Applied One: Functional Program Report

December 12st, 2023

THE UNIVERSITY OF BRITISH COLUMBIA
Applied Science

local .

MILLER HULL

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We acknowledge that the University of British Columbia Vancouver campus is located within the traditional, ancestral and unceded territory of the xʷməθkʷəy̓əm (Musqueam) people. The land it is situated on has always been a place of learning for the Musqueam, who for millennia have passed on their culture, history, and traditions from one generation to the next on this site.

Broadly speaking, there are few outdoor or built environments on campus that reflect the original landscape that was so supportive of Musqueam life on the campus. Applied One has an opportunity to counter this design approach and weave the presence of Musqueam culture and understanding into the design of the landscape, the building and the rooms inside. The Faculty of Applied Science aspires to change the way we work by engaging in inclusive processes and committing to long-term relationships with Musqueam that extend beyond the Applied One project. Applied Science is committed to learning and unlearning to better train future professionals to work in more inclusive and respectful ways.

Prepared for:
Faculty of Applied Science, University of British Columbia

Prepared by:

local. MILLER HULL

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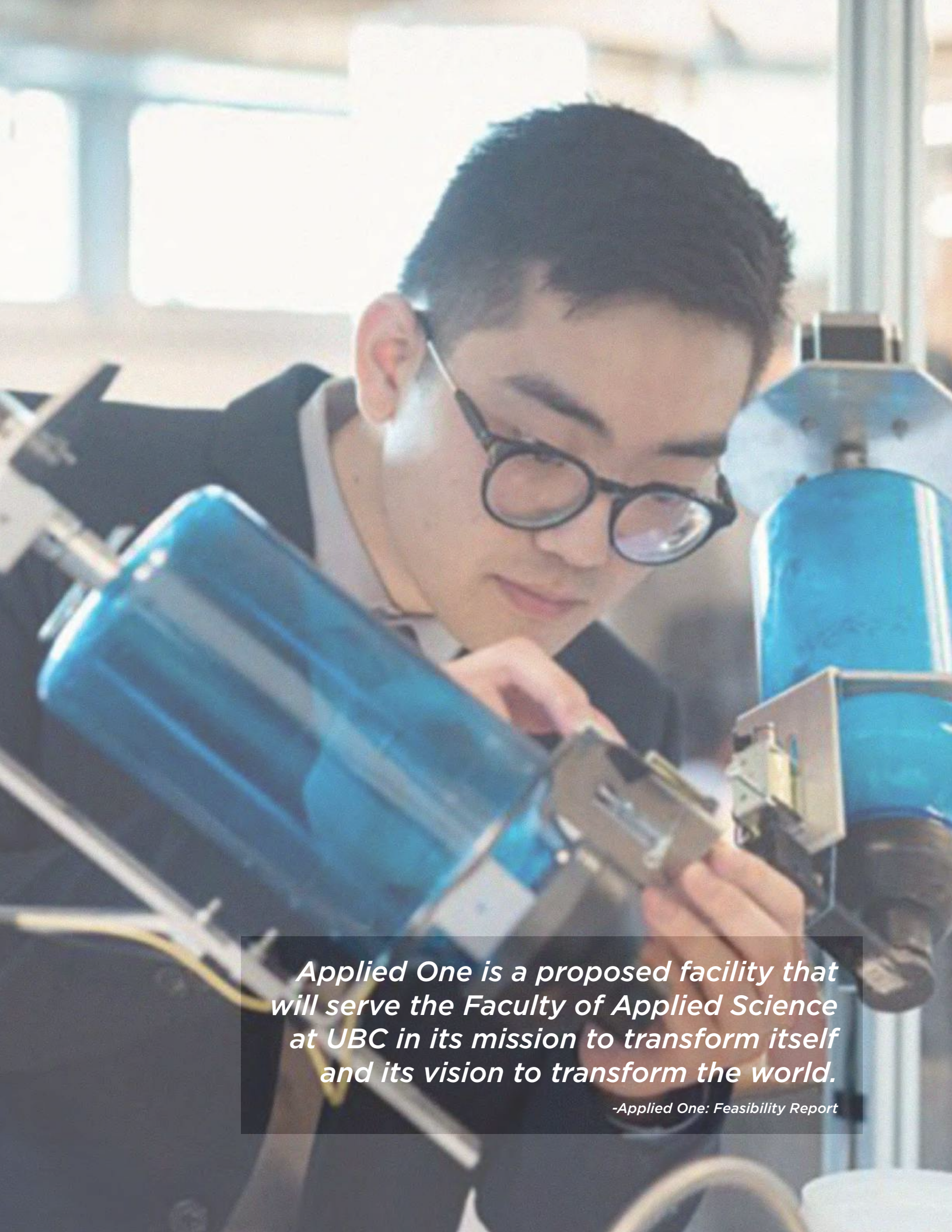
CONTENTS



Applied One is a proposed facility that will serve the Faculty of Applied Science at UBC in its mission to transform itself and its vision to transform the world.

-Applied One: Feasibility Report

1.0 INTRODUCTION

1.1. FRAMING APPLIED ONE

1.1.1. PROJECT VISION

Project Mission

The Faculty of Applied Science (APSC) at the University of British Columbia is comprised of a unique grouping of disciplines whose core purpose is to discover, design and innovate, and to provide exemplary education to champion a community of responsible professionals. The shortage of high quality, functional research and learning space is a significant barrier to attracting faculty and students to Applied Science at UBC, limiting the Faculty's aspirations for growth and innovation. The Faculty's space in multiple ageing, deteriorating, undersized, and scattered buildings cannot support the growth nor the innovative pedagogy envisioned.

Applied One will deliver a facility that supports interdisciplinary research, experiential learning, and creative partnerships that accelerate APSC's commitment to address 21st century global challenges. Applied One will accommodate the Faculty's planned growth in undergraduate and graduate student populations to meet the growing demands for engineering and design education and the rapidly expanding opportunities in the labour market. The facility will also allow APSC to expand and develop new programming aligned with Faculty expertise in policy, society, technology, and design.

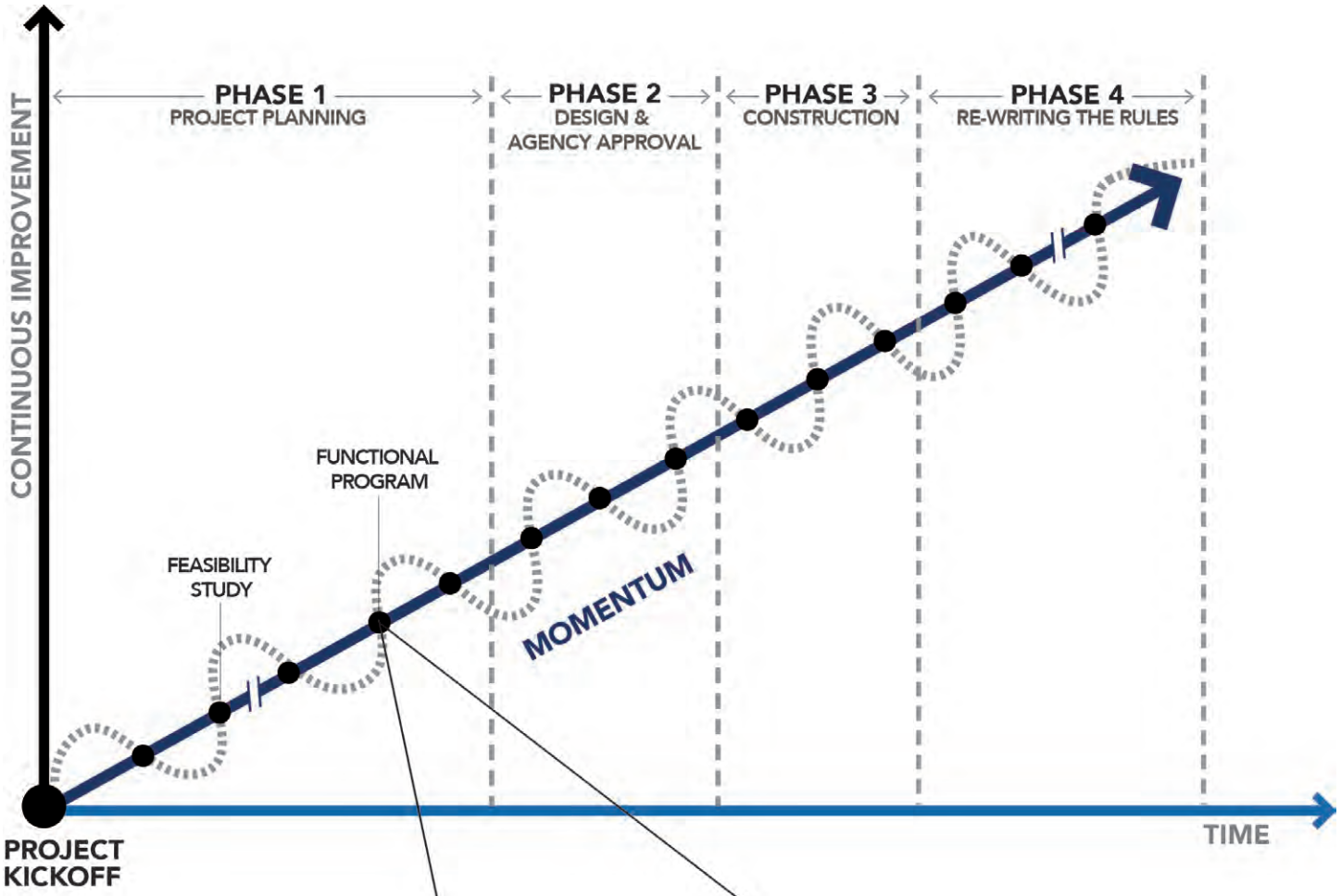
Applied One will provide facilities for four academic units – the School of Architecture and Landscape Architecture (SALA), the School of Community and Regional Planning (SCARP), the Department of Materials Engineering (MTRL) and the Norman B. Keevil Institute of Mining Engineering (MINE) – as well as shared facilities for all APSC Departments and Schools to research, teach and collaborate.

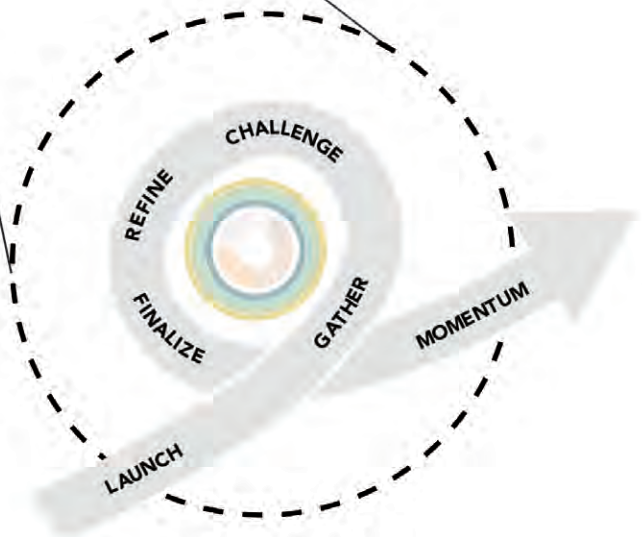
Applied Science currently occupies space in 25 buildings across campus, many of which are seismically vulnerable and have significant deferred maintenance. One of these, the Frank Forward Building, will be deconstructed as part of the project. Space vacated in other buildings may be renovated or upgraded for other academic units. UBC will proceed with more detailed planning for these spaces once project implementation is more assured.

Target Outcomes

Applied One will enable the Faculty of Applied Science to implement its ambitious Strategic Plan in the context of UBC's Strategic Plan with new models and initiatives of education and research. Target project outcomes include:

- Provision of new homes for academic units currently in substandard and seismically vulnerable buildings.
- Consolidation of shared resources across APSC to create a laboratory of collaboration where architects, landscape architects, engineers, planners and designers come together in a space optimized for cooperation and problem solving to transform thinking about people, places and the planet.
- Creation of an environment that encourages serendipitous connections between the disciplines of APSC and of other UBC faculties.
- Concentration of APSC programs in order to address critical space shortages.
- Alignment with new curriculum that is developed to produce graduates with an integrated understanding of technology, policy and design.
- Provision of dedicated spaces for engagement with public and private industry programs and communities in order to forge links from APSC out to the world.
- Establishment of advanced and accessible centres of innovation, community-building and engagement that propel Campus as Living Lab priorities.





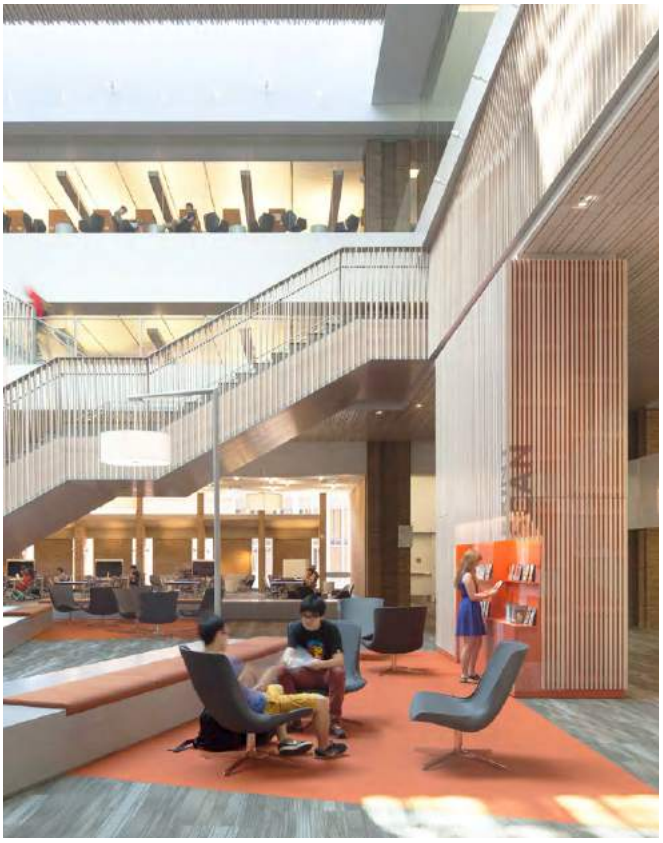
Project Process:

The journey to interdisciplinarity and realizing the mission and vision of Applied One is a long one, starting years ago with the idea of a building, and it will continue well after the building is built and occupied.

The functional program is a critical step in maintaining momentum and offers a chance to focus entirely on space qualities and quantities to support the Applied One mission and target outcomes.

1.1.2. FACILITATING APSC STRATEGIC PLAN

Applied One is a catalyst for integrated research, experiential learning and creative partnerships to solve grand challenges. It is a Faculty of Applied Science building that will help the Faculty realize the ambitious visions outlined in the UBC and Applied Science strategic plans.



Odegaard Undergraduate Library, University of Washington

Shaping UBC's Next Century: UBC Strategic Plan

In 2018, UBC published a new ten-year strategic plan *Shaping UBC's Next Century*. It provides UBC with a vision: *Inspiring people, ideas and actions for a better world and a purpose statement: Pursuing excellence in research, learning and engagement to foster global citizenship and advance a sustainable and just society across British Columbia, Canada and the world.* The strategy is represented by four core areas:

- **People and Places:** creating vibrant sustainable environments that enhance wellbeing and excellence for people at UBC and beyond.
- **Research Excellence:** creating and mobilizing knowledge for impact.
- **Transformative Learning:** enabling learning through evidence-based teaching, mentorship and enriched experiences.
- **Local and Global Engagement:** engaging ethically through the exchange of knowledge and resources for everyone's benefit.

The Shaping UBC's Next Century core areas offer directives for Applied One: it informs how the building will relate to the campus context and support the campus community through the *inspiring spaces* and *thriving communities* strategies; it underscores the importance of creating spaces that maximize collaborative research clusters, knowledge exchange and student research; it defines the need to transform learning experience to foster more interdisciplinary and practical learning; and finally, it prompts us to consider how the building can shape and enable more and deeper engagement with local, global and Indigenous communities.

As a guiding document for the University, Applied One must be aligned with the *Shaping UBC's Next Century*. It is exciting to note that these directives are in alignment with *Transforming Tomorrow*, the Applied Science strategic plan and what emerged during the Functional Program engagement process.

Transforming Tomorrow: Applied Science Strategic Plan

Transforming Tomorrow captures the APSC vision and sets out aspirations for the future. It articulates the diverse voices of the Applied Science community and reflects what matters most to them. The priorities and strategies in the plan form a framework for decision-making and investment across the Faculty.

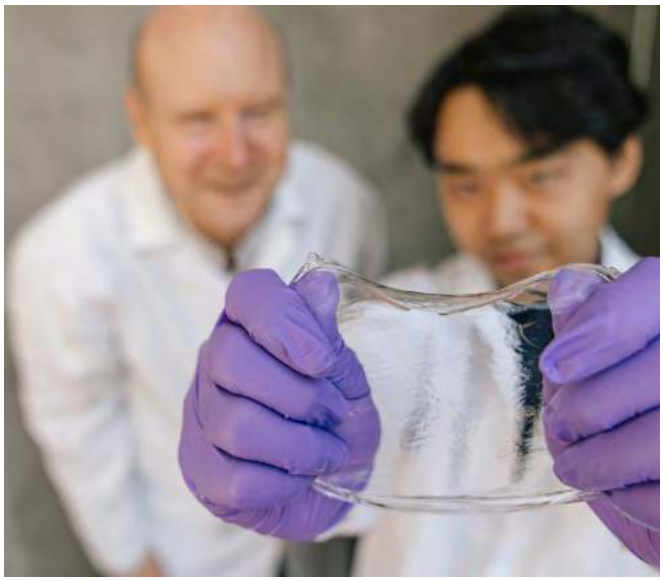
The Applied Science strategic plan also nests under Shaping UBC's Next Century's umbrella. *Transforming Tomorrow's* vision of thriving people, places and planet, and mission of shaping leaders and professionals that shape the world is the distinctly Applied science method of achieving UBC's vision.

UBC APSC strategic priorities are:

- **University for the Future**. Demonstrating innovation throughout the institution from new pedagogical approaches, to administrative processes, to providing lifelong value to students, alumni, faculty and staff.
- **Future of Work.** Equipping students, staff and faculty with the skills to thrive in a rapidly changing professional landscape.
- **Inclusive Leadership and Respectful Engagement.** Fostering the future's inclusive leaders and cultivating a culture grounded in respect, understanding, humility, wellness, balance and joy.
- **Solutions for People.** Developing the health, technology and equity solutions that serve our communities and the individuals within them.
- **Thriving Cities and Communities.** Improving how we move, work and connect to create healthier, safer and more productive communities.
- **Planetary Health.** Spearheading efforts to accelerate global environmental health.

Transforming Tomorrow's priorities encompass the grand challenges of social inequity, climate change, and thriving communities. Tackling these challenges require us to earnestly invest in interdisciplinary collaboration and engagement with the communities we serve. Applied One will offer the armature for this new approach. It is far more than a building; it will be a dynamic, inclusive living laboratory. Here, students and researchers will join industry and community stakeholders in uniting the different perspectives of design, technology and policy.

Leadership and volunteering at UBC within intertidal zones.



Smart Skin hydrogel research at UBC

1.1.3. SITE & CAMPUS CONTEXT

Time Immemorial

Musqueam have stewarded the lands that are now UBC since Time Immemorial. Musqueam Elder Larry Grant described the importance of what is now the UBC campus for the Musqueam, in a 2017 conversation with Scott Steedman of the Tyee. From the article:

> *"Trails criss-crossed the forest, from the river to the inlet. It was a place where we gathered our medicines, some of our foods, and the materials for making houses and canoes."*
>
> *The Musqueam also used the forest for ceremonial and spiritual retreat. "People would go there on their own, or sometimes together, and come to peace, come to terms," Grant explains. "Very much like we take off for a few weeks and go camping somewhere and reflect on our life."*
>
> *Young people were trained in the forest, learning what plants were safe to eat and acquiring the discipline it took to live there. "So it's been a place of learning, of physical and emotional learning, for a long time. As it is today — it's really interesting to see that."*

Applied Science should continue to seek opportunities to listen, learn and unlearn from the Musqueam and explore how Applied One can produce physical and non-tangible design elements that can reveal the Musqueam history, understanding and story of this place.

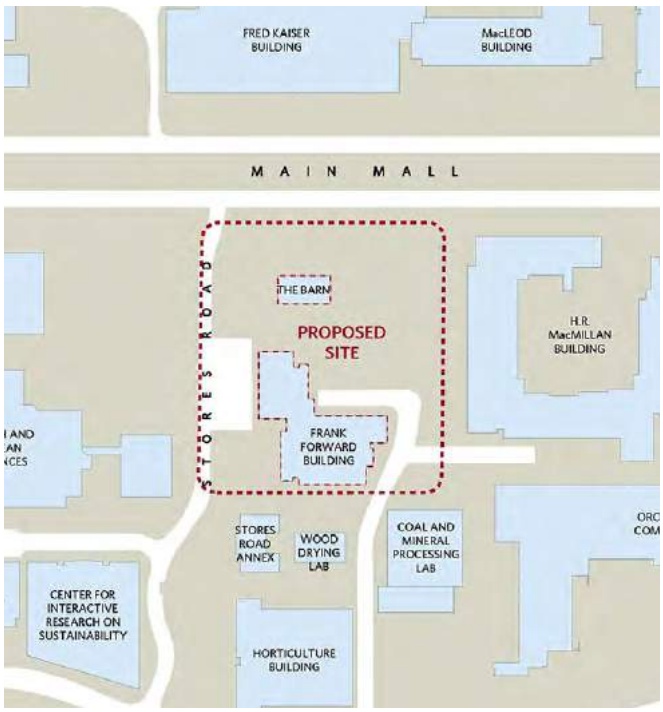
UBC Reconciliation Pole on Main Mall by James Hart

Location and Land Use

The Site recommended for Applied One by the UBC Site Selection Committee is located on Main Mall between Stores Road and the H.R. MacMillan building. The site, directly across from the Fred Kaiser Building, encompasses the current footprint of the Barn building and the Frank Forward building.

The UBC Vancouver Campus Plan identifies the site as located within the 'Campus Core' character district. The Campus Core character district design guidelines specify a maximum building height of 28m. The site is also identified as a 'Pedestrian Priority Zone' with adjacent open space identified as part of the campus 'Commons, Plazas and Natural Areas'.

To maximize efficient use of academic lands the building footprint should endeavor to occupy the site as much as possible, leaving the most land available for the future build out of the site area towards West Mall. The specific size and location of the building, set-backs from the lane and adjacent buildings as well as critical landscape and tree replacement strategies will be confirmed in further consultation with Campus & Community Planning. Programming and design of the new building should emphasize and build on the creation of this new focal point as development of new buildings continues near the southern end of Main Mall.



Proposed Site of Applied One

Landscape

The landscape design should consider the role of indigenous plants and animals in contributing to the development of local ecology and grounding the project in its local culture. Landscaping strategies should be climate-adaptive through use of climatically appropriate vegetation that are resilient to drought and watering restrictions. It should endeavor to retain significant trees and increase biodiversity on campus while providing a safe and usable space to complement internal Applied One activities. The adjacent green area, immediately north of Stores Road, should also be considered during the design process as the design of Applied One will contribute to its sustained use.

The Connected Landscapes initiative is an emerging campus-wide public realm framework which seeks to build on the vision for the campus Knowledge Walks with enhanced east-west corridors that support landscape ecology, integrated systems, inclusion, and Musqueam identity. The Central Connector, part of this initiative, is located adjacent to the Applied One site and consists of an enhanced pedestrian path extending from West Mall to Wesbrook Mall through a series of paths and courtyards. The project is expected to respond appropriately to this initiative which may include specific landscape features.

Trees

The site is occupied by mature trees in multiple locations. The strong avenue of single species red oaks and their continuous canopies along Main Mall are to be maintained. The existing grouping of trees surrounding The Barn building includes specimens of five British Columbia and Point Grey native species: western redcedar, douglas fir, western hemlock, grand fir and red alder and should be thoughtfully considered and maintained where possible. Any tree removal should consider actual eco-system services being provided as well as the natural element's cultural and social values determined through engagement with the Musqueam. A landscape enhancement plan that contributes an equivalent or greater ecosystem service to any natural asset being removed and aligns with the cultural values of the Musqueam will be critical.

Site Services

Energy and Water Services (EWS) and Building Operations have confirmed that there are generally adequate services in adjacent utility corridors to service the new facility. Should the site boundary expand to include the Potential Additional Site Area as previously described, site servicing upgrades may be required.

Existing Structures

The proposed site encompasses two existing structures: the Frank Forward Building and The Barn. The Frank Forward Building was recommended for replacement in UBC's Seismic Resilience Plan of 2019 as it was determined not to be suitable for remediation. The Barn facility is identified in "UBC Campus Historical Context and Themes" (2009) as contributing to heritage themes. A Statement of Significance is required for the Barn.

Immediately adjacent to the site area are three additional existing structures: The Stores Road Annex, Wood Drying Laboratory, and the Coal and Mineral Processing Lab. These existing buildings will require specific planning considerations to ensure undisturbed operation, and to explore public realm and site servicing integration strategies. The Stores Road Annex is identified in "UBC Campus Historical Context and Themes" (2009) as contributing to heritage themes. A Statement of Significant is required for the Stores Road Annex.

In addition to the structures noted above, the Applied One site selection report from August 2022 calls for exploration of impacts on adjacent buildings and for the inclusion of the Landscape Architecture Annex in the above-mentioned Statements of Significance to understand the collection of early agriculture research buildings at the south end of campus.

UBC Vancouver Campus

1.1.4. APPLIED ONE THROUGH DIFFERENT LENSES

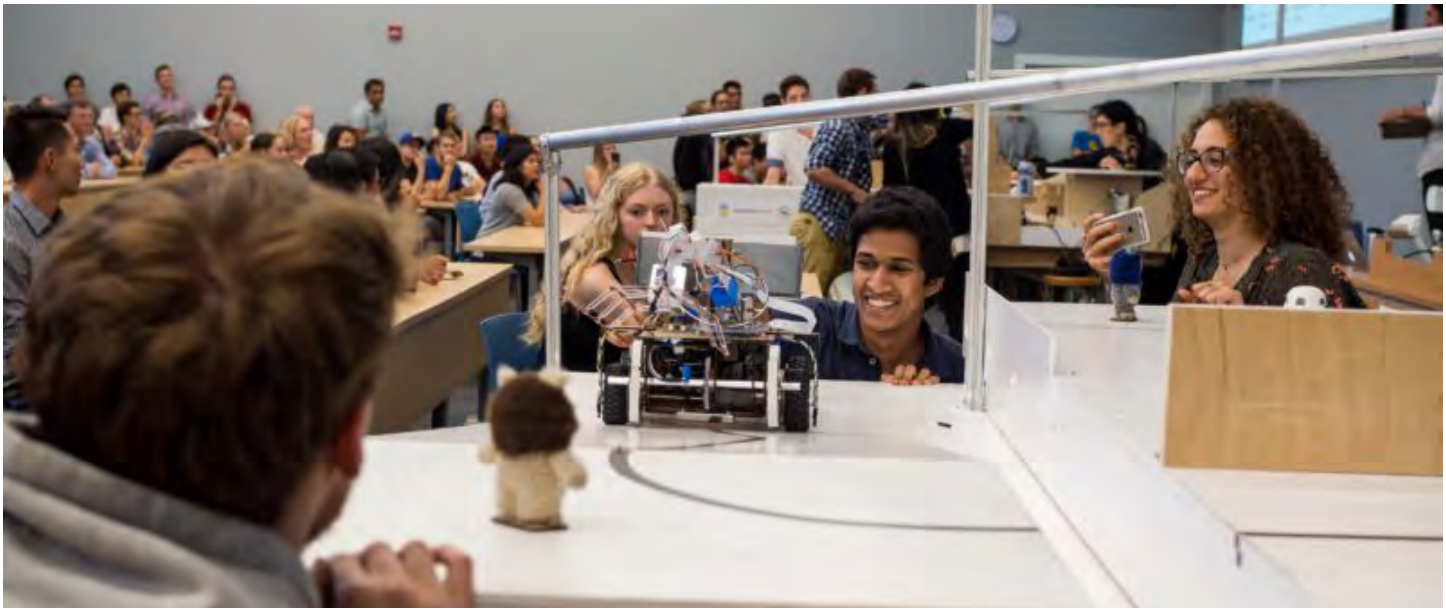
The mission of Applied One is to deliver exemplary interdisciplinary research and teaching in the domains of technology, design, community engagement and policy through the use of world-class spaces in order to affect transformational change locally and across the globe.

-Faculty of Applied Science

Re-Writing the Rules

The Faculty of Applied Science acknowledges that we've outgrown the traditional model of academics. Across the world, higher education programs have become hyper-specialized and "siloed." At the same time, society's problems have become increasingly interdependent and complex. Applied One upends the "silo" paradigm by transforming the career-focused framework universities have been perpetuating. Instead of rewarding advancement in insular disciplines, APSC is focused on combining the varied perspectives of applied science to benefit people across the planet. We're incentivizing researchers to work together in a space that's custom-built for intentional and productive interaction. We're creating experts whose common specialty is solving problems together—problems no one could solve on their own.

Through Applied One, the Faculty of Applied Science is transforming from a place where one collects knowledge to an inclusive group of people committed to shared action. It is a bold new model of what education must be, one that maximizes innovation and impact. To support this transformation, the functional program for Applied One was framed intentionally around shared activities. This allowed for a focus on activities and outcomes that cut across disciplines and encourage people to embrace interaction and the de-siloing that will occur as the focus becomes solving problems together.



UBC Engineering Students learning through making

Enable Interdisciplinary Research

Understanding common activities that researchers need to be successful in their work is critical to breaking down silos and helping people connect. Legacy space allocation and historic planning metrics are being rethought as academic units review opportunities for shared space. Modeled after commercial STEM facilities, new academic research environments across the world are being designed to provide variety with visible lab spaces complemented by adjacent areas for casual interaction and collaboration, allowing students or researchers to leave the lab but continue to work together.

The objective is to de-silo research lab environments that are historically hierarchical and silo-ed with a network of adaptive and collaborative spaces. With this tactic employed, interdisciplinary research at Applied One will be supported through open labs with flexible casework, easy to modify utility distribution systems, equipment on wheels, assignment based on research duration and type, and supportive areas in close proximity that will form a laboratory of collaboration that feeds the collective future of APSC and grows with the Faculty.

Support Interdisciplinary Learning

The future of work requires collaboration, learning across career continuums, experiential learning and entrepreneurial thinking. With spaces such as large lecture classrooms, flexible learn labs, design studios and capstone spaces, the program includes spaces that enable a new curriculum, a curriculum that integrates learners across the Applied Science disciplines and prepares them for life after graduation. Reimagined and reconstructed educational spaces will bring together students, faculty, industry and especially community as members of solution-focused project teams, furthering APSC's commitment to address the world's most complex, globally reaching challenges.

Working in separate siloes with very strong individual identities but zero collaboration.

Starting to collaborate by sharing specific spaces and having areas of overlap between disciplines while maintaining individual identities.

Generating interdisciplinary research projects and curriculum that reinforce the identities of each discipline - becoming stronger together.

Applied One as a catalyst for transformational departmental advancement – evolution from silos to integrated whole

1.1.4. APPLIED ONE THROUGH DIFFERENT LENSES

Design From the User Out

In its process and expression, Applied One is proactive in supporting physical, mental and community health and comfort. The design and engagement process centres the participation of end-users and collaborators in defining how spaces can support learning, research, working and social needs.

Identity: APSC & Academic Units

Applied One is a beacon facility for all of Applied Science. We form our identity by the depth of knowledge present in our research and the breadth of impact of our Faculty. Applied One makes what we do and how we do it visible to others. It will celebrate the achievements of Applied Science through defined spaces for collaboration, communication and display.

Applied One will be an outstanding new facility for the people who make up the collective Applied Science identity, while also facilitating and enabling the many other characteristics and identities of all Applied Science members.

The functional programming process focused on how to balance the need to support and foster the identities of academic disciplines and programs and reinforce what makes them successful in their pursuit of knowledge and research. It also acknowledged that there are critical nested scales of community: from small student groups to academic unit micro-communities to APSC as a whole and to the full UBC community. Across all of the activity categories, the program includes a variety of spaces at different scales that support group, class, faculty, student, and community activities and provides spaces that energize on-campus communities, and encourages interactions with visitors from around the globe.

Applied One Functional Program includes:

4,200 net-square-metres **of shared lab, studio and workshop space.**

15% **of the overall program is dedicated for inter-disciplinary research.**

2,600 net-square-metres **dedicated to building community through meetings, hybrid connections, and conversations between engineers, planners, and architects that centre climate, health, and social inequity**

Assumptions guiding the totals above

- *Research spaces (labs, studios, workspaces) assigned to academic units are not included in the total for "inter-disciplinary research", as they have a primary function of supporting the work and research of SALA, SCARP, Mining, and Materials.*
- *Workspaces, gathering places, and sharing venues will be critical to supporting interdisciplinary interactions, but are also not included in the total for "inter-disciplinary research".*
- *Areas dedicated to "building community" include spaces identified as for informal learning, collaborating, event, and exhibition.*

"If we want to reach sustainability targets, we'll need as much copper in the next 30 years as we have produced in the whole of human history. For that, we'll need people trained in multiple ways of thinking who can break down the old silos of specialization."

-John Steen

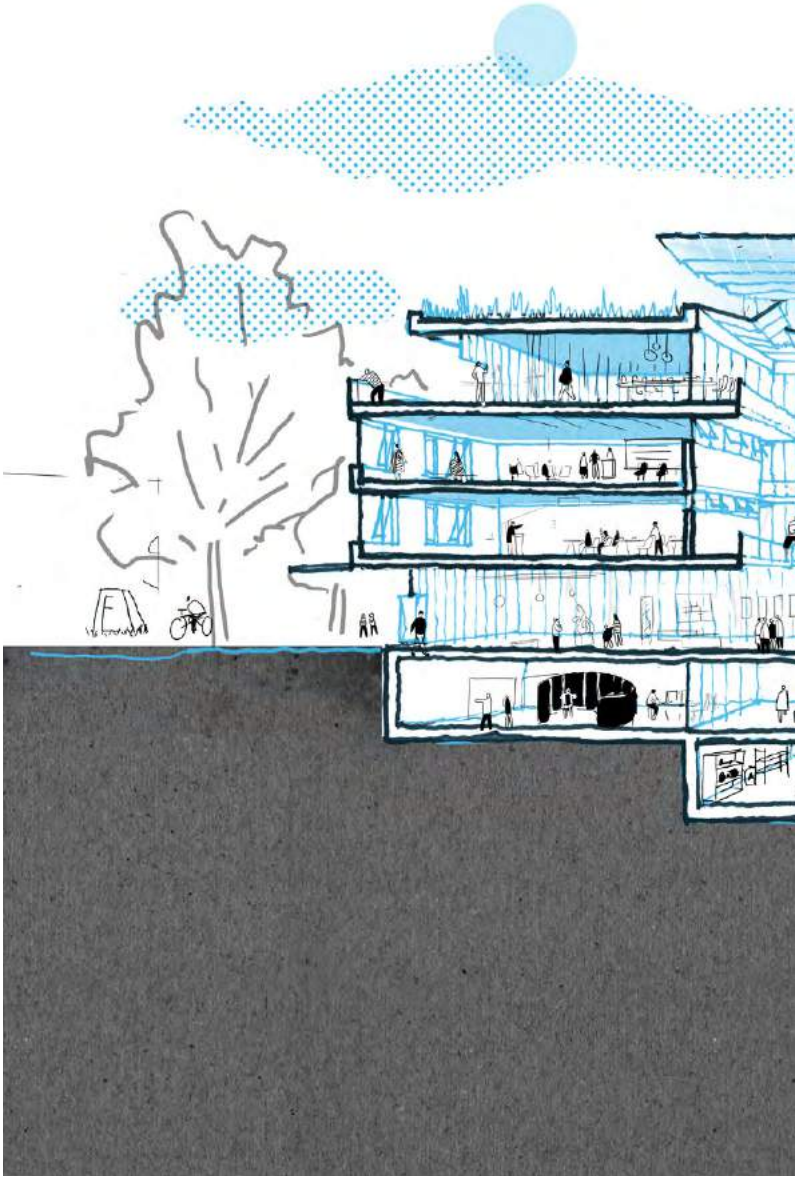
Associate Professor, Director of the Bradshaw Research Initiative in Minerals and Mining (BRIMM), and EY Distinguished Scholar in Global Mining Futures

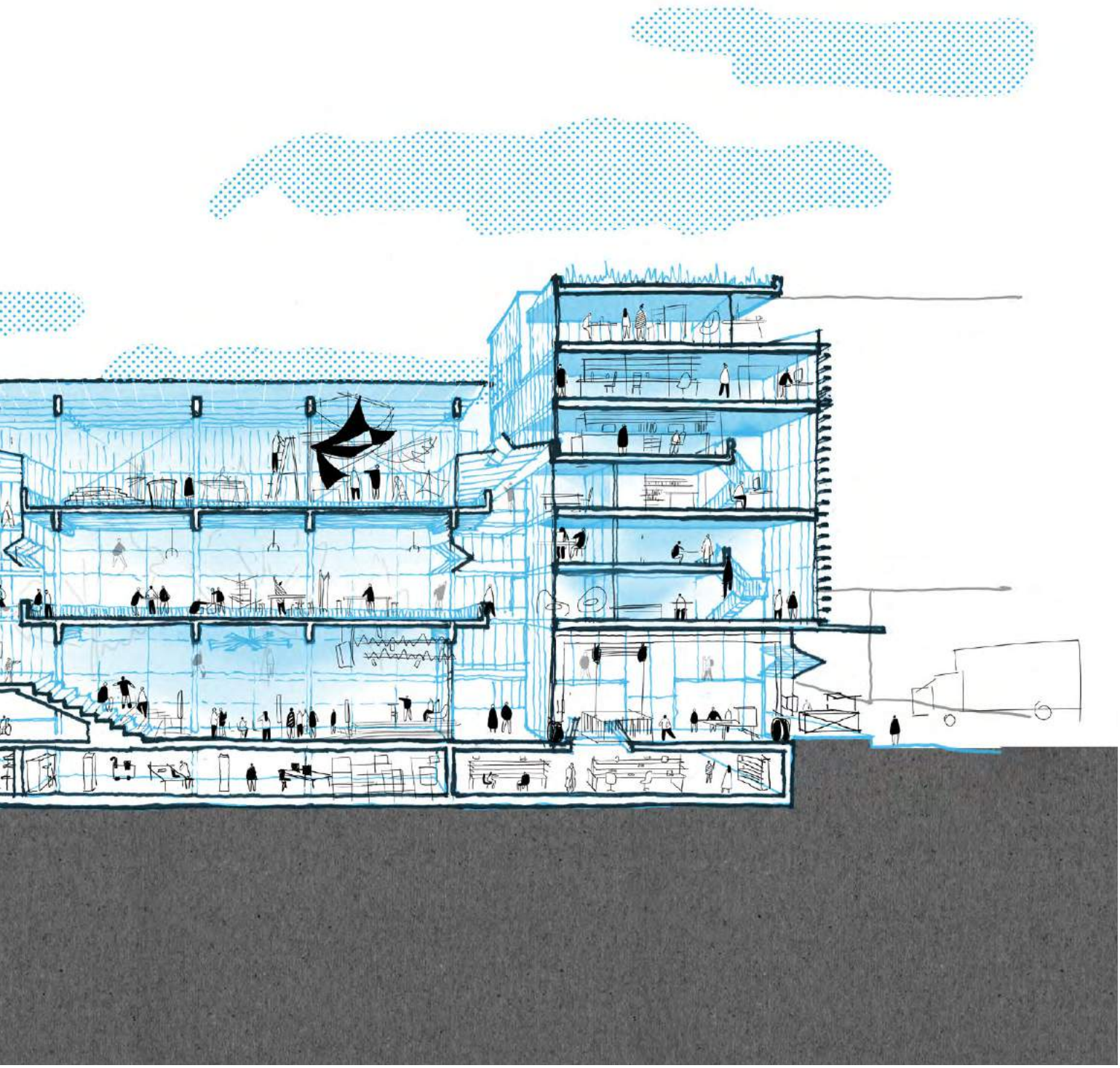
1.1.4. APPLIED ONE THROUGH DIFFERENT LENSES

Interdependence of Spaces

Applied One will be part of a network of spaces within the campus setting. The Applied One Feasibility Study articulated that it is critical to connect to existing campus flows by leveraging physical and intangible connections to the campus. The same concept is applied to the spaces within the building; each room should be considered for its role as an interconnected network of spaces within Applied One. This is critical to ensure each space supports a variety of activities that all users conduct throughout the day.

Section 3 “Program Groups” offers a representation of the program through this lens, framing intentional groupings of spaces that support a set of activities and uses. Studio spaces, for example, exist as part of a hands-on, project-focused learning environment with 15-person studios surrounded by space for critique, design review, meeting and gathering. The building section to the right intentionally shows the potential of this interdependent network of spaces at the scale of the entire building. This organizational logic can be used in future design phases to further explore programmatic adjacencies as well as opportunities to reinforce connections between users and departments.





Applied One, East-West Site Section from Feasibility Study

1.1.4. APPLIED ONE THROUGH DIFFERENT LENSES

Equity, Diversity, Inclusion and Indigenization Principles

Applied One will embed equity, diversity and inclusion in the design of space to be welcoming to all. Through the design, engagement and procurement processes, we will invite a broad range of voices to contribute to the definition of welcome.

Equity, Diversity and Inclusion are central principles for APSC's planning and delivery of programs, standards for workplace culture and spatial design. Historically, program spaces were designed to support the "average" student who was typically defined as able-bodied, cis-gender and male. Through design improvements, Applied Science has been challenging who is an "average" student. The engagement process must continue to uplift the voices of groups who are underrepresented in the Faculty in order to define an appropriate process for engagement and to co-generate design outcomes. Where relevant, the outcomes of this process will inform other APSC projects, seeking to help understand:

- **Social Sustainability** - Social sustainability weaves together elements from both the physical and social realm to create spaces that promote wellbeing, inclusion, and community cohesion. How does the building embed social sustainability into the project, prioritizing principles of equity, diversity, inclusion and Indigeneity to create a welcoming space for all?
- **Belonging** - How does the building promote activities that foster inter-cultural trust and individual belonging?
- **Opportunities and Barriers** – What ways has the built environment presented opportunities for, or barriers to, feeling welcome and included?
- **Accessibility and Universal Design** - What ways can the built environment support communities representing spectra of abilities and disabilities?
- **Childcare** - How can academic environments support working parents and support interconnection across generations of humans on campuses?
- **Ongoing Feedback** – How does the building remain responsive to its occupants?

The Applied One program includes areas of space grounded in physical, mental and spiritual health. In addition to specific spaces, the following themes were supported during community engagement, and can guide the future design of the building to ensure success:

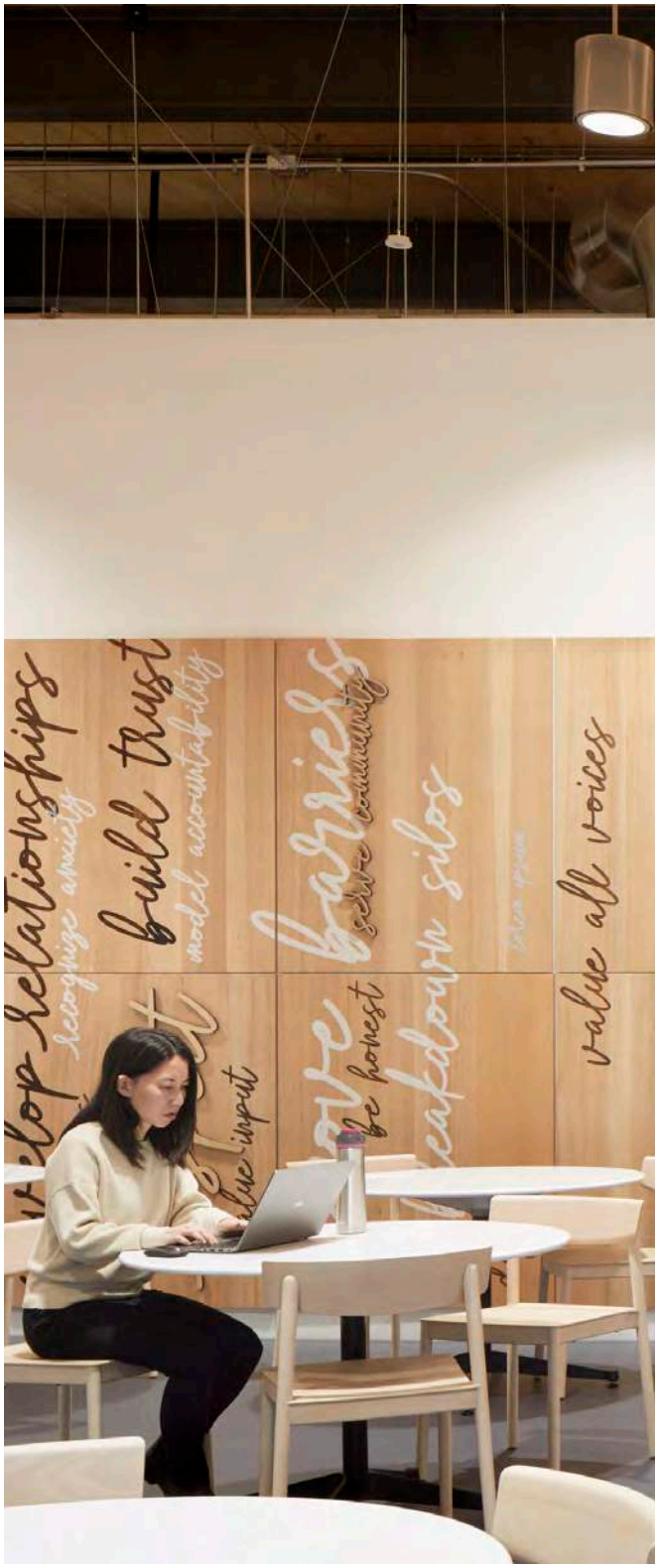
- **Social spaces for all scales of culture building.** Shared social spaces are important for fostering relationships across discipline, role and identity. Defined spaces for sub-communities are also valued for their role in shaping one's identity and sense of belonging. Assigned space for culture building at all scales will be important for building a collaborative ethos within Applied One.
- **Space designated for quiet.** Finding a quiet space to study, work or rest shouldn't be difficult. While these spaces may not need to be reservable or enclosed, they should be defined as quiet zones, and should have many electrical outlets.
- **Intentional space for collaboration.** Just as individual work spaces require a space free of distraction, so do collaborative spaces. Spaces that can be reserved for group work or study that are equipped with virtual and analog collaboration tools (moveable furniture, whiteboards, videoconferencing, electrical outlets) would contribute to the success of collaboration spaces.

UBC's Musqueam Pole

- **Human health is human comfort.** Maximize human health through design. Natural light, greenery, thermal comfort, ergonomic furniture, fresh air, and acoustic performance are essential attributes of human comfort and they contribute to human health and wellbeing. Spaces currently identified such as wellness rooms, prayer and reflection space, inclusive washrooms, and childcare will go a long way, but campuses are considering what else buildings can offer to support the people who occupy them.

Applied One will embed EDI.I in all of the decision making and as a key consideration in all conversations. Seeking to understand what the structural and motivational barriers to students and faculty are and what are the issues specific to under-represented communities that need to be addressed (BIPOC students and faculty, first-generation students, students facing homelessness, adult learners, etc.), campuses are strategically asking what helps students and faculty feel that they belong and framing project solutions with program, architecture, and site to support that.

- It is critical to separate Musqueam from broad Indigenous engagement and from EDI. We are in the process of inviting Musqueam to partner in this effort.
- Students value extended hours of access to study spaces, workspaces and shops for use after class. Access should be considered alongside custodial, safety and risk procedures.
- Space qualities, relationships, and new investments in space types can all represent equity and inclusivity.
- People need to see themselves in spaces and be invited. For example, do Indigenous elders have culturally appropriate space for conducting teaching and student support?
- Resources for mental and spiritual health need to be easy to access during exams, classes, from offices, and public spaces.
- Cost of attending university is an equity issue - consider needs of students who commute, how individuals store and share meals, what people are bringing with them as they move about during the day, how classrooms can facilitate remote attendance.
- APSC academic units have ties to Indigenous peoples. As the academic units and APSC continue to look for ways to shift curriculum and activities, planning for Applied One can look for how activities and individuals might be better supported in teaching, research, learning, making, and ceremony and how Indigenous groups could be engaged to impact the design.



Health Science Education Building, University of Washington

1.1.4. APPLIED ONE THROUGH DIFFERENT LENSES

Welcome and Collaborate with Partners + Community

Through the purposeful design of meeting and event spaces at all scales, Applied One offers an invitation to collaborate with internal and external partners.

Work on Display - Applied One will provide more space for more students and more collaborative advancement. It will give us time and space for the deliberate and chance interactions that are the essential ingredients of revolutionary ideas. With large open flexible spaces like research bays, lobby and entry spaces, and a gallery, Applied One will act as an interpretive centre, a venue for speakers, a place for panel discussions and single dynamic speakers, offering new ways to engage broader communities and bring big groups together. Applied One will be designed around principles of pedestrian movement and connectivity, where student and faculty research is present and visible so that incoming students, visitors, guests, donors or industry recruiters and partners are surrounded by dynamic representations of current projects and initiatives.

Universities have created learning spaces that can take you, virtually, into worlds as varied as a temple in Egypt, an ancient copper smelting site in Jordan or an underwater cave system on the Yucatan Peninsula. Spaces like this can strengthen the use of digital and virtual environments and increase interactions between students, researchers, and industry. Critiques and reviews when tucked into departmental spaces have to work to be interdisciplinary and visible. Spaces like galleries and critique rooms will increase chances for mixing between disciplines and guests from UBC, Vancouver, and the region.

Applied One will embrace process as much as product, with storage of materials as well as display of work as part of experiential learning. This can be critical to students understanding how ideas turn into reality. Whether exploring a new climate technology or rapid-construction methods, students will experience the future in real-time.

Applied One Functional Program includes:

3,200 net-square-metres **and 1,100 seats to host events.**

500 net-square-metres **for curated exhibitions of student and faculty work in dedicated galleries, critique spaces, and flexible public and corridor shoulder spaces**

Assumptions guiding the totals above

- *Event spaces include large Commons areas such as the Gallery and Lobby as well as a selections of Teaching spaces such as large classrooms and theatres*

Mycelium Mockup - UBC SALA, Joe Dahmen

UBC C-Shore Pavilion - SALA Design Build

1.1.4. APPLIED ONE THROUGH DIFFERENT LENSES

Support Social Connections and Community in an Academic Workplace

With a drive to bring interdisciplinary groups together, paired with increased demand for utilization of space on campuses, historic planning metrics and norms are being revised as campuses start to explore new ways to balance dedicated and shared space. Understanding common activities that humans need to be successful in their workday is critical to breaking down silos and helping people connect. New designs offer a huge opportunity to craft spaces for collisions and engagement within and between teams. Defined spaces for sub-communities are also valued for their role in shaping one's identity and sense of belonging. Assigned space for culture building at all scales will be important for building a collaborative ethos within Applied One.

UBC APSC Students

Open House Event, Kendeda Building, Georgia Institute of Technology

The following design criteria will support social connections and community:

- **Variety of Flexible Space.** Instead of a one-size-fits-all office size, Applied One will offer a blend of enclosed and open spaces offering more variety and opportunities to reduce dedicated and inflexible space allocation.
- **Variety of Formal and Informal Meeting Space.** With a reduction in dedicated assigned space, meeting spaces become more important. A balance of open, unreservable meeting spaces with scheduled meeting rooms to support all types of in-person and virtual collaboration is required.
- **Encouraging Movement.** Supporting active lifestyles along with encouraging movement throughout the day.
- **Wellness Spaces.** Mental health and wellbeing will be supported through the inclusion of well-considered washroom accommodations, wellness spaces, lactation spaces, prayer and reflection spaces, and childcare.
- **Democratization of Daylight.** Ensuring that access to daylight is democratized and either natural daylight or borrowed light is available in all spaces occupied by people when appropriate.
- **Healthy Building Materials.** Warm and natural materials to support occupant health and wellbeing.
- **Gathering Around Food**. Gathering with food to support social interactions is important in APSC and there are significant areas in Applied One for this purpose. This can mean everything from conversations over coffee to an academic unit celebrating a research accomplishment in a dining area.
- **Kitchens as Social Spaces.** Students, faculty, and staff need to eat and drink. Investments in kitchens as social spaces, creating a “dine- in” culture are increasingly common. These could be faculty gathering areas, discipline specific, or student focused.
- **Interdisciplinary Social Spaces.** Socialization within and between research groups and academic units is now an important planning factor. Interdisciplinary connections and community are supported by spaces where humans can gather, talk, share, and collaborate. Spaces with comfortable seating, moveable furniture for impromptu coffee breaks and quick conversations are critical to balance the focused work spaces.

Student-built project at Iowa State University

1.1.4. APPLIED ONE THROUGH DIFFERENT LENSES

Regenerative and Net-Positive Design

Applied One strives to offer net-positive contributions to human and natural systems. This work is guided by UBC's 2020 Climate Action Plan, UBC Green Building Action Plan, the 20-year Sustainability Strategy, and the UBC Water Action Plan, among others.

In support of the UBC Green Building Action Plan the University is committed to a holistic pathway for buildings on the Vancouver campus to advance towards making net positive contributions to human and natural systems. All major capital projects at UBC must achieve LEED Gold certification and meet aggressive targets for energy and emissions, water, materials and resources, climate adaption and health and wellbeing. UBC-specific accessibility guidelines to ensure meaningful building access are under development.

SALA Professor Blair Satterfield offers an example of what Applied One can uniquely achieve. In the tiny HiLo lab he directs, architecture and engineering students were aghast at how much wood was wasted by Vancouver's rapid real estate turnover. Together, they conceived an inspired technique that transforms scrap lumber into a kind of wooden zipper. This novel process turns discarded 2x4s into elegant curving shapes that make sophisticated, strong architecture possible. Their collaboration—neither engineering nor architecture, but problem solving—rewrites the rules of construction. This is what a small interdisciplinary team with limited resources and space already accomplishes. Now imagine what we can make real with Applied One.

The baselines are shifting for academic spaces, with increasing demand for sustainable and regenerative spaces, interdisciplinary research, and planning for uncertain futures. Aggressive targets and an integrated approach to sustainability can be embedded from the planning stages throughout the design process, impacting everything from the programmatic organization to the design of the building enclosure.

In a rapidly-urbanizing world, climate action is irrevocably tied to decarbonizing the built environment sector; as a collection of all disciplines who are involved in the creation of built environments, the Faculty of Applied Science at UBC is uniquely positioned to become worldwide leaders in this task. Furthermore, the Faculty's deliberate interweaving of culturally-appropriate and community-centered curricula with cutting-edge technological innovation is positioning its students to directly address the social impacts of innovation, actively working to dismantle historical structures of injustice.

At its core, Applied One strives to be net-positive within natural as well as human and economic systems. In its environment, this project takes a proactive stance to heal more rather than harm less. The intertwining of design elements that advance site, architecture, program, regeneration and culture simultaneously is an opportunity to demonstrate the commitment of the Faculty of Applied Science to creating regenerative built environments that go beyond "sustaining" the status quo.

The Bullitt Center PV Array, Seattle WA

Zippered Wood Pavilion, HiLo Lab

They Grow With Us, Mycelium Furniture, AFJD Studio

"If you believe climate change is a human crisis that exacerbates inequity, then you know we need a new kind of professional capable of addressing such world-scale problems. You need more than traditional architects or engineers or planners; you need professionals with shared competencies across design, technology and policy."

