COLORADO SCHOOL OF MINES

PROGRAM PLAN

ARTHUR LAKES LIBRARY RENOVATION

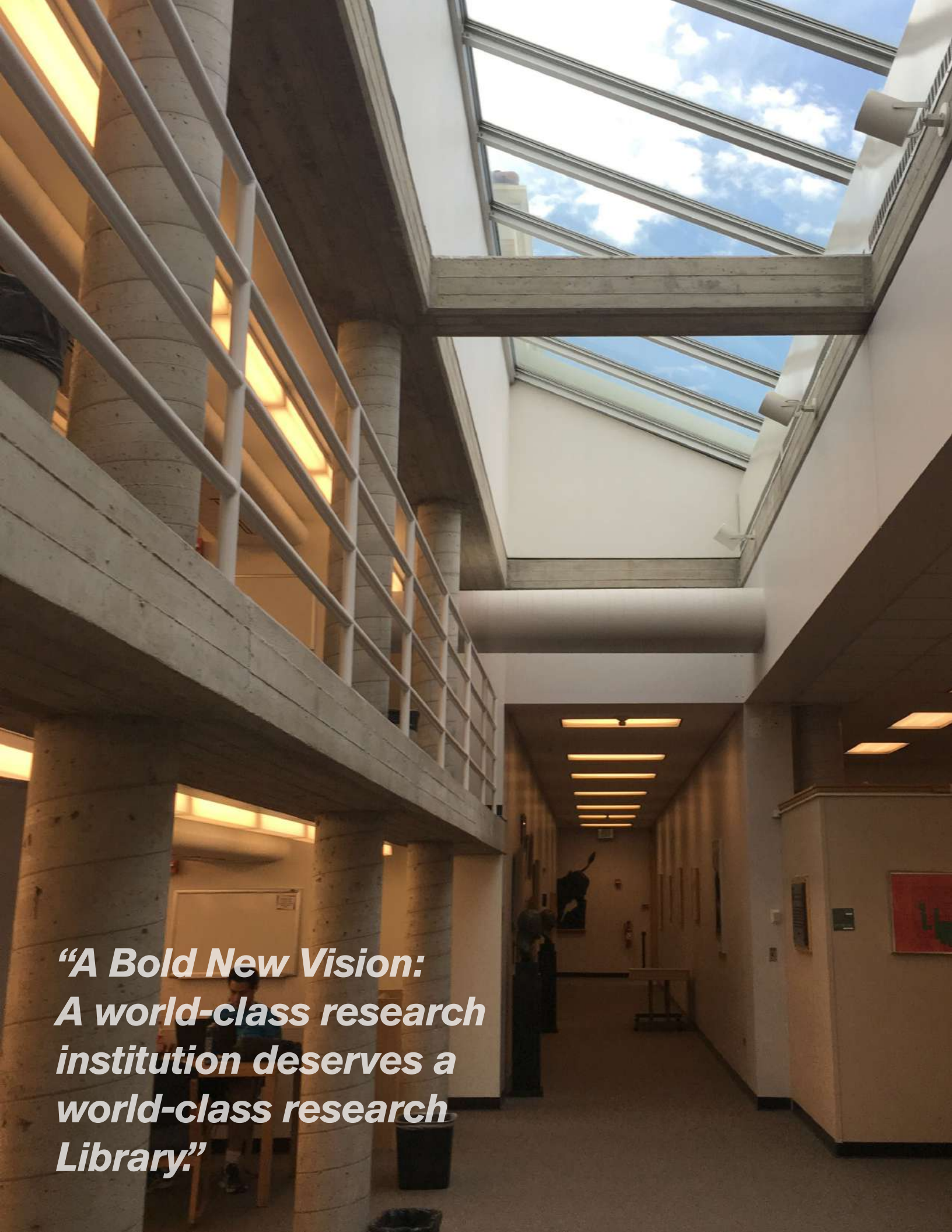
Colorado School of Mines
Golden, Colorado

July 27, 2018

hord | coplan | macht

PROGRAM PLAN

TABLE OF CONTENTS



“A Bold New Vision: A world-class research institution deserves a world-class research Library.”

1.1 EXECUTIVE SUMMARY

PROGRAMMATIC JUSTIFICATION

Colorado School of Mines (CSM) is a research university located in Golden, Colorado that focuses on academic programs in engineering and applied science. The campus has seen significant growth in recent years to accommodate its 6,117 undergraduate, graduate and non-degree students. CSM recently commissioned Hord Coplan Macht to complete a study of the existing Arthur Lakes Library to prepare a program plan and a conceptual design for a reimagined Library. The programming and concept design process has included a number of focus groups and workshops with the building advisory committee to test program configurations, entry strategies, and architectural concepts. The program includes staff workspace, library collections, student services, and study space.

The library on a college campus plays an important role, especially at a university that has such rigorous academic standards. It is the heart of campus and a neutral place between faculty, staff, and students of different departments, and should encourage cross-discipline discourse. It should also be a place that meets the expectations of the next generation of students.

The Arthur Lakes Library is the academic community's intellectual and scholarly commons. It is the place where tis users pursue knowledge, whether virtually or in-person. It is the intellectual nexus of Colorado School of Mines and the broader community of Golden. The Library is a place where patrons can freely engage in learning, experimentation, and information discovery.

The mission of the Library has transformed from an emphasis on access to collections to the creation of dynamic space where the people can connect with information and each other in order to create new knowledge.

Arthur Lakes Library

2017-2020 Strategic Plan - High Level Goals

The Arthur Lakes Library team created a strategic plan that identified seven goals that relate to one of the high-level institutional goals identified in the CSM 2014-2024 Strategic Plan.

1. Enhance the user experience
2. Cultivate and strengthen information competencies
3. Dynamically respond to users' resource needs
4. Expand outreach and engagement
5. Become the campus nexus for scholarly communication
6. Commit to career development for all Library staff
7. Formalize library development

Built in 1955 and expanded in 1979, the current library structure is undersized with poor layout, is technologically outmoded, and no longer effectively embodies, supports, or enhances the Library's mission or the innovative spirit of the Mines research community. Current faculty and staff have expressed a lack of satisfaction with the current physical library. Importantly, it also fails to appeal to potential Mines faculty and students as they consider their career and educational options.

The newly updated mission of the Arthur Lakes Library is to: Foster a rich and responsive information environment that empowers learning, discovery, critical thinking, and knowledge creation for Mines and a sustainable global society.

The design team was tasked with evaluating the condition and functionality of the existing building. HCM performed a series of user interviews and hired a consultant team to carry out building assessments. The team concluded that the existing building is not meeting the needs of the campus due to shortage of space and building code issues and could be greatly improved by a full renovation and improved space utilization.

The original Arthur Lakes Library was built in 1955 and in 1979 a library addition was completed which nearly doubled the size of the building. The library has three stories with two mezzanine levels at its core. The ceiling height at its core is 7'-3 1/2" which is occupied entirely by library collections. The design team explored alternate uses for the existing stack levels, but ultimately selected a strategy that maintains the stacks at the mezzanine areas but removes a center portion at each level to improve wayfinding from the east entry and provide larger volume spaces at the core of the building. Square footage is taken away from the building but the space left behind is greatly improved. The ceiling height will be elevated to nearly 12', and an atrium will be added to bring light down through all three levels.

The selected site strategy provides a new accessible entry at the west elevation to Level 1 where the existing site grades can be easily adjusted to meet ADA accessibility requirements, and provides a highly visible and inviting face to the student life side of the library. The strategy was chosen based on analysis of pedestrian campus traffic patterns, and also to preserve the historic 1955 facade of the building where the existing historic non-accessible east entry will remain in operation. The

STEAM AT MINES
HASS - ARTHUR LAKES LIBRARY - WRITING CENTER

proposed second entrance to the building includes a pedestrian plaza from the building to Maple Street that connects to the new parking garage directly across Maple Street and Maple Street Pedestrian Plaza. The relationship of the building with existing topography translates to Level 2 meeting grade on the south side, and Level 1 meeting grade on the north that will serve as the new service zone of the building, housing the loading dock and staff entry point.

