCA will provide a modern facility for key education programs related to Indigenous learning, ecological restoration, and climate change adaptation to be based on a solid foundation of First Nations knowledge and practices in managing natural resources and land.

The Centre will allow for expansion of the Ecological Restoration Department's MSc and BSc programs, and support associated programs, such as Fish, Wildlife & Recreation, and Forest and Natural Areas Management.

To support learners attending programs in the Smith Street precinct area, this project also includes an Indigenous gathering and learning space in a prominent ground level location near the main entry of the building.

Programs to be accommodated in this building will have unique access to the co-located Rivers Institute, with its focus on the protection and restoration of rivers, streams, estuaries, lakes, and wetlands in BC.

Planning for this project is advanced, with a draft *Business Plan* in place. Where feasible, the project design will include engineered wood products.

This project has an opportunity to consider Indigenous focused Student Housing being collocated at the same or adjacent lot, should Indigenous focused Federal and Provincial Housing programs be available.

4. DISTRICT ENERGY DECARBONIZATION - PHASE 1 CENTRAL PLANT ELECTRIFICATION ($9.0 MILLION)

The SE08 Central District Energy System (DES) provides 40% of the BCIT Burnaby Campus with heating and cooling energy. This decarbonization project will significantly reduce carbon emissions by: 1) replacing three low-efficiency (1960s era) gas fired boilers with renewable energy primary electric boilers, 2) adding heat recovery from the adjacent educational steam boiler, and 3) converting the distribution system to variable volume with a fully demand-based control system.

With a projected 25% reduction (-1,800 tCO2e) in GHG emissions from 2007 levels, this project is the most effective way for BCIT to reduce carbon emissions, and would significantly advance BCIT towards the overall target of a 33% reduction in emissions by 2023.

BC Hydro has confirmed a $200,000 grant for the project, and an application has also been made to the federal *Low Carbon Economy Fund* and has already passed the first stage of review.

An important design element of this upgrade is the incorporation of a living lab demonstration component with learning opportunities for BCIT power engineering students. Project design includes viewing windows and interpretive signage to permit the broader community (students, staff, public) to visually engage and learn about low-carbon district heating technology.

5. SOUTH CAMPUS INFRASTRUCTURE RENEWAL - PHASE 3 ($49.6 MILLION)

Phase 1 of this infrastructure renewal project has already been approved by the Province and construction is underway. Phase 2 is listed in this Capital Plan as Priority Project #2 (see above).

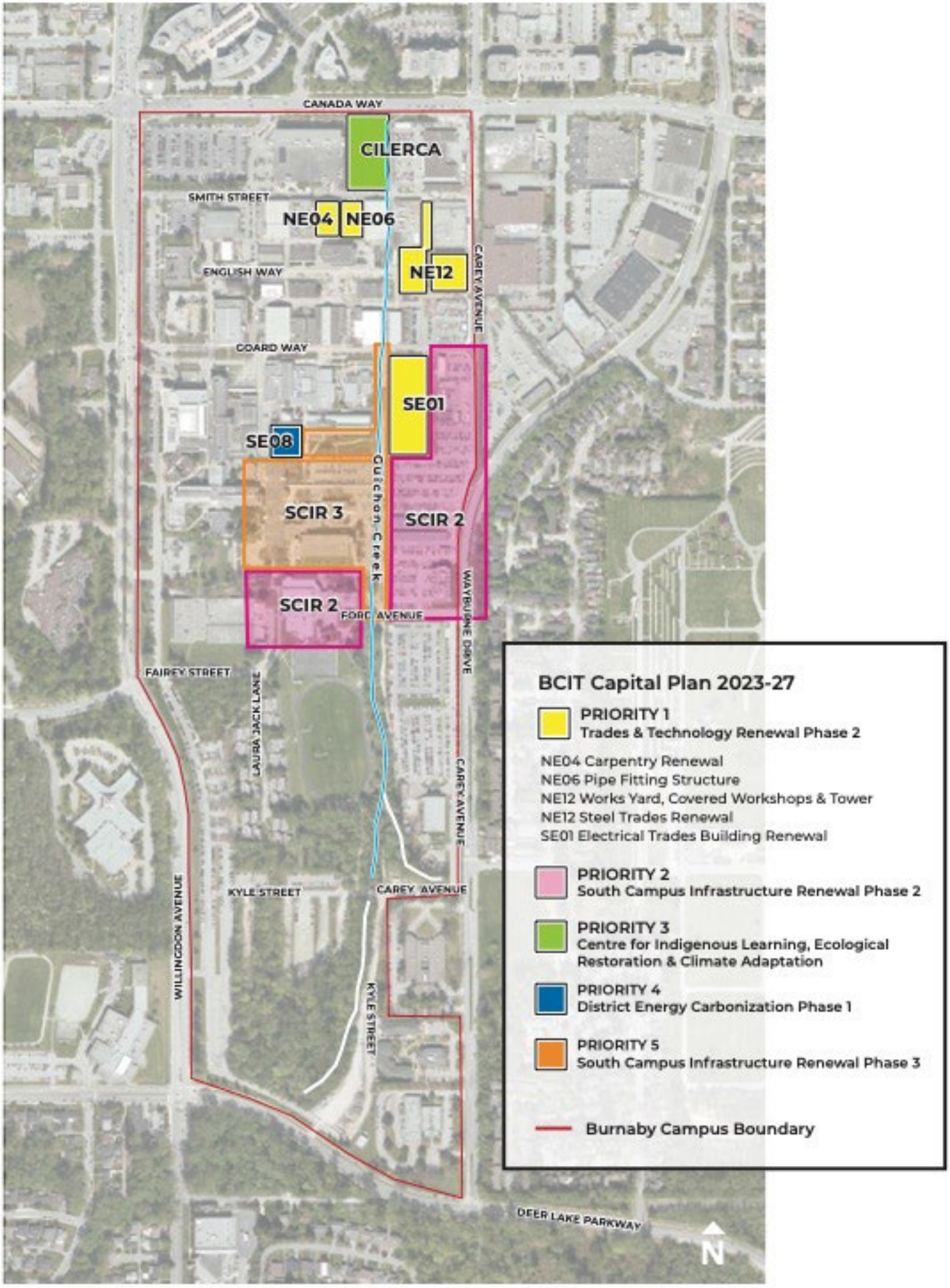
Phase 3's scope of work includes replacement of underground utilities along Roper Avenue and services to the following buildings: Renewable Resources (SE04), Business (SE06), Broadcast Centre (SE10), Computing & Academic Studies and Health Sciences (SE12), and Library (SE14). This phase also includes implementation of Guichon Creek channel, as well as greatly enhancing the pedestrian public realm on both sides of the soon-to-be daylighted channel. Phase 3 has a project value of $49.6 million.

