



SUBJECT	Board 4 Post-Completion Report - Quantum Matter Institute (QMI) / Advanced Materials and Process Engineering Laboratory (AMPEL)
SUBMITTED TO	Property Committee
MEETING DATE	April 7, 2020
SESSION CLASSIFICATION	Recommended session criteria from Board Meetings Policy: OPEN
ACTION REQUESTED	Please indicate requested Board action: No decision requested: for information
SUBMISSION DATE	March 13, 2020
LEAD EXECUTIVE	Peter Smailes, Vice-President Finance & Operations
PRESENTED BY	John Metras, Associate Vice-President Facilities
SUPPORTED BY	Andrew Szeri, Provost and Vice-President Academic, UBC Vancouver Meigan Aronson, Dean, Faculty of Science James Olson, Dean, Faculty of Applied Science Yale Loh, Treasurer Michael White, Associate Vice-President, Campus & Community Planning Jennifer Sanguinetti, Managing Director, Infrastructure Development Aubrey Kelly, President & CEO, UBC Properties Trust

PRIOR SUBMISSIONS

The subject matter of this submission has been considered previously by the Property Committee on the following occasions:

1. [September 2015](#) (OPEN SESSION) Revised Board 3 Approval, Funding release: \$3,068,000
 1. Revised BOARD 3 approval for the Quantum Matter Institute (QMI) / Advanced Materials and Process Engineering Laboratory (AMPEL) project with a revised capital budget of \$30.269 million and a funding release of \$3.068 million to complete research space fit-out in accordance with a new funding contribution from the Canada First Research Excellence Fund (CFREF).
 2. Approval for a fundraising bridging loan of up to \$4.8 million at 3.9% annual interest, to be paid back over four (4) years.

Revised Capital Budget	\$30,269,000
Revised Operating Budget	\$449,144
Revised Schedule	
Funding Release	\$3,068,000
2. [December 2014](#) (OPEN SESSION), Board 3 Approval, Funding Release \$24,201,000
3. [April 2014](#) (OPEN SESSION), Board 2 Approval, Funding Release: \$2,500,000
4. [June 2013](#) (OPEN SESSION), Board 1 Approval, Funding release: \$500,000

The following Executive Summary assumes familiarity with the prior submissions and provides a status update from the date of the most recent submission.

EXECUTIVE SUMMARY

In accordance with the Capital Projects Policy, this Board 4 post-completion report is provided as part of the project management process following the construction, occupancy and warranty period on the Quantum Matter Institute (QMI) / Advanced Materials and Process Laboratory (AMPEL).

The 4,977 gross square metre Quantum Matter Institute (QMI - also known as the Brimacombe Addition) provides high infrastructure, high quality laboratories, offices and collaboration space to support UBC's world class research in quantum materials. The relatively modestly sized building addition is efficiently planned and makes maximum use of a tight building site. Although the project's tight budget was mostly focused on delivering optimally functional labs, the design team was able to create visually interesting interior spaces, and the exterior brick detailing led the project to win the 2018 Architectural Institute of British Columbia (AIBC) "LG design award for innovation - creative use of a common material (exterior brick)". A range of research laboratory environments includes basement ultra-low vibration labs and upper floor higher head space, and the building's facilities and research activities are well integrated with those of the existing AMPEL (also known as the Brimacombe Building). QMI was completed in April 2017, and anticipates LEED Gold certification.

Renovations to specific AMPEL laboratories were part of the overall project but changing scope required additional funding, which was divided proportionally between the Faculties of Science and Applied Science, and supplemented with additional contributions from Central Contingency and the Retained Risk Fund. Additional changes to funding occurred with the Faculty of Science making up the shortfall resulting from a reduction in the Canada Excellence Research Chairs (CERC) funding due to the unexpected departure of the lead CERC researcher.

The following table illustrates the final sources of funding for the project:

Funding Source in \$000s	Revised Board 3	Board 4
UBC Operating Budget (internally financed)	\$11,000	\$11,000
Faculty of Science Fundraising committed	\$8,000	\$8,000
Fundraising – Supported by Faculty of Science	\$1,600	\$1,600
Fundraising – Supported by Faculty of Applied Science	\$3,001	\$3,001
Fundraising – Supported by UBC Central	\$1,600	\$1,600
CERC Indirect Costs Allocation	\$2,000	\$277
Faculty of Science loan (CERC funding shortfall)	-	\$1,723
Canada First Research Excellence Fund (CFREF)	\$3,068	\$3,068
Faculty of Science – AMPEL renovation extras	-	\$675
Faculty of Applied Science – AMPEL renovation extras	-	\$337
Retained Risk Fund	-	\$474
UBC Operating Budget Contingency	-	\$275
TOTAL	\$30,269	\$32,030

The overage on the project budget is within the 15% permitted under Policy FM11 (Capital Projects Policy) and it was noted in the December 2018 Capital Projects Update report to the Board of Governors.

A stakeholder meeting of occupants, operators and the project delivery team was held on January 7, 2020 to review project successes, constraints and lessons learned. The new building is a great success, and the project team and user group accomplished a great deal within a challenging budget. Laboratories are working well, including the specialized labs designed for low-vibration research. Formal and informal spaces for collaborative interaction were a project priority and these are very successful. The entry/reception area is welcoming and inviting, and a significant improvement over the original Brimacombe building entrance. The project delivery team and project stakeholders worked well together.

While overall a successful project, some issues emerged that can serve as lessons learned for future projects. As this was a relatively small addition, the team made early decisions, based on usable space and budget, about which systems would be add-ons to those of the existing building and which would be distinct new systems. Stakeholder discussion noted that sharing systems on building addition projects requires careful case-by-case scrutiny of the potential operational impact on each system. For example, the decision not to add an elevator has placed added burden on the existing elevator, and this seems to be affecting its performance; however the decision to tie the controls systems together allowed the team to change out the existing building's aging controls system which has been a positive change.

Major scope changes coupled with an already complicated research building made for a challenging budget. The resulting value engineering forced a number of trade-off-based decisions. Having the design team be more explicit about effects of certain trade-offs, particularly as they relate to long term operations would better inform working groups during the decision making process. Elimination of the rooftop mechanical penthouse is of primary concern as exposure of building mechanical equipment to the elements may shorten the life of the equipment. Other mechanical and electrical challenges were cited, such as ongoing lab temperature and humidity instability, and a pre-packaged lighting controls system that has already been struck from use on subsequent projects. Some mechanical issues may be due to ongoing renovations in AMPEL and fit-out of QMI basement, and the project management team has recommended a re-commissioning of the HVAC system once renovations are complete. It is anticipated that this will resolve the environmental instability issues.

Clear lessons learned are that buildings with complex research programs require adequate funding, and rooftop penthouses are critical to house the building equipment necessary to serve these buildings. The team suggested that a lessons learned session be held with the design team at the start of design of the next research building.

Attached

1. Photographs of Quantum Matter Institute



Photos by Martin Tessler, courtesy of Public Architecture
Photo 1 and 2 – Exterior Views of Quantum Matter institute



Photo by Martin Tessler, courtesy of Public Architecture
Photo 3 – Interior View of Corridor



Photo by Martin Tessler, courtesy of Public Architecture
Photo 4 – Interior View of Collaboration Space



Photo by Martin Tessler, courtesy of Public Architecture
Photo 5 – Interior View of laboratory