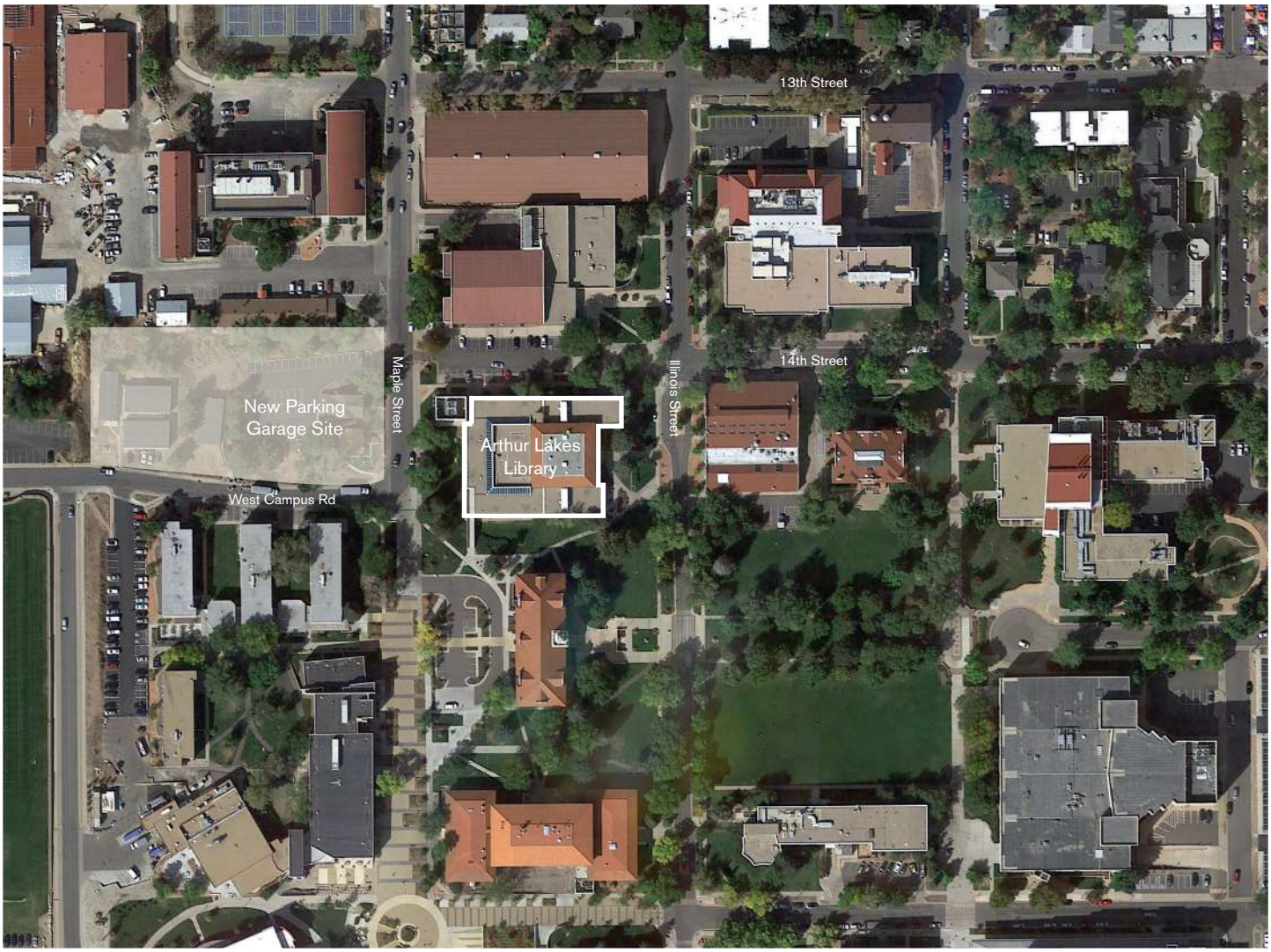
OVERVIEW: PROJECT DESCRIPTION

The renovation of the Arthur Lakes Library will include a complete renovation of the existing building, including the replacement of some MEP systems and modernization of the 1995 elevator. It will also include the removal of a portion of the existing mezzanines and the 2nd floor at the mezzanine locations to provide a more inviting entry from the existing east entry and the new accessible west entry, and provide improved wayfinding throughout the building.

OVERVIEW: SITE

The existing Arthur Lakes Library is located at the heart of campus, oriented towards Stratton & Kafadar Commons along Illinois Street. A key objective is to take better advantage of that location by creating a new, primary entrance for the building along the heavily student trafficked Maple Street side. The new entry will allow for ADA access to enter directly into the library, and those patrons will not be isolated to the Level 2 bridge to enter, as they do today. The new entry will also draw more students off the major pedestrian path along Maple Street and welcome the patrons who utilize the new parking garage across Maple.

A new plaza will be incorporated into the design of the new west entry. Pedestrian access will continue to enter from the existing east entry, but the west entry will likely serve the bulk of users and patrons with this new access point. The staff-only entrance on the north side will continue to serve as a secondary egress/access for staff.



1.2 PARTICIPANTS & PROCESS

The Program Plan for the Arthur Lakes Library Renovation was developed by:

Administration
Paul C. Johnson, President
Tom Boyd, Interim Provost, Academic Affairs
Daniel Fox, Vice President of Student Affairs
Kristen Volpi, EVP, COO, CFO

Building Advisory Committee (BAC)
Chris Cocallas, ODC, Co-Chair
Carol Smith, Library, Co-Chair
Jurgen Brune, Mining Engineering
Beth Zecca, Library
Paul Martin, AMS
Patricia Andersen, Library
Colin Terry, Student Life
Amy Argyris, Student Life/CASA
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Toni Lefton, AA/HASS
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Programming & Design Team
Gwen Gilley - Principal-in-Charge
Mecayla Cobb - Program Manager/Programmer
Travis Bostic – Design Architect
Hunter Stephenson – Designer
Cade Hammers – Designer
Michelle Horn – Interior Designer
Sheri Binkly – Interior Designer
Craig Stoffel – Landscape Architect

Consultants
Martin Martin - Civil & Structural Engineering
RMH Group - MEP Engineering
The Sextant Group – IT/AV/Acoustics
Cumming Group – Cost Estimating

PROCESS

The Building Advisory Committee (BAC) developed this master plan to guide the improvements to the existing Arthur Lakes Library, starting in late 2016 and revisited once again this past Spring - Summer 2018 after a two-year pause.

Early in the programming process in 2016, the BAC toured several newly renovated peer libraries to gain a clear picture of their potential needs and program opportunities. The focus of these explorations included multiple entries, student service offerings, collection consolidation, and overall layout and ease of wayfinding.

During the spring of 2018, early meetings involved revisiting the project goals and weighing the relevance of previously discussed needs and new programmatic considerations. A benchmarking exercise was conducted by the Design Team comparing Arthur Lakes Library to the current libraries at its peer institutions, including Worcester Polytechnic Institute (WPI), Rensselaer Polytechnic Institute (RPI) and Missouri University of Science and Technology (MS&T). The benchmarking exercise confirmed that the goals of the Program Plan for Arthur Lakes Library were in line with the trends and programmatic functions of institutions of comparable size and curriculum.