This project will replace a section of the decaying Guichon Creek storm culvert with an ecologically restorative stream channel as outlined in the *Campus Plan*. Modernization of this infrastructure also supports core educational building service resilience, and will provide the modern infrastructure required for future development on Campus.

PRIORITIZED LIST OF BCIT PROPOSED PROJECTS

						TOTAL CASH FLOW FORECAST (FISCAL YEARS IN MILLIONS)					
#	PROJECT DESCRIPTION	PROJECT CATEGORY	ANTICIPATED CONSTRUCTION START DATE	ANTICIPATED OCCUPANCY DATE*	TOTAL PROJECT BUDGET	2023/24	2024/25	2025/26	2026/27	2027/28	Total Forecast Ongoing Years
1	Phase 2: T&T Complex **NE04 & NE06**	2	June 2025	February 2026	$13.0 M	$0.6 M	$1.4 M	$11.0 M	--	--	--
1	Phase 2: T&T Complex **NE12 Steel Trades Building Renewal & Tower**	2	October 2025	January 2027	$22.0 M	$0.5 M	$2.0 M	$7.9 M	$11.6 M	--	--
1	Phase 2: T&T Complex **SE01 Building Renewal**	2	October 2025	April 2027	$27.0 M	$1.0 M	$3.0 M	$6.4 M	$16.6 M	--	--
PROJECT 1 TOTAL					**$62.0 M**	**$2.1 M**	**$6.4 M**	**$25.3 M**	**$28.2 M**	--	--
2	South Campus **Infrastructure Renewal Project Phase 2**	6	June 2024	December 2025	$41.2 M	$5.0 M	$18.1 M	$18.1 M	--	--	--
3	**Centre for Indigenouse Learning, Ecological Restoration & Climate Adaptation**	1	February 2026	July 2027	$88.2 M	--	$7.2 M	$11.0 M	$49.0 M	$21.0 M	--
4	Phase 1: **Burnaby Capus District Energy Decarbonization**	5	May 2023	November 2023	$9.0 M	$9.0 M	--	--	--	--	--
5	South Campus **Infrastructure Renewal Project Phase 3**	6	June 2026	August 2028	$49.6 M	--	--	$5.6 M	$17.9 M	$18.0 M	$8.1 M
TOTAL ALL PROJECTS					**$250 M**	**$16.1 M**	**$31.7 M**	**$60.0 M**	**$95.1 M**	**$39.0 M**	**$8.1 M**

NOTE: ALL COSTS INCLUDE TAXES & FIGURES ARE ROUNDED.