-James Olson, Ph.D.
Dean and Professor, Faculty of Applied Science

1.2. FRAMING THE FUNCTIONAL PROGRAM

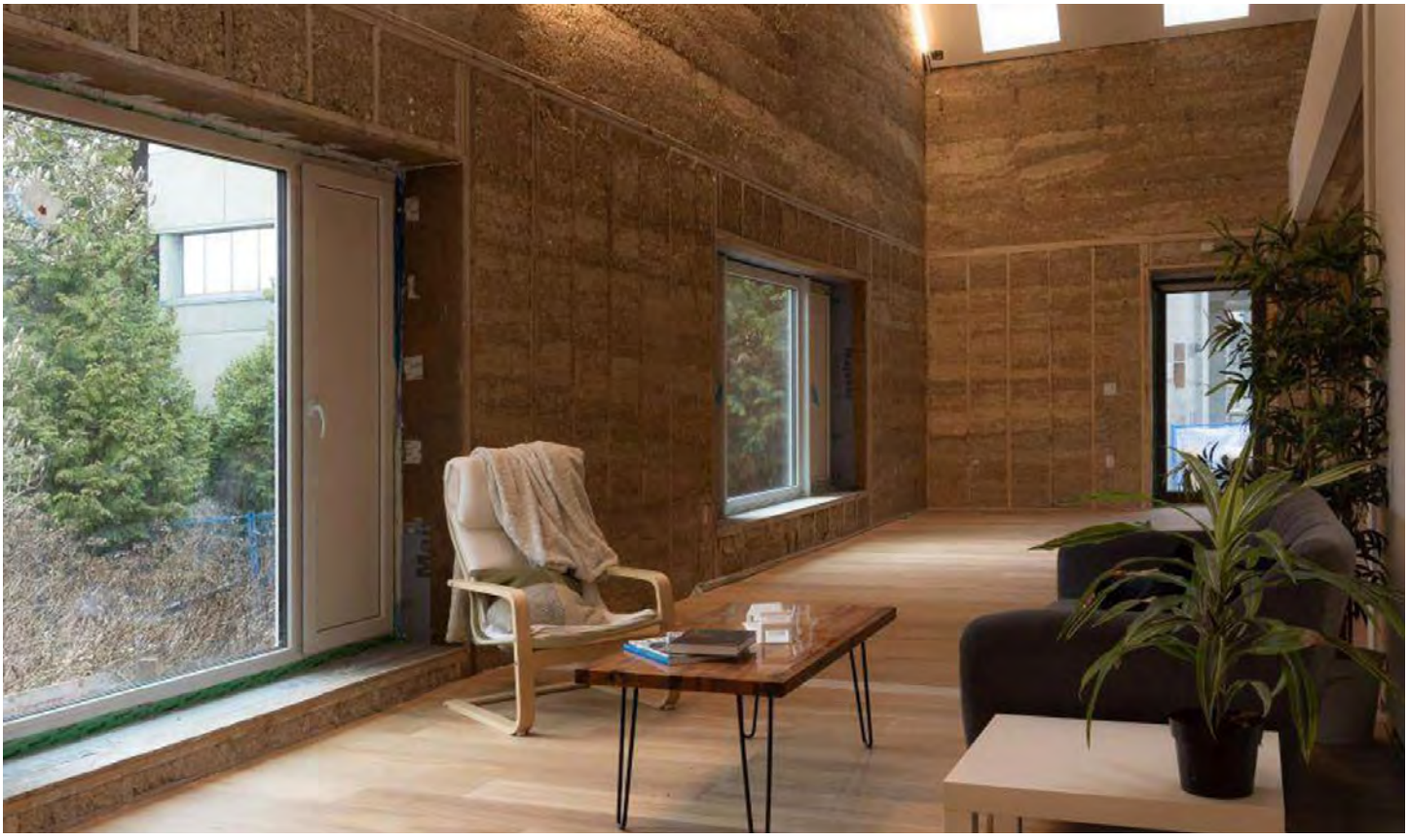
1.2.1. PURPOSE OF THE FUNCTIONAL PROGRAM

The Project Planning phase for Applied One is a critical element for success – this phase determines its values, goals and the way they are realized. The Functional Program describes space types, activities and room areas needed to realize the mission of Applied One. The program will provide space to support the current functionality of the main tenants while planning for the future to ensure spaces will be flexible and inclusive for years to come. The design phase will follow project planning and finally construction.

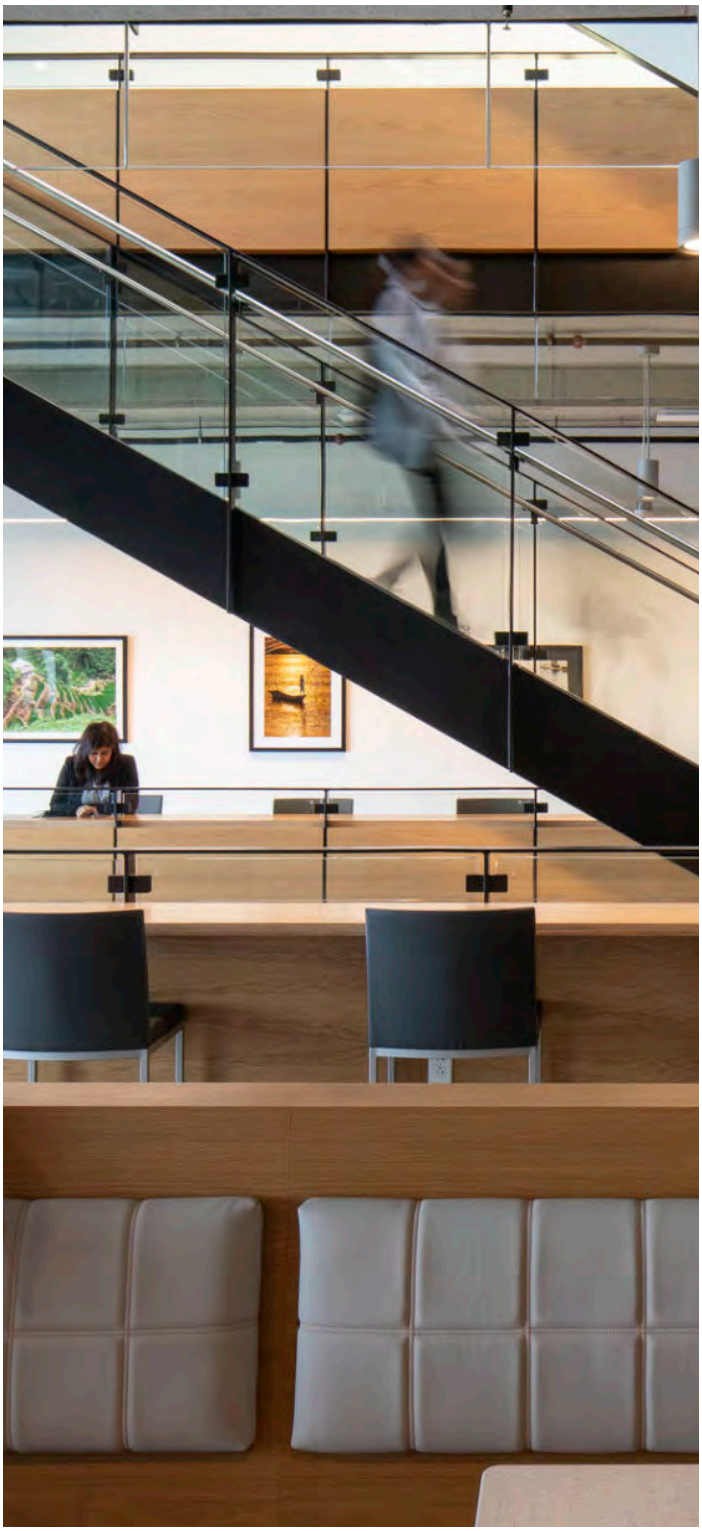
Due to its complexity and ambitious objectives, the planning and development of Applied One Is expected to take several years.

The development of the Functional Program occurred between May, 2022 through December 2023, with the help of Miller Hull and Local Practice (MH-LP). This report has been developed to document functional program-level information for Applied One. This Functional Program document serves a range of purposes; it:

- Provides the design team, users and management with a document summarizing key functional, operational and spatial requirements for the project in sufficient detail to initiate schematic design.
- Summarizes key functional and operational needs for each of the spaces, organizing concepts and spatial requirements in sufficient detail for preliminary planning.
- Provides project approval and funding authorities with information on which to base preliminary capital cost and operating requirements.
- Provides a reference manual that can be used to assist in the development of organizational policies, new services and new operational procedures for the project.



Third Space Commons, Third Quadrant Design - An ultra low carbon hempcrete building by an interdisciplinary UBC student design team



Hans Rosling Center for Population Health, University of Washington

Lecture Hall, Kendeda Building, Georgia Institute of Technology

1.2.2. STAKEHOLDER ENGAGEMENT PHASES

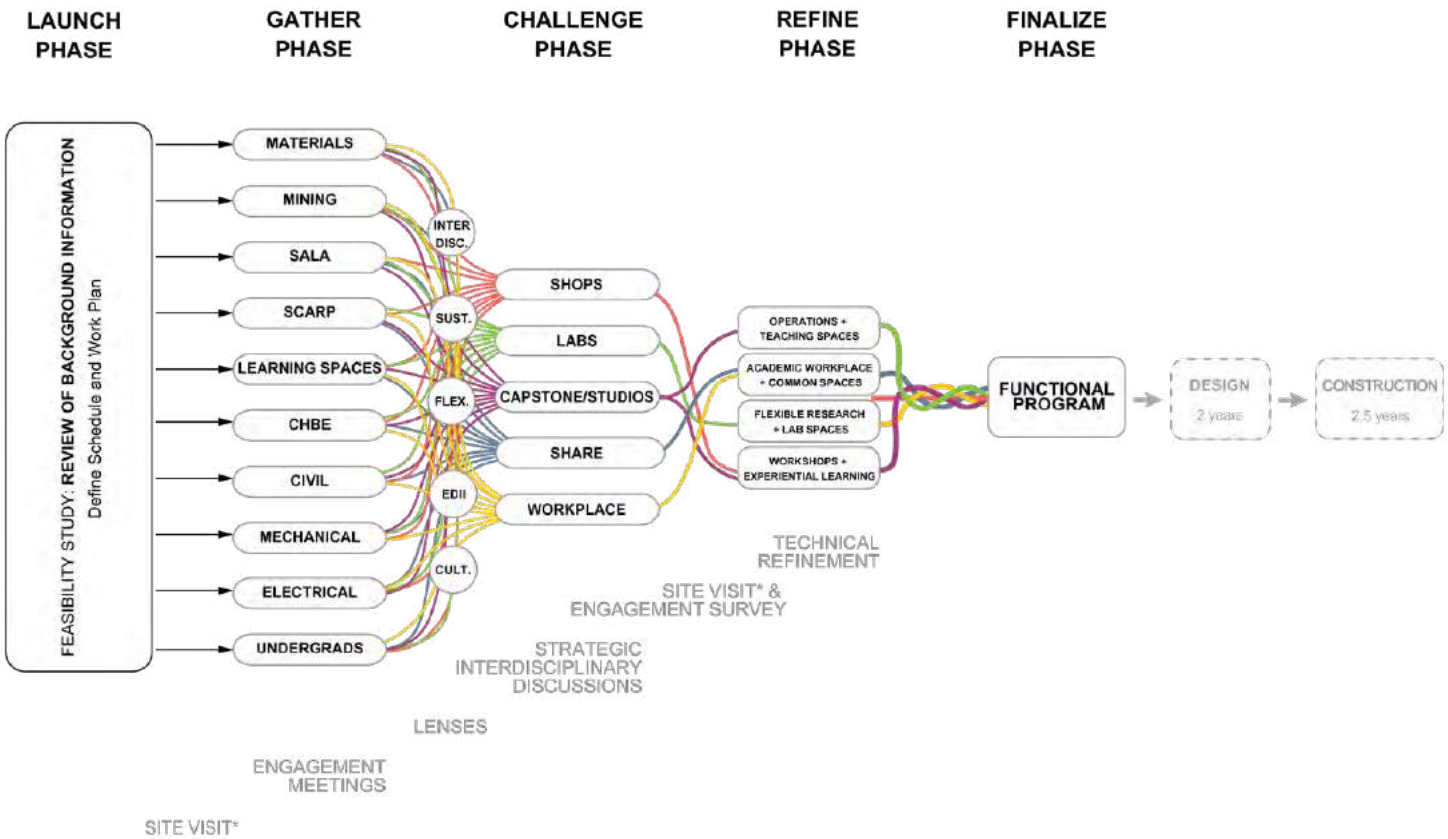
Stakeholder Engagement

The Functional Program process is a catalyst for change: from a culture of siloed disciplines to one of interdisciplinary collaborations that aim to solve world problems. The functional program process must be sensitive to the needs of the facility occupants and understand the intricacies of the campus existing facilities functioning. Stakeholder engagement was a critical exercise to build the team's understanding of needs, current conditions and future opportunities.

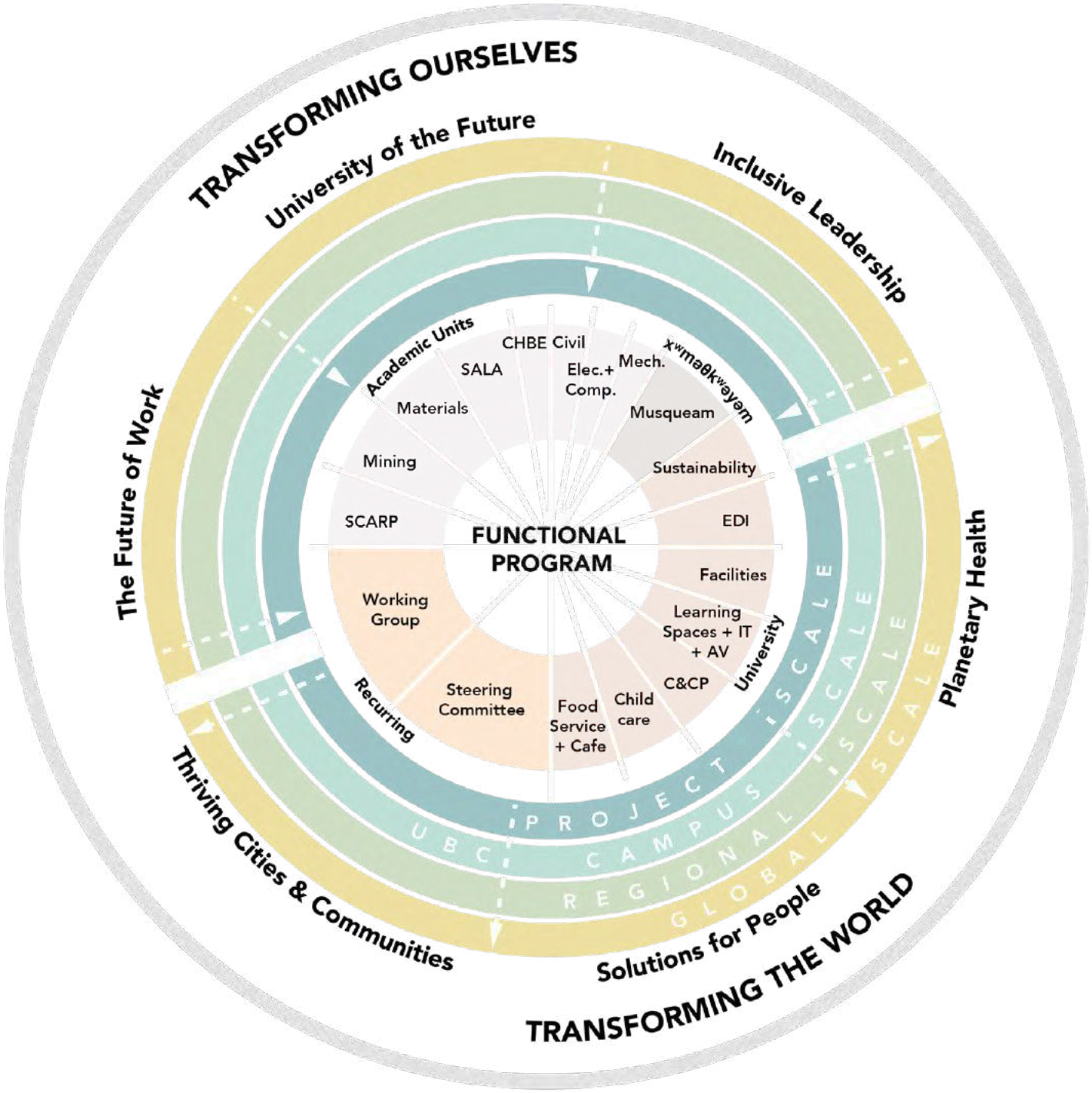
The main academic units that will occupy the building are SCARP, Mining, Materials and SALA with other APSC units having access to shared and communal spaces. The engagement involved students, faculty, and staff from the main academic units and across Applied Science to ensure that spaces would be welcoming and inclusive of APSC groups in addition to industry and community partners.

Building on stakeholder feedback from the Applied One feasibility study, The Miller Hull - Local Practice (MH-LP) team led an interdisciplinary process through each phase, together with the Project Team, comprised of Faculty of Applied Science and UBC Facilities representatives. The diagram below shows the stakeholder engagement across the project process. The engagement process made use of targeted interviews, group meetings, interdisciplinary workshops and a faculty-wide survey to inform the project team of user requirements. Once a month, the project team also met with the Applied One Leadership Working Group, which helped align the functional program process to Applied Science and university priorities.

The project phases and engagement process are outlined in the following pages.



The diagram above illustrates the strategy and key milestones for the engagement process of weaving together input from all critical voices toward a cohesive functional program for the project.



The diagram above captures the critical voices and key participants invited to help craft the detailed program. The aspiration of this project is not to recreate yesterday's narrative, but to create future ways of working. All who came to the discussions were asked to hold dear the voices that could not have direct representation at a project, campus, regional, and global scale to ensure the building is set up for the future.

1.2.2. STAKEHOLDER ENGAGEMENT PHASES

Phases

In order to achieve the Functional Program goals, the project was divided into five phases: Launch, Gather, Challenge, Refine and Finalize (further described in the graphic below).

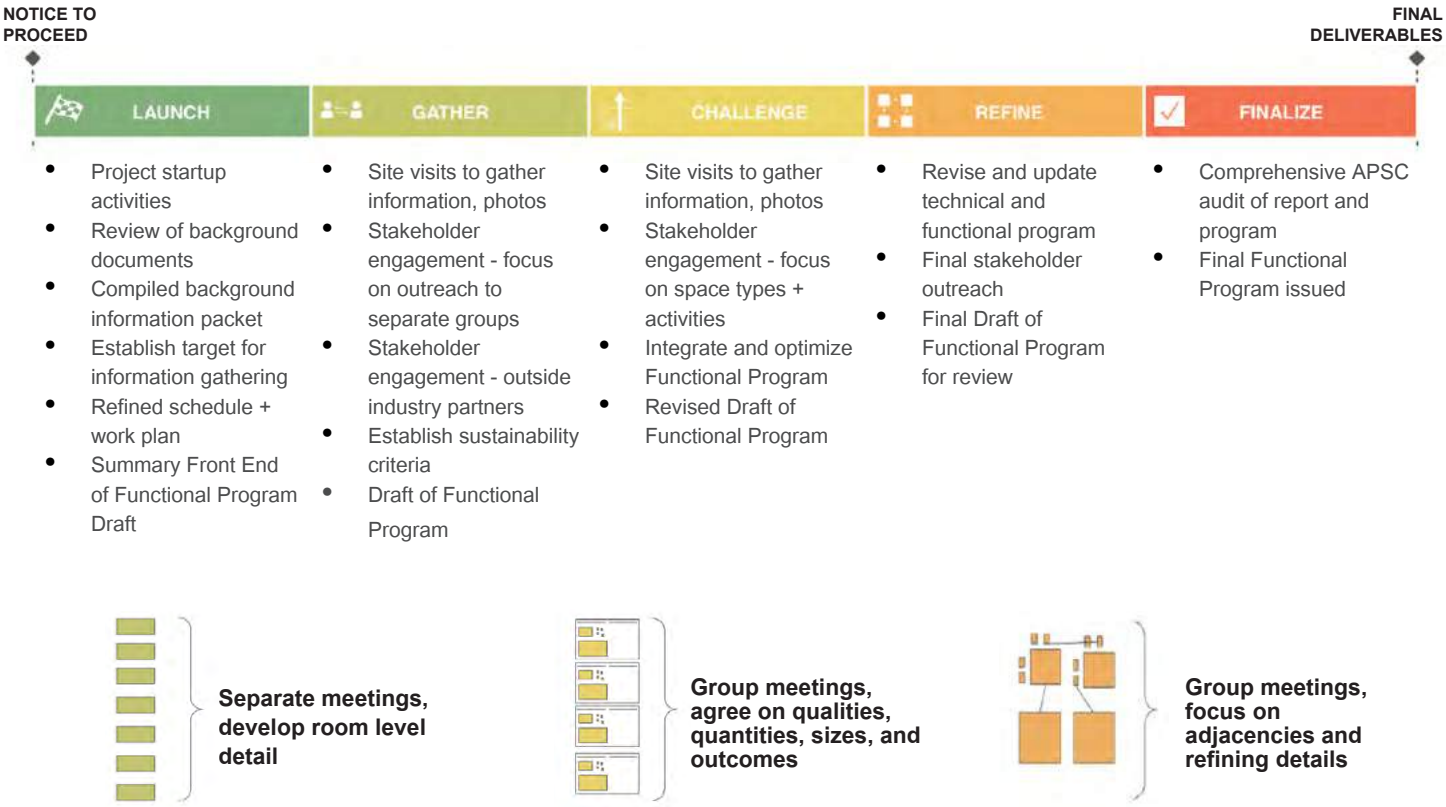
Phase 1: Launch

During the Launch phase, the MH-LP team generated a work plan and visited all the spaces dedicated to affected academic units in current buildings.

Phase 2: Gather

The primary purpose of the Gather phase was to listen to a broad group of representatives in order to align the Functional Program to the needs of end-users. This engagement phase unfolded over 18 virtual interviews with stakeholder groups from:

- Department of Materials Engineering (MTRL)
- Norman B. Keevil Institute of Mining Engineering (MINE)
- School of Architecture and Landscape Architecture (SALA)
- School of Community and Regional Planning (SCARP)
- Department of Chemical and Biological Engineering (CHBE)
- Department of Civil Engineering (CIVL)
- Department of Mechanical Engineering (MECH)
- Department of Electrical & Computer Engineering (ECE)
- Learning Spaces
- Campus & Community Planning (C&CP)
- APSC Equity, Diversity, Inclusion + Indigeneity (EDI.I) Leads



Phase 3: Challenge

The Challenge phase was a turning point. The MH-LP team not only listened, but also tested boundaries between current practices and what could be done differently. With that in mind, the engagement meetings were strategically organized to host cross-unit discussions about programmatic groupings that worked together to balance the needs of a specific activity: Academic Workplace, Capstone and Studios, Labs, Shops and Sharing. In addition to targeted engagement meetings, MH-LP received feedback from a large pool of APSC undergraduate and graduate students, faculty and staff through a digital Functional Program survey. The MH-LP team also returned to the campus to review precedent spaces that the stakeholders had referenced in the Gather phase.

Key takeaways from the challenge phase included: an emphasis on creating large, flexible high-quality spaces, designing common spaces with a diverse set of qualities (quiet, social, etc.), and the importance of how shared spaces are managed. Differences between undergraduate and graduate spaces were raised, as well as the balance between a separate and shared identity.

Phase 4: Refine

The Refine phase translated the previous phase explorations into a Functional Program Draft which included a spreadsheet of itemized spaces separated into Program Groups, Room Type Sheets, and project narratives. The purpose of this phase was to formalize previous work and to facilitate decision-making about specific quantity and quality of space as well as relationships. In addition to a focused session with APSC leadership, meetings were held to distill important information about FTE targets, operational considerations, AV standards, and space standards that will facilitate future teams' development of the program into a full design in following phases.

Phase 5: Finalize

During the Finalize phase, a revised draft was produced to determine the final program and any adjustments in expectations for program elements to align with the target gross area from UBC Facilities and APSC. This final document represents the alignment of vision, mission, and detail that will offer a base for future design phases. A final review was facilitated by APSC and UBC Facilities Planning to allow for consensus to develop on the number and type of spaces along with desired adjacencies and relationships. The final Functional Program will be part of future planning and approvals to move the project to the next stage.

University of Washington Health Science Education Building

UBC Applied Science Students

The Kendeda Building for Innovative Sustainable Design, Georgia Tech

Applied One will propagate learning opportunities beyond a student's discipline. Rather than standing apart as architects, landscape architects, planners and engineers, we will learn from one another and become problem-solvers who act with intention – together.

-Faculty of Applied Science

2.0 SUMMARY

2.1. GENERAL PLANNING CRITERIA

2.1.1. OCCUPANT TARGETS

Within the target of 32,000 gross-square-metres (344,500 gross-square-foot) building, Applied One will accommodate the Faculty's planned growth in undergraduate and graduate student populations, as well as the necessary and growing demands for engineering and design education and rapidly expanding and diversifying opportunities in the labour market. The facility will also allow APSC to expand and develop new programming aligned with Faculty expertise in clean technology and healthy, resilient cities and communities. The following targets for FTE, head count, and seat count were used to determine the appropriate types, quantities and sizes of spaces in the program.

Applied One is an opportunity to bring the disciplines of Applied Science under the same roof to learn through one another's experiences.

-Faculty of Applied Science

Academic Unit Specific Targets

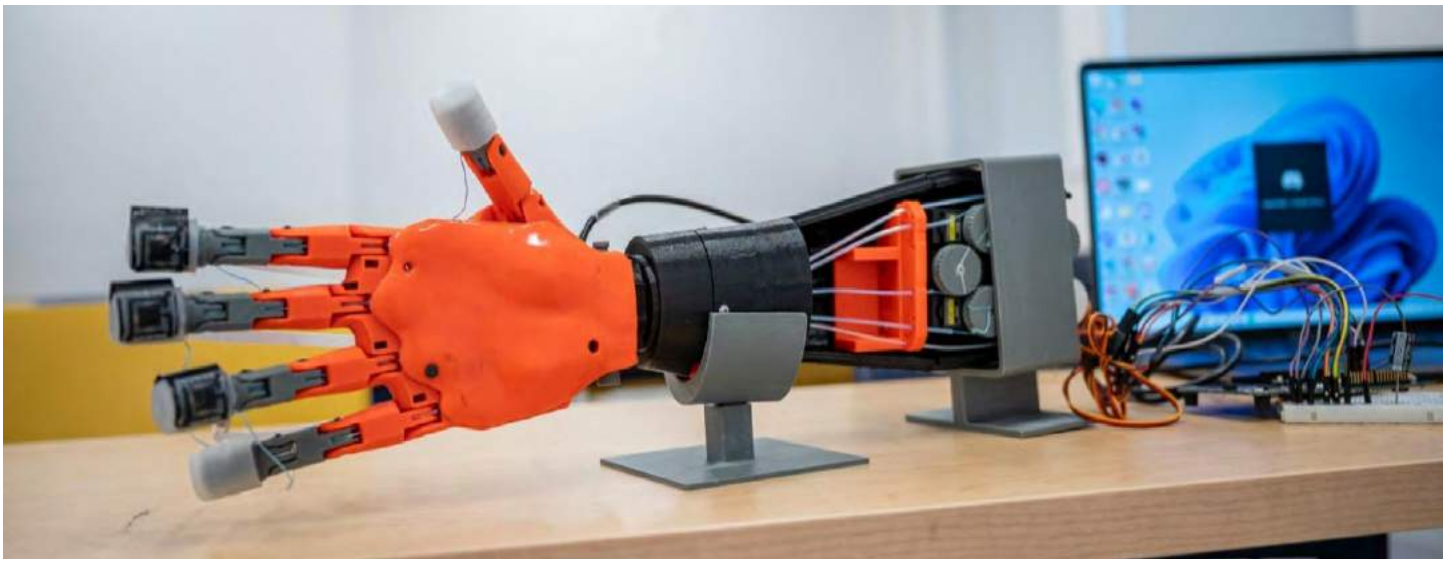
With four academic units housed within Applied One, the following chart summarizes estimated faculty, staff, research-oriented graduate students and post-doctoral fellows that may be accommodated in Applied One spaces are summarized in the following table in terms of ~full-time equivalents (FTE) and Headcount.

APSC Full Time Equivalent Targets

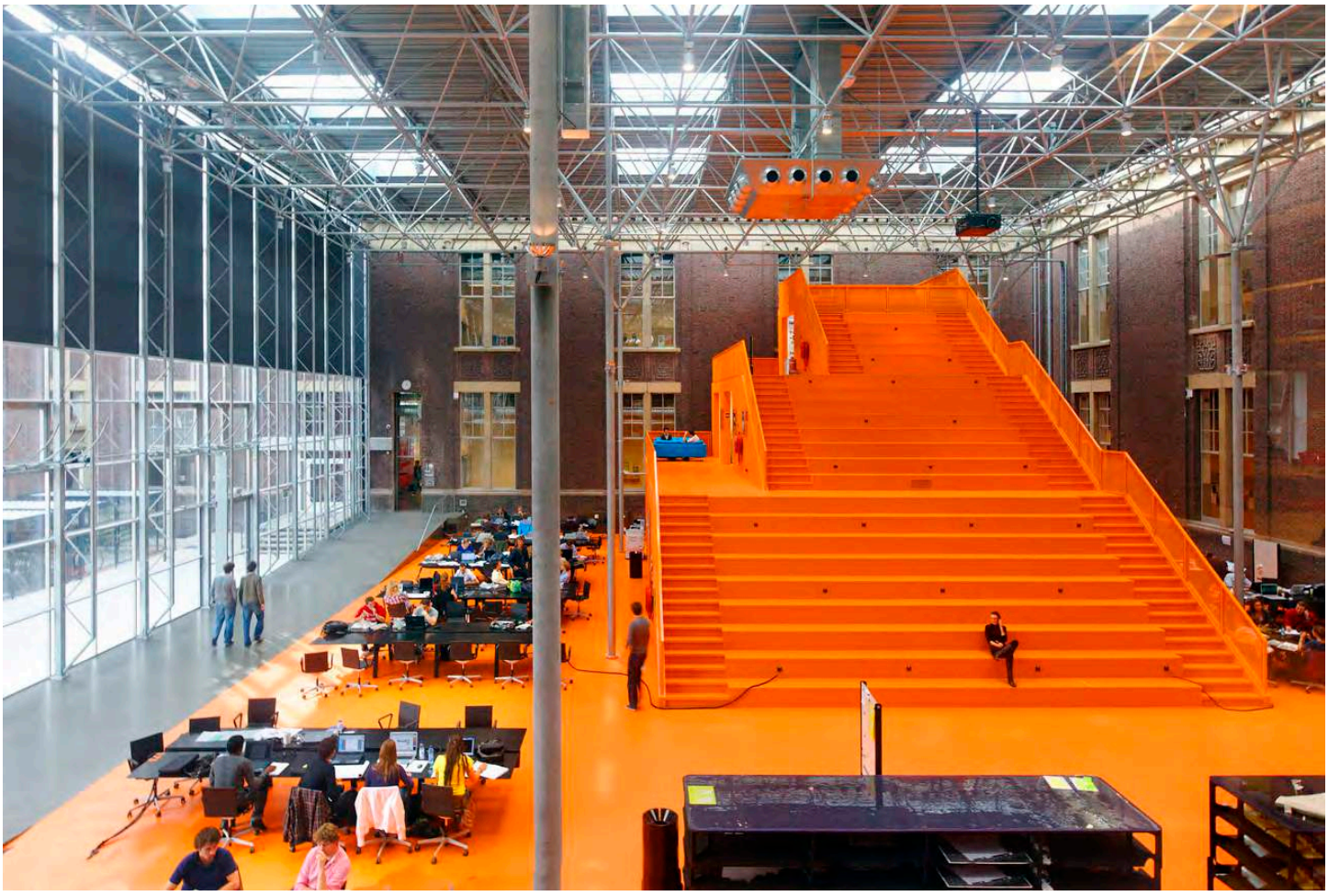
Estimated faculty, staff, research-oriented graduate students and post-doctoral fellows that may be accommodated in Applied One spaces are summarized in the following table in terms of ~full-time equivalents (FTE) targets.

		2022						2035					
File	Measure	SALA	SCARP	MANU	MTRL	MINE	Total	SALA	SCARP	MANU	MTRL	MINE	Total
Faculty	Professorial Rank (Tenure)	22	13		18	9	62	24	14		20	10	68
	Educational Leadership (Tenure)	1			4		5	1			4		6
	Professorial Rank & Instructors (Non-Tenure)		1				1		1				1
	Short-Term Faculty	27	12		9	5	53	30	13		10	6	58
	Other Academic	4	3		14	8	29	4	3		15	9	32
Staff	Staff	14	7		23	6	50	15	8		25	7	55
Student Employees	Student Employee	68	15		70	38	191	75	17		77	42	210
Students	Undergraduate Course FTE	152	41	51	164	72	480	167	45	56	181	79	528
	Master's FTE	260	75		30	79	443	286	83		33	87	488
	Doctoral FTE		18		58	38	114	10	19		64	42	126

Headcount		2022						2035					
Undergraduate		185	30	136	181	84	616	230	50	150	199	92	721
Graduate	Masters Professional	290	84		1	58	433	319	92		2	64	477
	Masters Research	10			26	43	79	11			29	47	87
	Doctoral FTE		21		58	38	117	10	25		64	42	141
	Subtotal	300	105		85	139	629	340	117		94	153	705
Total		485	135	136	266	223	1,245	570	167	150	294	245	1,426



UBC engineers created the sensor in collaboration with Frontier Robotics, UBC Applied Science/Paul Joseph



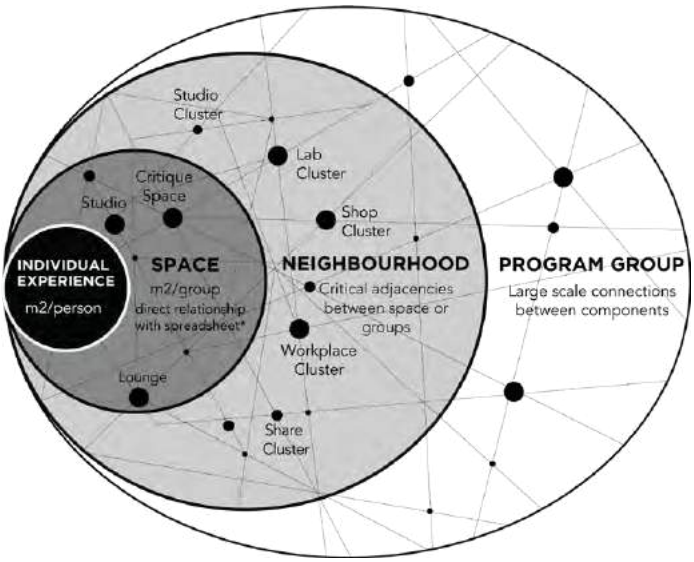
Enclosed courtyard as commons, BK City, TU Delft

2.1.2. QUANTIFYING SPACE

Key Terms + Definitions Used to Quantify Space

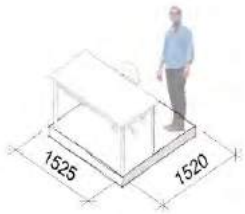
The diagrams describe the nested scales through which the program was studied, from the intimate or individual scale, to spaces that allow many individuals come together, to the Neighbourhoods that bring those spaces together, to the larger Program Group scale.

The Functional Program process led to the categorization of spaces by “Program Group” and “Neighbourhood” to establish key adjacencies and support a network of relationships between program elements. Within this system of categorization, a Neighbourhood is a collection of individual spaces that are grouped by use, often with critical spatial requirements, whereas a Program Group is a group of Neighbourhoods forming a more broad use-category. This tiered system of program organization is designed to identify overlaps in programmatic functions and illustrate the overall Applied One program in an accessible manner.



Individual Experience

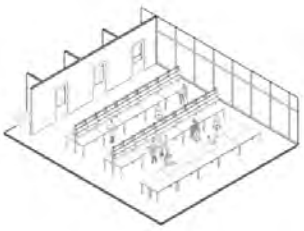
(m2/person)



Defines **space per person needed** to support different types of activities.

Space

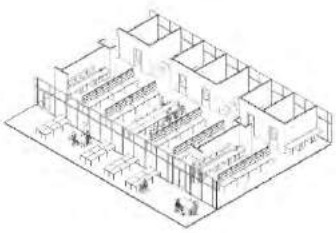
(m2/space)



Defines primary **unit of space** that acts as the **building block** used to generate Neighbourhoods and Program Groups.

Neighbourhood

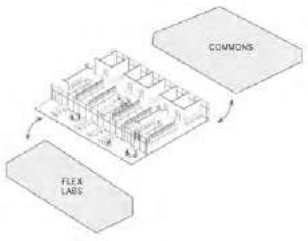
(Combination of Spaces)



Represents **immediate key adjacencies** and/or key relationships between spaces that support and reinforce a set of activities and uses.

Program Group

(Combination of Neighbourhoods)



Neighbourhoods` combined together to represent large scale connections or conceptual ties that **reinforce a set of uses, activities, and/or communities**.

Nested Scales Terminology

Space Per Person by Space Type / Activity

Acknowledging that there is no "average" student, faculty, or staff in Applied One, the Functional Program process carefully considered the space required per person for each activity that could take place in Applied One. Section 3 contains summary charts with space requirements for each program group. The following section sets expectations and provides rationale of the space-per-person allocated to the activities in labs, workspaces and learning spaces.

Lab Space Expectations

Research Labs occur in the Laboratory Program Group as well as the Flexible Cluster Program Group. On average, PI-run research labs will have space equivalent to two or three 25 NSM lab modules that each support five two-metre adjustable lab benches. All two-metre adjustable lab benches are assumed to have five to six NSM to allow for associated space for safe movement around the bench area. For each 25 NSM lab space, 12-16 NSM of lab support is assumed for equipment, support and prep. For more information, refer to Section 3.2.3.

Work Space Expectations

The Academic Workplace Program Group contains many of the workspaces for faculty, staff, post-docs, graduate and undergraduate students, but open and enclosed offices are also part of the other Program Groups as they directly support lab and shop activities. The following standards for space assignment supported the development of the quantities and sizes of workspaces:

- Full time faculty, Heads, and Directors | Private enclosed offices at 9 NSM
- Part-time faculty and senior staff | 2-person shared enclosed offices at 9 NSM
- Non-senior staff, postdoctoral fellows, research associates, visiting faculty, and active and inactive emeritus faculty | Large shared enclosed offices at 4.5 NSM/person with 4-6 stations per space
- PhD candidates, master's candidates, teaching assistants, and visitors hoteling for short period | Open workstations at 4.5 NSM/person
- Undergraduate student lounges and study spaces will be sized for 3.2-3.5 NSM/person
- Capstone student locker spaces can be assumed to be .25 cubic metres

Learning Space Expectations

Most classrooms in Applied One will be classified as General Teaching Spaces (GTS), and will be part of the larger campus-wide inventory that is scheduled through Enrollment Services. Facilities Planning provided recommendations for room sizes after a review of the academic section needs that will be housed within the Applied One building as well as overall precinct and campus academic scheduling needs. The course section review included subject codes APSC, ARCH, DES, IGEN, LARC, MANU, MINE, MTRL, PLAN and UDES. See AA 4 for workload detail.

The following table lists the recommended classroom sizes for the GTS in Applied One. These classrooms include replacement for the following GTS classrooms that will be demolished as part of this project: FORW 303 (60 seats), FORW 317 (50 seats), FORW 519 (34 seats) For this program, Facilities Planning has used a baseline multiplier of 2.4NSM/seat. Room sizes may need to be adjusted as design progresses.

Room Size	Units	Total Seats	NSM (2.4NSM/Seat)
26 Seats	3	78	187
40 Seats	2	80	160
60 Seats	2	120	288
80 Seats	1	80	192
100 Seats	1	100	240
210 Seats	1	210	504
300 Seats	1	300	720
Total	**11**	**968**	**2291**

Classroom recommendation based on 80% utilization of a 45 hr week = 36hrs/week of the highest term.

Room sizes may need to be refined and adjusted as design progresses. Recommendations around which classrooms can be cut from the program to be provided by Facilities Planning.

Space Expectations for Teaching-in-the-Round

A flexible learning space for teaching-in-the-round has been programmed to accommodate formal and informal gatherings of various scales. While tables and chairs in this space should remain flexible and reconfigurable, the default set-up for this space should be a circular layout. The classroom will support instructors and collaborators while encouraging interactive discussions between peers.

2.1.2. QUANTIFYING SPACE

Net to Gross Assumption

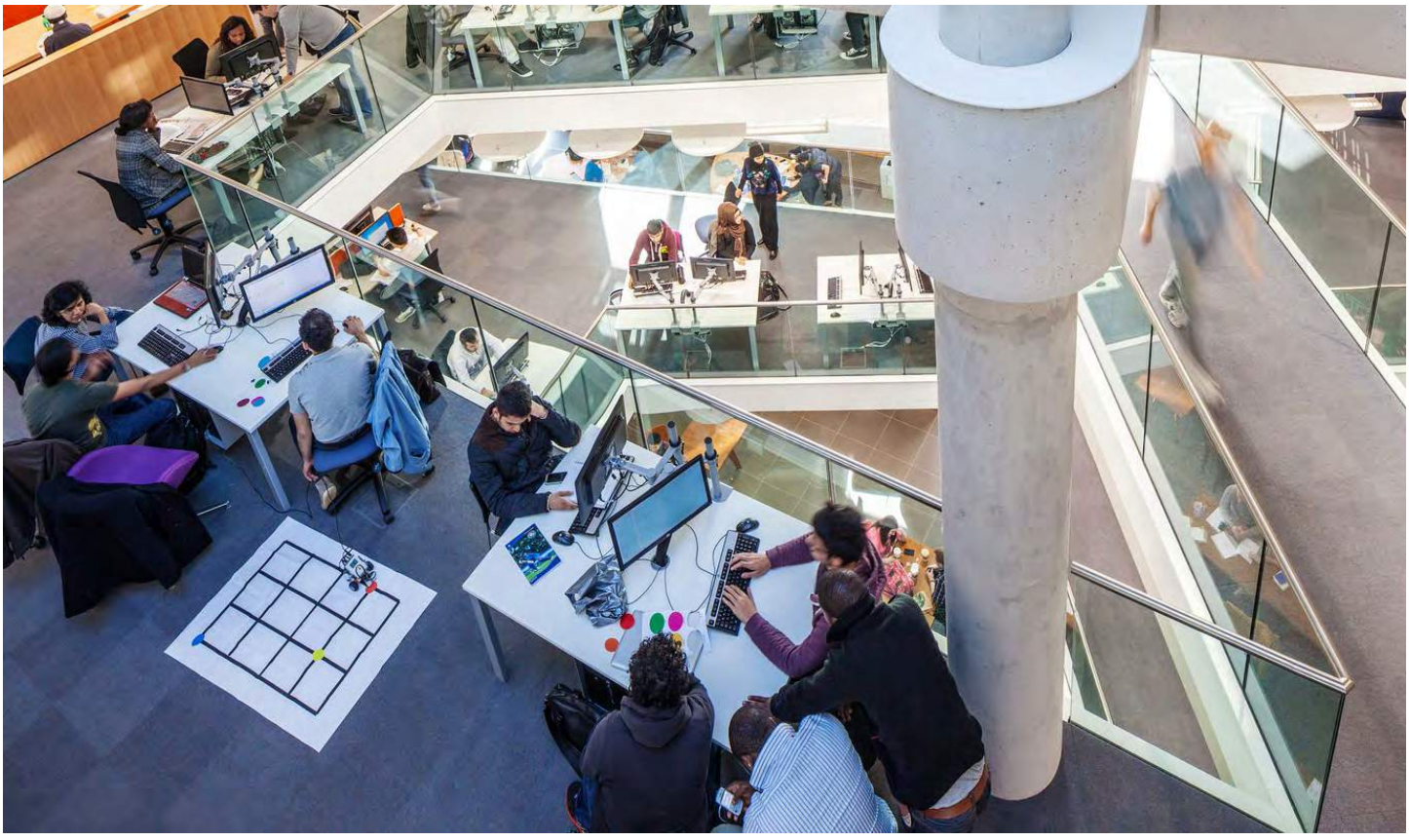
A target area of approximately 32,000 gross-square-metres (344,500 gross-square-feet) was established, based on a total assignable net area of 18,834 square-metres and a net-to-gross factor of 1.68. The net-to-gross factor accommodates:

- General circulation
- Circulation based informal learning space
- Elevator shafts
- Mechanical and electrical rooms
- Washrooms
- Exterior wall thickness

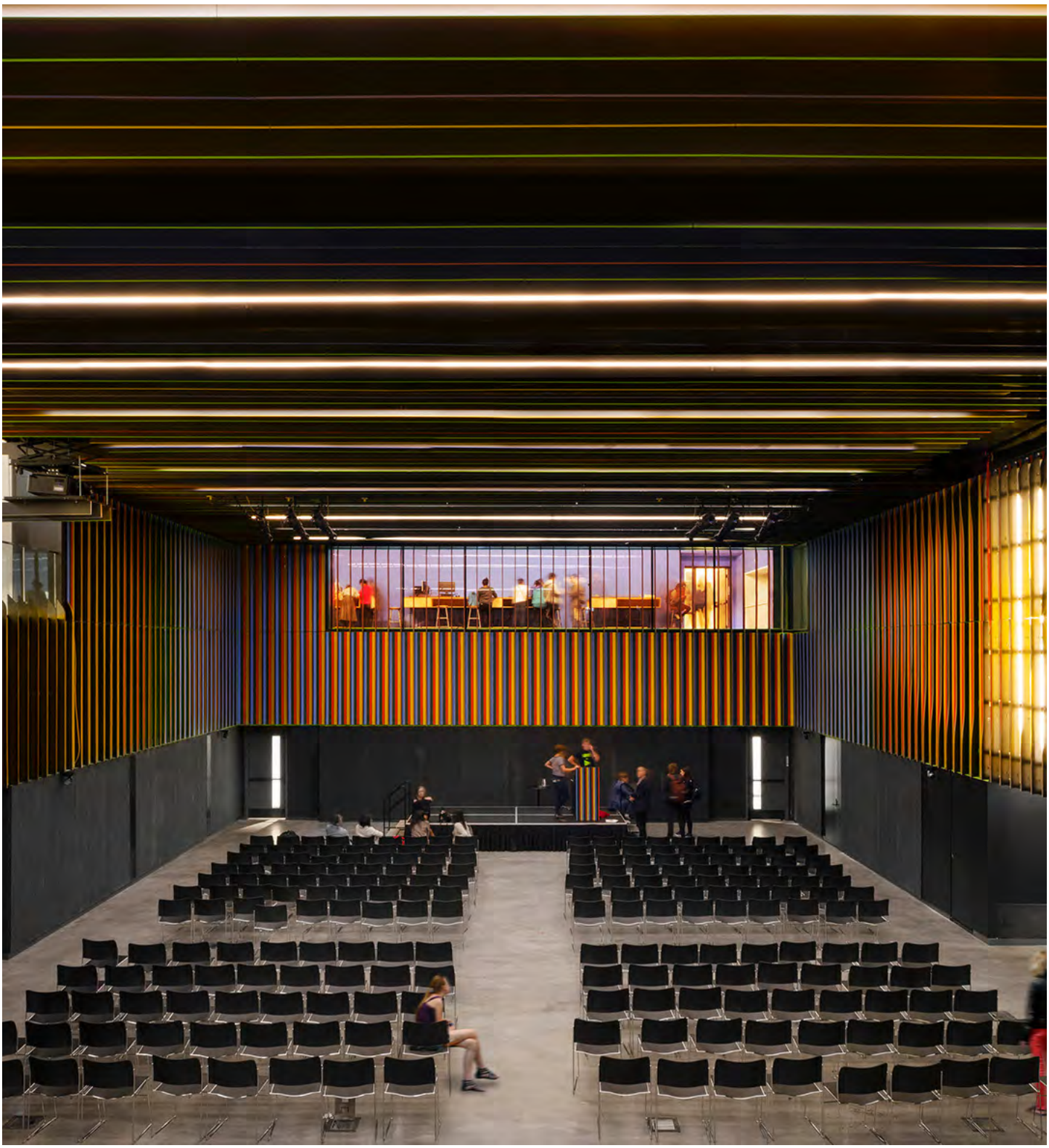
Section 3.2.8 Building Support includes building support spaces that are not included within the net-to-gross factor.

The net areas listed represent the usable floor area assigned to a specific function and are measured to the inside face of wall surfaces. During the design phase, opportunities to locate mechanical, electrical and equipment such as dust collection outside of the buildable area should be tested.

UBC's Vantage One proogram in a GTS Active Learning Environment



Animated informal learning space embedded within circulation areas, BK City, TU Delft



Black box Grand Hall space being prepared for a public lecture, Daniels School of Architecture Landscape and Design, Toronto

2.2. SPACE SUMMARY

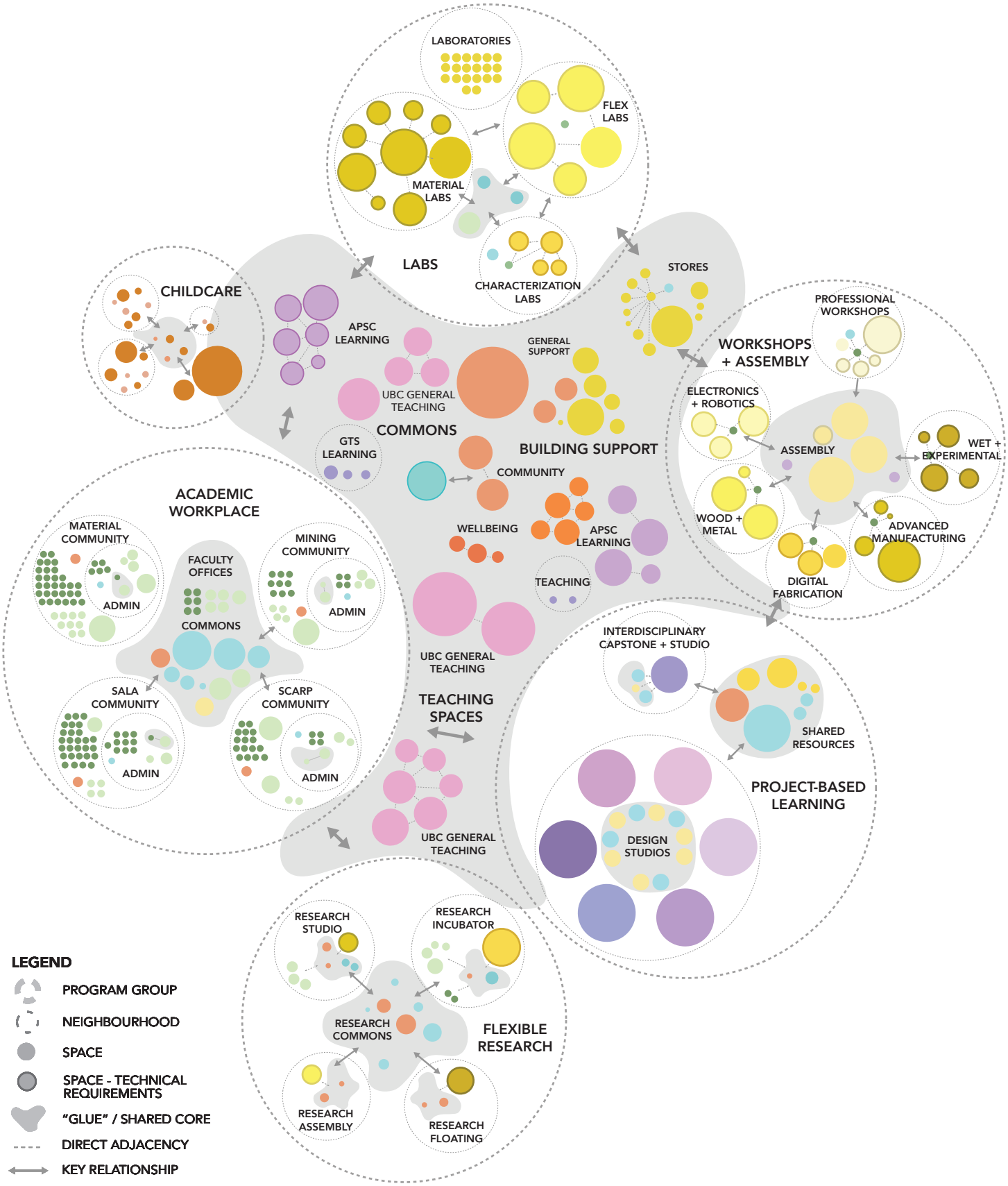
2.2.1. OVERALL PROGRAM SUMMARY

The Functional Program process involved categorizing design criteria, qualities, and quantities for spaces that would support the target activities, outcomes and mission of Applied One. The main lens through which the program will be represented is by “Program Group” and “Neighbourhood” as described in Section 2.1.2.

The diagram on the next page illustrates relationships between Program Groups and Neighbourhoods with “Shared Core” spaces as the glue or connective tissue that ties different programmatic elements together.

In developing the Functional Program, the focus was on the activities and everyday actions that would need to be accommodated to allow for continued success in Applied Science, while encouraging collaborative, exploratory fabrication that will lead to interdisciplinary relationships needed to solve global grand challenges.

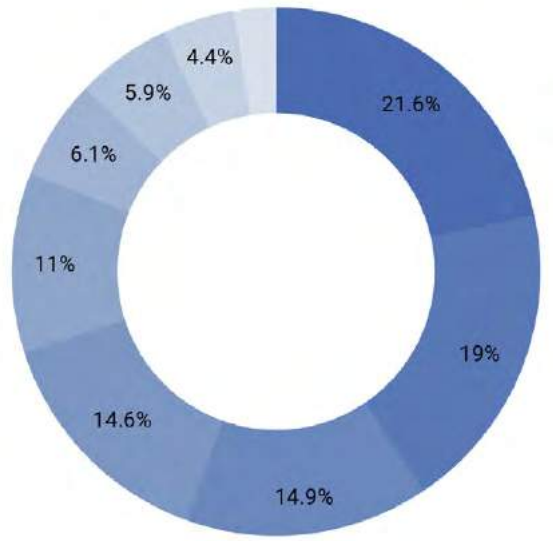
-Miller Hull and Local Practice


LABORATORIES
FLEX LABS
MATERIAL LABS
CHARACTERIZATION LABS
LABS
CHILDCARE
APSC LEARNING
UBC GENERAL TEACHING
GENERAL SUPPORT
COMMONS
GTS LEARNING
BUILDING SUPPORT
COMMUNITY
WELLBEING
APSC LEARNING
TEACHING
STORES
PROFESSIONAL WORKSHOPS
WORKSHOPS + ASSEMBLY
ELECTRONICS + ROBOTICS
ASSEMBLY
WET + EXPERIMENTAL
WOOD + METAL
ADVANCED MANUFACTURING
DIGITAL FABRICATION
ACADEMIC WORKPLACE
MATERIAL COMMUNITY
ADMIN
FACULTY OFFICES
COMMONS
MINING COMMUNITY
ADMIN
SALA COMMUNITY
ADMIN
SCARP COMMUNITY
ADMIN
UBC GENERAL TEACHING
TEACHING SPACES
UBC GENERAL TEACHING
INTERDISCIPLINARY CAPSTONE + STUDIO
SHARED RESOURCES
PROJECT-BASED LEARNING
DESIGN STUDIOS
RESEARCH STUDIO
RESEARCH INCUBATOR
RESEARCH COMMONS
FLEXIBLE RESEARCH
RESEARCH ASSEMBLY
RESEARCH FLOATING
LEGEND
PROGRAM GROUP
NEIGHBOURHOOD
SPACE
SPACE - TECHNICAL REQUIREMENTS
"GLUE" / SHARED CORE
DIRECT ADJACENCY
KEY RELATIONSHIP

2.2.1. OVERALL PROGRAM SUMMARY

Program Groups and Neighbourhoods

The following visualizations summarize area by Program Group and Neighbourhood. Refer to Section 2.1.2. Quantifying Space: Key Terms + Definitions Used to Quantify Space for categorization information. Refer to Section 3.1 for more information on each Program Group: Commons, Workshops + Assembly, Laboratories, Project-Based Learning, Flexible Research, Teaching Spaces, Academic Workplace, Operations, and Childcare.

