The following Motions and Documents were considered by the GFC Facilities Development Committee at its Thursday, February 16, 2017 meeting:

Agenda Title: **Students' Union (SU): Myer Horwitz Theater Schematic Design**

CARRIED MOTION: THAT the GFC Facilities Development Committee, under delegated authority from GFC, approve the proposed schematic design of the Myer Horowitz Theatre, as proposed by the Students' Union (SU), and contained in attachment 1, to be effective immediately.

Final Item: 5

FINAL Item No. 5

OUTLINE OF ISSUE
Action Item

Agenda Title: **Students' Union (SU) Building - Myer Horowitz Theatre: Renovation and Expansion - Schematic Design Report**

Motion: THAT the GFC Facilities Development Committee approve, under delegated authority from General Faculties Council, and on the recommendation of Planning and Project Delivery, the proposed Students' Union Building - Myer Horowitz Theatre: Renovation and Expansion – Schematic Design Report (as set forth in Attachment 2) as the basis for further planning.

Item

Action Requested	☒Approval ☐Recommendation
Proposed by	Ben Louie, University Architect, Facilities and Operations Robyn Paches, Vice-President (Operations and Finance), Students' Union
Presenter	Ben Louie, University Architect, Facilities and Operations Robyn Paches, Vice-President (Operations and Finance), Students' Union Stephen Boyd, Principal, Dialog

Details

Responsibility	Vice-President (Facilities and Operations)
The Purpose of the Proposal is (please be specific)	To approve the schematic design report which revitalizes and expands the theatre's performance in delivering its vision to educate, entertain and bring the campus community together.
The Impact of the Proposal is	To renovate and expand the back and front of house functionality of the performance hall, technical and support systems as well as expanding the size and flexibility of the pre-performance spaces to support a wide range of activities and programming; resulting in an active and vibrant facility, increased relevance and viability of the Students' Union Building.
Replaces/Revises (eg, policies, resolutions)	N/A
Timeline/Implementation Date	Design development report will proceed immediately following.
Estimated Cost and funding source	N/A
Next Steps (ie.: Communications Plan, Implementation plans)	The schematic design and development design reports will contribute to the fund raising activities through the work of the Friends of the Myer Horowitz Theatre.
Supplementary Notes and context	N/A

Engagement and Routing (Include meeting dates)

Participation: (parties who have seen the proposal and in what capacity)	<u>*Those who have been **informed**:*</u> N/A
	<u>*Those who have been **consulted**:*</u> • Friends of the Myer Horowitz Theatre – November 14, 2016, December 20, 2016 and January 17, 2017 • Presentations to Student Council – June 28, 2016 and January 24, 2017 • Dean of Students Office

	• SUB Advisory Group
	Those who are actively ***participating****:* • Students' Union Project Steering Committee – July 27, 2016 to January 25, 2017
Approval Route (Governance) (including meeting dates)	GFC Facilities Development Committee (February 16, 2017) – for approval
Final Approver	GFC Facilities Development Committee

Alignment/Compliance

Alignment with Guiding Documents	**Comprehensive Institutional Plan** **Institutional Strategic Plan – *For the Public Good*** BUILD…as a community, we recognize that our future is built on shared values. 5. OBJECTIVE: Build and strengthen trust, connection, and a sense of belonging among all members of the university community through a focus on shared values. i. Strategy: Support and enhance activities, initiatives, and traditions that bond alumni, students, staff, faculty, and professors emeriti to the university. vi. Strategy: Encourage and support institution-wide initiatives, services, and programs, such as arts and cultural activities, intramurals, student groups, volunteering, clubs, and centres, which bring students from all faculties into community with each other. BUILD…and our story is built on the accomplishments and contributions of our people. 6. OBJECTIVE: Build and support an integrated, cross-institutional strategy to demonstrate and enhance the University of Alberta's local, national, and international story, so that it is shared, understood, and valued by the full University of Alberta community and our many stakeholders. iii. Strategy: Communicate, using both quantitative and qualitative evidence, how the University of Alberta serves as a cornerstone of the community bringing widespread economic and societal benefits to all Albertans, as well as to national and international partners and stakeholders. EXPERIENCE…and beyond. 8. OBJECTIVE: Create and facilitate co-curricular and extracurricular learning experiences for undergraduate and graduate students that enable their self-discovery and give them the skills to use their talents, creativity, and curiosity to contribute as future citizens and leaders. i. Strategy: Increase the opportunities for all undergraduate and graduate students to experience the benefits of living on campus,

	including guaranteeing the offer of a place in residence to every first-year undergraduate student. iii. Strategy: Support the roles of the Graduate Students' Association and Students' Union, along with other student groups, in the promotion of extracurricular programs that create a sense of community and support the learning environment. ENGAGE…our ability to contribute to society will flow in large measure from our ability to connect with our communities… 16. OBJECTIVE: Enhance, increase, and sustain reciprocal, mutually beneficial community relations, community engagement, and community-engaged research and scholarship that will extend the reach, effectiveness, benefit, and value of our university-community connections. i. Strategy: Identify and embrace opportunities to build, strengthen, and extend the University of Alberta's connections to and engagement with external stakeholders, including the general public, neighbouring communities, ethnic and cultural communities, and other communities of practice. iv. Strategy: Continue to build mutually beneficial, authentic relationships with alumni and donors. v. Strategy: Welcome increased community access, participation, and engagement at all University of Alberta sites, such as our downtown campus at Enterprise Square and our sport facilities at South Campus. SUSTAIN…and our commitment to sustainability. 20. OBJECTIVE: Continue to build and support an integrated approach to social, economic, and environmental sustainability that incorporates teaching and learning, research, outreach, capacity building, and the operations that support them. ii. Strategy: Embed social, economic, and environmental sustainability into the development and care of the university's natural and built environments. SUSTAIN…our commitment extends to administration and governance… 21. OBJECTIVE: Encourage continuous improvement in administrative, governance, planning, and stewardship systems, procedures, and policies that enable students, faculty, staff, and the institution as a whole to achieve shared strategic goals. i. Strategy: Encourage transparency and improve communication across the university through clear consultation and decision-making processes, substantive and timely communication of information, and

	access to shared, reliable institutional data. iv. Strategy: Facilitate easy access to and use of university services and systems; reducing duplication and complexity; and encourage cross-institutional administrative and operational collaboration. SUSTAIN…and infrastructure. 23. OBJECTIVE: Ensure that the University of Alberta's campuses, facilities, utility, and information technology infrastructure can continue to meet the needs and strategic goals of the university.
Compliance with Legislation, Policy and/or Procedure Relevant to the Proposal (please quote legislation and include identifying section numbers)	***Post-Secondary Learning Act* (*PSLA*):** The *PSLA* gives GFC responsibility, subject to the authority of the Board of Governors, over academic affairs (Section 26(1)) and provides that GFC may make recommendations to the Board of Governors on a building program and related matters (Section 26(1) (o)). Section 18(1) of the PSLA give the Board of Governors the authority to make any bylaws "appropriate for the management, government and control of the university buildings and land." Section 19 of the *Act* requires that the Board "consider the recommendations of the general faculties council, if any, on matters of academic import prior to providing for (a) the support and maintenance of the university, (b) the betterment of existing buildings, (c) the construction of any new buildings the board considers necessary for the purposes of the university [and] (d) the furnishing and equipping of the existing and newly erected buildings [.] […]" Section 67(1) of the *Act* governs the terms under which university land may be leased. **GFC Facilities Development Committee Terms of Reference** **3. MANDATE OF THE COMMITTEE** 2. Delegation of Authority Notwithstanding anything to the contrary in the terms of reference above, the Board of Governors and General Faculties Council have delegated to the Facilities Development Committee the following powers and authority: A. Facilities 1. To approve proposed General Space Programmes for academic units. 2 (i) To approve proposals concerning the design and use of all new facilities and the repurposing of existing facilities and to routinely report these decisions for information to the Board of Governors. (ii) In considering such proposals, GFC FDC may provide advice, upon request, to the Provost and Vice-President (Academic), Vice-President

	(Facilities and Operations), and/or the University Architect (or their respective delegates) on the siting of such faculties. B. Other Matters The Chair of FDC will bring forward to FDC items where the Office of the Provost and Vice-President (Academic) and/or the Office of the Vice-President (Facilities and Operations), in consultation with other units or officers of the University, is seeking the advice of the Committee. **UAPPOL** Space Management Policy and Space Management Procedure The respective roles of GFC FDC and the Vice-President (Facilities and Operations) with regard to institutional space management are set out in the Board-approved Policy and attendant Procedure.

Attachments

1. Briefing Note (3 pages)
2. SUB Myer Horowitz Theatre Renovation and Expansion SD Report, January 30, 2017 (84 pages)
3. Appendix XX, North Campus Amendment, March 2014, Exhibits 6.1.1 and 6.1.2 (2 pages)

Prepared by: Ben Louie, University Architect, ben.louie@ualberta.ca

UNIVERSITY OF ALBERTA

BRIEFING NOTES

Office of the University Architect
Planning and Project Delivery
Facilities and Operations

Students' Union Building – Myer Horowitz Theatre: Renovation and Expansion - Schematic Design Report

Background

The Myer Horowitz Theatre was a key element of the original concept for the Students' Union Building (SUB), which envisioned SUB as a place that fostered the development of students as active, engaged members of the community. SUB is a place where the principles of civic engagement and the opportunity to cross paths with peers from other disciplines allow students to learn, grow, and become well-rounded citizens and leaders. In doing so, it helps fulfill the University's mission of service for the public good.

The theatre is central to this mission, and was intended to educate, entertain, and bring the campus community together. It is an essential resource for ensuring that the University of Alberta can offer students all of the essential elements of a liberal education. The theatre is a place where students have experiences with the arts, intellectual debate, and community events they otherwise could not. It is a unique facility on campus, serving as a venue for community events for both the campus and the city as whole, helping bridge the divide between town and gown.

Issues

The goal of this project is to restore and expand the theatre's ability to meet this vision, by bringing the design and technical elements of the theatre up-to-date and judiciously expanding the flexibility and size of the pre-performance spaces to allow for a wider range of activities and programming. Specific program objectives include:

1. Ensure the technical and support systems in the theatre are up-to-date and allow for cost-effective, efficient, and competitive operation. This includes updating the audiovisual and multimedia capabilities of the theatre, so that modern presenter needs can be better addressed.

2. Improve the patron experience, so that the theatre is the 'go-to' venue for large events on campus. Improving the patron experience includes better pre-show spaces (lobby improvements) and an improved show experience (improved audiovisual capabilities and seating).

3. Expand the ability of the theatre to host a wider variety of events at a higher velocity. That is, by expanding the lobby and adding a terrace, we will enable additional kinds of events to be hosted in the theatre, and by updating systems and re-planning the space, we will increase the number of events that the theatre can host in a year.

These goals are tightly aligned with Students' Union's current Strategic Plan and highlighted critical success factors of:

- Supporting Students;
- Increase relevance to, and connection with, members;

- Collaboration; and
- Build Organizational Capacity.

This proposed improvement also aligns with seven of the Institutional Strategic Plan: For the Public Good as noted in the Outline of Issues.

This proposed development is consistent with the Long Range Development Plan of the University with a site designation of mix use development as an Activity Centre in support of Campus Life (Appendix XX, North Campus Amendment, March 2014, Exhibits 6.1.1 and 6.1.2). In addition, the North Campus Open Space plan indicates that the courtyard immediately to the north of the theatre shall be considered a pedestrian connection between the Alumni Walk to the east and a proposed Open Air Market to the west.

The project program calls for the design to make better use of existing space and improve existing building conditions for SUB functions as well as theatre functions. This investment addresses deferred maintenance and functional renewal of existing physical assets. It is also a progressive methodology in supporting sustainability by reducing demolition and waste reduction.

The design challenge is to accommodate the demands of the existing student entrances and building functions, yet allow for the upgraded demands of the community theatre access and programming. The two programs should enhance each other with no compromises to either.

The project program that has been identified for the proposed Myer Horowitz Theatre renovation expansion includes:

- The upgrade and renovation of the main theatre chamber with new sound, lighting, seating and overall finishes;
- The expansion of the lobby to accommodate pre and post performances, rentable function area, gathering area;
- Upper theatre lobby area interconnected to main theatre lobby;
- New and expanded public washrooms for main and upper lobby;
- Back of house upgrades, renovated green room and dressing rooms;
- Expanded upper level lobby interconnected to main lobby with improved balcony exiting;
- Expanded upper level footprint with theatre offices, storage and staff areas;
- New main floor dedicated theatre entrance;
- Improved SUB student entrance on east side from main University Quad;
- Equipment upgrades will increase theatre flexibility and allow for faster turnaround between events;
- Lobby and performance hall improvements will enhance the patron experience and make all events more ‘theatrical’ and dramatic;
- The addition of a third public elevator joining the first three levels of SUB will also serve to ameliorate some of the demands placed on the existing tower elevators by displacing some the demand;
- Upgraded catering kitchen; and
- Addition that is respectful to the integrity of the architecture.

The proposed design solution presented in the schematic design report is a creative and faithful response to the program requirement outlined.

Recommendation

THAT the GFC Facilities Development Committee approve the proposed Students' Union Building - Myer Horowitz Theatre: Renovation and Expansion - Schematic Design Report.

Attachment 2

SUB Myer Horowitz Theatre **Renovation and Expansion**

SCHEMATIC DESIGN REPORT

Project No. 01257E0500 I 2017.1.30

DIALOG®

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Table of contents

1. INTRODUCTION

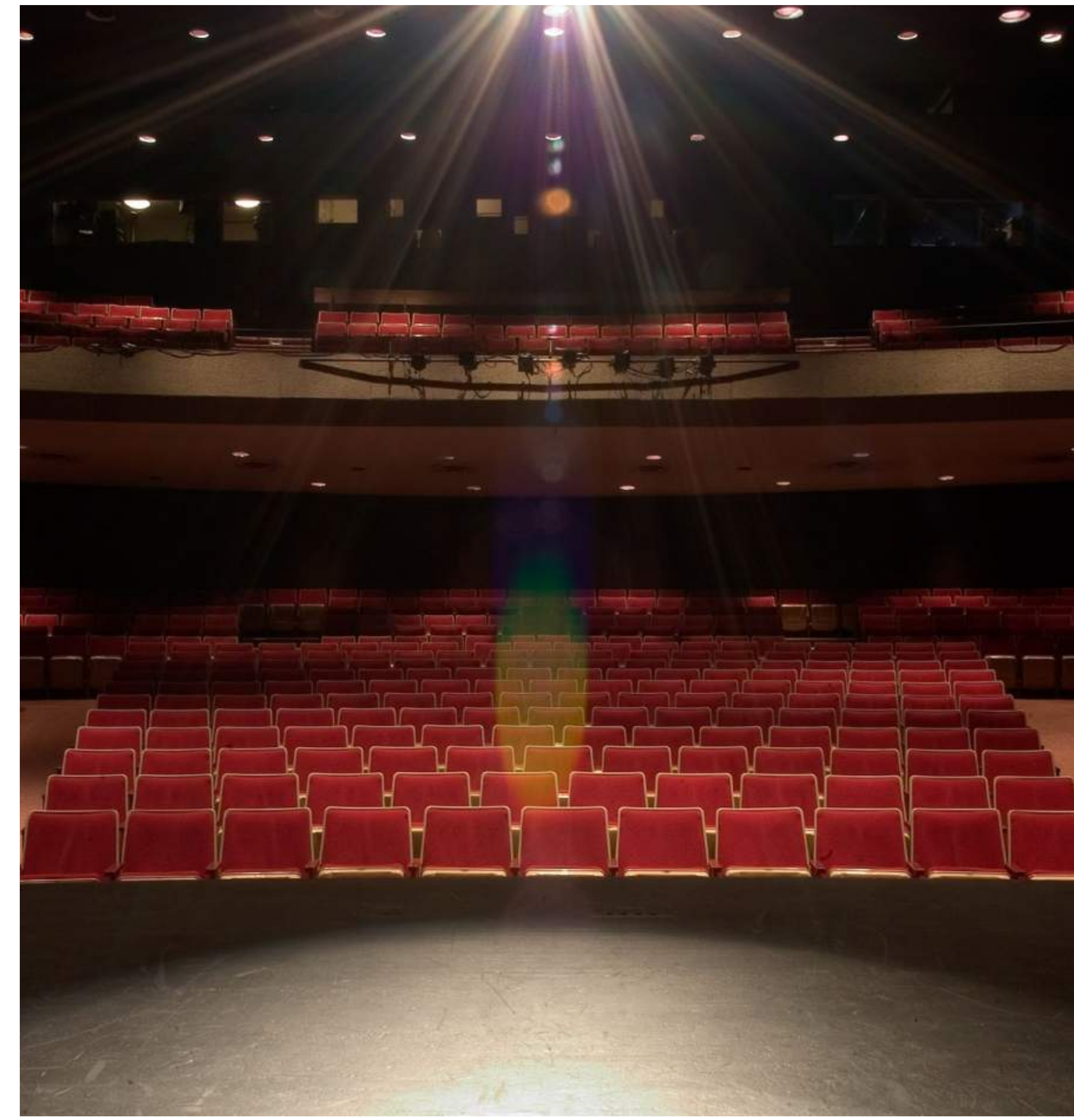
1.1 Project Vision and Goal

The Myer Horowitz Theatre was a key element of the original vision for the Students' Union Building, which envisioned SUB as a place that fostered the development of students as active, engaged members of the community. SUB was intended to be a place where the principles of civic engagement and the opportunity to cross paths with peers from other disciplines allowed students to learn, grow, and become well-rounded citizens and leaders. In so doing, it helps fulfill the University mission of service for the public good.

The Theatre is central to this mission, and was intended to educate, entertain, and bring the campus community together. It is an essential resource for ensuring that the University of Alberta can offer students all of the essential elements of a liberal education. The Theatre is a place where students have experiences with the arts, intellectual debate, and community events they otherwise could not. It is a unique facility on campus, serving as a venue for community events for both the campus and the city as whole, helping bridge the divide between town and gown.

The goal of this project is to restore and expand the Theatre's ability to meet this vision, by bringing the design and technical elements of the Theatre up-to-date and judiciously expanding the flexibility and size of the pre-performance spaces to allow for a wider range of activities and programming. Specific program objectives include:

1. Ensure the technical and support systems in the Theatre are up-to-date and allow for cost-effective, efficient, and competitive operation. This includes updating the audiovisual and multimedia capabilities of the Theatre, so that modern presenter needs can be better addressed.
2. Improve the patron experience, so that the Theatre is the 'go-to' venue for large events on campus. Improving the patron experience includes better pre-show spaces (lobby improvements) and an improved show experience (improved audiovisual capabilities and seating).
3. Expand the ability of the Theatre to host a wider variety of events at a higher velocity. That is, by expanding the lobby and adding a terrace, we will enable additional kinds of events to be hosted in the Theatre, and by updating systems and replanning the space, we will seek to increase the number of events that the Theatre can host in a year.



Existing conditions - Myer Horowitz Theatre chamber

1.2 Context

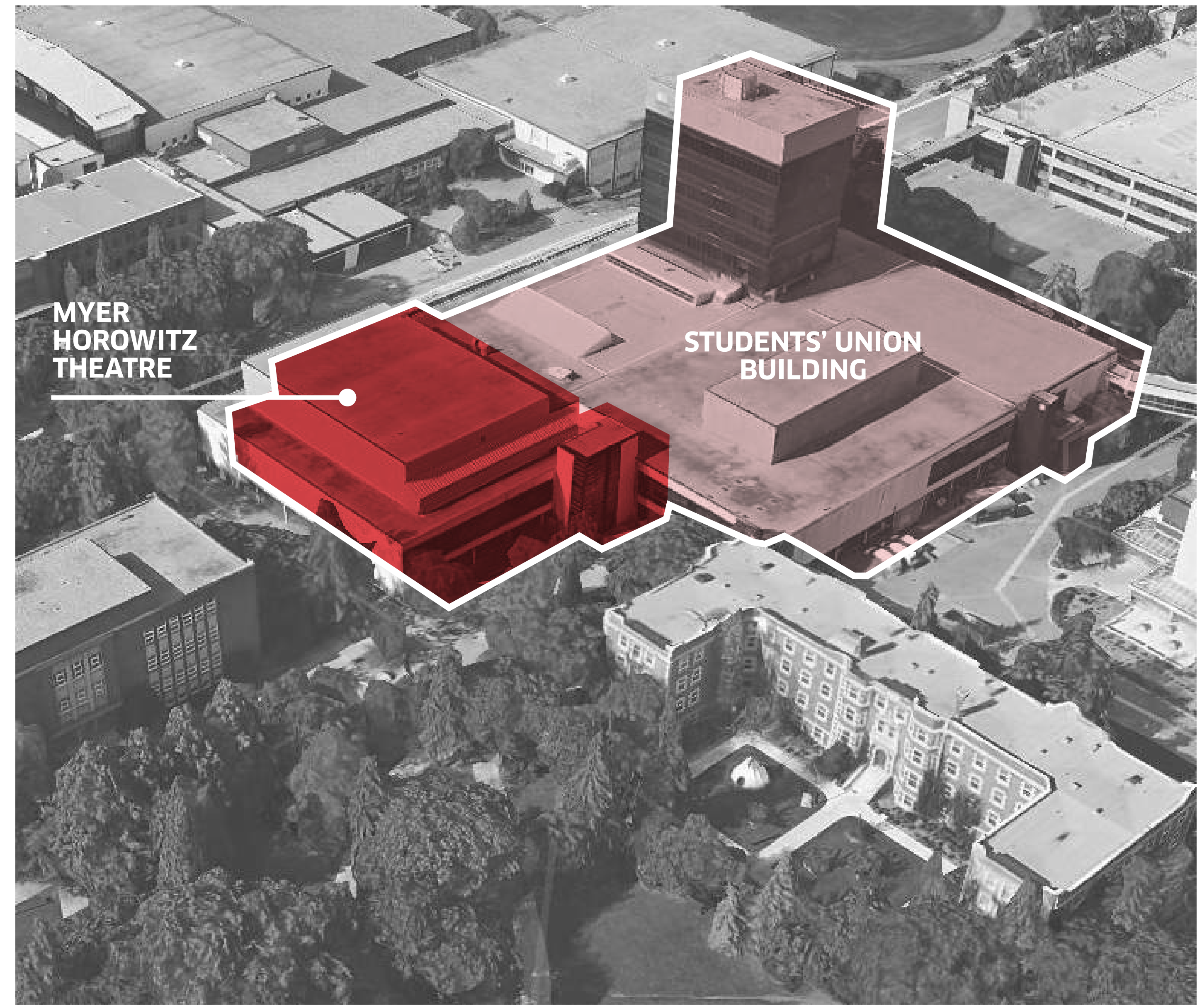
Originally opened in 1967 as the SUB Theatre, the Theatre was designed and developed by James Hull Miller. It was renamed in 1989 for the outgoing University President, Dr. Myer Horowitz. The Theatre last underwent renovations in 1983 and last had a technical upgrade in 1988. The Students' Union is committed to returning the Theatre to a caliber that is worthy of its long history of service.

Over the last 50 years, the Theatre has served this role well, earning a defining place in the experiences of many alumni. It has been a crucial link to the larger community, bringing in artists and programs to the University campus. Its patrons include students, alumni, and many Edmontonians with no other link to the University of Alberta. For many future students, attending a show at the Myer Horowitz Theatre is the first time they step foot on campus.

The Myer Horowitz Theatre is booked for approximately 250 events every year and has an annual attendance of up to 100,000 patrons. The Theatre is a key cultural asset for the campus and the larger community and, as one of few 700-seat performance spaces in the area, fills specific niche within the larger Edmonton arts and performance community. Reflecting this, the project will seek financing from students, alumni, and the larger community.

The Students' Union believes that a renovated and enhanced Theatre can provide new opportunities for student and alumni programming and be an even stronger link between the University and the rest of the city. Currently, while still serviceable, the Theatre is slowly losing its competitiveness in the Edmonton market as the facility ages: Technical systems become outdated, the audience experience degrades, and the inherent appeal of the Theatre to both presenters and patrons declines. The Theatre will, without renovation, be forced to move down-market and lose its appeal as a host for the variety programming, the political and issue debates, and the live arts that defined the original vision of SUB and the Theatre.

With a higher seating capacity than the Timms Centre and Convocation Hall, greater lighting and sound flexibility than Convocation Hall, and a schedule less constrained by the requirements of academic programs, the Myer Horowitz Theatre is fundamentally unique in its program on campus. It provides a public space for events that can be more formal and flexible than a lecture hall. As a publicly bookable facility that is managed independently of the University by students, it provides a venue to third-parties who bring programming that would not otherwise normally have a place on campus, and can be more reflective of student needs and more accommodating to community events. As such, it is key part of any strategy to revitalize campus life, and make being on-campus outside of classroom hours appealing to students and the larger community alike. The University does not and should not exist as an isolated island amidst the larger community; the Theatre is one of the key bridges that connect the institution to the community it lives in.



Context Diagram

1.3 Alignment with the Institutional Strategic Plan: For the Public Good

The Myer Horowitz Theatre Renovation and Expansion Project addresses a number of objectives contained in the Institutional Strategic Plan.

Objective 5: Build and strengthen trust, connection, and a sense of belonging among all members of the university community through a focus on shared values.

- Strategy 1: Support and enhance activities, initiatives, and traditions that bond alumni, students, staff, faculty, and professors emeriti to the university.
- Strategy 6: Encourage and support institution-wide initiatives, services, and programs, such as arts and cultural activities, intramurals, student groups, volunteering, clubs, and centres, which bring students from all faculties into community with each other.

Events at the Theatre include key touch points for the University experience, both at the institution-wide level (e.g. Orientation), the faculty level (e.g. Med Show), and for individual communities within campus (e.g. Orchesis). It has hosted a variety of intellectual debates, speakers such as Frank Warren, and student government activities. It regularly partners with external groups to bring contemporary live arts and culture programming to campus. A renovated Theatre can also play a much more prominent role with alumni-centric events.

Objective 6: Build and support an integrated, cross-institutional strategy to demonstrate and enhance the University of Alberta's local, national and international story, so that it is shared, understood, and valued by the full University of Alberta community and its many stakeholders.

- Strategy 3: Communicate, using both quantitative and qualitative evidence, how the University of Alberta serves as a cornerstone of the community bringing widespread economic and societal benefits to all Albertans, as well as to national and international partners and stakeholders.

By bringing prominent events to campus – for example, the Theatre has hosted speaking events by former prime ministers – the Theatre has helped bring a spotlight to the University and its role in the intellectual and cultural life of Edmonton, Alberta, and Canada.

Existing conditions - Green space north of the project area

Objective 8: Create and facilitate co- and extra-curricular learning experiences for undergraduate and graduate students that enable their self-discovery and give them the skills to use their talents, creativity, and curiosity to contribute as future citizens and leaders.

- Strategy 1: Increase the opportunities for all undergraduate and graduate students to experience the benefits of living on campus.
- Strategy 3: Support the roles of the Graduate Students' Association and Students' Union, along with other student groups, in the promotion of extracurricular programs that create a sense of community and support the learning environment.

Educational and intellectual programming, as well as cultural and entertainment programming, have been a key part of the Theatre's program since the beginning. Hosting political forums, the Revolutionary Speaker Series, and cultural events are all part of supporting the University's larger learning mission and key to preparing students to be active contributors to civil society.

Objective 16: Enhance, increase, and sustain reciprocal, mutually beneficial community relations, community engagement, and community-engaged research and scholarship that will extend the reach, effectiveness, benefit, and value of our university-community connections.

- Strategy 1: Identify and embrace opportunities to build, strengthen, and extend the University of Alberta's connections to and engagement with external stakeholders, including the general public, neighboring communities, ethnic and cultural communities, and other communities of practice.
- Strategy 4: Continue to build mutually beneficial, authentic relationships with alumni and donors.
- Strategy 5: Welcome increased community access, participation, and engagement at all University of Alberta sites.

The Theatre has always served as key link with alumni and the community at large. It is uniquely able to serve this function and bring the larger community to the University's largest campus. However, the Theatre's capability to serve this function is under threat from due to the age and condition of the facility. Restoring that capability is clearly aligned with the Institutional Strategic Plan.

Objective 20: Continue to build and support an integrated approach to social, economic, and environmental sustainability that incorporates teaching and learning, research, outreach, capacity building, and the operations that support them.

- Strategy 2: Embed social, economic, and environmental sustainability into the development and care of the university's natural and built environments.

New lighting and building systems offer clear opportunities for reducing the energy usage of the Theatre, and the sourcing of materials and products will consider the environmental impact when specified.

Objective 21: Encourage continuous improvement in administrative, governance, planning and stewardship systems, procedures, and policies that enable students, faculty, staff, and the institution as a whole to achieve shared strategic goals.

- Strategy 4: Facilitate easy access to and use of university services and systems; reducing duplication and complexity; and encourage cross-institutional administrative and operational collaboration.

Improvements to operational efficiency enabled by the renovation will enable greater affordable access to the services the Theatre provides. Renewal of the Theatre will also serve to reinforce and re-establish the differentiation of Theatre from other large campus spaces as a truly multi-purpose, open-access venue positioned in the mid- to high-end venue market.

Objective 23: Ensure that the University of Alberta's campuses, facilities, utilities, and information technology infrastructure can continue to meet the needs and strategic goals of the university.

- Strategy 4: Engage and strategically partner with stakeholders to explore and develop joint-use projects.

As a project collaboratively developed by the Students' Union and the University, the Theatre renovation is inherently a joint project, and will serve to address deferred maintenance issues with the Theatre and the systems supporting the Theatre.

1.4 Strategic Alignment for the Students' Union

In broad strokes, the Students' Union key strategic thrust for the next four years is to re-invigorate campus life. Measured against past performance, the last fifteen years have seen a drift of student activities to off-campus venues, to the point where approximately 70% of licensed student group events are hosted off campus. This waning of activity on campus outside of classroom hours degrades the personal connection students feel to the institution, and exacerbates certain isolating trends in student social lives. The Students' Union seeks to greatly increase the level of student cultural and social activities on campus, and a restored Theatre with an expanded program is key element of the strategy to achieve that goal.

The Students' Union's strategic plan sets out a number of critical success factors with associated objectives. As the lead partner in this project, the project must also align with Students' Union strategy.

Critical Success Factor 1: Supporting Students

- Objective A: Increase student opportunities (paid and volunteer) within the SU.

Expanded Theatre activity following a successful renovation will create additional student employment opportunities.

- Objective C: Ensure the inclusivity of the Students' Union: Improve the accessibility of facilities and programs and the diversity of students involved.

The renovated Theatre is anticipated to host an expanded program, and operational efficiencies enabled by the project will allow for a greater diversity of presenters to be accommodated, servicing a more diverse student body. Physical accessibility of the Theatre will also be improved.

- Objective D: Promote better mental health among students.

As a cornerstone of the Students' Union's larger strategy to revitalize co- and extra-curricular student life, an expanded Theatre program will provide additional opportunities for students to socialize and de-stress, promoting better mental health.

- Objective E: Provide for the social needs of students.

A renovated and more efficient Theatre provides a key part of necessary infrastructure to increase the number of student-run and student-oriented events on campus, the vast majority of which will help form a part of the social life of campus.

Critical Success Factor 2: Increase relevance to, and connection with, members

- Objective C: Connect with alumni.