CANADA WAY
CILERCA
SMITH STREET
NE04
NE06
NE12
ENGLISH WAY
CAREY AVENUE
COARD WAY
SE01
SE08
Cuichon Creek
SCIR 3
SCIR 2
SCIR 2
FORD AVENUE
WAYBURNE DRIVE
FAIREY STREET
LAURA JACK LANE
CAREY AVENUE
KYLE STREET
CAREY AVENUE
WILLINGDON AVENUE
KYLE STREET
DEER LAKE PARKWAY
N
BCIT Capital Plan 2023-27
PRIORITY 1
Trades & Technology Renewal Phase 2
NE04 Carpentry Renewal
NE06 Pipe Fitting Structure
NE12 Works Yard, Covered Workshops & Tower
NE12 Steel Trades Renewal
SE01 Electrical Trades Building Renewal
PRIORITY 2
South Campus Infrastructure Renewal Phase 2
PRIORITY 3
Centre for Indigenous Learning, Ecological Restoration & Climate Adaptation
PRIORITY 4
District Energy Carbonization Phase 1
PRIORITY 5
South Campus Infrastructure Renewal Phase 3
Burnaby Campus Boundary

Attachment 2: Project Overview

Five-Year Capital Plan (2023/24 – 2027/28)

Project Detail		
Institution	**Campus/City**	**Project Priority**
BCIT	Burnaby	1 of 5
Project Title		
Trades and Technology Complex - Phase 2		
Project Category		**Program Type**
New Priority		Trades

Project Budget ($ millions)		
Total Project Cost	**Provincial Funding**	**PSI / Donor Funding**
$62 million	$52.7 million	$9.3 million

- This project involves improving the quality and life safety of existing trades education facilities, and will primarily involve the reallocation of existing educational resources.
- The renewal of existing facilities will enhance facility scheduling and permit modest intake increases to existing programs.
- The forecasted project cashflow is detailed on Attachment 3: Prioritized Projects

Strategic Alignment	
CleanBC Targets	**DRIPA Response**
• This project contributes to a strong sustainable economy that works for everyone, and directly supports the Clean BC Strategy. • Renewal of NE06, NE12, NE04, and SE01 will make use of existing structures, but significantly improve their energy efficiency. The buildings, particularly SE01, will operate with clean electricity, which specifically addresses the Province's high efficiency standards set for new spaces by 2030. • These renovations will assist in the expansion of the workforce for low carbon industries, contributing to GHG reduction objectives.	• BCIT's Indigenous Initiatives Office participates in the design process for all major capital projects. • During the design phase, Indigenous Initiatives will focus on design issues, such as culturally appropriate interior and exterior design, sustainability, and safe spaces for Indigenous students. • When facilities are nearing occupancy, Indigenous Initiatives will focus on partnership opportunities; cultural awareness and cultural safety workshops for staff, faculty, and students; indigenizing curriculum; and Indigenous student support services.

Mass Timber Eligibility	Community Benefits
• Mass timber technology may be used to construct the Piping Shop addition (NE06) and, together with Carpentry Shop (NE04), will contribute to education in mass timber construction. • The Carpentry Shop (NE04) renewal will help fill the training gap for carpenters in the mass timber sector. Education programming at BCIT includes the *Associate Certificate in Construction of Mass Timber Structures*.	• The Trades and Technology Phase 2 is part of the transformation of the Burnaby Campus, as BCIT becomes a leader and model for sustainability development with the graduates it produces and the facilities it builds. • Renovations for energy efficiency and new clean energy systems will contribute to a strong sustainable economy.

- This project aligns with Stronger BC, and assists in the implementation of its economic plan, particularly with BCIT's training for the jobs of tomorrow. This project is the second phase of the Trades and Technology Complex cited in the *Stronger BC Plan*, and will provide educational opportunities for a wide range of construction trades.
- This project aligns with BCIT's Vision and Mission. Phase 2 is critical to renewing the Trades buildings and expanding opportunities for growth in training programs.

Project Schedule		
Target Bus. Plan Approval Date	**Target Construction Start Date**	**Target Occupancy Date**
December 2023	• <u>JUNE 2025</u> Piping Shop NE06 Carpentry Shop NE04 • <u>OCTOBER 2025</u> Steel Trades NE12 Electrical Trades SE01	• <u>FEBRUARY 2026</u> Piping Shop NE06 Carpentry Shop NE04 • <u>JANUARY 2027</u> Steel Trades NE12 • <u>APRIL 2027</u> Electrical Trades SE01

The overall project schedule assumes Ministry notional approval in January 2023, *Business Plan* submission in June 2023, and Ministry *Business Plan* approval in December 2023.

Project Scope & Objectives

Project Scope

A Strong Sustainable Economy That Works For Everyone

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.

The Phase 2 submission for the proposed renewal of the northern part of the Burnaby Campus was originally part of a larger capital project that has now been split into two phases: Phase 1 involves construction of the new Trades & Technology Centre through relocation of the Campus Services Building, and construction of the NE21 Carpentry Pavilion and NE12 Steel & Mass Timber Assembly Structure. Phase 2 includes the NE06 Piping Structre, the NE12 Steel Trades building renewal, the NE12 Steel Trades tower, NE04 Renovation & Addition, and SE01 Renewal & Addition.