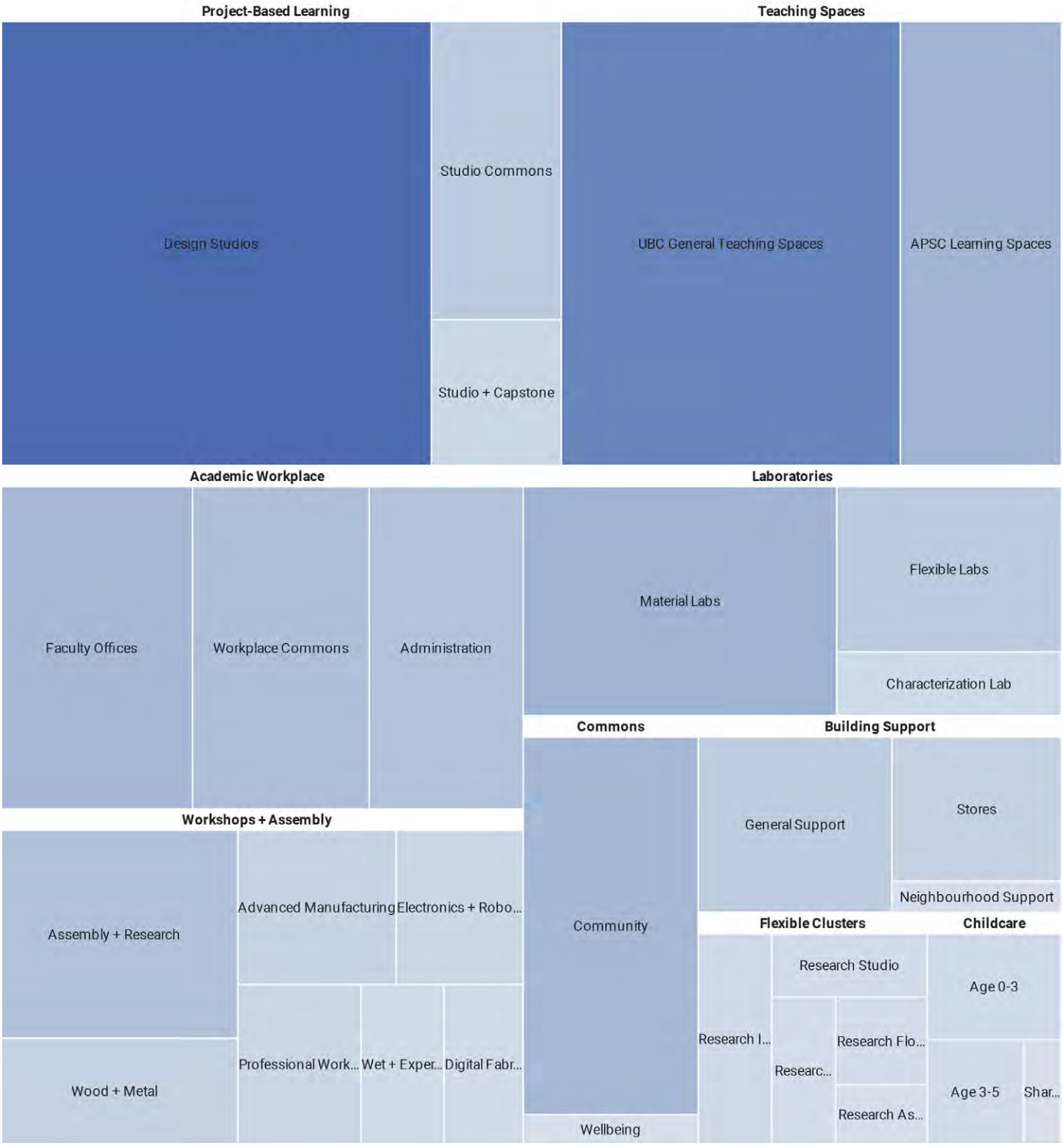


Project-Based Learning	21.6% | 4,066 NSM
Teaching Spaces	19.0% | 3,557 NSM
Academic Workplace	14.9% | 2,809 NSM
Workshops + Assembly	14.6% | 2,743 NSM
Laboratories	11.0% | 2,074 NSM
Commons	6.1% | 1,152 NSM
Building Support	5.9% | 1,103 NSM
Flexible Clusters	4.4% | 826 NSM
Childcare	2.6% | 458 NSM

Doughnut Chart Area Summary by Program Group

	Area Summary by Program Group	Total NSM	% of overall program
1	**Commons**	**1,152**	**6.1%**
	1.1 Community	1,068	5.7%
	1.2 Wellbeing	84	0.4%
2	**Workshops + Assembly**	**2,743**	**14.6%**
	2.1 Digital Fabrication	211	1.1%
	2.2 Electronics + Robotics	324	1.7%
	2.3 Wood + Metal	429	2.3%
	2.4 Wet + Experimental	219	1.2%
	2.5 Advanced Manufacturing	399	2.1%
	2.6 Professional Workshops	321	1.7%
	2.7 Assembly + Research	840	4.5%
3	**Laboratories**	**2,074**	**11.0%**
	3.1 Flexible Labs	625	3.3%
	3.2 Material Labs	1,206	6.4%
	3.3 Characterization Lab	243	1.3%
4	**Project-Based Learning**	**4,066**	**21.6%**
	4.1 Design Studios	3,140	16.7%
	4.2 Studio + Capstone	305	1.6%
	4.3 Studio Commons	621	3.3%
5	**Flexible Clusters**	**826**	**4.4%**
	5.1 Research Studio	170	0.9%
	5.2 Research Assembly	95	0.5%
	5.3 Research Floating	140	0.7%
	5.4 Research Incubator	263	1.4%
	5.5 Research Commons	158	0.8%
6	**Teaching Spaces**	**3,577**	**19.0%**
	6.1 APSC Learning Spaces	1,161	6.2%
	6.2 UBC General Teaching Spaces	2,416	12.8%
7	**Academic Workplace**	**2,809**	**14.9%**
	7.1 Faculty Offices	1,065	5.7%
	7.2 Administration	818	4.3%
	7.3 Workplace Commons	926	4.9%
8	**Building Support**	**1,103**	**5.9%**
	8.1 Stores	423	2.2%
	8.2 Neighbourhood Support	95	0.5%
	8.8 General Support	585	3.1%
9	**Childcare**	**485**	**2.6%**
	9.1 Age 0-3	241	1.3%
	9.2 Age 3-5	173	0.9%
	9.3 Shared	71	0.4%
	TOTAL	**18,834**	**100.0%**

Tabulated Area Summary by Program Group and Neighbourhood



Treemap area summary by Program Group and Neighbourhood spatially illustrating the overall program.

Applied One will be far more than a building—it will be a dynamic, inclusive, living laboratory designed on the premise that today's challenges are too massive, too complex, too interconnected for a single discipline.

3.0 PROGRAM GROUPS

3.1. INTRODUCTION

Purpose

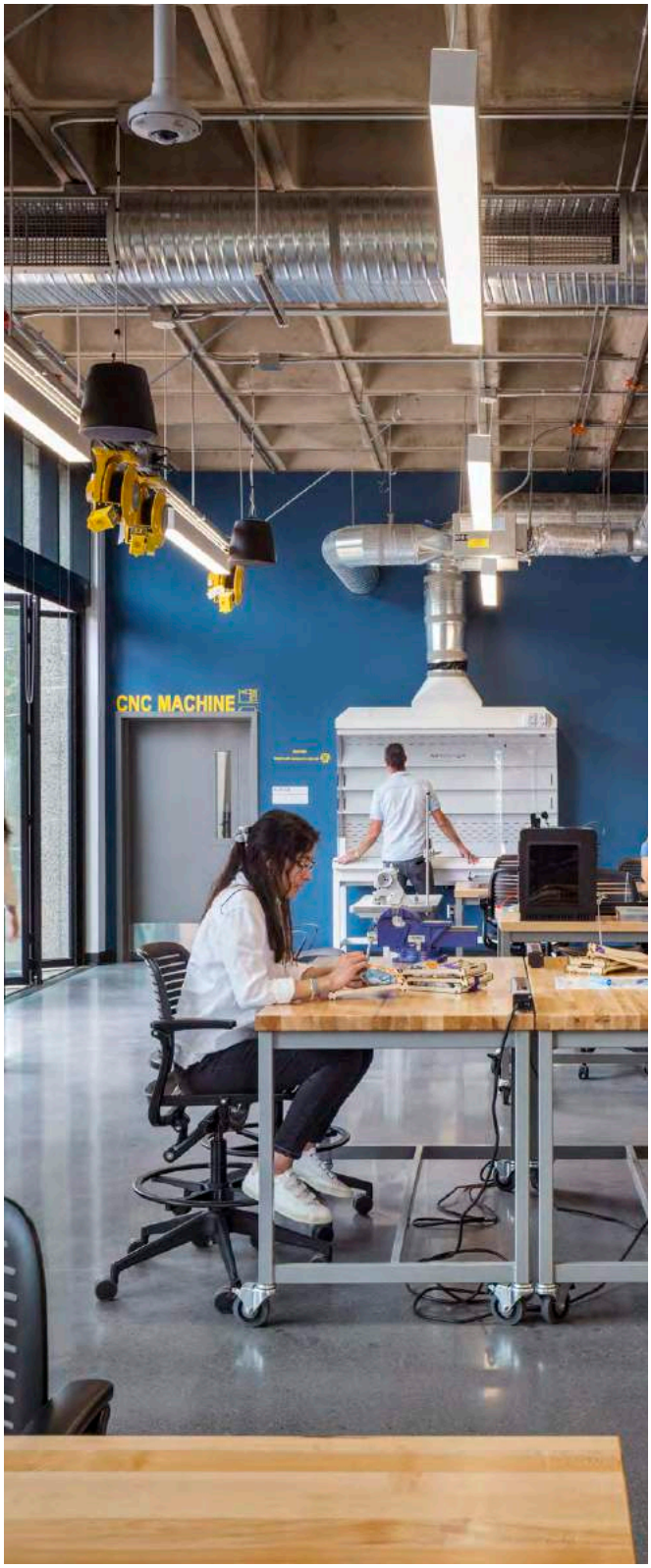
This section:

- Identifies greater details about the key program criteria and functions to be accommodated in the project.
- Summarizes key functional, system, quality, and operational needs for each of the spaces, organizing concepts and spatial requirements in sufficient detail for preliminary planning (additional information for each room type is found in Appendix A)
- Provides project approval and funding authorities with information on which to base preliminary capital cost and operating requirements.
- Highlights potential issues related to access and shared facilities that may precipitate development of organizational relationships, new services and/or operational procedures for APSC.

Organization

Each Program Group subsection contains a written description, diagrammatic representation, experiential vignettes, and tabulated space data about the program group in question. The diagrammatic representation illustrates direct adjacencies and key relationships while the experiential vignettes represent a speculative user experience and the activities to be accommodated within the spaces and program groups.

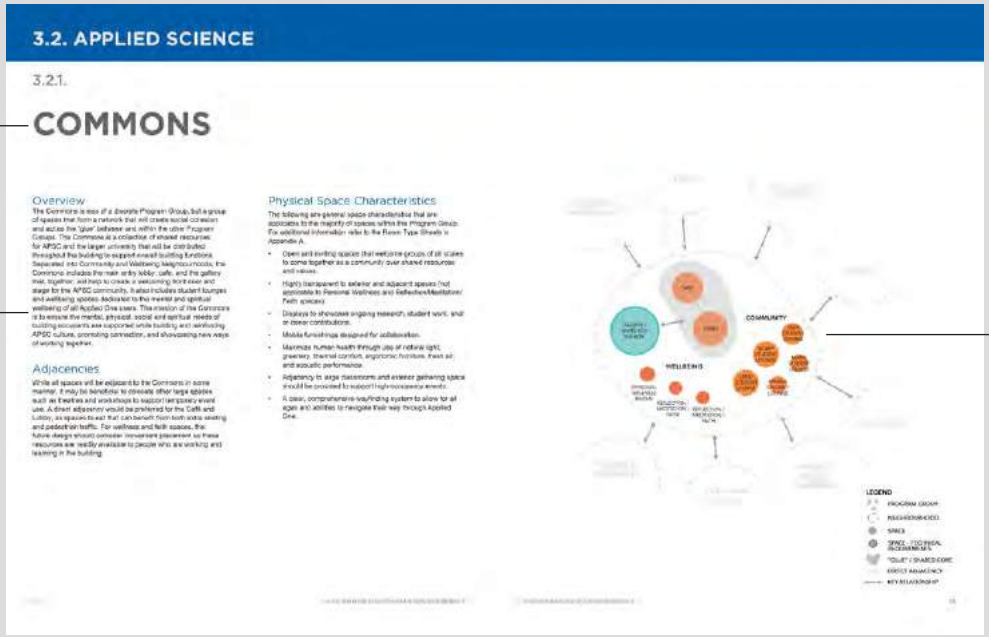
Tabulated space data is represented in a Space List that includes for each space: space number, steward (primary user), space name, number of seats provided, NSM/seat used for size calculation, number of units, area for each unit, total net area, descriptive remarks, AV requirements, fume hood count, and a Room Type Sheet reference code which will offer additional information in Appendix A.



Program Group Name

Written Description

Diagrammatic Representation



Experiential Vignettes

Tabulated Space Data

General Space Requirements

In addition to what is captured in the space requirements spreadsheets, the following general space requirements apply to all spaces within Applied One.

Network: High density wireless coverage with data ports as needed in teaching spaces, project-based learning spaces, meeting and conference rooms, research areas and workshops to meet UBC standards and program requirements. Dedicated data ports are required for all offices. See UBC Technical Guidelines Division 27 for port and data standards. The Operations category identifies some dedicated space for communications rooms throughout the building.

Mechanical: System type(s), controls, temperature ranges, fume and dust exhaust, to be developed as per UBC Technical Guidelines. Occupant comfort and a preference for indirect air circulation should be a high priority when locating and designing air exchanges/vents. When possible, future designs should consider natural ventilation and access to thermostat control for building occupants.

Fire Protection: As required by the BC Building Code.

Accessibility: In addition to accessibility provisions required by the Building Code, broader best practices in accessible design and universal design must be incorporated into all spaces, based on the CSA B651:23 Standard and guidance from Facilities Planning.

Audio Visual: AV needs are represented by a system type that has been identified at a space level within the space requirements list. Generally, the Audio Visual categories follow UBC technical guidelines and standards. During the design process, UBC IT Audio Visual will consult with the User Groups to refine the use-cases and detail the spaces.

See Appendix A.4 - Audio / Visual Description for the list of AV types, with brief description. Confirmation of AV infrastructure will dictate pathway size and location. AV control rooms have been noted where applicable. Sufficient space for AV racks and cooling will be needed.

Confirmation of AV infrastructure will dictate pathway size and location needs. Sufficient space within the AV racks and cooling options need to be considered. AV Control Rooms have been noted where applicable.

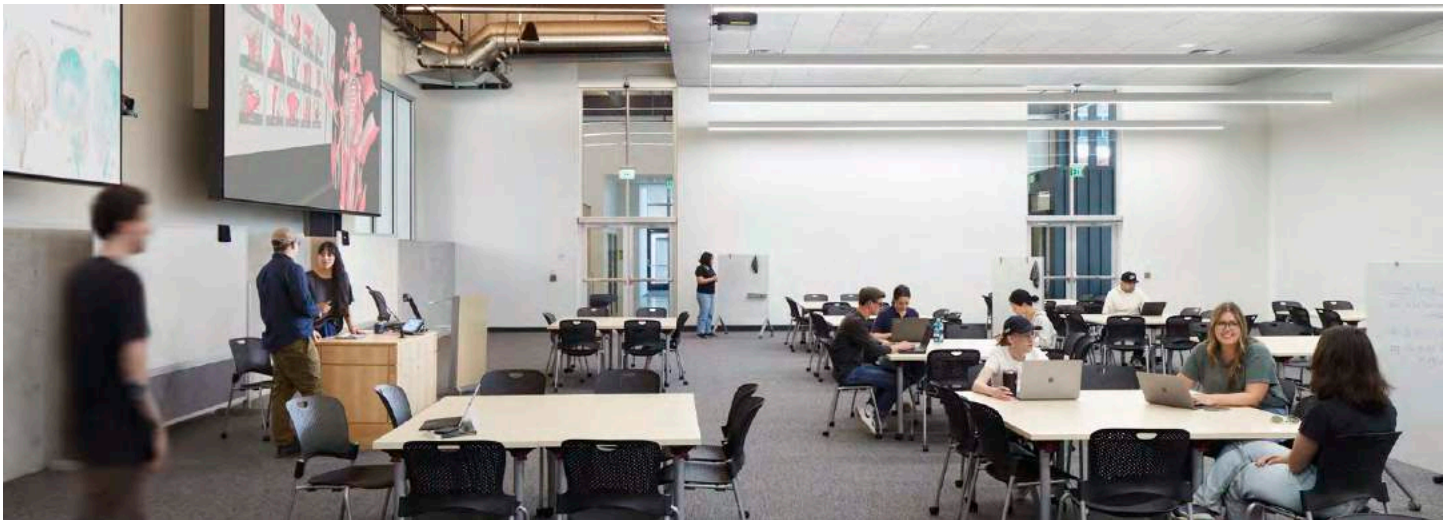
Signage: Provide signage outside of each space that clearly states what the room's purpose is. Additional thoughtfulness and visibility should be given to donor named spaces to acknowledge donors and giving levels. Spaces that support activities and equipment that require personal protection equipment, like makerspaces are to have signage posted outside the space to comply with UBC safety signage standards.

The building is a living lab and the future design should consider exposed building systems with clear and visible labels noting system components such as hot/cold, flow direction, voltage, etc.

Wayfinding: Building layout should be intuitive and easy to navigate for students, visitors and guests - provide wayfinding signage in prominent locations.

Elevator: A minimum of two elevators are required with at least one large freight elevator sized for small forklift and pallet jack with walls and floors that are highly resistant to damage.

Safe Access and Maintenance: Maintainability of building systems is a high priority. Locate building system access and maintenance items in locations that are easily accessible and/or accessible via standard ladder or standard lift.



“We’re creating the conditions for the accelerated testing and real-world application of our health, tech and equity solutions while there’s still time.”

-Faculty of Applied Science

3.2. APPLIED SCIENCE

3.2.1.

COMMONS

Overview

The Commons is less of a discrete Program Group, but a group of spaces that form a network that will create social cohesion and act as the “glue” between and within the other Program Groups. The Commons is a collection of shared resources for APSC and the larger university that will be distributed throughout the building to support overall building functions. Separated into Community and Wellbeing Neighbourhoods, the Commons includes the main entry lobby, cafe, and the gallery that, together, will help to create a welcoming front door and stage for the APSC community. It also includes student lounges and wellbeing spaces dedicated to the mental and spiritual wellbeing of all Applied One users. The mission of the Commons is to ensure the mental, physical, social and spiritual needs of building occupants are supported while building and reinforcing APSC culture, promoting connection, and showcasing new ways of working together.

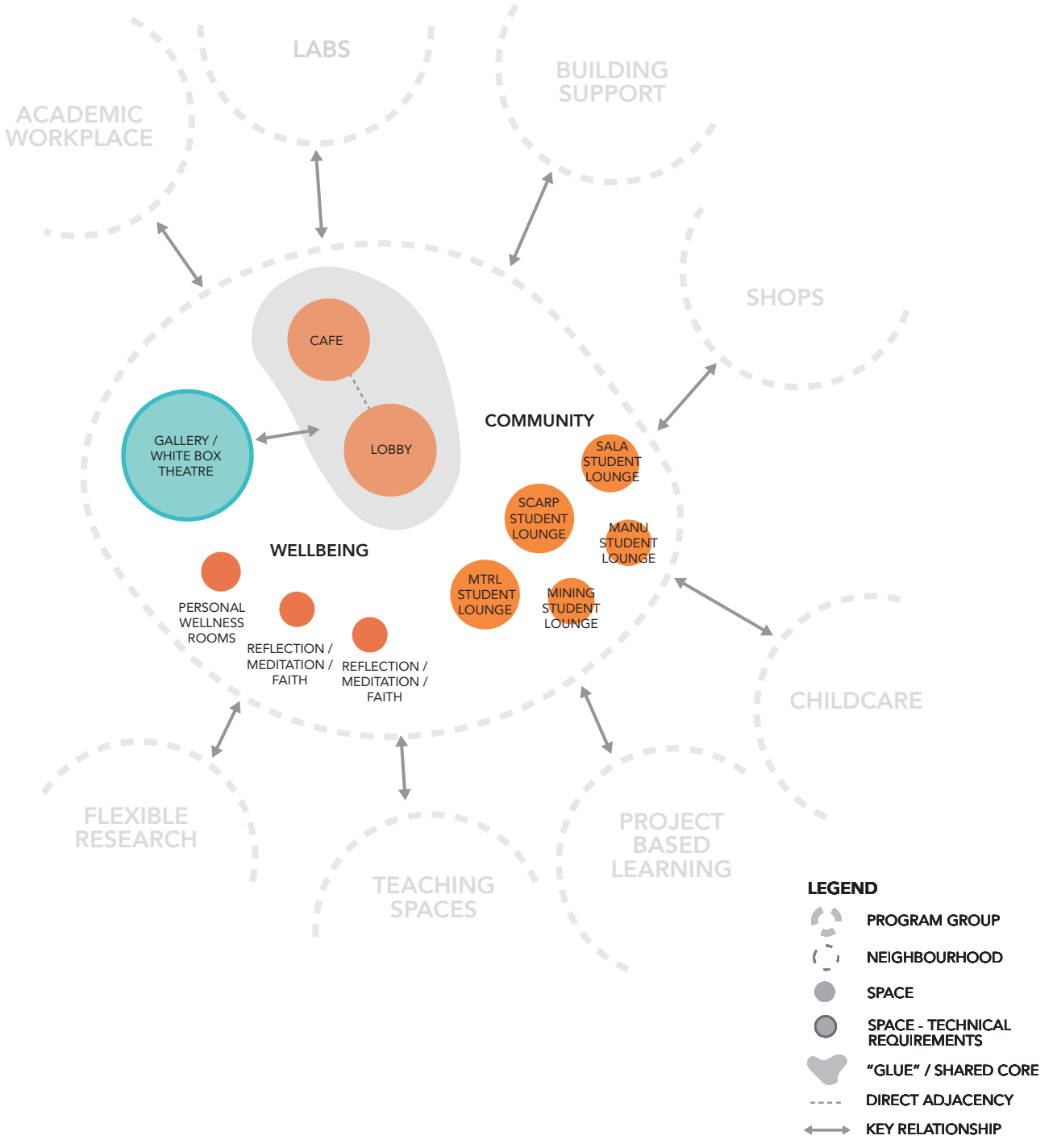
Adjacencies

While all spaces will be adjacent to the Commons in some manner, it may be beneficial to co-locate other large spaces such as theatres and workshops to support temporary event use. A direct adjacency would be preferred for the Café and Lobby, as spaces to eat that can benefit from both extra seating and pedestrian traffic. For wellness and faith spaces, the future design should consider convenient placement so these resources are readily available to people who are working and learning in the building.

Physical Space Characteristics

The following are general space characteristics that are applicable to the majority of spaces within this Program Group. For additional information refer to the Room Type Sheets in Appendix A.

- Open and inviting spaces that welcome groups of all scales to come together as a community over shared resources and values.
- Highly transparent to exterior and adjacent spaces (not applicable to Personal Wellness and Reflection/Meditation/ Faith spaces).
- Displays to showcase ongoing research, student work, and/ or donor contributions.
- Mobile furnishings designed for collaboration.
- Maximize human health through use of natural light, greenery, thermal comfort, ergonomic furniture, fresh air, and acoustic performance.
- Adjacency to large classrooms and exterior gathering space should be provided to support high-occupancy events.
- A clear, comprehensive wayfinding system to allow for all ages and abilities to navigate their way through Applied One.


LABS
BUILDING SUPPORT
ACADEMIC WORKPLACE
SHOPS
CAFE
LOBBY
GALLERY / WHITE BOX THEATRE
COMMUNITY
SALA STUDENT LOUNGE
SCARP STUDENT LOUNGE
MANU STUDENT LOUNGE
MTRL STUDENT LOUNGE
MINING STUDENT LOUNGE
WELLBEING
PERSONAL WELLNESS ROOMS
REFLECTION / MEDITATION / FAITH
REFLECTION / MEDITATION / FAITH
CHILDCARE
FLEXIBLE RESEARCH
TEACHING SPACES
PROJECT BASED LEARNING
LEGEND
PROGRAM GROUP
NEIGHBOURHOOD
SPACE
SPACE - TECHNICAL REQUIREMENTS
"GLUE" / SHARED CORE
DIRECT ADJACENCY
KEY RELATIONSHIP

3.2.1. COMMONS

Big Events, gathering in groups of 50+ (impromptu or formal gatherings)

Lobby Gathering, reaching out to UBC and Vancouver community at large

Lactation, Meditation, Prayer in private spaces to support humans throughout the day

Gallery Shows, bringing industry and community together and sharing large and small scale faculty and student work

Interactive Display, viewing changing display of student work, engaging visitors with research

Informal Learning Space, with students studying casually or collaboratively, lounging and building community, informal mentorship and connection between all years and age groups

"We often miss sight on how wide the scale is for students to sit and study. There needs to be space for them to hang out and socialize in an improvised way".

-Daan Majier
Department Head, Materials Engineering

Space List

The Space List for this Program Group is shown below in terms of net-square-metres (NSM) with any specific remarks and descriptions noted.

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		1.1 | Commons | Community | Subtotal 1068 NSM									
1.1.1	APSC Shared	Gallery / White Box Theatre / Commons / Grand Hall	100	2.4	1	240.0	240.0	Multi-use, flexible, double-height, public space with target uses: 100 people in flexible seating; installation of work with standing/walking space only, 60 people at for critique/design review events. Big load-in door directly into the space for large objects.	9		S1
1.1.2	APSC Shared	Roundtable Room - Indigenous Teaching + Discussion	60	2.4	1	144.0	144.0	Teaching and discussion space capable of various groupings. Primary use - gathering in the round. Secondary Use - events.	9		S2
1.1.3	APSC Shared	Café - Commercial Kitchen			1	60.0	60.0	Dedicated space for coffee or food handling, and storage.	7		B5
1.1.3a	APSC Shared	Café - Seating	15	2.4	1	36.0	36.0	Flexible space for cafe tables and chairs. Include packed lunch station w/microwaves, sinks for cleanup, and Sort It Out station.	8		B2
1.1.4	APSC Shared	Lobby	60	2.4	1	144.0	144.0	Multi-use, double-height public space. Soft seating and informal learning, welcoming.	9		B1
1.1.5	MTRL	Distributed Student Lounge	30	2.4	1	72.0	72.0	Flexible space with soft seating for informal learning and gathering.	8		B2
1.1.6	MANU	Distributed Student Lounge	15	2.4	1	36.0	36.0	Flexible space with soft seating for informal learning and gathering.	8		B2
1.1.7	MINE	Distributed Student Lounge	15	2.4	1	36.0	36.0	Flexible space with soft seating for informal learning and gathering.	8		B2
1.1.8	SALA	Distributed Student Lounge	30	2.4	1	72.0	72.0	Flexible space with soft seating for informal learning and gathering.	8		B2
1.1.9	SCARP	Distributed Student Lounge	15	2.4	1	36.0	36.0	Flexible space with soft seating for informal learning and gathering.	8		B2
1.1.10	APSC Shared	Informal Learning - Small Seating Areas	4	2.4	20	9.6	192.0	Flexible space with soft seating for informal learning and gathering scattered around building in corridors and near teaching and learning spaces.	none		B2
		1.2 | Commons | Wellbeing | Subtotal 84 NSM									
1.2.1	APSC Shared	Reflection/Meditation/Faith	10	2.4	1	24.0	24.0	Flexible use with little/no furnishings.	10		B3
1.2.2	APSC Shared	Reflection/Meditation/Faith	10	2.4	1	24.0	24.0	Flexible use with little/no furnishings. Moveable wooden divider for separation between men and women and shoe removal area. Ablution to be provided within the space or adjacent to washroom with ablution area.	10		B3
1.2.3	APSC Shared	Personal Wellness Room	1	9	4	9.0	36.0	Multi-use to support lactation, migraine, meditation, anxiety, quiet room needs. Space for 1 person, with single chair, foot stool, small sink and base cabinet.	10		B3
							1,152				

3.2.2.

WORKSHOPS AND ASSEMBLY

Overview

This Program Group includes Neighbourhoods of workshops for wood and metal, electronics and robotics, digital fabrication, advanced manufacturing, wet and experimental materials, and shared assembly spaces that act as the “glue” between the more specialized making Neighbourhoods. This collection of spaces add to the network of shop space across campus that APSC can use to make, create, and learn.

The Workshop + Assembly Program Group aims to become the new heart for shop activities in APSC. It supports undergraduate, graduate, post-doc, and faculty activities and should provide access based on skills training. For example a student with minimal training could have access to an assembly area with hand tools while a researcher with advanced training could have access to assembly areas as well as the Advanced Manufacturing workshop. The different Workshop + Assembly Neighbourhoods represent different fields of work with distinct associated materials, tools, and processes. Within the group are shared spaces for learning and training that will offer opportunities for breakout and instruction and more specialized areas will be supervised by a technician that can provide support and consultation.

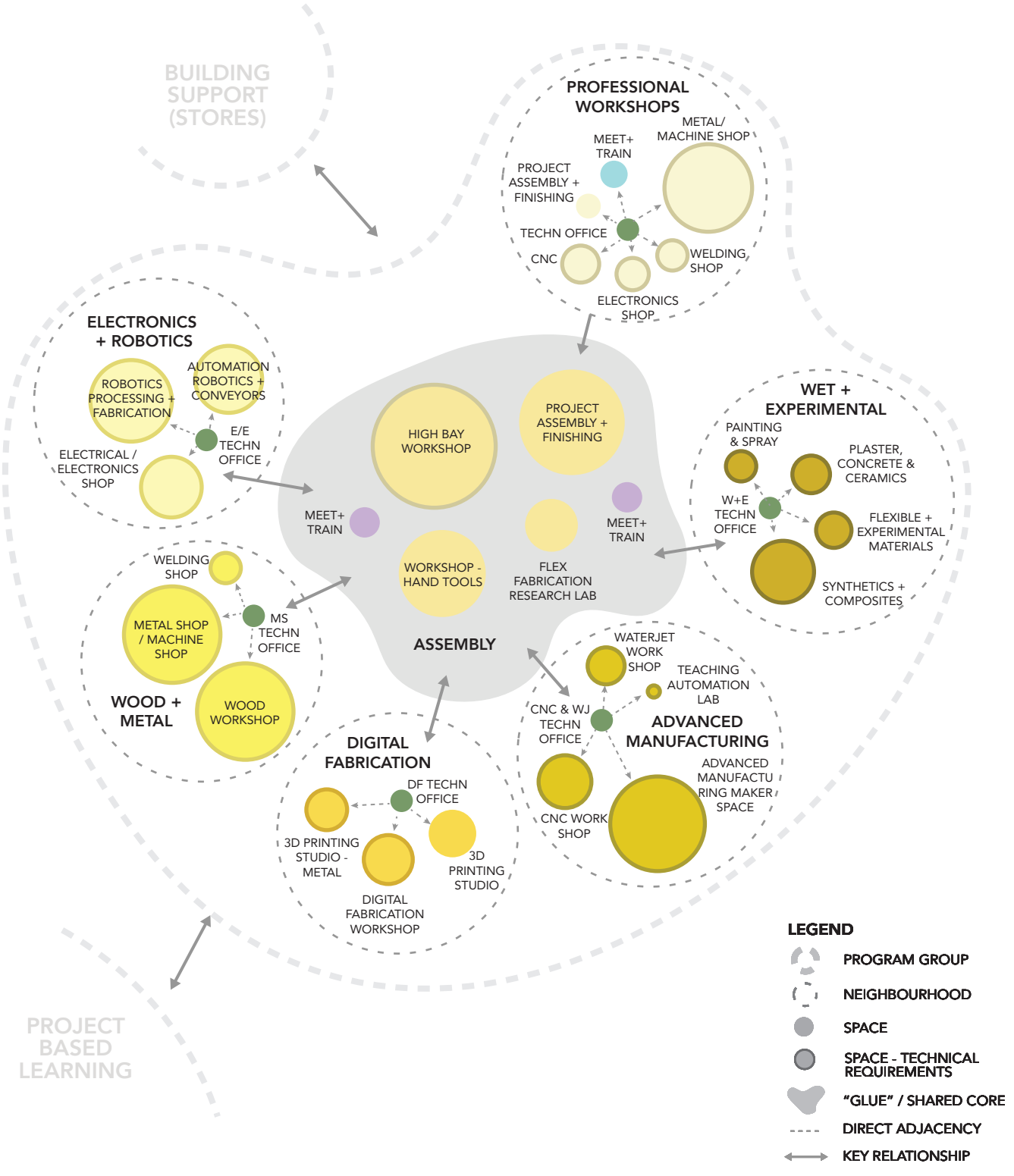
Adjacencies

Workshops + Assembly is a destination that can be a series of showcase spaces for APSC at the centre of Applied One. The large assembly spaces may benefit from direct adjacency to the Commons for event purposes and Operations for proximity to the Stores and loading. Within the Program Group the more flexible assembly spaces are grouped together with the more dedicated, specialized, high systems spaces surrounding them creating a network of shop activities. Six neighborhoods of direct adjacency are shown in the diagram, each of which would include an Technician Office for support and management of specialized workspaces: Electronics + Robotics, Wood + Metal, Digital Fabrication, Advanced Manufacturing, Wet + Experimental, and Professional Workshops.

Physical Space Characteristics

The following are general space characteristics that are applicable to the majority of spaces within this Program Group. For additional information refer to the Room Type Sheets in Appendix A.

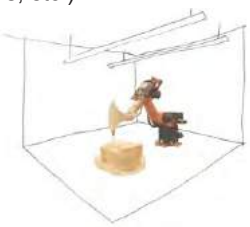
- Open spaces with high ceiling height, generous circulation paths, overheight doors and clear paths for loading and movement.
- Creative environment with workbenches and large equipment.
- High mechanical and electrical demand.
- Accommodate a spectrum of analog, mechanical, and digital tools.
- Need to separate some activities for safety and security, acoustics, dust collection and HVAC requirements.
- Healthy workspaces - great ventilation, healthy materials, daylight.
- Durable finishes and materials that are forgiving and supportive of messy making processes.
- Card/fob access based on user type and skills training.
- Storage spaces with racks / shelving for new, used, and waste materials as well as in-progress project storage.


BUILDING SUPPORT (STORES)
PROFESSIONAL WORKSHOPS
METAL/ MACHINE SHOP
MEET+ TRAIN
PROJECT ASSEMBLY + FINISHING
TECHN OFFICE
CNC
WELDING SHOP
ELECTRONICS SHOP
ELECTRONICS + ROBOTICS
AUTOMATION ROBOTICS + CONVEYORS
ROBOTICS PROCESSING + FABRICATION
E/E TECHN OFFICE
ELECTRICAL / ELECTRONICS SHOP
HIGH BAY WORKSHOP
PROJECT ASSEMBLY + FINISHING
MEET+ TRAIN
WORKSHOP - HAND TOOLS
FLEX FABRICATION RESEARCH LAB
MEET+ TRAIN
ASSEMBLY
WET + EXPERIMENTAL
PAINTING & SPRAY
PLASTER, CONCRETE & CERAMICS
W+E TECHN OFFICE
FLEXIBLE + EXPERIMENTAL MATERIALS
SYNTHETICS + COMPOSITES
WELDING SHOP
METAL SHOP / MACHINE SHOP
MS TECHN OFFICE
WOOD WORKSHOP
WOOD + METAL
WATERJET WORK SHOP
TEACHING AUTOMATION LAB
CNC & WJ TECHN OFFICE
ADVANCED MANUFACTURING
CNC WORK SHOP
ADVANCED MANUFACTURING MAKER SPACE
DIGITAL FABRICATION
DF TECHN OFFICE
3D PRINTING STUDIO - METAL
3D PRINTING STUDIO
DIGITAL FABRICATION WORKSHOP
PROJECT BASED LEARNING
LEGEND
PROGRAM GROUP
NEIGHBOURHOOD
SPACE
SPACE - TECHNICAL REQUIREMENTS
"GLUE" / SHARED CORE
DIRECT ADJACENCY
KEY RELATIONSHIP

3.2.2. WORKSHOPS + ASSEMBLY

Assembly Space, flexible space used for prep and finishing processes or as unprogrammed shoulder space (hand tools, clamps, work benches, etc.)

Dedicated Big Scale Machines, machines fixed on the ground capable of handling larger stock in an enclosed dedicated space due to noise and or safety (saws, mills, CNC, welding, laser, waterjet cutters, etc.)



Messy Wet Space, wet production (concrete testing, synthetics, painting, spraying, etc.)

Flexible Fabrication Lab, high bay space with a gantry crane for big scale research and assembly

Heavy Equipment Shop, a room with many big machines fixed on the ground (wood, metal, etc.)

Smaller Scale Fabrication, 3D printers, wire cutters, sewing machines and other non dusty processes

Meeting, Seminar and Training, a space to meet casually or collaboratively work on a problem, train new students (white boards and pin up areas)

Technician Office, space used by the office staff with excellent visibility into the shop spaces for supervision

PROJECT EVOLUTION AND REQUIRED SYSTEMS

Low Systems
lower cost / lower investment

High Systems
complex systems / high investment

Medium Systems
medium cost / medium investment

Planning the Project
Meeting casually or collaboratively, working on a problem, planning a workflow, reviewing a plan on a screen, talking with peers, faculty, industry, reviewing a sequence,working things out on white boards, pinning up ideas, samples, made objects.

Layout + Prep
Developing cut files, marking on wood, metal, raw material, developing a manufacturing 3D file, layout pieces and mockup, preparing a file for the professional shops mills, CNC, welding, laser, waterjet cutters, etc.)

Making, Cutting, Fabricating, Painting, Forming, Bending, Breaking, Drilling
Shop Time! Working with specialized equipment under supervision.

Assembly + Testing, Finishing
Assembling a model, working with peers, faculty, industry, reviewing results, testing a large construction.

Diagram above illustrates the relationship between phases of a workshop based project and the required spaces and their associated system requirements necessary for project realization.

"We need to do full scale mockups, so the size of the space has to be high enough to assemble something habitable".

-Annalisa Meyboom
Associate Professor, SALA

3.2.2. WORKSHOPS + ASSEMBLY

Space List

The Space List for this Program Group is shown below in terms of net-square-metres (NSM) with any specific remarks and descriptions noted.

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		2.1 | Workshops + Assembly | Digital Fabrication | Subtotal 211 NSM									
2.1.1	APSC Shared	3D Printing Studio	20	3.5	1	70.0	70.0	Multi-use space with small 3D printers and worktables. Sufficient space for some planning and assembly.	10		M1
2.1.2	APSC Shared	3D Printing Studio - Metal	12	5	1	60.0	60.0	Multi-use space with larger, specialized metal 3D printers (dry metal powders) and worktables. Sufficient space for some planning and assembly.	10		M2
2.1.3	APSC Shared	Digital Fabrication Workshop	18	4	1	72.0	72.0	Multi-use space for Laser cutting, Zund cutting, Advanced 3D Printing, 3D Scanning.	10		M2
2.1.4	APSC Shared	Digital Fabrication Technician Office	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.2 | Workshops + Assembly | Electronics + Robotics | Subtotal 324 NSM									
2.2.1	APSC Shared	Automation Robotics and Conveyors	30	4	1	120.0	120.0	Specialized space for robotics with "high head" & overhead crane.	10		M3
2.2.2	APSC Shared	Robotics Processing & Fabrication	30	4	1	120.0	120.0	Specialized space for robotics with "high head" & overhead crane.	10		M3
2.2.3	APSC Shared	Electrical/Electronics Shop	15	5	1	75.0	75.0	Multi-use space with work bench stations & electronics tools.	10		M2
2.2.4	APSC Shared	Electrical/Electronics Technician Office	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.3 | Workshops + Assembly | Wood + Metal | Subtotal 429 NSM									
2.3.1	APSC Shared	Metal Shop / Machine Shop	10	20	1	200.0	200.0	Multi-use space with metal and machine shop tools.	10		M2
2.3.2	SALA	Workshop - Wood	10	20	1	200.0	200.0	Wood Shop with large fixed tools. Multi-use space with larger, fixed tools and workbenches for tabletop equipment. Assume "high head" space if possible for oversized constructed objects.	10		M3
2.3.3	APSC Shared	Welding Shop	2	10	1	20.0	20.0	Small welding space.	10		M2
2.3.4	APSC Shared	Metal Shop Technicians Office	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.4 | Workshops + Assembly | Wet + Experimental | Subtotal 219 NSM									
2.4.1	MTRL	Synthetics & Composites	20	5	1	100.0	100.0	Multi-use space for working with MANU Fabrics & Resins.	10		M2
2.4.2	APSC Shared	Workshop - Plaster, Concrete & Ceramics	10	5	1	50.0	50.0	Wet workshop with sinks and sediment traps/filtration.	10		M1
2.4.3	APSC Shared	Workshop - Flexible & Experimental Materials	8	5	1	40.0	40.0	Multi-use space for working with plastics, thermoforming, foam, fabrics & sewing, etc.	10		M2
2.4.4	APSC Shared	Painting & Spray Studio	2	10	1	20.0	20.0	Specialized space for paint, coatings & adhesive spraying. Exhaust ventilation.	10		M2
2.4.5	APSC Shared	Wet + Experimental Technician Office	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.5 | Workshops + Assembly | Advanced Manufacturing | Subtotal 399 NSM									
2.5.1	MTRL - MANU	Advanced Manufacturing Makerspace	60	4	1	240.0	240.0	Multi-use space for working with advanced manufacturing equipment and tools. Includes space for lockers. Systems will require busbar power distribution and compressed air access. High head space required for equipment.	10		M3
2.5.2	APSC Shared	Workshop - CNC	6	10	1	60.0	60.0	Multi-use space for student access with larger, fixed tools like 3-axis and 5-axis mills and workbenches for tabletop equipment. Assume "high head" space if possible for oversized constructed objects.	10		M3
2.5.3	APSC Shared	Waterjet Workshop	2	15	1	30.0	30.0	Specialized space for water-jet cutting. Exhaust ventilation.	10		M2
2.5.4	MTRL - MANU	Automation Lab (Injection Molding)	12	5	1	60.0	60.0	Specialized space for injection molding.	10		M2
2.5.5	APSC Shared	CNC & Waterjet Technician Office, 2 Seat	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		2.6 | Workshops + Assembly | Professional Workshops | Subtotal 321 NSM									
2.6.1	MTRL	Metal/Machine Shop	10	20	1	200.0	200.0	Professional workshop with metal and machine shop tools.	10		M2
2.6.2	MTRL	Electrical/Electronics Shop	6	5	1	30.0	30.0	Professional workshop for work with electronics.	10		M2
2.6.3	MTRL	Project Assembly & Finishing	4	5	1	20.0	20.0	Workbenches that can accommodate assembly of projects by professionals. Large, flexible space that can accomodate 6 people at 5 NSM.	6a		M1
2.6.4	MTRL	CNC Room	3	10	1	30.0	30.0	Specialized space for professional use of 5-axis CNC equipment.	10		M2
2.6.5	MTRL	Welding Shop	2	10	1	20.0	20.0	Small welding space.	10		M2
2.6.6	MTRL	Meeting/Seminar/Training Room	6	2	1	12.0	12.0	Multi-use meeting and conference space.	6a		S2
2.6.7	MTRL	Office - Small Shared (Workshop Technician)	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.7 | Workshops + Assembly | Assembly + Research | Subtotal 840 NSM									
2.7.1	APSC Shared	Project Assembly & Finishing	60	4	1	240.0	240.0	Workbenches and basic tools that can accommodate assembly as well as project-based capstone work. Large, flexible space.	10		M1
2.7.2	SALA	Workshop - Hand Tools	60	4	1	240.0	240.0	Workbenches and basic tools that can accommodate assembly as well as project-based capstone work. Large, flexible space.	10		M1
2.7.3	SALA	Flex Fabrication Research Lab	30	4	1	120.0	120.0	Flexible Research Space with workbenches that can be adjusted to accommodate fabrication and research.	10		M2
2.7.4	APSC Shared	Workshop High-Bay Flex/Assembly Hall	20	10	1	200.0	200.0	Flexible Research Space for large scale making, fabrication, and research. Gantry crane in to assist with large scale making. .	10		M3
2.7.5	APSC Shared	Meeting/Seminar/Training Room	10	2	2	20.0	40.0	Multi-use meeting and conference space.	6b		S2
2.7.6	APSC Shared	Outdoor Assembly Area			1	0.0	0.0	Multi-use outdoor space that can accommodate large scale making and outdoor gathering. Space to be adjacent to "high head" Workshop + Assembly spaces.	none		-
							2,743				

3.2.3.

LABORATORIES

Overview

The Laboratories Program Group is a collection of spaces focused on research activities with subsidiary teaching functions. The group contains the Flex Labs, Material Labs, and Characterization Labs Neighbourhoods. Within these Neighbourhoods are a mixture of flexible and dedicated laboratories with a range of equipment and support spaces forming an APSC laboratory hub. The Laboratories Program Group provides contemporary research environments that accommodate and build on existing departmental needs while providing flexible laboratory space for projected APSC research.

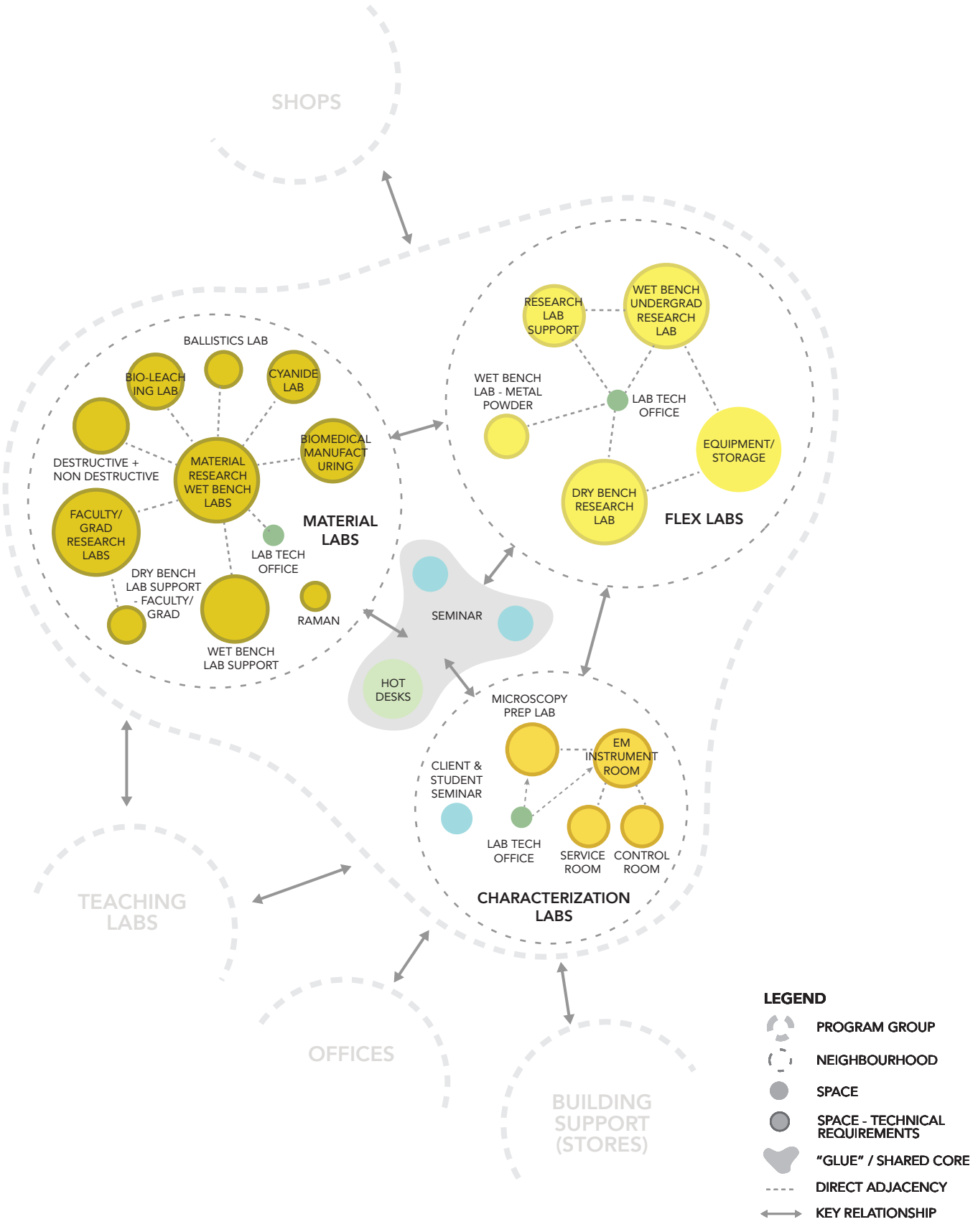
Adjacencies

The Laboratories are a core technical component of the Applied One program akin to Workshops + Assembly in regards to work production and destination nature. Laboratories generally have high system requirements and would benefit from stacking/arraying rooms vertically and/or horizontally for efficiency purposes. The activity based Neighbourhoods within the Program Group illustrate predetermined internal spatial adjacencies between laboratories, lab support, seminar, technician offices and additional specialized spaces.

Physical Space Characteristics

The following are general space characteristics that are applicable to the majority of spaces within this Program Group. For additional information refer to the Room Type Sheets in Appendix A.

- Fixed and/or moveable casework at perimeter and moveable casework / tables in centre to allow for flexibility.
- Natural daylight in open labs. Ambient lighting within the space and flexible task lighting at benchtops to be provided.
- Flexible overhead or surface mounted raceways for power and data.
- Centralized compressed air and vacuum systems to be provided at the perimeters of rooms and overhead. Other gases to be accommodated in local cylinders at their point of use.
- Lab sinks, hand sinks, eye wash stations and safety showers as required.
- At least one door into each lab space to have a 132 cm minimum opening. Doors to swing out from labs in the direction of exit.
- Security systems that match campus standards and include monitoring, access control, and alarms.
- Laboratory spaces to be organized based on modular planning principles to produce flexible large, open lab spaces, or subdivided to small instrument or special-use spaces.
- Laboratory benches to accommodate technical workstations and benchtop equipment.
- Provide Storage/ Equipment rooms adjacent to Open Lab spaces to store equipment, loud instruments, gas cylinders, and other materials.
- Provide a space for a lab technician to oversee activities in the lab. At a minimum, one lab technician should be located adjacent to every 360 NSM of lab space.
- Laboratory spaces should be connected either side-by-side, cross-corridor or through laboratory support space connections. Shared support spaces (equipment and instrument rooms) should be located directly adjacent to the laboratories.


SHOPS
BALLISTICS LAB
BIO-LEACH ING LAB
CYANIDE LAB
DESTRUCTIVE + NON DESTRUCTIVE
MATERIAL RESEARCH WET BENCH LABS
BIOMEDICAL MANUFACT URING
FACULTY/ GRAD RESEARCH LABS
LAB TECH OFFICE
MATERIAL LABS
DRY BENCH LAB SUPPORT - FACULTY/ GRAD
RAMAN
WET BENCH LAB SUPPORT
RESEARCH LAB SUPPORT
WET BENCH UNDERGRAD RESEARCH LAB
WET BENCH LAB - METAL POWDER
LAB TECH OFFICE
EQUIPMENT/ STORAGE
DRY BENCH RESEARCH LAB
FLEX LABS
SEMINAR
HOT DESKS
MICROSCOPY PREP LAB
EM INSTRUMENT ROOM
CLIENT & STUDENT SEMINAR
LAB TECH OFFICE
SERVICE ROOM
CONTROL ROOM
CHARACTERIZATION LABS
TEACHING LABS
OFFICES
BUILDING SUPPORT (STORES)
LEGEND
PROGRAM GROUP
NEIGHBOURHOOD
SPACE
SPACE - TECHNICAL REQUIREMENTS
"GLUE" / SHARED CORE
DIRECT ADJACENCY
KEY RELATIONSHIP

3.2.3. LABORATORIES

Bench Space, benches for research

Computational Space, spaces where people work alone or together on data analysis

Specialized Equipment Use, autoclaves, experiment on wheels, fume hoods

Large Output Equipment, electron microscopy, material testing equipment

Lab Prep, preparing samples, using chemicals, shared equipment

Collaboration Zone, studying casually or collaboratively, lounging and building community, informal mentorship, connection between all years / age groups

Informal Meeting Space, presentation, training, practice, meeting with industry, partners and sponsors at lounge space, review concepts on screens or whiteboards

Structured Meeting Space, meeting with industry partners / sponsors at high table, work on problems and assignments with faculty, make work plans on screens / whiteboards

Lockers, for personal items while people are in the lab

SPECTRUM OF LABORATORY TYPES

Wet Lab

A space for manipulating liquids, biological matter, and chemicals that is designed to avoid issues with spillage and contamination with stations connected to overhead utilities, increased plumbing, both demand and waste, increased mechanical needs with outside air, ventilation, humidity levels, exposure control devices like fume hoods/biological safety cabinets, and can be vibration sensitive.

Dry Lab

A space focused on computation, engineering, physics, mechanical and electrical engineering exploration, materials and manufacturing analysis and experimentation. Space should offer flexibility with open floor space and overhead utilities, support higher electrical and mechanical demand from computers, lasers, testing equipment, and can be sound and vibration sensitive as well as dust and electrostatic discharge sensitive.

Digital Lab

A space focused on computational work, often with high electrical and network demand with computers and/or monitors for visualizing data. This space might be full of computers, whiteboards, and people wearing street clothes.

The chart above defines the spectrum of labs that exist in this Program Group. Reference Appendix A for detail on wet, dry, digital, and damp labs such as the electron microscopy lab.

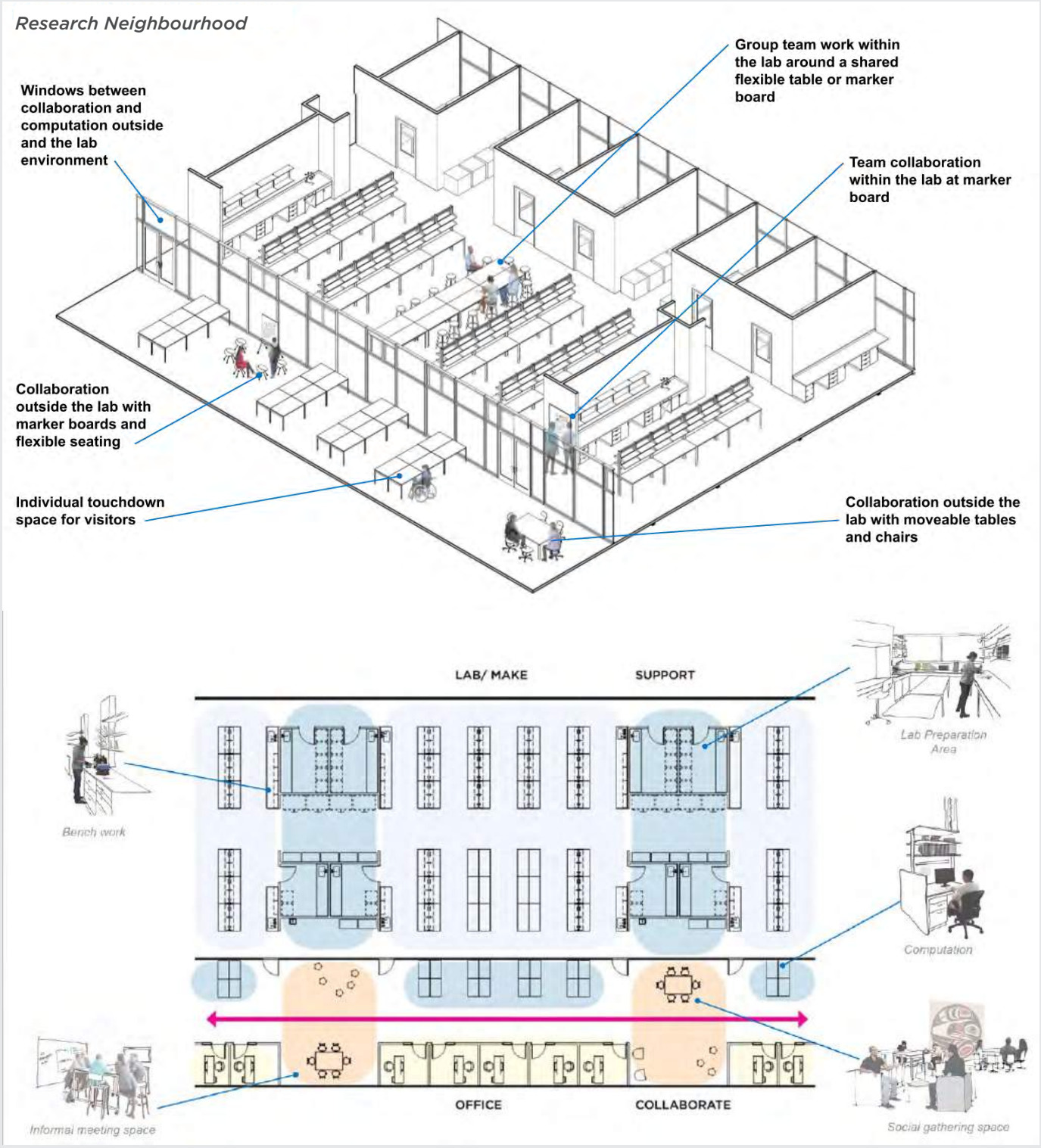
Laboratory Space Considerations/Expectations

Research lab spaces will often combine multiple lab modules at 25 NSM that support (5) 2m adjustable lab benches with associated space for movement. It is assumed that each lab will include a combination of fixed casework at the perimeter, and moveable casework and tables in the center along with flexible overhead or surface mounted raceways for power and data. These modules will also include lab sinks, hand sinks, eyewashes and safety showers per recommended guidelines. Lab Support, Equipment, and Prep spaces will include a full range from space to store loud instruments, gas cylinders, and other materials to sample prep and hosting ancillary equipment (vacuum pumps, power and electrical transformers, UPS batteries, data storage arrays, gas bottles). Totals for Lab Support in Section 3.1 assumes that 15 NSM is required for every 75 NSM of research lab space.