The BAC identified primary project goals for a proposed library renovation project as follows:

- Create a Nexus/Hub of the campus
- Transparency, Visibility and Connectivity of program spaces
- Create an attractive library that students can be proud of and helps students succeed
- More Student-Centered Spaces
- Accessibility
- Create Noise Zones: Quiet Study Space/Social area/ Group study
- Improve Circulation and Wayfinding

Later meetings involved the consolidation of program, brainstorming of multiple use scenarios and diagramming to determine how the program spaces could realistically be accommodated in the existing building footprint, considering its challenges and opportunities. Additional meetings were held with a variety of stakeholders to create a program of optimal space types and quantities. These participants included student representatives, faculty, library staff, administrators, leadership from each of the colleges on campus, and campus

facility architects/engineers.

After a series of highly interactive workshops with the Building Advisory Committee utilizing digital and physical models, the design team completed a conceptual design for Arthur Lakes Library that met the needs of library staff, students, and the greater Mines community. The over-arching goals of the renovation and the preferred conceptual plan included in this Program Plan are a direct result of the interactive and inclusive process employed and the active participation of all constituents.

1.3 PROGRAM DESCRIPTIONS

Librarians are more important now than ever before for navigating the large quantities of information, both digital and physical, available by library users today. The library staff is the backbone of the Arthur Lakes Library, and consists of many different divisions: administration, collection development, information technology, government information, map collections, reference, student services, special collections, cataloging, and preservation. Each department plays a key role in the daily functions of the library, and they all have specific relationships and programmatic needs. The design team performed a program analysis to explore these primary and secondary relationships and ultimately found a conceptual solution that promotes staff efficiency. Most staff functions will occur in a "back of house" space at the northeast corner of the building with a separation between public and private staff. They will also have a staff lounge.

The Special Collections at Arthur Lakes Library are a source of pride for the Colorado School of Mines Campus. This collection comprises the Mining History Archive, the Information Center for Ropeway Studies, the Tell Ertl Oil Shale Repository, and other collections and are currently scattered throughout the building. The Library Staff emphasized the importance of co-locating these collections into one space so that they could be showcased as a single entity. The Special Collections high-density stack area and reading room are located on Level 1 in the conceptual design. The stack area will require a separate climate controlled environment.

A new grand stair connects the bottom two levels and the intermediate mezzanine levels and serves as a light well provided by a new clerestory monitor at the 1979 roof over the existing 2nd floor mezzanine, that provides natural daylighting to spaces that currently do not receive direct sunlight at the center of the building. The central grand stair also serves as a wayfinding device and point of context to make it easy for library patrons to navigate the multiple levels. Level 1 will be highly active, especially with the relocation of Book & Brew to the new west entrance. Publicly, half of Level 1 will serve as an academic resource and the visible front door to the Special Collections, and privately the other half of Level 1 will accommodate the Library's back of house, operational functions. Level 2 will be a more vibrant environment where collaboration is encouraged throughout the STEAM, tutoring, business incubator, and general study spaces. Level 3 will be designated as the "Quiet Study" level and adequate acoustical separation will separate a Multi-Purpose Space and the rooftop patio on the same level.

To attract more students to the building, the BAC emphasized the importance of providing improved technological capabilities, a variety of study environments, and home for valuable academic resources. The library will be equipped with numerous laptop plug-in locations, ample power outlets, and upgraded, modernized computer stations distributed throughout the Library. Students will have easy access to the tutoring space. There will also be multiple copy/scan stations distributed throughout the library on multiple floors. In addition to open seating areas equipped with data capabilities, study rooms dedicated to group and individual use are distributed throughout the library for a variety of study environments. The cafe on Level 1 and the multi-purpose room on Level 3 will be heavily used by students and faculty and will activate new outdoor spaces in the redesigned Library.

As part of the planning process, Hord Coplan Macht performed a library collections assessment which studied current holdings, projected growth and estimated space requirements for the future collection. To accommodate the projected growth, the design team proposed the use of high density shelving. The collections also will require less physical space as more items are converted to a digital format. Journals are primarily electronic and no longer need physical library space and microfiche will eventually be digital as well.

The content of this report represents the conceptualization of this project; however, it is anticipated that many factors will influence the development of the project and costs over the coming years including detailed development of the building design and comprehensive review of the existing building. It is the intent that this conceptual design meets the programmatic needs of the Colorado School of Mines Arthur Lakes Library and will be a point of departure for the renovation project in the future.

Students studying and utilizing the active desks

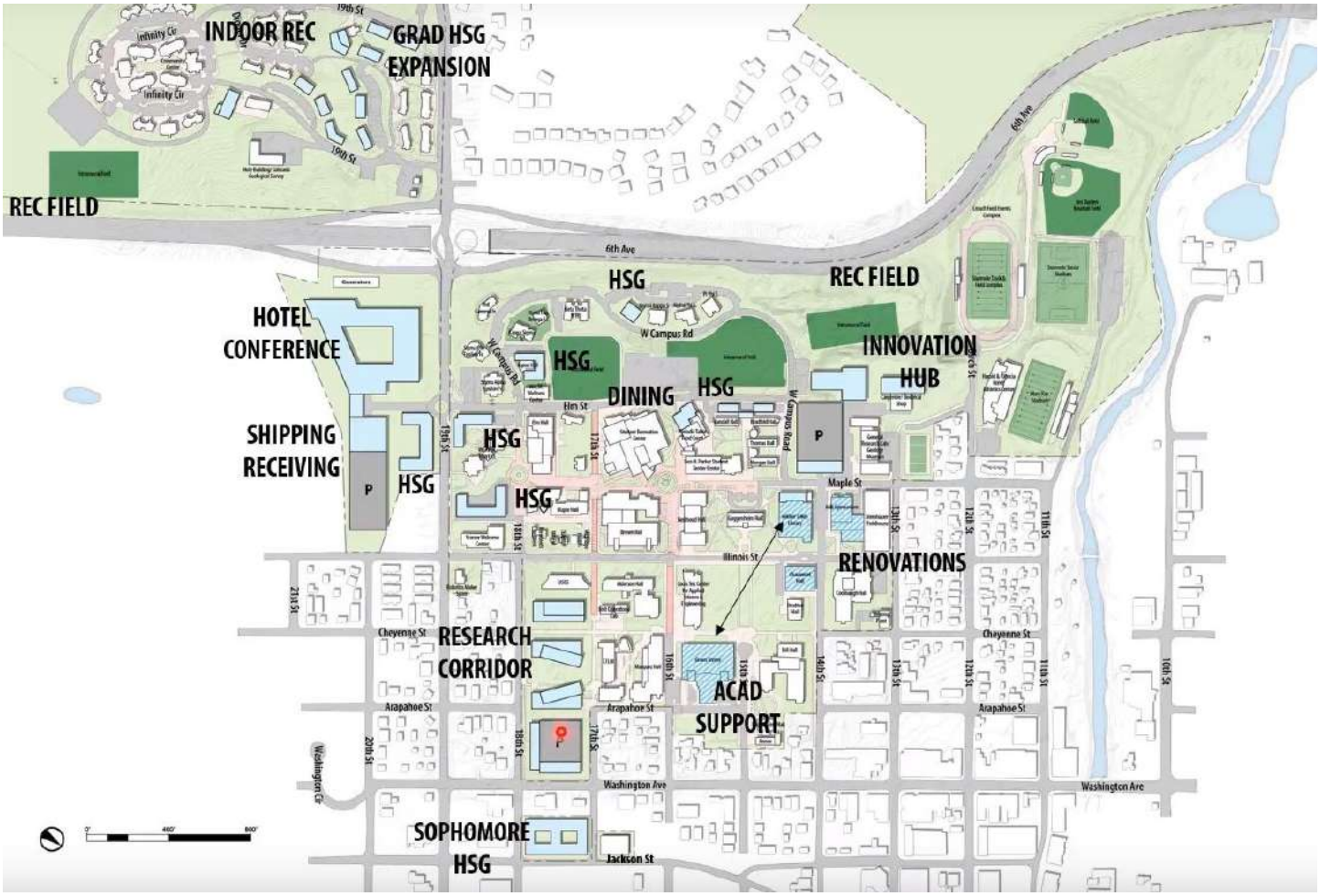
1.4 RELATIONSHIP TO FACILITIES MASTER PLAN

Simultaneously while Hord Coplan Macht developed the Program Plan for the Arthur Lakes Library Renovation, Colorado School of Mines was in the process of updating their Campus Master Plan. Mines Leadership, in partnership with SmithGroupJJR and Anderson Mason Dale Architects, are developing the new direction for the overall campus plan. The physical planning phase will respond to the Mines @150 Strategic Plan. As the state's oldest public institution of higher education, this is critical to the college's development.