CURRENT OR PROPOSED BUILDING	USE	EXISTING SIZE	ADDITIONAL NEW SPACE	YEAR BUILT	FACILITY CONDITION INDEX	DEFERRED MAINTENANCE	BUILDING OUTCOME
NE04 Carpentry Shop	Classroom /Shop	2.057 m^2	157 m^2	1959	0.26	$3,733,000	Renovated + Addition
NE06 Piping Structure	Classroom /Shop	2,570 m^2	1,570 m2	1961	0.39	$4,458,000	New Build
NE12 Steel Trades Shop	Classroom /Shop	2,935 m^2	1,874 m^2	1972	0.34	$3,050,000	Renovated + Addition
SE01 Electrical Trades Centre	Classroom /Labs	7,213 m^2	271 m^2	1980	0.27	$7,732,000	Renovated + Addition

Current FTEs accommodated:

- Electrical Trades 240 FTE, predominately SE01
- Steel Trades 48 FTE, predominately NE12
- Piping Trades 112 FTE, predominately NE06
- Carpentry Trades 64 FTE, predominately NE04

Project Objectives

- Provide modern trades learning spaces and facilities.
- 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, 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.
- 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.
- Provide safer workshops and outdoor work areas that are more functional and use space more efficiently.
- Demonstrate "Living Lab" principles by employing leading edge building science principles in design and construction.

Key Risks

If the project does not proceed, the key risks are:

- Retention of existing building that do not meet seismic standards, are functionally inadequate, and have high FCIs;
- A progressively widening gap between existing and modern 21st century learning environments;
- That 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.

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 at 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.

Current Situation

As outlined previously, modernization and renewal of these 40 to 60-year old facilities will mitigate seismic risk, deferred maintenance, and replace end-of-life building systems with modern and sustainable building services. This renewal plan will:

- Transform dated trades education spaces into safe and modern, 21st century learning spaces; and
- Optimize space utilization of existing facilities and permit strategic expansion of key trades facilities to increase student intakes in piping, carpentry, steel, and electrical trades programs.

Attachment 2: Project Overview

Five-Year Capital Plan (2023/24 – 2027/28)

Project Detail		
Institution	**Campus/City**	**Project Priority**
BCIT	Burnaby	2 of 5
Project Title		
South Campus Infrastructure Renewal - Phase 2		
Project Category		**Program Type**
Linear Infrastructure		Other

Project Budget ($ millions)		
Total Project Cost	**Provincial Funding**	**PSI / Donor Funding**
$41.2 million	$37.1 million	$4.1 million

- This linear infrastructure project continues work currently underway in Phase 1 ($14.6 million, Area 6 and Substation K).
- There is no increase to operational costs associated with this linear infrastructure renewal project.
- There would be a reduction in unplanned “emergency” repair work that currently occurs with end-of-life infrastructure, such as recent stormwater pipe sinkhole repairs.
- Please note the forecasted project cashflow is detailed on Attachment 3: Prioritized Projects

Strategic Alignment	
CleanBC Targets	**DRIPA Response**
Goal: A better future through fighting climate change, and a resilient public education system. This infrastructure project will contribute to CleanBC and its road map, and is directly consistent with the first pathway. This project will contribute to a reliable, efficient, and resilient campus.	As linear infrastructure renewal project will replace existing services, this section is not applicable.
Mass Timber Eligibility	**Community Benefits**
This project is not eligible for mass timber construction, but will provide modern services that support the educational build-out of the BCIT Burnaby Campus, which will utilize mass timber construction (where permitted).	This initiative will contribute to a strong and resilient campus within the municipality of Burnaby by removing and replacing failing infrastructure. This project includes major accessibility improvements, such replacing an exterior stair with an accessible ramp, and will also improve the walking route for students living on campus.

- BC Hydro is transitioning electrical services in the Willingdon corridor to 25kV services (from the current 12.5kV). The planned changes add to the urgency for upgrading electrical distribution to match the system recently installed in the North Campus.
- This project aligns with Stronger BC, and assists in the implementation of its economic plan, particularly with BCIT's training for the jobs of tomorrow.
- This initiative underpins and supports BCIT's *Strategic Plan* for renewal and the creation of resiliency for its Burnaby Campus.

Project Schedule

Target Bus. Plan Approval Date	Target Construction Start Date	Target Occupancy Date
June 2023	June 2024	December 2025

- The Ministry has already reviewed the overall *Business Case* for the South Campus Infrastructure Project, and has funded the Phase 1 works, which are valued at $14.6 million.
- The project schedule for Phase 2 assumes Ministry notional approval in December 2022 and the *Business Plan* update in March 2023

Project Scope & Objectives

Project Scope

Phase 2 scope of work includes replacement of underground utilities between the Library (SE14) and the Recreation Centre (SE16), including major accessibility improvements to replace the stairs adjacent to SE16. This phase also involves installing key service lines along Carey Avenue near the Electrical Trades building (SE01) and Discovery Park (SE19). With a project value of $41.2 million, this phase needs to be completed before Phase 3 to reposition utilities in the planned alignment of the future Guichon Creek daylighting.

Project Objectives

- Maintain business continuity for the entire South Campus.
- Upgrade critical deferred maintenance conditions related to electrical equipment reaching end of life.
- Provide a modern 25kV electrical distribution system.
- 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.
- Significant improvement to pedestrian accessibility by remove existing barriers to mobility.

