



| | |
|-------------------------------|--|
| SUBJECT | Faculty of Applied Science Digital Design Studio |
| SUBMITTED TO | Property Committee |
| MEETING DATE | June 16, 2022 |
| SESSION CLASSIFICATION | Recommended session criteria from Board Meetings Policy: OPEN |
| REQUEST | <p>APPROVAL REQUESTED</p> <p>IT IS HEREBY RESOLVED that the Property Committee, in accordance with authority delegated by the Board of Governors, grants BOARD 1 approval for the Faculty of Applied Science Digital Design Studio as follows:</p> <ul style="list-style-type: none"><i>i.</i> approval of project in principle;<i>ii.</i> approval of preliminary program and schedule;<i>iii.</i> approval of location;<i>iv.</i> approval of preliminary capital budget of \$12.861 million and operating costs as set out in the Appendices of this submission;<i>v.</i> approval of funding of \$7.861 million from Faculty of Applied Science Surplus/Reserves and funding of \$5 million from School of Architecture + Landscape Architecture (SALA) Capital Investment Fund;<i>vi.</i> authorization to proceed to schematic design; and,<i>vii.</i> approval of funding release of \$1.4 million for the next stage of project development. |
| LEAD EXECUTIVE | John Metras, Interim Vice-President Operations |
| SUPPORTED BY | Gage Averill, Provost and Vice-President Academic pro tem, UBC Vancouver Karamjeet Heer, Interim Vice-President Finance James Olson, Dean, Faculty of Applied Science Bhushan Gopaluni, Vice-Provost and Associate Vice-President, Faculty Planning pro tem Jennifer Sanguinetti, Managing Director, Infrastructure Development Michael White, Associate Vice-President, Campus + Community Planning Yale Loh, Treasurer |

PRIOR SUBMISSIONS

The subject matter of this submission has not previously been considered by the Property Committee.

EXECUTIVE SUMMARY

In accordance with the [Capital Projects Policy](#), this Board 1 approval request for the Faculty of Applied Science Digital Design Studio is provided as part of the project management process for construction projects over \$5,000,000. The Board of Governors has delegated to the Property Committee the authority to make decisions on its behalf for construction projects between \$5 million and \$20 million. The aggregate estimated value of the Faculty of Applied Science Digital Design Studio is \$12,861,000.

Background and Rationale

The Faculty of Applied Science (APSC) is actively advancing leading-edge teaching opportunities for digital collaboration and new programs to integrate disciplines and support the development of critical thinkers who can examine a problem from all sides and draw on a well-rounded education in terms of ethics, design, technical and social elements. To support these efforts, APSC proposes to build a new Digital Design Studio for undergraduate and graduate students that will enable creative and interactive synthesis of design thinking, materials and fabrication technologies. This new, student-centered facility will provide critical space for the convergence of design approaches specific to APSC disciplines and support the transformation of the design process to better serve the needs of society.

The proposed Facility will help position UBC as a global leader in training for the future-state of the engineering profession and its approach to design, and may open highly novel avenues for research and training that are currently not being investigated. Engineering students will have the opportunity to learn and engage with the leading-edge digital design and professional collaboration technology necessary to increase their skills and abilities, preparing them to be leaders in the future of work within the engineering field.

The project will also fill a critical fabrication workshop teaching and learning space gap that the School of Architecture + Landscape Architecture (SALA) must resolve to maintain their accreditation and position as a global leader in architectural education. Recent internal and external reviews of SALA have emphasized that the existing workshop and digital fabrication facilities do not adequately serve the pedagogical objectives of the School and its goal to deliver strong studio design training, and will not service the growing number of students enrolled in the SALA undergraduate and graduate programs.