In the prior 2010 Master Plan, improvements to the existing facility and a potential addition along the south and west facades of the 1979 Addition to Arthur Lakes Library were indicated. This dynamic plan called for the Library to remain an anchor at the end of the main pedestrian corridor and serve as a pedestrian entry point to the campus.

It is anticipated at the end of the Mines Master Plan 2017 process, Arthur Lakes Library will remain in the heart of campus at the academic core. The current plan illustrates an expansion on the western facade. Also anticipated in the near future is the re-opening of 14th street along the north side of the Library. The removal of surface parking in this area will likely not be greatly affected due to the new Mines Parking garage opening in the spring of 2020.

If further expansion is needed beyond that which is proposed in this Program Plan, parts of Chauvenet Hall could be renovated to accommodate more library functions and expansion in the future.



Mines Master Plan 2017 (In Progress)

2.1 EXISTING CONDITIONS

This program plan is recommending the renovation of the current library to address the needs of students today and for the future. In large part this is because the existing spaces currently provide inadequate study space for students, insufficient access to technology and power, and lack of flexibility in spaces large and small to function and reconfigure in new ways to facilitate new opportunities.

The Arthur Lakes Library was originally constructed in 1955 and was designed by Fuller, Fuller, & Fuller, Architects - Engineers.

A significant 37,660 gross square foot addition was added in 1979 . The combined buildings are three stories tall and include two mezzanines which yields 5 floors of stacks. Additional minor renovations and updates were completed over the building's 65-year lifespan. The overall gross area is 76,689 square feet.

The following summarizes the needs and other issues associated with the existing Arthur Lakes Library and its diminishing functionality.

Safety Issues

The existing Library does not currently pose any significant safety issues to its users. However, the existing main east entry has an approximate 30 foot grade difference from the street level to the Level 2 entry and is therefore not ADA accessible. An accessible entry has been provided at the west bridge entry, however, this entry is locked at all times and requires a door bell to be rung if a handicapped visitor needs to access the building and therefore does not provide equal access to all visitors.

Environmental Issues

A Hazardous Material Inventory was completed in both February 2011 and October 2017. The most significant items identified as asbestos containing material (ACMs) were 9"x9" floor tiles, ceiling tiles and on pipe covering compound. Refer to the Appendix (A.1 Hazardous Material Inventory) for the full report.

Code Compliance

The following areas do not meet current ANSI accessibility codes:

- Accessible entry is locked at all times
- Existing toilet rooms do not have accessible plumbing fixtures or turning radius
- Handrails at stairs

Additionally, both existing elevators do not meet current elevator codes and the existing plumbing fixture count is inadequate for occupancy uses and will have to be updated at the time that the library is fully renovated.

Building Envelope

The building's exterior envelope is primarily brick, with precast concrete sills and coping at the original 1955 building. The original 1" insulated, reflective glass curtain wall on the north, west and south elevations are original to the 1979 addition.

Conveying System

The Library has two elevators located within the existing building envelope:

- Elevator #1 was installed in the original1955 building and is a traction elevator that serves all 5 levels of the building. It is still operational but at the end of its life expectancy. A 2014 facility audit indicated that the cables should have a guard installed around them but it is unclear if this has been put in place.
- Elevator #2 was added in 1995 in the 1979 section of the building and also connect all 5 levels of the Library. Elevator #2 is a hydraulic elevator and it is recommended that this elevator be modernized to meet current elevator codes and extend its service.

Roof

1955 Roof: The existing 1955 roof is an asphaltic built-up roof assembly surrounded by sloped clay tile over a 2" concrete deck on sloped steel truss structure. The 1955 build-up roof assembly has not been replaced, however, it has had only minor leaks over time which have been repaired adequately by the Mines facilities team, and is not a priority to replace at this time for this project, but is a priority deficiency item for Mines to replace in a future project. The clay tile roofing is in good condition. The existing gutter over the main east entry has had ice dam issues in the past but was replaced in 2010 and heat tape added to avoid future ice damming issues and has not had recent issues.

Existing Level 1 and Mezzanine 1 Collection Space

1979 Roof: The existing roofing over the 1979 section is also an asphaltic built-up roof assembly over concrete roof structure and was replaced in 1995 and is in good condition. In 2009 the existing glazing and seals were replaced at the skylights.

Proposed West Entry Vestibule Addition: The proposed west entry addition will include an EPDM membrane roofing over 5" rigid insulation on metal deck over steel structure and slope toward a gutter and downspout to drain to adjacent landscaping.

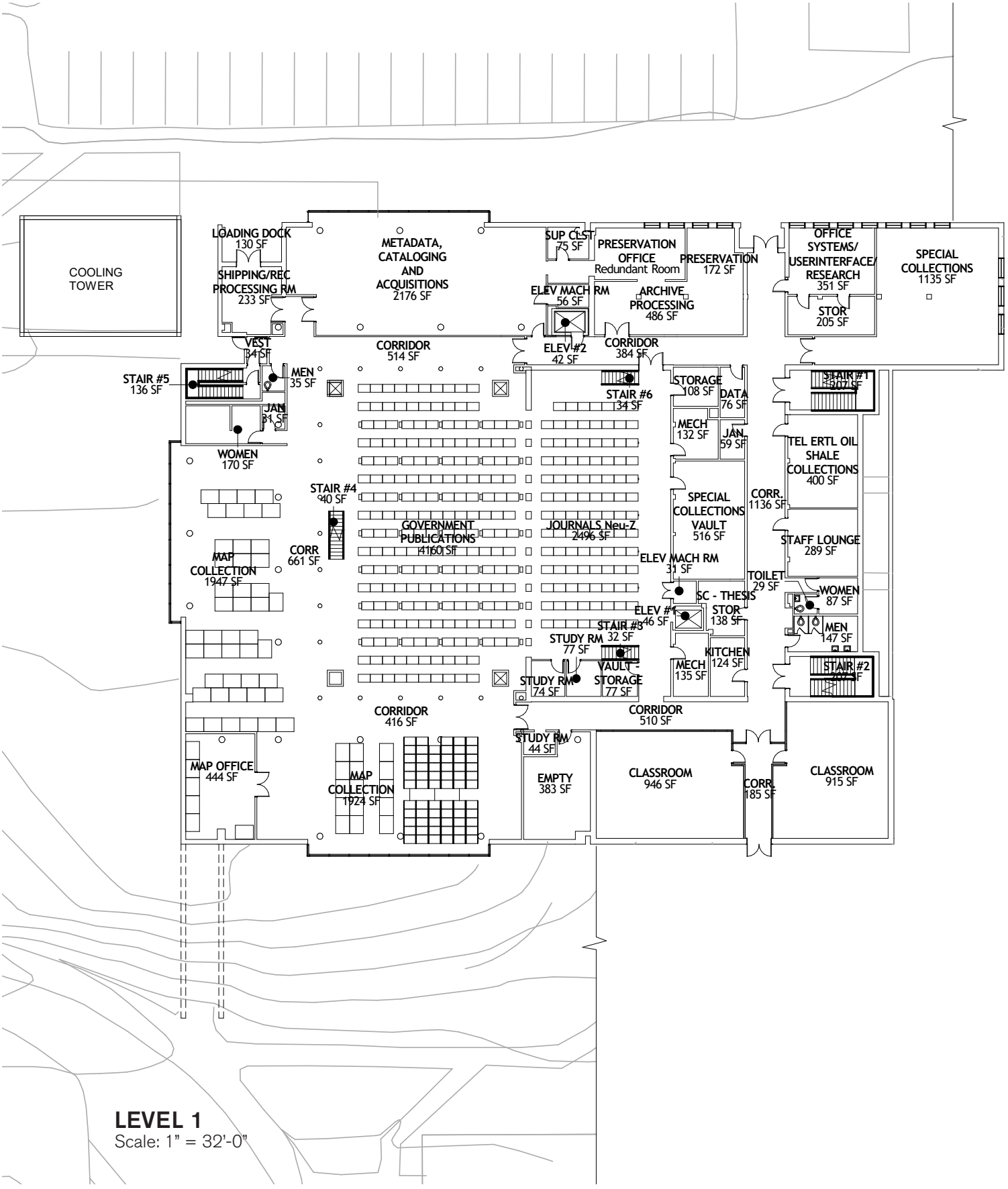
REFER TO NARRATIVES BY LANDSCAPE ARCHITECT, STRUCTURAL CONSULTANT, AND MEP CONSULTANTS IN SECTION 3.1 FOR OTHER EXISTING CONDITIONS.