Key Risks

If the project does not proceed, the key risks are:

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

Options Considered
Given the risk 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.
Current Situation
A condition assessment shows the majority of electrical, water, gas, storm, and sewer services to the southern part of campus are past serviceable life, and pose a high risk of failure and to business continuity. This project is aligned with Provincial resilience and sustainability objectives. BC Hydro is transitioning electrical services in the Willingdon corridor to 25kV service (from the current 12.5kV). The planned service change adds to the urgency for upgrading electrical distribution infrastructure to match the system recently installed in the North Campus. In addition, this project will replace a section of the decaying Guichon Creek storm culvert with an ecologically restorative stream channel, as outlined in the *Campus Plan*. Modernization of this infrastructure also supports core educational building service reliability, and will provide modern infrastructure required for future development on campus. An overall project business case was submitted to the Ministry in July 2020. The Ministry subsequently provided capital grants for Phase 1 underground utility replacement on White Avenue and Fairy Street near the Energy building (SW09), and will pre-service the future Tall Timber Student Housing project. Phase 1 work is valued at $14.6 million, and is currently in progress.

Attachment 2: Project Overview

Five-Year Capital Plan (2023/24 – 2027/28)

Project Detail		
Institution	**Campus/City**	**Project Priority**
BCIT	Burnaby	3 of 5
Project Title		
Centre for Indigenous Learning, Ecological Restoration & Climate Adaptation (CILERCA)		
Project Category		**Program Type**
New Priority		Sciences & Technology

Project Budget ($ millions)		
Total Project Cost	**Provincial Funding**	**PSI / Donor Funding**
$88.2	$75 million	$13.2 million

- This new facility will provide modern facilities to support and expand existing education programs in Environmental Engineering Technology; Fish, Wildlife & Recreation; Forestry & Natural Areas Management; and Ecological Restoration, supported with Indigenous Learning Centre and opportunity for co-management of natural resources based on the First Nations culture and knowledge.
- The new facility will have an estimated operating cost of $625,000 per annum.
- The forecasted project cashflow is detailed on Attachment 3: Prioritized Projects and Summary Table.

Strategic Alignment	
CleanBC Targets	**DRIPA Response**
This project directly contributes to the Climate and Preparedness and Adaptation Strategy, and CleanBC and supports four of its pathways to build resilience: <u>Pathway 1: Foundations for Our Success</u> • Enhancing partnerships with Indigenous peoples • Improving data collection and monitoring networks • Integrating climate adaptation into decision-making • Expanding climate education <u>Pathway 2: Safe & Healthy Communities</u> • Reducing risks from heatwaves, flooding, and wildfires • Expanding cultural and prescribed burning • Enhancing floodplain mapping and extreme heat preparedness • Building food security and ensuring our health system is resilient	Courses and spaces within the building will contribute to BCIT's response to DRIPA, and include: • Culturally appropriate Indigenous services and gathering space, and a Student Liaison Office to provide province-wide ecological restoration outreach training programs for First Nations. • Programs to directly support, train, and increase participation of Indigenous learners, and collaborative support for First Nations in Ecological Restoration initiatives. • Indigenous Liaison Office will serve to support students in their educational pursuits. • Working with First Nations in-community to provide direction, training, and agency with respect to ecological restoration.

Pathway 3: Resilient Species & Ecosystems • Establishing an Ecosystem Forecast Centre • Protecting and maintaining healthy watersheds • Revitalizing wild salmon populations • Addressing threats posed by ocean acidification and sea level rise Pathway 4: Climate-Ready Economy & Infrastructure • Supporting key industries to prepare for a changing climate • Making our roads and highways resilient • Ensuring hospitals, schools and other buildings are climate ready	
Mass Timber Eligibility	**Community Benefits**
Where permitted by building code, the building will utilize engineered wood products, and serve as an important demonstration "living lab" opportunity for students and researchers, promoting sustainable building design.	This building will: • Provide educational opportunities for a range of industry partners in both current and anticipated restoration and adaptation technologies. • Located adjacent to the restored and daylighted Guichon Creek, highlighting the potential for daylighting creeks in urban areas as part of ecological restoration. • A community destination for Indigenous teaching initiatives and their integration with reconciliation processes. • Provide co-management opportunities for the natural resources management within BC based on integrated and collaborative approach with First Nations. • Impact of this building and education program has an opportunity to significantly shift systemic approach to natural resources management, and centres it within the First Nations principles and culture. This will accelerate decolonisation in BC.

This project will meet a number of key government priorities:

- Demonstrating and embracing First Nations knowledge and experience in management of natural resources, and propelling opportunities for co-management and decolonization
- Restoration of damaged environments is a significant activity around the world, and CILERCA will contribute toward recognition of BC as a leader in ensuring a clean and sustainable economy.
- Use of engineered wood products and energy efficient techniques for heating and cooling.
- Unique spaces, courses, and programs will support reconciliation and provide education opportunities for Indigenous learners in areas such as ecological restoration, including forest and watercourse environments and the bio economy.
- An opportunity to bring together a range of sectors in a unique setting reflecting and contributing to the concept of environmental restoration.
- This project also aligns with *Stronger BC*, and assists in the implementation of its economic plan, particularly with BCIT's training for the jobs of tomorrow.