Project Description

The proposed Digital Design Studio is a 1,092-gross square metre (11,755 gross square foot) facility that will provide cutting-edge, technology-enriched spaces to facilitate new courses and modes of instruction aligned with the Faculty's strategic plan. The facility will allow novel curriculum development to support innovation by bringing together APSC disciplines within an open and highly collaborative training environment, offering students opportunities to learn and apply cross-disciplinary design theories, methodologies and perspectives, and providing access to the specialized infrastructure needed to realize advanced designs and lead to a new generation of design specialists. The facility will provide:

- Informal pods that support brain-storming, conceptualizing tasks and project planning;
- A training centre that enables students to learn methodologies, and advanced software supporting multi-faceted, multi-objective design;
- A wide range of virtual and physical media to support rapid iterative prototyping and design testing;
- A variety of specialized design tools and fabrication infrastructure;
- Virtual communication and presentation technology to facilitate engagement between design teams and stakeholders, domain experts and other external partners; and
- Adaptable space for community and group presentations and podcasts for knowledge dissemination and technology transfer.

The Faculty of Applied Science Digital Design Studio project is strongly aligned with all four core areas of *Shaping the Next Century 2018-2028*, [UBC Strategic Plan, 2018-2028](#), and in particular:

- People and Places – Strategy 2: Inspiring Spaces
- Research Excellence – Strategy 8: Student Research
- Transformative Learning – Strategy 13: Practical Learning and Strategy 14: Interdisciplinary Education
- Local and Global Engagement – Strategy 16: Public Relevance

Preliminary Program

In 2021, APSC engaged a planning consultant to develop a functional program for the Digital Design Studio. The proposed building will include the following components:

| Component | Net Area (square metres) | Net Area (square feet) |
|--|-----------------------------|---------------------------|
| Program Component | | |
| Virtual Design Teaching & Learning | | |
| Classroom/Labs & Studios | 192 | |
| Virtual Conference Rooms | 66 | |
| Sub-total Virtual Design Teaching & Learning space | 258 | 2,777 |
| Workshop & Fabrication | | |
| Fabrication Shop | 236 | |
| Digital Robot Shop | 70 | |
| Assembly Labs | 145 | |
| Storage & Technician Offices | 24 | |
| Sub-total Workshop & Fabrication space | 475 | 5,113 |
| Exhibit Area | | |
| Gallery and lounge | 107 | |
| Sub-total Exhibit Area | 107 | 1,152 |
| Subtotal Net Area | 840 | 9,042 |
| Gross-up @ 1.3 x net area | 252 | 2,713 |
| TOTAL Building Gross Area | 1,092 | 11,755 |

Site

The proposed site for the Digital Design Facility is the south end of the Chemical and Biological Engineering (CHBE) Building open air courtyard. This site is within the footprint and envelope that was to be developed into a high head laboratory when the CHBE Building was constructed in 2005. The high head lab was part of the original Site Selection and Development Permit approvals processes but was not built due to funding constraints at the time. The proposed infill site was confirmed by the New Building Site Selection Committee on January 17, 2022.

The courtyard is open at the north end, allowing good construction access from the adjacent road. With the existing building wrapping the site on the other three sides, there will be some disruption to occupants during the noisier phases of construction and tie-in to the existing atrium. Infrastructure Development is working with the Faculty to evaluate swing space requirements.

Preliminary Capital and Operating Budgets

UBC Project Services (Infrastructure Development) has estimated the capital budget for the project at \$12,861,000, including allowances for relocation of a building generator located in the courtyard. The facility's equipment will be procured and approved separately in accordance with the Capital Purchase provisions of UBC Policy FM11 (Capital Projects, Capital Purchases & Internal Loans) and the Signing Resolutions.

Annual operation and maintenance (O&M) costs will be calculated at the standard rate (\$8.60/gsf/year for new buildings) and paid by the Faculty of Applied Science. The current O&M rate is under review and may increase prior to final Board 3 approval. Lifecycle capital costs will be funded by the UBC operating budget and Provincial government through the Routine Capital Program.

The detailed breakdowns of the preliminary capital budget and O&M costs are shown in *Appendix 2 Preliminary Capital Budget and Operating Costs*.