FACILITY CONDITIONS AUDIT

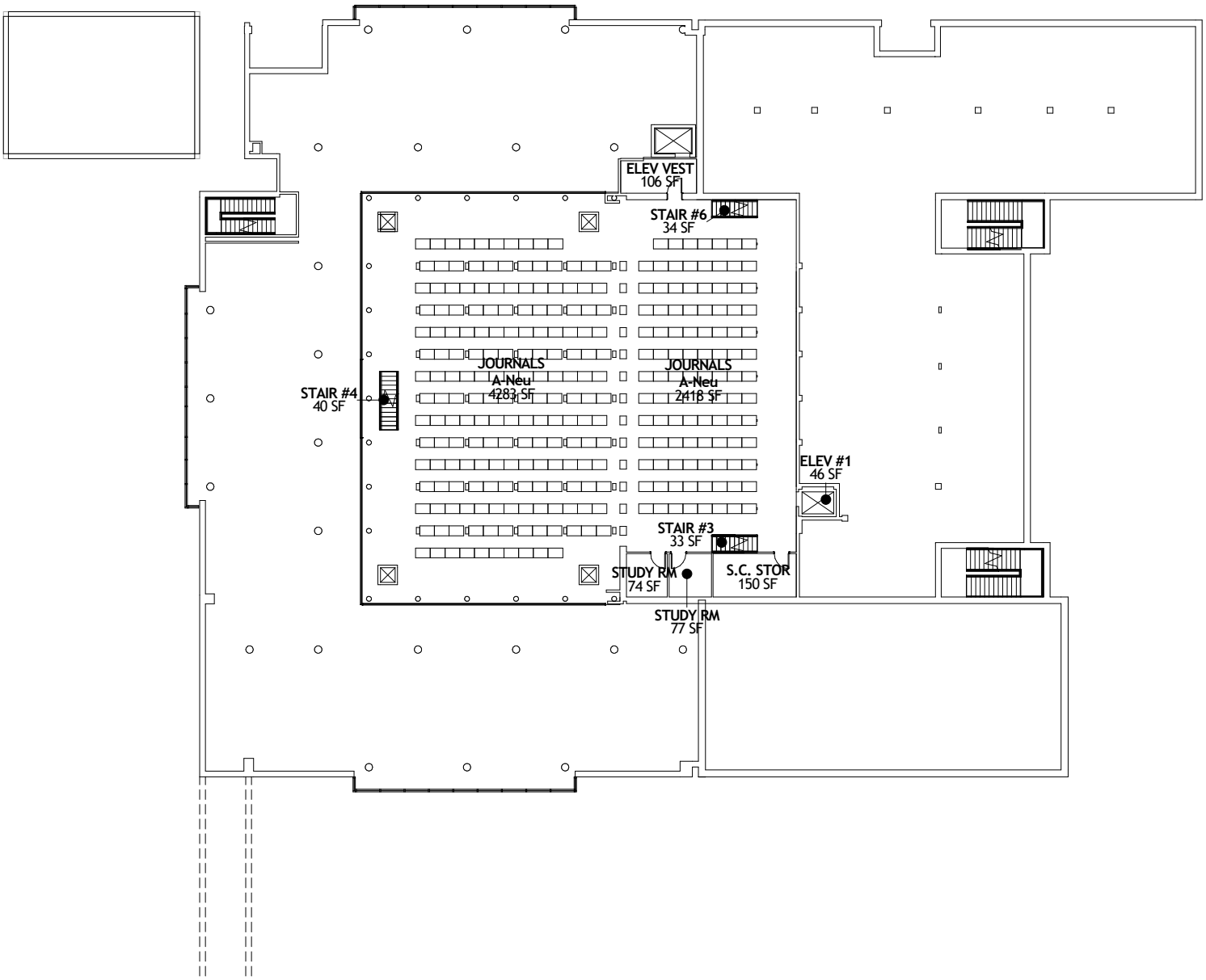
The Facility Condition Index (FCI) represents the relative condition of a facility to its total replacement value. The lower the FCI, the poorer the relative condition of the facility and its component systems. As of January 2014, the Arthur Lakes Library building's FCI was 73.3%, which indicates the Library needs remodeling. This FCI rated the components that make up the substructure, superstructure, exterior enclosure, roof, interior, plumbing, HVAC, fire protection, and electrical. The CSM target FCI for the Library s 85%.

For deficiency items identified in the 2013 Facility Audit Report that will not be covered in this scope, refer to Section 4.2 in Appendix.