Project Schedule

Target Bus. Plan Approval Date	Target Construction Start Date	Target Occupancy Date
March 2024	February 2026	July 2027

The project timeline assumes Ministry notional approval in March 2023 and *Business Plan* submission in September 2023.

Project Scope & Objectives

Project Scope

- Construction of the new 4-storey learning and applied research facility situated on Canada Way, adjacent to the approved Trades & Technology Centre.
- Total estimated area = 6,655 m^2 (71,600 sf)
- The proposed facility will include a dedicated Indigenous Initiatives gathering space and learning centre, a 144-seat lecture theatre, several student collaboration meeting rooms, two computer labs, 8 classrooms, 5 wet research laboratories, graduate student and faculty workspace, and BCIT's Rivers Institute.
- This facility will accommodate 242 student FTE in the following programs: Environmental Engineering Technology (64 FTE); Fish, Wildlife & Recreation (64 FTE); Forestry & Natural Areas Management (64 FTE); and Ecological Restoration (50 FTE).

Project Objectives

- The proposed new centre will provide a modern facility for key education and applied research programs related to Indigenous learning, ecological restoration, and climate change adaptation, based on a strong foundation of First Nations knowledge and practices in managing natural resources and land.
- With the planned daylighting of Guichon Creek, the building will serve as a living lab for sustainable design.
- This project is aligned with Provincial skilled labour economic recovery, Indigenous reconciliation, and sustainability objectives.
- The centre will allow for expansion of the Ecological Restoration department's MSc and BSc programs, and support associated programs, such as Fish, Wildlife and Recreation; and Forest & Natural Areas Management.
- As these programs are founded in First Nations learnings and practices of managing natural resources and land, this project also includes an Indigenous gathering and learning space to support learners attending programs by providing a prominent ground level space near the main entry of the building.
- The project will create modern teaching and research spaces to replace BCIT's current scattered facilities. This building will solidify BCIT's as a leader in ecological restoration and climate adaptation by integrating several complementary programs into a single centre.

Key Risks

If the project does not proceed, the key risks are:

- There will be an impact on recruitment of students, faculty, and staff – a loss of market share to other ecological restoration and climate adaptation research institutions, and dependence on out-of-province training;
- Loss of leadership role in training and research, and failure to capitalize on BCIT's existing experience, and investment in teaching ecological restoration, including integration of the work undertaken by the Rivers Institute;
- Loss of opportunity to contribute toward DRIPA commitments, and CleanBC Pathways, especially BioForestry;
- The Province's ability to successfully implement its priorities and initiatives, identified in the "Strategic Alignments" section, will be limited.

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.
- Renovation. BCIT has concluded it is impractical to renovate and enlarge the SE04 building, as this poor quality, single-storey building does not have sufficient site area to accommodate the CILERCA building programs
- New Centre. Preferred

Current Situation

Ecological Restoration is a new and rapidly developing industry intimately integrated with climate change adaptation. BCIT is an educational pioneer in this field since establishing its first courses in 2009, and has become a leading educational institution in Canada for these programs, which are housed within the School of Construction & the Environment.

BCIT offers students phased opportunities to incrementally obtain credentials. For example, students can complete a Fish, Wildlife & Recreation Diploma, move into BCIT's B.Sc. in Ecological Restoration (one of Canada's first degrees in Ecological Restoration), and subsequently undertake a M.Sc. degree in Ecological Restoration. BCIT offers Canada's first professional graduate degree specializing in restoring degraded ecosystems; this is a joint program offered by BCIT and Simon Fraser University.

The Institute provides world-class applied restoration training for aquatic and terrestrial ecosystems across the province, the country, and around the world. Ecological Restoration is an emerging and growing scientific discipline because of the increasing need to restore damaged ecosystems. This combined with Indigenous Learning focus and opportunity for co-management and decolonisation makes this opportunity very unique.

Attachment 2: Project Overview

Five-Year Capital Plan (2023/24 – 2027/28)

Project Detail		
Institution	**Campus/City**	**Project Priority**
BCIT	Burnaby	4 of 5
Project Title		
Burnaby Campus District Energy Decarbonization, Phase 1 - Central Plant Electrification (SE08)		
Project Category		**Program Type**
Carbon Neutral		Other

Project Budget ($ millions)		
Total Project Cost	**Provincial Funding**	**PSI / Donor Funding**
$9 million	$7.9 million	$1.1 million

Capital Budget Contributions

- BC Hydro has confirmed a funding grant of $200,000 towards this project.
- BCIT will allocate $900,000 of the Routine Capital budget (10% of total project value) to this project.
- BCIT has applied and successfully advanced through the first round of the Federal *Low Carbon Economy Fund* program. A funding decision is anticipated by December 2022.