Funding Sources

The capital budget of \$12,861,000 will be funded through a \$5 million SALA reserve fund dedicated to capital investment, and a \$7.9 million contribution from the Faculty of Applied Science surplus/reserves. The Faculty of Applied Science expects the SALA Capital Investment fund to reach the full \$5 million target prior to the construction start date, but will backstop any shortfall. The Faculty has sufficient reserves to fund the full \$12,861,000 project including the SALA backstop if required. No construction period financing or internal loans are required for this project.

| Funding Source | \$ |
|---|---------------------|
| SALA Capital Investment Fund | 5,000,000 |
| Faculty of Applied Science Surplus/Reserves | 7,861,000 |
| Total | \$12,861,000 |

Sustainability Targets

The Digital Design Studio will be designed to meet UBC Green Building requirements for tier 2, small new buildings. While the project will not be required to be LEED certified, it will be required to meet operational and embodied carbon targets defined by Campus & Community Planning and to maximize rainwater management.

The project team will work towards defined energy and carbon performance targets as well as meaningful sustainability goals that are relevant for the project type. These goals will be defined and articulated in the project's Design Brief and reported at Board 2.

Risks

- Projects that tie into existing building infrastructure involve inherent cost and schedule risks due to potential unknown conditions. A 15% construction contingency has been included in the project budget to account for these unknown conditions.
- Infrastructure Development advises that the current construction market continues to be extremely volatile, with many trade prices continuing to trend upward due to supply chain disruptions. An escalation contingency of \$945,000 is included to mitigate this risk.

Preliminary Schedule

The following preliminary schedule has been provided by UBC Project Services (Infrastructure Development):

| MILESTONE | TARGET DATE |
|--|---------------|
| Executive 1 and 2 | October 2021 |
| New Building Site Selection Committee confirmation | January 2022 |
| Executive 3 | May 2022 |
| Board 1 | June 2022 |
| Board 2 | March 2023 |
| Board 3 | December 2023 |
| Construction Start | January 2024 |
| Construction Completion | March 2025 |
| Occupancy | May 2025 |
| Board 4 | June 2027 |