An updated Theatre will provide a premium space for large-scale alumni events on campus, at a level and size not currently possible on campus. Expanded production capabilities and flexibility, combined with a larger audience size than any other venue on campus, will allow for events to be held on campus when, previously, the constraints of existing large halls on campus would dictate moving off-campus.

Critical Success Factor 3: Collaboration

- Objective B: Develop systems and expertise that are unique in the University community.

As one of only two campus organizations with a vertically-integrated unit dedicated to large-scale event management and execution, and the only one controlling a 700-seat Theatre, the Students' Union's event services unit already provides essential services to the campus community, and the additional capabilities of a renewed Theatre will enhance their ability to serve campus needs.

Critical Success Factor 4: Build Organizational Capacity

- Objective A: Develop and expand non-student revenue sources.
- Objective C: Maintain capital assets.
- Objective G: Integrate sustainability into operations.

The renovation allows for a significant expansion of Students' Union capabilities, by providing the necessary improvements to increase usage of the Theatre. This will enable additional revenue generation from non-student sources, ensures that the capital assets of the Theatre are kept current, and provides an opportunity to improve the environmental and economic sustainability of the Theatre operations.

1.5 Project Methodology

After over a year of internal discussion and review, the Students' Union commissioned a needs assessment and concept design for Theatre renewal in late 2015. That assessment and early concept was completed in April 2016, and has led to the development of this project.

The Students' Union wanted the project to reflect the core values of the University and the Students' Union, and has sought to create a design process that is inclusive of all stakeholders and respectful to their needs, and that is fundamentally collaborative.

Overall guidance of the project rests with a Project Steering Committee. The Dean of Students and Facilities and Operations each provided representation to the Steering Committee, and Students' Council has been regularly consulted. The full Steering Committee met 11 times in the summer and fall to develop the design concepts outlined in the report. Additional other meetings between the Dialog design team, specialized consultants, and various stakeholders also took place in this timeframe.

In addition to extensive campus consultation, the Students' Union has facilitated the creation of the Friends of the Horowitz Theatre society to provide both topic expertise and external community input into the project. As the Theatre is a key bridge to the larger community, their input into the programmatic needs of the Theatre has been essential. This group includes members with extensive experience in the arts community and in operating facilities such as the Theatre, and provided considerable guidance with regard to the direction of the project as it relates to the connection between the University and the larger community.

1.6 Acknowledgments

The Myer Horowitz Theatre Renovation and Expansion was prepared by DIALOG in consultation with the Students' Union, University of Alberta representatives, and the Students' Union Project Manager R.C. Steffes Management Ltd. The valuable contribution of these participants is acknowledged and greatly appreciated.

Students' Union Project Steering Committee

Students' Union Executive and Management

Robyn Paches, Vice President (Operations & Finance)
Marc Dumouchel, General Manager
Margriet Tilroe-West, Senior Manager (Facilities and Operations)
Brennan Murphy, Manager, Programming and Venues

Members of Students' Council

Levi Flaman, Councilor (Open Studies)
Nicole Hammond, Councilor (Faculty of Business)

Dean of Students

Rob Washburn, Associate Dean, Administration

University Facilities and Operations

Ben Louie, University Architect, P & PD
Keith Hollands, Associate Director, Design and Technical Services

Project Management

Russell Steffes, R.C. Steffes Management Ltd.

Cost Verifications

Bruce Foster, Carlson

DIALOG Project Team

Stephen Boyd, Principal, Architecture (DIALOG)
Michell Morissette, Architecture (DIALOG)
Michael Zabinski, Architecture (DIALOG)
Michelle Sigurdson, Interior Design (DIALOG)
Nicole Guenette, Interior Design (DIALOG)
Grant Kidd, Principal, Mechanical Engineering (DIALOG)
Dianna Williamson, Mechanical Engineering (DIALOG)
Neil Robson, Structural Engineering (DIALOG)
Juan Garay, Structural Engineering (DIALOG)
Ed Pon, Electrical Engineering (DIALOG)
Josh Bornia, Electrical Engineering (DIALOG)

Consultants

Rick Schick, Theatre Equipment (Schick Schiner)

2. OVERVIEW

2.1 Purpose of Document

This report documents the schematic design for the renovation and expansion of the Myer Horowitz Theatre. Schematic design defines the primary elements of the project in terms of architectural and interior space planning, massing and preliminary material selections. It provides for preliminary engineering system descriptions. The schematic design estimate of construction costs confirms alignment of project scope with budget. Schematic design sets the direction for continued refinement and development of the design to the next level of detail.

Schematic design continues the process established by the concept design report completed in April 2016. The concept design report established a reference point from which overall project goals and priorities were reconfirmed. The concept design also served as a point of departure from which new options were explored and the design refined. The design team continued to meet with stakeholder groups and the steering committee to confirm user requirements, review design updated and confirm overall project direction. The Steering Committee was expanded to include representatives from the University Facilities and Operations and the University Bookstore.

DIALOG's architectural and engineering teams, along with Schick Shiner Theatre Consultant confirmed existing conditions through the review existing drawings, on site visits and meetings with the University's maintenance staff. The design recommendations provided in this report are based on the information gathered in this process and the proposed design solution.

Existing conditions - Theatre chamber

2.2 Program and Deliverables

The Myer Horowitz Theatre is requires several upgrades and improvements as well as an expansion of the lobby to meet current needs and update to existing code requirements. The Theatre has not had a major renovation for over 30 years and, given its location on the 2nd floor of the existing Students' Union Building, there are a number of constraints on expansion. It is this requirement for upgrade and expansion that forms the starting point for initiating the design process.

The project program in general calls for the design to make better use of existing space and increasing space efficiency, maximizing efficiency of space, and improving existing building conditions for SUB functions as well as Theatre functions all within a controlled budget. The design challenge is to accommodate the demands of the existing student entrances and building functions, yet allow for the upgraded demands of the community Theatre access and programming. The two programs should enhance each other with no compromises to either.

The project program that has been identified for the proposed Horowitz Theatre renovation expansion includes:

- The upgrade and renovation of the main Theatre chamber with new sound, lighting, seating and overall finishes;
- The expansion of the lobby to accommodate pre and post performances, rentable function area, gathering area;
- Upper Theatre lobby area interconnected to main Theatre lobby;
- New and expanded public washrooms for main and upper lobby;
- Back of house upgrades, renovated green room and dressing rooms;
- Expanded upper level lobby interconnected to main lobby with improved balcony exiting;
- Expanded upper level footprint with Theatre offices, storage and staff areas;
- New main floor dedicated Theatre entrance; and,
- Improved SUB student entrance on East side from main University Quad.

Equipment upgrades will increase Theatre flexibility and allow for faster turnaround between events. They will also make the facility more appealing to touring performances, and provide a more current hands-on learning environment for students involved in Theatre operations. It will also enable the reduction of costs associated with hosting student group events.

Lobby and performance hall improvements will enhance the patron experience and make all events more 'theatrical' and dramatic. Students and arts patrons are seeking a more sophisticated experience, and the renovated Theatre will be able to better meet this need. This will solidify the Theatre's place as the premier campus venue for awards, lectures, and speeches.

The addition of a third public elevator joining the first three levels of SUB will also serve to ameliorate some of the demands placed on the existing tower elevators by displacing some the demand. Users with accessibility issues and building operations personnel will have a third option for reaching the second floor.

This Schematic Design has been used as a tool to help the project team confirm a functional space requirement and scope of work. This program will be developed further and refined in Design Development. s process and the proposed design solution.

2.3 Opportunities and Constraints

As the project site is well established on the second floor of the Students' Union Building, it has inherent physical constraints. The unique structural design of the Theatre with sloping cast in place concrete floors and an upper balcony do not allow for easy modifications to overall chamber size or floor slopes. The primary entrance to the Theatre exists on the East side of the building, as do the Theatre stage door and loading areas, these are constraints to the overall design of the expansion planning. One of the main doors to the Students' Union Building from the Campus Quad is currently shared with the Theatre providing for a challenging clash of competing functions at times.

The building footprint is difficult to expand due to limited site area. Directly to the east is the campus Administration Building and the main North Campus Quad. North of the existing Theatre lobby is a small courtyard area and the Pembina Hall Building. Any expansion to the existing footprint is constrained in order to respect existing campus buildings and landscaped areas.

Opportunities exist within all of the constraints that the project is facing. The challenges of the site constraints provide for the opportunity to re-purpose the courtyard between SUB and Pembina Hall. The possibility exists to create a new forecourt to the Theatre, and recreate the exterior connection from the Alumni lLounge, and through this redevelopment of the courtyard, improvements to the pedestrian circulation from the north can be redefined. Another site improvement opportunity would be to complete the colonnade around the entire east side of the building leading to the SUB and Theatre entrances. This expanded colonnade would provide covered access to the building as well as accommodate improved bicycle parking areas.

An opportunity to improve the Theatre's presence on campus and out to the greater community exists with the expansion. Visual access to the Theatre lobby from the Quad as well as from the interior of the lobby out to the expanded campus can be enhanced.

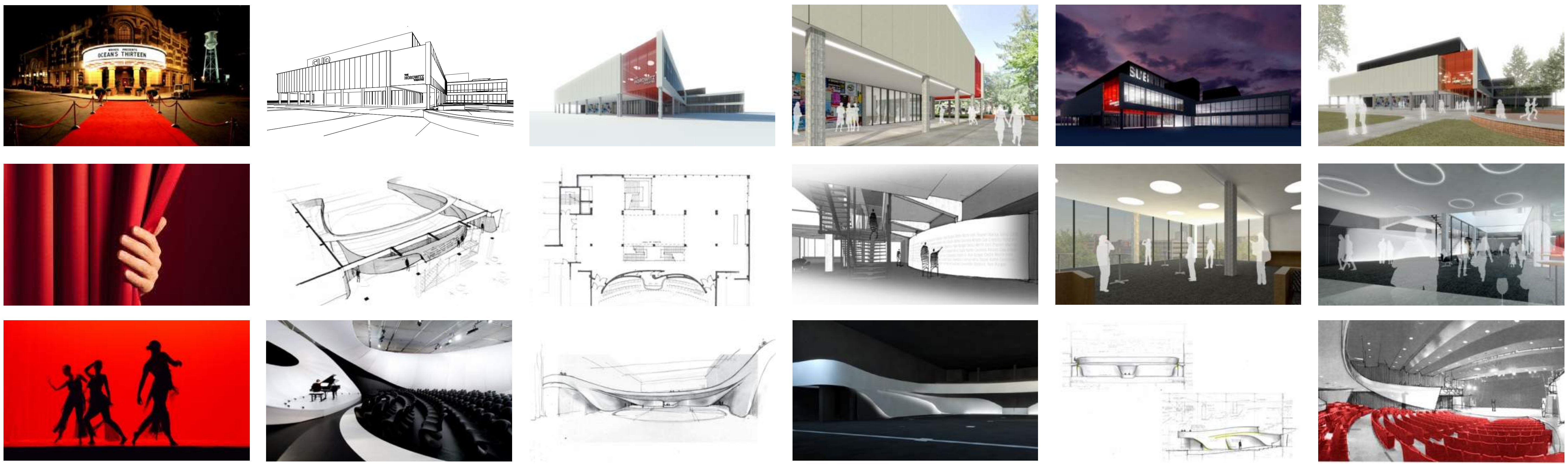
Existing conditions - North facade and colonnade

2.4 Process

Input from stakeholders is critical in ensuring that the future of the Myer Horowitz Theatre considers the views of both current and future users. During concept and schematic design, bi-weekly meetings were held with a client group made up of representatives from the University of Alberta's Students' Union, Facilities and Operations groups, Student Council, design engineering consultants, and a construction management team.

Throughout the course of these meetings information was gathered, options were presented and feedback was used to develop subsequent concepts. Key themes covered during the course of these sessions included but are not limited to technical requirements, user experience and sequencing (marquee, arrival, anticipation, spectacle) and community benefit and growth.



Above and left: These images represent a sampling of the design explorations that were presented and developed with the stakeholders.

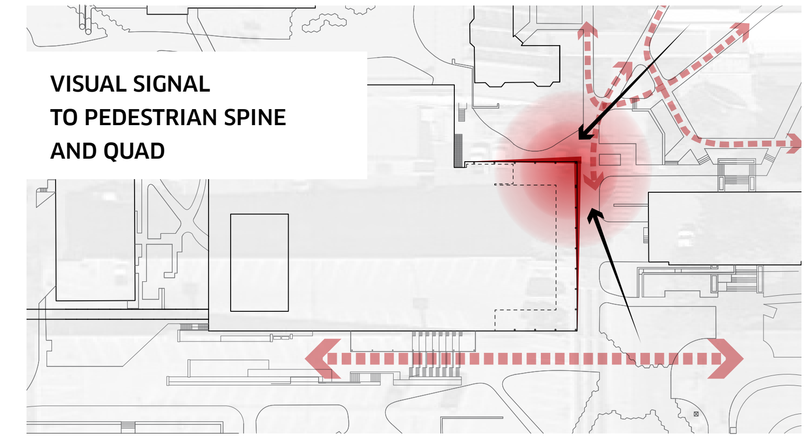
3. ARCHITECTURAL AND INTERIOR DESIGN

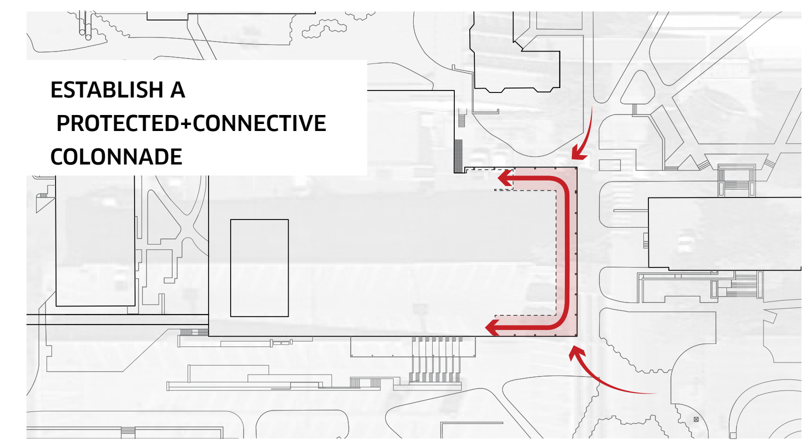
3.1 Site Analysis

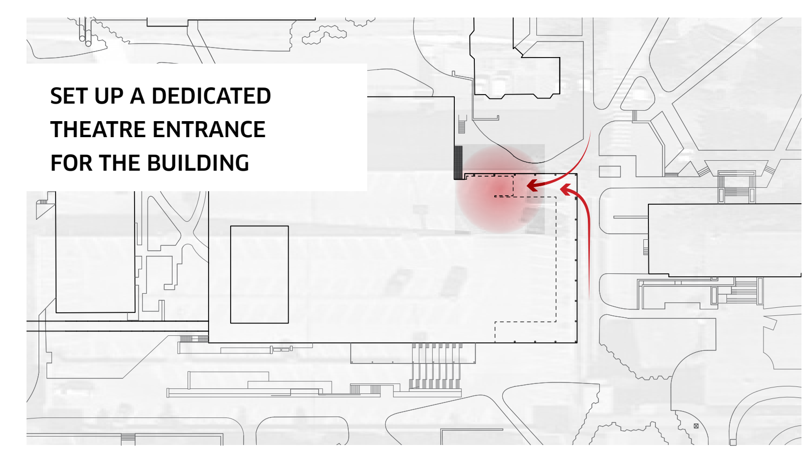
The Students' Union Building (SUB) is located on the north side of 89th Avenue between the Administration Building to the east and the Industrial Design Studio to the west. To the south across 89th Avenue are the Physical Activity and Wellness (PAW) Centre and University Hall and to the north are Pembina Hall and the Agriculture Forestry Centre.

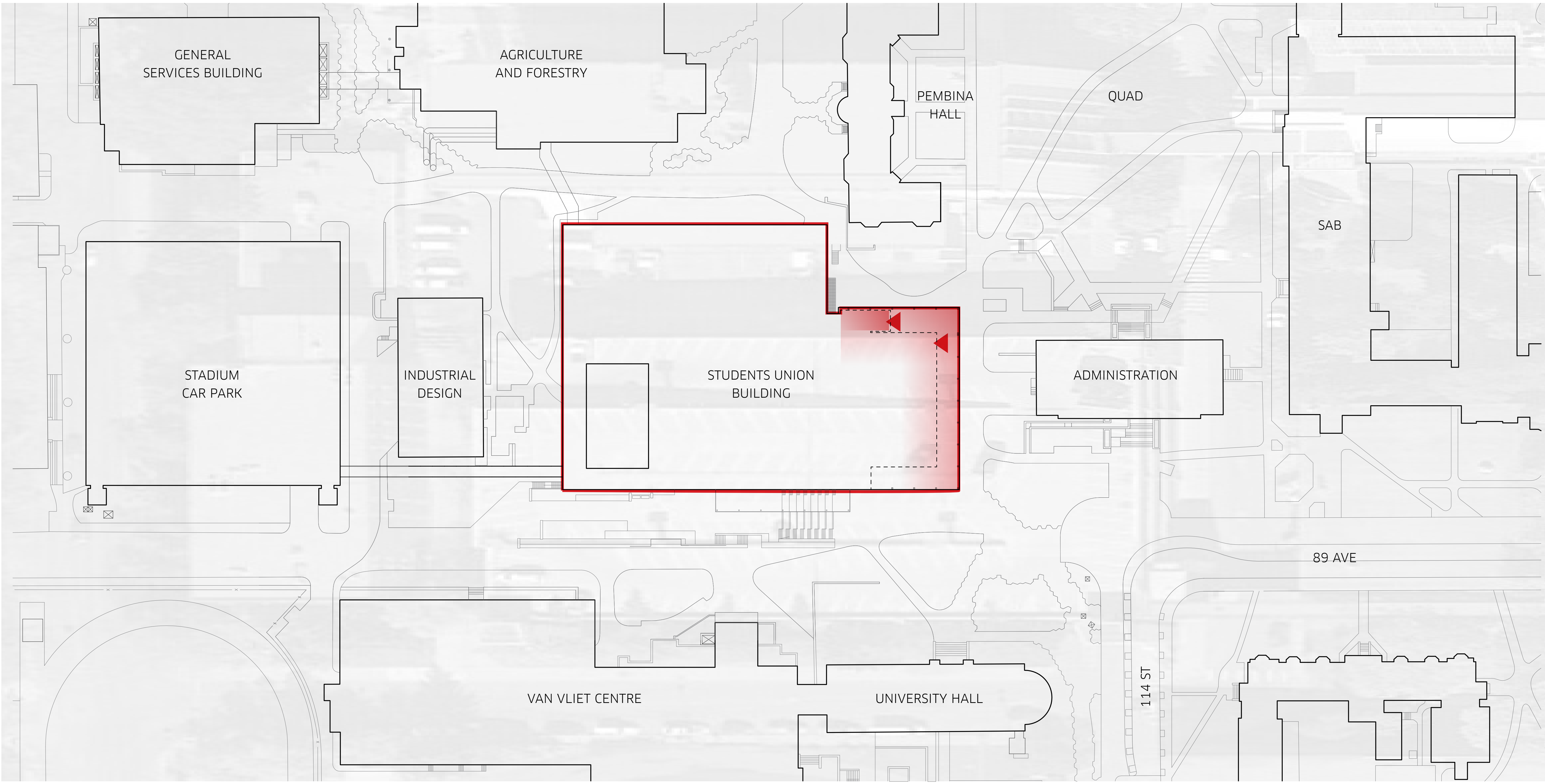
The scope of this project is localized mainly to the northeast corner of the building. Adjacent exterior spaces to the expansion area are the north-south Alumni Walk and the small landscaped area separating SUB from Pembina Hall. Connected to the expansion via the Alumni Walk are 89th Avenue pedestrian spine to the south and the main campus Quad to the north. The proposed design direction aims to take advantage of these site opportunities to increase visibility and access for the Theatre.

It proposed a new dedicated Theatre entry on the north side of the building adjacent to the existing open space. This entry signals the Theatre to visitors from both the north and the south. The existing Theatre access stair will be relocated to this new entrance. In doing so, the colonnade at ground level is opened up providing a weather protected pedestrian connection between the main building entrances on the south and west sides of the building.



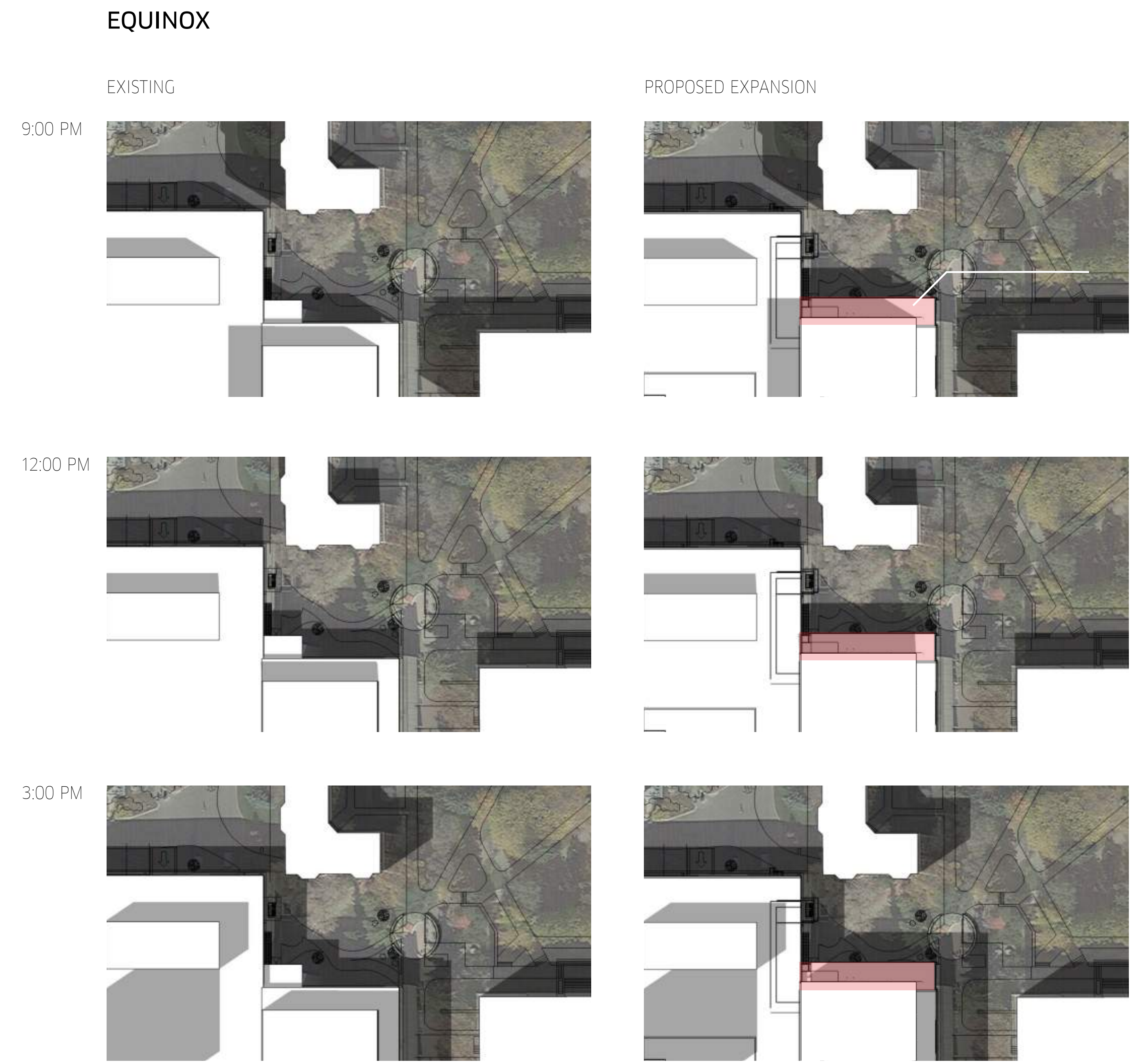





GENERAL
SERVICES BUILDING
AGRICULTURE
AND FORESTRY
PEMBINA
HALL
QUAD
SAB
STADIUM
CAR PARK
INDUSTRIAL
DESIGN
STUDENTS UNION
BUILDING
ADMINISTRATION
89 AVE
114 ST
VAN VLIET CENTRE
UNIVERSITY HALL

Shadow Analysis

The following diagram illustrates the shadowing effects of the proposed expansion (highlighted in red) on the neighboring buildings and open spaces at various times of day throughout the year.



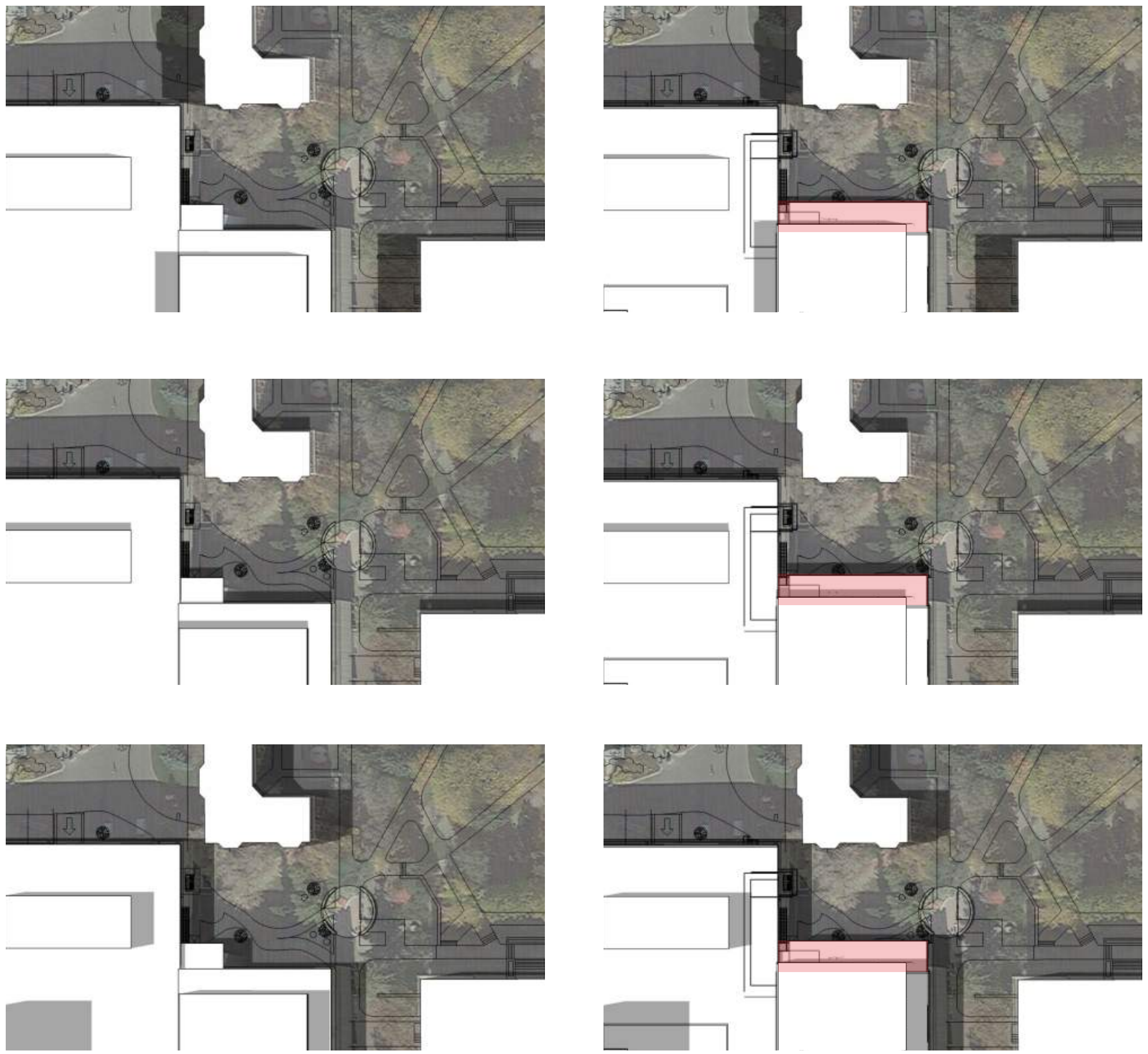
SUMMER SOLSTICE

EXISTING | PROPOSED EXPANSION

9:00 PM

12:00 PM

3:00 PM



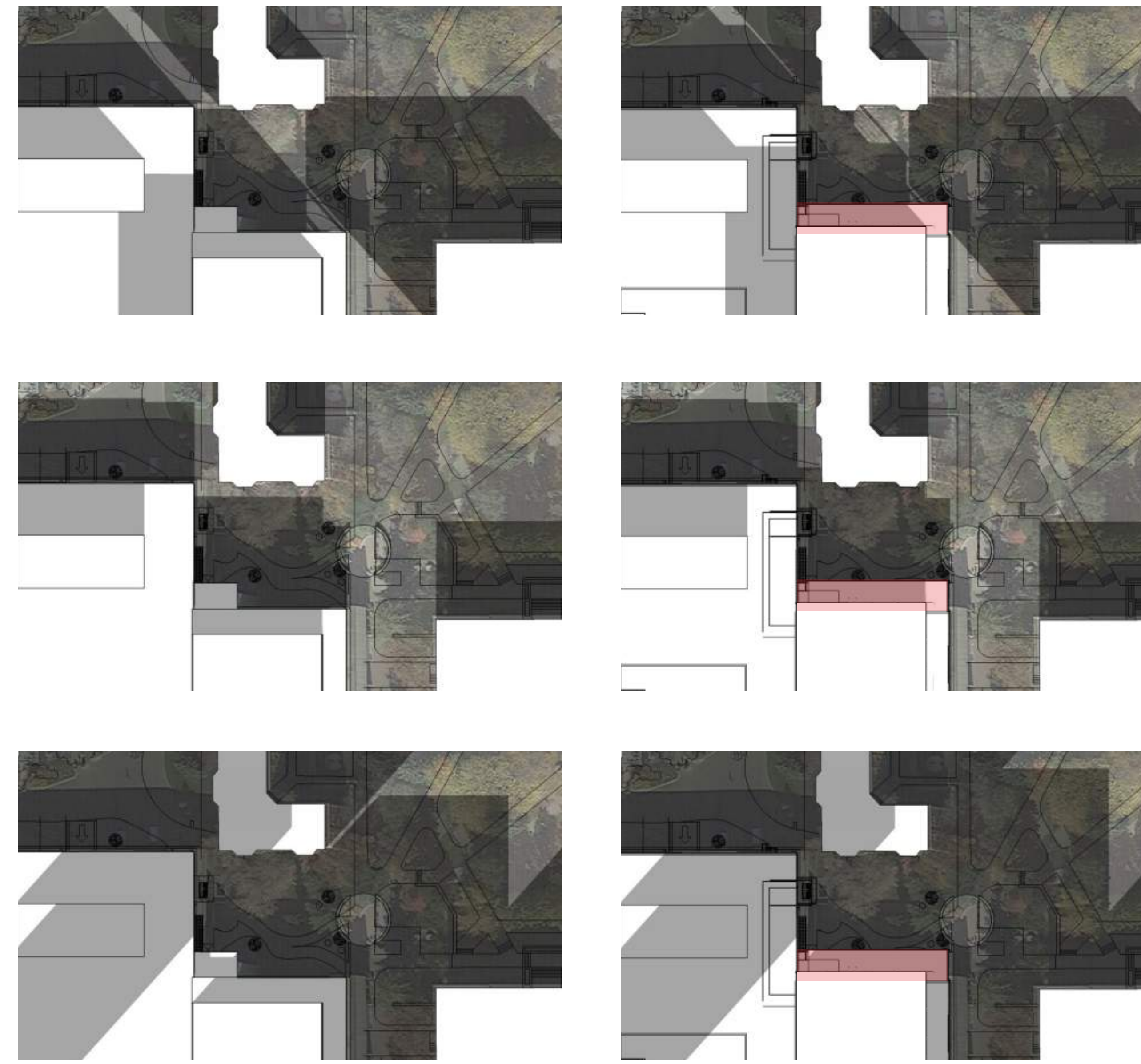
WINTER SOLSTICE

EXISTING | PROPOSED EXPANSION

9:00 PM

12:00 PM

3:00 PM



3.2 Project Description

Context and Overview

The University of Alberta's Students' Union Building was completed in 1967 and stands as a strong example of mid-century modern architecture. The precast-clad upper floor and column-lined colonnade below are two of the building's characteristic architectural features. On the inside, the unique wood and steel stair cases and large window apertures continue the mid-century modern aesthetic. Like the 2015 addition on the south side of the Students' Union Building, this addition to the north has been designed to take advantage of and highlight the existing characteristics of the building.