Operational Budget Benefits

- Switching to electricity shields BCIT from the volatile natural gas market (where the rate has increased by more than 50% over the last two years), and will reduce carbon offset costs by $45,000 per annum.

Strategic Alignment	
CleanBC Targets	**DRIPA Response**
This project is the cornerstone for BCIT to meet its GHG reduction target, and will reduce BCIT's GHG emissions by about 25%, or 1,800 tonnes CO2e per year.	As this is a mechanical renovation to the existing Central Plant (SE8), this section is not applicable.
Mass Timber Eligibility	**Community Benefits**
As this is a mechanical renovation to the existing Central Plant (SE8), this section is not applicable.	This project will foster interprofessional development and working relationships between BCIT Power Engineering operational staff and School of Energy Power Engineering program faculty and students.

- This project aligns with the Province's priorities for GHG reduction, and with BCIT's vision in shaping BC and inspiring global progress. The project will reduce BCIT's GHG emissions by about 25%, or 1,800 tonnes CO2e per year.
- The project design includes technology viewing windows and interpretive signage to permit the broader community (students, staff, public) to visually engage and learn about low-carbon district heating technology.

Project Schedule

Target Bus. Plan Approval Date	Target Construction Start Date	Target Occupancy Date
December 2022	May 2023	November 2023

The design of this project is well advanced, and a Class C schematic design cost estimate will be ready to share with the Ministry by September 2022.

This renovation project needs to occur over the warm (non-heating) season, with hazardous material abatement and temporary heating plant construction in the April/May 2023.

Primary construction will occur during the summer season and aim for project completion by November 2023.

If the Ministry *Business Case* decision is not made by December 2022, the project timeline will be pushed back one year to a Spring 2024 start.

Project Scope & Objectives

Project Scope

The Central District Energy System (DES) serves 40% of the Burnaby Campus (750,000 sf) primarily on the south side. This project will reduce a majority of the DES carbon footprint by replacing old inefficient boilers with modern, high efficiency electric boilers, recovering heat from the educational steam boiler, and converting the distribution system from constant volume to variable volume.

In addition, the new DES will be fully integrated to campus-wide control system, enabling demand-based control strategies. The system is designed to allow for future phases of decarbonization projects.

The project involves renovating approximately 390 m^2 (4,200 sf) of the existing Central Heating Plant (SE08), including the provision of a modern 1,050 sf heating plant control centre.

Project Objectives

<u>Goal: A better future through fighting climate change</u>

BCIT has a critical role to play in addressing climate change, and this project will reduce its GHG emissions by 25% from 2007 levels, as BCIT heads toward its emission reduction goal of 33% by 2023.

With the reduced physical boiler footprint, a 24/7 staffed Facilities Maintenance & Control Centre will be built in the heart of the Campus to provide improved service, especially outside of core campus hours.

Currently, there is no delineation between the power engineer teaching space and operations facilities. This project will provide a glazed physical barrier, improving safety and security while also improving a visual connection between power engineering students and professional BCIT power engineers.

Key Risks

The following items could significantly impact the success of the project:

- Installed in the 1960s, the existing boilers contain hazardous materials. During the design phase, a Hazardous Material Consultant assessed the facility and has provided an abatement plan.
- The DES serves a large portion of the campus that cannot shutdown operations during construction, so a temporary heating solution will provide continuous heating to the campus through construction. Summer has been selected as the construction season to further mitigate risk of heating interruption. A mechanical contractor was engaged during the design phase to provide input on the feasibility of this solution, and a high-level plan have been drafted.
- Project timeline delays due to the City's Building Permit review process. Based on recent projects on Campus, a Building Permit may take up to 6 months to obtain. To mitigate the risk, BCIT will submit the Building Permit application at the Business Case stage so it is in place when funding is confirmed.

Options Considered

High-efficiency condensing boilers only

This is the most cost-effective option; however, this would mean BCIT would not make its GHG emission reduction targets, and would set a long-term course for BCIT to be heated primarily by fossil fuel.

Electric boilers only

There is currently not enough electrical capacity to provide this option. Natural gas peaking boilers are a cost-effective design solution for the possible cold snaps, such as recently experienced in December 2021.

Heat pump system

There is no heat pump product available on the market to satisfy the high temperature water required for the DES in its current state. However, the proposed system will facilitate future renovations to the DES building that will enable provision of heat pumps while meeting the most immediate goal of reducing carbon emissions by 33% by 2023.

Current Situation

The Central Heating Plant (SE08) was constructed in 1967 and has an **FCI = 0.55**, with total FCI deferred maintenance estimated at $7.8 million.

Currently, the DES is served by three end-of-life natural gas, low-efficiency boilers. These boilers need to be replaced for future heating reliability purposes, and this is a once-in-a-generation opportunity to significantly decarbonize BCIT operations.

If the project is not funded, the aged District heating system will be maintained, leading to downtime on the heating plant for costly maintenance and emergency repairs. This situation would not only preclude BCIT from reaching its goal of 33% GHG emission reduction by 2023, but also put in jeopardy the 2040 goal of reaching a 40% GHG emission reduction, which is in line with CleanBC targets.