EXISTING PLANS



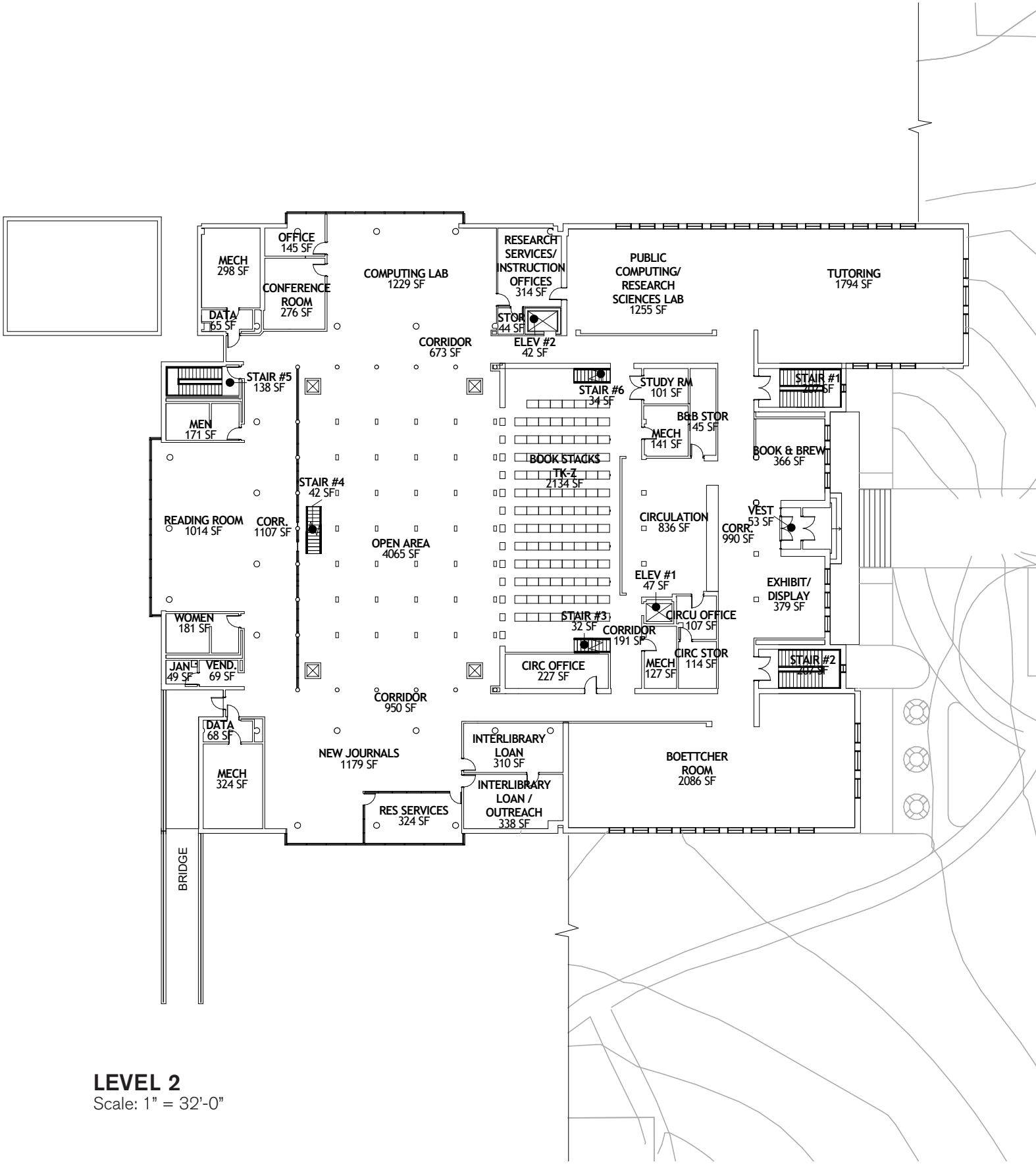
LEVEL 1
Scale: 1" = 32'-0"



LEVEL 1 MEZZANINE

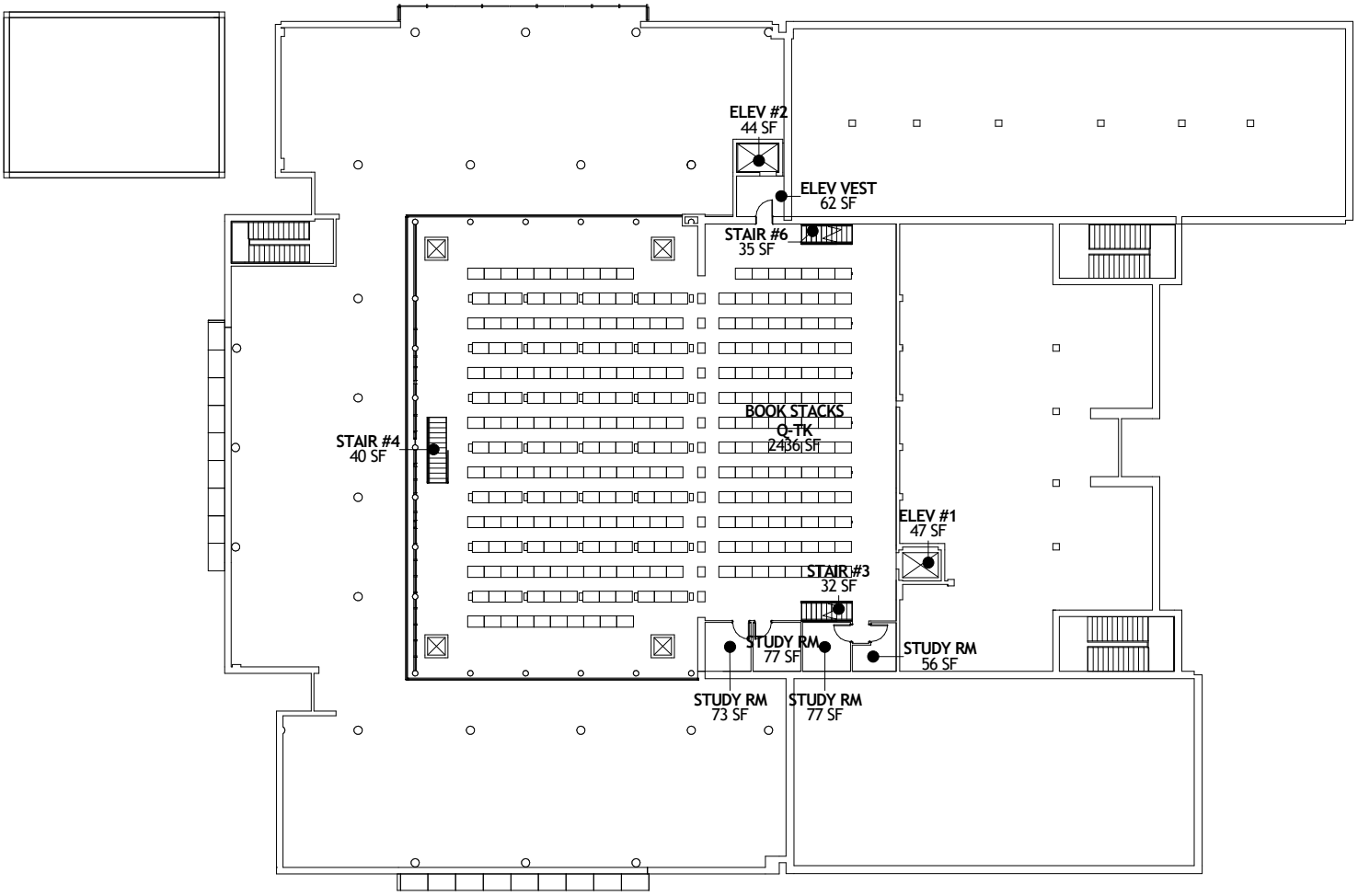
Scale: 1” = 32’-0”