The architectural and interior design themes established in concept design are continued and refined in schematic design. The architectural expression of the addition to the north has been refined to more effectively signal the expansion to visitors while the interior spaces have been developed to take into account spatial relationships and materiality.

Students' Union Building in the 1970's


South expansion courtyard


South expansion atrium

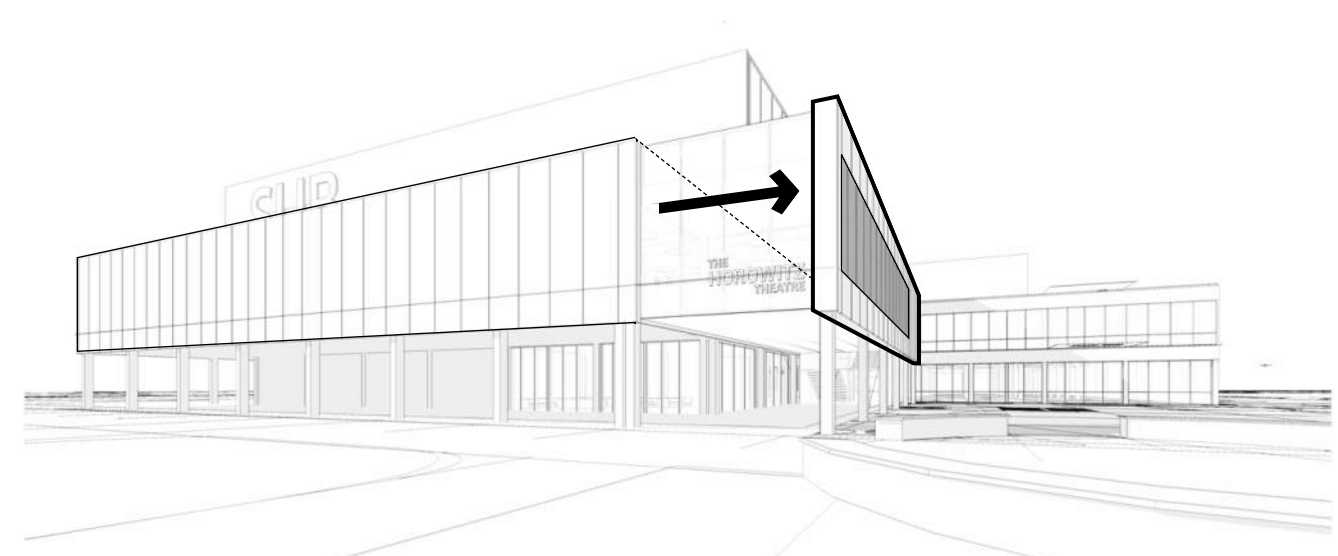
Exterior + Entry

The renovation of the exterior and entry sequence presented two key challenges to the design team. The first involves adding onto a building with the architectural purity of the Students’ Union Building in a way that is both sensitive to the existing structure yet also signals ‘newness’. The second challenge relates to the question of how to brand a principally student-focused building at the heart of campus as a publicly accessible Theatre. The following diagram outlines the architectural response to these two challenges:

Conceptual Examination and Design Response

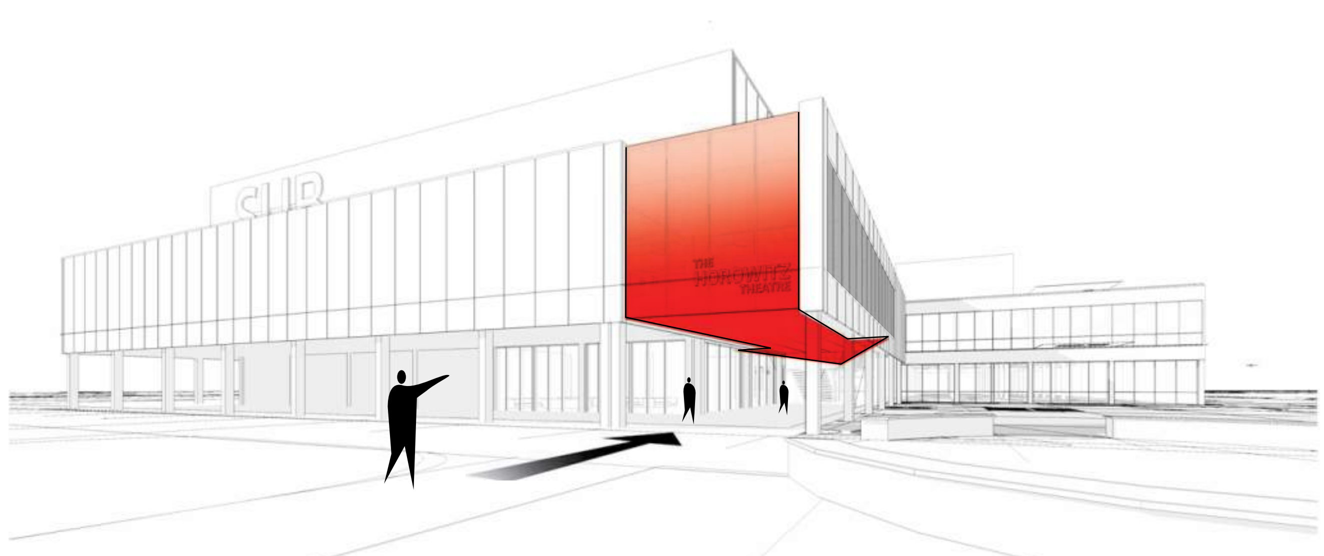
1. FACADE EXTRACTION

FACADE MOVES FORWARD TO ALLOW FOR AND EXPRESS EXPANSION



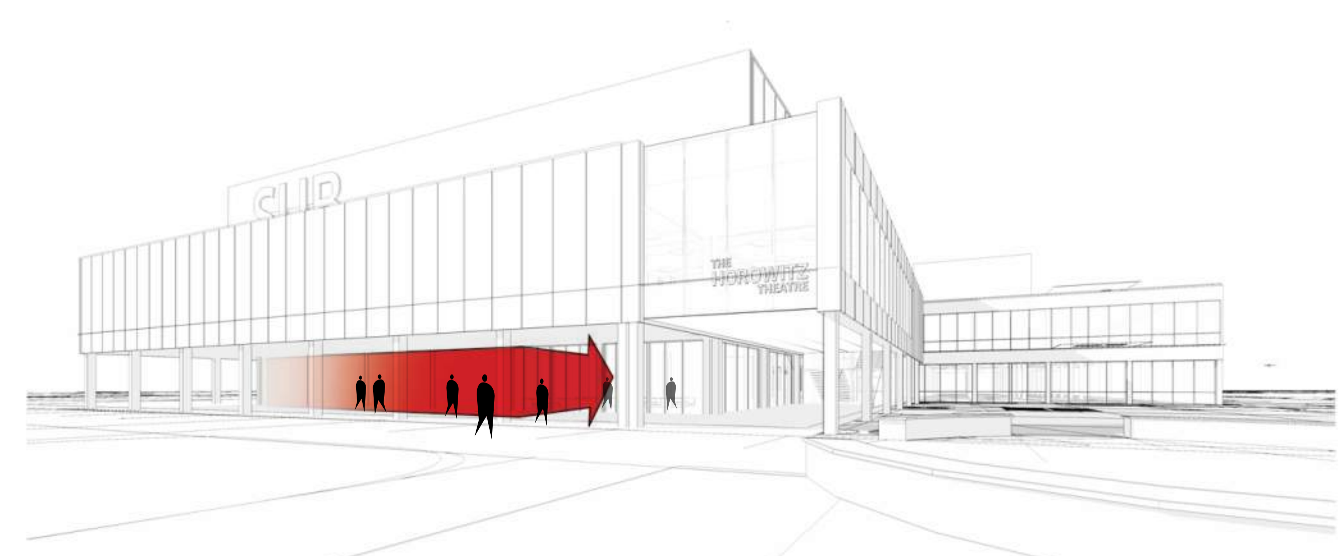
2. SENSE OF WELCOME

A 'RED CARPET' OF COLORED GLASS DRAWS
THE VISITOR TOWARDS THE THEATRE ENTRY



3. STUDENT SPACE

A WALL OF STUDENT-CURATED DISPLAY
MATERIAL ANNOUNCES THE STUDENT ENTRY



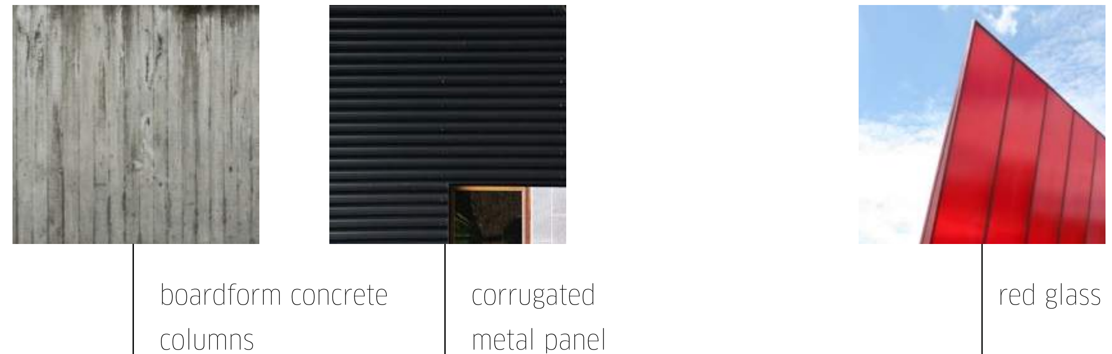
The proposed architectural design solution opens up the north side of the Students' Union Building. The marquee of red glass gives the Myer Horowitz a new public face while the new entry below gives visitors a streamlined entry into the theatre.

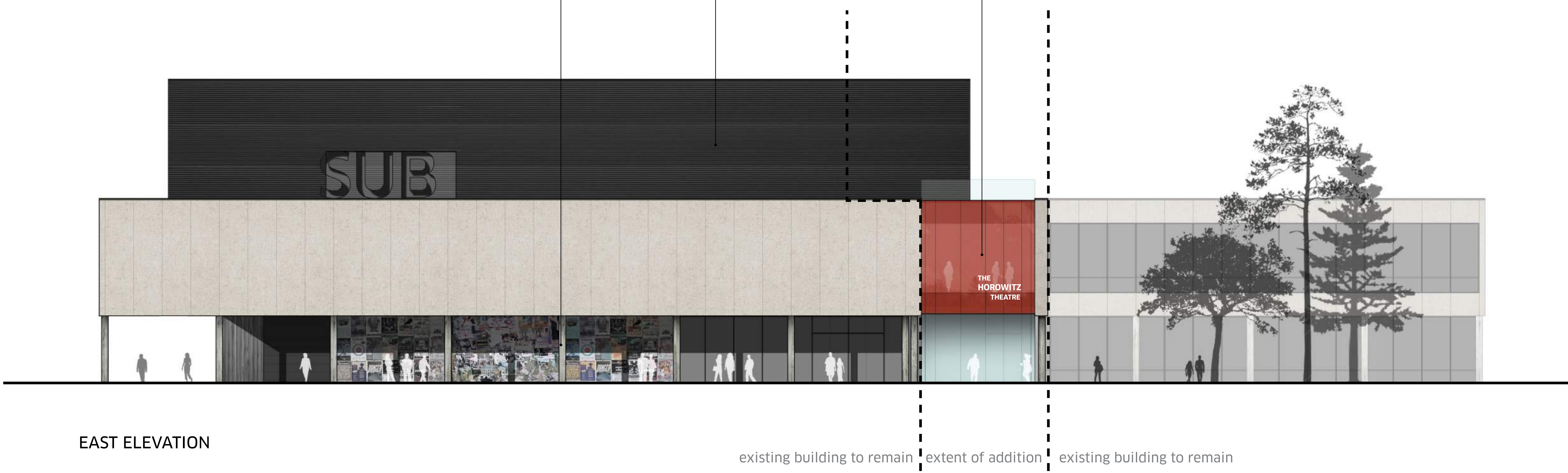
View of new theatre entry from the Quad

DIALOG

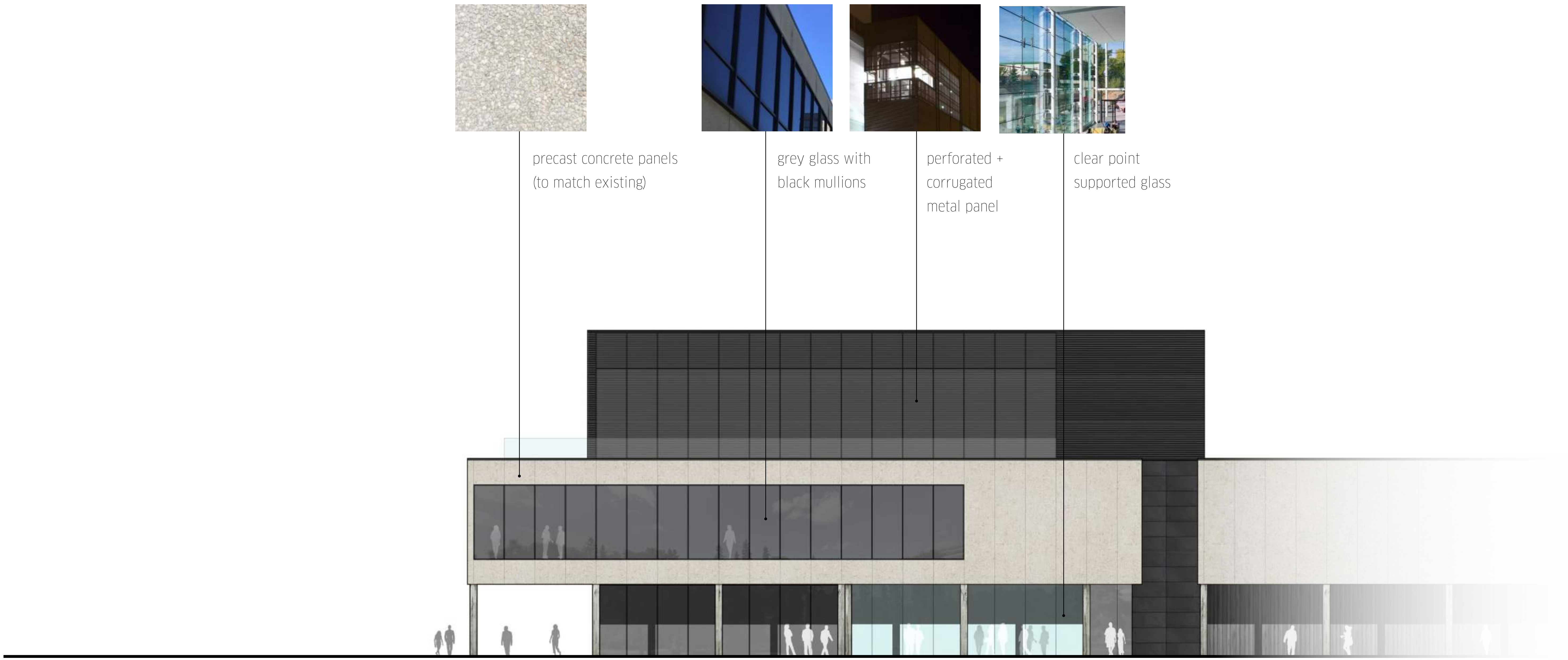
Exterior Finishes

Finishes for the exterior fall into two categories: materials that are sympathetic with the original architecture (ex. boardform and precast concrete), and those that are explicitly 'new' and signal the intervention (ex, clear and red glass). Consideration was given to the durability, cost and lifespan of the selected materials. The following images represent a summary of the material examination completed during the Schematic Design phase of the project:





EAST ELEVATION



NORTH ELEVATION

Theatre Chamber

The proportions and spatial experience of the existing space inspire the conceptual approach to the renovation of the Theatre chamber. The Myer Horowitz Theatre's shallow, wide hall gives the audience a very horizontally oriented experience. This horizontality is strengthened by the balcony wings that reach out from the back of the chamber to almost envelope the audience.

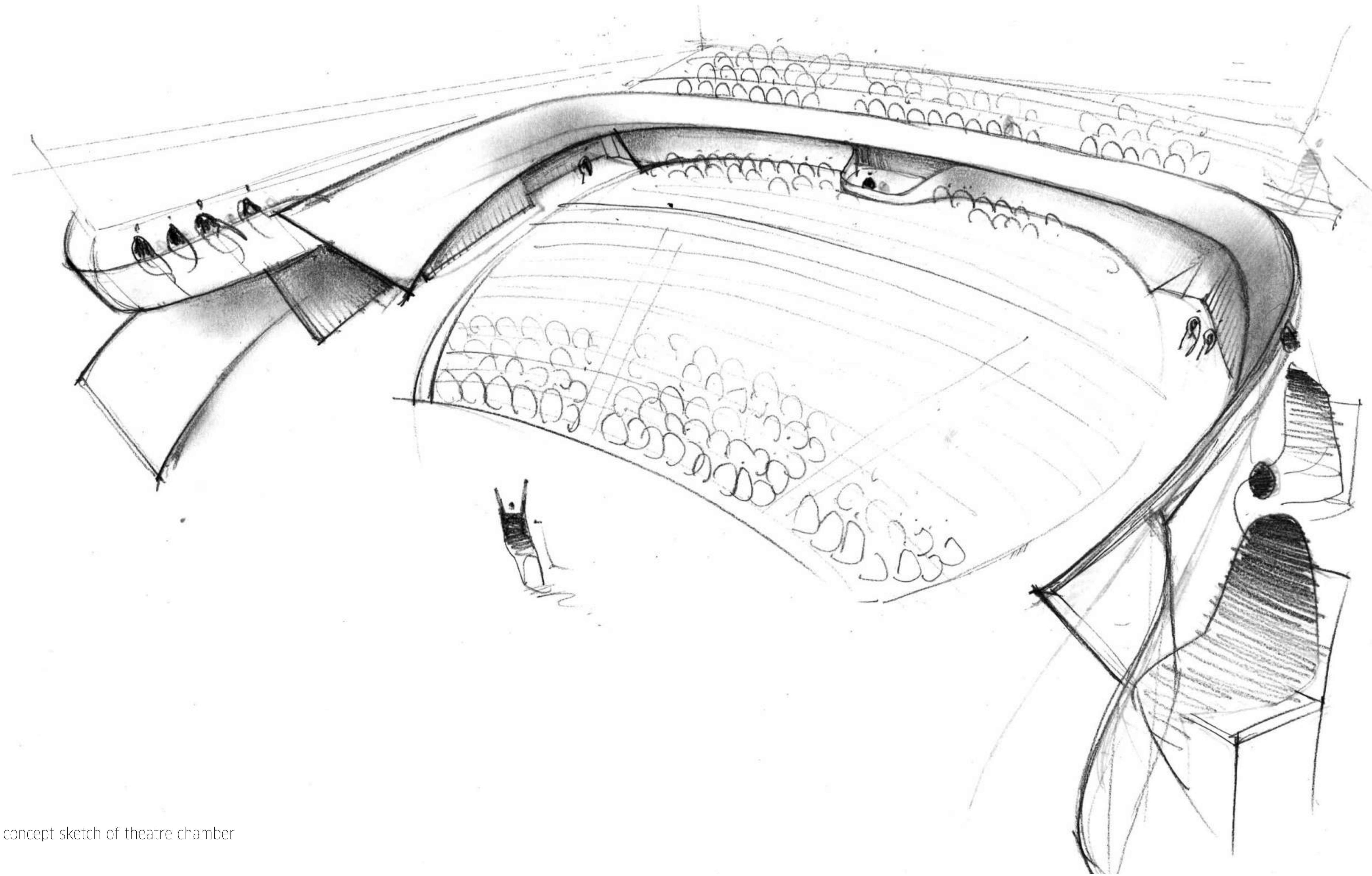
The architectural approach is to accentuate this experience by re-cladding the precast balcony edge with a plaster ribbon whose ends frame the stage. This is an intervention that is lyrical, dynamic and engaging. The intent is that the form of the ribbon will harmonize with the performance without upstaging it.

The remaining vertical surfaces are intended to recede into the background as acoustically tunable surfaces composed of dark, vertical slats. A similar pragmatic approach has been taken with the ceiling clouds with the intent being to re-configure them to provide a better approach to stage lighting and improve acoustic efficiency. Finishing the clouds in a dark recessive color.

The existing seats will replaced in a similar 'theatre red' color and will be re-planned in order to meet current building code and improve accessibility.

Back of house facilities have been re-planned in order to improve the efficiency of Theatre operations and re-finished to enhance the experience of both artists and Theatre employees.

The current seating count is 720, seats available is 700 when incorporating equipment for performances, optimal seating is 680. The new seating to be installed will provide a seating count of 700 diminishing the overall but provide more optimal seating for performances.



concept sketch of theatre chamber

The chamber is a welcoming space whose design takes inspiration from the performances taking place on stage. The dramatic architectural expression of the feature wall will set the Myer Horowitz apart from the city's theatre stock and leave a lasting impression on those who visit it.

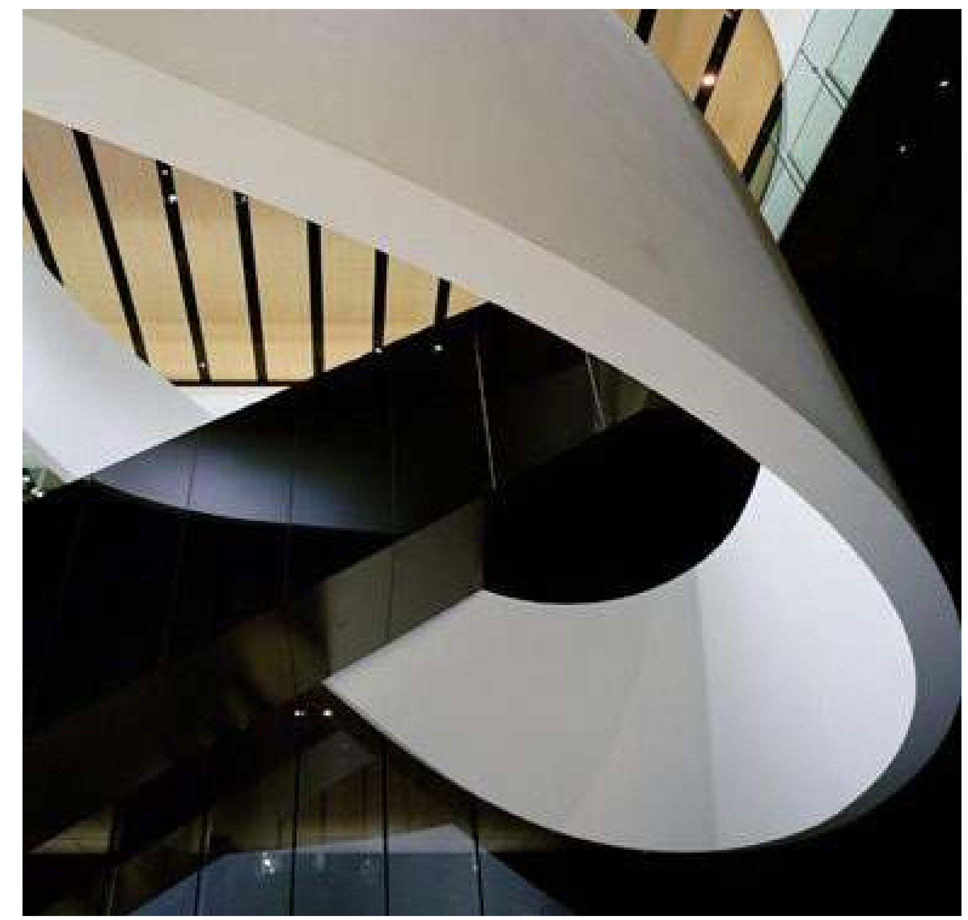
View of theatre chamber

Material Finishes Theatre Chamber

Materials for the theatre were selected to give the chamber an radically improved spatial character. Consideration was given to the materials' acoustic characteristics, aesthetic quality, and durability. The following images represent a summary of the material examination completed during the Schematic Design phase of the project:

Red replacement seats preserve the strong visual presence of the existing seating.

Black slatted walls will cover the side and rear walls of the chamber. The slats provide the opportunity for different backings to suit the acoustic needs of the space.



The gestural **plaster feature walls** stand out from the recessive, dark walls and ceiling of the chamber. Plaster allows the complex form of the wall to be fabricated in an economical manner. Acoustic plaster will be used where necessary.

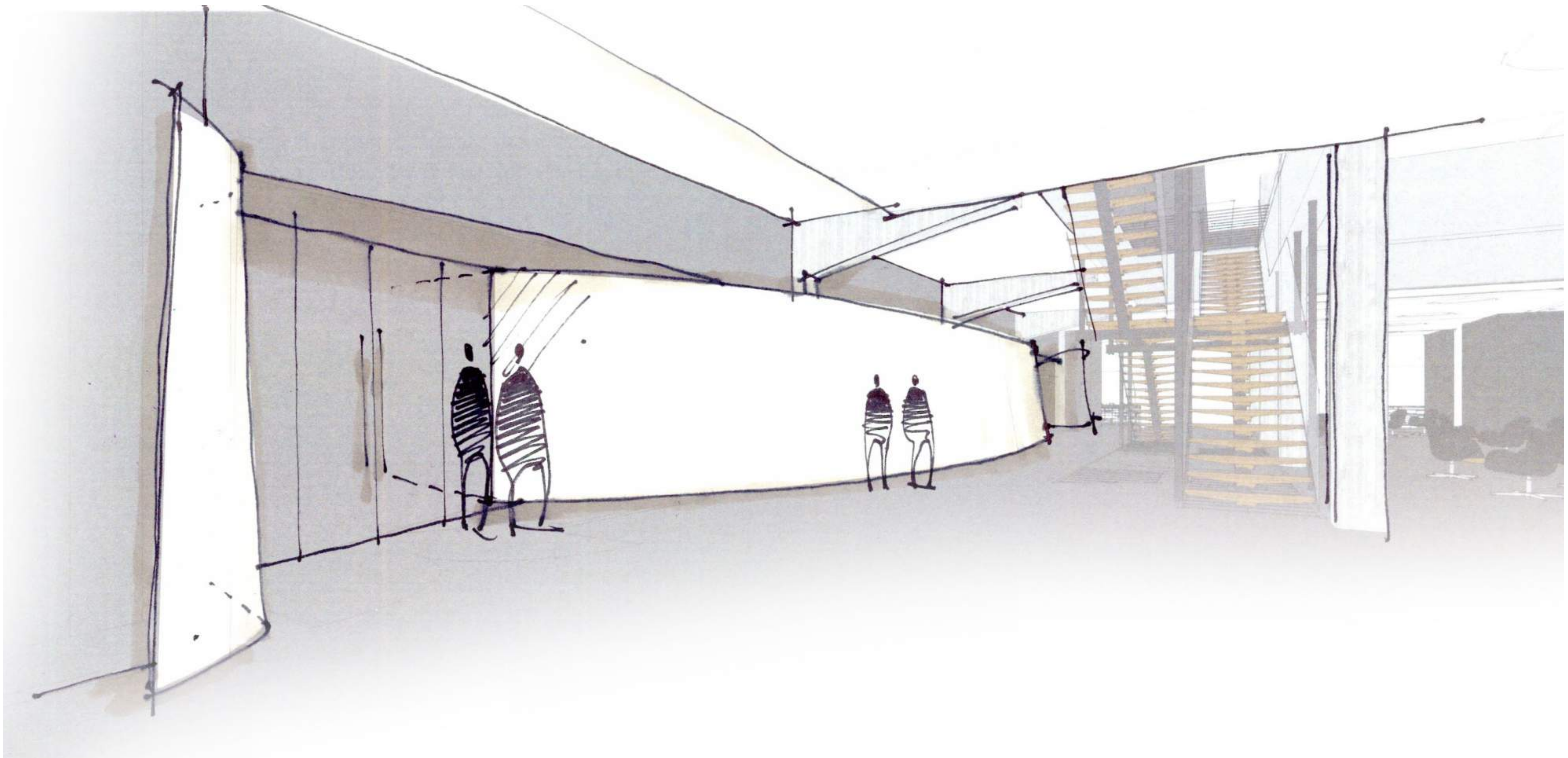
Lobby

The design of the Theatre lobby reflects an aspiration to create a gathering place that is flexible, welcoming and one that builds the sense of anticipation. The existing space is characterized by expansive views out to the north, boardformed concrete columns, and a unique feature stair at the centre of the space. At the same time, many of its finishes have reached the end of their lifespan and the space is undersized for flexible programming and current performance hall standards.

The proposed solution uses architectural elements and space to build the sense of anticipation for the performance; the lobby is viewed as an integral part of the patron experience. Expansion of the lobby to the mezzanine level and allowing outside light to filter in from above enhances the grandeur of the lobby. The project plan honors the history of the Theatre by maintaining and highlighting the feature stair at heart of the space, and by utilizing finishes and furnishings that reflect the original design intent. Inclusion of a small terrace further enhances the sense of specialness of the Theatre and enables additional programming opportunities.