The following standards for space assignment support the wet and dry labs included in this program group.

User	Space Type	Area (NSM)	Remarks
Primary Investigator-Run Research Group	Lab Module	75	PI's receive space equivalent to (3) 25 NSM lab modules that each support 2m adjustable lab benches
	Lab Support	15	Each lab spaces assumes 12-16 NSM for equipment, support, prep
Graduate / Post Doc	Lab Workstation (within module)	5-6	(1) 2m adjustable lab bench with associated space for movement
Undergraduate	Lab Workstation (within module)	5-6	(1) 2m adjustable lab bench with associated space for movement
Lab Manager / Tech	Office - Small Shared Enclosed	9	(2 stations per office)

3.2.3. LABORATORIES



Many neighborhood relationships will be possible with the program identified for laboratories. The diagrams on the previous page labelled Research Neighbourhood, illustrate the potential of heads down research work being done inside the enclosed lab spaces, with collaboration touchdown, computation, undergraduate research zones, and informal meeting spaces along with offices and workspaces as critical immediate key adjacencies that support and reinforce a set of activities and uses. In this example, blocks of support strategically divide lab work spaces, offering a way to break down a larger cluster into assignable zones. They can also offer spaces to put equipment and materials that have to be secured into enclosures, while keeping the larger lab space flexible and more open.

National Institute for Nanotechnology, University of Alberta

Materials Engineering at UBC

"Solving the problems of tomorrow is a creative endeavour. To come up with the solutions and technology, for that creativity to build, we need to include personalities that break the mold of the stereotypical engineer".

-Amanda Clifford

Assistant Professor, Materials Engineering

3.2.3. LABORATORIES

Space List

The Space List for this Program Group is shown below in terms of net-square-metres (NSM) with any specific remarks and descriptions noted.

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		3.1 | Laboratories | Flexible Labs | Subtotal 625 NSM									
3.1.1	APSC Shared	Research Lab	15	5	2	75.0	150.0	Dry Bench Lab. Provide fume hood chase/rough-in for 2 future tie-ins.	10	Rough-In x2	M6
3.1.1a	APSC Shared	Research Lab Support			6	20.0	120.0	Dry Bench Lab Support Space	10	1	M6
3.1.2	APSC Shared	Research Lab Dry - Undergrad	15	5	2	75.0	150.0	Dry Bench Lab	10	1	M6
3.1.2a	APSC Shared	Research Lab Support - Undergrad			4	20.0	80.0	Dry Bench Lab Support Space	10		M6
3.1.3	APSC Shared	Research/Teaching Lab - Dangerous Metal Powders	10	5	1	50.0	50.0	Wet Bench Teaching Lab	10	1	M7
3.1.4	APSC Shared	Lab Seminar Room	15	2	1	30.0	30.0	Seminar / Meeting Room	1a		S2
3.1.5	APSC Shared	Office - Open Workstations	6	4.5	1	27.0	27.0	Hot-desk workstations in open area	none		W2
3.1.6	APSC Shared	Office - Small Shared (Lab Tech)	2	4.5	2	9.0	18.0	Enclosed workspace for lab technicians. Office also functions occasionally as meeting room, instruction & consultation. Visibility into workshops for observation.	10		W1
		3.2 | Laboratories | Material Labs | Subtotal 1206 NSM									
3.2.1	MTRL - MANU	Biomedical Manufacturing Area	15	5	1	75.0	75.0	Wet Bench Lab, BSL-2	10	1	M7
3.2.2	MTRL	Research Lab - Ballistics	5	5	1	50.0	50.0	Dry Bench Lab. Provide fume hood chase/rough-in for 2 future tie-ins.	10	Rough-In x2	M6
3.2.3	MTRL	Research Lab - Cyanide	10	5	1	50.0	50.0	Wet Bench Lab	10	1	M7
3.2.4	MTRL	Research Wet Bench Lab	15	5	2	75.0	150.0	Wet Bench Lab	10	1	M7
3.2.5	MTRL	Research Lab - Bio Leaching	15	5	1	75.0	75.0	Wet Bench Lab	10	1	M7
3.2.6	MTRL	Materials Testing Lab - Destructive & Non-destructive	15	5	1	75.0	75.0	Wet Bench Lab	10	1	M7
3.2.7	MTRL	Faculty/Grad Research Wet Lab	15	5	2	75.0	150.0	Wet Bench Lab	10	2	M7
3.2.8	MTRL	Raman Lab			1	20.0	20.0	Dry Bench Lab Support Space	10		M6
3.2.9	MTRL	Faculty/Grad Research Dry Lab Support			1	20.0	20.0	Dry Bench Lab Support Space	10		M6
3.2.10	MTRL	Research Wet Bench Lab Support			4	20.0	80.0	Wet Bench Lab Support Space	10	1	M7
3.2.11	APSC Shared	Lab Seminar Room			1	20.0	20.0	Seminar/ Meeting Room	1a		S2
3.2.12	APSC Shared	Office - Open Workstations	6	4.5	1	27.0	27.0	Hot-desk workstations in open area	none		W2
3.2.13	APSC Shared	Office - Small Shared (Lab Tech)	2	4.5	1	9.0	9.0	Enclosed workspace for lab technicians. Office also functions occasionally as meeting room, instruction & consultation. Visibility into workshops for observation.	10		W1
3.2.14	MINE	Surface Chemistry Research	30	3.5	1	105.0	105.0	Wet Bench Lab Space with (40) 2m adjustable lab benches. Equipment: Biosafety cabinet, (Class 2 Type A1), Bench for precision balances to minimize vibration, (3) Fume hoods for chemical use and dust-generation equipment. Fridge for sample and chemical storage (some flammables). Chemical/corrosives/solvent storage.	4	3	M7
3.2.15	APSC Shared	Laboratory Storage / Support Space			20	15.0	300.0	Includes specialized spaces like server room, fume hood etching and cryogenic materials storage, equipment, chemicals/acids & bases, Materials testing lab hydraulic compressor room. In addition to 4 fume hoods, provide fume hood chase/rough-in for 4 future tie-ins.	none	4 + Rough-In x4	M10
		3.3 | Laboratories | Characterization Lab | Subtotal 243 NSM									
3.3.1	APSC Shared	Microscopy Prep Lab	10	5	1	50.0	50.0	Wet Bench Lab - space includes lab modules with adjustable lab benches with associated space for movement. Ample room for benchtop equipment. Clean sample prep lab requires 2 fume hoods (acid work: one for static instruments and one for active work etching samples), splashdown area, and dedicated flexible long benches. Provide lab sinks, hand sinks, eyewashes and safety showers per recommended guidelines.	10	2	M7
3.3.2	APSC Shared	Optical Microscopy Room			1	20.0	20.0	Optical microscopes (x4) that occupies the equivalent space of 1.5 computers, at bench height.	10		M6
3.3.3	APSC Shared	Seminar Room	12	2.5	1	30.0	30.0	Seminar/ Meeting Room	1a		S2

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
3.3.4	APSC Shared	Electron Microscopy Room			4	20.0	80.0	Computational/Analysis Lab must have vibration control required with isolated slab per instrument. Characterisation using electron microscopes requires dedicated rooms with low electromagnetic noise, controlled temperature, room darkening, low acoustic and vibration noise.	10		M5
3.3.5	APSC Shared	Office - Small Shared (Lab Tech)	2	4.5	1.0	9.0	9.0	Enclosed workspace for lab technicians. Office also functions occasionally as meeting room, instruction & consultation. Visibility into workshops for observation.	10		W1
3.3.6	APSC Shared	Service Room			3	9.0	27.0	Service Room to host ancillary equipment (vacuum pumps, power and electrical transformers, UPS batteries, data storage arrays, gas bottles). Support may include fixed casework at the perimeter and flexible overhead or surface mounted raceways for power and data.	10		M10
3.3.7	APSC Shared	Control Room			3	9.0	27.0	Space for operators like a computational analysis office. Each instrument will require space for one or two computer consoles to operate and control them.	none		W1
							2,074				

3.2.4.

PROJECT-BASED LEARNING

Overview

The Project-Based Learning Program Group houses a collection of spaces primarily dedicated for engineering capstone projects and the studio-based pedagogies of SCARP and SALA. The group contains the Design Studios, Studio + Capstone, and Studio Commons Neighbourhoods. The Design Studios are dedicated spaces for SALA and SCARP while Studio + Capstone is a shared APSC space. Studio Commons is a set of shared spaces that support the process of project-based work through auxiliary spaces for making and sharing.

Used throughout the day and night, Project-Based Learning spaces support undergraduate and graduate work that require dedicated space for project planning, hands-on exploration, creation and assembly of 2D and 3D work, and research. Studios use a base module that accommodates 15 students. The modules can join together to fit a variety of course section sizes, that are typically in multiples of 15. For use of planning, the studio size is 240 NSM which accommodates 60 students, or 4 modules. This configuration allows for the development of relationships between different groups of people, planning and design disciplines, and people and tools in a highly flexible layout.

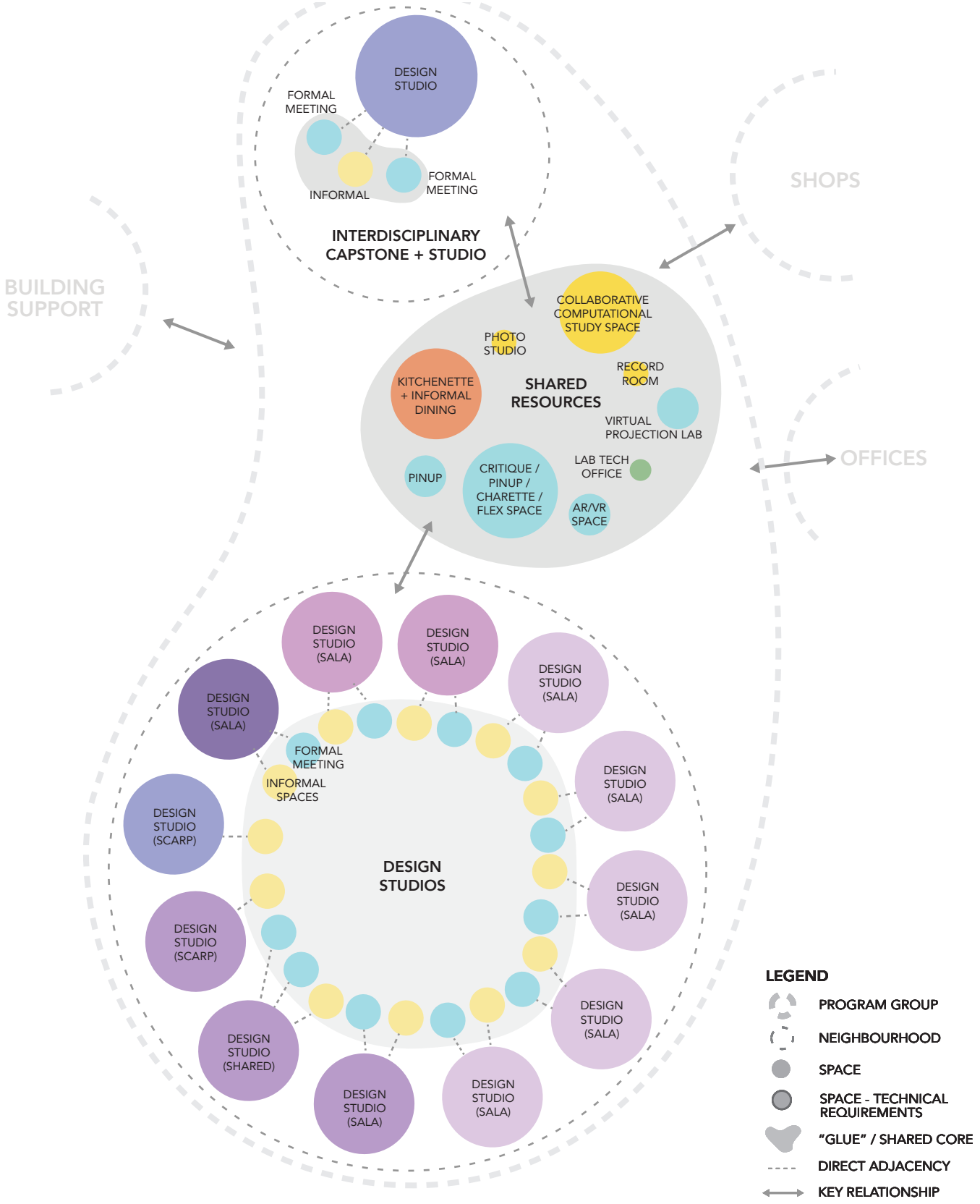
Adjacencies

Project-Based Learning is a collection of interdependent spaces required to support the core functions of project-based work through the provision of base modules and shared support spaces, both at the scale of Neighbourhoods and individual spaces. At the Neighbourhood scale, the Studio Commons supports both the Design Studios and Studio + Capstone and should be located adjacent in a collective or distributed manner depending on the future design intent of studio organization. At the scale of individual spaces, each studio base module is paired with, and should be immediately adjacent to, Studio Informal Spaces and/or Studio Formal Meeting Space. Project-Based Learning should have a spatial link with Workshops + Assembly for ease of access and to minimize the risk of activities that pose a safety risk from occurring in the studio space.

Physical Space Characteristics

The following are general space characteristics that are applicable to the majority of spaces within this Program Group. For additional information refer to the Room Type Sheets in Appendix A.

- Highly adaptable layout with furnished and open areas.
- Durable finishes to allow for a wide range of activities.
- Highly flexible furniture for variety of body types that encouraging movement and perching.
- Individual, adjustable-height desks that support computer-based work and analog work (glueing, sketching, testing).
- Shared workbenches and/or tables to accommodate making and sharing.
- Ability to tune space with visual and acoustical barriers: ceiling panels, rolling partitions, moveable casework.
- Ability to accommodate a wide range of objects such as models, paper drawings, printed materials, and plants.
- Studio and capstone spaces to have a single sink, and overhead or floor-based power distribution.
- Healthy workspaces - great ventilation, healthy materials, daylight.
- Card/fob access control.


DESIGN STUDIO
FORMAL MEETING
INFORMAL
FORMAL MEETING
INTERDISCIPLINARY CAPSTONE + STUDIO
SHOPS
BUILDING SUPPORT
OFFICES
COLLABORATIVE COMPUTATIONAL STUDY SPACE
PHOTO STUDIO
RECORD ROOM
KITCHENETTE + INFORMAL DINING
SHARED RESOURCES
VIRTUAL PROJECTION LAB
LAB TECH OFFICE
PINUP
CRITIQUE / PINUP / CHARETTE / FLEX SPACE
AR/VR SPACE
DESIGN STUDIO (SALA)
DESIGN STUDIO (SALA)
DESIGN STUDIO (SALA)
DESIGN STUDIO (SALA)
DESIGN STUDIO (SALA)
DESIGN STUDIO (SALA)
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DESIGN STUDIO (SALA)
DESIGN STUDIO (SALA)
DESIGN STUDIO (SCARP)
DESIGN STUDIO (SCARP)
DESIGN STUDIO (SHARED)
FORMAL MEETING
INFORMAL SPACES
DESIGN STUDIOS
LEGEND
PROGRAM GROUP
NEIGHBOURHOOD
SPACE
SPACE - TECHNICAL REQUIREMENTS
"GLUE" / SHARED CORE
DIRECT ADJACENCY
KEY RELATIONSHIP

3.2.4. PROJECT-BASED LEARNING

Social Space, studying casually or collaboratively, lounging and building community, informal mentorship, connection between all years and age groups

Work Space, making everywhere! Benches or workstations on wheels set up around the room to teach prototyping and making in a safe space. Flexible and moveable furniture (stools or chairs) and white boards

Storage Space, small scale for personal items and large scale for project work

Big Model Space, open space with large common tables for messy activities in large groups or individually

Intimate Gathering Space, spaces where collaborators of all kinds can step out of the flow and into a productive mode, relaxing or taking a personal call, having an impromptu meeting

Informal Meeting Space, presentation training and practice, meeting with industry partners and sponsors at lounge space, review concepts on screens and whiteboards

Structured Meeting Space, meeting with industry partners / sponsors at high table, work on problems and assignments with faculty, make work plans on screens / whiteboards

Pin-Up Space, pin up at different scales, two people standing, 15-person studio group and final presentation at studio with guests

SHARING AT DIFFERENT SCALES

Intimate Critique / Discussion

1-2 people speaking about a 2D or 3D exploration

Medium-size Critiques

10-18 people together, speaking about 2D and 3D work

Large-size Critiques

Bigger groups of 30-60 at the end of the semester/year

"One of the things that I really hope continues to be captured is the kind of space that is flexible and unprogrammed. Things are in spaces that line up with semesters, but a lot of the work that is done through research has a different timeline. The shoulder space is important".

-Blair Satterfield
Associate Professor and Chair, SALA

3.2.4. PROJECT-BASED LEARNING

Space List

The Space List for this Program Group is shown below in terms of net-square-metres (NSM) with any specific remarks and descriptions noted.

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		4.1 | Project-Based Learning | Design Studios | Subtotal 3140 NSM									
4.1.1	SCARP	**Design Studio**	60	4	2	240.0	480.0	Base Module - Highly adaptable layout with flexible furniture. A mix of high top and lower desks for variety of body types, encouraging movement and perching. Combined spaces supports SCARP Planning I/II and SCARP ICP Design Studio, SCARP Digital Studio, and SCARP Grad/PhD Studio.	4		L6
4.1.1a	SCARP	Studio Informal Spaces	10	2.5	2	25.0	50.0	Assembly Area, Informal Meeting Space with tables and chairs for informal learning and gathering.	8		B2
4.1.2	SALA	**Design Studio**	60	4	9	240.0	2,160.0	Base Module - Highly adaptable layout with flexible furniture. A mix of high top and lower desks for variety of body types, encouraging movement and perching. Combined spaces together support (9) SALA studios at 60 seats each.	4		L6
4.1.2a	SALA	Studio Informal Spaces	10	2.5	9	25.0	225.0	Assembly Area, Informal Meeting Space with tables and chairs for informal learning and gathering.	8		B2
4.1.2b	SALA	Studio Meeting Space	10	2.5	9	25.0	225.0	Group Breakout Rooms, Intimate Gathering, Structured Meeting Space.	6b		S3
		4.2 | Project-Based Learning | Studio + Capstone | Subtotal 305 NSM									
4.2.1	APSC Shared	**Interdisciplinary Design Studio and Project Based Capstone**	60	4	1	240.0	240.0	Base Module - Highly adaptable layout with flexible furniture. A mix of high top and lower desks for variety of body types, encouraging movement and perching. Combined space supports (1) SALA Interdisciplinary Studios s and (1) Flexible Project-Based Capstone for MANU/IGEN/Materials.	4		L6
4.2.1a	APSC Shared	Studio Informal Spaces	10	2.5	1	25.0	25.0	Assembly Area, Informal Meeting Space with tables and chairs for informal learning and gathering.	8		B2
4.2.1b	APSC Shared	Studio Meeting Space	8	2.5	2	20.0	40.0	Group Breakout Rooms, Intimate Gathering, Structured Meeting.	6a		S3
		4.3 | Project-Based Learning | Studio Commons | Subtotal 621 NSM									
4.3.1	APSC Shared	Collaborative Computational Study Space	60	2.4	1	144.0	144.0	Collaborative study space similar to a Learn Lab. Assume pods of 6 people.	2		M8
4.3.2	APSC Shared	Pin-up/Critique/Charette - Flex Space	15	2	6	30.0	180.0	Critique + Design Review Space. 1 Unit per 60 Project-based Learning Seats. Flexible Multi-purpose space with pin-up/tackable surfaces on walls.	6b		S4
4.3.3	APSC Shared	Pin-up/Critique/Charette - Flex Space	15	2	1	30.0	30.0	Critique + Design Review Space with enhanced AV package.	5		S4
4.3.4	APSC Shared	Virtual Projection Lab			1	30.0	30.0	Bookable Room - Immersive Sharing Experience, Multiscalar 2D Projection/Screens. No external light sources.	10		S4
4.3.5	APSC Shared	AR/VR Space			1	30.0	30.0	Bookable Room - Immersive Sharing Experience.	10		S4
4.3.6	APSC Shared	Kitchenette + Informal Dining			12	15.0	180.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, refrigerator, microwave in casework. 1 Unit per 60 Project-Based Learning Seats.	none		B4
4.3.7	APSC Shared	Office - Technician, Studio + Capstone Support	2	4.5	1	9.0	9.0	Enclosed workspace for 2 studio technicians. Office also functions occasionally as meeting room, instruction & consultation.	none		W1
4.3.8	APSC Shared	Photography Studio			1	9.0	9.0	Bookable room to document project work. No external light sources. Space for one person with moveable and fixed photography equipment.	10		M9
4.3.9	APSC Shared	Recording Room			1	9.0	9.0	Bookable, sound-proofed room for audio recording - voice primary, video secondary and supported with green screen and cabled internet for live broadcasts. Space for one person with moveable and fixed recording equipment.	4		M9
							4,066				

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3.2.5.

FLEXIBLE CLUSTERS

Overview

The Flexible Clusters is a Program Group with spaces that are easily purposed and repurposed for solution-focused research. This Program Group is comprised of five Neighbourhoods: four Research Neighbourhoods that accommodate different scales and types of research groups and the Research Commons that provides support functions including meeting rooms, a lounge and a kitchen. With exception of the SALA research studio, Flexible Clusters accommodates emerging research needs. It allows for new arrangements of open and enclosed space to support collaborations between research groups, academic units and community/industry partners. The Flexible Clusters support critical heads-down research with comfortable spaces for people to eat, pore through reading, and work through data analysis.

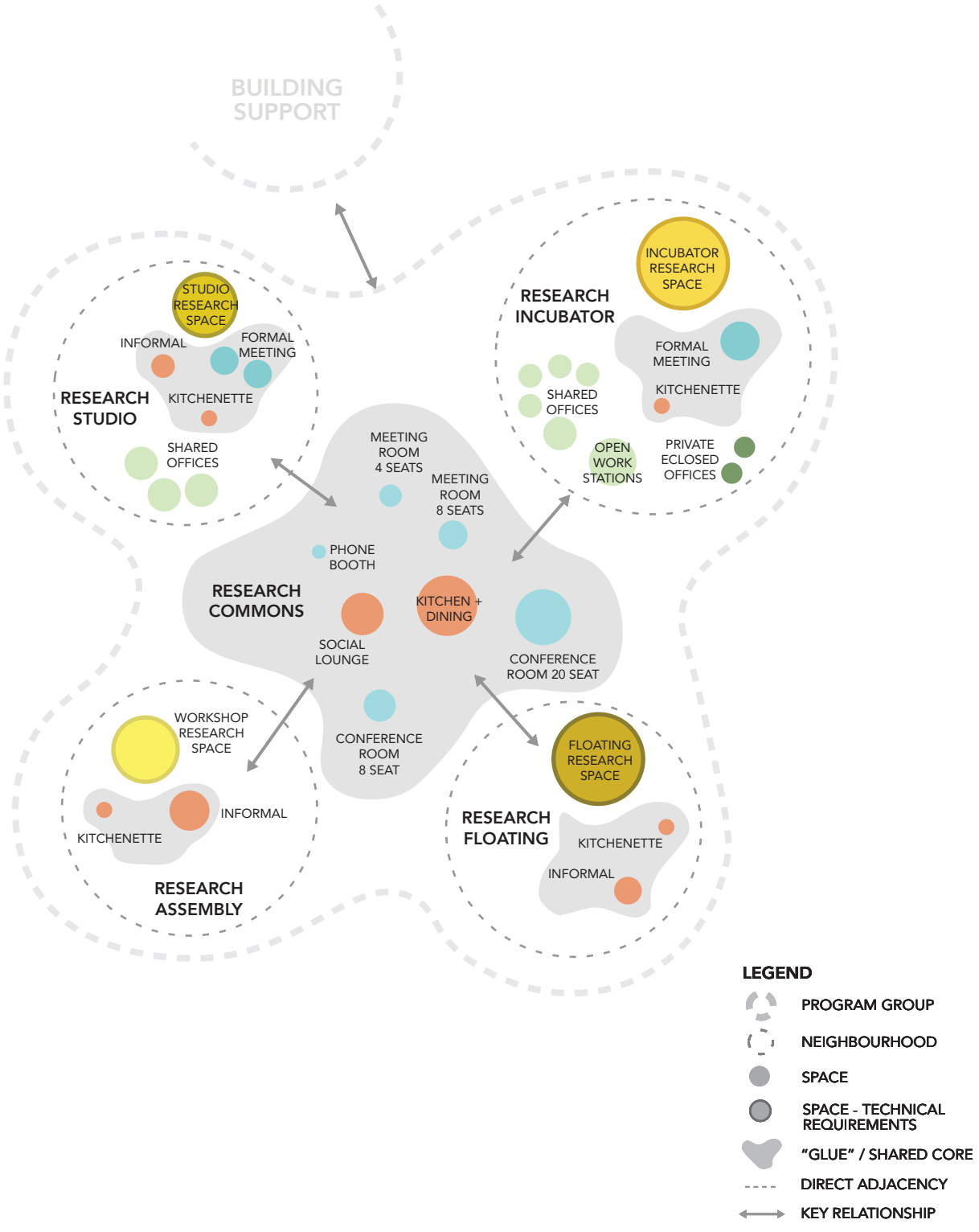
Adjacencies

The Flexible Clusters are organized so that internally the research Neighbourhoods are adjacent to and supported by Research Commons. The Flexible Clusters have key relationships with other groups like the Academic Workplace, Laboratories and Workshops + Assembly due to the degree of applied research that requires workshop functions.

Physical Space Characteristics

The following are general space characteristics that are applicable to the majority of spaces within this Program Group. For additional information refer to the Room Type Sheets in Appendix A.

- Highly adaptable layout and open space to allow for either different size research groups or large equipment associated with research grants.
- Individual desk areas that encourage computer-based work and analog work.
- Ability to tune space with visual and acoustical barriers: ceiling panels, rolling partitions, moveable casework.
- ‘In-lab’ storage where people can park experiments/ apparatus/samples etc that are in use.
- Floor space, clear circulation widths, and proximity to freight elevators, and durability of floor and wall finishes should be considered carefully to allow for moving equipment and project work.
- At least one door into each Cluster space to have a 132 cm minimum opening. When possible provide double swing doors with half-lites. Doors to swing out from labs in the direction of exit.
- Visibility balanced against dangers of “fish-bowl effect” and the social dynamics of over-visibility.
- Flexible overhead or surface mounted raceways for power and data.
- Healthy workspaces - great ventilation, healthy materials, daylight.
- Card/fob access control.


BUILDING SUPPORT
STUDIO RESEARCH SPACE
INFORMAL
FORMAL MEETING
RESEARCH STUDIO
KITCHENETTE
SHARED OFFICES
INCUBATOR RESEARCH SPACE
RESEARCH INCUBATOR
FORMAL MEETING
KITCHENETTE
SHARED OFFICES
OPEN WORK STATIONS
PRIVATE ECLOSED OFFICES
MEETING ROOM 4 SEATS
MEETING ROOM 8 SEATS
PHONE BOOTH
RESEARCH COMMONS
KITCHEN + DINING
SOCIAL LOUNGE
CONFERENCE ROOM 20 SEAT
CONFERENCE ROOM 8 SEAT
WORKSHOP RESEARCH SPACE
INFORMAL
KITCHENETTE
RESEARCH ASSEMBLY
FLOATING RESEARCH SPACE
RESEARCH FLOATING
KITCHENETTE
INFORMAL
LEGEND
PROGRAM GROUP
NEIGHBOURHOOD
SPACE
SPACE - TECHNICAL REQUIREMENTS
"GLUE" / SHARED CORE
DIRECT ADJACENCY
KEY RELATIONSHIP

3.2.5. FLEXIBLE CLUSTERS

Structured Meeting Space, meeting with industry partners and sponsors at a high table, working on problems and assignments with faculty, making work plans on screens and whiteboards

Informal Meeting Space, presentation training and practice, meeting with industry partners and sponsors at lounge space, review concepts on screens and whiteboards

Intimate Gathering Space, spaces where collaborators of all kinds can step out of the flow and into a productive mode, relaxing or taking a personal call, having an impromptu meeting

Bench Space, benches for research on experiments

Assembly Space, flexible space used for prep and finishing processes or as unprogrammed shoulder space (hand tools, clamps, sturdy work, benches…)

Work Space, making everywhere! Benches or workstations on wheels set up around the room to teach prototyping and making in a safe space. Flexible and moveable furniture (stools or chairs) and white boards

Heads-down Computational Space, Spaces where people work alone or together on data analysis

"Productivity happens in our offices. Creativity happens when we mingle."

-Tony Yang
Professor, Civil Engineering

Space List

The Space List for this Program Group is shown below in terms of net-square-metres (NSM) with any specific remarks and descriptions noted.

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		5.1 | Flexible Clusters | Research Studio | Subtotal 170 NSM									
5.1.1	SALA	**Research Space - Sml, Studio Based**	15	4	1	60.0	60.0	Flexible Research Base Module - Includes Lockers. Highly adaptable layout with flexible furniture. A mix of high top and lower desks for variety of body types, encouraging movement and perching.	10		M4
5.1.2	SALA	Offices - Large Shared	20	3	1	60.0	60.0	Enclosed or open office with groups of workstations.	none		W1
5.1.3	SALA	Meeting Places	15	2	1	30.0	30.0	Group Breakout Rooms, Intimate Gathering, Structured Meeting.	6b		S3
5.1.4	SALA	Informal Spaces	6	2.5	1	15.0	15.0	Informal Meeting Space with tables and chairs.	8		B2
5.1.5	SALA	Kitchenette / Refresh Station			1	5.0	5.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, microwave in casework.	none		B4
		5.2 | Flexible Clusters | Research Assembly | Subtotal 95 NSM									
5.2.1	APSC Shared	**Research Space - Sml, Workshop Based**	15	4	1	60.0	60.0	Flexible Research Base Module with workbenches that can be adjusted to accommodate fabrication and research. Includes lockers. Provide fume hood chase/rough-in for 1 future tie-in.	10	Rough-In x1	M4
5.2.2	APSC Shared	Informal Spaces	6	2.5	2	15.0	30.0	Informal Meeting Space with tables and chairs.	8		B2
5.2.3	APSC Shared	Kitchenette / Refresh Station			1	5.0	5.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, microwave in casework.	none		B4
		5.3 | Flexible Clusters | Research Floating | Subtotal 140 NSM									
5.3.1	APSC Shared	**Research Space - Lrg, Floating**	30	4	1	120.0	120.0	Flexible Research Base Module. Includes Lockers. Provide fume hood chase/rough-in for 2 future tie-ins.	10	Rough-In x2	M4
5.3.2	APSC Shared	Informal Spaces	6	2.5	1	15.0	15.0	Informal Meeting Space with tables and chairs.	8		B2
5.3.3	APSC Shared	Kitchenette / Refresh Station			1	5.0	5.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, microwave in casework.	none		B4
		5.4 | Flexible Clusters | Research Incubator | Subtotal 263 NSM									
5.4.1	APSC Shared	**Research Space - Lrg, Incubator**			1	120.0	120.0	Flexible Research Base Module for hosting Design Studio, Computational/Analysis Lab, Bench Labs - Includes Lockers. Reconfigurable space with rough-in for future research build-out. Provide fume hood chase/rough-in for 2 future tie-ins.	10	Rough-In x2	M4
5.4.2	APSC Shared	Office - Small Shared	2	4.5	4	9.0	36.0	Assignable/Bookable Enclosed office with workstations.	none		W1
5.4.3	APSC Shared	Office - Large Shared	4	4.5	1	18.0	18.0	Assignable/Bookable Enclosed office with workstations.	none		W1
5.4.4	APSC Shared	Office - Private Enclosed	1	9	2	9.0	18.0	Assignable/Bookable Enclosed office with workstations.	none		W1
5.4.5	APSC Shared	Office - Open Workstations	8	4.5	1	36.0	36.0	Hot-desk workstations in open area.	none		W2
5.4.6	APSC Shared	Meeting Places	15	2	1	30.0	30.0	Group Breakout Rooms, Intimate Gathering, Structured Meeting.	6b		S3
5.4.7	APSC Shared	Kitchenette / Refresh Station			1	5.0	5.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, microwave in casework.	none		B4
		5.5 | Flexible Clusters | Research Commons | Subtotal 158 NSM									
5.5.1	APSC Shared	Meeting Room - L	20	2.4	1	48.0	48.0	Research grouping shared amenity.	6c		S2
5.5.2	APSC Shared	Meeting Room - M	8	2.4	2	19.0	38.0	Research grouping shared amenity.	6a		S3
5.5.3	APSC Shared	Meeting Room - S	4	2.4	1	10.0	10.0	Research grouping shared amenity.	6a		S3
5.5.4	APSC Shared	Focus Booth			2	4.0	8.0	Research grouping shared amenity. Small space for phone calls - assume BYOD & no AV support.	none		S3
5.5.5	APSC Shared	Social Lounge	10	2.4	1	24.0	24.0	Research grouping shared amenity. Social area with mix of soft seating and tables and chairs.	8		B2
5.5.6	APSC Shared	Kitchen + Dining			1	30.0	30.0	Research grouping shared amenity. Kitchen area includes multiple fridges, sinks, dishwasher, etc. as well as tables and chairs/booths for seating. Large enough to hold bigger groups and some people alone together.	none		B4
							826				

3.2.6.

TEACHING SPACES

Overview

This Program Group organized into APSC Learning Spaces and UBC General Teaching Spaces Neighborhoods includes classrooms, teaching labs, and theatres. APSC Learning Spaces will be administered and scheduled by APSC whereas the UBC General Teaching Spaces will add to the university wide pool of General Teaching Space (GTS). GTS are classrooms that are available to all UBC departments, faculties and schools for academic course scheduling. GTS are managed centrally by the Learning Spaces Team, Facilities Planning and scheduled through Enrolment Services following the Academic Course Scheduling Guidelines and the UBC Vancouver Booking Guidelines for General Teaching Space. The number and sizes of GTS are based on a review of future academic sections needs for programs that will be housed within the Applied One building as well as overall precinct and campus academic scheduling needs. Both the APSC Learning Spaces and UBC General Teaching Spaces can be scheduled for events after hours and for specific classes that require adjacency to labs, studios, equipment or other teaching resources.

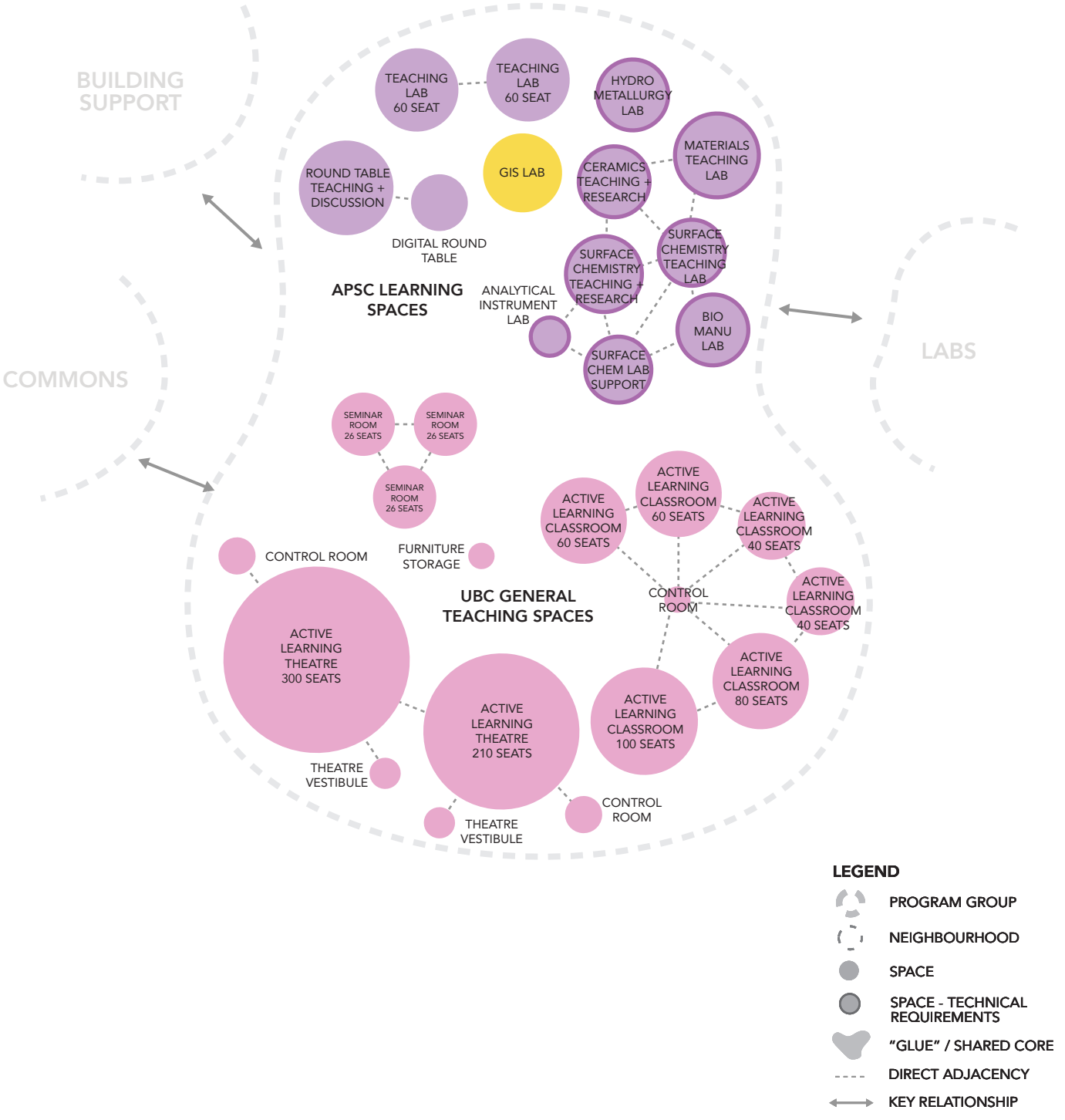
Adjacencies

APSC Learning Spaces and UBC General Teaching Spaces do not have a Neighbourhood-to-Neighbourhood critical adjacency similar to other Program Groups. Locate large learning spaces as close to the building entrance level, major stairs and elevators as possible in order to improve access, isolate class change noise and high traffic functions from office and lab functions, and provide opportunities for building security zoning. Large learning spaces in particular, should be located close together and close to primary building entrances and circulation spaces that are large enough to accommodate students waiting for the next class. Cluster learning spaces (preferably on the ground floor) to enable opportunities for optimal thermal zoning, lighting zoning and application of energy efficiency strategies. Learning spaces should generally be separated from research labs, hazardous material rooms and noise generating areas such as mechanical rooms, elevators, cafeterias, vending machine areas, and restrooms. The larger theatre spaces should be conveniently located adjacent to the lobby and/or other significant common areas to allow for event use.

Physical Space Characteristics

The following are general space characteristics that are applicable to the majority of spaces within this Program Group. For additional information refer to the Room Type Sheets in Appendix A.

- All spaces to follow UBC Learning Space Design Guidelines 2022.
- GTS will be open from 7:30 am to 11 pm and can be used by building users outside of scheduled bookings.
- GTS follow the Learning Space Design Guidelines and will have a range of space between 2.2 and 2.6 nsm/seat.
- Participants can move around the room easily and instructional processes can occur anywhere in the room.
- Appropriate acoustics for a wide range of activities so that all participants can effectively hear each other.
- Table and wall surfaces support student work (e.g. multiple markerboards, projection surfaces/video displays, maker equipment).
- HVAC, acoustical controls, ambient noise levels and lighting that fully support intended teaching and pedagogical use cases.
- Furniture that is comfortable, ergonomic, and robust.
- Inviting, welcoming ambience that supports accessibility.
- Sight-lines between all participants must be unobstructed. Ensure that learning spaces are free of structural columns and that any elevation changes allow participants to see one another.


BUILDING SUPPORT
COMMONS
LABS
TEACHING LAB 60 SEAT
TEACHING LAB 60 SEAT
HYDRO METALLURGY LAB
MATERIALS TEACHING LAB
ROUND TABLE TEACHING + DISCUSSION
GIS LAB
CERAMICS TEACHING + RESEARCH
DIGITAL ROUND TABLE
SURFACE CHEMISTRY TEACHING LAB
SURFACE CHEMISTRY TEACHING + RESEARCH
APSC LEARNING SPACES
ANALYTICAL INSTRUMENT LAB
BIO MANU LAB
SURFACE CHEM LAB SUPPORT
SEMINAR ROOM 26 SEATS
SEMINAR ROOM 26 SEATS
SEMINAR ROOM 26 SEATS
ACTIVE LEARNING CLASSROOM 60 SEATS
ACTIVE LEARNING CLASSROOM 60 SEATS
ACTIVE LEARNING CLASSROOM 40 SEATS
CONTROL ROOM
FURNITURE STORAGE
ACTIVE LEARNING CLASSROOM 40 SEATS
UBC GENERAL TEACHING SPACES
CONTROL ROOM
ACTIVE LEARNING THEATRE 300 SEATS
ACTIVE LEARNING CLASSROOM 80 SEATS
ACTIVE LEARNING THEATRE 210 SEATS
ACTIVE LEARNING CLASSROOM 100 SEATS
THEATRE VESTIBULE
CONTROL ROOM
THEATRE VESTIBULE
LEGEND
PROGRAM GROUP
NEIGHBOURHOOD
SPACE
SPACE - TECHNICAL REQUIREMENTS
"GLUE" / SHARED CORE
DIRECT ADJACENCY
KEY RELATIONSHIP

3.2.6. TEACHING SPACES

Discussion at Tables, peer-to-peer interaction

Gathering in the Round, meetings that include First Nations communities with opportunities to gather organically

Teaching Lab - Testing and experimenting with materials, surface chemistry, and ceramics

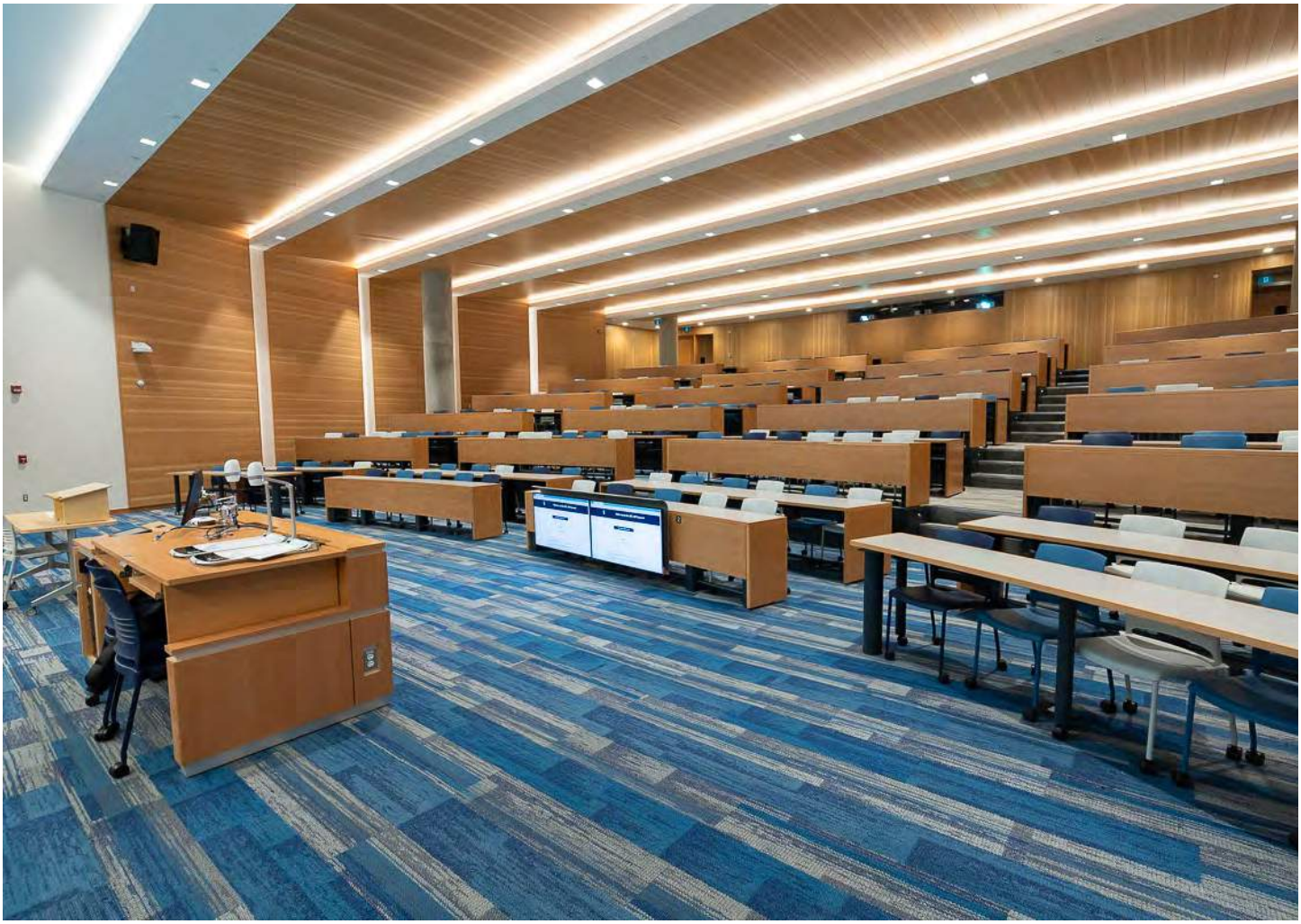
Active Learning - Students engage with the course material through discussions and problem-solving

Big Events, Gathering in groups of 50+; Impromptu or formal gatherings

Testing and Celebrating Work, End of semester testing; Student engineering design and clubs

"It's refreshing to see that some spaces reflect increasing collaboration with Coastal First Nations: immersive spaces that are dedicated".

-Danilo Caron
PhD Candidate, Civil Engineering



GTS Tiered Theatre, Biological Sciences (BIOL) - 1000, UBC

3.2.6. TEACHING SPACES

Space List

The Space List for this Program Group is shown below in terms of net-square-metres (NSM) with any specific remarks and descriptions noted.

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		6.1 | Teaching Spaces | APSC Learning Spaces | Subtotal 1161 NSM									
6.1.1	APSC Shared	Outdoor Classroom - Indigenous Teaching + Discussion			1	0.0	0.0	Space for teaching, discussion, and ceremony outside. Appropriate for Indigenous teaching and events and/or gatherings.	none		L7
6.1.2	APSC Shared	Digital Roundtable / Seminar Room	30	2.4	1	72.0	72.0	Indigenous & Remote Communities Collaboration space for teaching and discussion. Ability to connect easily to remote locations or provide immersive experience.	6c		L1
6.1.3	APSC Shared	Geographic Information System (GIS) Lab	40	2.4	1	96.0	96.0	Shared Teaching Computer Lab.	4		M8
6.1.4	APSC Shared	Teaching Lab	60	2.4	2	144.0	288.0	Teaching Lab Space	1b		L4
6.1.5	APSC Shared	Materials Teaching Lab - Open Floor Wet Lab	40	4	1	160.0	160.0	Teaching Lab Space. Equipment: Chem Fume Hood, Tube Furnace, Rolling Mill, Charpy Tester, ballistic pendulum, Zwick Universal Test, Fatigue tester (x2), Instron (x6), Furnace.	4	2	L5
6.1.6	APSC Shared	Ceramics Teaching and Research	30	4	1	120.0	120.0	Teaching Lab Space. Open for after hours research. Equipment: Dedicated Fume Hood w/ cup sink, Extractor for furnaces for sintering materials, (3) Furnaces, Ball Mill, Mixing/ Blending.	4	2	L5
6.1.7	MTRL	Hydrometallurgy, Structures, Properties Teaching	30	4	1	120.0	120.0	Wet Bench Teaching Lab Space with 2m adjustable lab benches. Equipment: Biosafety cabinet, (Class 2 Type A1), Bench for precision balances to minimize vibration, (3) Fume hoods for chemical use and dust-generation	4	3	L5
6.1.8	MTRL - MANU	Bio Manufacturing Teaching Lab	30	4	1	120.0	120.0	Wet Bench Teaching Lab Space with 2m adjustable lab benches. Equipment: Biosafety cabinet, (Class 2 Type A1), Bench for precision balances to minimize vibration, (3) Fume hoods for chemical use and dust-generation	4	3	L5
6.1.9	MINE	Surface Chemistry Teaching Lab	30	3.5	1	105.0	105.0	Wet Bench Teaching Lab Space with 2m adjustable lab benches. Equipment: variety of benchtop equipment.	4	1	L5
6.1.10	MINE	Analytical Instrument Lab - Surface Chemistry Research Support			1	20.0	20.0	Dry Bench Lab support space for Surface Chemistry Teaching Lab.	none		M6
6.1.11	MINE	Research Lab - Surface Chemistry Support			3	20.0	60.0	Wet Bench Lab Support Space adjacent to Surface Chemistry Teaching Lab	none		M7
		6.2 | Teaching Spaces | UBC General Teaching Spaces | Subtotal 2415.5 NSM									
6.2.1	UBC	GTS - Active Learning Theatre - Med-Large	300	2.4	1	720.0	720.0	Active Learning Theatre. Double height space for sightlines. Locate adjacent to lobby / common area for gathering and sharing purposes.	3		L2
6.2.1a	UBC	GTS Learning Spaces - Theatre Control Room			1	17.5	17.5	Control Room for Active Learning Theatre. Location and shape of control room is critical for function of space; must be centered at back of auditorium for projection/sightlines.	none		L9
6.2.1b	UBC	GTS Learning Spaces - Theatre Vestibules			2	7.5	15.0	Entry vestibules for acoustic separation. Serves Active Learning Theatre.	none		-
6.2.2	UBC	GTS - Active Learning Theatre - Med-Small	210	2.4	1	504.0	504.0	Active Learning Theatre . Double height space for sightlines. Locate adjacent to lobby / common area for gathering and sharing purposes.	3		L2
6.2.2a	UBC	GTS Learning Spaces - Theatre Control Room			1	17.5	17.5	Control Room for Active Learning Theater. Location and shape of control room is critical for function of space; must be centered at back of auditorium for projection/sightlines.	none		L9
6.2.2b	UBC	GTS Learning Spaces - Theatre Vestibules			2	7.5	15.0	Entry vestibules for acoustic separation. Serves Active Learning Theatre.	none		-
6.2.3	UBC	GTS - Active Learning Classroom - Large	100	2.4	1	240.0	240.0	Active Learning Classroom.	1c		L4
6.2.4	UBC	GTS - Active Learning Classroom - Large	80	2.4	1	192.0	192.0	Active Learning Classroom.	1c		L4
6.2.5	UBC	GTS - Active Learning Classroom - Medium	60	2.4	2	144.0	288.0	Active Learning Classroom.	1b		L4
6.2.6	UBC	GTS - Active Learning Classroom - Small	40	2.4	2	96.0	192.0	Active Learning Classroom.	1b		L4
6.2.7	UBC	GTS - Classroom Control Room			1	9.0	9.0	Control Room for Active Learning Classrooms. Location to be adjacent or in the immediate vicinity of classrooms.	none		L9
6.2.8	UBC	GTS - Seminar Room	26	2.4	3	62.5	187.5	Active Learning Classroom.	1a		L1

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
6.2.9	UBC	GTS Learning Spaces - Learn Lab Control Room			1	9.0	9.0	Control Room for Learn Labs. Location to be adjacent or in the immediate vicinity of Learn Labs. 1 Control Room per 3 Learn Labs.	none		L9
6.2.10	UBC	GTS Learning Spaces - Storage			1	9.0	9.0	Furniture storage room for Learning Spaces. Located near GTS and easily accessed, not located within a GTS. This room is used to store broken furniture that will be accessed by vendors when they come onsite to do maintenance.	none		-
							3,577				

3.2.7.

ACADEMIC WORKPLACE

Overview

Academic Workplace consists of the Faculty Offices, Administration, and Workplace Commons Neighbourhoods. The Faculty Offices and Administration Neighrbourhoods house offices for faculty, staff, post-docs, and graduate students. The Workplace Commons Neighbourhood offers spaces for informal and formal meetings, socializing, eating and gathering that can be used by all inhabitants of the Faculty Office and Administration Neighbourhoods.

The following standards for space assignment supported the development of the quantities and sizes of workspaces:

- Full time faculty, Heads, and Directors | Private enclosed offices at 9 NSM
- Part-time faculty and senior staff | 2-person shared enclosed offices at 9 NSM
- Non-senior staff, postdoctoral fellows, research associates, visiting faculty, and active and inactive emeritus faculty | Large shared enclosed offices at 4.5 NSM/person with 4-6 stations per space
- PhD candidates, master's candidates, teaching assistants, and visitors hoteling for short period | Open workstations at 4.5 NSM/person
- Undergraduate student lounges and study spaces will be sized for 3.2-3.5 NSM/person
- Capstone student locker spaces can be assumed to be .25 cubic metres

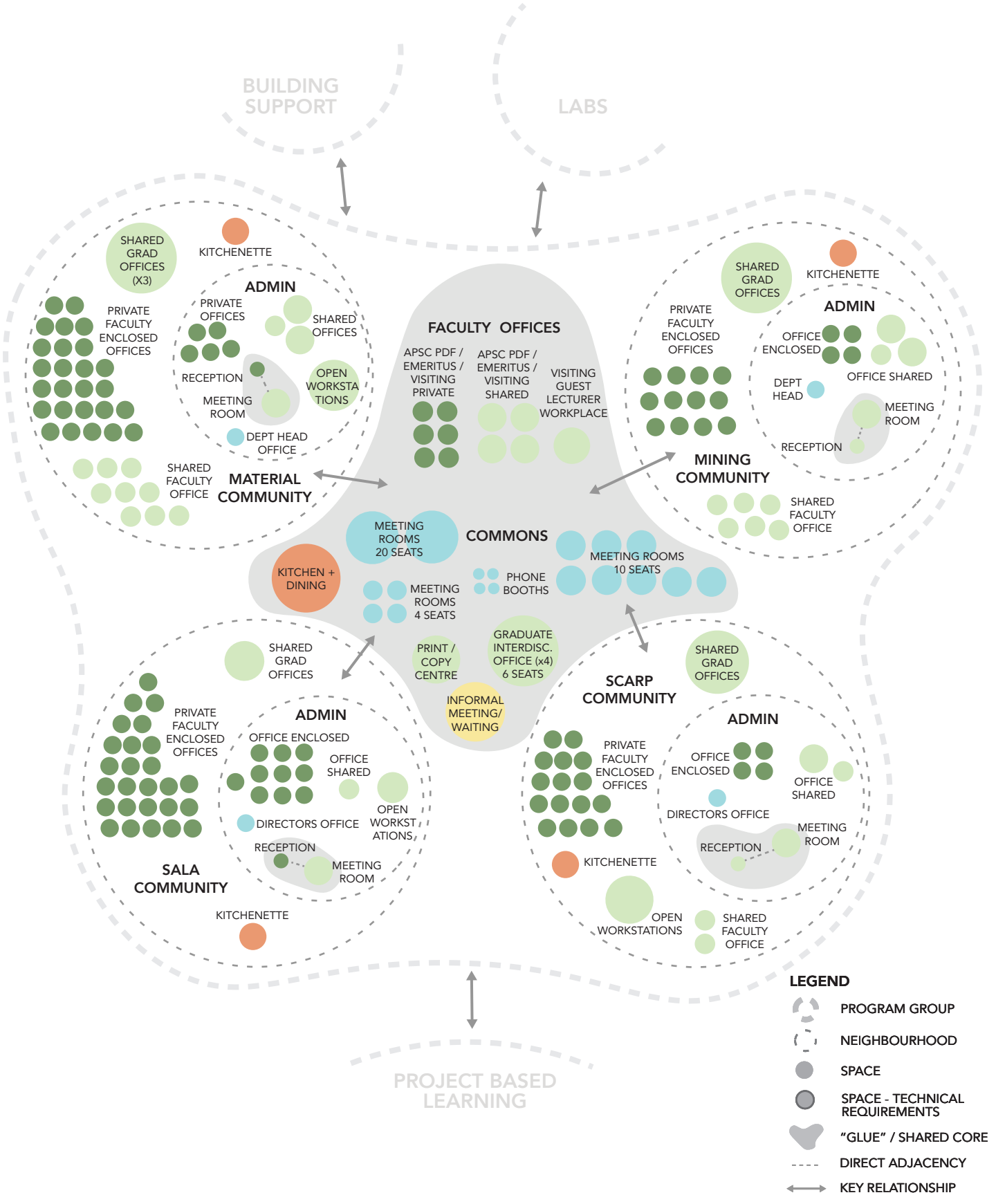
Adjacencies

The three Neighbourhoods within the Program Group establish critical adjacencies between Faculty Offices, Administration, and Workplace Commons. The program diagram suggests four "micro-community" areas which represent the primary departments to be accommodated in Applied One. The final design of this Program Group should seek to further harmonize departmental homes with collaborative work environments.