Attachment 2: Project Overview

Five-Year Capital Plan (2023/24 – 2027/28)

Project Detail		
Institution	**Campus/City**	**Project Priority**
BCIT	Burnaby	5 of 5
Project Title		
South Campus Infrastructure Renewal - Phase 3		
Project Category		**Program Type**
Linear Infrastructure		Other

Project Budget ($ millions)		
Total Project Cost	**Provincial Funding**	**PSI / Donor Funding**
$49.6 million	$44.6 million	$5 million

- This linear infrastructure project continues work currently underway in Phase 1 ($14.6 million, Area 6 and Substation K).
- There is no increase to operational costs associated with this linear infrastructure renewal project.
- There would be a reduction in unplanned "emergency" repair work that currently occurs with end-of-life infrastructure, such as recent stormwater pipe sinkhole repairs.
- Please note the forecasted project cashflow is detailed on Attachment 3: Prioritized Projects

Strategic Alignment	
CleanBC Targets	**DRIPA Response**
Goal: A better future through fighting climate change, and a resilient public education system. The third phase of this infrastructure project will continue to contribute to CleanBC and its road map, and is directly consistent with the first pathway. This project will contribute to a reliable, efficient, and resilient campus.	• BCIT's Indigenous Initiatives Office participates in the design process for all major capital projects. • This phase of linear infrastructure involves the replacement of aged stormwater culverts with a daylighted Guichon Creek stream channel that will include culturally important ecological restoration of the creek to promote salmonid species reproduction on the campus. • During the design phase, BCIT Indigenous Initiatives will focus on design issues, such as culturally appropriate exterior design, sustainability, and safe spaces for Indigenous students.

Mass Timber Eligibility	Community Benefits
This project is not eligible for mass timber construction, but will provide modern services that support the educational build-out of the BCIT Burnaby Campus, which will utilize mass timber construction (where permitted).	This initiative will contribute to a strong and resilient campus within the municipality of Burnaby by removing and replacing failing infrastructure. This project includes major accessibility improvements that create fully accessible pedestrian walking routes. The project involves replacement of existing stormwater culverts to daylight and ecologically restore a section of Guichon Creek.

- BC Hydro is transitioning electrical services in the Willingdon corridor to 25kV services (from the current 12.5kV). The planned changes add to the urgency for upgrading electrical distribution to match the system recently installed in the North Campus.
- This project aligns with Stronger BC, and assists in the implementation of its economic plan, particularly with BCIT's training for the jobs of tomorrow.
- This initiative underpins and supports BCIT's *Strategic Plan* for renewal and the creation of resiliency for its Burnaby Campus.

Project Schedule

Target Bus. Plan Approval Date	Target Construction Start Date	Target Occupancy Date
June 2025	June 2026	August 2028

- The Ministry has already reviewed the overall *Business Case* for the South Campus Infrastructure Project, and has funded the Phase 1 works, which are valued at $14.6 million.
- The project schedule for Phase 3 assumes Ministry notional approval in December 2025.

Project Scope & Objectives

Project Scope

The Phase 3 scope of work includes replacement of underground utilities along Roper Avenue and services to the following buildings: Renewable Resources (SE04), Business (SE06), Broadcast Centre (SE10), Computing & Academic Studies and Health Sciences (SE12), and Library (SE14).

This phase also features the implementation of Guichon Creek channel daylighting and ecological restoration, as well enhancement of the pedestrian public realm on both sides of the daylighted stream channel. Phase 3 has a project value of $49.6 million.

Project Objectives

- Maintain business continuity for the entire South Campus.
- Upgrade critical deferred maintenance conditions related to electrical equipment reaching end of life.
- Provide a modern 25kV electrical distribution system.
- 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.
- Significant improvement to pedestrian accessibility by remove existing barriers to mobility.

Key Risks

If the project does not proceed, the key risks are:

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

Options Considered

Given the risk 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.

Current Situation

A condition assessment shows the majority of electrical, water, gas, storm, and sewer services to the southern part of campus are past serviceable life, and pose a high risk of failure and to business continuity. This project is aligned with Provincial resilience and sustainability objectives.

BC Hydro is transitioning electrical services in the Willingdon corridor to 25kV service (from the current 12.5kV). The planned service change adds to the urgency for upgrading electrical distribution infrastructure to match the system recently installed in the North Campus. In addition, this project will replace a section of the decaying Guichon Creek storm culvert with an ecologically restorative stream channel, as outlined in the *Campus Plan*. Modernization of this infrastructure also supports core educational building service reliability, and will provide modern infrastructure required for future development on campus.

An overall project business case was submitted to the Ministry in July 2020. The Ministry subsequently provided capital grants for Phase 1 underground utility replacement on White Avenue and Fairy Street near the Energy building (SW09), and will pre-service the future Tall Timber Student Housing project. Phase 1 work is valued at $14.6 million, and is currently in progress.