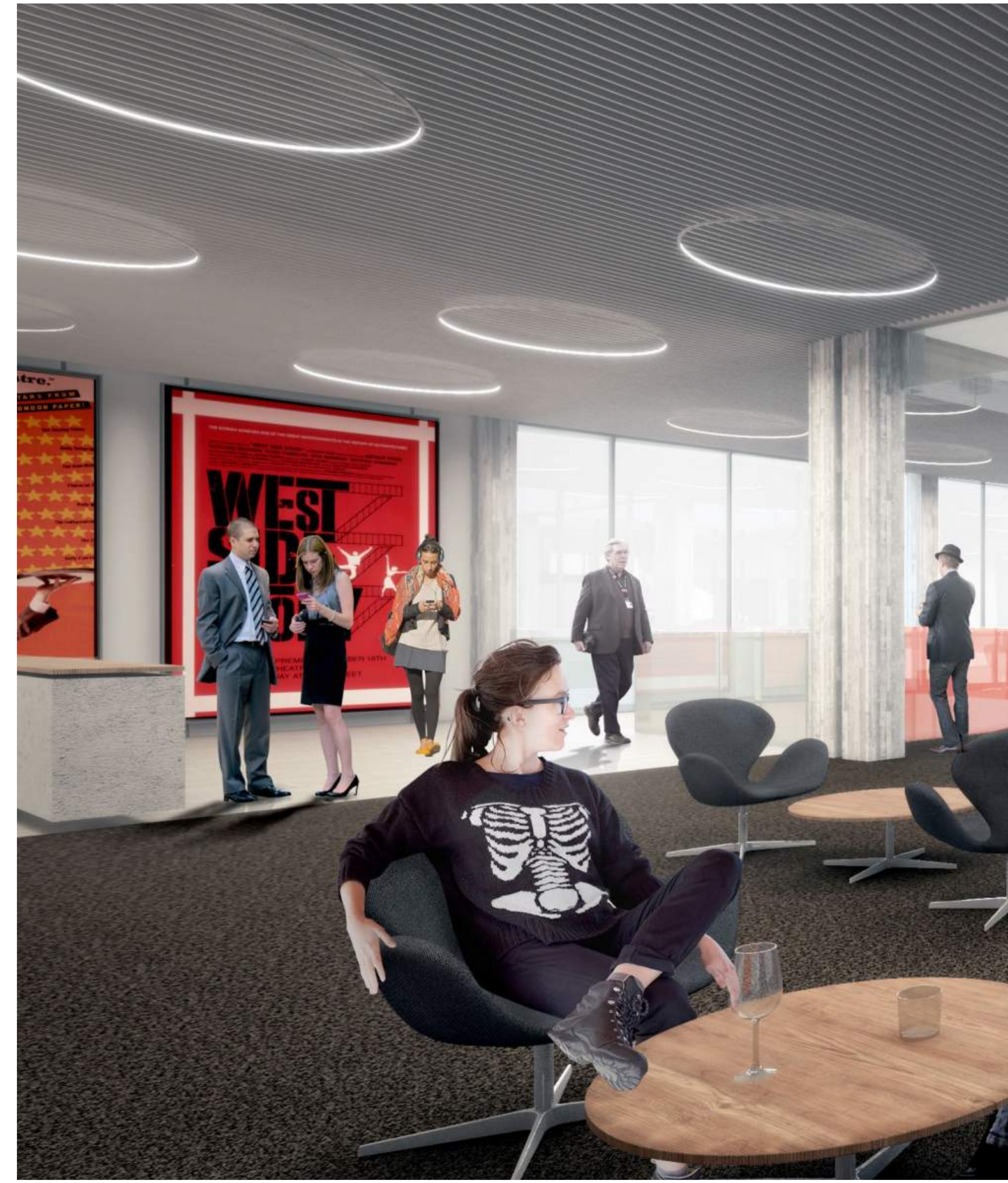
Improved access to the lobby that is better integrated into traffic flows in and around the building yet maintains a separation between students' daily space and Theatre space was a key outcome of the design process. The use of colored glass aids in highlighting and separating the Theatre from the body of the building, both from inside and outside the building. The use of colored features, from an exterior perspective, provides a virtual 'red carpet' leading patrons to the Theatre and creating a sense of anticipation as patrons arrive.

Finally, amenity upgrades – washroom expansion, plumed bar, coat check, and merchandising space – ensure that Theatre experience is complete, seamless, and fully meets patron needs.



concept sketch of lobby

The lobby is designed to welcome the visitor to the theatre, build up the sense of anticipation, encourage lingering, and build community. It is a flexible space that will play host to a wide range of pre and post-performance activities.

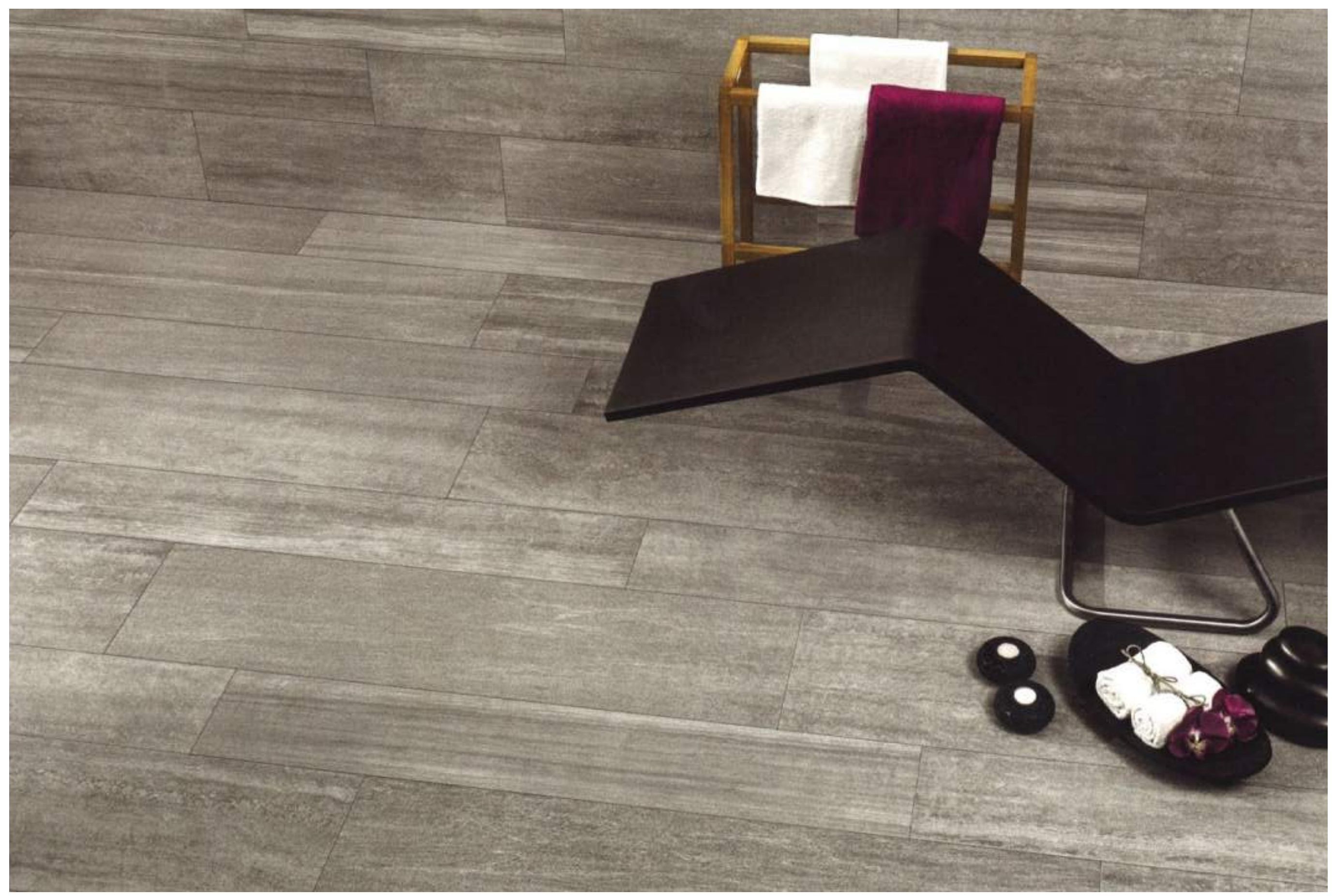


View of theatre lobby
reception area

Material Finishes Lobby

Materials for the lobbies were selected to respect the existing modernist pallet of wood and boardform concrete while at the same time, giving the space a dramatically new look and feel. Durability and maintenance were also factors in the selection of materials. The following images represent a summary of the material examination completed during the Schematic Design phase of the project:

A **red glass** balustrade is a continuation of the material expression of the marquee glass on the exterior.



Ceramic tile with a warm, earthy tone compliments the boardform concrete columns and provide a durable, cleanable surface for high traffic areas including the top of the stairs and bar flooring.

Charcoal carpet tile is a maintenance friendly alternative to replace the deficient broadloom that currently exists in the space.

A **metal linear ceiling** is a contemporary take on the original wood ceilings and soffits of the Students' Union Building that provides acoustic benefit and easy systems access.

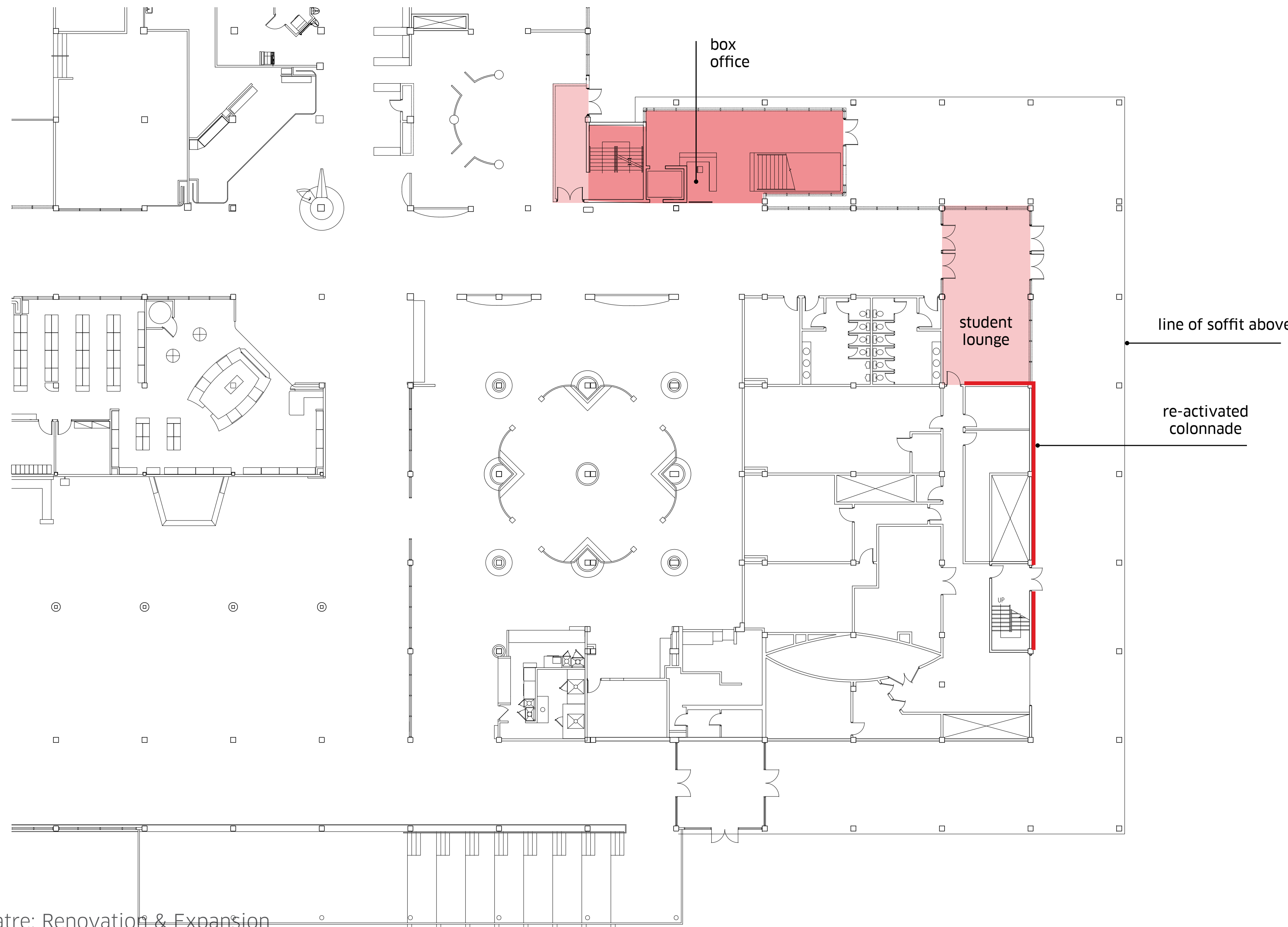
Light projection on the plaster feature wall, while not a material in the traditional sense, will give the space a constantly evolving character.

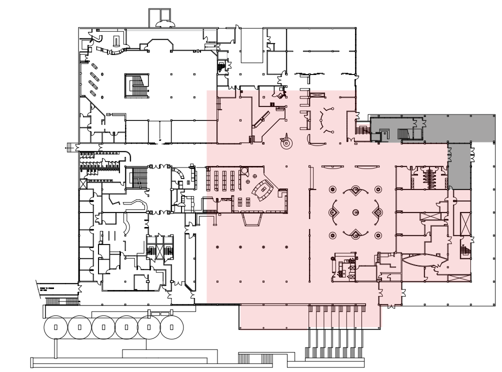
3.3 Building Drawings

Main Floor Plan

renovated space

new floor area





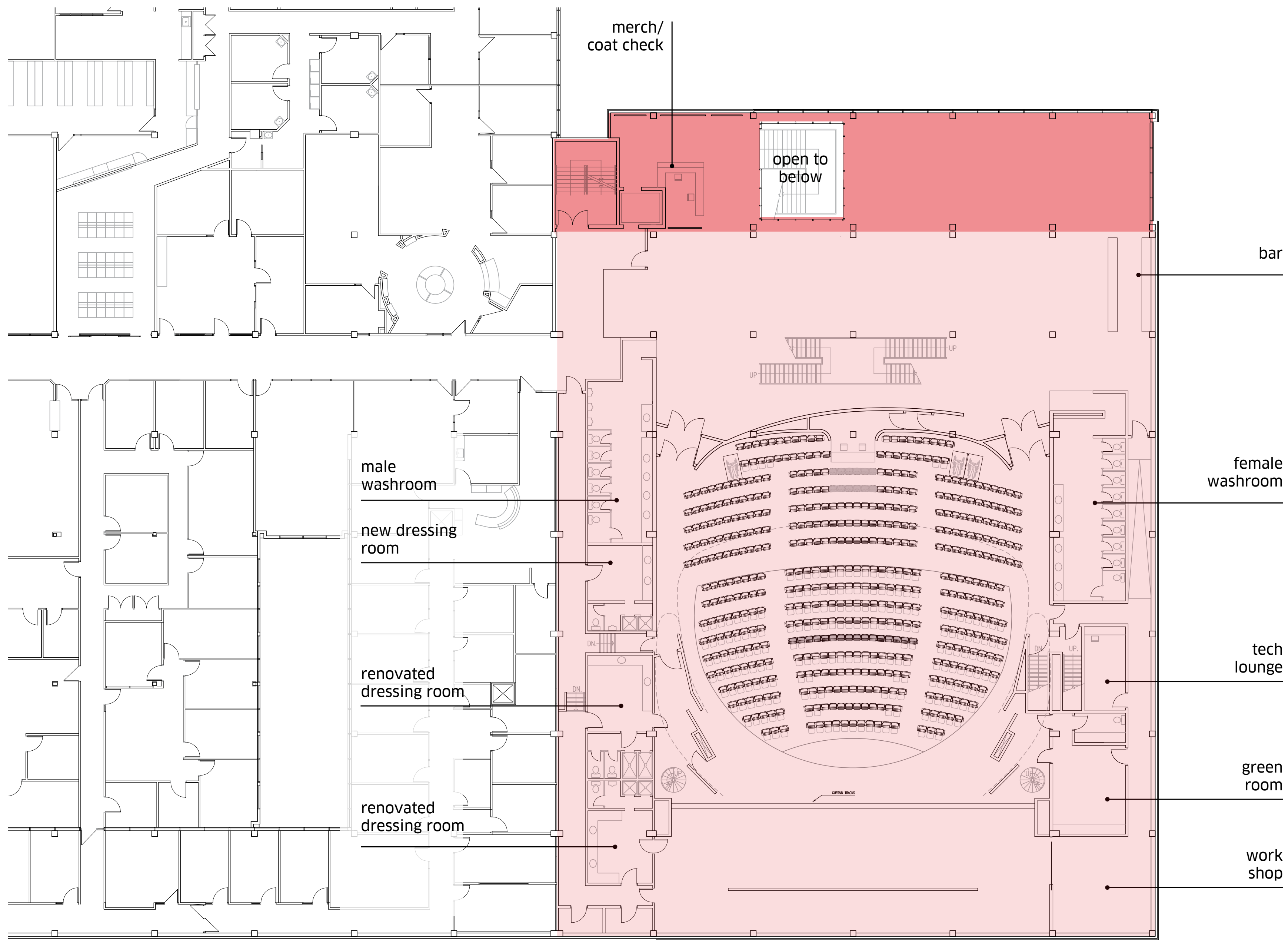
Main Floor Key Plan

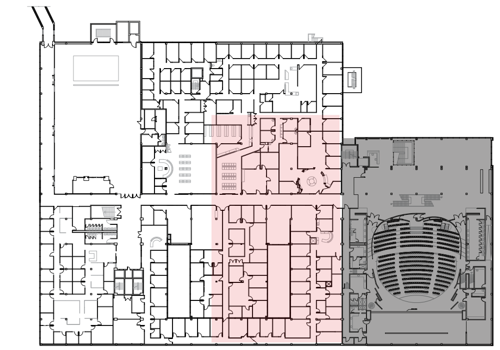
DIALOG

Second Floor Plan

renovated space

new floor area



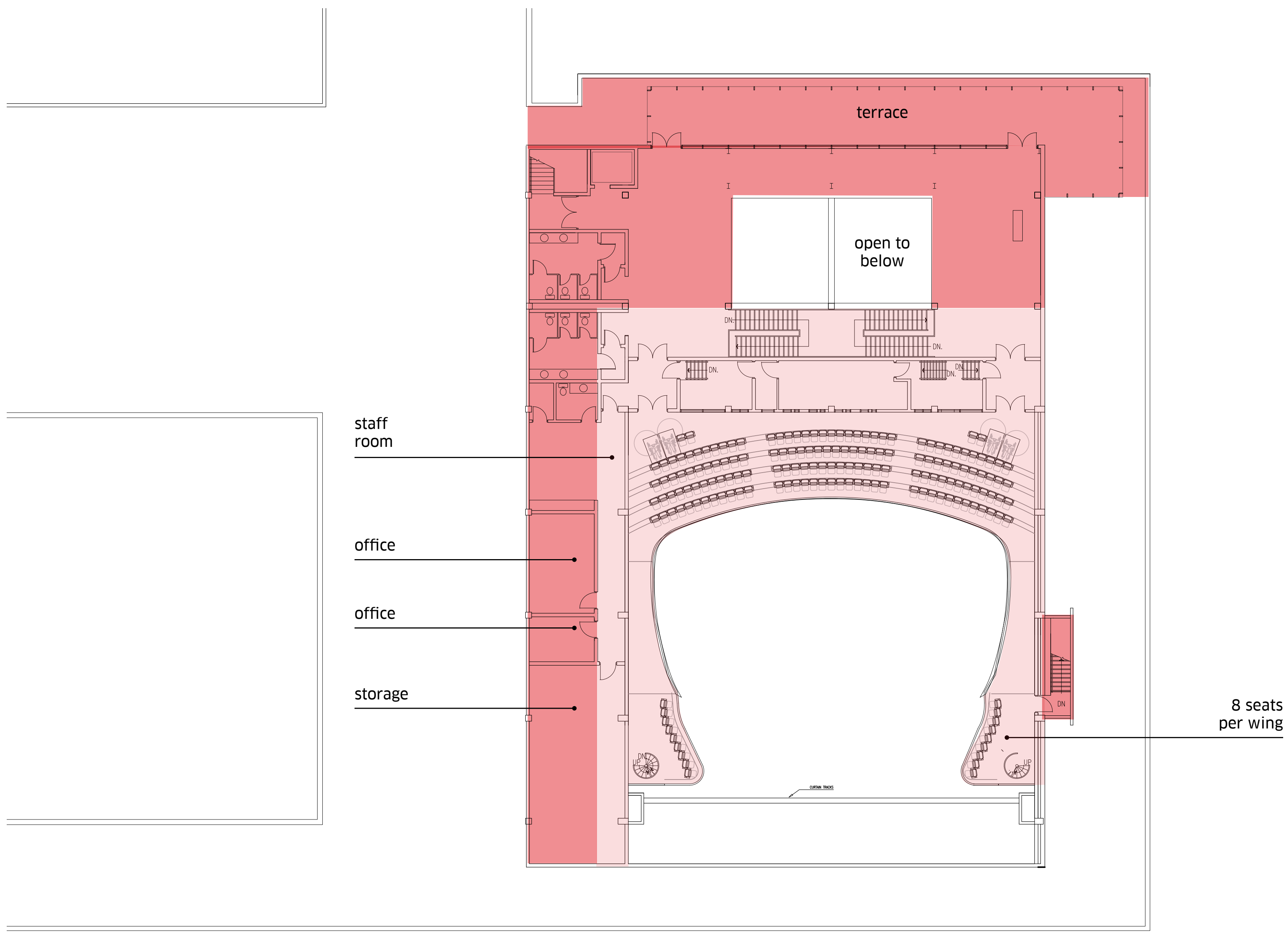


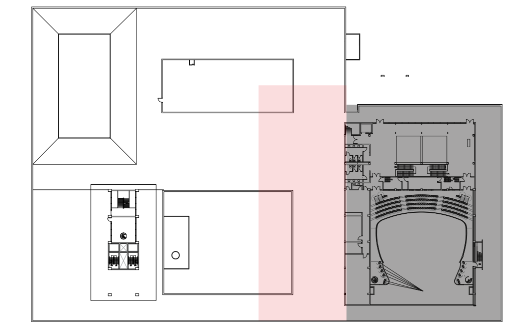
Second Floor Key Plan

Balcony Floor Plan

renovated space

new floor area





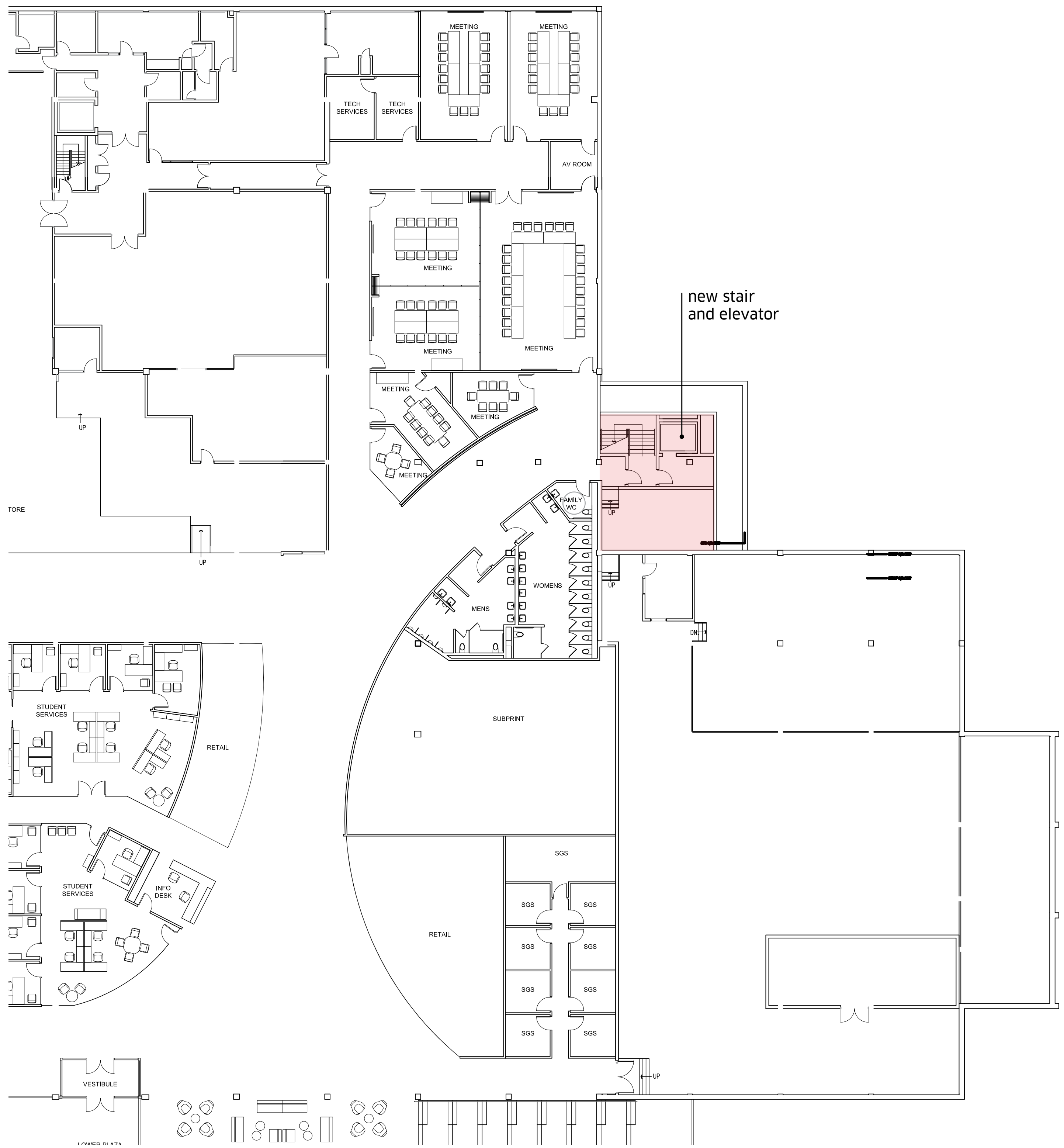
Balcony Floor / Roof Plan Key Plan

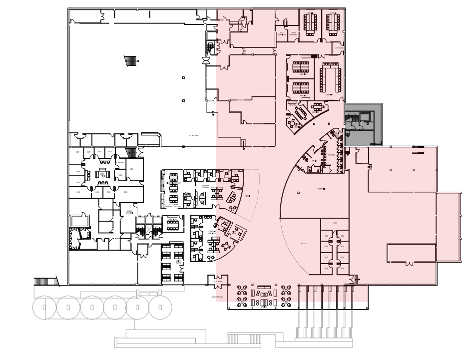
DIALOG

Basement Floor Plan

renovated space

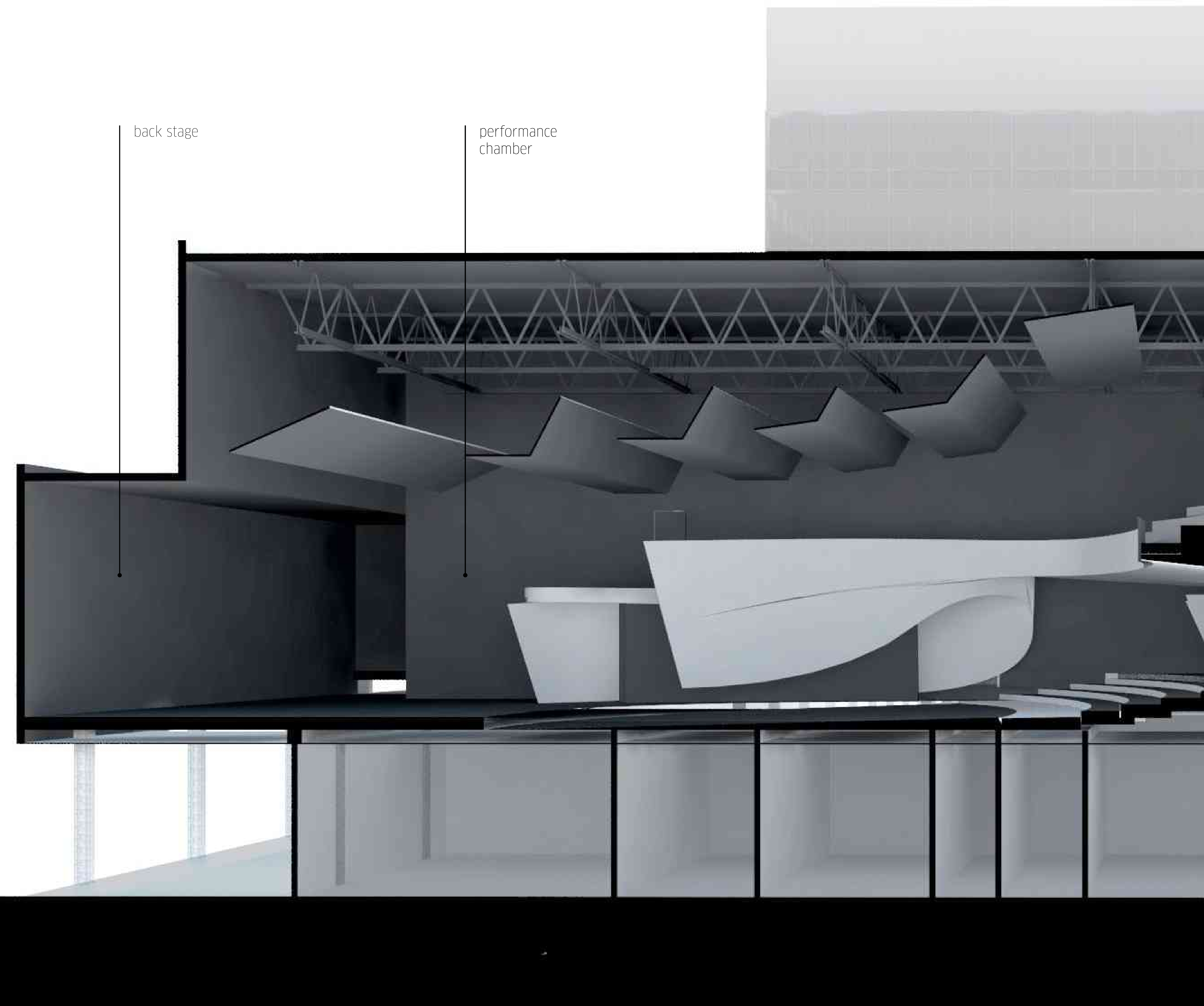
new floor area





Basement Floor Key Plan

North+South Section




control
rooms
lobby
balcony
lobby
terrace

3.4 Preliminary Program Breakdown

The Schematic Design process has been used as a tool to help the project team develop the following functional space requirements. This program will be developed further and refined in the Design Development phase of the project.

Main Floor Entry

Entry Lobby Area	67 sqm
Box Office	8 sqm
Total Area	75 sqm

Theatre Lobby (second level)

Crush Space (top of stair)	42 sqm
Merchandise/Coat Check	12 sqm
Renovated Reception Space	397 sqm
Expanded Reception Space	134 sqm
Female Washroom	52 sqm (9 fix.)
Male Washroom	44 sqm (9 fix.)
Total Area	1151 sqm

Theatre Lobby (third level)

Reception Space	188 sqm
Female Washroom	22 sqm (3 fix.)
Male Washroom	22 sqm (3 fix.)
Terrace	100 sqm
Total Area	332 sqm

Theatre Chamber

Lower Seating Area	518 seats
Balcony Seating Area	155 seats
Total	673

Theatre Back of House (stage level)

Stage	190 sqm
Tech Lounge/Promoter Station	13 sqm
Green Room	33 sqm
Work Shop	26 sqm
Renovated Dressing Rooms	55 sqm
New Dressing Room	21 sqm
Total Area	838 sqm

Theatre Back of House (third level)

Staff Room	37 sqm
Flex Office	23 sqm
Office	10 sqm
Storage	65 sqm
Total Area	135 sqm

4. STRUCTURAL

4.1 Introduction

The purpose of the Structural Schematic Design Report is to:

- Present the preliminary structural design of SUB Myer Horowitz Theatre Renovation and Expansion.
- Provide the architectural, mechanical, and electrical disciplines with information that will allow the design of the facility to progress.
- Provide information for project costing.