Physical Space Characteristics

The following are general space characteristics that are applicable to the majority of spaces within this Program Group. For additional information refer to the Room Type Sheets in Appendix A.

- Welcoming and professional enclosed office spaces to accommodate 1, 2, or 4 persons with interior finishes and acoustic attenuation that supports health and wellbeing of occupants.
- Adaptable interstitial spaces for social gathering to include mobile furniture for ease of reconfiguration and have integrated power and data capabilities.
- Range of ergonomic furniture for different body types and work styles.
- Assume mobile systems furniture in most workplace spaces. Storage integrated within office furnishings systems and lockers.
- Daylight and inspiring views to promote creativity, focus, and humanize space.
- Offices to be accessible and welcoming to those with disabilities.
- Visual connections are critical for fostering curiosity and connections, but desire for visibility should be balanced against dangers of "fish-bowl effect" and the social dynamics of over-visibility.
- Power, communications, and internet connections to support office work.
- Assume plentiful whiteboards or writable surfaces to support collaboration and working out of ideas in corridors, gathering areas, and offices.


BUILDING SUPPORT
LABS
PROJECT BASED LEARNING
FACULTY OFFICES
APSC PDF / EMERITUS / VISITING PRIVATE
APSC PDF / EMERITUS / VISITING SHARED
VISITING GUEST LECTURER WORKPLACE
COMMONS
MEETING ROOMS 20 SEATS
KITCHEN + DINING
MEETING ROOMS 4 SEATS
PHONE BOOTHS
MEETING ROOMS 10 SEATS
PRINT / COPY CENTRE
GRADUATE INTERDISC. OFFICE (x4) 6 SEATS
INFORMAL MEETING/ WAITING
MATERIAL COMMUNITY
SHARED GRAD OFFICES (X3)
KITCHENETTE
ADMIN
PRIVATE OFFICES
SHARED OFFICES
RECEPTION
MEETING ROOM
OPEN WORKSTATIONS
DEPT HEAD OFFICE
PRIVATE FACULTY ENCLOSED OFFICES
SHARED FACULTY OFFICE
MINING COMMUNITY
SHARED GRAD OFFICES
KITCHENETTE
ADMIN
OFFICE ENCLOSED
OFFICE SHARED
DEPT HEAD
MEETING ROOM
RECEPTION
PRIVATE FACULTY ENCLOSED OFFICES
SHARED FACULTY OFFICE
SALA COMMUNITY
SHARED GRAD OFFICES
ADMIN
OFFICE ENCLOSED
OFFICE SHARED
DIRECTORS OFFICE
OPEN WORKSTATIONS
RECEPTION
MEETING ROOM
PRIVATE FACULTY ENCLOSED OFFICES
KITCHENETTE
SCARP COMMUNITY
SHARED GRAD OFFICES
ADMIN
OFFICE ENCLOSED
OFFICE SHARED
DIRECTORS OFFICE
MEETING ROOM
RECEPTION
PRIVATE FACULTY ENCLOSED OFFICES
KITCHENETTE
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SPACE - TECHNICAL REQUIREMENTS
"GLUE" / SHARED CORE
DIRECT ADJACENCY
KEY RELATIONSHIP

3.2.7. ACADEMIC WORKPLACE

Workspaces

Single and Shared Enclosed Offices, for private and/or focused work

Collaborative 4-Person Workspaces, to support connections between groups and peer-to-peer mentorship

Open Workstations, places for touchdown work and heads-down production for visiting faculty, staff, post-docs, and graduate students

Spaces to Meet

Focus Booth, quiet refuge for private conversations and individual work

Informal Meeting, acoustically permeable, mix of screens and pinup surfaces to support ideation and discussion.

Meeting Room / Huddle Space, relaxing or taking a personal call, having an impromptu meeting (small of 1-2 people, medium of 4-5 people or large of 5-8 people)

Meeting Room - Small, meetings for up to 4 people, presentation training and practice, meeting with industry partners or sponsors, review concepts on screens or whiteboards

Meeting Room - Medium, meetings for up to 10 people, industry partners or sponsors, work on problems and assignments with faculty, make work plans on screens or whiteboards

Meeting Room - Large, meetings for up to 20 people, group discussions, team touchpoints, partner collaborations, big table sharing

Spaces to Gather

Locker Area, casual space with provisions for small scale storage of personal belongings

Casual Displays, surrounding workplace with small displays, dynamic screens, sharing research and progress

Outdoor Space, terraces, roof decks, connection to outdoors

Booths / Eddies / Nooks, finding a quiet space for casual work, encourage small, intimate discussions

Small Lunch or Coffee Space, one to two people gathering over food to talk, laugh, share and discuss

Kitchenette and Lunch Area, 20-40 people gathered together in groups at a shared resource, having a potluck, heating up food from home, getting water or coffee

3.2.7. ACADEMIC WORKPLACE

Space List

The Space List for this Program Group is shown below in terms of net-square-metres (NSM) with any specific remarks and descriptions noted.

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		7.1 | Academic Workplace | Faculty Offices | Subtotal 1065 NSM									
7.1.1	MTRL	Office - Small Shared	2	4.5	8	9.0	72.0	Enclosed office with workstations.	none		W1
7.1.2	MTRL	Office - Private Enclosed	1	9	26	9.0	234.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.1.3	MINE	Office - Small Shared	2	4.5	6	9.0	54.0	Enclosed office with workstations.	none		W1
7.1.4	MINE	Office - Private Enclosed	1	9	12	9.0	108.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.1.5	SALA	Office - Small Shared	0	4.5	0	9.0	0.0	Enclosed office with workstations.	none		W1
7.1.6	SALA	Office - Private Enclosed	1	9	26	9.0	234.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.1.7	SCARP	Office - Small Shared	2	4.5	2	9.0	18.0	Enclosed office with workstations.	none		W1
7.1.8	SCARP	Office - Open Workstations	10	4.5	1	45.0	45.0	Workstations in open area.	none		W2
7.1.9	SCARP	Office - Private Enclosed	1	9	16	9.0	144.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.1.10	APSC Shared	Office - PDF/Emeritus/Visiting Faculty/RA - S	2	4.5	6	9.0	54.0	Enclosed office with workstations.	none		W1
7.1.11	APSC Shared	Office - PDF/Emeritus/Visiting Faculty/RA - L	4	4.5	4	18.0	72.0	Enclosed office with workstations.	none		W1
7.1.12	APSC Shared	Visiting/Guest Lecturer Informal Workplace	12	2.5	1	30.0	30.0	Touchdown stations/seating to support visitors/collaborators. Not a full workstation - shared tables with power and wifi.	none		W2
		7.2 | Academic Workplace | Administration | Subtotal 818.2 NSM									
7.2.1	MTRL	Office - Small Shared	2	4.5	1	9.0	9.0	Enclosed office with workstations.	none		W1
7.2.2	MTRL	Office - Large Shared	6	4.5	2	27.0	54.0	Enclosed office with workstations.	none		W1
7.2.3	MTRL	Office - Open Workstations	12	4.5	1	54.0	54.0	Workstations in open area.	none		W2
7.2.4	MTRL	Office - Private Enclosed	1	9	5	9.0	45.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.5	MTRL	Admin Reception			1	6.0	6.0	Workstation and reception space. Space for digital signage.	7		W2
7.2.6	MTRL	Admin/Dept Head - Meeting Room - M	8	2	1	19.0	19.0	Multi-use meeting space.	6a		S3
7.2.7	MTRL	Dept Head Office - Private Enclosed	1	9	1	9.0	9.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.8	MINE	Office - Small Shared	2	4.5	1	9.0	9.0	Enclosed office with workstations.	none		W1
7.2.9	MINE	Office - Large Shared	4	4.5	2	18.0	36.0	Enclosed office with workstations.	none		W1
7.2.10	MINE	Office - Private Enclosed	1	9	4	9.0	36.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.11	MINE	Admin Reception			1	6.0	6.0	Workstation and reception space. Space for digital signage.	7		W2
7.2.12	MINE	Admin/Dept Head - Meeting Room - M	8	2	1	19.0	19.0	Multi-use meeting space.	6a		S3
7.2.13	MINE	Dept Head Office - Private Enclosed	1	9	1	9.0	9.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.14	SALA	Office - Small Shared	2	4.5	1	9.0	9.0	Enclosed office with workstations.	none		W1
7.2.15	SALA	Office - Open Workstations	4	4.5	1	18.0	18.0	Workstations in open area.	none		W2
7.2.16	SALA	Office - Private Enclosed	1	9	10	9.0	90.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.17	SALA	Admin Reception			1	6.0	6.0	Workstation and reception space. Space for digital signage.	7		W2
7.2.18	SALA	Admin/Director Meeting Room - M	8	2.4	1	19.0	19.0	Multi-use meeting space.	6a		S3
7.2.19	SALA	Directors Office - Private Enclosed	1	9	1	9.0	9.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.20	SCARP	Office - Small Shared	2	4.5	1	9.0	9.0	Enclosed office with workstations.	none		W1
7.2.21	SCARP	Office - Large Shared	4	4.5	1	18.0	18.0	Enclosed office with workstations.	none		W1
7.2.22	SCARP	Office - Private Enclosed	1	9	4	9.0	36.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.23	SCARP	Admin Reception			1	6.0	6.0	Workstation and reception space. Space for digital signage.	7		W2

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
7.2.24	SCARP	Admin/Director Meeting Room - M	8	2.4	1	19.0	19.0	Multi-use meeting space.	6a		S3
7.2.25	SCARP	Directors Office - Private Enclosed	1	9	1	9.0	9.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.26	APSC Shared	Print/Copy Centre	8	4	1	32.0	32.0	Staff/faculty printing room with printing equipment.	none		W3
7.2.27	APSC Shared	Informal Waiting/Seating/Meeting	7	2.4	4	17	67	Flexible space with soft seating.	none		B2
7.2.28	APSC Shared	Kitchen w/Informal Seating	20	2.4	2	48.0	96.0	Kitchen area includes multiple fridges, sinks, dishwasher, etc. as well as tables and chairs/booths for seating. Large enough to hold bigger groups and some people alone together.	none		B4
7.2.29	APSC Shared	Kitchenette / Refresh Station			4	16.0	64.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, microwave in casework. Strategically located around academic workplace.	none		B4
		7.3 | Academic Workplace | Workplace Commons | Subtotal 926 NSM									
7.3.1	APSC Shared	Meeting Room - L	20	2.4	1	48.0	48.0	Meeting space.	6c		S2
7.3.2	APSC Shared	Meeting Room - L	20	2.4	1	48.0	48.0	Meeting space with enhanced AV package.	5		S2
7.3.3	APSC Shared	Meeting Room - M	10	2.4	8	24.0	192.0	Meeting space.	6b		S3
7.3.4	APSC Shared	Meeting Room - S	4	2.25	4	9.0	36.0	Meeting space.	10		S3
7.3.5	APSC Shared	Focus Booth	1	4.5	4	4.5	18.0	Small space for phone calls - assume BYOD & no AV support.	none		S3
7.3.6	APSC Shared	Graduate Interdisciplinary Office	20	4.5	1	90.0	90.0	Enclosed office with workstations to support graduate student. Tables with power and wifi.	none		W1
7.3.7	MTRL	Graduate Office, 4 Seat	20	4.5	3	90.0	270.0	Enclosed office with workstations to support graduate student. Tables with power and wifi.	none		W1
7.3.8	MINE	Graduate Office, 4 Seat	20	4.5	1	90.0	90.0	Enclosed office with workstations to support graduate student. Tables with power and wifi.	none		W1
7.3.9	SALA	Graduate Office, 4 Seat	8	4.5	1	36.0	36.0	Enclosed office with workstations to support graduate student. Tables with power and wifi.	none		W1
7.3.10	SCARP	Graduate Office, 4 Seat	15	4.5	1	68.0	68.0	Enclosed office with workstations to support graduate student. Tables with power and wifi.	none		W1
7.3.11	APSC Shared	Print/Copy Centre	15		1	30.0	30.0	Traditional printing and large format plotting with printing equipment.	none		W3
							2,809				

3.2.8.

BUILDING SUPPORT

Overview

Building Support consists of three program Neighbourhoods – Stores, Neighbourhood Support, and General Support. Stores provides Applied One with a centralized supply of consumable parts and materials for APSC activities. Included in the stores are an array of specialized bulk storage facilities as well as a reception/office for management purposes. Neighbourhood Support consists of miscellaneous support spaces required for the Neighbourhoods to function such as compressor rooms and storage spaces. General Support consists of operational spaces such a mail room, custodial facilities and loading areas. To ensure that these are not lost in the net-to-gross calculations, they are assigned as individual spaces with sizes that meet UBC technical standards.

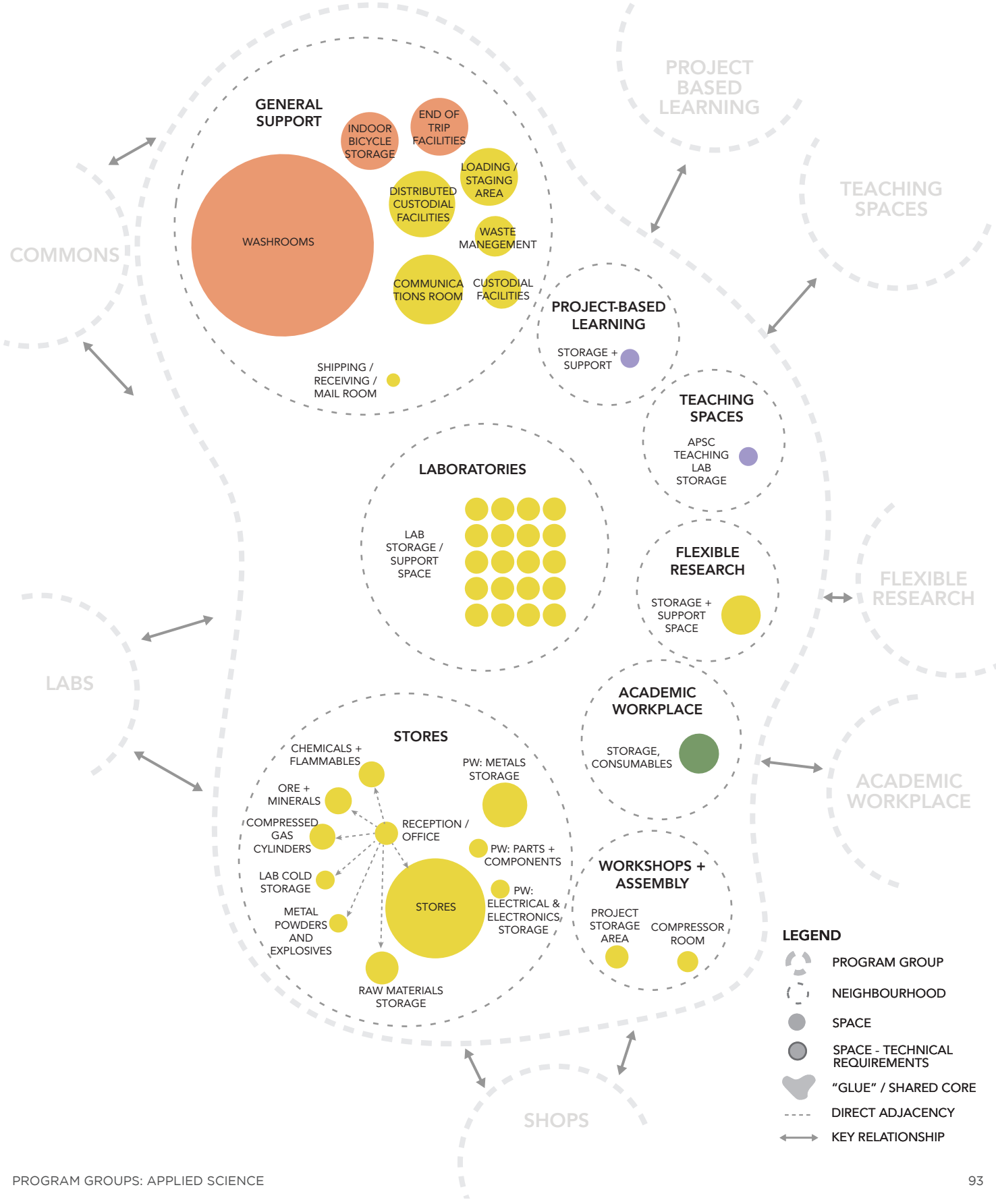
Adjacencies

In general, Building Support will form a network of spaces to be distributed throughout Applied One in support of operations and functioning of all spaces. It will be critical for Stores to have spatial relationships to loading, shop space and lab space for materials handling purposes. A selection of spaces in General Support such as Indoor-Secure Bicycle Storage, Shipping, Waste Management, and Loading require access to the building's exterior.

Physical Space Characteristics

The following are general space characteristics that are applicable to the majority of spaces within this Program Group. For additional information refer to the Room Type Sheets in Appendix A.

- All spaces to follow UBC Technical Guidelines
- Width of entry doors, floor space and clear circulation widths, elevators, etc. should be considered carefully to allow for safe and efficient materials handling.
- Durable finishes to allow for a wide range of activities.
- Wide range of storage solutions from heavy duty pallet racks to small parts bins.
- Provide security systems to match campus standards and include monitoring, access control, and alarms.


PROJECT BASED LEARNING
TEACHING SPACES
COMMONS
GENERAL SUPPORT
INDOOR BICYCLE STORAGE
END OF TRIP FACILITIES
LOADING / STAGING AREA
DISTRIBUTED CUSTODIAL FACILITIES
WASTE MANEGEMENT
WASHROOMS
COMMUNICATIONS ROOM
CUSTODIAL FACILITIES
SHIPPING / RECEIVING / MAIL ROOM
PROJECT-BASED LEARNING
STORAGE + SUPPORT
TEACHING SPACES
APSC TEACHING LAB STORAGE
LABORATORIES
LAB STORAGE / SUPPORT SPACE
FLEXIBLE RESEARCH
STORAGE + SUPPORT SPACE
FLEXIBLE RESEARCH
LABS
ACADEMIC WORKPLACE
STORAGE, CONSUMABLES
ACADEMIC WORKPLACE
STORES
CHEMICALS + FLAMMABLES
PW: METALS STORAGE
ORE + MINERALS
COMPRESSED GAS CYLINDERS
RECEPTION / OFFICE
PW: PARTS + COMPONENTS
LAB COLD STORAGE
PW: ELECTRICAL & ELECTRONICS, STORAGE
METAL POWDERS AND EXPLOSIVES
STORES
RAW MATERIALS STORAGE
WORKSHOPS + ASSEMBLY
PROJECT STORAGE AREA
COMPRESSOR ROOM
SHOPS
LEGEND
PROGRAM GROUP
NEIGHBOURHOOD
SPACE
SPACE - TECHNICAL REQUIREMENTS
"GLUE" / SHARED CORE
DIRECT ADJACENCY
KEY RELATIONSHIP

3.2.8. BUILDING SUPPORT

Space List

The Space List for this Program Group is shown below in terms of net-square-metres (NSM) with any specific remarks and descriptions noted.

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		8.1 | Building Support | Stores | Subtotal 423 NSM									
8.1.1	APSC Shared	Stores			1	240.0	240.0	Large well organized room with rolling high-density shelves for consumable parts and materials. such as tools, chemicals, common consumables, fittings, sensors, etc. Stores will support all of Applied One, with a high percentage of use by Materials Engineering.	none		M10
8.1.2	APSC Shared	Raw Materials Storage			1	30.0	30.0	Storage for materials for student use. Should be adjacent to Workshops + Assembly grouping.	none		M10
8.1.3	APSC Shared	Reception/Office	2		1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Visibility into workshops for observation.	none		W1
8.1.4	APSC Shared	Bulk Storage - Chemicals & Flammables			1	18.0	18.0	Bulk Materials Storage	none		M10
8.1.5	APSC Shared	Bulk Storage - Compressed Gas Cylinders			1	18.0	18.0	Bulk Materials Storage	none		M10
8.1.6	APSC Shared	Bulk Storage - Lab Cold Storage			1	10.0	10.0	Bulk Materials Storage	none		M10
8.1.7	APSC Shared	Bulk Storage - Metal Powders & Explosives			1	10.0	10.0	Bulk Materials Storage	none		M10
8.1.8	MINE	Bulk Storage - Ore & Minerals			1	18.0	18.0	Bulk Materials Storage	none		M10
8.1.9	MTRL	Professional Workshops - Electrical & Electronics Storage			1	10.0	10.0	Bulk Materials Storage	none		M10
8.1.10	MTRL	Professional Workshops - Metals Storage			1	50.0	50.0	Bulk Materials Storage	none		M10
8.1.11	MTRL	Professional Workshops - Parts, Assemblies, Components			1	10.0	10.0	Bulk Materials Storage	none		M10
		8.2 | Building Support | Neighbourhood Support | Subtotal 95 NSM									
8.2.1	APSC Shared	Workshop - Compressor Room			1	12.0	12.0	Technical space for support of workshops. To be adjacent to / integrated with Workshops + Assembly.	none		M10
8.2.2	APSC Shared	Workshop - Project Storage Area			1	15.0	15.0	Lockers / Shelves - Assumption based on .25 cu. meters/person. To be adjacent to / integrated with Workshops + Assembly.	none		M10
8.2.3	APSC Shared	Project Based Learning Storage / Support Space			1	10.0	10.0	Furniture storage room for Project-Based Learning studios. Located near and easily accessed, but not located within a studio. This room is used to store broken furniture that will be accessed by vendors when they come onsite to do maintenance.	none		L8
8.2.4	APSC Shared	Flexible Clusters Storage / Support Space			2	15.0	30	Support for Flexible Research Base Modules. To be adjacent to / integrated with Flexible Clusters.	none		M10
8.2.5	APSC Shared	APSC Teaching Lab Storage			1	10.0	10.0	Support space for reoccuring classes. Adjacent/Integrated with Lab space. Needed for demonstrations, extra equipment so spaces can be used by departments.	none		L8
8.2.6	APSC Shared	Academic Workplace Storage, Consumables			1	18.0	18.0	No adjacency requirements. Desire to have shared storage. To be adjacent to / integrated with Academic Workplace.	none		W3
		8.3 | Building Support | General Support | Subtotal 585 NSM									
8.3.1	APSC Shared	End-of-Trip Facilities			1	90.0	90.0	UBC Design Guidelines, Section 2.5.6.	none		B6
8.3.2	APSC Shared	Indoor-Secure Bicycle Storage			1	90.0	90.0	UBC Design Guidelines, Section 2.5.5.	none		B7
8.3.3	APSC Shared	Shipping / Receiving / Mail Room	1		1	5.0	5.0	Assume central shipping & receiving in addition to Stores for research and workshops-related receiving.	none		W4
8.3.4	APSC Shared	Main Custodial Facilities			1	40.0	40.0	Main custodial facilities located at grade if possible	none		W4
8.3.5	APSC Shared	Distributed Custodial Facilities			10	12.0	120.0	Custodial facilities located throughout the building.	none		W4
8.3.6	APSC Shared	Communications Rooms			15	9.0	135.0	IT Infrastructure spaces located throughout the building	none		W4
8.3.7	APSC Shared	Recycling + Waste Management			1	45.0	45.0	Recycling & waste management located at grade.	none		W4
8.3.8	APSC Shared	Loading/Staging Area			1	60.0	60.0	Adjacent to exterior loading area. Confirm maximum size vehicle that needs to be accommodated. Two bays for recycle/trash and delivery.	none		W4
							1,103				

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3.3. CHILDCARE SERVICES

3.3.1.

CHILDCARE

Overview

This Program Group consists of a standalone childcare facility to be incorporated within the Applied One framework. This facility is to provide an Infant and Toddler program (0-3: Children up to 36 months of age) and Preschooler program (3-5: Children between 30 months to school age). This facility is a replacement for the existing childcare facility located in The Barn.

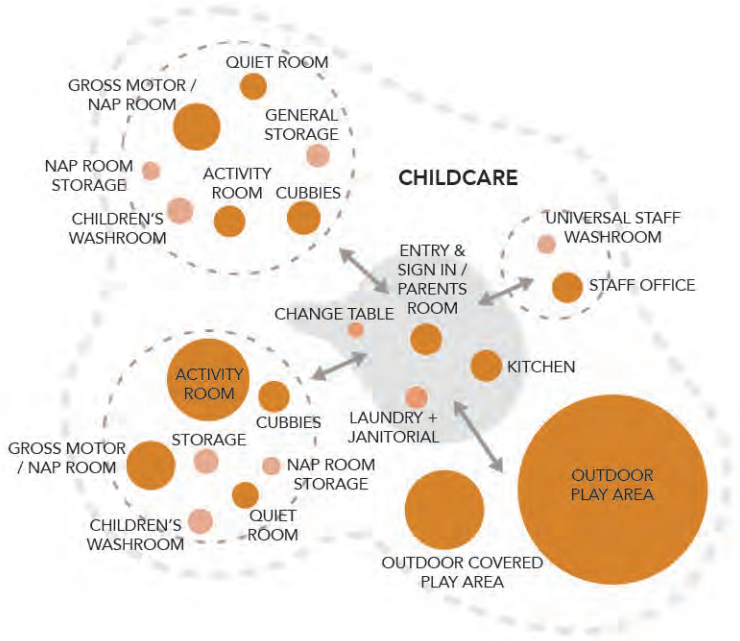
Adjacencies

Childcare consists of Age 0-3, Age 3-5, and Shared Neighbourhoods which are representative of spatial boundaries between programs and areas of program overlap. Childcare requires a relationship between indoor and outdoor space with a typical preference to be at grade or on an upper floor to utilize rooftop as outdoor space. Childcare does not have any critical internal adjacencies with other Applied One Program Groups but may benefit from a relationship with the Commons. Childcare should not be adjacent to Building Support spaces such as loading areas, mechanical equipment, electrical substations etc. to mitigate related unwanted impacts.

Physical Space Characteristics

The following are general space characteristics that are applicable to the majority of spaces within this Program Group. For additional information refer to the Room Type Sheets in Appendix A.

- Maximize human health through use of natural light, greenery, thermal comfort, ergonomic furniture, fresh air, and acoustic performance.
- Prioritize use of healthy and natural materials.
- Dedicated safe and secure access.
- Spatial and detail design should respond to the scale and mobility of age groups being supported.
- Outdoor space for each program should be at the same level (plus or minus 0.5 m) as the indoor space for the same program and be contiguous with it.
- A strong visual connection should exist between the indoor and outdoor activity areas.
- Indoor and outdoor spaces should allow for inter-related indoor and outdoor activities and free movement by children.
- The facility should be oriented to facilitate the surveillance of outdoor play areas from the primary indoor activity area.
- The facility should be oriented so that outdoor play areas for each program receive a minimum of three hours of direct sunlight per day at the winter solstice. Two hours of sunlight should occur during the typical playtimes of 9:30 am - 11:30 am or 1:30 pm - 4:00 pm. This is particularly important for 0-3 programs due to the limited mobility of the children.



LEGEND

- PROGRAM GROUP
- NEIGHBOURHOOD
- SPACE
- SPACE - TECHNICAL REQUIREMENTS
- "GLUE" / SHARED CORE
- DIRECT ADJACENCY
- KEY RELATIONSHIP

3.3.1. CHILDCARE

Space List

The Space List for this Program Group is shown below in terms of net-square-metres (NSM) with any specific remarks and descriptions noted.

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		9.1 | Childcare | Age 0-3 | Subtotal 241 NSM									
9.1.1	UBC	Indoor Activity Rooms and Settings			1	164.0	164.0	Art Area, Table Area, Area for Other Activity Settings, Gross Motor/Nap Room, Storage for Mats & Equipment, Quiet Room	none		B8
9.1.2	UBC	Support Spaces			1	77.0	77.0	Kitchen, Cubby, Laundry/Janitoral, Storage, Child W/C & Diapering Area	none		B8
		9.2 | Childcare | Age 3-5 | Subtotal 172.5 NSM									
9.2.1	UBC	Indoor Activity Rooms and Settings			1	128.0	128.0	Dedicated Art Area (wet messy), Table Area, Area for Other Activity Settings, Gross Motor/Nap Room, Storage with Large Motor/Nap Room, Quiet Room	none		B8
9.2.2	UBC	Support Spaces			1	44.5	44.5	Kitchen, Cubby, Laundry/Janitoral, Storage, Children's W/C	none		B8
		9.3 | Childcare | Shared | Subtotal 71 NSM									
9.3.1	UBC	Outdoor Play Space - Open			1		0.0	579m2 Outdoor Play Area	none		B8
9.3.2	UBC	Outdoor Space - Covered			1		0.0	111m2 Outdoor Covered Play Area	none		B8
9.3.3	UBC	General Support Spaces			1	71.0	71.0	Admin Office, Staff Office / Lounge, Accessible Staff W/C w/ Diapering Area, Entry / Lobby	none		B8
							485				

"Together, we'll improve how we work, connect, and move within cities and rural communities."

-Rewrite the Rules: Campaign for Applied One

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4.0 CONCLUSION

4.1. NOTES FOR MOVING FORWARD

Further Considerations

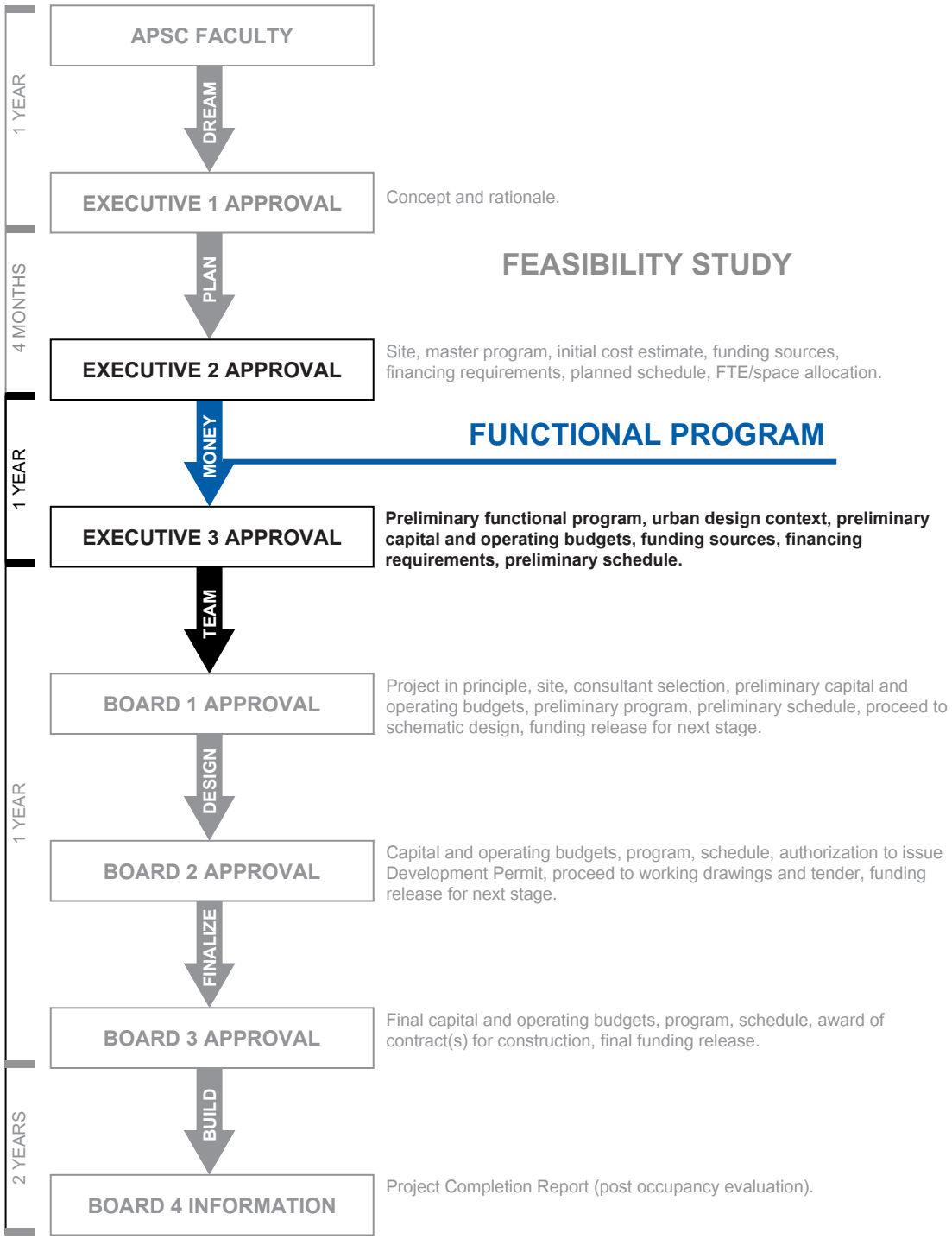
While the Functional Program helps frame ways that APSC can be building for their fundamental pivot that Applied One will catalyze, there is also a lot of planning and soft infrastructure conversations that will need to occur in parallel. The work to develop the Functional Program allowed for some conversations to continue, and inspired some new work to be done as well. The following ongoing discussions may continue to shape and adjust the project between the Functional Program phase and Design:

- Discussions of the future of research and the proper balance within Applied One of support for cutting edge research and undergraduate/academic space.
- Paving the way for bringing together a variety of shop environments into a collaboratively run “supershop”.
- Strategies around space assignment and discussions of how the building will be occupied day one on the spectrum of “spaces assigned to group academic units together” to “the future of Applied Science is shared identity and integration of groups is fully embraced.”
- The design team should work alongside the APSC project team to deepen engagement with student groups, including the Engineering Undergraduate Society, Graduate Student Societies, Engineering Affinity Groups, the EDI.I groups in APSC Academic Units and other groups who may broaden the voices who participate in the design process.

Next Steps

Immediate next steps include moving forward to Board 1 approval. This involves further development of urban design approach, preliminary capital and operating budgets, funding sources, financing requirements, a preliminary schedule, and plan for interim swing space.

Further socialization of the Functional Program and planning for Applied One will continue to Board 1 Approval and beyond.



UBC Applied One Approval Process Diagram

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Appendix A

APPLIED ONE: FUNCTIONAL PROGRAM - SUPPLEMENTAL MATERIAL

THE UNIVERSITY OF BRITISH COLUMBIA
Applied Science

local .

MILLER HULL

Event Space at the Kendeda Building for Innovative Sustainable Design - Georgia Tech, designed by The Miller Hull Partnership

CONTENTS

AA.1 ROOM TYPE SHEETS

NAVIGATING THE INFORMATION

Activities-Based Organization by VERBS

Through Applied One, the Faculty of Applied Science is transforming from a place where one collects knowledge to an inclusive group of people committed to shared action (reference Section 1.1.4 in the Functional Program for more information). It is a bold new model of what education must be, one that's practical and applied. Room type sheets are organized around shared activities, using the verbs MAKING, SHARING, LEARNING, WORKING, and BEING as a process tool. This allowed for a focus on activities and outcomes that cut across disciplines and encourage people to embrace change interaction and the de-silo-ing that will occur as the focus becomes solving problems together.

This categorization continues here in the room type sheets, grouping together program spaces based on activities, not the neighbourhood or grouping they are associated with in Section 3 of the Functional Program. This eliminates duplication and allows for consolidation of the room types to their core activities. Sizes and names of the spaces themselves may change, but the activities supported unites these types in this section for the purposes of expanding on "room essence" or mission and details regarding look and feel, spatial qualities, environmental conditions, technical requirements, and materials.
The Room Type Sheets are organized in the following order, matching those shared activity categories:

- MAKING
- SHARING
- LEARNING
- BEING
- WORKING

Room Type Sheets Information

Glossary of Terms

The following terms are used frequently in the room type sheets. Please reference this glossary as needed to understand information. Future design work will have more in depth information regarding systems requirements like power, mechanical, plumbing, gas, etc. The information provided in the Room Type Sheets indicates base operational expectations and high level information.

Ref. Code: Unique code to identify each space in the Functional Program

Room Type: Descriptive Room Type name

Description: Functional description of use

Area Range: Indicates range of areas within the room type for the numerous spaces in the program. Reference Functional Program for detailed information on sizes of specific spaces.

Clear Height (m): Minimum clear floor to ceiling height in metres.

Critical Adjacencies: Locate adjacent to or in close proximity of

Daylighting: High = Lots; Low = Little.

Solar Control: Strategies for mitigating unwanted solar exposure.

Transparency: High = Public; Low = Private.

Views: Visual connections.

Acoustics: Acoustic conditions / requirements.

Vibration: Vibration conditions / requirements.

Access / Entry: Door type

Active Lighting: Electrical lighting requirements.

Power: Power distribution and use.

Mechanical: Mechanical requirements in addition to .

Plumbing: Plumbing requirements.

Gas: Gas infrastructure requirements.

Finishes: Floor, wall, and ceiling finishes.

Casework / Furniture: Example casework and furniture.

AV Type(s): Associated Audiovisual Type(s).

Example Equipment: Example equipment to be used in the space.

Additional Notes: References and misc notes.

Audiovisual Types

AV/IT type information can be found in AA.5. See below summary table of audiovisual categories:

1a	Seminar / Classroom / Multipurpose / Training Room (Under 30)
1b	Seminar / Classroom / Multipurpose / Training Room (30-60)
1c	Seminar / Classroom / Multipurpose / Training Room (over 60)
2	Learn Lab - Indicate # pods
3	Lecture Theatre
4	Teaching Lab (Computer, Dry, Wet, Studio, Workshop, Maker Space, Project Room)
5	Deluxe Conference
6a	Meeting Room (under 9)
6b	Meeting Room (9-18)
6c	Meeting Room (over 18)
7	Lobby, Reception Desk, Help Desk, Store Front, Food Services
8	Lounge, Collegium, Fitness Centre
9	Event Space, Ballroom, Foyer, Gallery
10	Infrastructure Only

Room Type Sheets - Example Page

Each room type contains the following information to articulate information for costing, design development, and expectations for the Applied One users.

Letter matches Activity Verb, in this case “MAKING” and types are numbered sequentially. This number is then shown in the Space List for each space for cross-referencing.

Room Type Name

Narrative Information expanding on “room essence” or mission and details regarding look and feel, spatial qualities, environmental conditions, technical requirements, and materials.

Associated Spaces notes the spaces in the program that qualify as this Room Type and their respective Program Group name and number (i.e.: Workshop + Assembly is Program Group number 2).

For a full list, reference the Functional Program for all the spaces and their associated Room Type.

M1
WORKSHOP, LIGHT

DESCRIPTION

Multi-use, workbench based light duty workshop space.

SPATIAL QUALITIES

Area Range:	30 NSM - 240 NSM
Clear Height:	4 m
Critical Adjacencies:	Workshops, Stores, Workshop Support Spaces, Service Elevator, Technician Office

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting:	Moderate
Solar Control:	Exterior shades as req.
Transparency:	Moderate
Views:	Outdoor work yard, inter-shop, associated Neighbourhood spaces, corridors, shop technician office
Acoustics:	Noise producing - good sound dampening with a mix of ceiling and wall finishes to minimize sound transfer to adjacent spaces
Vibration:	Vibration Producing

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry:	CR, Double door w/lites, ADO
Active Lighting:	Direct
Power:	Perimeter distribution and pendant / overhead
Mechanical:	ASHRAE Standard
Plumbing:	Sink w/ Sediment Trap, Eye Wash
Gas:	C. Air

MATERIALS / EQUIPMENT

Finishes:	Sealed Concrete Floor, Typ. Walls, Exposed Ceiling
Casework/ Furniture:	Non-fixed workbenches, stools, tool + project storage
AV Type(s):	10 - Infrastructure Only
Example Equipment:	Hand tools, power tools, clamps, bench vise

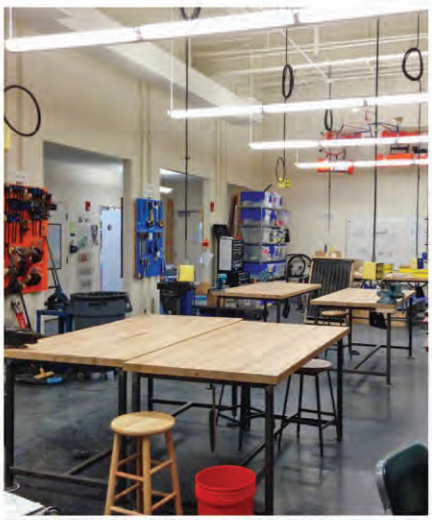
ADDITIONAL NOTES

- Floor based fittings not recommended due to dust and debris accumulation

ASSOCIATED SPACES

Workshop + Assembly [2]	3D Printing Studio Workshop - Plaster, Concrete & Ceramics Project Assembly & Finishing Project Assembly & Finishing, 60 Seat Workshop - Hand Tools

Alfacaes Launchpad Toronto - Multi-use space with workbenches, hand tools and transparency to other shop spaces.



M1 Impact Labs - Workshop with minimal HVAC servicing and field distributed electrical pendant outlet boxes.

127 APPENDIX A - ROOM TYPE SHEETS

APPLIED ONE: FUNCTIONAL PROGRAM REPORT

PRINCIPLES AND STRATEGIES

Before diving into each Room Type Sheet for each verb category, see below the overarching principles and strategies that govern the design of Applied One from a big picture perspective.

Accessibility and Inclusion

Principles

Design to:

- Accommodate and provide comfort for people with a wide range of body sizes, statures and abilities or function.
- Ensure critical information is easily perceived.
- Ensure methods of operation and use are intuitive, clear and unambiguous.
- Contribute to health promotion, avoidance of disease, and protection from hazards.
- Treat all groups of people with dignity and respect.
- Offer opportunities for choice and expression of individual preferences.
- Respect and reinforce cultural values and the social and environmental context.

Pay careful consideration to space and clearance, height of controls, slope and level change, surfaces and texture, visual contrast, illumination and lighting, force, shape, safety, consistency and predictability.

In performance terms, a “universally accessible environment” is one in which those who wish to use it are able to do so without difficulty. Striving to meet this ideal will create environments that perform better for all users. This is understood to include wheelchair users, ambulant mobility impaired, hard of hearing and deaf persons, blind, visually impaired and people with low vision, and people with perceptual or cognitive differences.

This project should strive to provide a universally accessible environment as well as one that is inclusive and welcoming to all groups.

Strategies

In addition to the UBC Technical Guidelines related to Universal Design, available via the following website - http://www.technicalguidelines.ubc.ca/technical/universal_access.html, the following strategies were captured throughout the Functional Program process:

- Design to provide appropriate size and space for multiple body sizes, postures or mobility (variety of work surfaces and seating options) and clear space for movement during and between activities.
- Signage that provides visual, tactile and audible directions.
- Same means of entry for all. Accessible route to be convenient and obvious.
- Design to minimize hazards by making the most used elements accessible and shielding hazardous elements.
- Minimize walking distances, provide seating when the route is long, gentle slopes, outlets within easy reach. Design to ensure it can be used comfortably and with a minimum of fatigue.
- Provide clear lines of sight to important elements, and adequate space allowance on pathways.
- Any fixed items along the route to be highly visible and cane detectable.
- Outward-opening doors to be protected with a door recess or guardrail.
- Provide warnings for hazards in contrasting colour and discourage unconscious action in tasks that require vigilance.
- Doors and frames to be colour contrasted with surrounding wall surfaces and floors to aid navigation and depth perception.
- Height adjustable work surfaces and desks with accessible clearances.
- Accessible clearances below counters.
- Provide the option for non hierarchical furniture layout.
- Provide non fixed seating options.
- Accessible service/sales counter.
- Multiple bike rack types.
- Levered handsets and pull style cupboard hardware to be provided, making it easy for anyone to use.
- Design to be flexible by providing choice in methods of use, accommodating right or left handed access and use and adaptable heights, speeds and power to the user’s pace.
- Seating areas to be provided at regular intervals to allow for people to move at their own pace.

Flexibility and Adaptability

Principles

Design to:

- Achieve long-term adaptability and resiliency by ensuring the building can adapt to unknown activities and uses.
- Identify whether spaces are specialized, adaptable, or flexible based on expectations of how often they may be reconfigured - daily, monthly, yearly, once-a-decade.
- Allow layouts to be modified or adapted to suite multiple functions.
- Create larger, more open spaces where possible instead of smaller confined ones.
- In lab and academic workplaces, provide universal designs that can be used in an interdisciplinary way.

Strategies

- Provide an abundance of power and excellent ventilation to allow for specialty equipment and appropriate infrastructure for future equipment possibilities.
- Provide physical infrastructure (mechanical and electrical rough-ins) to offer flexibility for future adjustments in AV and equipment.
- Plan for a wide range of occupant capacity with flexibility in scheduling.
- Plan for places to store extra chairs, tables, easels, program supplies to be moved quickly and allow spaces to be multi-functional.
- Provide a range of furniture and equipment layouts during design to test adaptability for group sizes, large gatherings or events under different scenarios.
- Prioritize non-fixed casework and furniture where possible to allow for tuning of spaces.
- Design a demand control ventilation system that responds to the building's operations.
- "Negative" space is important - seek to maximize opportunity to fabricate large installations, move equipment and furniture, and clear a wide path.

Kendeda Building, Georgia Institute of Technology, Atlanta, GA

PRINCIPLES AND STRATEGIES

Sustainability

In addition to minimizing the environmental impact through sustainable construction and passive design, the conceptual vision for Applied One actively seeks to help UBC become a net-positive university. This includes, among others, designing to support occupants' physical/mental health through access to natural light, ventilation and outdoor spaces, giving back energy and clean water to campus metabolic flows, adapting to future technology and climate, and communicating regenerative design decisions through architectural expression.

Applied One' program and interior design will be driven by an equitable promotion of building occupants' health and well-being while responding to natural and human systems that support occupants' experience of place. The Functional Program Room Types are guided by the following principles of designing for: occupant comfort, healthy user experience, material health, system health, energy use reduction, renewable energy integration, campus integration, maintenance and life cycle cost considerations, safety and security, embodied carbon, and operational carbon.

The following principles and strategies related to sustainability are noted to highlight their importance to the project. Once developed, the Design Brief, created as part of UBC's Integrated Sustainability Process, will ultimately set the guiding framework for the project. The process will define project goals and priorities related to sustainability. It encourages whole systems thinking and synergies across key disciplines to achieve a high level of sustainable performance in the building.

Occupant Comfort Strategies

- Employ daylighting and human-based lighting design.
- Enhance indoor air quality through ventilation and VOC reduction strategy.
- Consider thermal comfort for all occupants, including radiant systems where possible.
- Consider orientation and width of building along with placement of program spaces to maximize opportunities for daylight and views.
- Identify and address mental health impacts of space design.
- Consider and acknowledge that long term occupant comfort is dependent on a well-maintained facility, especially HVAC.
- Provide active indoor/outdoor relationships and access to green space where possible.

Ecosystem Health Strategies

- Consider the project as a representation of the University's commitment to the environment, mitigating or slowing climate change at the scale of a significant building on campus.
- Support the use of plants adapted to this region to promote success and minimize long-term maintenance and water requirements, and opportunities to bring landscape inside to reinforce a living lab experience.

Material Health Strategies

- In design, screen material selections for toxicity and remove hazards when possible in all materials that occupants come into contact with every day.
- Use lifecycle analysis in support of decision-making.
- Consider the minimizing of waste when designing spaces and selecting materials.

Healthy User Experience Strategies

- Incorporate passive strategies to support occupant connection to natural cycles, seasonal change and sensory needs.
- Bring nature to workspaces and commons areas.
- Allow for local and user control of comfort systems and consider providing access to fresh outdoor air through natural ventilation and operable windows.
- Strive for a sense of humanity, joy, and delight.
- Clearly communicate the aspirations of Applied Science and be transparent about its functional performance, teaching Applied Science staff, students and visitors about quality as a regenerative outcome.
- Offer healthy food and drink options on site, including, if possible, edible vegetation in the landscape.
- Include spaces for wellness within the building.
- Encourage movement and activity with a variety of sit-stand desking options, smaller dedicated space balanced with spaces to have gatherings.
- Create balance between QUIET AND VITALITY: need to support focused work and minimize aural and visual distraction while also creating an environment that is energetic and active.
- Create human scaled spaces inside and outside that allow for different levels of comfort with open and enclosed, large and small spaces.

Energy Use Reduction Strategies

- Meet energy performance targets ahead of schedule, prioritizing passive strategies, and showing a pathway to net-positive energy generation and carbon sequestration, while incorporating climate adaptive strategies that will extend its useful life.
- Establish energy use reduction relative to baselines and project's energy goals and select equipment that will support and reinforce this reduction.
- Develop facade design for passive strategies including daylighting and natural ventilation.
- Use strategies that respond to specific solar conditions on each facade/elevation.

- Consider all energy end uses for reduction (including plug energy & water use).
- Use enhanced commissioning to verify systems are operating as designed.
- Deploy ongoing commissioning strategies for life of building to control energy use and gauge occupant satisfaction.
- Strategically use vegetation to help reduce building heat gain and urban heat island effect.

Operational Carbon Strategies

- Use energy systems that reduce campus carbon emissions.
- Use life cycle analysis in support of decision-making.

Renewable Energy Integration Strategies

- Design for renewable energy contribution.
- Explore options for improving economics of renewables at UW.
- Explore opportunities to engage with campus renewable energy program to give visibility to their work.

Campus Integration Strategies

- Envision the project as a representation of UBC's climate commitments.
- Understand and address the full implications of connection to campus energy systems.
- Connect to campus metabolic flows, functioning as in integral part of campus life and its habitat and energy and water systems.

Maintenance and Life Cycle Cost Strategies

- Strive for long term energy efficiency through systems that are easy to maintain and operate.
- Ensure that facility is imminently maintainable.
- Recognize that some of the biggest life cycle costs are in maintenance and strive for easily maintained systems and accent features.

Safe + Secure Environment Strategies

- Provide interior and exterior lighting to enhance feelings of safety for users and pedestrians.
- Include proper signage and wayfinding systems.
- Use responsible materials selected based on minimizing toxicity.
- Include well-designed public spaces that have clear sight-lines and opportunities for eyes on the street, considering "Crime Prevention Through Environmental Design" (CPTED).
- Balance public access and openness with features that protect occupant personal physical safety.

Embodied Carbon Strategies

- Strive for more efficient use of resources and materials.
- Analyze main structural and enclosure elements early in design process.
- Use low carbon concrete mix design where applicable.
- Design to optimize building use.
- Design to minimize material consumption.
- Select materials with durability consistent with expected lifetime of building/element.
- Utilize transportation and delivery methods that reduce energy and carbon impacts.
- During design, continually ask and answer the questions: "Do I need it at all?","What is it made of?", "How is it made?", "Where does it come from, and where does it go to?".

Water Use Minimization Strategies

- Install low-flow fixtures (low-flow toilets, faucets, and showers to reduce water consumption without compromising user experience).
- Install sensor-activated faucets (in restrooms and other common areas to eliminate water waste from taps being left running).
- Opt for native and drought-tolerant plant species in landscaping to minimize irrigation needs.
- Implement smart irrigation systems that use weather data and soil moisture sensors to adjust watering schedules and prevent over watering.

Stormwater Management Strategies

- Use permeable pavements, such as pervious concrete or porous asphalt, for walkways, parking lots, and other surfaces to allow rainwater to infiltrate into the ground, reducing runoff.
- Incorporate rain gardens and bioswales into the landscape design to capture and treat stormwater runoff naturally while enhancing biodiversity.
- Install green roofs on buildings to absorb and retain rainwater, reducing the amount of runoff and alleviating pressure on stormwater infrastructure.
- Construct basins or cisterns to capture rainwater from rooftops, which can then be used for irrigation or non-potable purposes.

Water Reuse and Rainwater Harvesting Strategies

- Implement a greywater recycling system to treat and reuse water from sinks, showers, and other non-toilet fixtures for irrigation or toilet flushing.
- Capture rainwater from rooftops and direct it to storage tanks for later use in irrigation, toilet flushing, or other non-potable applications.
- Explore opportunities to reuse water within the building, such as implementing dual plumbing systems for greywater and freshwater separately.
- Install water-efficient appliances, such as dishwashers and washing machines, to minimize water consumption in common areas and residential buildings.

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MAKING

ROOM TYPE SHEETS

M1 Workshop, Light

M2 Workshop, Heavy

M3 Workshop, High Head

M4 Cluster Base Module

M5 Electron Microscope & X-Ray Rooms

M6 Dry Lab

M7 Wet Lab

M8 Digital Lab

M9 Photography / Recording

M10 Making Support - Service / Storage / Equip.

M1
WORKSHOP, LIGHT

DESCRIPTION

Multi-use, workbench based light duty workshop space.

SPATIAL QUALITIES

Area Range: 20 NSM - 240 NSM
Clear Height: 4 m
Critical Adjacencies: Workshops, Stores, Workshop Support Spaces, Service Elevator, Technician Office

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Exterior shades as req.
Transparency: Moderate
Views: Outdoor work yard, inter-shop, associated Neighbourhood spaces, corridors, shop technician office
Acoustics: Noise producing - good sound dampening with a mix of ceiling and wall finishes to minimize sound transfer to adjacent spaces
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Double door w/lites, ADO
Active Lighting: Direct
Power: Perimeter distribution and pendant / overhead
Mechanical: N/A
Plumbing: Sink w/ Sediment Trap, Eye Wash
Gas: Compressed air, shop

MATERIALS / EQUIPMENT

Finishes: Sealed Concrete Floor, Typ. Walls, Exposed Ceiling
Casework/ Furniture: Non-fixed workbenches, stools, tool + project storage
AV Type(s): 10 - Infrastructure Only
Example Equipment: Hand tools, hand power tools, light floor-mounted tools, clamps, bench vise

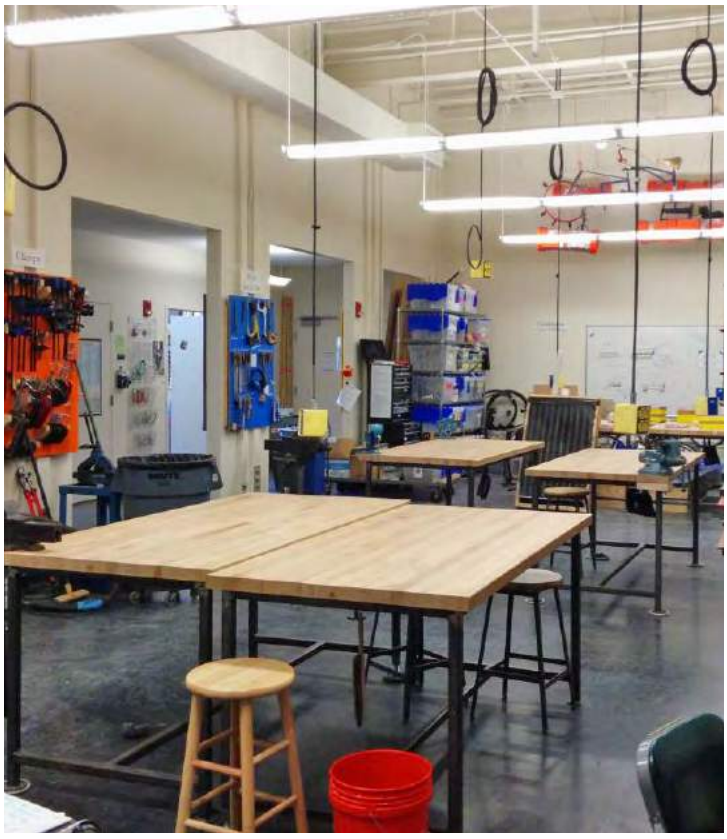
ADDITIONAL NOTES

- Floor based fittings not recommended due to dust and debris accumulation

ASSOCIATED SPACES

Workshop + Assembly [2] 3D Printing Studio
Workshop - Plaster, Concrete & Ceramics
Project Assembly & Finishing
Project Assembly & Finishing
Workshop - Hand Tools

Artscape Launchpad Toronto - Multi-use space with workbenches, hand tools and transparency to other shop spaces



MIT Impact Labs - Workshop with minimal HVAC servicing and field distributed electrical pendant outlet boxes

M2
WORKSHOP, HEAVY

DESCRIPTION

Equipment/process based heavy duty workshop space.