EXISTING PLANS



LEVEL 2

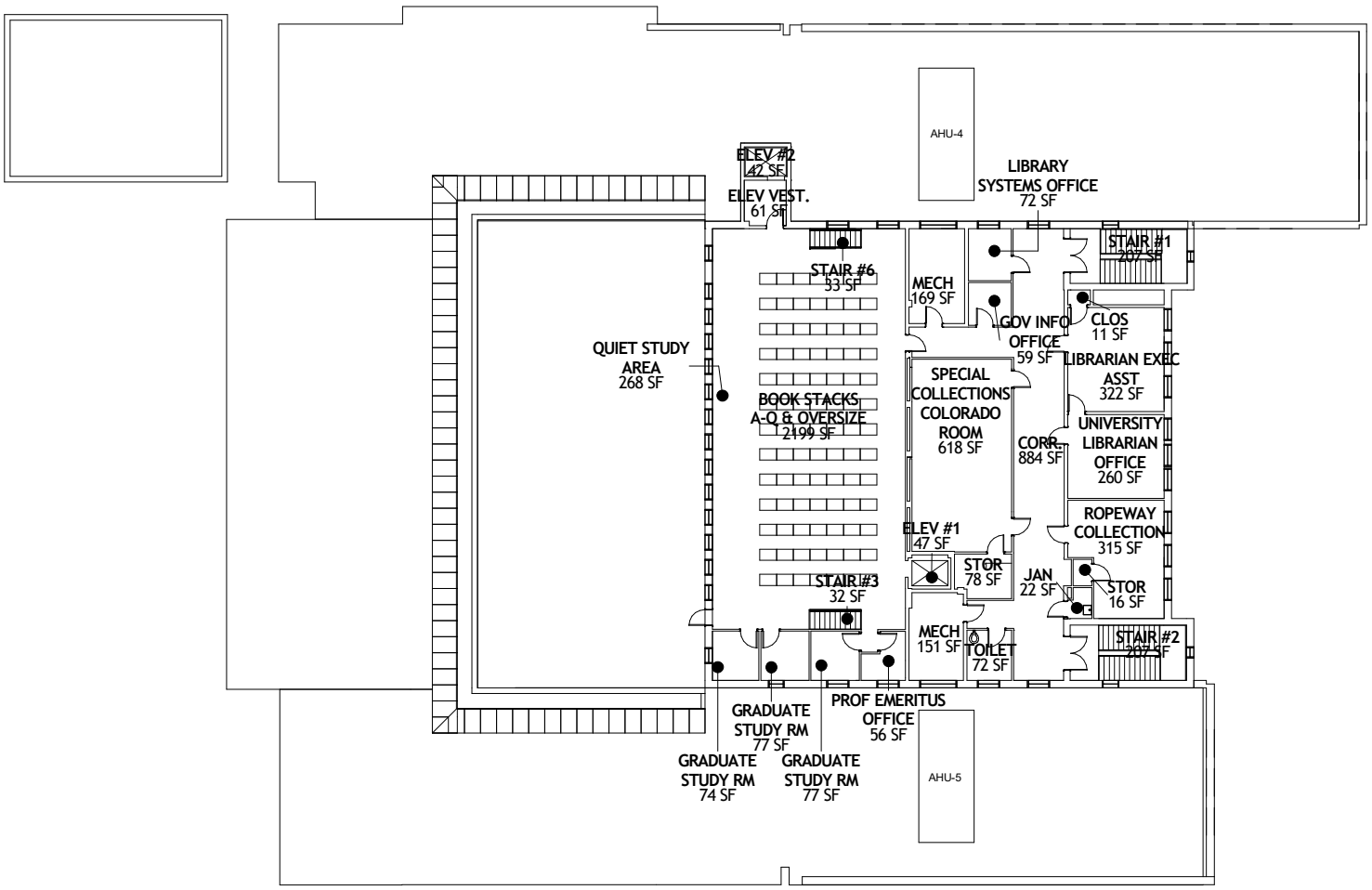
Scale: 1" = 32'-0"



LEVEL 2 MEZZANINE

Scale: 1” = 32”-0”

EXISTING PLANS

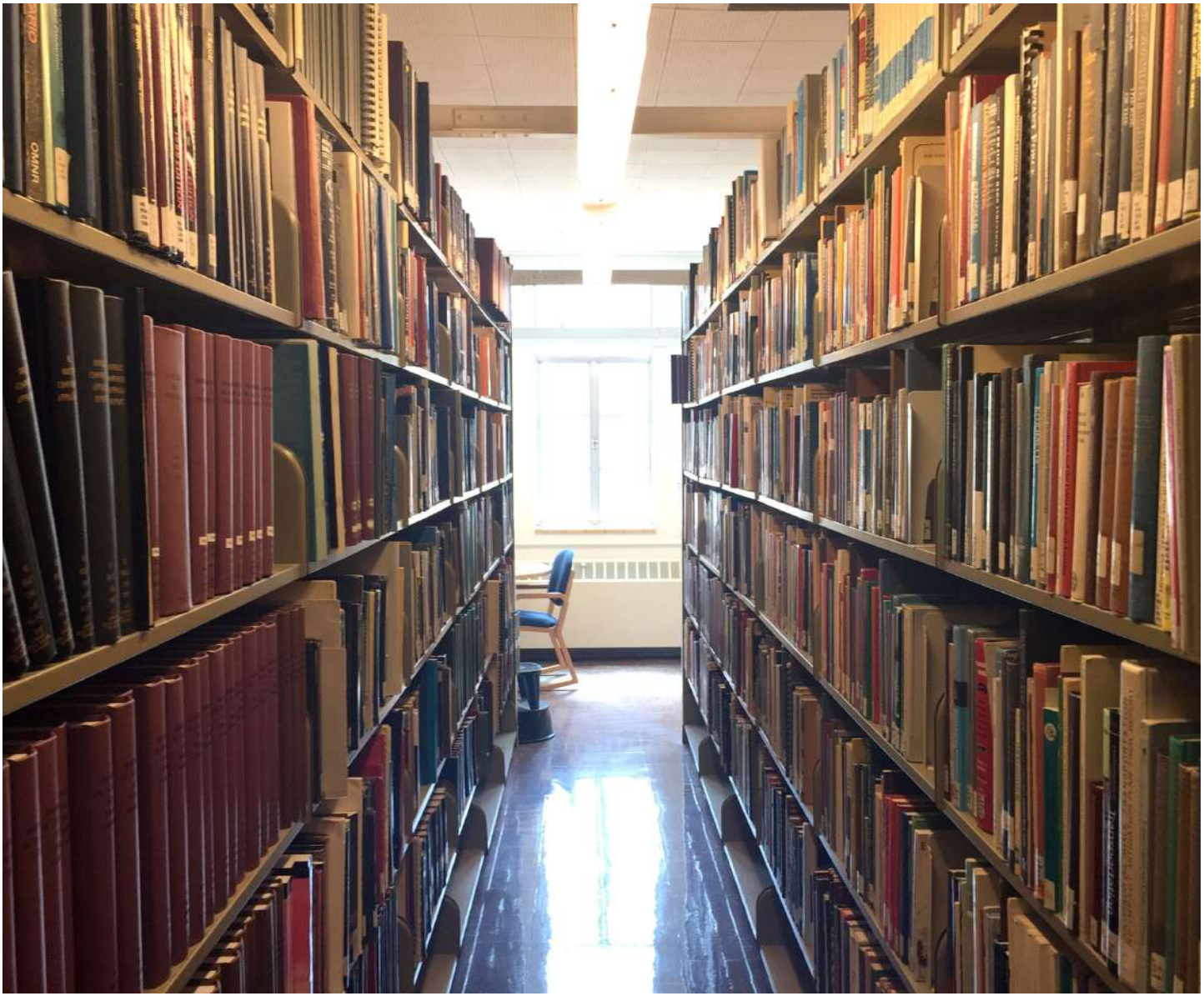


LEVEL 3

Scale: 1" = 32'-0"

Level 2 day-lit corridor to ADA Entry at Bridge

CASA/ AMS Tutoring Space on Level 2



Existing Level 3 Collection & Quiet Study Space

Maps Collection on Level 1 on west side of Library.

Reading Room on Level 2 with glass separation from stack area

Low ceiling height in Mezzanine 2 Stack Area

Quiet Study Area on Level 3

Book & Brew Cafe near Main Entry on Level 2

2.2 CHANGES & PROJECTIONS

In the Spring of 2017 the campus engaged in a series of discussions envisioning MINES at 150. The President, Paul Johnson, outlined the value proposition of change in the campus' direction. He highlighted Mines' competitive edge of undergraduate students, but urged the faculty, staff and students to consider an increase in the graduate student population. He discussed leveraging the Mines identity and enhancing the reputation/recognition of the institution, growth in resources, and increasing student & faculty quality and diversity.

The campus at Colorado School of Mines continues to grow year-to-year. A large growth in the student population is anticipated by 2020 to reach a total of 8,000 students. The majority of growth is intended to be in graduate students with an increase of 1,200 students. The remaining 800-student increase will account for in on-line education.