These report sections include a summary of the structural design criteria, including the assumed design loads, the proposed construction materials, a description of structural components and structural sketches. The structural information should be read in conjunction with reports and drawings prepared by the other design disciplines. The structural information presented is under development and will be revised and supplemented to satisfy functional and architectural requirements and to accommodate the needs of the mechanical and electrical disciplines, as the project proceeds into detailed.

4.2 Project Description

The structural work for SUB Myer Horowitz Theatre Renovation and Expansion consists primarily of:

- Conversion of existing exterior roof area into interior floor space at the existing Balcony Level. This includes a roof structure over these areas and the associated structural framing.
- A new expansion to the north side of the existing building. This includes for new foundations, columns, floors and roof structures.
- Strengthening of the existing structure to resist new loading conditions.

4.3 Selection of Structural Systems

In the schematic design phase, the emphasis of the structural work was on the evaluation of the existing structure, establishing design criteria, investigating framing alternatives for the building expansion, coordinating closely with the design team, and preparing schematic design sketches for the facility.

The structural systems proposed for SUB Myer Horowitz Theatre Renovation and Expansion are traditional, involving cast-in-place concrete and structural steel that can be constructed easily by experienced sub-trades in the Alberta marketplace.

In selecting the structural systems, we considered the following key issues:

Safety. Design loads selected are appropriate for the use and occupancy of the building. The structural systems are designed to provide safe use for generations of staff and visitors.

Structural serviceability. The potential for excessive structural deflections or movements is evaluated carefully. Cracking of concrete is controlled through appropriate design. The effects of differential movements between existing and new structures are controlled through appropriate design and detailing.

Value for money. Preference is given to structural systems that provide economy for the project as a whole, taking into account the interdependence of costs between architectural, structural, mechanical, electrical components, and life cycle costs (capital and operating/maintenance).

Appearance. Exposed structural systems in selected areas are part of the architectural approach to the design. Careful consideration – along with close collaboration with the architectural team – is given to the appearance of the structure in these areas.

4.4 Structural Design Criteria

4.4.1 DESIGN CODE AND STANDARDS

Structural systems for SUB Myer Horowitz Theatre Renovation and Expansion are designed in accordance with the Alberta Building Code 2014 and the material standards referenced in this Code.

Structural components and materials will be proportioned in accordance with the requirements of the following codes:

- CSA-S16-14 Design of Steel Structures
- CSA-A23.1-14/A23.2-14 Concrete Materials and Methods of Concrete Construction / Test Methods and Standard Practices for Concrete
- CSA-A23.3-14 Design of Concrete Structures
- CSA G40.20-13/G40.21-13 General Requirements for Rolled or Welded Structural Quality Steel / Structural Quality Steel
- CSA-S304-14 Design of Masonry Structures

4.4.2 IMPORTANCE CATEGORY

The Code requires that an Importance Category be assigned to the building based on the intended use and occupancy. SUB Myer Horowitz Theatre Renovation and Expansion is a normal occupancy building that does not need to serve as a post-disaster shelter and therefore is designated as Normal Importance.

The importance factors shown in Table 1 will be applied to loads.

Table 1 Importance factors for ultimate and serviceability limit states.

Load	Ultimate Limit State	Serviceability Limit State
Snow	1.0	0.9
Wind	1.0	0.75
Earthquake	1.0	Not applicable

4.4.3 DESIGN LOADS

4.4.3.1 FLOOR LOADS

Each area of SUB Myer Horowitz Theatre Renovation and Expansion has been assessed for the intended use and occupancy to determine appropriate loading values. The proposed loads are consistent with those specified in the Alberta Building Code and used for other similar building types in North America.

4.4.3.1.1 MAIN FLOOR (EXPANSION AREA)

- Live 4.8 kPa (100 psf)
- Partition Allowance 1.0 kPa (20 psf)
- Superimposed Dead 0.5 kPa (10 psf)

4.4.3.1.2 SECOND FLOOR (EXPANSION AREA)

- Live 4.8 kPa (100 psf)
- Partition Allowance 1.0 kPa (20 psf)
- Superimposed Dead 0.5 kPa (10 psf)

4.4.3.1.3 BALCONY FRAMING FLOOR (EXISTING AND EXPANSION AREA)

- Live (Storage and Assembly areas) 4.8 kPa (100 psf)
- Live (Office space areas) 2.4 kPa (100 psf)
- Partition Allowance 1.0 kPa (20 psf)
- Superimposed Dead 0.5 kPa (10 psf)

4.4.3.2 ROOF LOADS

- Snow General 1.46 kPa (30 psf)
- Superimposed Dead 1.0 kPa (20 psf)

The roof structure is also designed for snow drifts in areas adjacent to high roofs or obstructions and the loads associated with the ponding of water caused by plugged roof drains during a one day rainfall of 97 mm.

The elevations of new roofs will change the snow accumulation and will be introducing new snow drift loads on existing structures, notably in the roof area immediately west of the new office space, at the third floor. This will require local strengthening of the adjacent structures.

4.4.3.3 LATERAL LOADS FROM WIND

The lateral load resisting elements for the new addition will be designed using the following wind parameters:

- Probability of being exceeded in any one year 1 in 50
- Reference velocity pressure 0.45 kPa
- Internal pressure category 2
- Importance factor for the ultimate

4.4.3.4 LATERAL LOADS FROM EARTHQUAKE

The lateral load resisting elements for the new addition will be designed using the following seismic parameters:

- 5% damped spectral response acceleration, expressed as a ratio to gravitational acceleration, as shown in Table 2 below.

Table 2 Percent damped spectral response acceleration.

Period T (s)	Spectral Acceleration S_a (T)
0.2	0.10
0.5	0.06
1.0	0.03
2.0	0.01

- Foundation Site Class (to be confirmed by geotechnical engineer) D
- Importance Factor 1.0
- Structural configuration Regular
- Seismic Force Resisting Systems for new structure
  o Structural steel, conventional construction
  Ductility-related force modification factor 1.5
  Overstrength-related force modification factor 1.3

  o Reinforced concrete shear walls and moment frames, conventional construction
  Ductility-related force modification factor 1.5
  Overstrength-related force modification factor 1.3

Note that for the purpose of this report, the Foundation Site Class has been considered as D based on a review of other geotechnical reports for structures near this area. A geotechnical study is recommended for this project to confirm this information as the project progresses, and we would recommend that this be completed during the design development phase to reduce this risk to the project.

4.5 Construction Materials

The building structures for SUB Myer Horowitz Theatre Renovation and Expansion will be constructed from cast-in-place reinforced concrete, structural steel, open-web steel joists, and steel decking.

Cast-in-place concrete will conform to the requirements of CSA A23.1-14, and have the minimum strengths shown in Table 3 below.

Table 3 Cast-in-place concrete exposure classes and minimum compressive strengths.

Concrete Element	Exposure Class	Minimum Compressive Strength at 28 Days (MPa)	Minimum Compressive Strength at 56 Days (MPa)
Piles, pile caps and footings	S-3		32
Foundation walls and retaining walls	S-3		32
Site concrete (non-structural)	C-2	32	
Exterior columns and slabs exposed to weather	C-1	40	
Interior Columns	N	40	
Shear walls	N	40	
Interior slab-on-grade	N	25	
Suspended slabs, beams and girders	N	30	

Air entrainment will be used for concrete exposed to the atmosphere or cast against the ground.

Based on assumed conditions and for the purpose of this report, the Portland cement concrete in contact with native soil at the site will be considered to be subjected to a “severe” degree of exposure to sulphate attack. The concrete shall be made with CSA Type Hs or HSb cement and have a maximum water to cementing materials ratio of 0.45. All remaining concrete will be made with Type GU Portland cement. A geotechnical investigation is required to confirm these parameters.

Reinforcing steel will conform to CSA G30.18-09 (R2014), Grade 400, or Grade 400W where welding of reinforcing is required.

Structural steel will conform to CSA G40.20-13/G40.21-13 Grade 350W for W-Shapes and HSS Sections and Grade 300W Air entrainment will be used for concrete exposed to the atmosphere or cast against the ground.

Based on assumed conditions and for the purpose of this report, the Portland cement concrete in contact with native soil at the site will be considered to be subjected to a “severe” degree of exposure to sulphate attack. The concrete shall be made with CSA Type Hs or HSb cement and have a maximum water to cementing materials ratio of 0.45. All remaining concrete will be made with Type GU Portland cement. A geotechnical investigation is required to confirm these parameters.

Reinforcing steel will conform to CSA G30.18-09 (R2014), Grade 400, or Grade 400W where welding of reinforcing is required.

Structural steel will conform to CSA G40.20-13/G40.21-13 Grade 350W for W-Shapes and HSS Sections and Grade 300W for other structural sections and plates. ASTM A992-06a Grade 50 is a more readily available material for W-Shapes and is an acceptable alternate.

Open web steel joists will conform to the requirements of CSA-S16 and CSA-S136.

Metal decking will conform to the requirements of CSA-S136.

4.6 Structural Systems

4.6.1 EXISTING STRUCTURE

Original structural drawings for The Myer Horowitz Theatre were available for review prepared by B.W. Brooker Engineering Ltd. dated September 27, 1965. The building has a partial basement with reinforced concrete columns, foundation walls and slab-on-grade floors. The building is founded on reinforced concrete piles.

The main, second and third floors consist mainly of reinforced concrete one-way slabs spanning between reinforced concrete joists. The concrete joists are supported on reinforced concrete beams, in turn supported on reinforced concrete columns.

The roof was split in two areas with different structural systems. The north roof area consists of reinforced concrete one-way slabs spanning between reinforced concrete joists, similar to the levels below, and supported on concrete columns. The south roof area consist of light concrete on steel deck supported by structural steel trusses, in turn supported on steel columns.

The main, second and third floors were all designed for a live load of 4.8 kPa (100 psf). The existing higher roof was designed for live loads of 1.45 kPa (30 psf) plus catwalk loads. There is no information on the drawings regarding the super-imposed dead loads used for design.

The building does not have a well-defined lateral load resisting system. No bracing system or shear walls are identified on the drawings. A more detailed analysis is required to confirm the feasibility to resist earthquake and wind loads due to the new additions above third floor. Our initial analyses indicate that we will need to mobilize some of the building's masonry partition walls to justify the lateral stability under seismic loading. Refer to Section 6.1.2 below for further details.

4.6.1.1 PERFORMANCE OF EXISTING STRUCTURAL SYSTEMS

The existing building was designed and built in the early-1960's, presumably in compliance with the applicable codes of the time. However, over the last fifty years, several significant changes in the calculation of loads and in the determination of structural capacities have occurred. The most pertinent are:

Snow loads: While the ground snow loads have only marginally changed, snow drift accumulation was added to the Alberta Building Code in 1965. Snow drifts increase the snow load where obstacles are placed on a roof or where a low roof is adjacent to a high roof. The increase in load can be up to 500 %, depending on the size of the obstacle and the height difference between two roofs, respectively.

Seismic loads: Seismic loads have only been considered in Edmonton since 1970. Depending on the soil conditions (see Site Class above), seismic forces can govern over wind loads, particularly for a heavier concrete building.

Shear resistance of concrete members: The shear resistance of concrete members has undergone several iterations in the last few decades, recognizing that shear failures are sudden and thus a dangerous mode of failure with little warning. Intensive research has shown that anticipated shear capacities according to codes of the 1950's and up to the 1970's has been overestimated. Therefore, the shear capacity of concrete members as proposed by current codes has generally diminished compared to older codes.

The Alberta Building Code allows us to keep an existing structure in service without the need for a structural retrofit if the structure has performed satisfactorily, no distress or damage to the structure is evident, and the loading conditions have not changed. An exception to this is that the seismic response should be verified in any case. Based on these current code requirements and the observations listed above, the following conclusions are drawn:

- The capacity of the existing floor and roof capacities, where new occupancies, layouts or modifications are proposed, will need to be assessed based on current codes and standards.
- A full seismic assessment of the existing structures will be required to determine if strengthening is required.

4.6.1.2 EXISTING LATERAL LOAD RESISTING SYSTEM

As noted above, the building does not have a well-defined lateral load resisting system (e.g. shear walls, cross bracing, moment frames) and the Building Code requires that an evaluation of the building to resist seismic loads be carried out.

- Given the age of the building, it is likely that a defined lateral load path was not considered during the original design. Best practices at the time indicated that, especially for low buildings, there was enough capacity in a conventionally built structure to resist wind loads. However, history has shown this same logic does not carry over to seismic loads which tend to have very different effects on the building.
- The building code recognizes that a full seismic upgrade to a building can be cost intensive and may not be justified, especially in low seismic regions such as Edmonton where a seismic event is unlikely. In some cases it is possible to use reduced load factors for evaluation, depending on the extent of structural modifications to the building. We will investigate the extent of these evaluations further in the design development phase.

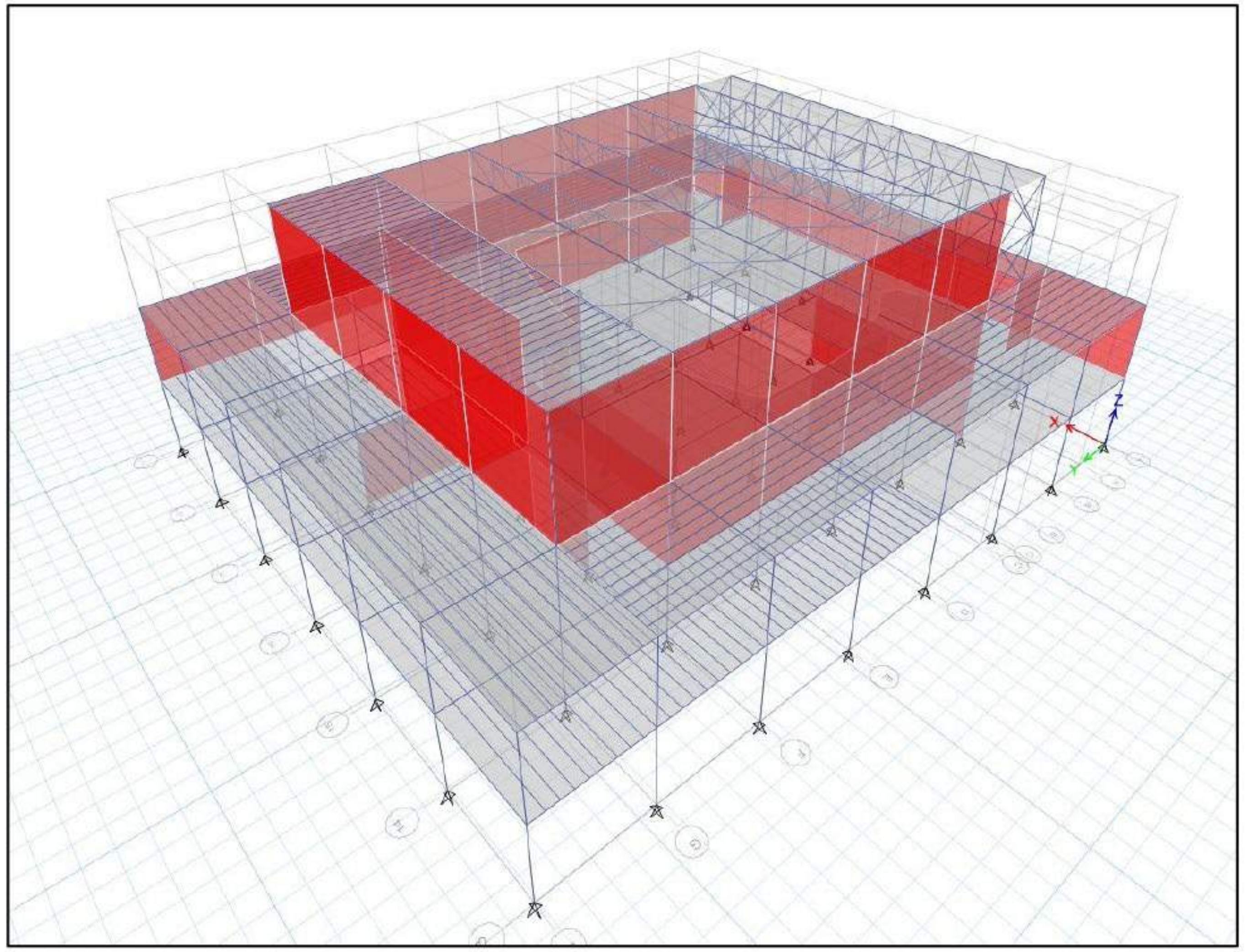


Figure 1 Etabs Model of the Existing Structure

- During the design development phase of the project, further work will be completed to verify these findings. If it is found that this load path is not sufficient in certain areas, interior masonry partitions could be identified and detailed as shear wall elements to carry additional seismic loads to the foundations. If this method is not appropriate, localized strengthening of the existing structure could be added. At this stage of the project, we recommend that masonry ties be allowed for during costing. These ties would be in the form of L127x127x6.4 continuous angles, added along the top of all existing masonry walls east of existing gridline 13. We would estimate this length to be 200 Lm of angle.
- We have made some progress in developing a computer model of the existing structure and performing some preliminary analyses during the schematic design phase. Our current design model, prepared using the structural software Etabs, is shown below in Figure 1.

4.6.1.3 EXISTING STRUCTURE MODIFICATIONS AND DEMOLITION

At Second Floor, immediately north of existing lobby stair, the existing structure will be demolished locally to create an open, double-height space. The concrete joist and slab will be removed, but the beams tying the concrete columns will remain.

The new stair from Second to Third Floor will require a new opening at the east side of the building, within an area adjacent to the balconies. Concrete slab and joists will be demolished as part of this work. Refer to the Second and Third floor plans found in Section 6.2.3 below.

All efforts will be made to avoid strengthening of the existing floors. If strengthening is required, new steel plates will be installed below the existing floor structure, and every effort will be made to avoid disturbing existing services. In some areas, strengthening will be required due to modifications made during the proposed renovation and expansion.

Due to the new snow drift resulting from the addition of roof area, the reinforced concrete joists located at the roof of the building west of the SUB Myer Horowitz Theatre will require strengthening.

Due to missing information in existing drawings, the capacity of the third floor structure at the north of the building cannot be determined. A field investigation is required to determine the existing reinforcement within the joists. This area is identified in Figure 5 below. We propose that these investigations occur during the Design Development phase of the project. At this stage, an appropriate allowance should be carried for structural strengthening in this area.

4.6.1.3 EXISTING FOUNDATION

The existing foundation system appears to be acceptable to carry the additional gravity loads from the new floor and roof at balcony level. However, current calculations are being developed to be determine the lateral capacity of the existing structure and its effect in the foundation loads

Mark	Count	Shaft Ø (mm)	Bell Ø (mm)	Vertical Reinforcement	Horizontal Reinforcement	Pile Length (m)
P1	16	500	1500	5-20M	10M @ 300	18

4.6.2 NEW STRUCTURES

The framing for the new floor space above the existing third floor will be supported directly on existing concrete columns. The selection of the roof framing system for this new structure was based on minimizing the loads that will be transferred to the existing building. The structural system for the north addition consist mainly of reinforcement concrete elements, with steel framing above Third Floor.

The following describes the structural members for the new addition of the SUB Myer Horowitz Theatre in more detail.

4.6.2.1 FOUNDATIONS

The SUB Myer Horowitz Theatre Renovation and Expansion will be founded on cast-in-place concrete, belled piles.

Sizes and lengths of the piles will depend on the soil bearing capacity specified by the geotechnical engineer. For the purpose of this report, a factored bearing capacity of 1000 kPa was assumed at a depth of 12m below ground level. This assumption is based on previous reports prepared for sites in this area. We recommend that a geotechnical report be prepared early in the design development phase to determine these parameters.

Note that demolition of existing stair shaft and foundation walls will be required to install three piles at this area. Early discussions with a piling contractor are required to assess accessibility of the piling rig. Backfilling or temporary shoring might be required to facilitate the installation of these piles.

A clear path should be provided for the piling rig to access the working space. Some obstacles like bollard posts might be required to be removed

4.6.2.2 SUB-STRUCTURE

The sub-structure to grade will be constructed from reinforced concrete. 300 mm thick reinforced concrete walls will be used at elevator and stair case shafts. The concrete walls will contain roughly 90 kg/m3 reinforcing steel.

Refer to Figure 2 below for Foundation level and substructure preliminary structural framing plan and layout.

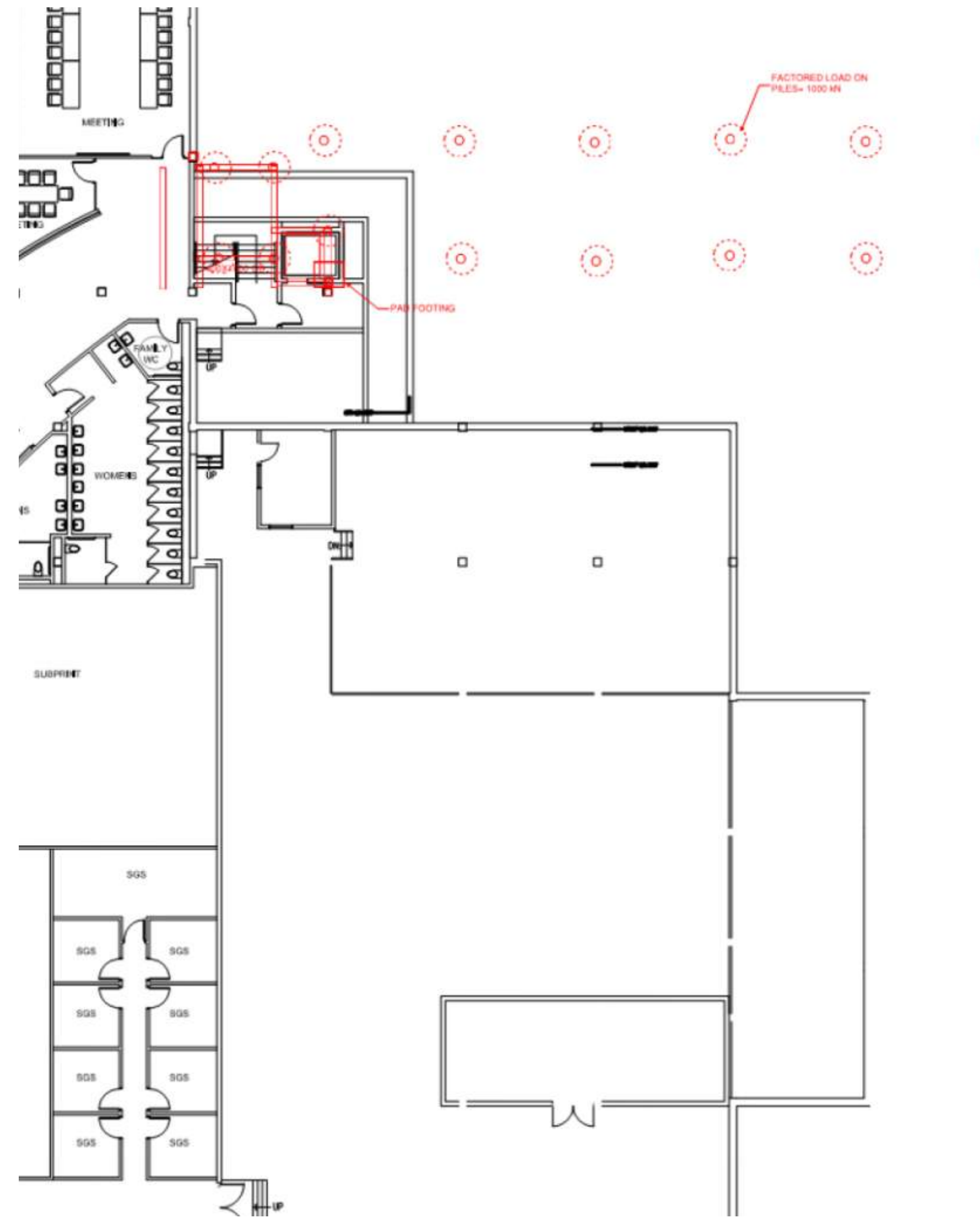


Figure 2 Foundation Plan

The construction of the floors at elevator and stair shaft areas will consist of a 150 mm slab on a 200 mm thick compacted granular sub-base. A slab thickening will be required to support the stair. Again, the slab and sub-base construction is based on assumed parameters, and these must be confirmed by the geotechnical engineer during the next phase.

A drainage board and weeping tile system will be constructed around the perimeter of the stair and elevator shaft walls acting as foundation walls.

Cantilever 600 wide by 1300 deep grade beams will provide support to new columns adjacent to the existing building. These grade beams will be placed to avoid installation conflicts with piles located below existing columns. 300x600 grade beams to support perimeter glass at main lobby will be provided. The grade beams will contain roughly 150 kg/m3 reinforcing steel.

A 150 mm slab on grade on 200 mm thick compacted granular sub-base will be placed at main level. The slabs-on-grade will contain roughly 8 kg/m2 reinforcing steel and will require contraction joints (e.g. saw-cuts) every 3,000 mm in both directions maximum.

4.6.2.3 SUPERSTRUCTURE

4.6.2.3.1 MAIN, SECOND AND THIRD FLOOR STRUCTURE

Second and third floors will be constructed from 200 mm thick reinforced concrete two ways slabs supported by 350 wide x 550 deep reinforced concrete beams. The beams are in turn supported by reinforced concrete columns. These slab, beams and columns will contain roughly 20, 150 and 250 kg/m3 reinforcing steel, respectively.

The 300 mm thick reinforced concrete walls at elevator and stair case shafts will continue from basement level and will extend beyond third floor, to the roof level.

Refer to Figure 3, 4 and 5 below for Main, Second and Third Floor preliminary structural framing plans and layouts respectively.