SPATIAL QUALITIES

Area Range: 20 NSM - 240 NSM
Clear Height: 4 m
Critical Adjacencies: Workshops, Stores, Workshop Support Spaces, Service Elevator, Outdoor work yard, Shop Technician Office

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate - low
Solar Control: Exterior shades as req.
Transparency: Moderate
Views: Outdoor work yard, inter-shop, associated Neighbourhood spaces, corridors, shop technician office
Acoustics: Noise producing - good sound dampening with a mix of ceiling and wall finishes to minimize sound transfer to adjacent spaces
Vibration: Vibration Producing

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Double door w/lites, ADO
Active Lighting: Direct
Power: Perimeter and overhead distribution, equipment based
Mechanical: Fume / Dust Extraction System
Plumbing: Sink w/ Sediment Trap, Eye Wash
Gas: Compressed air, shop

MATERIALS / EQUIPMENT

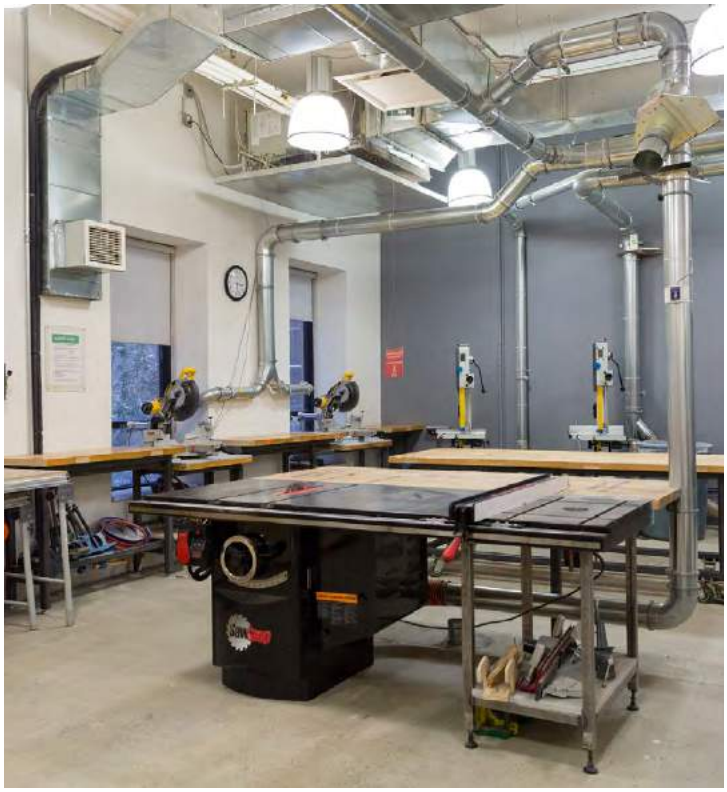
Finishes: Sealed Concrete Floor, Typ. Walls, Exposed Ceiling
Casework/ Furniture: Non-fixed workbenches, stools, tool storage
AV Type(s): 10 - Infrastructure Only
Example Equipment: 3D printers, low-hazard metal 3D printers, laser cutters, drill press, band saw, table saw, jointer, planer, miter saw, sanders, metal saw, welder, CNC, 3-Axis mill, 5-Axis mill, injection molding machine

ADDITIONAL NOTES

- Floor based fittings not recommended due to dust and debris accumulation
- All spaces have varying special safety and/or mechanical requirements

ASSOCIATED SPACES

Workshop + Assembly [2]
3D Printing Studio - Metal
Digital Fabrication Workshop
Electrical/Electronics Shop
Metal Shop / Machine Shop
Welding Shop
Synthetics & Composites
Workshop - Flexible & Experimental Materials
Painting & Spray Studio
Advanced Manufacturing Makerspace
Waterjet Workshop
Teaching Automation Lab (Injection Molding)
CNC Room



SVA NYC - Workshop with fixed woodworking equipment and dust extraction system

Carnegie Mellon University - Heavy equipment based metal workshop

M3
WORKSHOP, HIGH HEAD

DESCRIPTION

High head workshop for large scale research and assembly.

SPATIAL QUALITIES

Area Range: 60 NSM - 200 NSM
Clear Height: 6 m
Critical Adjacencies: Workshops, Stores, Workshop Support Spaces, Service Elevator, Outdoor work yard, Shop Technician Office

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: High
Solar Control: Exterior shades as req.
Transparency: High
Views: Outdoor work yard, inter-shop, associated Neighbourhood spaces, corridors, shop technician office
Acoustics: Noise producing - good sound dampening with a mix of ceiling and wall finishes to minimize sound transfer to adjacent spaces
Vibration: Vibration Producing

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Double door w/lites and Insulated glazed overhead Sectional Door access to Outdoor Work Yard, 3m min. width and 2.4m min. height, ADO
Active Lighting: Direct
Power: Perimeter distribution and equipment based
Mechanical: Equipment Based
Plumbing: Sink w/ sediment trap, eyewash
Gas: Compressed air, shop

MATERIALS / EQUIPMENT

Finishes: Sealed concrete floor, typ. walls, exposed ceiling
Casework/ Furniture: Minimal
AV Type(s): 10 - Infrastructure Only
Example Equipment: Gantry Crane, 5-Axis CNC Arm, automation and conveyor systems

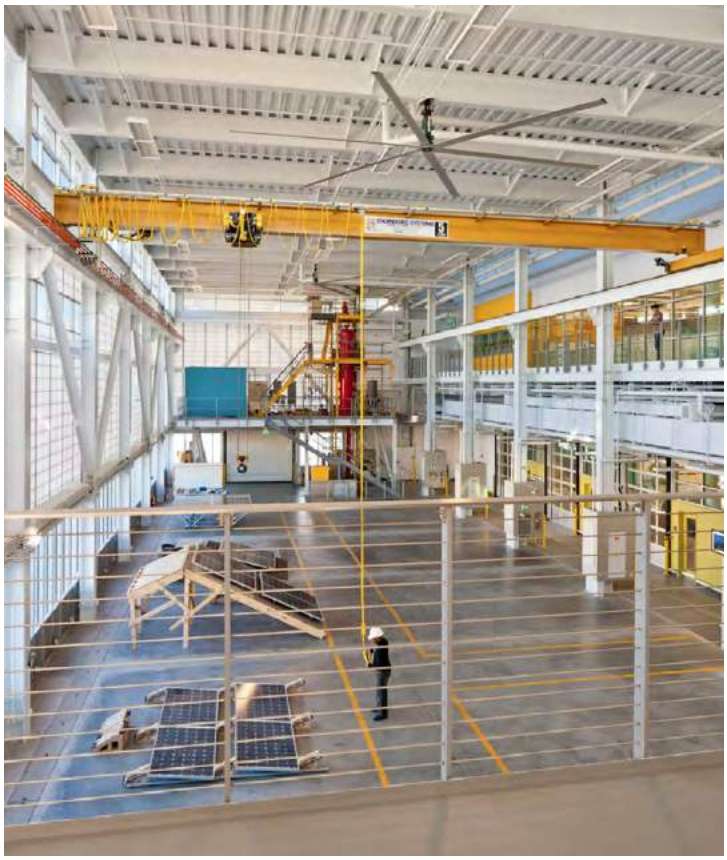
ADDITIONAL NOTES

- Floor based fittings not recommended due to dust and debris accumulation

ASSOCIATED SPACES

Workshop + Assembly [2]
Automation Robotics and Conveyors
Robotics Processing & Fabrication
Workshop - Wood
Workshop - CNC
Workshop High-Bay Flex/Assembly Hall
Advanced Manufacturing Makerspace

Arch Tec Lab, ETH Zurich - Demonstration of gantry mounted robot arm



Carbon-Neutral Lab, Georgia Tech - High bay research space with gantry crane

M4
CLUSTER BASE MODULE

DESCRIPTION

Highly adaptable space for rotating research groups with varied requirements.

SPATIAL QUALITIES

Area Range: 60 NSM - 120 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Flexible Cluster spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Outside, associated Neighbourhood spaces, corridors
Acoustics: Acoustic treatment as required
Vibration: Vibration sensitive

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Double door w/lites, ADO
Active Lighting: Diffused - Dimmable
Power: Perimeter distribution, raceway, equipment rough-ins
Mechanical: Airflow control, temp. and humidity control, fume extraction rough-in
Plumbing: Sink w/ sediment trap, LH/CW, eyewash
Gas: Lab Gas, Vacuum, C. Air

MATERIALS / EQUIPMENT

Finishes: Sealed concrete floor or resilient flooring, typ. walls, exposed ceiling
Casework/ Furniture: Non-fixed cabinets / work benches, stools, chairs
AV Type(s): 10 - Infrastructure Only
Example Equipment: Cyl. Gas

ADDITIONAL NOTES

- N/A

ASSOCIATED SPACES

Flexible Clusters [5]
Research Space - Sml, Studio Based
Research Space - Sml, Workshop Based
Research Space - Lrg, Floating
Research Space - Lrg, Incubator

Lowell Francis College of Engineering, University of Massachusetts - Highly adaptable research area

Patrick F. Taylor Hall, Louisiana State University - Research on display

Innovation Hall, Purdue School of Engineering & Technology - Research area with highly durable finishes and an exposed ceiling

M5
ELECTRON MICROSCOPE & X-RAY ROOMS

DESCRIPTION

Specialized, equipment based sensitive environment for material characterization.

SPATIAL QUALITIES

Area Range: 20 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Characterization Lab spaces (Media Prep Lab, Control Rooms)

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: N/A
Solar Control: N/A
Transparency: Moderate
Views: Control room, seminar room (optional)
Acoustics: Noise producing, acoustically sensitive
Vibration: Vibration sensitive

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Acoustic door
Active Lighting: Diffused - Dimmable
Power: Equipment based, UPS w/emergency power
Mechanical: Airflow control, temp. and humidity control
Plumbing: Sink, eyewash, LH/CW, floor drain
Gas: Lab gas, vacuum, C. Air, Nitrogen

MATERIALS / EQUIPMENT

Finishes: ESD Flooring, typ. walls, ACT
Casework/ Furniture: Tech equipment racks / cabinets
AV Type(s): 10 - Infrastructure Only
Example Equipment: SEM 1 Electron Microscope, TEM 1 Electron Microscope, X-Ray Diffractometer, Cyl gas

ADDITIONAL NOTES

- In-slab vibration isolation required for characterization instruments
- Purpose-built engineering controls may be required

ASSOCIATED SPACES

Laboratories [3] EM Instrument Room

Center for Electron Microscopy and Analysis (CEMAS), Ohio State - Instrument and control room with clear views between for control purposes

Cryo-electron Microscopy Lab, NeCEN - Instrument room with vibration isolation in slab

M6
DRY LAB

DESCRIPTION

Multi-use, bench based open laboratory for dry experimentation, computation and analysis.

SPATIAL QUALITIES

Area Range: 20 NSM - 75 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces, Lab support spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate-Low-
Solar Control: Anti-glare, shades/blinds, blackout option
Transparency: Moderate
Views: Outside, Inter-lab, corridors
Acoustics: Noise producing, acoustically sensitive
Vibration: Vibration sensitive

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Double door w/lites (30 NSM = Single door)
Active Lighting: Diffused - Dimmable, Task
Power: Perimeter distribution, SMR, pendant / overhead
Mechanical: Airflow control, temp. and humidity control, fume extraction
Plumbing: Sink, eyewash, LH/CW, emer. shower, floor drain
Gas: C. Air

MATERIALS / EQUIPMENT

Finishes: Sealed concrete / resilient / ESD Flooring, typ. walls, ACT
Casework/ Furniture: Fixed and mobile cabinets / benches / desks, stools, chairs, lockable storage, room dividers
AV Type(s): 10 - Infrastructure Only
Example Equipment: Cyl. Gas, optical table, raman spectrometer, benchtop furnace, monitors, projectors, laptops, markerboards

ADDITIONAL NOTES

- Instrument areas to be acoustically isolated and have room darkening capabilities
- Benches to be non-continuous to limit instrument vibration transfer
- Purpose-built engineering controls may be required

ASSOCIATED SPACES

Laboratories [3]
Research Lab
Research Lab Support
Research Lab Dry - Undergrad
Research Lab Support - Undergrad
Research Lab - Ballistics
Raman Lab
Faculty/Grad Research Dry Lab Support

Teaching Spaces [6]
Analytical Instrument Lab - Surface Chemistry
Research Support

SDIC Lab, University of Waterloo - Adaptable dry lab with non-fixed benches, pendant outlets, and markerboards

Medical Sciences Building, UofT - Standardized isolated workstations, ceiling based service distribution, and acoustic ceiling treatment

M7
WET LAB

DESCRIPTION

Multi-use, bench based open laboratory for wet experimentation, testing and analysis.

SPATIAL QUALITIES

Area Range: 20 NSM - 105 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces, Lab support spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Outside, Inter-lab, corridors
Acoustics: Noise producing
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Double door w/lites (30 NSM = Single door)
Active Lighting: Diffused, Task
Power: Perimeter distribution, SMR, overhead
Mechanical: Airflow control, temp. and humidity control, fume extraction
Plumbing: Sink, eyewash, LH/CW, emer. shower, floor drain
Gas: Lab Gas, Vac, C. Air, LN2

MATERIALS / EQUIPMENT

Finishes: Resilient flooring w/integral base, typ. walls, ACT
Casework/ Furniture: Fixed and mobile cabinets / benches, stools, flam./ acid cabinets
AV Type(s): 10 - Infrastructure Only
Example Equipment: Cyl. Gas, furnace, ball mill, mixing/blending, spectrophotometer, monitors, projectors, laptops, markerboards

ADDITIONAL NOTES

- Provide metal recycling as required
- Benches to be non-continuous to limit instrument vibration transfer
- All spaces have varying special safety and/or mechanical requirements

ASSOCIATED SPACES

Laboratories [3]
Research/Teaching Lab - Dangerous Metal Powders
Biomedical Manufacturing Area
Research Lab - Cyanide
Research Wet Bench Lab
Research Lab - Bio Leaching
Materials Testing Lab - Destructive & Non-destructive
Faculty/Grad Research Wet Lab
Research Wet Bench Lab Support
Surface Chemistry Teaching and Research
Microscopy Prep Lab
Research Lab - Surface Chemistry, Flex Area

Teaching Spaces [6]
Research Lab - Surface Chemistry Support

Riverside , UC - Standardized workstations, perimeter casework, mobile casework and ceiling based service distribution

Biodesign Institute, ASU - Flexible wet lab with non-fixed casework and high transparency

M8
DIGITAL LAB

DESCRIPTION

Computer lab for teaching and collaborative study.

SPATIAL QUALITIES

Area Range: 96 NSM - 144 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces, Studios

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Low
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Associated Neighbourhood spaces, corridors
Acoustics: Treatment required
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door w/lite, ADO
Active Lighting: Diffused - Dimmable
Power: Perimeter and floor distribution
Mechanical: Temp. control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Resilient flooring / carpet tile, typ. walls, exposed ceiling / dropped ceiling
Casework/ Furniture: Desks, chairs
AV Type(s): 2 - Learn Lab, 4 - Teaching Lab
Example Equipment: Desktop computers, laptops, projectors, monitors/ screens, printers and plotters, markerboards

ADDITIONAL NOTES

- GIS Lab to have lighting controls for active lighting and daylighting

ASSOCIATED SPACES

Project-Based Learning [4] Collaborative Computational Study Space

Teaching Spaces [6] Geographic Information System (GIS) Lab

Digital Media Commons, Northeastern University - Open computer lab with a variety of work stations types

Innovation Studios, Victoria University of Wellington - Computer lab with lighting control and multiple projection surfaces

M9
PHOTOGRAPHY / RECORDING

DESCRIPTION

Specialized, equipment/process based documentation space.

SPATIAL QUALITIES

Area Range: 9 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces, Studios

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: N/A
Solar Control: N/A
Transparency: Low
Views: Associated Neighbourhood spaces, corridors
Acoustics: Treatment required (Recording Room)
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, acoustic door w/lite
Active Lighting: Diffused - Dimmable, Task
Power: Perimeter distribution
Mechanical: N/A
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete floor / carpet tile, typ. walls, exposed ceiling / dropped ceiling
Casework/ Furniture: Table, chair
AV Type(s): 4 - Teaching Lab, 10 - Infrastructure Only
Example Equipment: Seamless backgrounds, softbox lights, Bi-Color LED video light, still camera, video camera, laptop, tabletop microphone, extension arm microphone

ADDITIONAL NOTES

- Recording room may be isolated “recording pod”

ASSOCIATED SPACES

Project-Based Learning [4] Photography Studio
Recording Room

Digital Photo Studio, AA School of Architecture - Space equipped with lighting, backgrounds, cameras, and tripods

WeWork, Irvine California - Space with recording equipment and acoustic treatment on walls

M10
MAKING SUPPORT - SERVICE / STORAGE / EQUIPMENT

DESCRIPTION

Range of support spaces for equipment, supplies, and bulk material storage.

SPATIAL QUALITIES

Area Range: 9 NSM - 240 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Low-N/A
Solar Control: N/A
Transparency: N/A
Views: N/A
Acoustics: Noise producing (equipment areas)
Vibration: Vibration producing (equipment areas)

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, equipment based, mixed reqs.
Active Lighting: Direct
Power: Perimeter distribution, equipment based
Mechanical: Equipment/use based
Plumbing: Equipment/use based
Gas: Equipment/use based

MATERIALS / EQUIPMENT

Finishes: Sealed concrete floor, typ. walls, exposed ceiling
Casework/ Furniture: Shelving, racking, flam./acid cabinets
AV Type(s): 10 - Infrastructure Only, N/A
Example Equipment: Compressors, filters, pumps

ADDITIONAL NOTES

- N/A

ASSOCIATED SPACES

Laboratories [3]
Laboratory Storage / Support Space
Service Room

Building Support [8]
Stores
Raw Materials Storage
Bulk Storage - Chemicals & Flammables
Bulk Storage - Compressed Gas Cylinders
Bulk Storage - Lab Cold Storage
Bulk Storage - Metal Powders & Explosives
Bulk Storage - Ore & Minerals
Professional Workshops - Electrical & Electronics Storage
Professional Workshops - Metals Storage
Professional Workshops - Parts, Assemblies, Components
Workshop - Compressor Room
Workshop - Project Storage Area
Flexible Research Storage / Support Space

School of Architecture Material Labs, University of Texas - Material library on storage racking

Charles River Laboratories - Equipment based laboratory support space

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SHARING

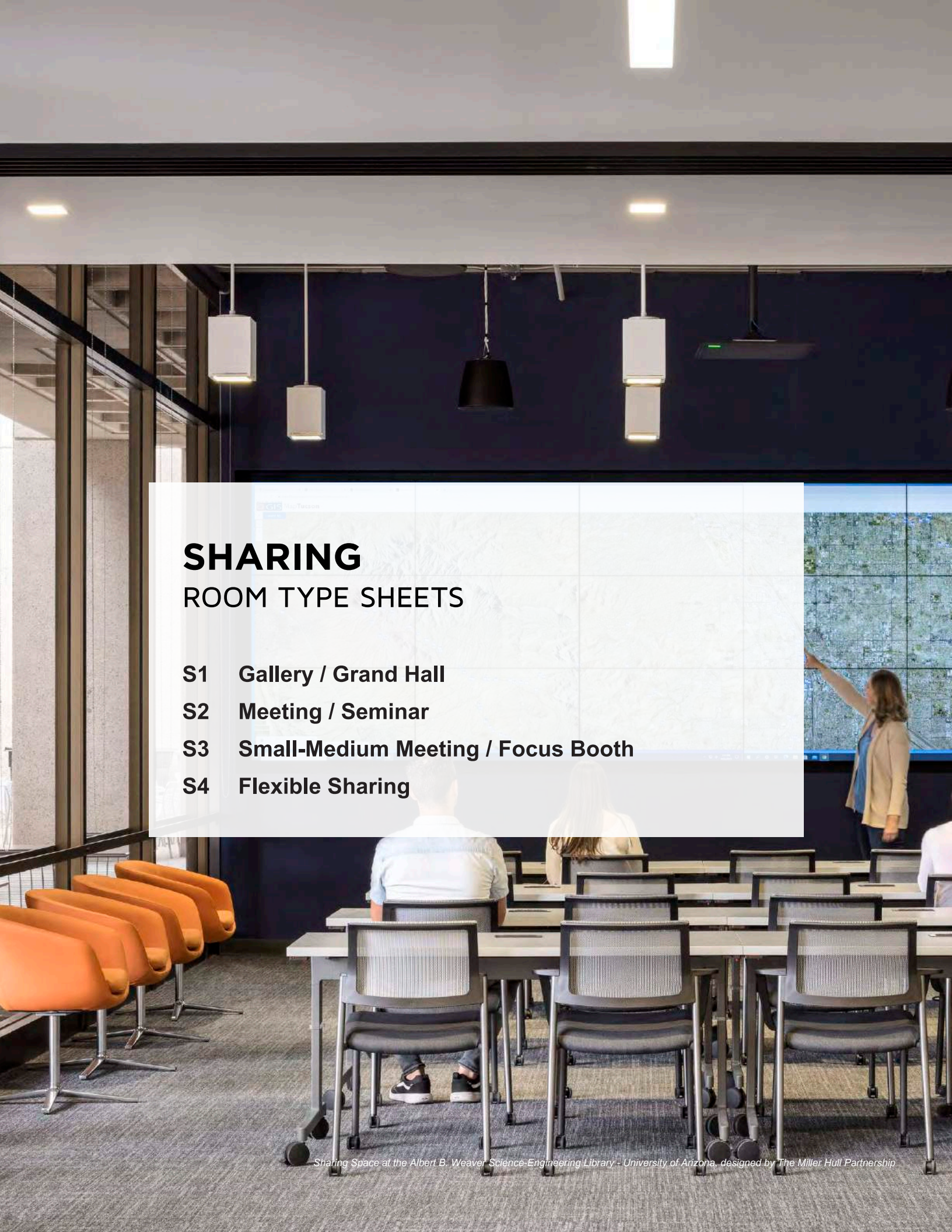
ROOM TYPE SHEETS

S1 Gallery / Grand Hall

S2 Meeting / Seminar

S3 Small-Medium Meeting / Focus Booth

S4 Flexible Sharing



Sharing Space at the Albert B. Weaver Science-Engineering Library - University of Arizona, designed by The Miller Hull Partnership

S1
GALLERY / GRAND HALL

DESCRIPTION

Multi-use and flexible public space for large scale gathering and sharing.

SPATIAL QUALITIES

Area Range: 240 NSM
Clear Height: 6 m
Critical Adjacencies: Active Learning Theatre, Lobby, Cafe, Service Elevator, Washrooms

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Low
Solar Control: Blackout option
Transparency: Moderate
Views: Active Learning Theatre, Commons, Outside
Acoustics: Treatment required, preference for ceiling
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Double door w/lites, ADO, double door - service
Active Lighting: Diffused - Dimmable, Track
Power: Perimeter and floor distribution
Mechanical: Temp. and humidity control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete floor, GWB or millwork or acoustic treated walls, exposed ceiling with acoustic panels
Casework/ Furniture: Ceiling pipe grid for lighting, equipment, curtains, stage, moveable chairs and tables, display stands, easels, plinths
AV Type(s): 9 - Event Space, Ballroom, Foyer, Gallery
Example Equipment: Projector, drop down screen, AV controls, drop down room partition

ADDITIONAL NOTES

- Potential to integrate with active learning theatre space

ASSOCIATED SPACES

Commons [1] Gallery / White Box Theatre / Commons / Grand Hall

Gallery, SCI-Arc - Flexible gallery space arranged with plinths and perimeter pin-up walls for public exhibition

Daniels Grand Hall, UofT - "Black box" space with non-fixed seating and transparency to a variety of adjacent areas

S2
MEETING / SEMINAR

DESCRIPTION

Table based sharing space for medium scale gathering with capable AV systems.

SPATIAL QUALITIES

Area Range: 48 NSM - 144 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces, Kitchenette/ Kitchen

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Outside, associated Neighbourhood spaces, corridors
Acoustics: Treatment required, preference for walls
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door w/lite
Active Lighting: Diffused / Pot Light - Dimmable
Power: Perimeter and floor distribution
Mechanical: Temp. control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Carpet tile, typ. walls, dropped ceiling / exposed ceiling
Casework/ Furniture: Tables, chairs-
AV Type(s): 1a - Seminar / Classroom / Multipurpose / Training Room (under 30), 5 - Deluxe Conference, 6a - Meeting Room (under 9), 6b - Meeting Room (9-18), 6c - Meeting Room (over 18)
Example Equipment: Conference AV, laptops, monitor, markerboards

ADDITIONAL NOTES

- N/A

ASSOCIATED SPACES

Commons [1] Roundtable Room - Indigenous Teaching + Discussion

Workshop + Assembly [2] Meeting/Seminar/Training Room

Laboratories [3] Lab Seminar Room

Flexible Clusters [5] Meeting Room - L

Academic Workplace [7] Meeting Room - L

University of Vienna - Multi-use large seminar / conference room with seating in-the-round

Hall & Partners, NY - Conference room with AV capabilities, acoustic treatment and high transparency to adjacent areas

S3
SMALL-MEDIUM MEETING / FOCUS BOOTH

DESCRIPTION

Table based sharing space for medium-small scale gathering with moderate AV systems.

SPATIAL QUALITIES

Area Range: 4 NSM - 30 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces, Kitchenette/ Kitchen

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Outside, associated Neighbourhood spaces, corridors
Acoustics: Treatment required, preference for walls
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door w/lite
Active Lighting: Diffused / Pot Light - Dimmable
Power: Perimeter and floor distribution
Mechanical: Temp. control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Carpet tile, typ. walls, dropped ceiling / exposed ceiling
Casework/ Furniture: Table, chairs
AV Type(s): 6a - Meeting Room (under 9), 6b- Meeting Room (9-18), 10- Infrastructure Only, N/A
Example Equipment: Laptops, monitor, markerboards

ADDITIONAL NOTES

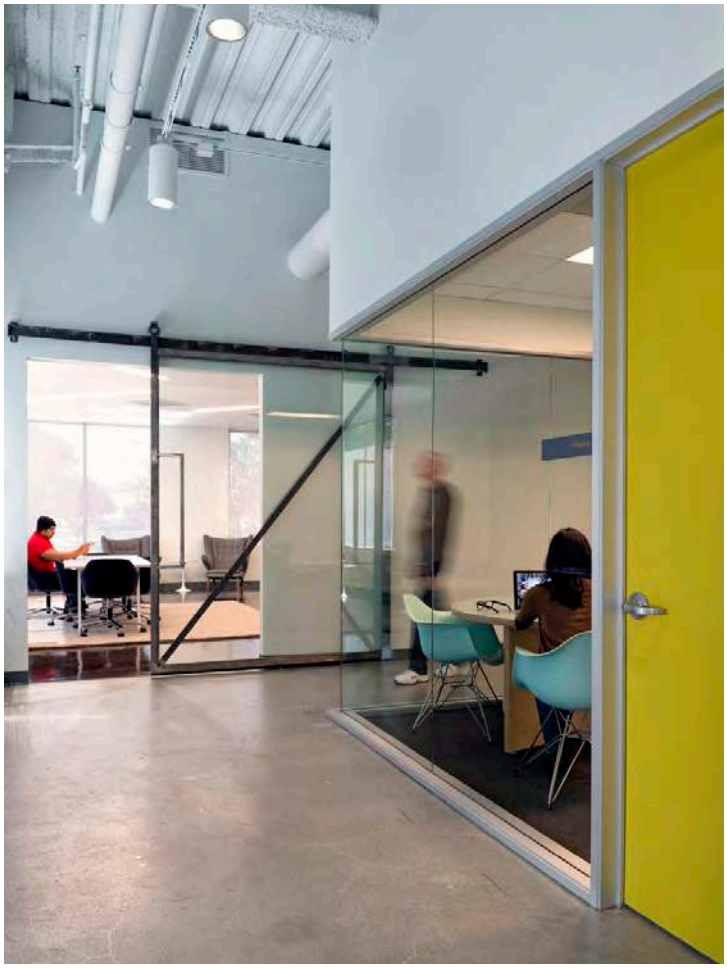
- N/A

ASSOCIATED SPACES

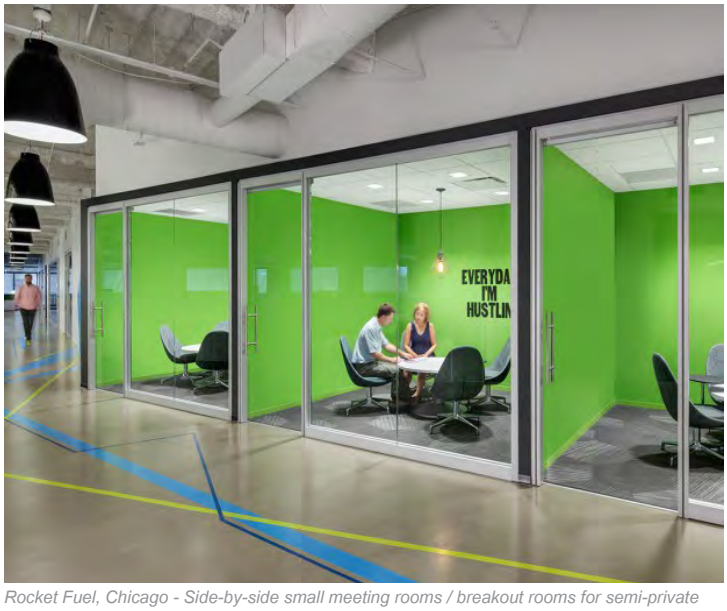
Project-Based Learning [4]
Studio Meeting Places

Flexible Clusters [5]
Meeting Places
Meeting Room - M
Focus Booth

Academic Workplace [7]
Admin/Dept Head - Meeting Room - M
Admin/Director Meeting Room - M
Meeting Room - M
Meeting Room - S
Focus Booth



Evernote Offices, Redwood City - Formal meeting places with transparency to adjacent areas



Rocket Fuel, Chicago - Side-by-side small meeting rooms / breakout rooms for semi-private gathering and discussion

S4
FLEXIBLE SHARING

DESCRIPTION

Multi-use, unfurnished sharing space for medium scale gathering with a range of AV systems.

SPATIAL QUALITIES

Area Range: 30 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces, Studios

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: High
Views: Corridors, Studios
Acoustics: N/A
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door w/lite, ADO
Active Lighting: Diffused - Dimmable
Power: Perimeter and floor distribution
Mechanical: Temp. control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete floor, pin-up walls, exposed ceiling
Casework/ Furniture: Moveable chairs, display stands, easels
AV Type(s): 5, 6b, 10
Example Equipment: Laptops, projector, projection screens, mobile monitors, AR/VR sensors

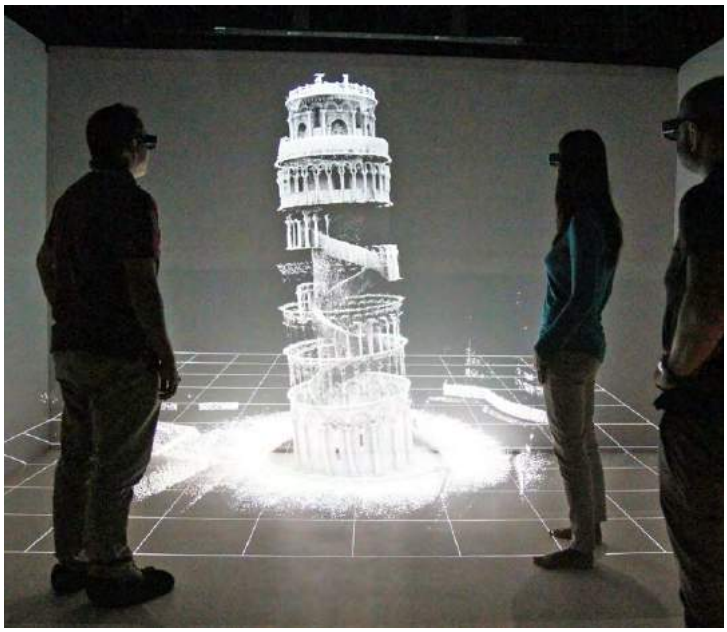
ADDITIONAL NOTES

- N/A

ASSOCIATED SPACES

Project-Based Learning [4] Pin-up/Critique/Charette - Flex Space
Virtual Projection Lab
AR/VR Space

GSAPP, Columbia - Flexible room with pin-up walls and non-fixed furnishing



CSIRO - Flexible room with room darkening and projection capabilities

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av

LEARNING

ROOM TYPE SHEETS

- **L1 Seminar Room / Roundtable Discussion**
- **L2 Active Learning Theatre**
- **L3 Learn Lab**
- **L4 Active Learning Classroom**
- **L5 Wet Bench Teaching Labs**
- **L6 Studio**
- **L7 Outdoor Classroom**
- **L8 Learning Support - Service / Storage / Equip.**
- **L9 Control Room**

Learning Space at The Kendeda Building for Innovative Sustainable Design, designed by The Miller Hull Partnership

L1
SEMINAR / GATHERING / DISCUSSION

DESCRIPTION

Table based learning space for medium-large gathering and discussion with appropriate AV systems.

SPATIAL QUALITIES

Area Range: 62.5 NSM - 72 NSM
Clear Height: As required for sight lines
Critical Adjacencies: Lobby, classrooms, Informal Learning Space

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Outside, Commons, corridors
Acoustics: Treatment required, preference for walls
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door w/lite, double door (Roundtable Discussion)
Active Lighting: Diffused Dimmable
Power: Perimeter and floor distribution
Mechanical: Temp. control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

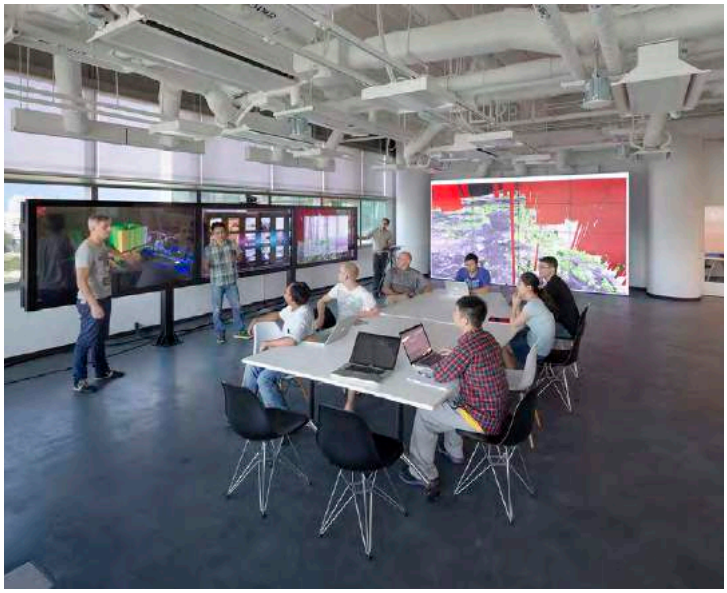
Finishes: Resilient flooring / carpet tile, typ. walls, dropped ceiling
Casework/ Furniture: Tables, chairs
AV Type(s): 1a - Seminar / Classroom / Multipurpose / Training Room (under 30), 6c - Meeting Room (over 18), 9 - Event Space, Ballroom, Foyer, Gallery
Example Equipment: Conference AV, laptops, monitor, markerboards

ADDITIONAL NOTES

• For additional information please see “Learning Space Design Guidelines 2022” - UBC Facilities Planning

ASSOCIATED SPACES

Teaching Spaces [6] Digital Roundtable / Seminar Room
GTS - Seminar Room



CREATE, Singapore - Flexible seminar space for remote collaboration with advanced AV

GTS Seminar Room, MacLeod (MCLD) - 2014, UBC

L2
ACTIVE LEARNING THEATRE

DESCRIPTION

Tiered theatre for lectures, presentations, demonstrations, and media viewing with group tables and chairs.

SPATIAL QUALITIES

Area Range: 504 NSM - 720 NSM
Clear Height: As required for sight lines
Critical Adjacencies: Theatre Control Room, Lobby, Gallery/Great Hall, Cafe, Informal Learning Space, Washrooms

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate-Low
Solar Control: Anti-glare, motorized blinds
Transparency: Moderate-Low
Views: Outside, corridors
Acoustics: Treatment required, preference for ceiling or upper walls
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Vestibules with two sets double door w/lites, ADO
Active Lighting: Diffused, Direct - Dimmable
Power: Perimeter distribution, lectern/front power, 100% of seats
Mechanical: Temp. control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Resilient flooring / carpet tile, typ. walls w/acoustic panels, dropped ceiling w/acoustic panels
Casework/ Furniture: Movable chairs, group tables, whiteboards, lectern
AV Type(s): 3 - Lecture Theatre
Example Equipment: Laptops, projectors, projection screen, instructor station

ADDITIONAL NOTES

• For additional information please see “Learning Space Design Guidelines 2022” - UBC Facilities Planning

ASSOCIATED SPACES

Teaching Spaces [6] GTS - Active Learning Theatre - Med-Large
GTS - Active Learning Theatre - Med-Small

Henn Theatre, UBC - High AV theatre with large tiers in floor to allow group tables

Lecture Room, Edward St. John Learning and Teaching Center - Tiered collaborative theatre with non-fixed seating

L3
LEARN LAB

DESCRIPTION

Multi-use classroom with group tables and chairs and advanced AV systems.

SPATIAL QUALITIES

Area Range: 96 NSM - 168 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces, Informal Learning Spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Outside, corridors
Acoustics: Acoustic treatment as required, preference for ceiling or upper walls
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door w/lite, ADO
Active Lighting: Diffused Dimmable
Power: Perimeter distribution, lectern/front power, 100% of seats
Mechanical: Temp. control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Resilient flooring, typ. walls, dropped ceiling / exposed ceiling
Casework/ Furniture: Group tables, moveable chairs, lectern
AV Type(s): 2 - Learn Lab
Example Equipment: Laptops, projectors, projection screen, monitors, markerboards

ADDITIONAL NOTES

• For additional information please see “Learning Space Design Guidelines 2022” - UBC Facilities Planning

ASSOCIATED SPACES

Biological Sciences 1012, UBC - Media sharable learning space with CT flooring, ACT ceiling, and Typ. walls

MacLeod 3008, UBC - Group table based learning environment with AV at each table

L4
ACTIVE LEARNING CLASSROOM

DESCRIPTION

Multi-use classroom with movable tables and chairs and AV systems.

SPATIAL QUALITIES

Area Range: 96 NSM - 240 NSM
Clear Height: As required for sight lines
Critical Adjacencies: Associated Neighbourhood spaces, Informal Learning Spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Outside, corridors
Acoustics: Acoustic treatment as required, preference for ceiling or upper walls
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door w/lite
Active Lighting: Diffused Dimmable
Power: Perimeter and floor distribution
Mechanical: Temp. control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Resilient flooring, typ. walls, dropped ceiling / exposed ceiling
Casework/ Furniture: Moveable group tables, moveable chairs/stools, presentation position or lectern
AV Type(s): 1b Seminar / Classroom / Multipurpose / Training Room (under 30), 1c Seminar / Classroom / Multipurpose / Training Room (over 60)
Example Equipment: Laptops, projectors, projection screen, monitors, markerboards

ADDITIONAL NOTES

• For additional information please see “Learning Space Design Guidelines 2022” - UBC Facilities Planning

ASSOCIATED SPACES

Teaching Spaces [6] Teaching Lab
GTS - Active Learning Classroom - Large
GTS - Active Learning Classroom - Medium
GTS - Active Learning Classroom - Small

Hebb 114, UBC - 80 seat classroom with non-fixed table and chair for reconfigurability

Engineering Design Pod, Duke - Hands on learning classroom with group tables and high transparency to outdoors

L5
WET BENCH TEACHING LABS

DESCRIPTION

Bench based teaching laboratory for wet experimentation, testing and analysis.

SPATIAL QUALITIES

Area Range: 105 NSM - 160 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces, Informal Learning Spaces, Lab support/flex areas

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Outside, corridors
Acoustics: Noise producing
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Double door w/lites, ADO
Active Lighting: Diffused Dimmable, Task
Power: Perimeter, overhead and floor distribution
Mechanical: Airflow control, temp. control, fume extraction
Plumbing: Sink, eyewash, LH/CW, emer. shower, floor drain
Gas: Natural gas, lab air, vacuum

MATERIALS / EQUIPMENT

Finishes: Resilient flooring w/integral base, typ. walls, ACT
Casework/ Furniture: Fixed and mobile cabinets / benches, stools, flam./ acid cabinets, lockable storage, cubbies
AV Type(s): 4 - Teaching Lab
Example Equipment: Fumehood, extraction arm hoods, biosafety cabinet, tool chest, benchtop equipment, fridge, autoclave, tube furnace, rolling mill, charpy tester, ballistic pendulum, Zwick universal test, fatigue tester, material testing system, anti-vibration table, cyl. gas

ADDITIONAL NOTES

- For additional information please see “Learning Space Design Guidelines 2022” - UBC Facilities Planning
- Benches to be non-continuous to limit instrument vibration transfer

ASSOCIATED SPACES

Teaching Spaces [6] Materials Teaching Lab - Open Floor Wet Lab
Ceramics Teaching and Research
Hydrometallurgy, Structures, Properties Teaching
Bio Manufacturing Teaching Lab
Surface Chemistry Teaching Lab

Chernoff Hall Lab, Queens - Lab with extension arm fume extractors and high transparency to the corridor providing visual activation

Chemistry Lab, UofA - Teaching laboratory with lockable storage and exposed ceiling for easy access to services

L6
STUDIO

DESCRIPTION

Flexible, desk based space for project oriented experiential learning.

SPATIAL QUALITIES

Area Range: 240 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces, Studio Commons, Service Elevator

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Outside, Grand Hall, Active Learning Theatre, corridors
Acoustics: Treatment required
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door w/lite, ADO
Active Lighting: Diffused Dimmable, Task
Power: Perimeter, overhead and floor distribution
Mechanical: Temp. control
Plumbing: Sink
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete, pin-up walls, exposed ceiling
Casework/ Furniture: Desks, chairs, tables, stools, project storage, secure personal equip. storage
AV Type(s): 4 - Teaching Lab
Example Equipment: Desktop computers, laptops, projectors, monitors/ screens, printers, markerboards, model stands

ADDITIONAL NOTES

- N/A

ASSOCIATED SPACES

Project-Based Learning [4] Design Studio
Interdisciplinary Design Studio and Project Based Capstone

Architecture Studio, Umea - Flexible studio space with durable finishes and restrained window to wall ratio

Milstein Hall, Cornell - Open floor plan studio with exposed ceiling and sealed concrete floors

L7
OUTDOOR CLASSROOM

DESCRIPTION

Designated outdoor area for gathering and learning in the round.

SPATIAL QUALITIES

Area Range: -
Clear Height: -
Critical Adjacencies: Roundtable Discussion

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: -
Solar Control: N/A
Transparency: N/A
Views: Roundtable Discussion
Acoustics: N/A
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: Accessible pathway
Active Lighting: N/A
Power: Landscape auxiliary power.
Mechanical: N/A
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: N/A
Casework/ Furniture: Site Furnishings - Seating
AV Type(s): N/A
Example Equipment: N/A

ADDITIONAL NOTES

- Space may incorporate weather protected covered areas

ASSOCIATED SPACES

Teaching Spaces [6] Outdoor Classroom - Indigenous Teaching + Discussion

Indian Residential School History and Dialogue Centre, UBC - Amphitheater type landscaping with informal seating

Indigenous Garden and Outdoor Classroom, SFU - Outdoor gathering space with hard and soft landscaping

L8
LEARNING SUPPORT - SERVICE / STORAGE / EQUIPMENT

DESCRIPTION

Range of support spaces for equipment, supplies, and furniture.

SPATIAL QUALITIES

Area Range: 10 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: N/A
Solar Control: N/A
Transparency: N/A
Views: N/A
Acoustics: N/A
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door
Active Lighting: Direct
Power: Perimeter distribution
Mechanical: N/A
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete, typ. walls, exposed ceiling
Casework/ Furniture: Shelving, racking
AV Type(s): N/A
Example Equipment: -

ADDITIONAL NOTES

- N/A

ASSOCIATED SPACES

Building Support [8] Project Based Learning Storage / Support Space
APSC Teaching Lab Storage

Support space with laboratory equipment on storage shelves

Support space for the storage of surplus and/or damaged furniture

L9
CONTROL ROOM

DESCRIPTION

UBC GTS support space for equipment and operational controls.

SPATIAL QUALITIES

Area Range: 9 NSM - 17.5 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: N/A
Solar Control: N/A
Transparency: N/A
Views: Associated Neighbourhood spaces
Acoustics: Treatment required for theatre control rooms
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door
Active Lighting: Diffused Dimmable, Task
Power: Perimeter distribution
Mechanical: N/A
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

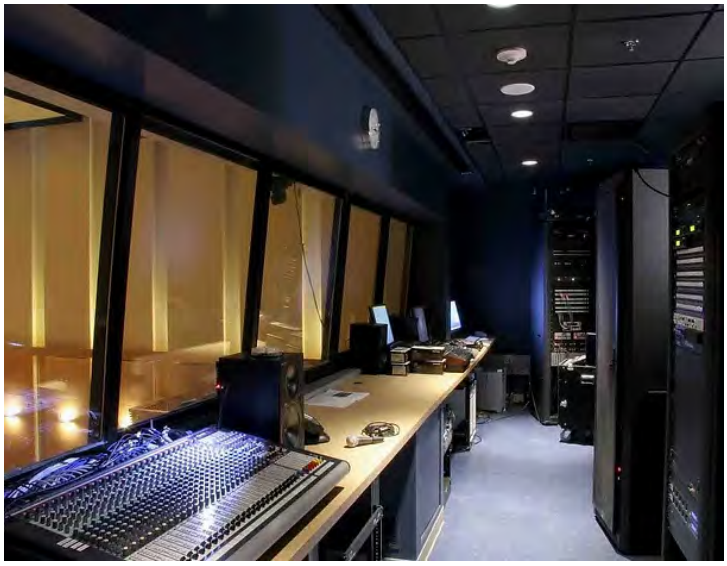
Finishes: Resilient flooring, typ. walls, dropped ceiling / exposed ceiling
Casework/ Furniture: Tables, chairs, cabinets, shelving
AV Type(s): See Associated Space
Example Equipment: AV controls, equipment racks, desktop computer, projector

ADDITIONAL NOTES

• For theatre spaces: Location and shape of control room is critical for function of space; must be centered at back of auditorium for projection/ sightlines

ASSOCIATED SPACES

Teaching Spaces [6]
GTS Learning Spaces - Theatre Control Room
GTS Learning Spaces - Theatre Control Room
GTS - Classroom Control Room
GTS Learning Spaces - Learn Lab Control Room



Theatre control room, Tufts University, MA - AV controls and equipment racks

Theatre control room, Luiss University, Rome - Located at rear with clear sightlines

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BEING

ROOM TYPE SHEETS

B1 Lobby
B2 Informal Learning Space
B3 Health / Wellness / Wellbeing
B4 Kitchen / Kitchenettes + Dining
B5 Cafe Kitchen
B6 Washrooms / End-of-Trip
B7 Bicycle Storage
B8 Childcare

Being Spaces in the UW - Odegaard Undergraduate Library, designed by The Miller Hull Partnership

B1
LOBBY

DESCRIPTION

Multi-use public space providing access to primary building components.

SPATIAL QUALITIES

Area Range: 144 NSM
Clear Height: Variable
Critical Adjacencies: Gallery/Grand Hall, Active Learning Theatres, Cafe, ILS, Service Elevator, Catering Kitchen

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: High
Solar Control: Exterior shades as req.
Transparency: High
Views: Outside, Cafe, Active Learning Theatre
Acoustics: Treatment required.
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Exterior double door w/lites, ADO
Active Lighting: Diffused
Power: Perimeter and floor distribution
Mechanical: N/A
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

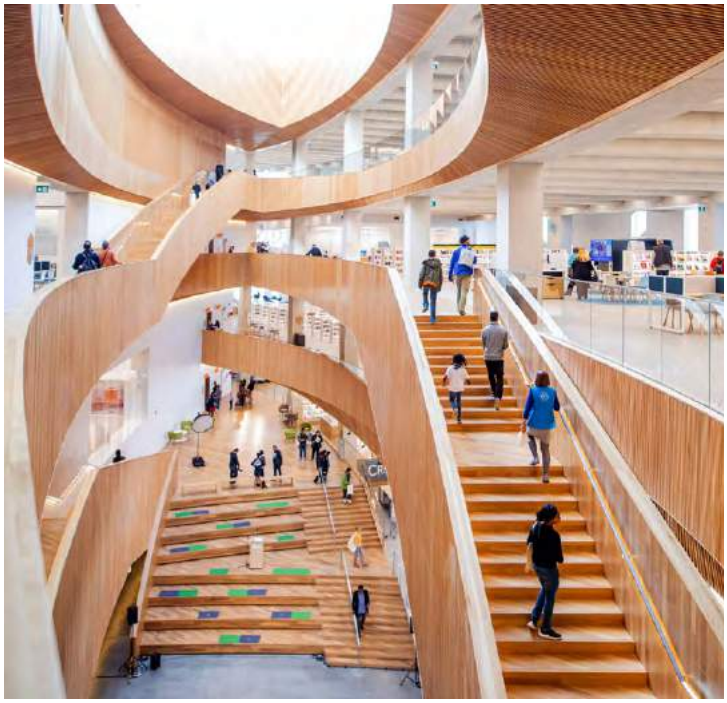
Finishes: Sealed concrete, architectural millwork, exposed structure
Casework/ Furniture: Bench seating and moveable informal learning and lounge seating
AV Type(s):
Example Equipment: 9 - Event Space, Ballroom, Foyer, Gallery Monitors

ADDITIONAL NOTES

- N/A

ASSOCIATED SPACES

Commons [1] Lobby



Central Public Library, Calgary - Clear circulation paths and integrated informal seating areas in central atrium

Earth Sciences, UBC - Identifiable building entrance into central circulation space with high transparency

B2
INFORMAL LEARNING SPACE

DESCRIPTION

Open learning spaces to support informal learning and gatherings, group work and individual study or work.

SPATIAL QUALITIES

Area Range: 9.6 NSM - 72 NSM
Clear Height: 3 m
Critical Adjacencies: Throughout building in circulation areas, adjacent to high-traffic zones, on ground floor accessible via Lobby

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: High
Solar Control: Anti-glare, shades/blinds
Transparency: High-Low
Views: Corridors, Commons
Acoustics: Treatment required.
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: Open to adjacent spaces
Indoor/outdoor access where applicable
Active Lighting: Diffused
Power: Perimeter and floor distribution, 100% of seats, in-casework
Mechanical: N/A
Plumbing: Water bottle fill / fountain
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete / resilient flooring / carpet tiles, typ. walls, exposed ceiling
Casework/ Furniture: Moveable and/or fixed tables, bench seating, soft seating, moveable chairs
AV Type(s): 8 - Lounge, Collegium, Fitness Centre, N/A
Example Equipment: Laptops, flat panel displays

ADDITIONAL NOTES

- For additional information please see “Learning Space Design Guidelines 2022” - UBC Facilities Planning
- Access to recycling stations

ASSOCIATED SPACES

Commons [1] Café - Seating
Distributed Student Lounge
Informal Learning - Small Seating Areas

Project-Based Learning [4] Studio Informal Spaces

Flexible Clusters [5] Informal Spaces
Social Lounge

Academic Workplace [7] Informal Waiting/Seating/Meeting

MacMillan Bloedel Atrium, UBC - Quiet study area for individuals and groups with a variety of seating options

Population Health, University of Washington - Impromptu meeting and study space

Student Union Building, SFU - Small scale nooks for more personal gathering

B3
HEALTH / WELLNESS / WELLBEING

DESCRIPTION

Flexible use space for private and shared health and wellness activities.

SPATIAL QUALITIES

Area Range: 9 NSM - 24 NSM
Clear Height: 3 m
Critical Adjacencies: Washrooms / facilities

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate-Low
Solar Control: Shades/blinds
Transparency: Moderate-Low
Views: Outside
Acoustics: Treatment required.
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: Single door w/ privacy lite
Active Lighting: Diffused Dimmable
Power: Perimeter distribution, in-casework
Mechanical: N/A
Plumbing: Sink / water bottle fill
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete / resilient flooring / carpet tiles, typ. walls, dropped ceiling
Casework/ Furniture: Cabinets, chair(s), soft seating (Shared Quiet Space)
AV Type(s): 10 - Infrastructure Only
Example Equipment: Mats, portable fitness aids, audio equipment, fridge as required, prayer mats

ADDITIONAL NOTES

- N/A

ASSOCIATED SPACES

Commons [1] Reflection/Meditation/ Faith
Personal Wellness Room

Ritual House, Seattle - Multi-use space for physical health finished with natural materials

Ahrend Inspiration Centre, Amsterdam - Shared quiet space with nap pods and acoustic treatment on multiple surfaces

Skanska - Personal wellness room with soft seating and casework with a sink

B4
KITCHEN / KITCHENETTES

DESCRIPTION

Counter based, combined food preparation and informal eating area.

SPATIAL QUALITIES

Area Range: 5 NSM - 48 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: High
Solar Control: Exterior shades as req.
Transparency: High
Views: Outside, associated Neighbourhood spaces
Acoustics: Treatment required.
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: Open to adjacent spaces
Active Lighting: Diffused
Power: Perimeter distribution, in-casework, counter outlets, equipment based
Mechanical: Exhaust hood (full kitchen only)
Plumbing: Sink / water bottle fill, dishwasher (full kitchen only)
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete / resilient flooring, typ. walls, exposed ceiling
Casework/ Furniture: Cabinets, mixture of fixed and non-fixed seating and tables
AV Type(s): N/A
Example Equipment: Microwaves, espresso/coffee machine, fridge, dishwasher + oven (full kitchen only)

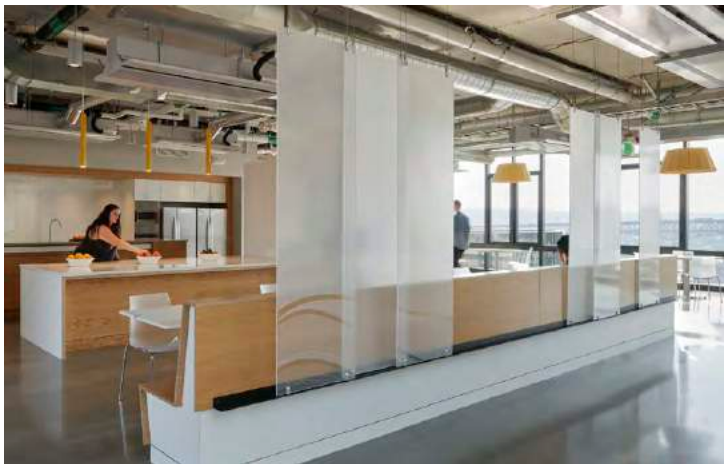
ADDITIONAL NOTES

- One kitchen in proximity to event areas to double as catering kitchen

ASSOCIATED SPACES

Project-Based Learning [4]	Kitchenette + Informal Dining
Flexible Clusters [5]	Kitchenette / Refresh Station Kitchen + Dining
Academic Workplace [7]	Kitchen w/Informal Seating Kitchenette / Refresh Station

Club Med Office, Shanghai - Shared kitchenette with formal and informal seating and high transparency to adjacent areas



Population Health, University of Washington - Shared kitchen and dining area with sealed concrete floors and an exposed ceiling

Dry Creek Offices - Kitchenette with informal seating integrated into office environment

B5
CAFE KITCHEN

DESCRIPTION

Dedicated space commercial kitchen for coffee and/or food handling, catering preparation and related storage.