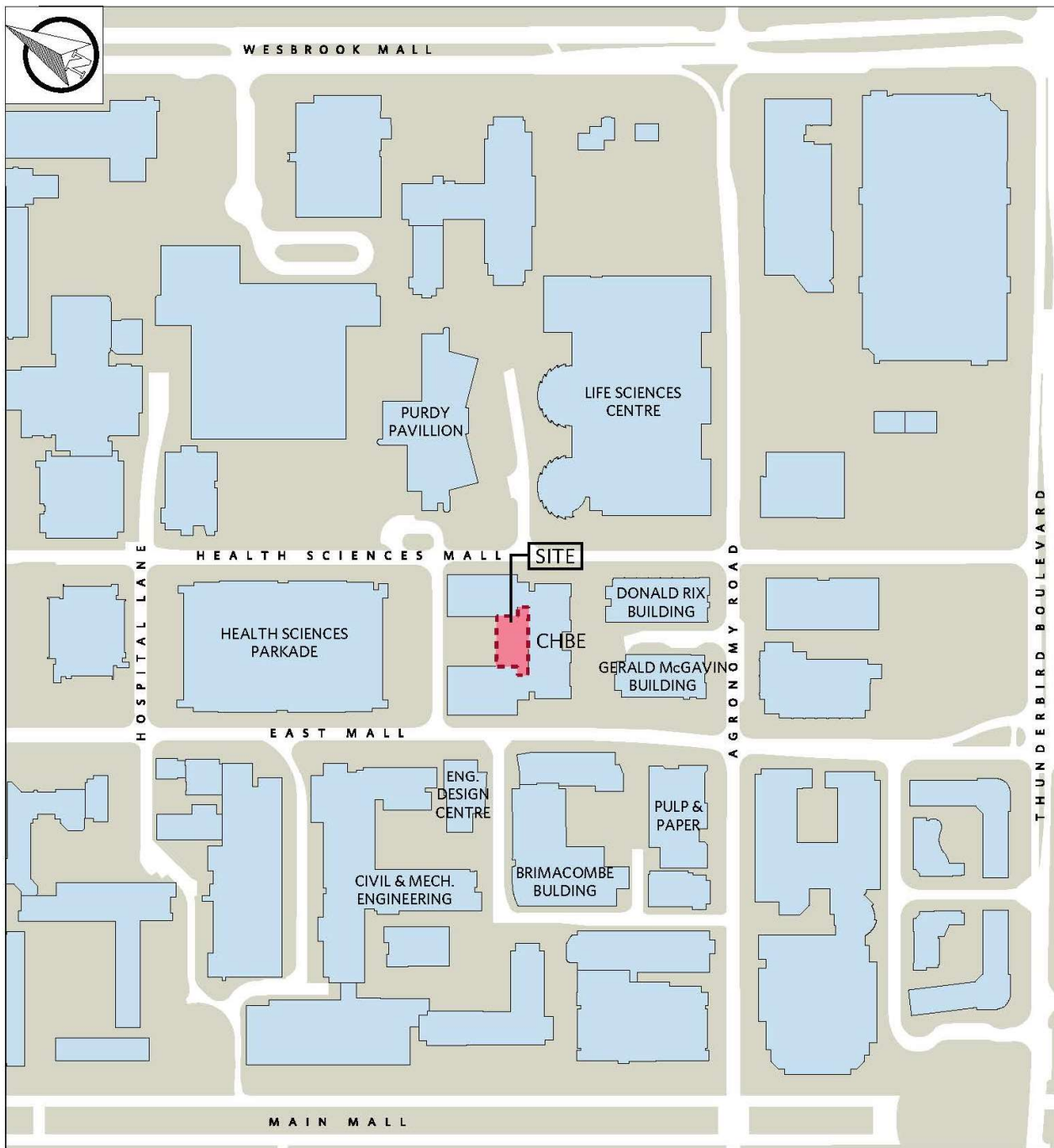
APPENDICES

1. Context Location Map
2. Preliminary Capital Budget and Operating Budgets

PRESENTATIONS

1. Applied Science Digital Design Facility Board 1

Appendix 1 – Context Location Map



Appendix 2 – Preliminary Capital and Operation Budgets

Preliminary Capital Budget

Project Services (Infrastructure Development) has provided the following capital cost estimate update for the Applied Science Digital Design Facility project. This is a class D estimate with an accuracy of +/-20-30%.

| Project Capital Cost Breakdown | \$ |
|--|----------------------|
| Construction | |
| Construction | 6,780,000 |
| Design Contingency (10%) | 678,000 |
| Construction Contingency ¹ | 1,183,000 |
| Construction Subtotal | 8,641,000 |
| Cash Allowances | |
| FF+E ² | 200,000 |
| Service Requests to UBC Facilities | 55,000 |
| UBC IT + AV | 120,000 |
| Secure Access | 52,000 |
| Cash Allowances Subtotal | 427,000 |
| Soft Costs | |
| Consultants | 1,673,000 |
| Project Management | 554,000 |
| Permits - BP/IIC | 85,000 |
| Insurance/Legal | 51,000 |
| Commissioning, Inspection + testing | 160,000 |
| Soft Costs Subtotal | 2,523,000 |
| Building Subtotal | 11,591,000 |
| GST | 199,000 |
| Construction Period Financing ³ | 0 |
| Retained Risk | 126,000 |
| Escalation Contingency | 945,000 |
| PROJECT TOTAL | \$ 12,861,000 |
| <i>Area (Gross Square Feet)</i> | <i>11,755</i> |
| <i>\$ Per Square Foot</i> | <i>\$1,094</i> |

¹ A 15% contingency is included at this time due to the inherent complexities of tying into an existing building, and unknown conditions around the generator.

² The cost of the fabrication equipment (3D printers, etc.) and digital design computers is outside this project budget.

³ Treasury has confirmed that no construction period financing is required.

Preliminary Operations and Maintenance Cost

Annual operation costs will be calculated at the standard rate (\$8.60/gsf/year for new buildings) and paid by the Faculty of Applied Science. The current O&M rate is under review and may increase prior to final Board 3 approval. Lifecycle capital costs will be funded by the UBC operating budget and Provincial government through the Routine Capital Program.

| Applied Science Digital Design Facility | \$/gsf | APSC |
|--|---------------|------------------|
| Total Gross Area (sf) | | 11,755 |
| OPERATION COSTS¹ | | |
| Annual Operations + Maintenance | \$6.37 | \$74,879 |
| Utilities | \$2.23 | \$26,214 |
| Total O+M Cost | \$8.60 | \$101,093 |
| LIFECYCLE CAPITAL COSTS² | | |
| Cyclical Maintenance | \$3.51 | \$41,260 |
| Modernization / Upgrade | \$0.93 | \$10,932 |
| Total Capital Renewal Cost | \$4.44 | \$52,192 |

¹ Final costs will be based on actual built areas and are subject to change pending final design and construction.