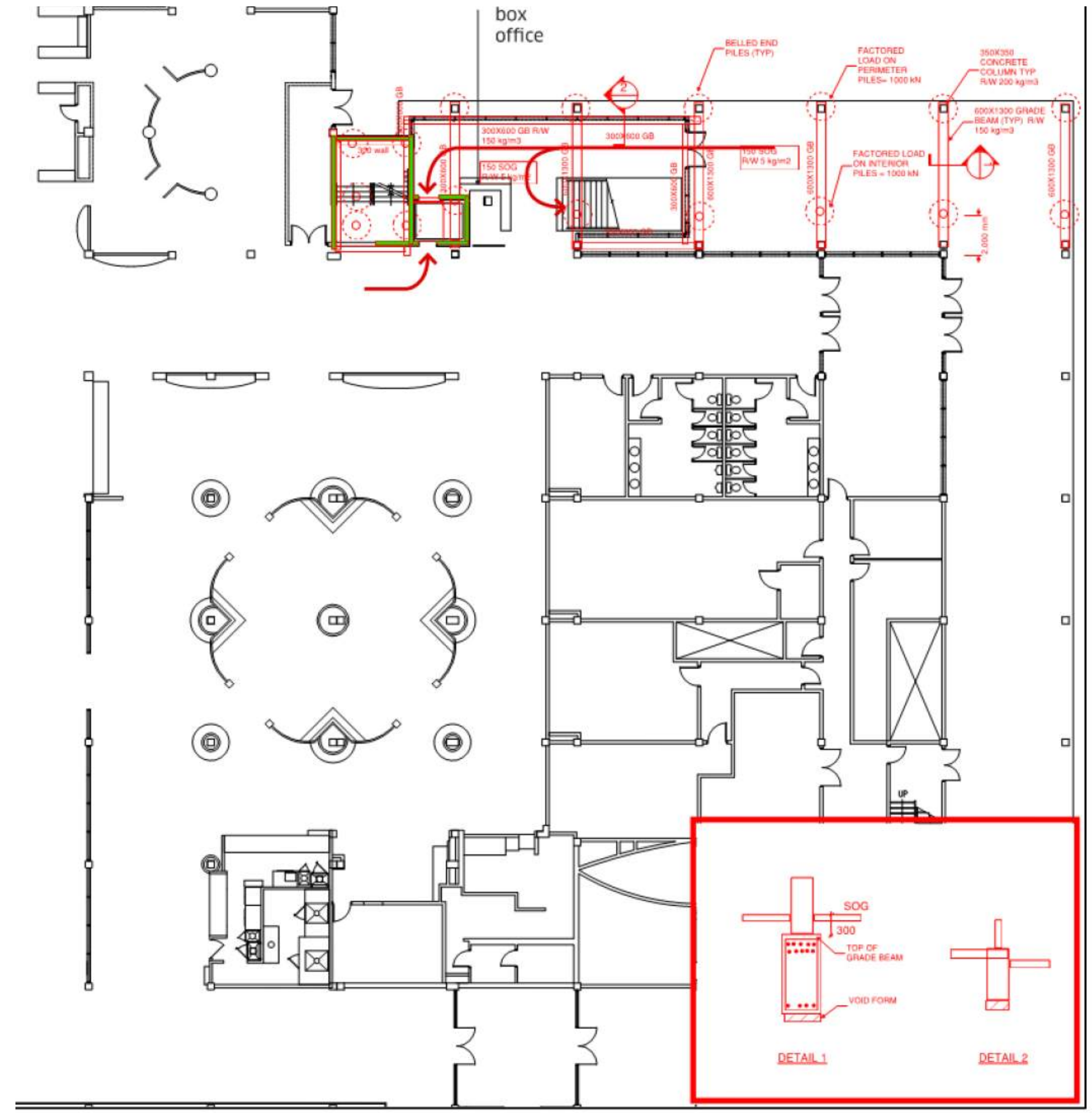


Figure 3 Main Floor Framing Plan

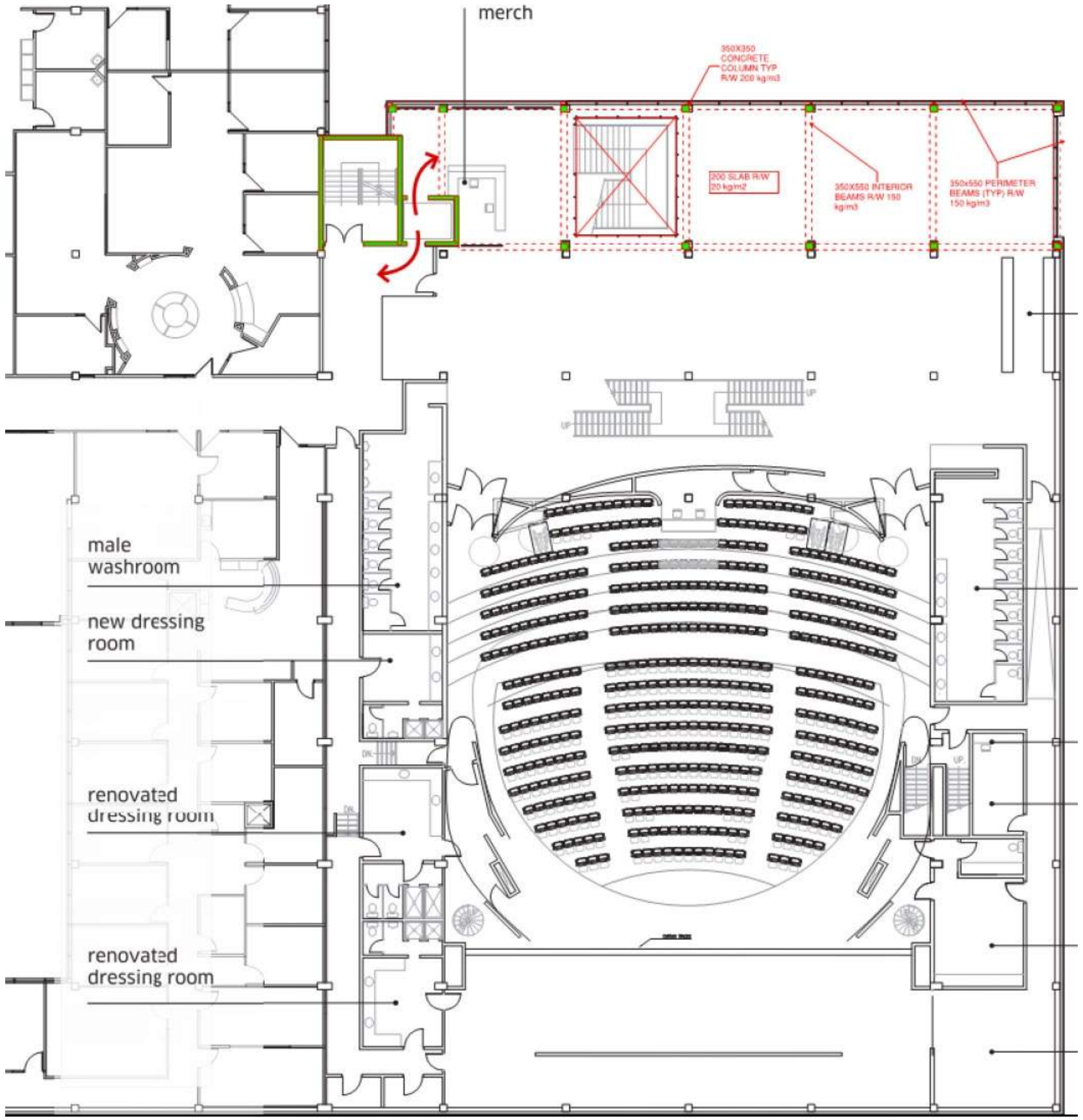


Figure 4 Second Floor Framing Plan

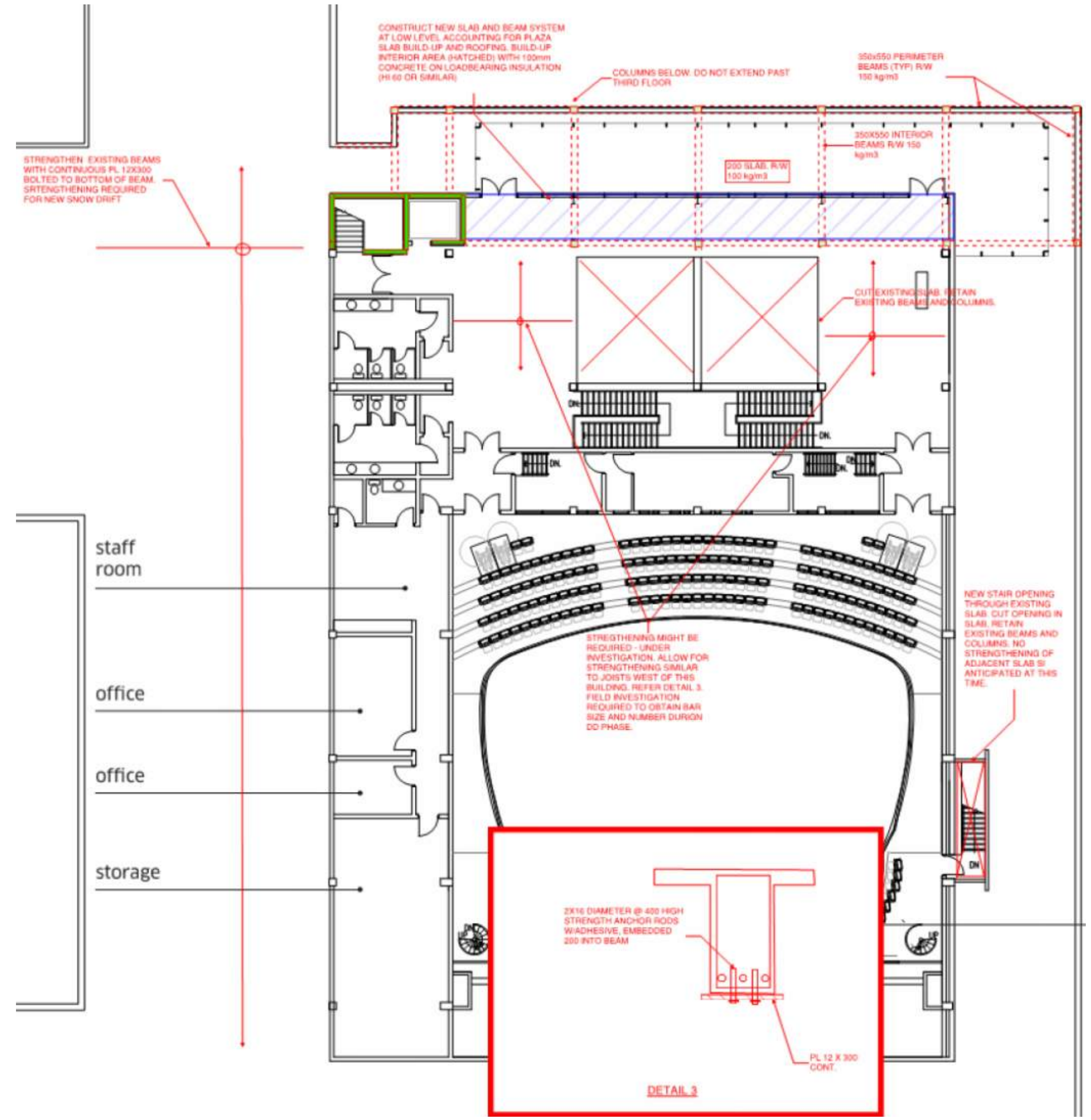


Figure 5 Balcony Floor Framing Plan

4.6.2.3.5 ROOF STRUCTURE

The framing above the Third Floor level will be constructed from structural steel as follow:

- Columns: HSS 152x152 sections.
- Open web steel joists (OWSJ) will be predominately used for the roof structure. The joists are supported by W-sections (mostly W310).
- Steel roof decks will span between the OWSJ.
- The roof framing will be attached to the existing structure.
- Refer to Figure 6 below for the roof preliminary structural framing plan.

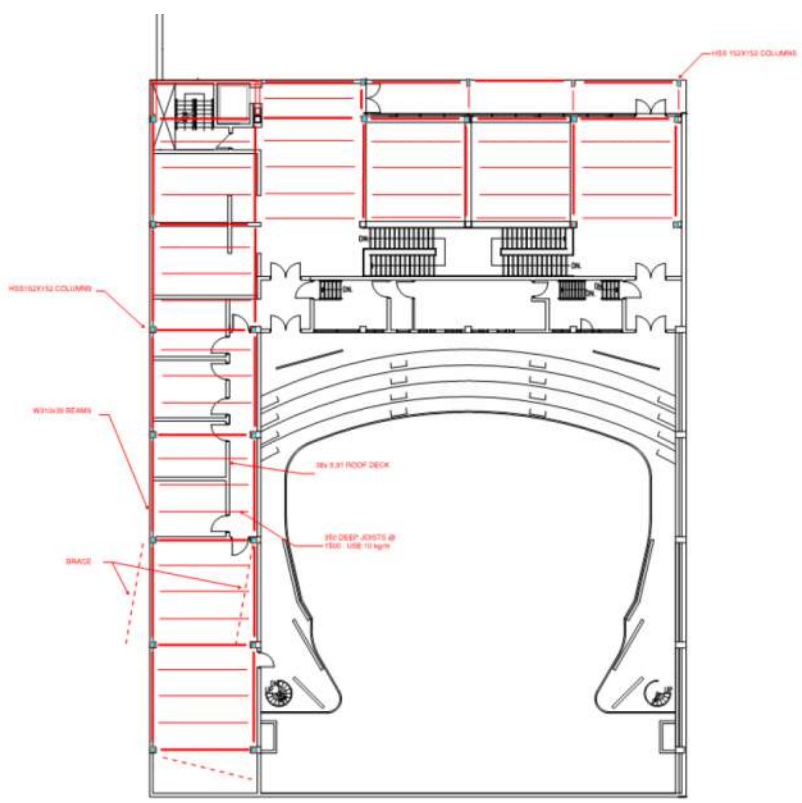


Figure 6 Roof Framing Plan

4.6.2.3 LATERAL LOAD RESISTING ELEMENTS

Lateral load resisting elements will be required to stabilize the new expansion structure at the SUB Myer Horowitz Theatre Renovation and Expansion for lateral winds and seismic loads. Where possible, the lateral load resisting elements will be incorporated into the elevator and stair shafts.

For concrete floor and roof construction, reinforced concrete shear walls will be used to stabilize the building. Where structural steel is used for construction, structural steel cross bracing or reinforced concrete shear walls will be used to stabilize the building. Preliminary layouts for these stabilizing structures can be found Figures 2 to 6 above.

4.7 Quantities

The reinforcing steel quantities tabulated in Table 4 below as a function of floor area or concrete volume may be used for the costing of the reinforced concrete systems when quantities are not shown on the drawings or specifically noted above.

Table 4 Reinforcing steel estimated quantities.

Component	Quantity
Pile caps	90 kg/m³
Columns	250 kg/m³
Foundation walls	90 kg/m³
Shear walls, elevator core walls, and stair shafts	250 kg/m³
Slab-on-grade	8 kg/m²
Typical suspended two-way flat plates and slabs	20 kg/m²
Beams and girders	150 kg/m³

In determining reinforcing steel quantities for beams and girders, the concrete volume is determined by multiplying the total depth of the member by the web width. In determining quantities for flat plates and slabs, the out-to-out floor areas should be used in calculations and areas should not be deducted for beam and girder or column plan dimensions.

4.8 Cost

Drawings have been prepared to show the structural intent with respect to the primary framing members, the lateral load resisting system, and joint arrangements. Some secondary miscellaneous structural elements are not shown at this stage. An appropriate cost allowance for these items should be made.

In determining overall building cost estimates from the information presented in this report, appropriate allowances should be made for atypical geometry, heavily loaded areas, and special framing required to suit the functional requirements of the other disciplines.

Cost estimates should include allowances for the following non-exhaustive list of elements:

- L127x127 angles along the top of existing masonry partition walls, as described in Section 6.1.2 above.
- Housekeeping pads located below all floor supported mechanical units. Refer to mechanical drawings for quantity and sizes.
- Weeping tile required at all basement perimeters.
- Secondary steel rails and brackets for elevators/lifts.
- Ladder access to roof areas for maintenance.
- Roof steel (including accessible roofs) to be sloped at ± 2 % to facilitate drainage.
- Guards/handrails at all internal edges.
- Overhead door framing.
- Framing for non-structural architectural elements.
- Cast-in plates required at all steel/concrete interfaces where not noted otherwise.
- Structure required for all external landscaping, entrance slabs, apron slabs, artwork and light poles.
- The forming of mechanical and electrical rooms and openings on the various floors, including pads, curbs, catwalks, and so forth.
- Special framing around mechanical and electrical shafts and risers.
- Cast-in supports and pockets for exterior cladding, glazing, mechanical equipment/louvers, screens and railings on the various levels.
- Exterior structures such as retaining walls, planters, walks, curbs, and so forth.
- Temporary excavation support systems.
- Potential increased pile depths due to unanticipated soil conditions.
- Cambers for all horizontal structural members greater than 6 m in length.
- Penetrations for mechanical and electrical services.
- Window washing and fall arrest supports.

A study of the capacity of the existing roof framing to support the new stage loading was carried out. The finding showed that there is enough capacity to support the preliminary specified loading and that strengthening of the existing members is not required.

4.9 Risk Assessment

The structural information included in this package was developed for conceptual architectural design drawings. Structural member sizing was undertaken for only representative elements in typical areas. There is the potential for structural design complications and increased costs to occur since detailed input regarding the following elements of the work has not yet occurred:

- Glazing support.
- Lateral load resisting elements.
- Window washing requirements.
- Acoustic requirements.
- Elevator and escalator requirements.
- Mechanical and electrical equipment loads.
- Mechanical and electrical penetrations through the structure.

We have assessed the following items to carry a risk to the project moving forward, both with respect to cost and to feasibility of the proposed layouts. We will be looking to address and resolve these items in the Design Development phase of the project, reducing these risks in the process:

- Stability of the existing structure under seismic loads, including requirements for additional bracing and strengthening.
- Geotechnical requirements with respect to foundations and slab-on-grade structures.
- Piling methods around existing structures.
- Excavation and shoring requirements.
- Ground contamination of in-situ soils.

4.10 Closure

The structural systems for SUB Myer Horowitz Theatre Renovation and Expansion provide a balanced approach to safety, comfort, functionality, economy, aesthetics, and sustainability. We will continue to develop the structural design in concert with the work of the full team as the project evolves.

5. MECHANICAL

5.1 General Overview

5.1.1 Introduction

This section defines the mechanical renovations to the Student Union Building. The work includes four main scopes: the expansion of the building, the Myer Horowitz Theatre renovation, and mechanical/electrical base building upgrades. While the project is not pursuing a LEED rating or other form of certification, good engineering practice with sustainable goals are still included in the design.

Existing mechanical system capacities have been based on existing drawings and site visits. Preliminary cooling and heating load requirements have been completed using schematic architectural layouts. System capacities will be finalized with detailed heating and cooling load calculations through the design development phase and in conjunction with the details of the building envelope construction to be developed by the architectural team. Based on these initial findings, the existing capacities will meet the new design requirements. Some of the main mechanical equipment is due for replacement because of age. There are construction efficiencies that may be gained by completing those at the same time as the project.

General Mechanical Design Criteria are as follows;

- Cost effective design for the mechanical systems. This is particularly important to obtain the best mechanical value in terms of life cycle while meeting the budget constraints.
- High ventilation effectiveness for increased indoor air quality.
- Utilize hydronic based systems wherever possible to save fan energy utilized by continuously operated fan systems.
- Limit water use in the new facility while maintaining important characteristics such as maintainability and performance for plumbing fixtures.
- Reduce energy usage wherever possible to provide long term sustainable performance from the facility.
- Elegance and simplicity of design to allow ease of operation of the mechanical systems.
- Integration into the design and finishes of the spaces.

5.1.2 Design Criteria

Design Criteria for the typical room types are as follows:

Heating and Cooling capacities will be based on the following criteria for peak winter design conditions, and defined in the Alberta Building Code.

- Outdoor design temperature: -33°C winter design condition, 28°C DB/19°C WB summer design conditions
- Indoor space temperature: 21°C winter, 24°C summer.
- Indoor space relative humidity (minimum): 30% minimum. This will typically require humidification to maintain these levels in winter conditions.

5.1.3 Code and Code-Referenced Standards

The mechanical system design is in accordance with all applicable codes and regulations of the local inspection authorities having jurisdiction.

- Alberta Building Code current edition
- Alberta Fire Code current edition
- National Plumbing Code of Canada current edition
- ASHRAE 55 – Thermal Environmental Conditions for Human Occupancy
- ASHRAE 62.1 – Ventilation for Acceptable Indoor Air Quality
- National Fire Protection Association (NFPA) Standards:
- NFPA 10: Portable Fire Extinguishers
- NFPA 13: Installation of Sprinkler Systems
- NFPA 14: Installation of Standpipe and Hose Systems
- NFPA 90A: Installation of Air Conditioning and Ventilation Systems
- NFPA 96: Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations
- SMACNA Standards for Ductwork and IAQ During Construction

5.2 Plumbing Systems

5.2.1 Storm Drainage

In the expansion, new storm drainage will consist of internally mounted rainwater leaders connected to storm water piping below grade. The roof drains will be a full flow design. Interior rain water leaders will be connected to existing storm lines, it is anticipated that lines are sufficiently sized. New patio drains will be required on the proposed exterior courtyard.

Storm drainage will consist of cast iron piping with MJ fittings or PVC piping.

5.2.2 Sanitary Drainage

Sanitary drainage will be provided for new plumbing fixture groups and connected to the existing sanitary.

Trap primers will be provided for all floor drain traps to ensure a positive seal is maintained on the trap, primer lines in concrete slabs will be plastic.

Sanitary drainage will consist of cast iron piping with MJ fittings or PVC piping.

5.2.3 Domestic Water Supply

Domestic water will be supplied to the new plumbing groups and roughed into bar areas. Domestic water will be extended from existing lines. The size and capacity of the existing lines will be reviewed during design development to determine which ones will support the additional loads.

Domestic water piping will consist of Type L copper minimum with Type K copper on domestic hot water recirculation lines.

5.2.4 Plumbing Fixtures

Two main washroom groups are located on either side of the theatre, as well as new washrooms on the third floor. Refer to the architectural floor plans for layouts and fixture numbers. The dressing rooms west of the theatre will be renovated with new fixtures including new showers. New private washrooms will be included in the green room and staff room on the third floor.

Plumbing fixtures will be selected based on the following criteria:

- Provision of high performance fixtures capable of performing the required service at lower water flows. Therefore, all water closets must have a Maximum Performance Test (MAP) rating of 1000 to ensure high performance. This testing is undertaken to verify manufacturer claims of high performance using test media.
- Provision of cost effective plumbing fixtures that provide these performance metrics.

5.3 Heating, Ventilation and Air Conditioning (HVAC)

5.3.1 Heating

Primary Source

Steam is provided from the Universities central plant which is converted to hot water using heat exchangers in the basement mechanical room. The envelope is not increasing substantially so the hydronic systems have adequate capacity.

Building Distribution

The building distribution system will be extended to provide heating to perimeter heating loads. Exterior perimeter heating panels will be provided along the new perimeter. It is anticipated that radiant fin with stainless steel cabinet will be used between columns.

During DD, a traffic study will be completed to determine if air curtains are required for the new Force flow units. These will be provided in entranceways to provide heating and will be ducted to linear diffusers. New reheat coils on the terminal boxes will be connected.

The theatre has existing radiation to offset the roof loads which will remain. This allows the air handling unit to shut down.

5.3.2 Cooling

Primary Source

The primary cooling source will be the existing cooling air supply from the basement. The chilled water system from the U of A district system has adequate capacity to supply cooling. Supplemental cooling will be provided by routing new chilled water lines up to the lobby. The chilled water lines will be connected to the return chilled water prior to return to the U of A.

Building Distribution

Supplemental cooling will be provided by either chilled beams or fan coils. These units will be designed to use return chilled water to attempt to widen the chilled water temperature differential. Chilled beams will be supplied from a temperature controlled loop to prevent condensation. If fan coils are used, they will be located above an area which is not as acoustically sensitive and provides access for maintenance.

5.3.3 Ventilation

Ventilation systems will provide adequate ventilation air to meet minimum air changes required by the cooling load, occupancy and the multiple space equation of ASHRAE 62.1.

Variable air volume systems will be utilized for variable load areas such as support rooms, lobby areas, and miscellaneous rooms. The main theatre will be configured as a variable single zone unit.

Theatre/Lobby Units

The theatre and lobby are served by two main air handling units. Based on preliminary calculations the air volumes do not have to increase and therefore the units could potentially remain, however they are original to the building and were installed in 1967. The Facility Condition Assessment (FCA) report dated October 12, 2016 notes that the units are in poor condition including issues with the cooling coils, poor mixing, and lack of preheat coils. Upon the review of the drawings and with site visits it was determined that the configuration of the outdoor air and return air plenums prevented an accurate distribution of outdoor air to each unit.

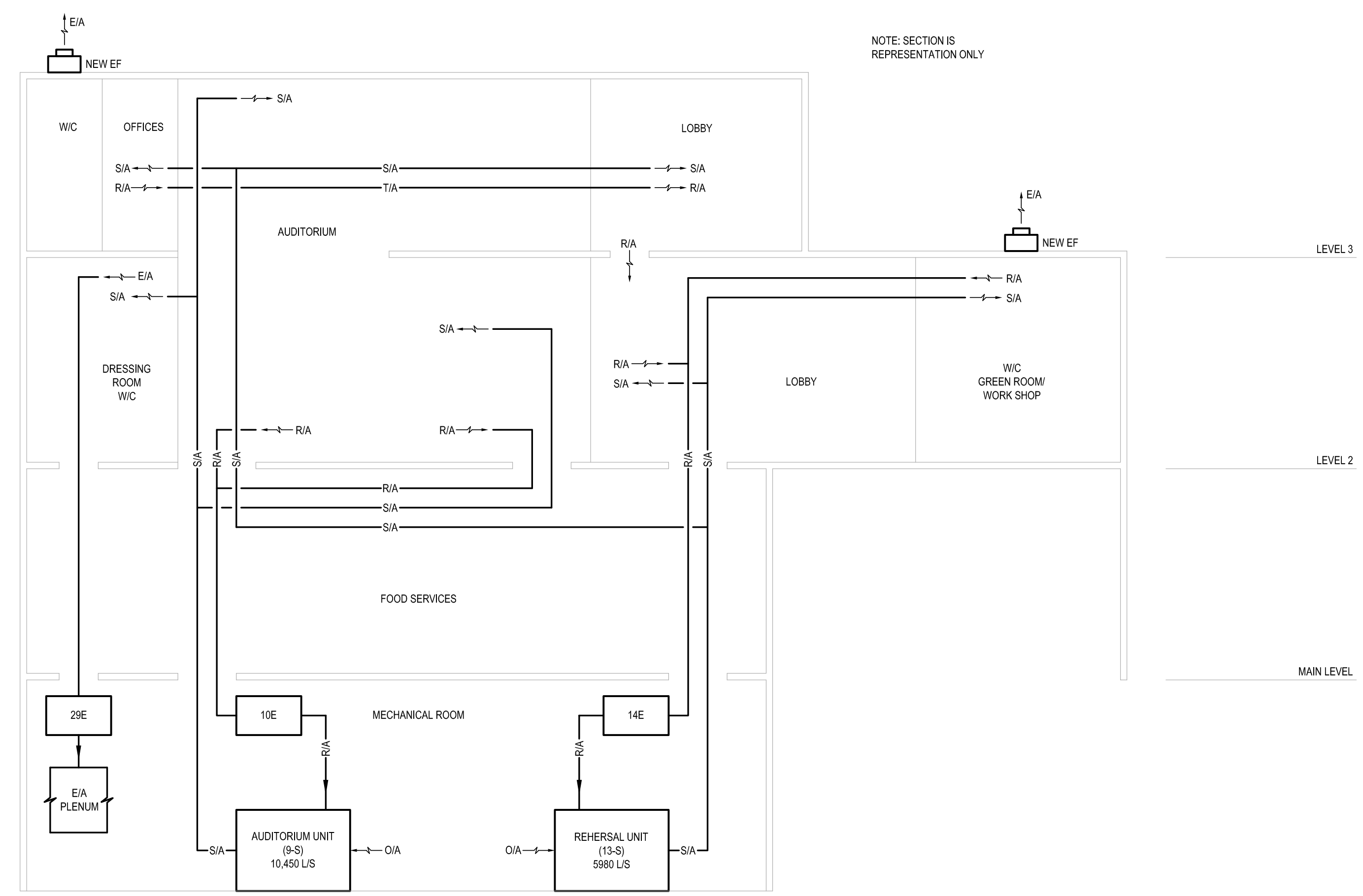
The two air handling units are

- AHU-9-S Auditorium: 22,500 cfm
- AHU-13-S Rehearsal: 12,670 cfm

Both will require new cabinets, coils, fan arrays, VFD's, humidifiers, filters and controls. The existing dampers have been replaced and can be retained. The tight constraints of the mechanical room will require the units to be stick-built on site. A new pre-heat coil will be included which will be connected to a glycol heating system at a later date. This will allow the University to slowly upgrade all units and eventually confirm proper outdoor airflow to each space.

The Theatre (or Auditorium) unit is currently controlled on by the aisle lights. This will continue to be the strategy which provides energy savings when the theatre is unoccupied. An acoustic analysis of the theatre will take place during Design Development which will influence any additional acoustic measures required for the mechanical systems. This may include new silencers or acoustically lined ductwork.

By replacing the units during the same time as the theatre and lobby renovation, a separate shut-down of the spaces would not be required. Contractors would also be on site already.



Theatre Ventilation Riser

Air Distribution

Since the same air volumes are used, the main supply and return ducts can remain and the shafts through the main floor do not have to be revised. Air will be provided through medium pressure ductwork to VAV boxes and low pressure ductwork to the auditorium.

All new diffusers will be provided for the lobby spaces to suit the interior design layout. It is anticipated that these diffusers will be a linear type running parallel to the exterior wall, and integrated with the ceiling system.

Exhaust Systems

Exhaust from public washrooms will be exhausted to the exterior, and connected to existing exhaust systems where possible.

Humidification

Steam humidification manifolds will be installed in each air handling unit and will be served from the existing U of A steam supply.

5.4 Controls

General

The control system will be an extension of the existing BMS which is connected to the University Control Center. The theatre will continue to be controlled by connection to the aisle lights to start and stop the theatre unit.

The control system will be displayed on the operator's workstation complete with intuitive operator graphics to allow ease of operation of the systems. The control system will provide full PID control of each system which will be tuned during the commissioning process. The control system will also have trending and energy management capabilities to ensure energy use is monitored.

5.5 Fire Protection and Life Safety Protection

5.5.1 Fire Protection

The theatre and lobby spaces will be fully sprinkled throughout and existing sprinkler mains will be reconfigured as required. The theatre and lobby areas will be provided with fully concealed sprinkler heads and semi-recessed sprinkler heads in common areas. Fire extinguishers will be located in flush mounted cabinets located at exits and intermediate locations where required.

5.5.2 Smoke Exhaust

The interconnected floor space from the three levels will require a new smoke exhaust fan. The smoke exhaust fan will have to exhaust the space at a capacity of four (4) air changes per hour. The theatre space will also require a smoke exhaust fan.

5.6 Commissioning

5.6.1 Mechanical Systems Commissioning

To provide assurance that all mechanical systems are installed as designed and are fully operational at the time of operation, a comprehensive commissioning and start-up program will be part of the construction process. The program shall ensure that the systems are trouble-free at the time of take-over and that maintenance staff are fully trained in their operation.

The commissioning process will include design analysis, installation monitoring, testing and correction of deficiencies for all mechanical systems.

5.7 Sustainability

Summary

The project sustainability objectives can be summarized as follows:

- Low flow plumbing fixtures for reduced water consumption.
- Variable volume air system to lower fan energy.
- Continuing to use hydronic perimeter heating.
- Introduce hydronic cooling systems for supplemental cooling in expansion.
- Controls which allow units or terminal boxes to shut down when space is not in use.
- New glazing with better thermal performance within the expansion foot print.

6. ELECTRICAL

6.1 Summary

The Myer Horowitz Theatre is located in the Students Union Building (SUB) which was constructed in 1967. With the exception of some minor upgrading and power panels that were added after the original construction, it appears that most of the electrical installation in the theatre dates back to 1967 and is in marginal condition. Electrical distribution equipment and light fixtures have a rated life of 30 years but installation in the theatre is reaching 50 years of age, so replacement and upgrading is recommended to maintain reliable and safe operation.

The electrical equipment in the theatre receives power from various distribution panels located in the SUB. In addition to providing power to the theatre systems, this distribution equipment also services areas and equipment in the SUB that are not directly associated with the theatre. This is not the recommended method of providing power for the sensitive electronic systems used in modern day theatres. The preferred power distribution for theatres is to provide a dedicated power distribution system for the theatre itself so that power supplies for production lighting and production sound systems can be isolated from the power supplies for general equipment and lighting. To accomplish this, it is proposed to provide new distribution equipment in the theatre to service only theatre equipment and that this distribution equipment will be fed with a dedicated power feeder from the SUB main electrical room.

Through the electrical upgrading, there are several contributions that can be made to the sustainable design of the theatre. The most noticeable will be upgrading the lighting from fluorescent and incandescent light sources to LED. The change to LED lighting will reduce energy use and lower maintenance requirements. LED lighting is also mercury free and reduces the amount of materials being sent to the landfill because LED's long life reduces the need for regular re-lamping which is necessary with the existing light sources in the theatre. In addition, the upgrading will include energy efficient transformers which will help contribute to the overall reduction in energy usage, while proper switching and lighting control will contribute to the controllability of systems, along with providing improved building operation.

6.2 General

The electrical system design will be in accordance with the requirements of the Canadian Electrical Code and the regulations of the local inspection authorities having jurisdiction.

The electrical equipment, lighting fixtures, and other electrical components specified will be based on readily available and standardized products wherever possible.

The electrical design will utilize up-to-date technology while giving due consideration to safety, flexibility, reliability, ease of maintenance, energy efficiency, and cost.

The electrical design and installation shall be in accordance with the guidelines as identified in the documents prepared by Schick Shiner and Associates.

The electrical systems work shall include but not necessarily be limited to the following:

- New 600V power service to the theatre from the existing main switchboard in basement level of the Students Union Building. This will involve adding a 600A power circuit breaker in an existing spare cell in the main switchboard.
- Rough-in conduit for Sound Video and Communications systems for the Theatre Equipment
- New distribution equipment will be provided as required.
- Power outlets and convenience receptacles throughout the redeveloped areas.
- Wiring and connection of bar and food service equipment in the lobby area.
- Power wiring for motorized doors and conveyance equipment.
- Base building lighting including work lights, house lights, emergency and exit lighting.
- Lighting controls (low voltage and local dimming) where not part of the production lighting dimming system.
- All conduits, back boxes, pull boxes, and terminal cabinets.
- All wire and wire pulling, except for the sound and performance communication system signal wiring in the theatre.
- All power distribution for the production and house lighting systems in the theatre.
- All permanently installed and moveable fixtures for house lighting, work lighting, back of house lighting, support space lighting, common area lighting and lobby lighting.
- Conduit system and horizontal cabling for data/telephone outlets.
- Conduit system and cabling for cable television outlets.
- Upgrades, modifications and additions to the base building fire alarm system and verification.
- Modification and additions to the base building security system.
- Power wiring to all architectural systems including hand dryers, power assisted doors, motorized blinds, etc.
- Theatre Equipment Fit-out
  - theatre equipment to be provided through Schick Shiner
- Supply and installation of the electrical accommodations required for the house and performance lighting DMX dimming system in the theatre.
- Supply and installation of the plug-in boxes used for distribution of house and theatrical lighting circuits in the theatre. The sound and performance communication system equipment and wiring is provided by the sound system contractor.
- All power distribution for the sound and performance communication systems equipment.

- All power distribution to motorized theatre equipment.
- All company switches.
- Acoustical, architectural, structural, and mechanical coordination.
- Provide equipment start-up, operator training seminars and O & M manuals.

6.3 Demolition

Electrical demolition to existing areas will be provided as required to suit the architectural changes. All power distribution and lighting systems in the areas of renovation will typically be decommissioned with conduit and wiring removed.

6.4 Power

New electrical installation will be provided for the new building areas and renovated areas. This will include new power distribution equipment to accommodate the requirements of the theatre.

Special event power centres (company switches) will be provided in the theatre for use by traveling shows. Company switches to be complete with NEMA 3R enclosure, main breaker, indicator lights and camlock receptacles. Equal to stagecraft Industries - Series 7.