SPATIAL QUALITIES

Area Range: 60 NSM
Clear Height: 3 m
Critical Adjacencies: Lobby, Gallery/Grand Hall, Theatres, ILS (Cafe - Seating)

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate-Low
Solar Control: N/A
Transparency: N/A
Views: N/A
Acoustics: Noise producing
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door w/lite
Active Lighting: Diffused
Power: Perimeter and floor distribution, equipment based, counter outlets
Mechanical: Exhaust hood
Plumbing: Sink w/grease trap, hand sink, dishwasher, floor drains
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete, typ. walls, exposed ceiling
Casework/ Furniture: Stainless work surfaces / cabinets
AV Type(s): 7 - Lobby, Reception Desk, Help Desk, Store Front, Food Services
Example Equipment: Commercial dishwasher, salamander oven, espresso machine, microwaves, fridge, icemaker, freezer

ADDITIONAL NOTES

- Design Req. as per UBC Food Services.

ASSOCIATED SPACES

Commons [1] Café - Commercial Kitchen

Pallet Coffee, Vancouver - Cafe/restaurant service area with dropped ceiling and casework

Connoisseur Food Equipment - Commercial kitchen with food safe stainless steel work surfaces, appliances and prep area

B6
WASHROOMS / END-OF-TRIP

DESCRIPTION

Fixture based personal hygiene facilities.

SPATIAL QUALITIES

Area Range: 4 NSM - 90 NSM
Clear Height: 3 m
Critical Adjacencies: Distributed in circulation areas, adjacent to high-traffic zones, on ground floor accessible via Lobby

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate-Low
Solar Control: Screen / film as req.
Transparency: Low
Views: -
Acoustics: High STC Rating - wall
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: Single door w/ privacy lite
Active Lighting: Diffused
Power: Counter outlets
Mechanical: N/A
Plumbing: Toilets, sinks, showers, floor drains
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete floor, typ. walls, exposed ceiling
Casework/ Furniture: Counters, partitions, fixed benches + lockers (EOT only)
AV Type(s): N/A
Example Equipment: N/A

ADDITIONAL NOTES

- For additional information please see UBC's draft 'Design Guidelines for All Gender Washrooms', UBC Campus Plan Part 3 Section 2.5.6 and UBC Technical Guidelines
- Typical washrooms are embedded within building gross-up factor

ASSOCIATED SPACES

Building Support [8] End-of-Trip Facilities

Health Sciences Education Building, University of Washington - Gender neutral washroom with durable finishes

Student Academic Center, Gallaudet University - Accessible washrooms with integrated wayfinding and waiting area

9 Castlereagh St, Sydney - End-of-trip facilities with shower stalls and lockable storage

B7
BICYCLE STORAGE

DESCRIPTION

Secure in-building, Long Term and Short Term bicycle parking.

SPATIAL QUALITIES

Area Range: 90 NSM
Clear Height: 3 m
Critical Adjacencies: End-of-Trip facilities, Lobby

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: N/A
Solar Control: N/A
Transparency: High
Views: -
Acoustics: N/A
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: CR, Single door
Active Lighting: Direct
Power: Perimeter distribution
Mechanical: N/A
Plumbing: Bike wash (hose bib), floor drain
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete floor, typ. walls, exposed ceiling
Casework/ Furniture: Bicycle racks
AV Type(s): N/A
Example Equipment: Surveillance equipment

ADDITIONAL NOTES

• For additional information please see UBC Part 3 Design Guidelines, Section 2.5.5.

ASSOCIATED SPACES

Building Support [8] Indoor-Secure Bicycle Storage

Fenchurch Street Offices, London - Indoor bike storage area with floor based wayfinding

Winthrop House, Harvard - Wall based bicycle hangers with integrated cable locks

B8
CHILDCARE

DESCRIPTION

Space characteristics to be according to relevant guidelines

SPATIAL QUALITIES

Area Range: 3 NSM - 84.5 NSM
Clear Height: 3 m
Critical Adjacencies: -

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: -
Solar Control: -
Transparency: -
Views: -
Acoustics: -
Vibration: -

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: -
Active Lighting: -
Power: -
Mechanical: -
Plumbing: -
Gas: -

MATERIALS / EQUIPMENT

Finishes: -
Casework/ Furniture: -
AV Type(s): -
Example Equipment: -

ADDITIONAL NOTES

- -

ASSOCIATED SPACES

Childcare [9]
General Storage
Children's Washroom
Nap Room storage
Activity Room
Cubbies
Gross Motor/Nap Room
Quiet Room
Storage
Outdoor Play Space - Open
Outdoor Space - Covered
Change Table
Entry & Sign-in/Parents Room
Kitchen
Laundry + Janitorial
Staff Office
Universal Staff Washroom

Lady Gowrie, Tasmania - Contained outdoor play area with a variety of non-structured equipment and architectural components with natural materials

Univercity Childcare Centre, SFU - Flexible space with moveable tables and chairs and moderate daylight exposure

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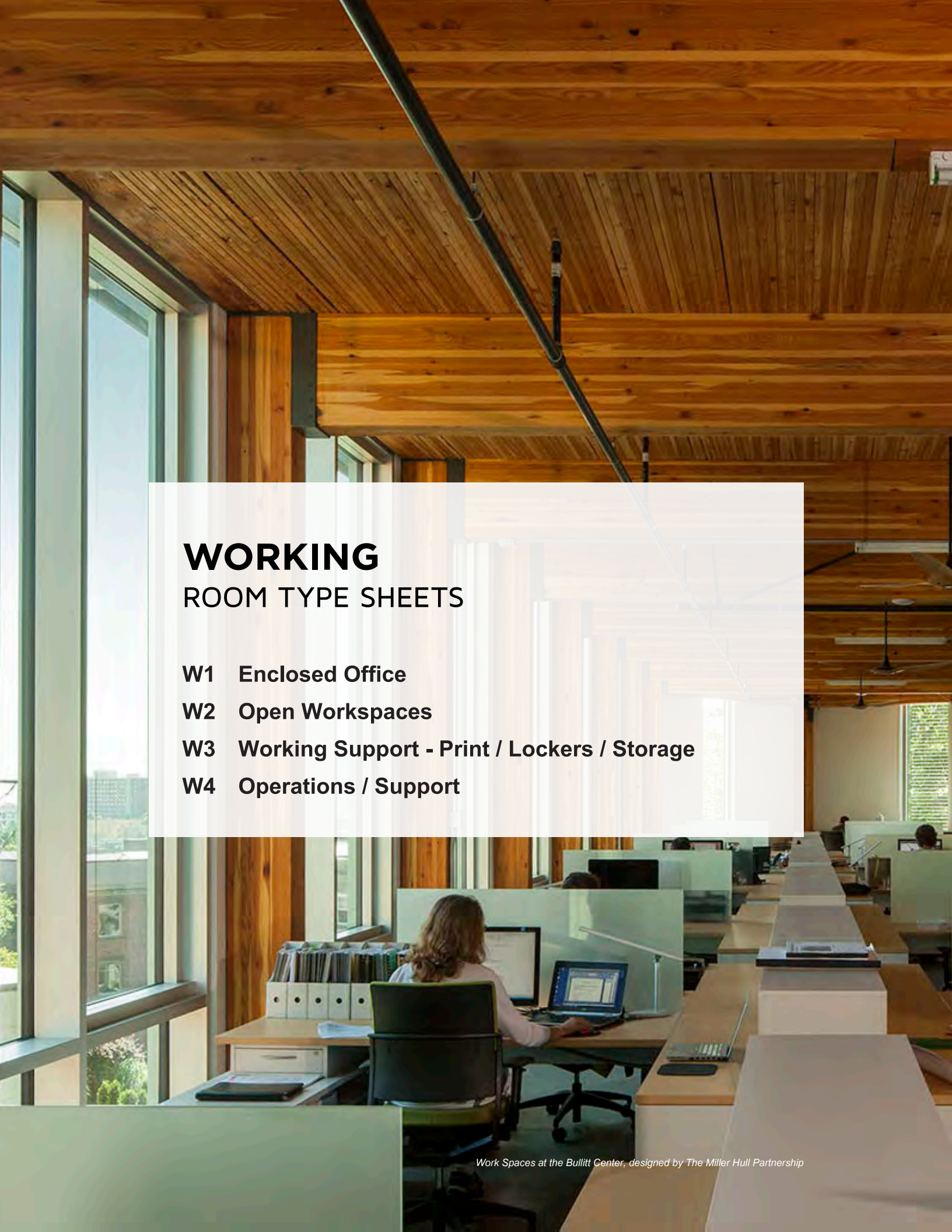


WORKING
ROOM TYPE SHEETS

W1 Enclosed Office

W2 Open Workspaces

W3 Working Support - Print / Lockers / Storage

W4 Operations / Support

Work Spaces at the Bullitt Center, designed by The Miller Hull Partnership

W1
ENCLOSED OFFICE

DESCRIPTION

Enclosed, workstation-based, private or shared space for focused, heads-down work and small meetings

SPATIAL QUALITIES

Area Range: 9 NSM - 90 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: Moderate
Views: Outside, associated Neighbourhood spaces, corridors
Acoustics: Treatment required.
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: Lockable, Single door w/lite
Active Lighting: Diffused Dimmable, Task Lighting
Power: Perimeter distribution
Mechanical: Temp. control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete / resilient flooring / carpet tiles, typ. walls, exposed ceiling
Casework/ Furniture: Desk(s), Chair(s), Shelving
AV Type(s): 10 - Infrastructure Only, N/A
Example Equipment: Desktop Computers, Monitors, Laptops

ASSOCIATED SPACES

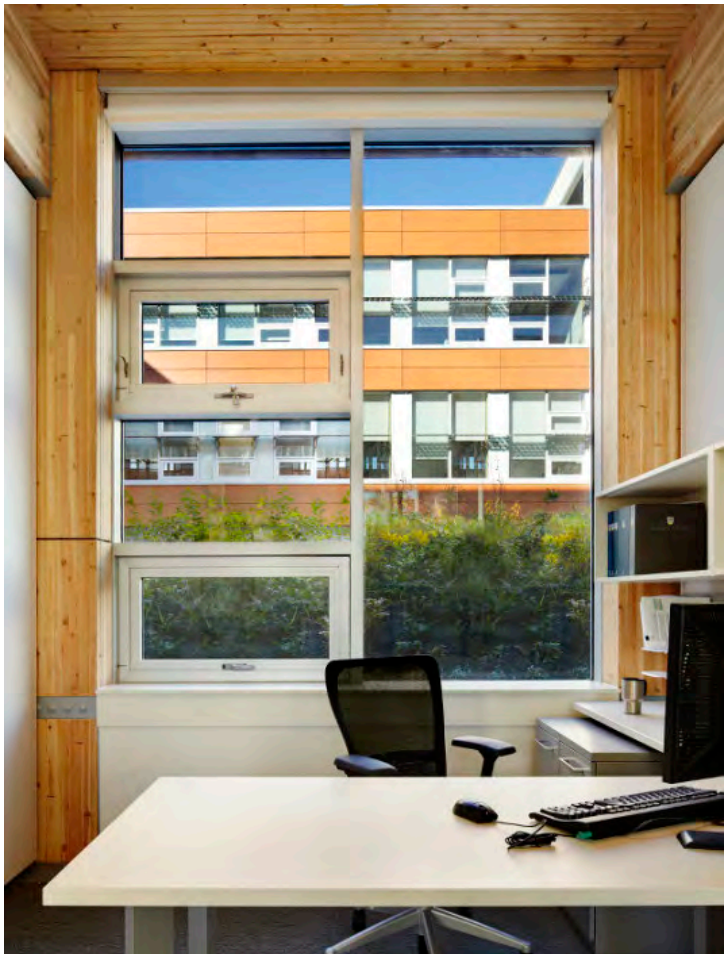
Workshops + Assembly [2]
Digital Fabrication Technician Office
Electrical/Electronics Technician Office
Metal Shop Technicians Office
Wet + Experimental Technician Office
CNC & Waterjet Technician Office, 2 Seat
Office - Small Shared (Workshop Technician)

Laboratories [3]
Office - Small Shared (Lab Tech)
Control Room

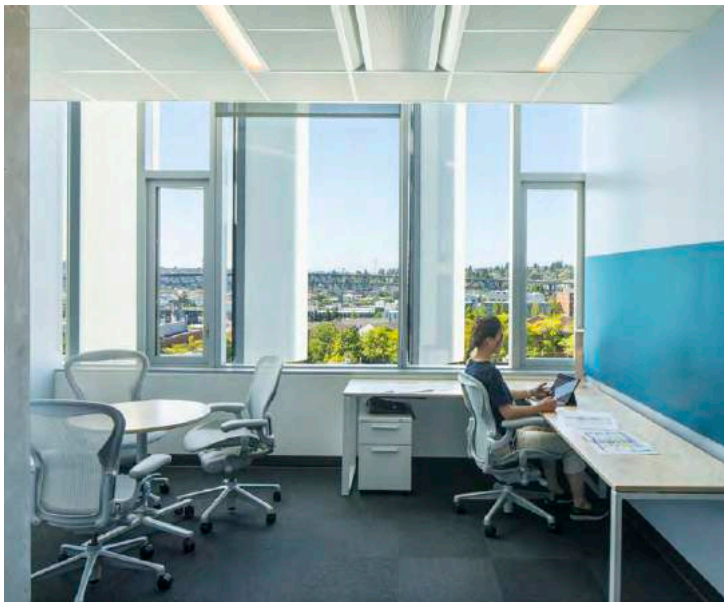
Project-Based Learning [4]
Office - Technician, Studio + Capstone Support

Flexible Clusters [5]
Offices - Private Enclosed
Offices - Large Shared
Office - Small Shared

Academic Workplace [7]
Offices - Private Enclosed
Offices - Large Shared
Office - Small Shared
Office - PDF/Emeritus/Visiting Faculty/RA
Dept Head Office - Private Enclosed
Directors Office - Private Enclosed
Directors Office - Private Enclosed
Graduate Interdisciplinary Office
Graduate Office



CIRS, UBC - Enclosed office with views to outside, operable windows, and dimmable lights



Population Health, University of Washington - Office space with work area and meeting area

W2
OPEN WORKSPACES

DESCRIPTION

Open, workstation or counter-based shared space for focused work.

SPATIAL QUALITIES

Area Range: 6 NSM - 54 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate
Solar Control: Anti-glare, shades/blinds
Transparency: High
Views: Outside, associated Neighbourhood spaces, corridors
Acoustics: Treatment required.
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: N/A
Active Lighting: Diffused Dimmable, Task Lighting
Power: Perimeter and floor distribution
Mechanical: Temp. control
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete / resilient flooring / carpet tiles, typ. walls, exposed ceiling
Casework/ Furniture: Desk(s), Chair(s), Shelving
AV Type(s): N/A
Example Equipment: Desktop Computers, Monitors, Laptops

ADDITIONAL NOTES

- N/A

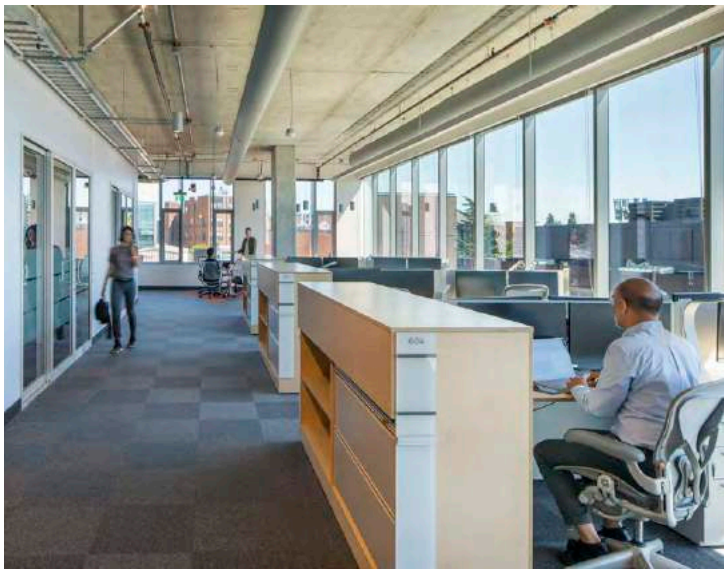
ASSOCIATED SPACES

Laboratories [3] Office - Open Workstations

Flexible Clusters [5] Office - Open Workstations

Academic Workplace [7] Office - Open Workstations
Visiting/Guest Lecturer Informal Workplace
Admin Reception

CIRS, UBC - Open workspace with transparency into adjacent enclosed offices



Health Sciences Building, University of Washington - Open workspace with ample access to daylight, an exposed ceiling and carpet tile.

W3
WORKING SUPPORT - PRINT / LOCKERS / STORAGE

DESCRIPTION

Range of support spaces for equipment, supplies, and storage.

SPATIAL QUALITIES

Area Range: 18 NSM - 32 NSM
Clear Height: 3 m
Critical Adjacencies: Associated Neighbourhood spaces

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate-Low
Solar Control: N/A
Transparency: Low
Views: Corridors
Acoustics: N/A
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: Lockable, Single door w/lite
Active Lighting: Diffused
Power: Perimeter distribution
Mechanical: N/A
Plumbing: N/A
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete, typ. walls, exposed ceiling
Casework/ Furniture: Shelving, Cabinets, Lockers
AV Type(s): N/A
Example Equipment: Printers, Plotters

ADDITIONAL NOTES

- N/A

ASSOCIATED SPACES

Academic Workplace [7] Print/Copy Centre

Building Support [8] Academic Workplace Storage, Consumables

HDR Offices, Minneapolis - Pin-pad lockers and cubbies integrated into office environment

Office support space with a printer, recycling, and storage for consumables

Wooter, NY - Large format plotting centre with sealed concrete floors and an exposed ceiling

W4
OPERATIONS / SUPPORT

DESCRIPTION

Range of process based support spaces for building operations.

SPATIAL QUALITIES

Area Range: 5 NSM - 60 NSM
Clear Height: 3 m
Critical Adjacencies: Loading bay (Distributed Custodial Facilities NIC)

ENVIRONMENTAL REQUIREMENTS / CONDITIONS

Daylighting: Moderate-Low
Solar Control: N/A
Transparency: N/A
Views: N/A
Acoustics: N/A
Vibration: N/A

TECHNICAL REQUIREMENTS / SERVICING

Access / Entry: Lockable, Mixed
Active Lighting: Direct
Power: Perimeter distribution
Mechanical: N/A
Plumbing: Sink and floor drain(s) as req.
Gas: N/A

MATERIALS / EQUIPMENT

Finishes: Sealed concrete, typ. walls, exposed ceiling
Casework/ Furniture: Cabinets and Shelving as req.
AV Type(s): N/A
Example Equipment: Floor cleaners/polishers, servers / IT decks

ADDITIONAL NOTES

• Reference UBC Technical Guidelines for Custodial and Communications Rooms

ASSOCIATED SPACES

Building Support [8] Shipping / Receiving / Mail Room
Main Custodial Facilities
Distributed Custodial Facilities
Communications Rooms
Recycling + Waste Management
Loading/Staging Area

Indoor staging area at loading dock with sealed concrete floors and minimal finishes

Custodial facility with storage racking for consumables

Partially finished support space with communications equipment

AA.2 COMPLETE SPACE LIST

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
		1.1 | Commons | Community | Subtotal 1068 NSM									
1.1.1	APSC Shared	Gallery / White Box Theatre / Commons / Grand Hall	100	2.4	1	240.0	240.0	Multi-use, flexible, double-height, public space with target uses: 100 people in flexible seating; installation of work with standing/walking space only, 60 people at for critique/design review events. Big load-in door directly into the space for large objects.	9		S1
1.1.2	APSC Shared	Roundtable Room - Indigenous Teaching + Discussion	60	2.4	1	144.0	144.0	Teaching and discussion space capable of various groupings. Primary use - gathering in the round. Secondary Use - events.	9		S2
1.1.3	APSC Shared	Café - Commercial Kitchen			1	60.0	60.0	Dedicated space for coffee or food handling, and storage.	7		B5
1.1.3a	APSC Shared	Café - Seating	15	2.4	1	36.0	36.0	Flexible space for cafe tables and chairs. Include packed lunch station w/microwaves, sinks for cleanup, and Sort It Out station.	8		B2
1.1.4	APSC Shared	Lobby	60	2.4	1	144.0	144.0	Multi-use, double-height public space. Soft seating and informal learning, welcoming.	9		B1
1.1.5	MTRL	Distributed Student Lounge	30	2.4	1	72.0	72.0	Flexible space with soft seating for informal learning and gathering.	8		B2
1.1.6	MANU	Distributed Student Lounge	15	2.4	1	36.0	36.0	Flexible space with soft seating for informal learning and gathering.	8		B2
1.1.7	MINE	Distributed Student Lounge	15	2.4	1	36.0	36.0	Flexible space with soft seating for informal learning and gathering.	8		B2
1.1.8	SALA	Distributed Student Lounge	30	2.4	1	72.0	72.0	Flexible space with soft seating for informal learning and gathering.	8		B2
1.1.9	SCARP	Distributed Student Lounge	15	2.4	1	36.0	36.0	Flexible space with soft seating for informal learning and gathering.	8		B2
1.1.10	APSC Shared	Informal Learning - Small Seating Areas	4	2.4	20	9.6	192.0	Flexible space with soft seating for informal learning and gathering scattered around building in corridors and near teaching and learning spaces.	none		B2
		1.2 | Commons | Wellbeing | Subtotal 84 NSM									
1.2.1	APSC Shared	Reflection/Meditation/Faith	10	2.4	1	24.0	24.0	Flexible use with little/no furnishings.	10		B3
1.2.2	APSC Shared	Reflection/Meditation/Faith	10	2.4	1	24.0	24.0	Flexible use with little/no furnishings. Moveable wooden divider for separation between men and women and shoe removal area. Ablution to be provided within the space or adjacent to washroom with ablution area.	10		B3
1.2.3	APSC Shared	Personal Wellness Room	1	9	4	9.0	36.0	Multi-use to support lactation, migraine, meditation, anxiety, quiet room needs. Space for 1 person, with single chair, foot stool, small sink and base cabinet.	10		B3
		2.1 | Workshops + Assembly | Digital Fabrication | Subtotal 211 NSM									
2.1.1	APSC Shared	3D Printing Studio	20	3.5	1	70.0	70.0	Multi-use space with small 3D printers and worktables. Sufficient space for some planning and assembly.	10		M1
2.1.2	APSC Shared	3D Printing Studio - Metal	12	5	1	60.0	60.0	Multi-use space with larger, specialized metal 3D printers (dry metal powders) and worktables. Sufficient space for some planning and assembly.	10		M2
2.1.3	APSC Shared	Digital Fabrication Workshop	18	4	1	72.0	72.0	Multi-use space for Laser cutting, Zund cutting, Advanced 3D Printing, 3D Scanning.	10		M2
2.1.4	APSC Shared	Digital Fabrication Technician Office	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.2 | Workshops + Assembly | Electronics + Robotics | Subtotal 324 NSM									
2.2.1	APSC Shared	Automation Robotics and Conveyors	30	4	1	120.0	120.0	Specialized space for robotics with "high head" & overhead crane.	10		M3
2.2.2	APSC Shared	Robotics Processing & Fabrication	30	4	1	120.0	120.0	Specialized space for robotics with "high head" & overhead crane.	10		M3
2.2.3	APSC Shared	Electrical/Electronics Shop	15	5	1	75.0	75.0	Multi-use space with work bench stations & electronics tools.	10		M2
2.2.4	APSC Shared	Electrical/Electronics Technician Office	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.3 | Workshops + Assembly | Wood + Metal | Subtotal 429 NSM									
2.3.1	APSC Shared	Metal Shop / Machine Shop	10	20	1	200.0	200.0	Multi-use space with metal and machine shop tools.	10		M2
2.3.2	SALA	Workshop - Wood	10	20	1	200.0	200.0	Wood Shop with large fixed tools. Multi-use space with larger, fixed tools and workbenches for tabletop equipment. Assume "high head" space if possible for oversized constructed objects.	10		M3
2.3.3	APSC Shared	Welding Shop	2	10	1	20.0	20.0	Small welding space.	10		M2
2.3.4	APSC Shared	Metal Shop Technicians Office	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.4 | Workshops + Assembly | Wet + Experimental | Subtotal 219 NSM									

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
2.4.1	MTRL	Synthetics & Composites	20	5	1	100.0	100.0	Multi-use space for working with MANU Fabrics & Resins.	10		M2
2.4.2	APSC Shared	Workshop - Plaster, Concrete & Ceramics	10	5	1	50.0	50.0	Wet workshop with sinks and sediment traps/filtration.	10		M1
2.4.3	APSC Shared	Workshop - Flexible & Experimental Materials	8	5	1	40.0	40.0	Multi-use space for working with plastics, thermoforming, foam, fabrics & sewing, etc.	10		M2
2.4.4	APSC Shared	Painting & Spray Studio	2	10	1	20.0	20.0	Specialized space for paint, coatings & adhesive spraying. Exhaust ventilation.	10		M2
2.4.5	APSC Shared	Wet + Experimental Technician Office	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.5 | Workshops + Assembly | Advanced Manufacturing | Subtotal 399 NSM									
2.5.1	MTRL - MANU	Advanced Manufacturing Makerspace	60	4	1	240.0	240.0	Multi-use space for working with advanced manufacturing equipment and tools. Includes space for lockers. Systems will require busbar power distribution and compressed air access. High head space required for equipment.	10		M3
2.5.2	APSC Shared	Workshop - CNC	6	10	1	60.0	60.0	Multi-use space for student access with larger, fixed tools like 3-axis and 5-axis mills and workbenches for tabletop equipment. Assume "high head" space if possible for oversized constructed objects.	10		M3
2.5.3	APSC Shared	Waterjet Workshop	2	15	1	30.0	30.0	Specialized space for water-jet cutting. Exhaust ventilation.	10		M2
2.5.4	MTRL - MANU	Automation Lab (Injection Molding)	12	5	1	60.0	60.0	Specialized space for injection molding.	10		M2
2.5.5	APSC Shared	CNC & Waterjet Technician Office, 2 Seat	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.6 | Workshops + Assembly | Professional Workshops | Subtotal 321 NSM									
2.6.1	MTRL	Metal/Machine Shop	10	20	1	200.0	200.0	Professional workshop with metal and machine shop tools.	10		M2
2.6.2	MTRL	Electrical/Electronics Shop	6	5	1	30.0	30.0	Professional workshop for work with electronics.	10		M2
2.6.3	MTRL	Project Assembly & Finishing	4	5	1	20.0	20.0	Workbenches that can accommodate assembly of projects by professionals. Large, flexible space that can accomodate 6 people at 5 NSM.	6a		M1
2.6.4	MTRL	CNC Room	3	10	1	30.0	30.0	Specialized space for professional use of 5-axis CNC equipment.	10		M2
2.6.5	MTRL	Welding Shop	2	10	1	20.0	20.0	Small welding space.	10		M2
2.6.6	MTRL	Meeting/Seminar/Training Room	6	2	1	12.0	12.0	Multi-use meeting and conference space.	6a		S2
2.6.7	MTRL	Office - Small Shared (Workshop Technician)	2	4.5	1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Requires visibility into workshops for observation.	10		W1
		2.7 | Workshops + Assembly | Assembly + Research | Subtotal 840 NSM									
2.7.1	APSC Shared	Project Assembly & Finishing	60	4	1	240.0	240.0	Workbenches and basic tools that can accommodate assembly as well as project-based capstone work. Large, flexible space.	10		M1
2.7.2	SALA	Workshop - Hand Tools	60	4	1	240.0	240.0	Workbenches and basic tools that can accommodate assembly as well as project-based capstone work. Large, flexible space.	10		M1
2.7.3	SALA	Flex Fabrication Research Lab	30	4	1	120.0	120.0	Flexible Research Space with workbenches that can be adjusted to accommodate fabrication and research.	10		M2
2.7.4	APSC Shared	Workshop High-Bay Flex/Assembly Hall	20	10	1	200.0	200.0	Flexible Research Space for large scale making, fabrication, and research. Gantry crane in to assist with large scale making. .	10		M3
2.7.5	APSC Shared	Meeting/Seminar/Training Room	10	2	2	20.0	40.0	Multi-use meeting and conference space.	6b		S2
2.7.6	APSC Shared	Outdoor Assembly Area			1	0.0	0.0	Multi-use outdoor space that can accommodate large scale making and outdoor gathering. Space to be adjacent to "high head" Workshop + Assembly spaces.	none		-
		3.1 | Laboratories | Flexible Labs | Subtotal 625 NSM									
3.1.1	APSC Shared	Research Lab	15	5	2	75.0	150.0	Dry Bench Lab. Provide fume hood chase/rough-in for 2 future tie-ins.	10	Rough-In x2	M6
3.1.1a	APSC Shared	Research Lab Support			6	20.0	120.0	Dry Bench Lab Support Space	10	1	M6
3.1.2	APSC Shared	Research Lab Dry - Undergrad	15	5	2	75.0	150.0	Dry Bench Lab	10	1	M6
3.1.2a	APSC Shared	Research Lab Support - Undergrad			4	20.0	80.0	Dry Bench Lab Support Space	10		M6
3.1.3	APSC Shared	Research/Teaching Lab - Dangerous Metal Powders	10	5	1	50.0	50.0	Wet Bench Teaching Lab	10	1	M7
3.1.4	APSC Shared	Lab Seminar Room	15	2	1	30.0	30.0	Seminar / Meeting Room	1a		S2
3.1.5	APSC Shared	Office - Open Workstations	6	4.5	1	27.0	27.0	Hot-desk workstations in open area	none		W2

AA.2 COMPLETE SPACE LIST

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
3.1.6	APSC Shared	Office - Small Shared (Lab Tech)	2	4.5	2	9.0	18.0	Enclosed workspace for lab technicians. Office also functions occasionally as meeting room, instruction & consultation. Visibility into workshops for observation.	10		W1
		3.2 | Laboratories | Material Labs | Subtotal 1206 NSM									
3.2.1	MTRL - MANU	Biomedical Manufacturing Area	15	5	1	75.0	75.0	Wet Bench Lab, BSL-2	10	1	M7
3.2.2	MTRL	Research Lab - Ballistics	5	5	1	50.0	50.0	Dry Bench Lab. Provide fume hood chase/rough-in for 2 future tie-ins.	10	Rough-In x2	M6
3.2.3	MTRL	Research Lab - Cyanide	10	5	1	50.0	50.0	Wet Bench Lab	10	1	M7
3.2.4	MTRL	Research Wet Bench Lab	15	5	2	75.0	150.0	Wet Bench Lab	10	1	M7
3.2.5	MTRL	Research Lab - Bio Leaching	15	5	1	75.0	75.0	Wet Bench Lab	10	1	M7
3.2.6	MTRL	Materials Testing Lab - Destructive & Non-destructive	15	5	1	75.0	75.0	Wet Bench Lab	10	1	M7
3.2.7	MTRL	Faculty/Grad Research Wet Lab	15	5	2	75.0	150.0	Wet Bench Lab	10	2	M7
3.2.8	MTRL	Raman Lab			1	20.0	20.0	Dry Bench Lab Support Space	10		M6
3.2.9	MTRL	Faculty/Grad Research Dry Lab Support			1	20.0	20.0	Dry Bench Lab Support Space	10		M6
3.2.10	MTRL	Research Wet Bench Lab Support			4	20.0	80.0	Wet Bench Lab Support Space	10	1	M7
3.2.11	APSC Shared	Lab Seminar Room			1	20.0	20.0	Seminar/ Meeting Room	1a		S2
3.2.12	APSC Shared	Office - Open Workstations	6	4.5	1	27.0	27.0	Hot-desk workstations in open area	none		W2
3.2.13	APSC Shared	Office - Small Shared (Lab Tech)	2	4.5	1	9.0	9.0	Enclosed workspace for lab technicians. Office also functions occasionally as meeting room, instruction & consultation. Visibility into workshops for observation.	10		W1
3.2.14	MINE	Surface Chemistry Research	30	3.5	1	105.0	105.0	Wet Bench Lab Space with (40) 2m adjustable lab benches. Equipment: Biosafety cabinet, (Class 2 Type A1), Bench for precision balances to minimize vibration, (3) Fume hoods for chemical use and dust-generation equipment. Fridge for sample and chemical storage (some flammables). Chemical/corrosives/solvent storage.	4	3	M7
3.2.15	APSC Shared	Laboratory Storage / Support Space			20	15.0	300.0	Includes specialized spaces like server room, fume hood etching and cryogenic materials storage, equipment, chemicals/acids & bases, Materials testing lab hydraulic compressor room. In addition to 4 fume hoods, provide fume hood chase/rough-in for 4 future tie-ins.	none	4 + Rough-In x4	M10
		3.3 | Laboratories | Characterization Lab | Subtotal 243 NSM									
3.3.1	APSC Shared	Microscopy Prep Lab	10	5	1	50.0	50.0	Wet Bench Lab - space includes lab modules with adjustable lab benches with associated space for movement. Ample room for benchtop equipment. Clean sample prep lab requires 2 fume hoods (acid work: one for static instruments and one for active work etching samples), splashdown area, and dedicated flexible long benches. Provide lab sinks, hand sinks, eyewashes and safety showers per recommended guidelines.	10	2	M7
3.3.2	APSC Shared	Optical Microscopy Room			1	20.0	20.0	Optical microscopes (x4) that occupies the equivalent space of 1.5 computers, at bench height.	10		M6
3.3.3	APSC Shared	Seminar Room	12	2.5	1	30.0	30.0	Seminar/ Meeting Room	1a		S2
3.3.4	APSC Shared	Electron Microscopy Room			4	20.0	80.0	Computational/Analysis Lab must have vibration control required with isolated slab per instrument. Characterisation using electron microscopes requires dedicated rooms with low electromagnetic noise, controlled temperature, room darkening, low acoustic and vibration noise.	10		M5
3.3.5	APSC Shared	Office - Small Shared (Lab Tech)	2	4.5	1.0	9.0	9.0	Enclosed workspace for lab technicians. Office also functions occasionally as meeting room, instruction & consultation. Visibility into workshops for observation.	10		W1
3.3.6	APSC Shared	Service Room			3	9.0	27.0	Service Room to host ancillary equipment (vacuum pumps, power and electrical transformers, UPS batteries, data storage arrays, gas bottles). Support may include fixed casework at the perimeter and flexible overhead or surface mounted raceways for power and data.	10		M10
3.3.7	APSC Shared	Control Room			3	9.0	27.0	Space for operators like a computational analysis office. Each instrument will require space for one or two computer consoles to operate and control them.	none		W1
		4.1 | Project-Based Learning | Design Studios | Subtotal 3140 NSM									

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
4.1.1	SCARP	**Design Studio**	60	4	2	240.0	480.0	Base Module - Highly adaptable layout with flexible furniture. A mix of high top and lower desks for variety of body types, encouraging movement and perching. Combined spaces supports SCARP Planning I/II and SCARP ICP Design Studio, SCARP Digital Studio, and SCARP Grad/PhD Studio.	4		L6
4.1.1a	SCARP	Studio Informal Spaces	10	2.5	2	25.0	50.0	Assembly Area, Informal Meeting Space with tables and chairs for informal learning and gathering.	8		B2
4.1.2	SALA	**Design Studio**	60	4	9	240.0	2,160.0	Base Module - Highly adaptable layout with flexible furniture. A mix of high top and lower desks for variety of body types, encouraging movement and perching. Combined spaces together support (9) SALA studios at 60 seats each.	4		L6
4.1.2a	SALA	Studio Informal Spaces	10	2.5	9	25.0	225.0	Assembly Area, Informal Meeting Space with tables and chairs for informal learning and gathering.	8		B2
4.1.2b	SALA	Studio Meeting Space	10	2.5	9	25.0	225.0	Group Breakout Rooms, Intimate Gathering, Structured Meeting Space.	6b		S3
		4.2 | Project-Based Learning | Studio + Capstone | Subtotal 305 NSM									
4.2.1	APSC Shared	**Interdisciplinary Design Studio and Project Based Capstone**	60	4	1	240.0	240.0	Base Module - Highly adaptable layout with flexible furniture. A mix of high top and lower desks for variety of body types, encouraging movement and perching. Combined space supports (1) SALA Interdisciplinary Studios s and (1) Flexible Project-Based Capstone for MANU/IGEN/Materials.	4		L6
4.2.1a	APSC Shared	Studio Informal Spaces	10	2.5	1	25.0	25.0	Assembly Area, Informal Meeting Space with tables and chairs for informal learning and gathering.	8		B2
4.2.1b	APSC Shared	Studio Meeting Space	8	2.5	2	20.0	40.0	Group Breakout Rooms, Intimate Gathering, Structured Meeting.	6a		S3
		4.3 | Project-Based Learning | Studio Commons | Subtotal 621 NSM									
4.3.1	APSC Shared	Collaborative Computational Study Space	60	2.4	1	144.0	144.0	Collaborative study space similar to a Learn Lab. Assume pods of 6 people.	2		M8
4.3.2	APSC Shared	Pin-up/Critique/Charette - Flex Space	15	2	6	30.0	180.0	Critique + Design Review Space. 1 Unit per 60 Project-based Learning Seats. Flexible Multi-purpose space with pin-up/tackable surfaces on walls.	6b		S4
4.3.3	APSC Shared	Pin-up/Critique/Charette - Flex Space	15	2	1	30.0	30.0	Critique + Design Review Space with enhanced AV package.	5		S4
4.3.4	APSC Shared	Virtual Projection Lab			1	30.0	30.0	Bookable Room - Immersive Sharing Experience, Multiscalar 2D Projection/Screens. No external light sources.	10		S4
4.3.5	APSC Shared	AR/VR Space			1	30.0	30.0	Bookable Room - Immersive Sharing Experience.	10		S4
4.3.6	APSC Shared	Kitchenette + Informal Dining			12	15.0	180.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, refrigerator, microwave in casework. 1 Unit per 60 Project-Based Learning Seats.	none		B4
4.3.7	APSC Shared	Office - Technician, Studio + Capstone Support	2	4.5	1	9.0	9.0	Enclosed workspace for 2 studio technicians. Office also functions occasionally as meeting room, instruction & consultation.	none		W1
4.3.8	APSC Shared	Photography Studio			1	9.0	9.0	Bookable room to document project work. No external light sources. Space for one person with moveable and fixed photography equipment.	10		M9
4.3.9	APSC Shared	Recording Room			1	9.0	9.0	Bookable, sound-proofed room for audio recording - voice primary, video secondary and supported with green screen and cabled internet for live broadcasts. Space for one person with moveable and fixed recording equipment.	4		M9
		5.1 | Flexible Clusters | Research Studio | Subtotal 170 NSM									
5.1.1	SALA	**Research Space - Sml, Studio Based**	15	4	1	60.0	60.0	Flexible Research Base Module - Includes Lockers. Highly adaptable layout with flexible furniture. A mix of high top and lower desks for variety of body types, encouraging movement and perching.	10		M4
5.1.2	SALA	Offices - Large Shared	20	3	1	60.0	60.0	Enclosed or open office with groups of workstations.	none		W1
5.1.3	SALA	Meeting Places	15	2	1	30.0	30.0	Group Breakout Rooms, Intimate Gathering, Structured Meeting.	6b		S3
5.1.4	SALA	Informal Spaces	6	2.5	1	15.0	15.0	Informal Meeting Space with tables and chairs.	8		B2
5.1.5	SALA	Kitchenette / Refresh Station			1	5.0	5.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, microwave in casework.	none		B4
		5.2 | Flexible Clusters | Research Assembly | Subtotal 95 NSM									
5.2.1	APSC Shared	**Research Space - Sml, Workshop Based**	15	4	1	60.0	60.0	Flexible Research Base Module with workbenches that can be adjusted to accommodate fabrication and research. Includes lockers. Provide fume hood chase/rough-in for 1 future tie-in.	10	Rough-In x1	M4
5.2.2	APSC Shared	Informal Spaces	6	2.5	2	15.0	30.0	Informal Meeting Space with tables and chairs.	8		B2
5.2.3	APSC Shared	Kitchenette / Refresh Station			1	5.0	5.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, microwave in casework.	none		B4
		5.3 | Flexible Clusters | Research Floating | Subtotal 140 NSM									

AA.2 COMPLETE SPACE LIST

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
5.3.1	APSC Shared	**Research Space - Lrg, Floating**	30	4	1	120.0	120.0	Flexible Research Base Module. Includes Lockers. Provide fume hood chase/rough-in for 2 future tie-ins.	10	Rough-In x2	M4
5.3.2	APSC Shared	Informal Spaces	6	2.5	1	15.0	15.0	Informal Meeting Space with tables and chairs.	8		B2
5.3.3	APSC Shared	Kitchenette / Refresh Station			1	5.0	5.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, microwave in casework.	none		B4
		5.4 | Flexible Clusters | Research Incubator | Subtotal 263 NSM									
5.4.1	APSC Shared	**Research Space - Lrg, Incubator**			1	120.0	120.0	Flexible Research Base Module for hosting Design Studio, Computational/Analysis Lab, Bench Labs - Includes Lockers. Reconfigurable space with rough-in for future research build-out. Provide fume hood chase/rough-in for 2 future tie-ins.	10	Rough-In x2	M4
5.4.2	APSC Shared	Office - Small Shared	2	4.5	4	9.0	36.0	Assignable/Bookable Enclosed office with workstations.	none		W1
5.4.3	APSC Shared	Office - Large Shared	4	4.5	1	18.0	18.0	Assignable/Bookable Enclosed office with workstations.	none		W1
5.4.4	APSC Shared	Office - Private Enclosed	1	9	2	9.0	18.0	Assignable/Bookable Enclosed office with workstations.	none		W1
5.4.5	APSC Shared	Office - Open Workstations	8	4.5	1	36.0	36.0	Hot-desk workstations in open area.	none		W2
5.4.6	APSC Shared	Meeting Places	15	2	1	30.0	30.0	Group Breakout Rooms, Intimate Gathering, Structured Meeting.	6b		S3
5.4.7	APSC Shared	Kitchenette / Refresh Station			1	5.0	5.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, microwave in casework.	none		B4
		5.5 | Flexible Clusters | Research Commons | Subtotal 158 NSM									
5.5.1	APSC Shared	Meeting Room - L	20	2.4	1	48.0	48.0	Research grouping shared amenity.	6c		S2
5.5.2	APSC Shared	Meeting Room - M	8	2.4	2	19.0	38.0	Research grouping shared amenity.	6a		S3
5.5.3	APSC Shared	Meeting Room - S	4	2.4	1	10.0	10.0	Research grouping shared amenity.	6a		S3
5.5.4	APSC Shared	Focus Booth			2	4.0	8.0	Research grouping shared amenity. Small space for phone calls - assume BYOD & no AV support.	none		S3
5.5.5	APSC Shared	Social Lounge	10	2.4	1	24.0	24.0	Research grouping shared amenity. Social area with mix of soft seating and tables and chairs.	8		B2
5.5.6	APSC Shared	Kitchen + Dining			1	30.0	30.0	Research grouping shared amenity. Kitchen area includes multiple fridges, sinks, dishwasher, etc. as well as tables and chairs/booths for seating. Large enough to hold bigger groups and some people alone together.	none		B4
		6.1 | Teaching Spaces | APSC Learning Spaces | Subtotal 1161 NSM									
6.1.1	APSC Shared	Outdoor Classroom - Indigenous Teaching + Discussion			1	0.0	0.0	Space for teaching, discussion, and ceremony outside. Appropriate for Indigenous teaching and events and/or gatherings.	none		L7
6.1.2	APSC Shared	Digital Roundtable / Seminar Room	30	2.4	1	72.0	72.0	Indigenous & Remote Communities Collaboration space for teaching and discussion. Ability to connect easily to remote locations or provide immersive experience.	6c		L1
6.1.3	APSC Shared	Geographic Information System (GIS) Lab	40	2.4	1	96.0	96.0	Shared Teaching Computer Lab.	4		M8
6.1.4	APSC Shared	Teaching Lab	60	2.4	2	144.0	288.0	Teaching Lab Space	1b		L4
6.1.5	APSC Shared	Materials Teaching Lab - Open Floor Wet Lab	40	4	1	160.0	160.0	Teaching Lab Space. Equipment: Chem Fume Hood, Tube Furnace, Rolling Mill, Charpy Tester, ballistic pendulum, Zwick Universal Test, Fatigue tester (x2), Instron (x6), Furnace.	4	2	L5
6.1.6	APSC Shared	Ceramics Teaching and Research	30	4	1	120.0	120.0	Teaching Lab Space. Open for after hours research. Equipment: Dedicated Fume Hood w/ cup sink, Extractor for furnaces for sintering materials, (3) Furnaces, Ball Mill, Mixing/ Blending.	4	2	L5
6.1.7	MTRL	Hydrometallurgy, Structures, Properties Teaching	30	4	1	120.0	120.0	Wet Bench Teaching Lab Space with 2m adjustable lab benches. Equipment: Biosafety cabinet, (Class 2 Type A1), Bench for precision balances to minimize vibration, (3) Fume hoods for chemical use and dust-generation	4	3	L5
6.1.8	MTRL - MANU	Bio Manufacturing Teaching Lab	30	4	1	120.0	120.0	Wet Bench Teaching Lab Space with 2m adjustable lab benches. Equipment: Biosafety cabinet, (Class 2 Type A1), Bench for precision balances to minimize vibration, (3) Fume hoods for chemical use and dust-generation	4	3	L5
6.1.9	MINE	Surface Chemistry Teaching Lab	30	3.5	1	105.0	105.0	Wet Bench Teaching Lab Space with 2m adjustable lab benches. Equipment: variety of benchtop equipment.	4	1	L5
6.1.10	MINE	Analytical Instrument Lab - Surface Chemistry Research Support			1	20.0	20.0	Dry Bench Lab support space for Surface Chemistry Teaching Lab.	none		M6
6.1.11	MINE	Research Lab - Surface Chemistry Support			3	20.0	60.0	Wet Bench Lab Support Space adjacent to Surface Chemistry Teaching Lab	none		M7
		6.2 | Teaching Spaces | UBC General Teaching Spaces | Subtotal 2415.5 NSM									
6.2.1	UBC	GTS - Active Learning Theatre - Med-Large	300	2.4	1	720.0	720.0	Active Learning Theatre. Double height space for sightlines. Locate adjacent to lobby / common area for gathering and sharing purposes.	3		L2

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
6.2.1a	UBC	GTS Learning Spaces - Theatre Control Room			1	17.5	17.5	Control Room for Active Learning Theatre. Location and shape of control room is critical for function of space; must be centered at back of auditorium for projection/sightlines.	none		L9
6.2.1b	UBC	GTS Learning Spaces - Theatre Vestibules			2	7.5	15.0	Entry vestibules for acoustic separation. Serves Active Learning Theatre.	none		-
6.2.2	UBC	GTS - Active Learning Theatre - Med-Small	210	2.4	1	504.0	504.0	Active Learning Theatre . Double height space for sightlines. Locate adjacent to lobby / common area for gathering and sharing purposes.	3		L2
6.2.2a	UBC	GTS Learning Spaces - Theatre Control Room			1	17.5	17.5	Control Room for Active Learning Theater. Location and shape of control room is critical for function of space; must be centered at back of auditorium for projection/sightlines.	none		L9
6.2.2b	UBC	GTS Learning Spaces - Theatre Vestibules			2	7.5	15.0	Entry vestibules for acoustic separation. Serves Active Learning Theatre.	none		-
6.2.3	UBC	GTS - Active Learning Classroom - Large	100	2.4	1	240.0	240.0	Active Learning Classroom.	1c		L4
6.2.4	UBC	GTS - Active Learning Classroom - Large	80	2.4	1	192.0	192.0	Active Learning Classroom.	1c		L4
6.2.5	UBC	GTS - Active Learning Classroom - Medium	60	2.4	2	144.0	288.0	Active Learning Classroom.	1b		L4
6.2.6	UBC	GTS - Active Learning Classroom - Small	40	2.4	2	96.0	192.0	Active Learning Classroom.	1b		L4
6.2.7	UBC	GTS - Classroom Control Room			1	9.0	9.0	Control Room for Active Learning Classrooms. Location to be adjacent or in the immediate vicinity of classrooms.	none		L9
6.2.8	UBC	GTS - Seminar Room	26	2.4	3	62.5	187.5	Active Learning Classroom.	1a		L1
6.2.9	UBC	GTS Learning Spaces - Learn Lab Control Room			1	9.0	9.0	Control Room for Learn Labs. Location to be adjacent or in the immediate vicinity of Learn Labs. 1 Control Room per 3 Learn Labs.	none		L9
6.2.10	UBC	GTS Learning Spaces - Storage			1	9.0	9.0	Furniture storage room for Learning Spaces. Located near GTS and easily accessed, not located within a GTS. This room is used to store broken furniture that will be accessed by vendors when they come onto to do maintenance.	none		-
		7.1 | Academic Workplace | Faculty Offices | Subtotal 1065 NSM									
7.1.1	MTRL	Office - Small Shared	2	4.5	8	9.0	72.0	Enclosed office with workstations.	none		W1
7.1.2	MTRL	Office - Private Enclosed	1	9	26	9.0	234.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.1.3	MINE	Office - Small Shared	2	4.5	6	9.0	54.0	Enclosed office with workstations.	none		W1
7.1.4	MINE	Office - Private Enclosed	1	9	12	9.0	108.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.1.5	SALA	Office - Small Shared	0	4.5	0	9.0	0.0	Enclosed office with workstations.	none		W1
7.1.6	SALA	Office - Private Enclosed	1	9	26	9.0	234.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.1.7	SCARP	Office - Small Shared	2	4.5	2	9.0	18.0	Enclosed office with workstations.	none		W1
7.1.8	SCARP	Office - Open Workstations	10	4.5	1	45.0	45.0	Workstations in open area.	none		W2
7.1.9	SCARP	Office - Private Enclosed	1	9	16	9.0	144.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.1.10	APSC Shared	Office - PDF/Emeritus/Visiting Faculty/RA - S	2	4.5	6	9.0	54.0	Enclosed office with workstations.	none		W1
7.1.11	APSC Shared	Office - PDF/Emeritus/Visiting Faculty/RA - L	4	4.5	4	18.0	72.0	Enclosed office with workstations.	none		W1
7.1.12	APSC Shared	Visiting/Guest Lecturer Informal Workplace	12	2.5	1	30.0	30.0	Touchdown stations/seating to support visitors/collaborators. Not a full workstation - shared tables with power and wifi.	none		W2
		7.2 | Academic Workplace | Administration | Subtotal 818.2 NSM									
7.2.1	MTRL	Office - Small Shared	2	4.5	1	9.0	9.0	Enclosed office with workstations.	none		W1
7.2.2	MTRL	Office - Large Shared	6	4.5	2	27.0	54.0	Enclosed office with workstations.	none		W1
7.2.3	MTRL	Office - Open Workstations	12	4.5	1	54.0	54.0	Workstations in open area.	none		W2
7.2.4	MTRL	Office - Private Enclosed	1	9	5	9.0	45.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.5	MTRL	Admin Reception			1	6.0	6.0	Workstation and reception space. Space for digital signage.	7		W2
7.2.6	MTRL	Admin/Dept Head - Meeting Room - M	8	2	1	19.0	19.0	Multi-use meeting space.	6a		S3
7.2.7	MTRL	Dept Head Office - Private Enclosed	1	9	1	9.0	9.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.8	MINE	Office - Small Shared	2	4.5	1	9.0	9.0	Enclosed office with workstations.	none		W1
7.2.9	MINE	Office - Large Shared	4	4.5	2	18.0	36.0	Enclosed office with workstations.	none		W1
7.2.10	MINE	Office - Private Enclosed	1	9	4	9.0	36.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1

AA.2 COMPLETE SPACE LIST

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
7.2.11	MINE	Admin Reception			1	6.0	6.0	Workstation and reception space. Space for digital signage.	7		W2
7.2.12	MINE	Admin/Dept Head - Meeting Room - M	8	2	1	19.0	19.0	Multi-use meeting space.	6a		S3
7.2.13	MINE	Dept Head Office - Private Enclosed	1	9	1	9.0	9.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.14	SALA	Office - Small Shared	2	4.5	1	9.0	9.0	Enclosed office with workstations.	none		W1
7.2.15	SALA	Office - Open Workstations	4	4.5	1	18.0	18.0	Workstations in open area.	none		W2
7.2.16	SALA	Office - Private Enclosed	1	9	10	9.0	90.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.17	SALA	Admin Reception			1	6.0	6.0	Workstation and reception space. Space for digital signage.	7		W2
7.2.18	SALA	Admin/Director Meeting Room - M	8	2.4	1	19.0	19.0	Multi-use meeting space.	6a		S3
7.2.19	SALA	Directors Office - Private Enclosed	1	9	1	9.0	9.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.20	SCARP	Office - Small Shared	2	4.5	1	9.0	9.0	Enclosed office with workstations.	none		W1
7.2.21	SCARP	Office - Large Shared	4	4.5	1	18.0	18.0	Enclosed office with workstations.	none		W1
7.2.22	SCARP	Office - Private Enclosed	1	9	4	9.0	36.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.23	SCARP	Admin Reception			1	6.0	6.0	Workstation and reception space. Space for digital signage.	7		W2
7.2.24	SCARP	Admin/Director Meeting Room - M	8	2.4	1	19.0	19.0	Multi-use meeting space.	6a		S3
7.2.25	SCARP	Directors Office - Private Enclosed	1	9	1	9.0	9.0	Enclosed office with 1 workstation and additional space for small table and chairs.	none		W1
7.2.26	APSC Shared	Print/Copy Centre	8	4	1	32.0	32.0	Staff/faculty printing room with printing equipment.	none		W3
7.2.27	APSC Shared	Informal Waiting/Seating/Meeting	7	2.4	4	17	67	Flexible space with soft seating.	none		B2
7.2.28	APSC Shared	Kitchen w/Informal Seating	20	2.4	2	48.0	96.0	Kitchen area includes multiple fridges, sinks, dishwasher, etc. as well as tables and chairs/booths for seating. Large enough to hold bigger groups and some people alone together.	none		B4
7.2.29	APSC Shared	Kitchenette / Refresh Station			4	16.0	64.0	Kitchenettes/Refresh Areas have small sink, water/hot water dispenser, coffee pot, microwave in casework. Strategically located around academic workplace.	none		B4
		7.3 | Academic Workplace | Workplace Commons | Subtotal 926 NSM									
7.3.1	APSC Shared	Meeting Room - L	20	2.4	1	48.0	48.0	Meeting space.	6c		S2
7.3.2	APSC Shared	Meeting Room - L	20	2.4	1	48.0	48.0	Meeting space with enhanced AV package.	5		S2
7.3.3	APSC Shared	Meeting Room - M	10	2.4	8	24.0	192.0	Meeting space.	6b		S3
7.3.4	APSC Shared	Meeting Room - S	4	2.25	4	9.0	36.0	Meeting space.	10		S3
7.3.5	APSC Shared	Focus Booth	1	4.5	4	4.5	18.0	Small space for phone calls - assume BYOD & no AV support.	none		S3
7.3.6	APSC Shared	Graduate Interdisciplinary Office	20	4.5	1	90.0	90.0	Enclosed office with workstations to support graduate student. Tables with power and wifi.	none		W1
7.3.7	MTRL	Graduate Office, 4 Seat	20	4.5	3	90.0	270.0	Enclosed office with workstations to support graduate student. Tables with power and wifi.	none		W1
7.3.8	MINE	Graduate Office, 4 Seat	20	4.5	1	90.0	90.0	Enclosed office with workstations to support graduate student. Tables with power and wifi.	none		W1
7.3.9	SALA	Graduate Office, 4 Seat	8	4.5	1	36.0	36.0	Enclosed office with workstations to support graduate student. Tables with power and wifi.	none		W1
7.3.10	SCARP	Graduate Office, 4 Seat	15	4.5	1	68.0	68.0	Enclosed office with workstations to support graduate student. Tables with power and wifi.	none		W1
7.3.11	APSC Shared	Print/Copy Centre	15		1	30.0	30.0	Traditional printing and large format plotting with printing equipment.	none		W3
		8.1 | Building Support | Stores | Subtotal 423 NSM									
8.1.1	APSC Shared	Stores			1	240.0	240.0	Large well organized room with rolling high-density shelves for consumable parts and materials. such as tools, chemicals, common consumables, fittings, sensors, etc. Stores will support all of Applied One, with a high percentage of use by Materials Engineering.	none		M10
8.1.2	APSC Shared	Raw Materials Storage			1	30.0	30.0	Storage for materials for student use. Should be adjacent to Workshops + Assembly grouping.	none		M10
8.1.3	APSC Shared	Reception/Office	2		1	9.0	9.0	Enclosed workspace for shop technicians. Office also functions occasionally as meeting room, instruction & consultation. Visibility into workshops for observation.	none		W1
8.1.4	APSC Shared	Bulk Storage - Chemicals & Flammables			1	18.0	18.0	Bulk Materials Storage	none		M10