² Lifecycle Capital Costs are covered by the UBC Operating Budget (Routine Capital program).



Applied Science Digital Design Studio Board 1

June 16, 2022

Jennifer Sanguinetti
Managing Director, Infrastructure Development



Introduction and summary



Proposed Digital Design Centre will:

- Provide opportunities for novel ways of teaching design disciplines
- Fill critical fabrication workshop gap for SALA
- Provide open, highly collaborative training environment supporting transformation of design process

Additional details



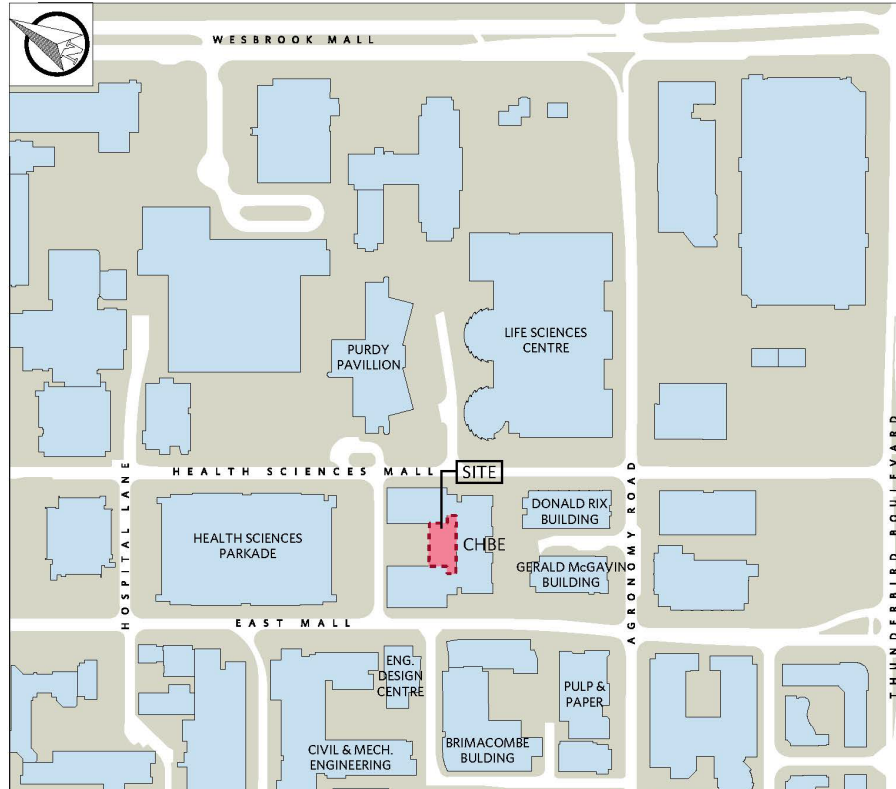
- Infill of CHBE Courtyard
- Addition will be 1,092 sq m (11,755 sq ft) facility
- Includes Virtual Design teaching space, workshop & fabrication facilities & exhibit area
- Provides cutting-edge, technology-enriched spaces supporting APSC Strategic Plan

Additional details



- Capital cost estimate is \$12.861 million
- Funding from Faculty, including SALA Capital Investment fund & Faculty reserves
- Infill of CHBE Courtyard originally envisioned as high head space; new facility is better aligned with strategic direction

Additional details – Site Map



Discussion and decision points



Board 1 approval of the APSC Dig Design project:

1. approval of project in principle;
2. approval of preliminary program and schedule;
3. approval of location;
4. approval of preliminary capital budget of \$12,861,000 & op costs;
5. approval of the preliminary funding strategy;
6. authorization to the University administration to proceed to architect selection and schematic design; and
7. funding release of \$1,400,000 to commence schematic design.