Electrical rough-in will be provided for connection of motorized theatre equipment as required.

Electrical installation will be provided as required for mechanical equipment changes and upgrades. Refer to the mechanical design report for additional details. Where new motor starters are required they will be combination type, complete with motor circuit protectors (MCP's), contactors, overloads, control switches, indicating lights, auxiliary contacts, terminal blocks and control transformers.

Provide electrical installation for the following proposed mechanical upgrade in the main mechanical room on the basement level of the SUB Building:

- Remove and disconnect two existing supply air fans and two existing return air fans. All fans are single speed with motor starters located in existing MCC #1.
- Wire and connect two new supply air fans and two new return air fans c/w with VSD's. Motor sizes will be approximately 25hp, 7.5hp, 40hp and 7.5hp. Convert the existing motor starters in the MCC to molded case circuit breakers to feed the new motors. Utilize DriveRX cable between the VSD's and the motors.

Convenience outlets (power receptacles) shall be provided as per user requirements and in areas as required by code. Standard convenience outlets to be white in colour. All device coverplates to be white "nylon" type except in areas subject to damage where stainless coverplates shall be provided. At locations with power receptacles and voice/data outlets provide multi-service outlet system equal to Hubbell – Multi-Connect. Special outlets for theatre and other specific equipment will be provided as required. Separate neutral and ground wires to be provided for computer equipment receptacles.

All building wiring, unless noted otherwise, will be 98% conductivity copper with minimum 600-volt insulation. Branch circuit wiring will use #12 AWG as the minimum size conductor. Wiring for data receptacles will have a dedicated ground and neutral wire per circuit. General convenience receptacles and lighting circuits can utilize shared ground and neutral wires. Shared neutrals to be minimum #10 AWG. Ground wires to be minimum #12 AWG.

The distribution system will consist of a standard conduit and wire system, with conduit provided to each outlet.

6.5 Interior Lighting

New interior lighting will be provided to suit the architectural concept and function of the spaces. Generally this will include accent, task and work lighting. Lighting will utilize LED sources.

Lighting will be designed so as to provide a comfortable and relaxed atmosphere for patrons and staff, while providing adequate illumination to meet the functional requirements of the space. Some of the parameters to be used for determining the various lighting systems will include:

- Quantity of light
- Quality of light
- Energy consumption of the light

Manual switching will typically be used to provide local control of lighting in areas such as dressing rooms, offices, storage rooms or janitorial closets. Where suitable, occupancy sensors will be provided to turn off lighting.

For the theatre, permanently installed fixtures will be provided for house lighting and work lighting. House lighting fixtures will be LED type and controlled through the theatrical dimming system.

A system of work lights shall be provided in back of house areas and in the cat walk area to serve as general lighting for cleaning, maintenance and production set-up. Work lights shall be LED type strip lights controlled through a low voltage switching system. The LED strip lights shall be complete with wire guards. The strip light housing and wire guard shall be finished in flat black paint. The work lights shall be zoned switched with switch banks located at each entrance door into the theatre. In addition, a centrally located switch bank complete with lockout switch will be provided at a designated location in theatre. The theatre will have multiple work light zones.

Work and set-up lighting for the stage area will utilize the LED production lighting fixtures.

A new theatrical DMX dimming system will be provided to serve the theatre. The base building electrical contractor shall provide electrical rough-in and connections for the performance lighting system. The base building electrical work associated with the theatrical and house lighting systems shall include but not limited to the following:

- Power distribution including transformers.
- Power feeds for the production lighting fixtures from dedicated production lighting power panels.
- Power feeds for the house lighting fixtures from dedicated house lighting power panels.
- Power supplies for the DMX controller(s).
- Wiring for connection of theatrical lighting control console in lighting booth.
- All house lighting luminaires and CAT 6 control wiring from the DMX controller(s).
- House lighting fixtures will be LED type with dim to black driver, equal to Chroma Q – Inspire Series.
- All theatrical lighting circuit outlets and CAT 6 control wiring from DMX controller(s). The CAT 6 wiring from the DMX controller(s) shall loop through DMX nodes which are located near the fixtures being controlled.
- Empty conduits and boxes for accessory lighting control system.
- Emergency power transfer relay panel to turn on selected house lighting and work lighting fixtures when there is a power failure.

The performance lighting luminaires and accessories, the performance lighting DMX controller(s), control console and accessories, and the accessory lighting control system will be supplied and installed by the theatre equipment contractor.

LED aisle lighting will be provided in the theatre to allow for patrons to safely leave or enter during a performance. These fixtures will be on emergency power and operate 24/7.

The vestibules into the theatre chamber will be provided with overhead downlighting with dim to black drivers. These fixtures will be DMX controlled through the production lighting dimming system. In addition to the overhead downlighting, LED step lighting will be provided in the vestibules. The step lighting will be on emergency power and operate 24/7.

The lobby area will be provided architectural LED lighting with 0 to 10V drivers dimmable to 1%. An architectural dimming system with 0 to 10V dimmers will be used.

Washrooms will be provided with architectural LED fixtures to suit the architectural design and lighting will be controlled by occupancy sensors with adjustable time delay.

Corridors, offices and support spaces will be provided with recessed or suspending LED fixtures to suit the ceiling design.

Theatre sound, lighting and projection control rooms will be provided with LED fixtures with 1% dimming control. Local dimming switches will be provided in each room.

Dressing rooms will be provided with LED general room lights plus make-up lighting at mirrors.

6.6 Emergency and Exit Lighting

Emergency egress and exit lighting will be provided in accordance with the Alberta Building Code. Emergency egress lighting shall be provided by normal house lighting fixtures connected to the base building emergency power system. Exit signs shall be LED type except in the theatre where self-luminous type will be used.

6.7 Exterior Lighting

New exterior accent and entrance area lighting will be provided to suit the architectural concept. Exterior architectural lighting will be provided for patio and terrace areas.

Exterior lighting will be connected for control by the existing base building control system for exterior lighting.

6.8 Systems

The existing base building fire alarm system has been previously upgraded with new headend equipment. For the renovation to the theatre the existing field devices will be replaced with new addressable field devices. New devices and conduit and wiring will be provided to suit the new architectural layout. Initiating and signaling devices will be provided as required by the Alberta Building Code and in accordance with the base building standard. Smoke detectors will not be used in the theatre and the adjacent spaces. Door hold opens will be provided on the theatre chamber vestibule outer doors. Where the fire alarm system is a 2 stage system, on 1st stage strobe lights in the back of house and control rooms will flash but the theatre chamber should be silent. Only 2nd stage will strobes and horns sound in the theatre chamber.

Electrical rough-in will be provided for the performance sound system and associated controls. This shall include conduits, junction and outlet boxes, speaker back boxes and baffles. The performance sound system will be supplied and installed by the sound system contractor.

Electrical rough-in will be provided for the performance communication system as required. The performance communication system will be supplied and installed by the sound system contractor.

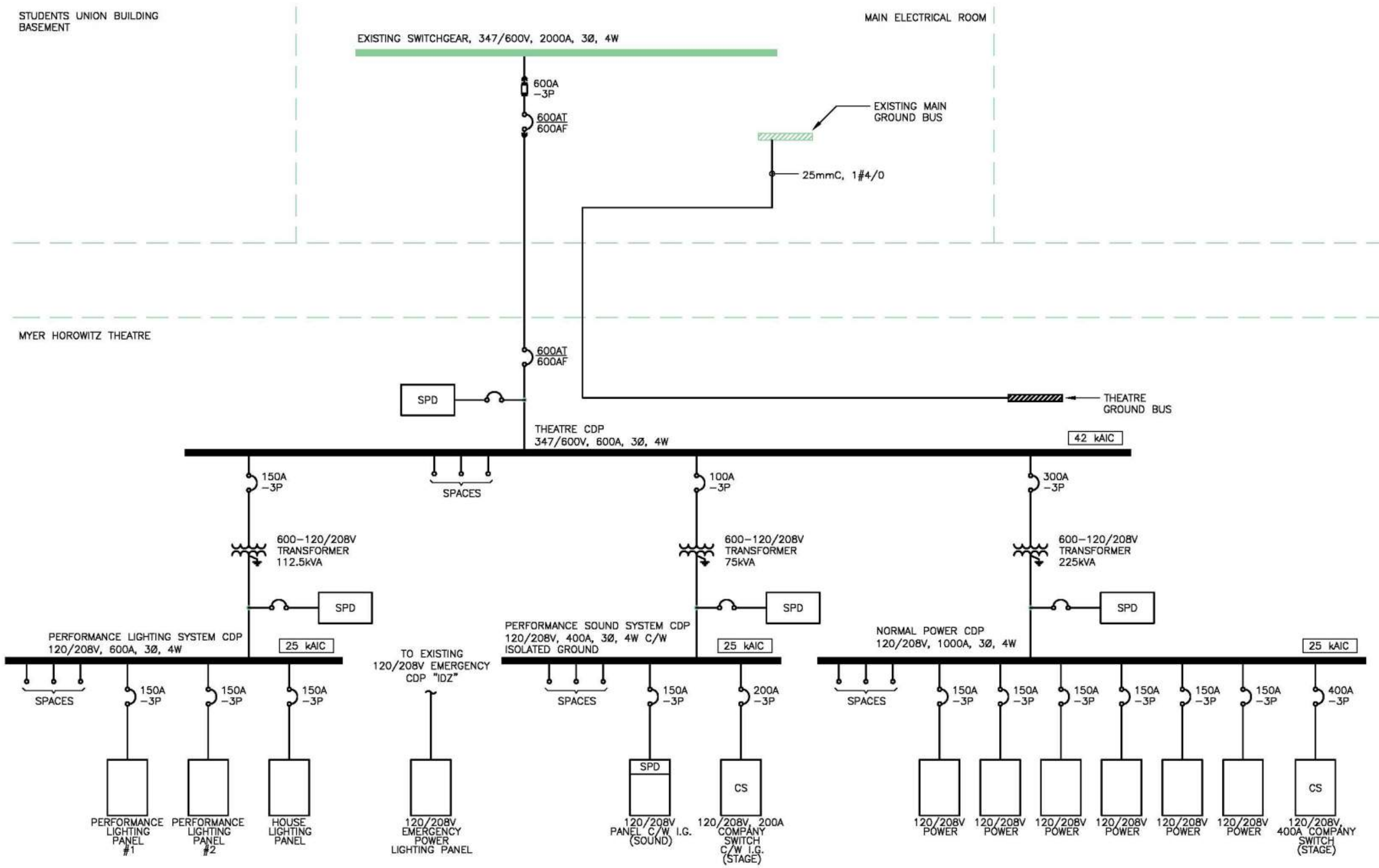
Electrical installation will be provided for distribution of IT and telecom services. All horizontal cabling, outlet jacks, cover plates, patch panels and patch racks will be supplied and installed to the base building standard.

Electrical installation will be provided for the security system as required. All security equipment and cabling will be supplied and installed to the requirements of the base building standard.

6.9 Commissioning and Performance Testing Program

To ensure that all electrical systems are installed as designed and are fully operational at the time of operation, a commissioning and start-up program will be part of the construction process. The program shall insure that the electrical systems are trouble-free at the time of take-over and that maintenance staff is fully trained in its operation. In addition, this program will insure that the facility operator receives complete and proper operating and maintenance materials.

Conceptual Single Line Diagram



7. APPENDIX

A1. Code Analysis

The original Students Union Building was constructed in 1967 with the most recent major renovations or expansions limited to the 2002 renovation of levels 1 and 2 including the infill of the existing courtyard; 2012 expansion to the south to include a student seating/gathering area c/w an acceptable solution on the interconnection between 3 levels of expansion.

The scope of this synopsis is limited to the proposed expansion to the northeast, adding a new entry to the Myer Horowitz Theatre at ground level, expand the theatre lobby at Level 2 and 3 to provide a multi-use space, reconfigure the existing exit stair from the 2002 expansion project, adding a passenger elevator from Level 0 to Level 3, renovate the theatre including replacement and reconfiguration of the seating.

- classification of the building will remain as 3.2.2.2.23 Group A Division 2, Any Height, Any Area, sprinklered.
- 1 hour FRR separation required between A2/D
- 2 hour FRR Floor and supporting Columns
- 2 Hour FRR Roof where a roof terrace is illustrated.
- New Passenger Elevator design to the 2016 Elevator Code
- Conform to sentence 3.2.8.2.(6) requires a 2 hour FRR between level 1 and level 2, this will be achieved with a fire shutter linked to the fire alarm system.
- Separation of the elevator shaft and the exit stair from the remainder of the floor plate will equal the floor to floor separation.
- With removal of the linking corridor to the exterior of the building currently located on the level 3 north side of the theatre footprint, the west exit stair was reconfigured and a second means of egress was created by extending the existing exit stair serving the level 2 theater to extend to level 3 provide a separate means of egress for Level 3 which currently does not exist.
- Exit widths will accommodate the required exit load of the existing and expanded facility
- Upgrade washrooms to the 2014 Barrier Free requirements.

A2. Costing

Construction			
Building Expansion & Lobby Renovations		7,493,041.65	
Theatre Renovation		1,981,834.15	
Mech + Elec Upgrades		842,824.50	
	Total Constructior	10,317,700.30	**10,317,700.30**
FF&E			
Building Expansion		100,000.00	
Theatre Renovation			
- Seating, 720seats at $389 each		280,000.00	
- Sound Cockpit		30,000.00	
- Stage rigging		650,000.00	
- Stage lift repair		30,000.00	
- Stage Lighting		280,000.00	
- Stage Lighting Consel		20,000.00	
- House Ligthing (160,000)		in Construction	
- Sound equipment		320,000.00	
- Sound equipment, Consels (2#)		80,000.00	
- Staff Intercom System		20,000.00	
- Video system projector plus $50,000 for other		100,000.00	
- Stage drapery		70,000.00	
		1,880,000.00	
	Total FF&E	1,980,000.00	**1,980,000.00**
Asbestos	**Total Asbestos**		**in Construction**
Consultant Fees		825,416.02	**825,416.02**
- Arhitectural, Structural, Mechanical & Electical		in above	in above
- Additional Arch, Stuct, Mech & Elec		in above	in above
- Landscape		in above	in above
- Theatre Consultant		in above	in above
- Acoustical Consultant		in above	in above
- Hazardous Materials Investigation (Asbestos)		in above	in above
- Geotechnical		in above	in above
- Survey		in above	in above
- Testing		in above	in above
- Pre Construction Services		in above	in above
	Total Consultant Fees		
Project Management			**400,000.00**
Contingency			**1,000,000.00**
	PROJECT TOTAL	-	**14,523,116.32**

A3. Schick Shiner Report

Appendix B Through I are not included as part of this SD Report. If this information is required for review it will be made availably through the SU. Comments within this report in regards to Costing for the project scope of work has already been included in Appendix A.2.

THE MYER HOROWITZ THEATRE

THEATRE ASSESSMENT AND RENOVATION OPTIONS

UNIVERSITY OF ALBERTA
STUDENT'S UNION
EDMONTON, ALBERTA

APRIL, 2016

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The Myer Horowitz Theatre

Theatre Assessment and Renovation Options

Table of Contents

1.0 Introduction

Schick Shiner and Associates have been engaged by the Students' Union of the University of Alberta to undertake an assessment of the Myer Horowitz Theatre.

Schick Shiner as assisted by Michael Madsen of Abarent Construction and Derek Sampson of BR2 Architecture.

During the study process the consultants received background documents and drawings and met with the facility administration and technical staff. The facility was toured several times and the through this process a building assessment and development plan has been created which addresses the comments received from the interviews and the observations by the consultants.

2.0 Scope

Schick Shiner were tasked with undertaking an assessment of the facility, developing a list of development options and Class 5 (Order of Magnitude) cost estimates.

This study and report will be used by the Students' Union to determine priorities and decide on a course of action. In addition the document and some of the visuals can be used for fundraising.

3.0 Context

The Myer Horowitz Theatre provides a welcoming environment for the Edmonton community to rent the theatre or attend high-calibre, professional shows. The theatre is quite versatile: hosting concerts, speakers, ceremonies, comedians, plays, competitions, recitals and many other traditional and non-traditional theatre events. Past performers and users have ranged from local community groups to international touring artists and companies. With a long record of hosting artists from all disciplines of the performing arts, the theatre is highly respected for culture and entertainment in Western Canada and is known internationally as a reliable promoter and facility operator.

As a soft-seat theatre with a capacity of 720, the Myer Horowitz Theatre is a unique and intimate venue that has seen thousands of audiences throughout its run. The Students' Union strongly believes that cultural and entertainment presentations are of great importance to both campus and community audiences. Because of the multi-faceted nature of the events put on, the Horowitz also sees a high degree of diverse and varied crowds. The majority of ticket-holders come from outside the campus realm to take in a show, and the Horowitz acts a first glimpse of post-secondary institutions for many of these spectators.

Originally opened in 1967 as the SUB Theatre, this venue was designed and developed by

James Hull Miller and was renamed in 1989 for the outgoing University President, Dr. Myer Horowitz. The theatre has undergone few renovations in the past fifty years, including a major overhaul in 1983 and a technical upgrade in 1988. The theatre has not seen substantive renovations for over 25 years. Long overdue for renovation and restoration, the Students' Union is committed to returning the theatre to a calibre that is worthy of its long history of service.

The Myer Horowitz Theatre was booked for approximately 250 events in 2014-15 and interacts with approximately 100,000 patrons every year. The Myer Horowitz is one of the few venues of this size in the Edmonton area and is well used by community members in and outside of Edmonton.

4.0 General Assessment

As stated in the previous section the theatre opened in 1967, had a major overhaul in 1983 and a technical upgrade in 1988 but the theatre has not seen a substantive renovation for the past 25 years. In touring the theatre it is obvious to see that this is the case with its mixtures of styles from the original architecture to recent upgrades and repairs. Life and operations are ongoing and where the facility has not responded to the needs of the operation the staff have had to solve issues without the benefit of a renovation. This has resulted in ad hoc and make do solutions. The following is a more in depth assessment of each of the areas of the facility.

It is important to note that these comments and observations are not intended to criticise the staff or the management of facility. The theatre is well run, services many groups and events providing high quality entertainment to the patrons.

These assessments should be read in the following context: the product which a theatre is selling or providing to the patrons is not just the performance, it is the experience of attending. This is the sum of many factors at play from the box office experience to the cleanliness of the washrooms. Of course the actual performance is the most important but the enjoyment of it can be spoilt by some of these other factors.

4.1 Theatre Entrance: In the original design the theatre entrance was on the second floor off the main part of the building, and patrons entered on the west side of the lobby after coming up the adjacent stair case from the main floor. Subsequent renovations in the building, not related to the theatre, which responded to the changing needs of the Student's Union and growth in student enrolment have made entrance from the west undesirable and difficult. The operation has responded by putting the box office on ground level in the north east corner of the building and bringing the audience to the theatre lobby via the northeast stair and accessible elevator. Although this is a superior entrance than the west side it does not help create or support the "theatrical experience" the fundamental product of the theatre. See Photograph #1 in Appendix A

4.2 Box Office: the box office is far too small for the size of the operation.

See Photograph #1 in Appendix A

4.3 Lobby Elevator: The elevator was installed in 1988 to meet accessibility codes and to provide access from the ground level box office to the main lobby. There is no elevator to the balcony level. The elevator is more of a "handicap lift" than an actual elevator and is very slow. On the lobby level there has been no attempt to build the elevator into the greater design of the lobby. It is quite unsightly and appears to be an afterthought.

See Photograph #2 in Appendix A

4.4 Lobby: Fundamentally the lobby is not large enough for the capacity of the theatre. The total area required is 5,000 square feet. There is no balcony lobby and the stairs to the balcony, although a fine architectural statement, take up far too much room in the lobby. They are located badly and visually obscure the patrons from one another. This isolates one patron from another rather than assisting in the collective experience which is theatre attendance.

There is no bar or coat check in the lobby and to provide these necessary elements of the theatre experience the operation has had to divide off a part of the lobby with tables decreasing the amount of crush space for the audience. In addition this area has been located in the northeast corner of the lobby against the glazing. It is unsightly from the lobby as well as the exterior of the building. The theatre operation counts the bar, coat check and merchandising revenue as a good part of their income and the current setup is not an efficient operation. With an appropriate design and location the patron would be better served and sales would increase.

The ceiling finish and lighting fixtures are dated. The lobby sound system lacks quality and coverage. There is no video system for late comers or other events.

See Photograph #3 and 4 in Appendix A

4.5 Theatre Offices: The only office in the theatre area is the technical director's office located just off the audience left vestibule on the main floor of the theatre. The manager's and programming offices are at the opposite end of the building. There is no visiting company office.

4.6 Audience Chamber: The audience chamber is showing some aging both in the actual materials and dated decor.

- **Seating:** The current seats are seriously in need of replacement. In some cases the springs in the seat pans will not allow the seat to flip up (a fire code issue) and the foam padding in most of the seats has degraded to such an extent that the seat is uncomfortable. The upholstery of many seats is soiled. There are step lights on the face of the steps leading into the theatre but there are no aisle lights. This is a code

issue.

The floor under the seats is carpeted and once the seats and the carpets are removed the concrete floor will have to be repaired before new seats are installed. The use of carpets under the seats restricts the operation from allowing drinks from the lobby bar into the theatre which results in lower bar and concession sales.

See Photograph #5 and 6 in Appendix A

- **Side Walls:** There are 2 issues with the side walls. The dark brown "ship lap siding" is very dated and shows the years of use. Something lighter in colour and a bit "grander" would address audience experience issue.

See Photograph #7 in Appendix A

The second issue is the flutter echo that occurs on the balcony level and at the rear of the main level under the balcony. Flutter echoes are a repetitive echo produced by sound traveling quickly between two parallel reflective surfaces. This can result in a perception of a pitch or timbre colouration of music and a reduction in the speech intelligibility within the room. This echo is extremely annoying especially for patrons sitting close to the walls and will spoil their enjoy of a performance.

- **Balcony Front Lighting Rail:** The original design did not allow for a lighting or projector position in this location. However this is a desirable position particularly when the location and lighting angles of the lighting catwalks are considered (see section below). The issue with the current installation is that it has been done in a less than neat and tidy way. The pipe which does not follow the curve of the balcony front is hung from the balcony railing. Power cables are run over the balcony wall and along the audience side of the balcony wall.

See Photograph #8 in Appendix A

- **Acoustical Reflectors:** There are two serious issues with the acoustical reflectors. The reflector immediately in front of the 2nd FOH catwalk obstructs the lighting shot to the stage. In order to solve this the theatre techs have installed a second lighting pipe lower on the catwalk to under shoot the Reflector. This solves the problem somewhat but not fully and it makes focusing the lighting fixtures on this pipe difficult and dangerous. The 1st FOH catwalk and lighting position has the same issue and the lighting pipe has been lowered to undershoot the on-stage reflector.

See Photograph #9 in Appendix A

The second issue is the elevation of the onstage reflector which forms the top of the "proscenium arch". This is too low to the stage and, as stated above, obstructs the stage lighting. This reflector needs to be raised to solve the lighting and projection issues and to give the stage opening more height.

A temporary lighting pipe has been installed under the 1st lighting catwalk and is hung from the lower lighting pipe of the catwalk. This pipe is used to hang lighting specials and a video projector used to project movies and data on the cyc wall. This pipe is extremely hard to get to safely and is unsightly.

- **Stage Side Lighting Positions:** The original design did not have any facility for side lighting down stage of the main drape. Lighting "trees" have been installed here and power is supplied at this location by extension cables from other areas. In addition the incandescent stage lighting has been augmented with some LED fixtures which are clamped on the hand railing and powered by extension cords. Lighting positions are required in this location but there needs to be a more organised, permanent and cleaner way to achieve this. See Photograph #10 in Appendix A

- **Stage Floor:** The stage surface is the original flooring which has been painted many times. The floor shrinks and expands with the seasons and it is uneven over its surface. As the theatre is used for dance performances this is critical. It is possible that over time the resilient pads have disintegrated or failed, A portion of the floor in the heaviest used area should be taken up to inspect the resilient pads to see if they are still resilient enough for dance. This was not undertaken because this would have been too invasive while the theatre was in operation.

4.7 Asbestos Removal: The asbestos was removed from the theatre structure above the reflectors. The reflectors were removed and re-installed. It is possible that not all the supports for the reflectors were used when they were re-installed. Inspection is required. In addition this should be confirmed that asbestos has been removed in other areas of the theatre, lobby and BOH where renovations could be undertaken.

4.8 Technical Equipment: The operation has tried to keep up with the technology and the demands of the clients but it has become harder to achieve this as the equipment gets older and technological change speeds up. So the sound and lighting can really not be called "systems" as they are in reality a collection of original equipment, upgrades and purchases made on an ad hoc basis.

- **Lighting System:** The most critical issue with the stage lighting system is the Lightfactory computer based stage lighting console with an Elation Lighting Midi Control Wing. Fundamentally this is a Neo Console sold by Strand Lighting but the current installation only uses the software and does not have the standard user interface. Therefore it is outside the norm for theatres and theatre techs and is configured as a preference for 1 or 2 operators. This format does not work for touring shows, the replacement of sick staff members or general turnover of staff. The operation is very vulnerable to a situation where there is no one with the knowledge to run this particular console.

The lighting inventory is thin and many of the lighting fixtures are old and have exceeded their life cycle. For example; The Strand Patt 223 fresnel (33 in inventory) was introduced in 1963 and discontinued in 1983. These were in the original inventory in 1967. The Colortran ellipsoidal spot lights (58 in inventory) have not been sold for at least 20 years. The Strand 2205 (18 in inventory) was introduced in 1992 and has not been sold for 15 years. The Strand Patt 293 follow spot is from the original 1967 lighting package.

The total inventory for a theatre of this size and calibre of events should be in the neighbourhood of 250 fixtures plus moving lights, cyc lights and effect fixtures.

- **House Lights:** There are 87 house lighting fixtures, The 26 fixtures under the balcony and the 9 fixtures over the balcony are 100w pars and the remaining 52 fixtures are 250w Par 38's. The fixtures which are easily accessible under the balcony have been changed to LED's but these are not "dim to black" fixtures and turn off at the bottom end of the dimming curve. The "dim to 1%" fixtures have a 10% perceived light level when they turn off. This does not support a quality theatrical experience.

- **Sound System:** Fundamentally the sound system is an analogue system with a digital console. As with the lighting system much of the equipment is dated technologically. The Yamaha M2000 is listed on Ebay for $800 and the A+H GL2000 goes for $1,152. The EAW Speakers were purchased from the Windspeare Concert Hall and no EASE (Enhanced Acoustic Simulator for Engineers) drawings/study was made to determine how the speakers would perform in the theatre. The speakers proved too heavy and large to hang easily and the operation is waiting for the results of this report before moving forward. Currently the speakers are in stacks at the side of the "proscenium". The system is a collection of purchases made on an ad hoc basis.

- **Video System:** Currently the video system consists of a projector mounted on the temporary pipe hung from the 1st FOH catwalk. The temporary pipe has been installed in this location to be able to shoot under the proscenium reflector. The image is projected on the cyc wall. For a quality cinema experience the projection screen surface has to be specialized and closer to the audience.

  Originally the theatre employed carbon arc and other film projectors but these have not be used for years and are stored in the centre control room.

  There is no video infrastructure in the theatre probably because when the theatre was built video was a technology that was new, expensive and not readily available. Some video cabling has been added on an ad hoc basis in the theatre. There are no monitors in the dressing rooms, back stage and in the lobby.

- **Stage Drapes:** The stage drapes are approximately 15 to 20 years old and are not manufactured from IFR fabric. The drapes have been made flame retardant by the application of retardant chemicals. The chemicals become less effective over time and in some environments the retardant should be reapplied every 5 years.

4.9 Dressing Rooms: the number of dressing rooms and their seating capacity is not adequate for this large an operation. The current dressing rooms are located badly (just off the stage) and the layout, with the 2 sinks taking up much of the counter space, does not make the room effective or efficient. There is a miss match of furniture, counters and other fittings are damaged. This does not help a performer get comfortable, relaxed and focused before a show. There is no green room (performers lounge) adjacent to the dressing rooms and this has to be set up in the wings (up stage right) when required.

See Photograph #11 in Appendix A

4.10 Orchestra Lift: The orchestra lift is used mostly as the means to move equipment, scenery and goods into the theatre from the ground floor. Over time the guides have become worn, making the lift floor unstable in the stage level position. The staff use large wedges placed between the wall of the lift and the floor of the theatre to stabilize the platform.

4.11 Over Stage Grid: The grid used to hang stage lighting fixtures, drapes and scenery was installed over 30 years ago when CBC or ITV was using the space for broadcasting. Pipe grids are ideal for studio theatres where the height of the room is low making access is easy. In large theatres where drapes and scenic elements are large and heavy, grids are less effective as all overhead work has to be done from a ladder or man lift. This is dangerous and labour intensive work and can increase the turnaround time for rentals negatively effecting the theatre's financial bottom line. There are more effective, labour saving and safer ways to operate.

See Photograph #12 in Appendix A

5.0 Renovation and Cost Summary

The cost summary in Appendix B includes all the cost estimates associated with the project and the various identified options. In addition Appendix C has a detailed cost breakdown of the lobby renovations. Note that this cost estimate was completed by Clark Construction using the drawings and artist rendering included in this report. Therefore this cost estimate should be considered preliminary and should only be relied upon as guide in the overall cost of the project.

6.0 Detailed Renovation Project Descriptions.

6.1 Theatre Entrance: It is proposed that the existing stair leading from the box office area to the second floor lobby be removed and a new stair be constructed to the south. This stair would take a patron to the second floor lobby and on up to the third floor lobby. In order to reconfigure this stair one of the external bays, where the bike racks are currently located,

would have to be used. Patrons would come into the theatre from doors on the south side of this vestibule. See drawings in Appendix B

The current box office would be removed. The food services office and storage room would be reconfigured to create a new box office. The elevator would be replaced and extended to the third floor. The access hallway to the orchestra lift and other building services would be maintained.

The new stair would penetrate the second floor approximately where the current theatre office is located. This office would be relocated on the third floor.

It would be important that this area have a decorative design in keeping with a theatre entrance. This would entice the audience and perpare them for things to come.

6.2 Elevator: The current elevator would be removed and a new elevator installed that would take patrons from the box office area to the second floor lobby and onto the third floor lobby. The stage lighting control room and the lighting catwalk access on the third level would need to be relocated as the elevator shaft would pass through their current location. The stage lighting control room could to be moved to the projection or the sound control room. Because the film projection equipment is not used it could be removed from the theatre entirely.

Choice of elevator would have to be compatible with other elevators on the university campus such "open source coding" on the elevator control system. This will allow competitive services for elevator maintenance contracts.

6.3 Lobby: The lobby renovation is the most extensive and expensive component of the proposed renovation. It is proposed that the existing staircase leading from the main lobby to the balcony be removed. Also it is proposed that the area which is currently the roof of the main lobby be extended, enclosed and a balcony lobby created. This balcony lobby would have access to the fire exit in the north west corner creating two means of egress from this area thus satisfying fire code regulations. In order to make this new lobby more interesting it is proposed that the area currently housing the access stairs to the balcony be left open between the second floor and third floor. Also there would be an opening between the two floors against the windows on the north side of the lobby. Creating these openings will add interest and a dynamic to the lobby. The existing walls in the northeast corner of the lobby on both levels would be glazed allowing an overview of the alumni circle to the north and east of the building.