Space Number	Steward	Space	Seats	NSM /Seat	Units	Unit NSM	Total NSM	Remarks	AV Reqs	Fume Hood /Unit	Room Type Sheet
8.1.5	APSC Shared	Bulk Storage - Compressed Gas Cylinders			1	18.0	18.0	Bulk Materials Storage	none		M10
8.1.6	APSC Shared	Bulk Storage - Lab Cold Storage			1	10.0	10.0	Bulk Materials Storage	none		M10
8.1.7	APSC Shared	Bulk Storage - Metal Powders & Explosives			1	10.0	10.0	Bulk Materials Storage	none		M10
8.1.8	MINE	Bulk Storage - Ore & Minerals			1	18.0	18.0	Bulk Materials Storage	none		M10
8.1.9	MTRL	Professional Workshops - Electrical & Electronics Storage			1	10.0	10.0	Bulk Materials Storage	none		M10
8.1.10	MTRL	Professional Workshops - Metals Storage			1	50.0	50.0	Bulk Materials Storage	none		M10
8.1.11	MTRL	Professional Workshops - Parts, Assemblies, Components			1	10.0	10.0	Bulk Materials Storage	none		M10
		8.2 | Building Support | Neighbourhood Support | Subtotal 95 NSM									
8.2.1	APSC Shared	Workshop - Compressor Room			1	12.0	12.0	Technical space for support of workshops. To be adjacent to / integrated with Workshops + Assembly.	none		M10
8.2.2	APSC Shared	Workshop - Project Storage Area			1	15.0	15.0	Lockers / Shelves - Assumption based on .25 cu. meters/person. To be adjacent to / integrated with Workshops + Assembly.	none		M10
8.2.3	APSC Shared	Project Based Learning Storage / Support Space			1	10.0	10.0	Furniture storage room for Project-Based Learning studios. Located near and easily accessed, but not located within a studio. This room is used to store broken furniture that will be accessed by vendors when they come onsite to do maintenance.	none		L8
8.2.4	APSC Shared	Flexible Clusters Storage / Support Space			2	15.0	30	Support for Flexible Research Base Modules. To be adjacent to / integrated with Flexible Clusters.	none		M10
8.2.5	APSC Shared	APSC Teaching Lab Storage			1	10.0	10.0	Support space for reoccuring classes. Adjacent/Integrated with Lab space. Needed for demonstrations, extra equipment so spaces can be used by departments.	none		L8
8.2.6	APSC Shared	Academic Workplace Storage, Consumables			1	18.0	18.0	No adjacency requirements. Desire to have shared storage. To be adjacent to / integrated with Academic Workplace.	none		W3
		8.3 | Building Support | General Support | Subtotal 585 NSM									
8.3.1	APSC Shared	End-of-Trip Facilities			1	90.0	90.0	UBC Design Guidelines, Section 2.5.6.	none		B6
8.3.2	APSC Shared	Indoor-Secure Bicycle Storage			1	90.0	90.0	UBC Design Guidelines, Section 2.5.5.	none		B7
8.3.3	APSC Shared	Shipping / Receiving / Mail Room	1		1	5.0	5.0	Assume central shipping & receiving in addition to Stores for research and workshops-related receiving.	none		W4
8.3.4	APSC Shared	Main Custodial Facilities			1	40.0	40.0	Main custodial facilities located at grade if possible	none		W4
8.3.5	APSC Shared	Distributed Custodial Facilities			10	12.0	120.0	Custodial facilities located throughout the building.	none		W4
8.3.6	APSC Shared	Communications Rooms			15	9.0	135.0	IT Infrastructure spaces located throughout the building	none		W4
8.3.7	APSC Shared	Recycling + Waste Management			1	45.0	45.0	Recycling & waste management located at grade.	none		W4
8.3.8	APSC Shared	Loading/Staging Area			1	60.0	60.0	Adjacent to exterior loading area. Confirm maximum size vehicle that needs to be accommodated. Two bays for recycle/trash and delivery.	none		W4
		9.1 | Childcare | Age 0-3 | Subtotal 241 NSM									
9.1.1	UBC	Indoor Activity Rooms and Settings			1	164.0	164.0	Art Area, Table Area, Area for Other Activity Settings, Gross Motor/Nap Room, Storage for Mats & Equipment, Quiet Room	none		B8
9.1.2	UBC	Support Spaces			1	77.0	77.0	Kitchen, Cubby, Laundry/Janitoral, Storage, Child W/C & Diapering Area	none		B8
		9.2 | Childcare | Age 3-5 | Subtotal 172.5 NSM									
9.2.1	UBC	Indoor Activity Rooms and Settings			1	128.0	128.0	Dedicated Art Area (wet messy), Table Area, Area for Other Activity Settings, Gross Motor/Nap Room, Storage with Large Motor/Nap Room, Quiet Room	none		B8
9.2.2	UBC	Support Spaces			1	44.5	44.5	Kitchen, Cubby, Laundry/Janitoral, Storage, Children's W/C	none		B8
		9.3 | Childcare | Shared | Subtotal 71 NSM									
9.3.1	UBC	Outdoor Play Space - Open			1		0.0	579m2 Outdoor Play Area	none		B8
9.3.2	UBC	Outdoor Space - Covered			1		0.0	111m2 Outdoor Covered Play Area	none		B8
9.3.3	UBC	General Support Spaces			1	71.0	71.0	Admin Office, Staff Office / Lounge, Accessible Staff W/C w/ Diapering Area, Entry / Lobby	none		B8
							18,834				

AA.3 WORKLOAD TABLE

Subject	Course	Department	Activity Type	Hours/Week (Per Section)	Term 1 Total Enrolment	Term 1 Number of Sections	Term 1 Average Section Size	Term 1 Total Hours Per Week	Term 2 Total Enrolment	Term 2 Number of Sections	Term 2 Average Section Size	Term 2 Total Hours Per Week	Room Type
APSC	278	Materials	LEC	3	600	2	300	6	600	2	300	6	CLASSROOM
APSC	279	Materials	LAB	2	300	10	30	20	300	10	30	20	LAB
MTRL	201	Materials	LEC	3				0	70	1	70	3	CLASSROOM
MTRL	250	Materials	LEC	3	70	1	70	3				0	CLASSROOM
MTRL	250	Materials	TUT	2	70	1	70	2				0	CLASSROOM
MTRL	251	Materials	TUT	2				0	70	1	70	2	CLASSROOM
MTRL	251	Materials	LEC	3				0	70	1	70	3	CLASSROOM
MTRL	263	Materials	TUT	2				0	140	1	140	2	CLASSROOM
MTRL	263	Materials	LEC	2				0	140	1	140	2	CLASSROOM
MTRL	264	Materials	TUT	2				0	140	1	140	2	CLASSROOM
MTRL	264	Materials	LEC	2				0	140	1	140	2	CLASSROOM
MTRL	280	Materials	LEC	2				0	160	1	160	2	CLASSROOM
MTRL	280	Materials	TUT	3				0	160	1	160	3	CLASSROOM
MTRL	320	Materials	LEC	1	70	1	70	1				0	CLASSROOM
MTRL	320	Materials	TUT	2	70	1	70	2				0	CLASSROOM
MTRL	340	Materials	LEC	4				0	160	1	160	4	CLASSROOM
MTRL	358	Materials	LEC	2	70	1	70	2				0	CLASSROOM
MTRL	358	Materials	TUT	2	70	1	70	2				0	CLASSROOM
MTRL	359	Materials	LAB	3	70	2	35	6				0	LAB
MTRL	361	Materials	LEC	3	70	1	70	3				0	CLASSROOM
MTRL	361	Materials	TUT	2	70	1	70	2				0	CLASSROOM
MTRL	363	Materials	LEC	2	70	1	70	2				0	CLASSROOM
MTRL	363	Materials	TUT	2	70	1	70	2				0	CLASSROOM
MTRL	365	Materials	LEC	3				0	70	1	70	3	CLASSROOM
MTRL	378	Materials	TUT	2				0	70	1	70	2	CLASSROOM
MTRL	378	Materials	LEC	3				0	70	1	70	3	CLASSROOM
MTRL	381	Materials	LAB	3				0	70	2	35	6	LAB
MTRL	382	Materials	LEC	3				0	70	1	70	3	CLASSROOM
MTRL	382	Materials	LAB	3				0	70	2	35	6	LAB
MTRL	394	Materials	TUT	2				0	70	1	70	2	CLASSROOM
MTRL	394	Materials	LEC	3				0	70	1	70	3	CLASSROOM
MTRL	451	Materials	LAB	3	70	2	35	6				0	LAB
MTRL	451	Materials	LEC	1	70	1	70	1				0	CLASSROOM
MTRL	455	Materials	LEC	2	70	1	70	2				0	CLASSROOM
MTRL	455	Materials	TUT	2	70	1	70	2				0	CLASSROOM
MTRL	456	Materials	TUT	2				0	70	1	70	2	CLASSROOM
MTRL	456	Materials	LEC	2				0	70	1	70	2	CLASSROOM
MTRL	460	Materials	LEC	2	70	1	70	2				0	CLASSROOM
MTRL	460	Materials	TUT	2	70	1	70	2				0	CLASSROOM
MTRL	466/467	Materials	LEC	1	70	1	70	1	70	1	70	1	LAB
MTRL	466/467	Materials	PRB	3	70	1	70	3	70	1	70	3	LAB
MTRL	466/467	Materials	TUT	2	70	1	70	2	70	1	70	2	LAB
MTRL	471/571	Materials	LEC/SEM	3				0	50	1	50	3	CLASSROOM
MTRL	472	Materials	LAB	2	50	1	50	2				0	CLASSROOM
MTRL	472	Materials	LEC	2	50	1	50	2				0	CLASSROOM
MTRL	475/578	Materials	LEC	2				0	25	1	25	2	CLASSROOM
MTRL	475/578	Materials	TUT	2				0	25	1	25	2	CLASSROOM
MTRL	478	Materials	LEC	3				0	40	1	40	3	CLASSROOM
MTRL	485	Materials	LEC	2	40	1	40	2				0	CLASSROOM
MTRL	485	Materials	TUT	2	40	1	40	2				0	CLASSROOM
MTRL	486	Materials	LEC	2	40	1	40	2				0	CLASSROOM
MTRL	486	Materials	TUT	2	40	1	40	2				0	CLASSROOM
MTRL	494	Materials	LEC	3				0	70	1	70	3	CLASSROOM
MTRL	495/595	Materials	TUT	2				0	70	1	70	2	CLASSROOM

Subject	Course	Department	Activity Type	Hours/Week (Per Section)	Term 1 Total Enrolment	Term 1 Number of Sections	Term 1 Average Section Size	Term 1 Total Hours Per Week	Term 2 Total Enrolment	Term 2 Number of Sections	Term 2 Average Section Size	Term 2 Total Hours Per Week	Room Type
MTRL	495/595	Materials	LEC	2				0	70	1	70	2	CLASSROOM
MTRL	496	Materials	TUT	2				0	40	1	40	2	CLASSROOM
MTRL	496	Materials	LEC	2				0	40	1	40	2	CLASSROOM
MTRL	515	Materials	LEC	4				0	40	1	40	4	CLASSROOM
MTRL	517	Materials	LEC	2	15	1	15	2				0	CLASSROOM
MTRL	517	Materials	TUT	2	15	1	15	2				0	CLASSROOM
MTRL	559	Materials	LEC	3				0	10	1	10	3	CLASSROOM
MTRL	579	Materials	LEC	2				0	10	1	10	2	CLASSROOM
MTRL	592B	Materials	DST	0				0				0	n/a
MTRL	594	Materials	LEC	2	15	1	15	2				0	CLASSROOM
MTRL	594	Materials	TUT	2	15	1	15	2				0	CLASSROOM
MTRL	596	Materials	THS	0	15	1	15	0				0	n/a
MTRL	596	Materials	THS	0	15	1	15	0				0	n/a
MTRL	599	Materials	THS	0				0				0	n/a
MTRL	599	Materials	THS	0	35	1	35	0				0	n/a
MTRL	699	Materials	THS	0				0				0	n/a
MTRL	699	Materials	THS	0				0				0	n/a
MTRL	699	Materials	THS	0	100	1	100	0				0	n/a
IGEN	201	Integrated Eng Prgm	LEC	3				0	90	2	45	6	CLASSROOM
IGEN	230	Integrated Eng Prgm	LAB	3	90	3	30	9	90	3	30	9	CLASSROOM
IGEN	230	Integrated Eng Prgm	LEC	1	90	1	90	1	90	1	90	1	CLASSROOM
IGEN	330	Integrated Eng Prgm	LAB	3	90	3	30	9	90	3	30	9	CLASSROOM
IGEN	330	Integrated Eng Prgm	LEC	1	90	1	90	1	90	1	90	1	CLASSROOM
IGEN	430	Integrated Eng Prgm	L-L	4	90	1	90	4	90	1	90	4	CLASSROOM
IGEN	450	Integrated Eng Prgm	LEC	3	30	1	30	3				0	CLASSROOM
IGEN	451	Integrated Eng Prgm	LEC	3				0	30	1	30	3	CLASSROOM
IGEN	452	Integrated Eng Prgm	LEC	2				0	30	1	30	2	CLASSROOM
IGEN	452	Integrated Eng Prgm	TUT	2				0	30	1	30	2	CLASSROOM
MINE	200	Mining	LAB	2	50	1	50	2				0	LAB
MINE	200	Mining	LEC	6	50	1	50	6				0	CLASSROOM
MINE	201	Mining	LEC	3				0	50	1	50	3	CLASSROOM
MINE	201	Mining	LAB	2				0	50	1	50	2	LAB
MINE	293	Mining	SEM	1	50	1	50	1				0	CLASSROOM
MINE	302	Mining	LAB	1				0	50	1	50	1	CLASSROOM
MINE	302/506	Mining	LEC	3				0	50	1	50	3	CLASSROOM
MINE	303/590M	Mining	LEC	3				0	75	1	75	3	CLASSROOM
MINE	303/590M	Mining	LAB	2				0	75	2	38	4	LAB
MINE	310/590C	Mining	LAB	2	50	1	50	2				0	CLASSROOM
MINE	310/590C	Mining	LEC	3	50	1	50	3				0	CLASSROOM
MINE	331/590F	Mining	LAB	2.5	50	1	50	2.5				0	CLASSROOM
MINE	331/590F	Mining	LEC	3	50	1	50	3				0	CLASSROOM
MINE	333/521	Mining	LEC	2				0	50	1	50	2	CLASSROOM
MINE	333	Mining	LAB	3				0	50	1	50	3	LAB
MINE	350	Mining	LAB	2	50	1	50	2				0	CLASSROOM
MINE	350	Mining	LEC	2	50	1	50	2				0	CLASSROOM
MINE	380/590Q	Mining	LEC	3				0	75	1	75	3	CLASSROOM

AA.3 WORKLOAD TABLE

Subject	Course	Department	Activity Type	Hours/Week (Per Section)	Term 1 Total Enrolment	Term 1 Number of Sections	Term 1 Average Section Size	Term 1 Total Hours Per Week	Term 2 Total Enrolment	Term 2 Number of Sections	Term 2 Average Section Size	Term 2 Total Hours Per Week	Room Type
MINE	396	Mining	LEC	3	85	1	85	3				0	CLASSROOM
MINE	402/509	Mining	LAB	2	50	2	25	4				0	LAB
MINE	402/509	Mining	LEC	3	50	1	50	3				0	CLASSROOM
MINE	403/590D	Mining	LEC	3				0	85	1	85	3	CLASSROOM
MINE	404	Mining	LEC	3				0	50	1	50	3	CLASSROOM
MINE	406/554	Mining	LEC	3				0	30	1	30	3	CLASSROOM
MINE	420/552	Mining	LEC	3				0	30	1	30	3	CLASSROOM
MINE	432/547	Mining	LAB	1.5	35	1	35	1.5				0	CLASSROOM
MINE	432/547	Mining	LEC	2	35	1	35	2				0	CLASSROOM
MINE	434/524	Mining	LEC	2				0	30	1	30	2	CLASSROOM
MINE	434/524	Mining	LAB	2				0	30	1	30	2	LAB
MINE	455/590X	Mining	LEC	3				0	80	1	80	3	CLASSROOM
MINE	462	Mining	LAB	2	20	1	20	2				0	LAB
MINE	462/520	Mining	LEC	2	20	1	20	2				0	CLASSROOM
MINE	465/590Y	Mining	LEC	3	90	1	90	3				0	CLASSROOM
MINE	470/559	Mining	LEC	3	100	1	100	3				0	CLASSROOM
MINE	485/507	Mining	LEC	3				0	30	1	30	3	CLASSROOM
MINE	486	Mining	LEC	3				0	80	1	80	3	CLASSROOM
MINE	491	Mining	LAB	2	50	1	50	2				0	CLASSROOM
MINE	491	Mining	LEC	2	50	1	50	2				0	CLASSROOM
MINE	491	Mining	LAB	2				0	50	1	30	2	CLASSROOM
MINE	491	Mining	LEC	2				0	50	1	30	2	CLASSROOM
MINE	501A	Mining	LEC	1.5	40	1	40	1.5	40	1	40	1.5	CLASSROOM
MINE	501B	Mining	LEC	0				0				0	n/a
MINE	501B	Mining	LEC	2	20	1	20	2	20	1	20	2	CLASSROOM
MINE	505	Mining	LEC	1	10	1	10	1				0	CLASSROOM
MINE	508	Mining	LEC	3				0	20	1	20	3	CLASSROOM
MINE	515	Mining	LEC	3				0	20	1	20	3	CLASSROOM
MINE	522	Mining	LEC	3	10	1	10	3				0	CLASSROOM
MINE	553	Mining	LEC	0				0	20	1	20	0	n/a
MINE	555	Mining	LEC	3	20	1	20	3				0	CLASSROOM
MINE	581	Mining	LEC	3	20	1	20	3				0	CLASSROOM
MINE	585	Mining	LEC	3				0	20	1	20	3	CLASSROOM
MINE	586	Mining	DEC	0	20	1	20	0				0	n/a
MINE	587	Mining	LEC	1.5				0	20	1	20	1.5	n/a
MINE	590T	Mining	DST	0				0				0	n/a
MINE/EOSC/LAW/PPGA	590W/543/467D/591W	Mining	LEC	3				0				0	CLASSROOM
MINE	590Y	Mining	LEC	3				0				0	CLASSROOM
MINE	597	Mining	DST	0				0				0	n/a
MINE	597	Mining	DST	0				0				0	n/a
MINE	598/698	Mining	SEM	2	100	1	100	2	100	1	100	2	CLASSROOM
MINE	599C	Mining	THS	0				0				0	N/A
MINE	599C	Mining	THS	0				0				0	N/A
MINE	698	Mining	SEM	2	50	1	50	2	50	1	50	2	N/A
MINE	699	Mining	THS	0				0				0	N/A
MINE	699	Mining	THS	0				0				0	N/A
ARCH	500	SALA	STD	12	52	1	52	12				0	STUDIO DESK+BREAKOUT
ARCH	501/520/540	SALA	STD	9	108	9	12	81	48	4	12	36	STUDIO DESK+BREAKOUT
ARCH	502	SALA	L-L	2	60	1	60	2				0	CLASSROOM

Subject	Course	Department	Activity Type	Hours/Week (Per Section)	Term 1 Total Enrolment	Term 1 Number of Sections	Term 1 Average Section Size	Term 1 Total Hours Per Week	Term 2 Total Enrolment	Term 2 Number of Sections	Term 2 Average Section Size	Term 2 Total Hours Per Week	Room Type
ARCH/DES	504F/321F	SALA	LEC	3	60	1	60	3				0	CLASSROOM
ARCH/DES	504F/321F	SALA	TUT	1.5	60	4	15	6				0	CLASSROOM
ARCH/DES	504I/321I	SALA	LEC	1.5				0	60	1	60	1.5	CLASSROOM
ARCH/DES	504I/321I	SALA	TUT	1.5				0	60	4	15	6	CLASSROOM
ARCH/DES	505L/322L	SALA	LEC	1.5				0	45	1	45	1.5	CLASSROOM
ARCH/DES	505L/322L	SALA	TUT	1.5				0	45	3	14	4.5	CLASSROOM
ARCH	511	SALA	LEC	3	50	1	50	3				0	CLASSROOM
ARCH	512	SALA	LEC	3				0	48	1	48	3	CLASSROOM
ARCH	513	SALA	LEC	3	55	1	55	3				0	CLASSROOM
ARCH	515-001	SALA	L-L	3	40	1	40	3				0	CLASSROOM
ARCH	515-002	SALA	L-L	3	24	1	24	3				0	CLASSROOM
ARCH	517-001	SALA	L-L	3				0	48	4	12	12	CLASSROOM
ARCH	517-002	SALA	L-L	3				0	18	1	18	3	CLASSROOM
ARCH	521	SALA	STD	12				0	50	1	50	12	STUDIO DESK+BREAKOUT
ARCH	523	SALA	L-S	3				0	50	1	50	3	CLASSROOM
ARCH	531	SALA	LEC	3				0	50	1	50	3	CLASSROOM
ARCH	532	SALA	LEC	3	50	1	50	3				0	CLASSROOM
ARCH	533	SALA	LEC	3				0	50	1	50	3	CLASSROOM
ARCH/LARC	541/551	SALA	LEC/L-S	3				0	90	1	90	3	CLASSROOM
ARCH	544C	SALA	SEM	3				0	20	1	20	3	CLASSROOM
ARCH	548	SALA	L-D	3	50	1	50	3	10	1	10	3	CLASSROOM
ARCH	549	SALA	PRJ	3	10	1	10	3	50	1	50	3	CLASSROOM
ARCH	555A	SALA	W/P	0	2			0				0	n/a
ARCH	555B	SALA	W/P	0	2			0				0	n/a
ARCH	571A	SALA	SEM	3	24	1	24	3				0	CLASSROOM
ARCH	571B	SALA	SEM	3				0	20	1	20	3	CLASSROOM
ARCH/HPB	574/501	SALA	L-S	3				0	20	1	20	3	CLASSROOM
ARCH/HPB	575/502	SALA	L-S	3	36	1	36	3				0	CLASSROOM
ARCH	597F	SALA	LEC	1.5	50	1	50	1.5				0	CLASSROOM
ARCH	597F	SALA	TUT	1.5	50	4	13	6				0	CLASSROOM
DES	101	SALA	L-L	1	65			0				0	STUDIO DESK+BREAKOUT
DES	110	SALA	LEC	3	50	1	50	3				0	CLASSROOM
DES	130	SALA	LAB	2				0	180	12	15	24	CLASSROOM
DES	130	SALA	LEC	1.5				0	180	1	15	1.5	CLASSROOM
DES	200	SALA	LAB	2	150	10	15	20				0	CLASSROOM
DES	200	SALA	LEC	1.5	150	1	150	1.5				0	CLASSROOM
DES	201	SALA	STD	7	60	1	60	7				0	STUDIO DESK+BREAKOUT
DES	202	SALA	STD	7				0	60	1	60	7	STUDIO DESK+BREAKOUT
DES	211	SALA	LAB	1.5	60	4	15	6				0	CLASSROOM
DES	211	SALA	LEC	1.5	60	1	60	1.5				0	CLASSROOM
DES	212	SALA	LEC	3				0	60	1	60	3	CLASSROOM
DES	220	SALA	LAB	2	90	6	15	12				0	CLASSROOM
DES	220	SALA	LEC	1.5	90	1	90	1.5				0	CLASSROOM
DES	230	SALA	TUT	2				0	210	14	15	28	CLASSROOM
DES	230	SALA	LEC	1.5				0	210	1	210	1.5	CLASSROOM
DES	231	SALA	LEC	3	60	1	60	3				0	CLASSROOM
DES	232	SALA	LEC	1.5				0	60	1	60	1.5	CLASSROOM
DES	232	SALA	DIS	1.5				0	60	4	15	6	CLASSROOM

AA.3 WORKLOAD TABLE

Subject	Course	Department	Activity Type	Hours/Week (Per Section)	Term 1 Total Enrolment	Term 1 Number of Sections	Term 1 Average Section Size	Term 1 Total Hours Per Week	Term 2 Total Enrolment	Term 2 Number of Sections	Term 2 Average Section Size	Term 2 Total Hours Per Week	Room Type
DES	301	SALA	STD	10	60	1	60	10				0	STUDIO DESK+BREAKOUT
DES	302	SALA	STD	10				0	60	1	60	10	STUDIO DESK+BREAKOUT
DES	320	SALA	LEC	1.5	60	1	60	1.5				0	CLASSROOM
DES	320	SALA	DIS	1.5	60	4	15	6				0	CLASSROOM
DES	323	SALA	L-D	3				0	30	1	30	3	CLASSROOM
DES	330	SALA	LEC	3	60	1	60	3				0	CLASSROOM
DES	401	SALA	STD	10	60	1	60	10				0	STUDIO DESK+BREAKOUT
DES	402	SALA	STD	10				0	60	1	60	10	STUDIO DESK+BREAKOUT
DES	403	SALA	STD	10				0	20	1	20	10	STUDIO DESK+BREAKOUT
DES	421	SALA	LEC	1.5	60	1	60	1.5				0	CLASSROOM
DES	421	SALA	DIS	1.5	60	2	30	3				0	CLASSROOM
DES/UDES	422/504	SALA	DIS	1	70	1	70	1				0	CLASSROOM
DES/UDES	422/504	SALA	LEC/L-L	2	70	5	14	10				0	CLASSROOM
DES	430	SALA	L-D	1.5	60	1	60	1.5				0	CLASSROOM
DES	430	SALA	L-D	1.5	60	2	30	3				0	CLASSROOM
DES	445	SALA	L-D	1.5				0	60	1	60	1.5	CLASSROOM
DES	445	SALA	L-D	1.5				0	60	2	30	3	CLASSROOM
DES/LARC	450R/582R	SALA	SEM	3	24	1	24	3				0	CLASSROOM
LARC	316	SALA	LEC	1.5	40	1	40	1.5				0	CLASSROOM
LARC	316	SALA	LAB	0	40	1	40	0				0	n/a
LARC	415	SALA	L-L	1.5	45	1	45	1.5				0	CLASSROOM
LARC	444/553	SALA	LAB	1	50	3	17	3				0	LAB
LARC	444/553	SALA	LEC/L-D	3	50	1	50	3				0	CLASSROOM
LARC	501	SALA	STD	12	30	1	30	12				0	STUDIO DESK+BREAKOUT
LARC	502	SALA	STD	12				0	30	1	30	12	STUDIO DESK+BREAKOUT
LARC	503	SALA	L-L	9				0	40	1	40	9	STUDIO DESK+BREAKOUT
LARC	504/505	SALA	STD	9	50	4	13	36				0	STUDIO DESK+BREAKOUT
LARC	511	SALA	L-L	2	35	1	35	2				0	CLASSROOM
LARC	522	SALA	L-L	3	40	1	40	3				0	CLASSROOM
LARC	523	SALA	L-S	3				0	40	1	40	3	CLASSROOM
LARC	525	SALA	LEC	3				0	40	1	40	3	CLASSROOM
LARC	531	SALA	L-L	3				0	30	1	30	3	CLASSROOM
LARC	532	SALA	LEC	3	40	1	40	3				0	CLASSROOM
LARC	540	SALA	L-L	3	40	1	40	3				0	CLASSROOM
LARC	541	SALA	L-S	3				0	30	1	30	3	CLASSROOM
LARC	580B	SALA	DST	0	5	1	5	0				0	N/A
LARC	582K	SALA	SEM	3				0	20	1	20	3	CLASSROOM
LARC	595	SALA	SEM	4	30	1	30	4				0	CLASSROOM

Subject	Course	Department	Activity Type	Hours/Week (Per Section)	Term 1 Total Enrolment	Term 1 Number of Sections	Term 1 Average Section Size	Term 1 Total Hours Per Week	Term 2 Total Enrolment	Term 2 Number of Sections	Term 2 Average Section Size	Term 2 Total Hours Per Week	Room Type
LARC	598	SALA	PRJ	9				0	30	1	30	9	CRIT SPACE
UDES	502	SALA	STD	9	24	1	24	9				0	STUDIO DESK+BREAKOUT
UDES	503	SALA	STD	9				0	24	1	24	9	STUDIO DESK+BREAKOUT
UDES	505	SALA	SEM	3				0	24	1	24	3	CLASSROOM
UDES	506	SALA	L-D	3				0	24	1	24	3	CLASSROOM
UDES	509C	SALA	SEM	3	24	1	24	3				0	CLASSROOM
SALA MEL								0				0	n/a
SALA PhD					6	1	6	0	6	1	6	0	n/a
SALA Cross-disciplinary Undergrad Program					30	1	30	0	30	1	30	0	n/a
MANU	201	Manufacturing Prgm	LEC	3	75	2	38	6				0	CLASSROOM
MANU	230	Manufacturing Prgm	LAB	2	75	3	25	6				0	LAB
MANU	230	Manufacturing Prgm	LEC	1	75	1	75	1				0	CLASSROOM
MANU	261	Manufacturing Prgm	LEC	3	75	1	75	3				0	CLASSROOM
MANU	261	Manufacturing Prgm	TUT	2	75	3	25	6				0	CLASSROOM
MANU	265	Manufacturing Prgm	LEC	3				0	75	1	75	3	CLASSROOM
MANU	265	Manufacturing Prgm	TUT	1				0	75	3	25	3	CLASSROOM
MANU	270	Manufacturing Prgm	LEC	3				0	75	1	75	3	CLASSROOM
MANU	330	Manufacturing Prgm	LAB	2	75	3	25	6	75	3	25	6	CLASSROOM
MANU	330	Manufacturing Prgm	LEC	1	75	1	75	1	75	1	75	1	CLASSROOM
MANU	370	Manufacturing Prgm	LEC	3	75	1	75	3				0	CLASSROOM
MANU	378	Manufacturing Prgm	LEC	2				0	75	1	75	2	CLASSROOM
MANU	378	Manufacturing Prgm	TUT	3				0	75	2	38	6	CLASSROOM
MANU	380	Manufacturing Prgm	LEC	2	75	1	75	2				0	CLASSROOM
MANU	380	Manufacturing Prgm	TUT	2	75	2	38	4				0	CLASSROOM
MANU/MECH	386/366	Manufacturing Prgm	LAB	3	200	8	25	24				0	CLASSROOM
MANU/MECH	386/366	Manufacturing Prgm	LEC	2	110	1	110	2				0	CLASSROOM
MANU	386	Manufacturing Prgm	TUT	1	75	2	38	2				0	CLASSROOM
MANU	400A	Manufacturing Prgm	LEC	2				0	40	1	40	2	CLASSROOM
MANU	400B	Manufacturing Prgm	LEC	3	40	1	40	3				0	CLASSROOM
MANU	400C	Manufacturing Prgm	LEC	2				0	40	1	40	2	CLASSROOM
MANU	400C	Manufacturing Prgm	TUT	2				0	40	2	20	4	CLASSROOM

AA.3 WORKLOAD TABLE

Subject	Course	Department	Activity Type	Hours/Week (Per Section)	Term 1 Total Enrolment	Term 1 Number of Sections	Term 1 Average Section Size	Term 1 Total Hours Per Week	Term 2 Total Enrolment	Term 2 Number of Sections	Term 2 Average Section Size	Term 2 Total Hours Per Week	Room Type
MANU	430	Manufacturing Prgm	LAB	2	75	3	25	6	75	3	25	6	LAB
MANU	430	Manufacturing Prgm	LEC	1	75	1	75	1	75	1	75	1	CLASSROOM
MANU	465	Manufacturing Prgm	LEC	3	100	1	100	3				0	CLASSROOM
MANU	465	Manufacturing Prgm	TUT	1	100	2	50	2				0	CLASSROOM
MANU	480	Manufacturing Prgm	LEC	2	75	1	75	2				0	CLASSROOM
MANU	480	Manufacturing Prgm	TUT	3	75	3	25	9				0	CLASSROOM
MANU	481	Manufacturing Prgm	LEC	2				0	75	1	75	2	CLASSROOM
MANU	481	Manufacturing Prgm	TUT	3				0	75	3	25	9	CLASSROOM
MANU	485	Manufacturing Prgm	LAB	4				0	75	3	25	12	CLASSROOM
MANU	485	Manufacturing Prgm	LEC	3				0	75	1	75	3	CLASSROOM
APSC	100	APSC	LAB	2	1,053	18	59	36				0	LAB
APSC	100	APSC	LEC	2	1,053	4	264	8				0	CLASSROOM
APSC	101	APSC	LAB	2				0	924	20	46	40	LAB
APSC	101	APSC	LEC	2				0	926	4	231	8	CLASSROOM
APSC	107	APSC	WRK	0	25	1	25	0	25	1	25	0	N/A
APSC	110	APSC	W/P	0	81	10	9	0	5	1	5	0	N/A
APSC	160	APSC	LAB	2	762	26	8	52	389	21	19	42	LAB
APSC	160	APSC	LEC	3	701	2	351	6	389	2	195	6	CLASSROOM
APSC	160	APSC	LEC (Vantage)	3	61	1	61	3				0	VANTAGE
APSC	172	APSC	LEC	3	61	1	61	3				0	VANTAGE
APSC	172	APSC	TUT	1	61	2	31	2				0	VANTAGE
APSC	173	APSC	LEC	3				0	61	1	61	3	VANTAGE
APSC	173	APSC	TUT	1				0	61	2	30	2	VANTAGE
APSC	178	APSC	LEC	4				0	61	1	61	4	VANTAGE
APSC	178	APSC	TUT	2				0	61	2	30	4	VANTAGE
APSC	182	APSC	LAB	2	61	3	21	6				0	VANTAGE
APSC	182	APSC	LEC	2	61	1	61	2				0	VANTAGE
APSC	182	APSC	TUT	2	61	2	31	4				0	VANTAGE
APSC	183	APSC	LAB	2				0	61	3	20	6	VANTAGE
APSC	183	APSC	LEC	2				0	61	1	61	2	VANTAGE
APSC	183	APSC	TUT	1				0	61	2	30	2	VANTAGE
APSC	201	APSC	LEC	3	31	2	16	6	21	1	21	3	CLASSROOM
APSC	210	APSC	W/P	0	421	12	36	0	39	10	4	0	N/A
APSC	262	APSC	LEC	3	156	5	32	15	150	4	37	12	CLASSROOM
APSC	310	APSC	W/P	0	141	10	15	0	90	11	8	0	N/A
APSC	366	APSC	LEC	3			0	0	64	1	64	3	CLASSROOM
APSC/POLI	377	APSC	LEC	3	96	1	97	3			0	0	CLASSROOM
APSC	383	APSC	LEC	3	36	1	37	3			0	0	LAB
APSC	410	APSC	W/P	0	59	8	8	0	29	7	4	0	N/A
APSC	411	APSC	W/P	0	22	9	3	0	6	3	2	0	N/A
APSC	412	APSC	W/P	0	9	5	2	0	9	7	1	0	N/A
APSC	440	APSC	LEC	3			0	0	43	1	43	3	CLASSROOM
APSC	450	APSC	LEC	1	289	1	289	1	293	1	293	1	N/A
APSC/APSC/COMM	486/496E/466	APSC	L-L	3	97	2	49	6	97	2	49	6	CLASSROOM

Subject	Course	Department	Activity Type	Hours/Week (Per Section)	Term 1 Total Enrolment	Term 1 Number of Sections	Term 1 Average Section Size	Term 1 Total Hours Per Week	Term 2 Total Enrolment	Term 2 Number of Sections	Term 2 Average Section Size	Term 2 Total Hours Per Week	Room Type
APSC	496A	APSC	L-L	1	11	1	11	1	11	1	11	1	CLASSROOM
APSC	520	APSC	W/P	0	10	1	10	0			0	0	N/A
APSC	521	APSC	W/P	0	39	1	39	0	6	1	6	0	N/A
APSC	522	APSC	W/P	0	13	1	13	0	3	1	3	0	N/A
APSC	540	APSC	LEC	3	39	1	39	3			0	0	CLASSROOM
PLAN	211	SCARP	LEC	2	200	2	100	4				0	CLASSROOM
PLAN	211	SCARP	TUT	1	200	7	30	7				0	CLASSROOM
PLAN	221	SCARP	LEC	3				0	160	2	80	6	CLASSROOM
PLAN	231	SCARP	TBC	3	160	2	80	6				0	CLASSROOM
PLAN	321	SCARP	LEC	3				0	50	1	50	3	CLASSROOM
PLAN	331	SCARP	LEC	3	80	1	80	3				0	CLASSROOM
PLAN	341	SCARP	LEC	3				0	120	1	120	3	CLASSROOM
PLAN	351	SCARP	LEC	3				0	75	1	75	3	CLASSROOM
PLAN	361	SCARP	TBC	3	60	1	60	3				0	CLASSROOM
PLAN	425	SCARP	LEC	3	80	1	80	3				0	CLASSROOM
PLAN	425	SCARP	WEB	3				0				0	N/A
PLAN	451	SCARP	TBC	3				0	50	1	50	3	CLASSROOM
PLAN	500	SCARP	LEC	3	50	1	50	3				0	CLASSROOM
PLAN	501	SCARP	LEC	3	50	1	50	3				0	CLASSROOM
PLAN	502	SCARP	LEC	3	50	1	50	3				0	CLASSROOM
PLAN	504	SCARP	LEC	3	50	1	50	3				0	CLASSROOM
PLAN	505	SCARP	LEC	3				0	50	1	50	3	CLASSROOM
PLAN	506	SCARP	LEC	3				0	50	1	50	3	CLASSROOM
PLAN	507	SCARP	LEC	3				0	50	1	50	3	CLASSROOM
PLAN	510	SCARP	LEC	0				0				0	N/A
PLAN	511	SCARP	LEC	3				0	50	1	50	3	CLASSROOM
PLAN	512	SCARP	LEC	3	50	1	15	3			0	0	CLASSROOM
PLAN	513	SCARP	LEC	3			0	0	50	1	50	3	CLASSROOM
PLAN	514	SCARP	SEM	3	15	1	15	3				0	CLASSROOM
PLAN	515	SCARP	LEC	3				0	15	1	15	3	CLASSROOM
PLAN	516	SCARP	LEC	3	15	1	15	3				0	CLASSROOM
PLAN	523	SCARP	LEC	0				0				0	N/A
PLAN	526	SCARP	LEC	0				0				0	N/A
PLAN	526	SCARP	STD	0				0				0	N/A
PLAN	527A	SCARP	W/P	0				0				0	N/A
PLAN	528A	SCARP	PRJ	0				0				0	N/A
PLAN	528B	SCARP	PRJ	0				0				0	N/A
PLAN	530	SCARP	LEC	3				0	40	1	40	3	CLASSROOM
PLAN	532	SCARP	LEC	3				0	40	1	40	3	CLASSROOM
PLAN	540	SCARP	PRJ	3	35	1	35	3	35	1	35	3	CLASSROOM
PLAN	541	SCARP	STD	3	35	1	35	3	35	1	35	3	CLASSROOM
PLAN	542	SCARP	LEC	3			0	0	30	1	30	3	CLASSROOM
PLAN	543	SCARP	PRJ	3	15	1	15	3	15	1	15	3	CLASSROOM
PLAN	548G	SCARP	LEC	3			0	0	50	1	50	3	LAB
PLAN	548O	SCARP	LEC	3	50	1	50	3			0	0	CLASSROOM
PLAN	548R	SCARP	SEM	3	25	1	25	3			0	0	CLASSROOM
PLAN	548S	SCARP	LEC	3			0	0	40	1	40	3	CLASSROOM
PLAN	549C	SCARP	THS	0			0	0			0	0	N/A
PLAN	549C	SCARP	THS	0			0	0			0	0	N/A
PLAN	559	SCARP	SEM	3			0	0	15	1	15	3	CLASSROOM
PLAN	579	SCARP	LEC	3			0	0	40	1	40	3	CLASSROOM
PLAN	580	SCARP	LEC	3			0	0	40	1	40	3	CLASSROOM
PLAN	587A	SCARP	STD	3			0	0	20	1	20	3	CLASSROOM
PLAN	597B	SCARP	STD	3			0	0			0	0	CLASSROOM

AA.3 WORKLOAD TABLE

Subject	Course	Department	Activity Type	Hours/Week (Per Section)	Term 1 Total Enrolment	Term 1 Number of Sections	Term 1 Average Section Size	Term 1 Total Hours Per Week	Term 2 Total Enrolment	Term 2 Number of Sections	Term 2 Average Section Size	Term 2 Total Hours Per Week	Room Type
PLAN	602	SCARP	SEM	3			0	0	15	1	15	3	CLASSROOM
PLAN	603	SCARP	SEM	3	15	1	15	3	15	1	15	3	CLASSROOM
PLAN	649	SCARP	THS	0				0				0	N/A
PLAN	649	SCARP	THS	0				0				0	N/A
PLAN/CIVL	548L/598 P	SCARP	LEC	3				0				0	CLASSROOM

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AA.4 GLOSSARY OF KEY TERMS

Terms Used in the Document

See below a glossary of terms that have been used throughout the document:

Term	Definition
Academic Workplace	One of the Applied One Program Groups that includes faculty and administration offices.
ACT	Acoustic Ceiling Tile. Depending on application, tile systems may be replaced with panel systems that leave ceiling spaces exposed.
ADO	Automatic Door Operator
Ar	Argon
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
AV	Audiovisual
BOH	Back of house
C. Air	Compressed air for lab use
Compressed air, shop	Compressed air for workshop use
CFI grants	Abbreviation for "Canada Foundation for Innovation," this is grant funding applied for by researchers to support UBC research within the Faculty of Applied Science. https://research.ubc.ca/ubc-projects-receive-cfi-funding-research-infrastructure
CFM	Cubic Feet Per Minute
Characterization	Characterization, when used in materials science, refers to the broad and general process by which a material's structure and properties are probed and measured. It is a fundamental process in the field of materials science, without which no scientific understanding of engineering materials could be ascertained. Characterization is critical to the Materials Engineering department, and spaces are included in Applied One to support the study of composite materials, microstructure, metallurgy, electron diffraction & microscopy, deformation, and microstructure/property models.
CR	Card Reader
Cyl. Gas	Cylinder Gas
DI	Deionized
Digital Lab	A space focused on computational work, often with high electrical and network demand with computers and/or monitors for visualizing data. This space might be full of computers, whiteboards, and people wearing street clothes.
Dry Bench Lab	A space focused on computation, engineering, physics, mechanical and electrical engineering exploration, materials and manufacturing analysis and experimentation. Space should offer flexibility with open floor space and overhead utilities, support higher electrical and mechanical demand from computers, lasers, testing equipment, and can be sound and vibration sensitive as well as dust and electrostatic discharge sensitive.
EDI.I	Abbreviation used by UBC to denote equity, diversity, inclusion, and Indigeneity. "We are committed to creating a community where human rights are respected and equity is embedded in all areas of academic, work and campus life. The principles of equity, diversity, inclusion and Indigeneity are fundamental in achieving our mission to shape the leaders and professions that shape the world." from https://apsc.ubc.ca/EDI.I
Electron Microscopy	Electron microscopy (EM) is a technique for obtaining high resolution images of biological and non-biological specimens.
EOT	End-of-Trip
ESD Flooring	Electrostatic Dissipative Flooring

Term	Definition
Flexible Cluster	One of the Applied One groupings that can be occupied by different research groups that need studio-based, workshop-based, incubator or lab and computational space as they work as an interdisciplinary whole to resolve world challenges and advance research. With interdepartmental research becoming increasingly common, this grouping is designed to support UBC Research Clusters and other groups who come together to solve grand challenges.
FTE	Full-time equivalent (an employee's scheduled hours divided by the employer's hours for a full-time workweek)
Gantry	A bridge-like overhead structure with a platform supporting equipment such as a crane
Headcount	Total number of people
ILS	Informal Learning Space
Lab gas	Laboratory Gas is a broad term used to describe a spectrum of gases that may be used in the lab environment. This may be gases needed for process control/carrier gas or is a pure gas needed to assist with instrument functioning. For others, it's used to calibrate instruments or as instrument support.
LH/CW	Lab Hot/Cold Water
LN2	Liquid Nitrogen
MANU	Shorthand reference for the Department of Manufacturing Engineering. https://manufacturing.engineering.ubc.ca/program/courses/
Materials	Shorthand reference for the Program of Materials Engineering, an academic unit within Applied Science at UBC who will be one of the primary stewards of spaces in Applied One. https://mtrl.ubc.ca/
MINE	Shorthand reference for the "The Norman B. Keevil Institute of Mining Engineering" an academic unit within Applied Science at UBC who will be one of the primary stewards of spaces in Applied One. https://mining.ubc.ca/
Mining	Shorthand reference for the "The Norman B. Keevil Institute of Mining Engineering" an academic unit within Applied Science at UBC who will be one of the primary stewards of spaces in Applied One. https://mining.ubc.ca/
MTRL	Shorthand reference for the Department of Materials Engineering, an academic unit within Applied Science at UBC who will be one of the primary stewards of spaces in Applied One. https://mtrl.ubc.ca/
N2	Nitrogen
Neighbourhood	A term used to Represent immediate key adjacencies between spaces that support and reinforce a set of activities and uses. Neighbourhoods paired with Program Groups make up a tiered system of program organization designed to identify overlaps in programmatic functions.
NIC	Not Included
NSERC grants	Abbreviation for "Natural Sciences and Engineering Research Council of Canada," this is an entity that provides grant funding with the goal to promote and assist research in the natural sciences and engineering, other than health.
NSM	Net-Square-Metres

AA.3 GLOSSARY OF KEY TERMS

Term	Definition
PI	Abbreviation for "Principal Investigator." As the individual responsible for the implementation of the research, the principal investigator bears direct responsibility for ensuring the protection of every research participant. Researcher who has primary responsibility for the design, conduct and supervision of a Research project. The Principal Investigator is normally the person identified as such to the funding agency and will normally be delegated Research Spending Responsibility over any Research Funds spent for a Research project. All Principal Investigators are required to meet the responsibilities assigned to them in UBC Policy #LR9, Procedures.
Program Group	A term used to represent a set of Neighbourhoods that could work together in the design to support and reinforce a set of uses, activities or communities. Program Groups paired with Neighbourhoods make up a tiered system of program organization designed to identify overlaps in programmatic functions.
Project-Based Learning	One of the Applied One groupings that includes the design studios and interdisciplinary design and project-based capstone studios that support hands-on learning and space to experiment, design, research, and explore. The mission of the project based learning spaces is to support peer-to-peer learning, tinkering, testing and demonstration with the goal to learn and gather as a community.
Req.	Required
Research	"Research" means any disciplined inquiry or systematic investigation intended to extend knowledge or to establish facts or principles that is conducted by UBC Persons acting in their UBC capacity but does not include quality assurance and quality improvement studies, program evaluation activities and performance reviews, or testing within normal educational requirements when undertaken for UBC's internal assessment, management or improvement purposes ("Internal Assessment").
Research Excellence Clusters	Research clusters are interdisciplinary networks of researchers addressing key societal and cultural problems, and working together to solve challenges that transcend traditional boundaries associated with departments, institutions, and funding agencies. UBC is committed to supporting the development of clusters of research excellence. Research cluster awards are specifically targeted at catalyzing advanced research initiatives with the expectation that awards will be used to enable the cluster to have more significant impact than otherwise possible.
SALA	Shorthand reference for the School of Architecture and Landscape Architecture, an academic unit within Applied Science at UBC who will be one of the primary stewards of spaces in Applied One. https://sala.ubc.ca/
SCARP	Shorthand reference for the School of Community and Regional Planning, an academic unit within Applied Science at UBC who will be one of the primary stewards of spaces in Applied One. https://scarp.ubc.ca/
SMR	Surface Mounted Raceway for power
Sort It Out	UBC Zero Waste Action Plan waste sorting station
Steward	Instead of traditional terms like "primary user" or "owner," this term denotes a group who will care for, manage, and supervise the space responsibly as a shared asset. The group named will be responsible for over-seeing and safeguarding the resources, with a focus on sustainability, ethics, and the long-term health of the space, building, and campus. It also indicates, contrary to "ownership" that this stewardship may shift and adjust over time, allowing for future adaptability and flexibility in who occupies spaces and for what duration.
Stores	A location that provides services and supplies for research and teaching, including ordering, receiving, and shipping of items. A central resource for the raw material required to run experiments, test materials, and work in shops. https://mtrl.ubc.ca/safety/mtrl-stores/

Term	Definition
Typ. Walls	Typical Walls is an abbreviated term used to describe typical wall finishes which generally refers to painted gypsum wall board. Depending on the architectural solution this may also be painted or un-painted concrete walls.
UPS	Uninterruptible Power Supply
Vacuum	Lab Vacuum
Wet Bench Lab	A space for manipulating liquids, biological matter, and chemicals that is designed to avoid issues with spillage and contamination with stations connected to overhead utilities, increased plumbing, both demand and waste, increased mechanical needs with outside air, ventilation, humidity levels, exposure control devices like fume hoods/BSC's, and can be vibration sensitive.

AA.5 AUDIO / VIDEO DESCRIPTIONS

AV type code	AV Description	Description of System
1a	Seminar/ Classroom/ Multipurpose/ Training Room (under 30)	Space that allows user's laptop or built-in PC to conduct local, conference or hybrid sessions with the ability to share content. Document camera is available to share notes.
1b	Seminar/ Classroom/ Multipurpose/ Training Room (30-60)	
1c	Seminar/ Classroom/ Multipurpose/ Training Room (over 60)	
2	Learn Lab - INDICATE # PODS	Collaborative teaching space where students sit in groups of 6 - 8 people around a table and instructor has lectern with typical AV equipment and interactive display allowing annotations and similar use-cases. The instructor's interactive display or anyone student group display can be shared with all displays in the room
3	Lecture Theatre	Space allows for connection of use devices such as laptops and tablets, in addition to a built-in PC and document camera at the height-adjustable lectern. Wireless microphones provide audio reinforcement via wall and ceiling speakers.
4	Teaching Lab (Computer, Dry, Wet, Studio, Workshop, Maker Space, Project Room)	Space that allows user's supplied device to display digital content or conduct hybrid session with the ability to share and record content and demonstrations. Space may require multiple display devices to accommodate features of space.
5	Deluxe Conference	Space with built-in hardware to conduct local, conference or hybrid sessions with the ability to share content. A camera and microphone are trained on the presenter and a 2nd set are trained on the audience at the same time. Displays and speakers show far-end participants for both the presenter and audience. (100K+)
6a	Meeting Room (under 9)	Space with built-in hardware to conduct local, conference or hybrid sessions with the ability to share content.
6b	Meeting Room (9-18)	
6c	Meeting Room (over 18)	
7	Lobby, Reception Desk, Help Desk, Store Front, Food Services	Space with video display to show signage content.
8	Lounge, Collegium, Fitness Centre	Space where a user can share video content from their laptop or mobile device, or watch cable television.
9	Event Space, Ballroom, Foyer, Gallery	Space with one or more projectors to show local content and wireless microphones to reinforce users' voices. Session can be recorded or broadcasted by using camera and wireless microphones. Supplemental connections available to setup additional event audio visual equipment.
10	Infrastructure Only	Rough-in for future AV.

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AA.6 TEAM

WORKING GROUP

Heather Campbell, Director, School of Community & Regional Planning

Danilo Caron, PhD Candidate, APSC Civil Engineering

Kelly Clifton, Professor, School of Community & Regional Planning

Davide Elmo, Associate Dean, Faculty of Applied Science

Ronald Kellett, Director, School of Architecture & Landscape Architecture

Jennifer Lippa, Senior Facilities Planner, UBC Facilities Planning

Valerie Martin, Director, APSC Development & Alumni Engagement

Walter Merida, Associate Dean, Faculty of Applied Science

James Olson, Dean, Faculty of Applied Science

Emily Rennalls, Senior Manager, APSC Strategic Initiatives & Planning

Ron Loewen, Director, APSC Capital Projects

Sheryl Staub-French, Associate Dean, Faculty of Applied Science

Jody Swift, Director, APSC Strategic Initiatives

Karen Tsang, Manager, APSC Development & Alumni Engagement

Debbie Woo, Senior Director, APSC Development & Alumni Engagement

Noelle Yeung, Development Officer, APSC Development & Alumni Engagement

ENGAGEMENT PROCESS PARTICIPANTS

Edouard Asselin, Professor, Materials Engineering

Ben Britton, Associate Professor, Materials Engineering

Heather Campbell, Professor & School Director (on leave), School of Community & Regional Planning

Marlene Chow, Director of Academic Programs, Administration and Resources, Chemical & Biological Engineering

Adam Clare, Professor, Mechanical Engineering

Kelly Clifton, Professor & School Director (pro tem), School of Community & Regional Planning

Joseph Dahmen, Associate Professor, School of Architecture & Landscape Architecture

Scott Dunbar, Professor & Department Head, Mining Engineering

Graham Entwistle, Workshop and Fabrication Supervisor, School of Architecture & Landscape Architecture

Steve Feng, Professor and Department Head, Mechanical Engineering

Markus Fengler, Machine Shop Lecturer, Mechanical Engineering

Dylan Gunn, Lab Director, Engineering Physics Program

Charles Haynes, Professor & Department Head, Chemical & Biological Engineering

Jessie Hemphill, Assistant Professor, School of Community & Regional Planning

Ioan Isbasescu, Head of Software Systems, Engineering Physics Program

Scott Russell Jackson, Director, Safety & Research Facilities, Civil Engineering

Ron Kellett, Professor & School Director, School of Architecture & Landscape Architecture

Casey Keulen, Assistant Professor, Materials Engineering

Bern Klein, Professor, Mining Engineering

Bernard Laval, Department Head, Civil Engineering

ENGAGEMENT PROCESS PARTICIPANTS Cont'

Kees Lokman, Associate Professor, School of Architecture & Landscape Architecture

Maggie Low, Assistant Professor, School of Community & Regional Planning

Ali Madiseh, Assistant Professor, Mining Engineering

Daan Maijer, Professor & Department Head, Materials Engineering

Delores Martin, Administration, School of Community & Regional Planning

Andre Marziali, Professor & Director, Engineering Physics Program

Annalisa Meyboom, Associate Professor, School of Architecture & Landscape Architecture

Ilija Miskovic, Assistant Professor, Mining Engineering

Jon Nakane, Assistant Professor, Materials Engineering

Yahya Nazhat, Lecturer, Civil Engineering

Marek Pawlik, Professor, Department Head, Mining Engineering

Jen Pelletier, Manager, Facilities & Special Projects, Mechanical Engineering

Warren Poole, Professor & Program Director, Materials Engineering

Bill Rawlings, Capstone Coordinator, Mechanical Engineering

Roberto Rosales, Sessional Instructor, Electrical & Computer Engineering

Adam Rysanek, Assistant Professor, School of Architecture & Landscape Architecture

Blair Satterfield, Associate Professor, School of Architecture & Landscape Architecture

Matthew Soules, Associate Professor, School of Architecture & Landscape Architecture

Mike Van der Loos, Associate Professor, Mechanical Engineering

Tonia Welch, Assistant Professor, Mining Engineering

Noboru Yonemitsu, Associate Professor, Civil Engineering

CONSULTANTS

Miller Hull Partnership

Crystal Day, AIA - Lab Specialist

Jim Hanford, AIA, Principal - Sustainability Specialist

Elizabeth Moggio, AIA, Principal - Project Manager + Academic Programmer

Rio Namiki, AIA - Production & Support

Local Practice Architecture + Design Ltd.

Ross Beardsley Wood, Intern Architect AIBC - Production & Support Lead

Annie Dahan, Intern Architect AIBC - Production & Support

Graham Girard, Architect AIBC - Production & Support

Michel Labrie, Architect AIBC, Principal - Project Executive

Anna Marco, Architectural Designer - Production & Project Management