A coat check would be added on the west end of the lobby. In addition a bar and merchandising area would be added on the south side of the lobby. A vestibule used to access the new sound cockpit in the rear of the audience chamber would be added between the bar and the merchandising area.

The ceiling and lighting fixtures would be upgraded to a more modern look. A programme sound system and video system would be added in the lobby.

Carpeting, wall finishes and another elements in the lobby would be upgraded and modernized to create an entirely new look.

The removal of the existing balcony stair and the addition of the balcony lobby would increase the crush space for patrons to a more appropriate size for a theatre of this seating capacity. This would result in increased patron satisfaction, bar and merchandising sales.

All of these elements in the lobby would enhance the patron experience and satisfaction generating increased attendance and therefore revenues.

Patron washrooms have been added on the east side of the theatre, balcony level, so that patrons no longer have to travel to the washrooms located on the second floor west side. In addition 2 offices have been added in this location. Unfortunately it is not possible to add more usable spaces along this side of the building without adding an exit stair in the south east corner from the balcony to ground level. The design of the building envelope at ground level makes this solution difficult and expensive. The washrooms and offices represent the maximum travel for a dead-end corridor.

See drawings in Appendix D and renderings in Appendix E.

Cost: See Appendix B and C for detailed cost estimates.

6.4 Second Floor Washroom Upgrade

Washrooms located on the second floor west side of the theatre would be upgraded and modernized. In addition the corridor that leads from the theatre lobby to the washrooms should be upgraded and finished in keeping with the theatre lobby decor. That is less institutional and more theatre. All lobby areas, corridors create wall space to feature historical photographs, rendering and posters of past shows and productions.

6.5 Balcony Level West Side Renovation

It is possible to add usable space on the west side of the theatre on the balcony level. Four options have been developed and drawings showing these are provided in Appendix F.

6.5.1 Option #1 - a maximum of 1,200 sf of space could be added using the existing egress located in the north west corner of the lobby. This space could be used for additional theatre offices, meeting rooms, storage and rehearsal. Occupant loading would be restricted due to the egress. This space could be used for additional theatre offices, meeting rooms, storage and rehearsal. Refer to Drawing A4 in Appendix F.

6.5.2 Option #1A - A reduced area (800 sf) of usable space could be added if budget concerns were an issue. This space could be used for additional theatre offices,

meeting rooms, storage and rehearsal. Refer to Drawing A5 in Appendix F.

6.5.3 Option #2 - This is the preferred option but the most expensive. A space expanding to the entire west side of the theatre could be added. This would add approximately 3,000 sf to the facility. This space could be used for additional theatre offices, meeting rooms, storage, rehearsals and dressing rooms. A requirement to make this option feasible is the addition of an exit stair in the south west corner of the space. This exit stair would lead down to the second floor exit corridor which runs along the west side of the theatre past the theatre washrooms. The storage spaces at the end of the corridor would be lost as well as part of the dressing room. This dressing room could be turned into a green room as additional dressing rooms would now be located in the new space. Refer to Drawing A6 and A8 in Appendix F.

6.5.4 Option #2A - This option is the same as Option 2 but with a reduced area (2,000 sf). The exit stair would still be required.

In all options a new HVAC and electrical system for the spaces would have to be added.

Cost: See Appendix B for detailed cost estimates.

6.6 Audience Chamber

6.6.1 Seating: It is proposed that the existing seats and the carpet under the seating be removed. It is expected that the once the carpet has been removed the concrete floor will have to be repaired and refinished. New seats would be installed with carpet used only on the stairs and in the aisles. Lights on the end panels of each row of seats would be used to illuminate the aisles as per code. These lights would be LED and would be left on 24/7. The wiring for these circuits would be run in the carpet trim so the floor would not have to be penetrated for wiring to power the fixtures.

A quotation and a seating layout was obtained from Hussey Seating for the replacement of the seating. Hussey has proposed their Designer Model with the following specification:

- Upholstered Chairs with a robust long wearing fabric
- Soft square back with 2" standard foam , low rise, laminate
- Standard upholstered seat with plastic pan
- Cast aluminum standards, floor and riser mount
- Wood armrests
- Seat and Row numbers
- Soft square laminate end panels
- Aisle lights
- Cup holders

- Seats would be 20, 21 and 22 inch seats
- There would be no 19 inch seats

This specification was only used to generate a cost. The seating layout shows 701 seats which is a 20 seat loss over the existing seating capacity. This is accounted for by the loss of seats for the new sound cockpit at the rear of the main floor and by the width of the seats specified. However seats could be added on the side balconies and percentage of 19" seats could be added where they would be the most effective in raising seat count. It will be possible to keep the seating capacity at 720.

Hussey has given a price of $260 a seat, installed, and making a total of $187,200 for the seat replacement. This price could change based on the manufacturer, type of chair, quality and the accessories requested. There would be a cost to remove and dispose of the existing seats and carpet.

There are many seating manufactures and the competition between them is fierce. Therefore it is important to release a detailed specification eliminating the "off-shore" manufacturers which supply an inferior product whose life cycle is short. It should be noted that Hussey is usually the least expensive seating option ($260/seat) but only one of many seating suppliers. There are two Canadian seating suppliers; Borgo ($320 to $350/seat) and Ducharme Seating ($320 to $360/seat). American suppliers include American Seating and Irwin Seating. Theatre seating is a very competitive market and prices will come down in competitive bidding. Manufacturers are happy to do seating layouts and to supply actual samples.

When the seats are taken away the carpet would need to be removed and the concrete floor repaired and refinished. Removing the glue from the concrete surface is difficult and labour intensive. It should be assumed that the concrete floor will need repairs. Carpeting would only be required in the aisles and steps for the new seating layout.

Appendix G provides the Hussey seating layouts. However it should be noted older CAD drawings of the audience chamber were used as the base for these layouts and therefore there are some anomalies with regard to row spacing. Therefore these drawings should only be considered as a pro forma to generate cost and test seating capacity.

Cost: See Appendix B or detailed cost estimates.

6.6.2 Audience Chamber Side Walls: The two issues with the side walls, visual and flutter echo, would be resolved by the addition of new panelling on the walls. The panelling would replace the wooden siding and would be configured in saw tooth configuration eliminating the parallel walls of the audience chamber and therefore the flutter echo. The panelling would be added to the side walls on the balcony level and the side walls on the main level as well as the walls leading onto the stage. This

would give the audience chamber a new look.

An acoustical design is required to provide the correct angle and configuration of the saw tooth panels and the density of the panelling.

The wooden siding may not have to be removed as the new panels could be applied over top of the signing thus reducing the cost of this part of the project.

See Appendix I for drawing

Cost: See Appendix B for detailed cost estimates.

6.6.3 Balcony Front Lighting Rail: The existing rail and should be removed and a 1-1/2" schedule 40 pipe, bent to follow the curve of the balcony front, installed in its place. Care must be taken to assure that lighting fixtures hung on the pipe do not obstruct the view of the patrons sitting in the first row of the balcony or on the main floor. Stage lighting Ethernet, sound and video circuits should be discretely in set into the balcony front convenient to the pipe. The pipe should be powder coated light grey to match the colour of the balcony front.

See Appendix I for a pro forma drawing of this configuration.

Cost: See Appendix B for detailed cost estimates.

6.6.4 Acoustical Reflectors: As stated before in the facility assessment the acoustical reflectors obstruct the stage lighting. The theatre staff have solved this by adding a lower lighting pipe roughly equal to the level of the catwalk deck on which the stage lighting fixtures are mounted. In this way the stage lighting fixtures are low enough to shoot under the acoustical reflector positioned in front of the catwalk. Although this makes the lighting shot better the fixtures are very hard to access to focus and cause a serious safety concern (see photograph in Appendix A). The reflector between the first and the second FOH catwalk should be removed, or raised, so it does not obscure the stage lighting.

The onstage reflector that forms the top of the proscenium arch should be raised as high as possible so that it does not obstruct the stage lighting and makes the proscenium higher. It would appear that this reflector could be lifted by 18 inches.

Once these reflectors are reconfigured the temporary stage lighting pipe hung below the first FOH catwalk could be deleted. This will make a much cleaner look in the theatre.

A detailed acoustical assessment should be undertaken of the audience chamber before and after any renovations.

Cost: See Appendix B for detailed cost estimates.

6.6.5 Acoustical Reflectors Option 2: Following a complete acoustical review of the audience chamber the existing acoustical reflectors could be removed and a new set installed. This would be in keeping with the modernization of the audience chamber and provide a new look as well as being acoustically more effective.

Cost: See Appendix B for detailed cost estimates.

6.6.6 Side Lighting Positions: The lighting trees that are located at the end of the balcony close to the proscenium should be removed and lighting bars hung from the structure to get the stage lighting fixtures out of the line of sight of the audience. Cables should be dressed and discrete and there should be no lighting fixtures attached to the balcony rail. It is possible that there will be seating in this location to increase the total seat capacity.

Power for these fixtures should be permanently run to these locations then there will be no need for the current number of extension cords now in use.

Cost: See Appendix B for detailed cost estimates.

6.7 Stage and BOH

6.7.1 Stage floor: The stage floor should be removed along with all sub floors, sleepers and neoprene resilient pads. A new floor consisting of resilient pads, sleepers, one layer of ¾" plywood and one layer of ¾" pylon. Pylon is a layer of 5/8" plywood with ¼" tempered hardboard permanently glued to each surface and it is a product designed for stage floors. It is dimensionally stable, takes paint readily and will last for years. The resilient pads and floor surface make the floor appropriate for dance.

Appendix I Pro forma drawing of a stage floor.
Appendix I Plyron information sheet

Cost: See Appendix B for detailed cost estimates.

6.7.2 Sound Cockpit: It is proposed that eight seats (4 per row) be removed in the last 2 rows of seats on the theatre's main level and a sound cockpit installed at this location. This would be the permanent sound position and the operator would access it, not from the last row of seating as they do now, but from the lobby through a vestibule and the door at the back of the cockpit. The sound console and associated equipment would live in roll top desks and cabinets which could be locked when not in use and secured against theft. The cockpit would be surrounded by a pony wall designed in keeping with the rest of the décor of the theatre. All wires and cables would be hidden from audience view making the area a lot cleaner and

professional looking.

The seats immediately in front of the cockpit and on each side would be removable to facilitate the temporary installation of touring show sound equipment. Doors in the side walls of the cockpit would allow technicians to pass into the seating rows beside.

Cost: See Appendix B for detailed cost estimates.

6.7.3 Control room suite: If the sound operating position is located in the new sound cockpit then the sound control room at the rear of the audience chamber balcony level will not be required. Although some space may be required for audio racks, the sound system would never be operated if from this location again.

The film projectors in the centre suite have not been used for some time and are taking up valuable space. These should be removed and if possible sold as used equipment. A small projection room for a large digital projector and support equipment would be added at the centre line of the projection suite. The projector would need to be vented and acoustically separated from the audience chamber.

The location of FOH elevator is set by the lowest level (box office) and the shaft will terminate on the balcony level in the stage lighting control room. The lighting catwalk access to the control room suite is above the stage lighting control room. This catwalk access will obstruct the elevator shaft. As it is extremely important for the elevator to access the balcony level the lighting control room will have to be moved and the lighting catwalk will have to be redirected to access the control room suite in the current projection booth. It is proposed that the lighting control room be relocated in the current sound booth. The small room, housing the projector rectifiers, originally intended as an announcer's booth, could be removed making the new stage lighting control room larger and placing the stage lighting operator closer to the centre line of the theatre. There does not need to be a wall between the stage lighting control room and the projector room.

Cost: See Appendix B for detailed cost estimates.

6.7.4 Stage Rigging System: The current pipe grid over the theatre is not an effective way to hang lights, curtains and scenery in a facility of this size. A system of motorized line sets would be a far better solution. Stage lights, drapes and scenery could be attached to the pipes at floor level and then raised to the correct trim. It is true that there is no room above the stage for a full fly tower but there is still a considerable amount of space to allow items to be flown out completely or at least to get draperies partly off the stage floor to keep them clean and from being damaged. It is estimated that there is 12 feet of clear space above the pipe grid. Of course stage lighting fixtures would still have to be focused from a man lift but the relocation of stage lights, drapes and other elements would be easily achieved and would the make the turnaround time for rentals much faster. This should have a positive effect on the financial bottom line of the theatre.

The recommended product is the Vortek Rigging System manufactured by ETC. It is proposed to install 14 motorized line sets between the current main drape and the rear wall of stage on roughly 12 inch centres. Line set pipes would run the full width of the stage and the payload would be approximately 1,200 pounds per line set. All stage lighting line sets would have cable management attached to allow the line sets to come to the floor. The line sets would be controlled by a computer console located on stage right.

A complete structural analysis of the trusses and structure above the stage would need to be done. Additional structural members may be needed to accept the rigging and this is factored into the costs. It is important to note that the load to structure would not be significantly different than it is now.

A cut sheet for a typical for Vortek line set is attached in Appendix I.

Cost: See Appendix B for detailed cost estimates.

6.7.5 Dressing Rooms:

Modernize dressing rooms, re-locate sinks and re-work lighting.

It is possible that one of the dressing room on stage level could be turned into a green room. See 6.5.3 and 6.5.4 Options #3 and 4.

Cost: See Appendix B for detailed cost estimates.

6.7.6 Theatre offices:

It is assumed that the technical office would remain in its current location in the back stage area. New offices (2) would be added on the balcony level in the lobby renovation. If the West Side development was included in the project then a suite of theatre offices, meeting rooms and support spaces could be added bringing all the theatre personnel into one location.

Cost: See Appendix B for detailed cost estimates.

6.7.7 Stage Lift Repair: An experienced elevator repair service can be engaged to undertake a detailed assessment of the stage lift and then undertake any repairs required to stabilize its movement when at stage level.

Cost: See Appendix B for detailed cost estimates.

6.7.8 Stage Lift Repair Option 2: If the stage lift cannot be repaired the lift mechanism could be replaced by a Gala Lift. Gala Lifts are the industry standard in theatre facilities. The structure for the stage platform of the lift would remain with just the lift mechanism replaced. This was done 10 years ago at the Arden Theatre in St Albert. They were experiencing the same unstable issues.

Cost: See Appendix B for detailed cost estimates.

6.8 Technical Equipment

6.8.1 Stage Lighting System: There are 2 options for the upgrade of the stage lighting system:

Option #1: In this option the stage lighting would be a mixture of incandescent and LED fixtures. The following steps would be undertaken:

- Replace the existing Strand dimmer rack with 2 ETC Sensor Racks
- Replace all the existing incandescent fixtures with ETC Source 4 incandescent fixtures of various focal lengths
- Keep the existing LED fixtures as specials (140 fixtures)
- Replace the existing stage lighting console with an ETC Ion or EOS console which is industry standard
- Connect the house lighting LED network (see house lighting section) to the stage lighting processor
- Add 80 LED fixtures (ETC Series 2 LED, ETC Colour Source fixtures, ETC fresnel's)
- Add 12 moving lights (the Robe line some with shutters)
- Keep the existing LED cyc lights
- Replace the 2 follow spots with units sized for the throw distance
- Infrastructure:
    - Add wiring infrastructure for the new dimmer capacity
    - Add a robust Ethernet network

Option #2: In this option all for the incandescent fixtures would be replaced with LED fixtures.

- Remove all incandescent fixtures
- Remove the dimmer rack and replace with ETC Echo relay panels or replace the Strand dimmers with non-dim modules (if these could be found). In both options the existing wiring infrastructure could be used to run the LED system
- Add a robust Ethernet network and DMX nodes
- Add 160 LED fixtures (ETC Series 2 LED, ETC Colour Source fixtures, ETC Fresnels)

- Add 12 LED moving Lights
- Keep the existing LED fixtures and the LED cyc lights
- Infrastructure:
    - Add wiring infrastructure for the new circuits in locations not already serviced
    - Add a robust Ethernet network

Cost: See Appendix B for detailed cost estimates.

Electrical load LED vs. Incandescent

The following table gives a comparison of the electrical load and the cost of operations of the current inventory of incandescent fixtures if they were replaced with LED fixtures:

Fixture				Cost					
	Qty	Load/ fixture	Total load	Hours /day	Days /year	Hours /year	Kw Hrs	Cost/ kwhr	Cost/ year
LED Fixtures									
ETC LED Series 2	80	171	13,680						
ETC Colour Source	20	147	2,940						
ETC Colour Source Fresnel	28	147	4,116						
Total	**128**		**20,736**	6	260	1560	32,348	0.08	**2,588**
Incandescent Fixtures									
Strand 223	33	1000	33,000						
Colortran 170	58	750	43,500						
Strand SL	18	575	10,350						
Strand 6x9	19	1000	19,000						
Total	**128**		**105,850**	6	260	1560	165,126	0.08	**13,210**

The table is making the following assumptions: the number of hours of use per day and per year and the cost per kilowatt hour. Even if the assumptions are not accurate it can be seen that without an increased fixture inventory there would be considerable savings just by disposing of the incandescent fixtures and replacing them with LEDs. The saving does not include the reduced expenses on the purchase of lamps and colour as well as the labor savings of ongoing maintenance and changing of lamps.

Therefore it would seem the best course of action would be to take Option 1 as the increase cost of the LED fixtures would be offset by savings in power and heat generation.

It may be possible for the Students' Union to qualify for the University of Alberta's Envision Energy Reduction Program which funds sustainability projects.

Cost: See Appendix B for detailed cost estimates.

6.8.2 House lights:

The following table gives the electrical load comparison (incandescent vs. LED) for the house lights.

Incandescent				Cost					
Location	**Qty**	**Wattage**	**Total Watts**	**Hours /day**	**Days /year**	**Hours /year**	**Kw Hrs**	**Cost/ kwhr**	**Cost/ year**
Under Balcony	26	100	2,600	8	300	2400	6,240	0.08	499
Over Balcony	9	100	900	8	300	2400	2,160	0.08	173
Over Main chamber	52	250	13,000	8	300	2400	31,200	0.08	2,496
Total	**87**		**16,500**				**39,600**		**3,168**
LED				**Cost**					
Location	**Qty**	**Wattage**	**Total Watts**	**Hours /day**	**Days /year**	**Hours /year**	**Kw Hrs**	**Cost/ kwhr**	**Cost/ year**
Under Balcony	26	25	650	8	300	2400	1,560	0.08	125
Over Balcony	9	25	225	8	300	2400	540	0.08	43
Over Main chamber	52	100	5,200	8	300	2400	12,480	0.08	998
Total	**87**		**6,075**				**14,580**		**1,166**

It can be seen that there is not the same amount of savings with the house lights as with the stage lighting. Therefore the payback time to cover the cost changing from incandescent to LED will be significant. This is because the "dim to black" LED fixtures are approximately $1400 each. The dim to black requirement for house lights is absolutely critical. However when you take into account that most of the house lights in the audience chamber are difficult to access for lamp change without setting up scaffolding it makes the LED system more attractive. An LED house light has a life span of 50,000 hours and with the usage of 8 hours a day for 300 days a year the lifespan would be 20 years. Therefore when the cost savings are factored in for power consumption lamp costs and labour to change the inaccessible lamps the LED fixtures become very attractive.

It is proposed that all the fixtures in the audience chamber be replaced with LED "dim to black" fixtures. This includes all the LED fixtures currently in use as well as the incandescent fixtures.

There are many stage lighting manufactures marketing house lighting fixtures:

- ETC Arcsystem
- Altman Chalice
- Chroma Q Inspire Series
- Chauvet Ovation Series

Due to this, competition prices have been dropping and will continue to drop as more manufacturers get into the market place.

Cost: See Appendix B for detailed cost estimates.

6.8.3 Sound System: The sound system is a very important component in the audience experience. Just about everyone has a digital stereo which has awesome sound and they expect the same when they attend a concert. Therefore most of the existing equipment that could be taken out of service and sold with the exception of the Yamaha M7CL-32 and much of the loose equipment. The front of house console, speakers and other related components need to be compatible and designed as an integrated system. Therefore the speakers, amplifiers and signal processing would not be required. The following proposal outlines a quality system that a theatre of this size and stature should have. It will make the theatre "rider ready".

The front of house console should be a Digico SD9 or a Yamaha CL5 running on a digital network such as Dante. There would be at least 3 three A to D stage boxes appropriately sized for the console inputs/outputs.

The existing Yamaha M7CL would be used as the monitor console running on the digital network. Network cards would be required for the console.

The front of house speakers should be self-powered Meyer or Outline. The theatre has two options for the FOH system. The first option, and the most economical, is a LCR point source. It would have six speakers located left, right and centre around the proscenium and a front fill system. The speakers would require an isolated ground power source and a network connection. There would be 4 floor mounted subwoofers. Peak levels of approximately 103 to 105 db would be achievable.

The second option is a LCR line array system and is the most expensive at twice the cost of the point source system. This would involve up to 30 small format line array boxes mounted left, right and centre. There would be 4 flyable subwoofers, loge fills and front fills. The speakers would require an isolated ground power source and a network connection. Peak levels of approximately 108 to 110 db would be achievable.

Either of these speakers systems could be used as part of the surround sound system that could be installed for the cinema component of the theatre programme (see the video section of this report for more details).

Monitors speakers would be JBL or Outline.

The sound system would require an isolated ground which connects all of the components including the speakers, console and any other power source used by the sound system. Isolated ground power disconnects backstage would be required to power touring equipment with the house system.

New CD players of high quality would be required as well as the high end laptop

computer with Pro Tools software installed and the large external hard drive with fire wire connections.

A new 12 channel high end wireless microphone system would be required. This system would have hand held and the belt pack microphones.

The system would be run from the sound cockpit where all the equipment that is user interfaced would be housed in roll top desks which could be closed and locked when the theatre is not in use.

An audio digital network would be run throughout the theatre with an Ethernet switch or patch panel located at the sound cockpit area.

Included as part of the sound system is an assisted hearing system, an upgraded programme sound system, and an upgraded lobby sound system.

Cost: See Appendix B for detailed cost estimates.

6.8.4 Video System: there are two video systems required for the facility

Theatre system; this system connects the dressing rooms, lobby, areas on the stage and other backstage areas is also used to feed displays in the lobby and monitors for latecomers. This system could also be used in productions. The system would run on a Cat6 network and consist of the following components:

- Blu Ray Player with HDMI out
- Video Switcher with touch panel interface
- HDMI video Cat 6 pair receiver scalers
- HDMI/VGA over Cat 6 transmitters in a portable enclosure
- Dual channel HD modulator
- HD CCTV Camera (infrared capable)
- Video projectors and a selection of lens with DMX controlled shutter and interface
- Flat screen LCD TV screens in various the locations 24", 32" and 60"

The video aux rack shall contain:

- video input panel
- Crestron DMPS3 -300C switcher
- Crestron 7" touch panel TSW-752
- 21" confidence monitor (outboard from the rack)
- Blu-ray Player (see 3.4.2 above)
- 2 - DecaBox Protocol Bridge (RS232 to DMX conversion)
- Pair of good quality stereo computer speakers

Main rack mounted equipment shall include

Digital HD modulator
Video Scalers
Video Receiver
PoE Injectors
Video signal patch panel

Loose equipment shall include;
HD CCTV Camera (low light)
Portable Scalers
HDMI/VGA Transmitters Mounted in Portable Enclosures 6911 with C-
Misc cables, adapters and connectors

Cinema Projection System: This system would consist of a high end digital video cinema projector located in the projection room above the balcony projecting on a roll up screen just upstage of the main drape. The system would consist of the following components:

Christie Solaria One projector with optional Christie integrated media block with SMS and high-performance NAS storage. This projector is capable of 4k, ultra HD, 3D and is upgradeable as projection requirements change.

A Blu Ray player and accessories.

A large roll up projection screen with an image size of approximately 17' x 30' (in 16:9 HD format (such as the screens manufactured by Stewart Screens, Belgium) will be mounted just upstage of the main drape. It is important for the audience to have a good cinema experience to bring the image closer to the proscenium.

The surround sound system consisting of 44 small speakers mounted on the walls surrounding the main level and balcony in the facility.

Cost: See Appendix D and E for detailed cost estimates.

6.8.5 Stage Drapery System: the existing stage drape system would be replaced with an inherently flame retardant drapery system consisting of:

- Main drape (coloured)
- Main drape valence (coloured)
- Four pairs of legs (black)
- Traveller (black)
- Cyclorama

Cost: See Appendix D and E for detailed cost estimates.

7.0 Phasing and Project Schedule

It would be possible to phase the project as funds become available through fundraising efforts. Careful project management is required so that work completed does not have to be redone on the completion of subsequent work. Suggested blocks of work are:

- Phase 1: Audience chamber items: Seating, acoustical reflectors, chamber walls

- Phase 2; Theatre equipment upgrades

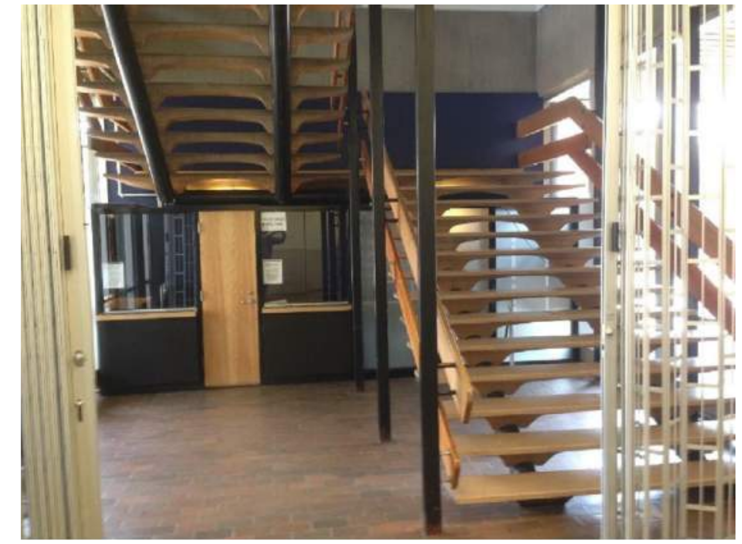
- Phase 3: lobby renovations; box office, balcony lobby, elevator, control room

It would be important that the work be undertaken with the minimum amount of downtime for the theatre.

Appendix A

Photographs

Existing Building



Picture #1 - Current Theatre Entrance and Box Office

Picture #2 - Lobby Elevator

Picture #3 - Lobby

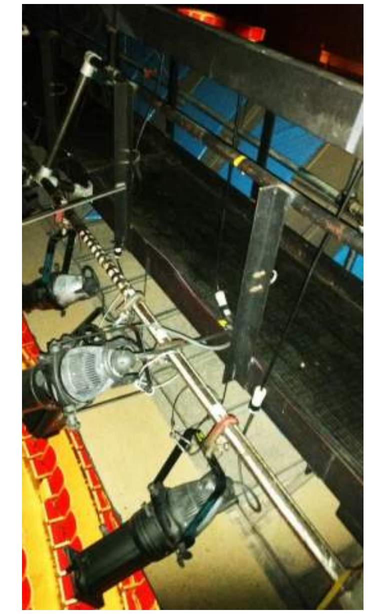
Picture #4 - Lobby

Picture #5 - Seating

Picture #6 - Seating

Picture 7 - Audience Chamber Side Walls

Picture 8 - Balcony Front Lighting Rail



Picture 9 - FOH Lighting Position

Picture 10 - Stage Side Lighting Positions

Attachment 3

EXHIBIT 6.1.1
LAND USE NORTH CAMPUS

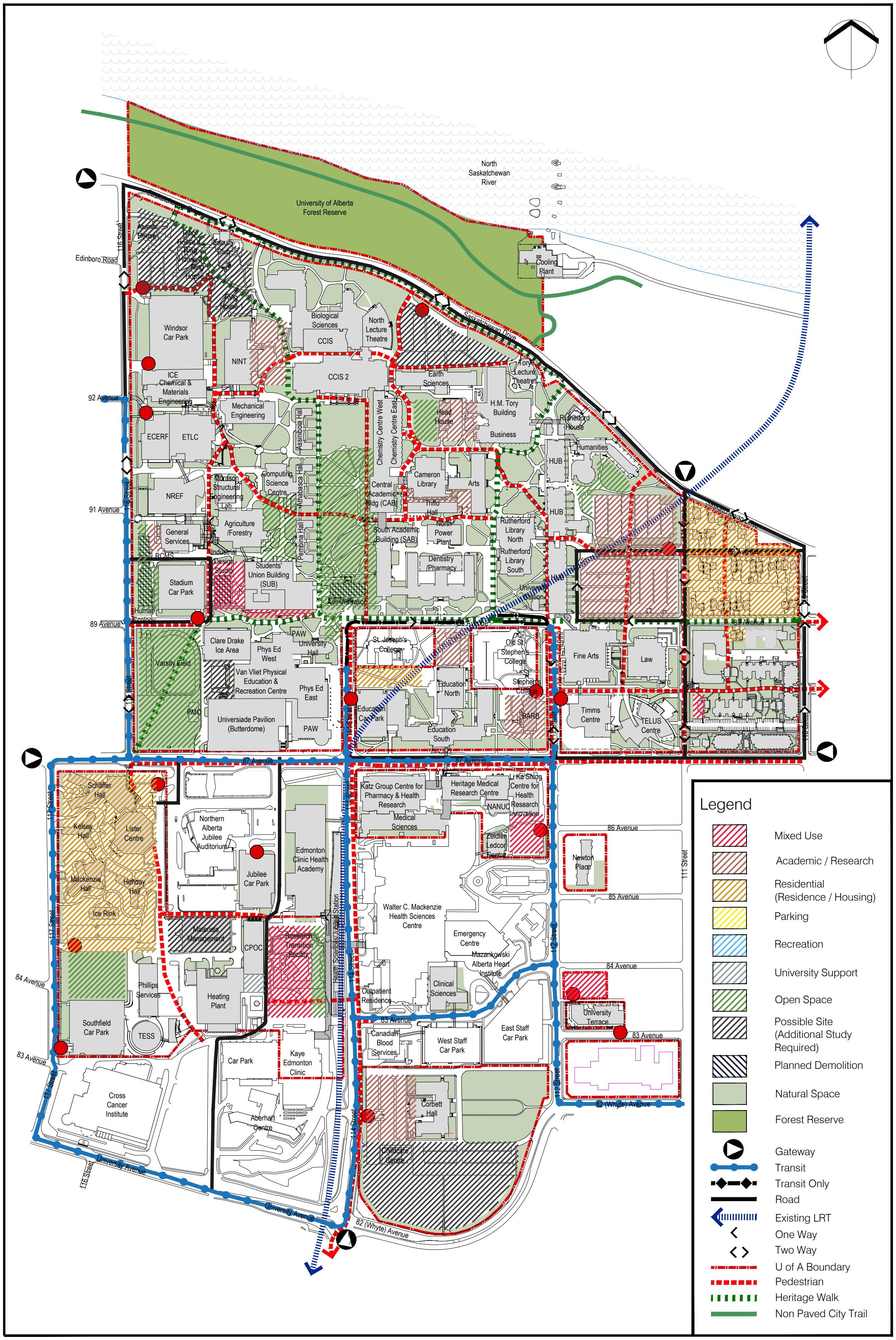


EXHIBIT 6.1.2
CAMPUS LIFE AND HOUSING, NORTH CAMPUS