The current student population on campus, as reported from the Fall 2017 Headcount Enrollment, is 6,117 students, and consists of 4,794 undergraduate students (of which 1,149 are freshman) and 1,286 graduate students pursuing master's and doctoral degrees. Non-degree students account for 37 students.

With a 20% anticipated increase in the student population on-campus (disregarding the on-line students), Arthur Lakes Library will need to provide more study spaces and resources to a larger group of users. The staff is likely to increase in the Library as well, specifically in the Scholarly Communications Center due to the increased need for guidance for graduate students accessing library resources/data and to continue to facilitate the development of research and disseminating that research to the larger academic community.

Therefore, Arthur Lakes Library is at a critical crossroads and in desperate need of renovation to accommodate the students on campus, and those future Orediggers as well.

2.3 SPACE REQUIREMENTS

The renovated facility will offer efficiencies in functionality and adjacencies that the current library does not provide. New programmed spaces will also offer students additional resources and technology, increased collaboration spaces, and much needed study space for the growing Mines campus. While the current plan does not include an expansion of the existing library footprint, the proposed renovation of the existing library, which will include a complete reconfiguring of its current spaces, will ultimately provide a library facility that can meet its needs for the next 20 years.

The following describes the specific space needs of the renovated facilities.

PROGRAM SPACE SUMMARY

Public / User Spaces

Lobby / Exhibit Space

The renovated Library will incorporate a new west entry on Level 1 while maintaining the original 2nd floor east entry off Illinois Street. The additional entry will draw students into the library as they travel along the Maple Street pedestrian plaza coming from the student life facilities at the southwest corner of campus towards the academic side of campus, anchoring the northern end of the Maple Street Plaza. This entry will also improve Universal Access. The two entry points will be supported and monitored by info desks to help users navigate the five-level Library. Exhibit areas to display special library collections, share STEAM projects, and exhibitions will be highlighted at both entries, possibly incorporating a digital visualization wall.

Info/ Circulation Desk & Reference Desk

The new info desk and reference desks will be reconfigured to allow for clear student access and serve as an inviting and welcoming feature located off the new central spine/grand stair. The new desk areas will meet the needs for access services and a tiered reference model. The separation of these two new service points will provide clarity and allow for clearer wayfinding and an improved east entry sequence. The new desk will accommodate laptop storage, technology for the tool collection and inventor toolkits - possibly housed in lockable, glass cabinets so students can see what kits are available for their use.

Book and Brew Cafe

The library's Book & Brew coffee shop will be relocated to Level 1 immediately adjacent to the new west entry. It will be expanded to offer light snacks and beverages. Student workers will acquire real-world business management skills via collaboration with the business incubator.

Multipurpose Space

This column-free space on the third floor will house a variety of programming events offered at the Library including musical concerts, poetry readings, popular Mindful Mondays meditation, and more. The new multi-functional space will have direct access to a new rooftop patio. Adequate acoustical separation from other adjacent spaces will be key, along with multi-use technology and controllability. A furniture storage space will be directly connected to provide ultimate flexibility to reconfigure the space as needed from lecture seating, to banquet tables to general study space. And, a small catering kitchen will support these various events.

General Seating

The current library provides user seating for approximately 630 students. Based on the recommendations of seating quantity at peer institutions, it is recommended to accommodate at least 12-15% of the student population. With significant growth in student population planned over the next 10 years at Mines, the new library is planned to have over 930 seats including table seating, carrels, lounge seating, computer stations, group study rooms and instructional space. A broad variety of new furnishings will transform the library into a more modern, comfortable, configurable, and welcoming place. The two outdoor patios (on Levels 1 & 3) will add an additional 75 seats.

Quiet Study Area

Fundamental to student learning are spaces where concentration, reflection and decompression can occur. An expanded quiet study area will be preserved on Level 3 along the eastern side of the Library. This space will allow a wide variety of seating types that accommodate concentration and individual use.

24/7 Study Space

An extended hour learning space will be accommodated so students will be able to utilize a portion of the library 24 hours a day, 7 days a week. Key to the design of this space will be offering all the necessary resources students need, including computers, technology, vending, and copy/print facilities in the space.

Group Study Space & Graduate Study

More frequently today than ever before, students work collaboratively in groups as well as individually. They need an expanded palette of technology-rich study spaces to support their multi-modal study habits. Group study spaces, varying in size from 4 to 10 persons that can be reserved for group projects and study, have been designed for this crucial need. Some study rooms will also be outfitted for the capability to be utilized as Presentation Practice rooms, where students can practice presenting while recording themselves, simply on their own device. Dedicated graduate study space will be reserved for graduate student needs which are often one- to two-person spaces for concentrated work and research.

Computer Labs

The library's current computer lab is popular and often at overflow capacity. Students need more computer lab stations and would prefer these additional stations be distributed throughout the library. The Design Team has distributed and increased the amount of computer stations. There will be computer stations that can accommodate 6-10 students at a time to still support group collaboration at computer stations.

Copy Areas & Campus Copy Center

The Ore Print station will be duplicated and distributed on multiple floors throughout the library for ease of access and convenience. Each copy area will be easily identified with signage, and co-located near the distributed computer stations. Currently, the campus leadership is anticipating that the Campus Copy Center might move to the library, however, space allocation for the Center is still to be determined.

CASA / AMS Tutoring Space

The library will continue to incorporate programs that are related to the institution's core academic mission. While these programs are not critical to the library operation, they allow the library to be an integral partner in the learning mission of the School by enhancing current collaboration among these groups. The CASA / AMS Tutoring Space will be similar to other general seating areas, but will digitally display the tutors on-staff each day, the tutoring schedule and various tutoring information. This space will utilize ample whiteboards as well.

Research Services & Center for Scholarly Communications

This new center is envisioned as a broad campus initiative to advance digital scholarship, develop and promote born digital collections, craft a collaborative research paradigm, and provide leadership in managing and disseminating the research output of Mines.

Library Instruction Classroom

The current library lacks a dedicated instruction space for teaching research skills. The new library will include one functional, interactive classroom that can seat approximately 40 persons. This classroom will be outfitted with projectors, whiteboards, instructor station, and collaborative tables that can double as study space when instruction is not scheduled. The classroom's adjacency to Scholarly Communications will benefit both library and academic instruction.

Collections

General Collection

The current collection of approximately 616,000 volumes has recently been aggressively weeded by the library staff. To most efficiently house the collections and maintain their current ease of accessibility on-site, many of the stacks spaces will continue to function in the same manner. Due to the low floor-to-floor heights between the mezzanines and main levels (Levels1-2M), there are limitations to how these spaces can function.

Special Collections

The library houses several special collections including the Center for Ropeways Studies, the Russell L. and Lyn Wood Mining History Archive, and the Tell Ertl Oil Shale Repository. These collections are currently dispersed throughout the building. The fully renovated library will bring these collections together in a central location that includes displays and exhibits, a public reading room, presentation/small instruction space, and a service desk. Staff offices and a work area will support the new space, and high-density shelving in an appropriately conditioned space will preserve and secure the collection so valued and unique to CSM.

Staff & Support Spaces

Library Administration

Relocating the University Librarian's office and support spaces to a more accessible location is key in the renovation. These offices will be located among the library staff spaces with views to the exterior on Level 1.

Collections Management Offices

The consolidation and reconfigured Collections Management space will allow the back of house/ operational side of the library to be slightly isolated from other public functions. The collections management offices and open workspace will be

Mountain View from the existing Rooftop, accessible on Level 3.

more efficient than its current space

Interlibrary Loan

Interlibrary Loan (ILL) controls borrowing and other resource lending/exchange, domestically and internationally for all Mines students, faculty, staff, and qualified alumni. Last year, they processed 8,000 requests. ILL will be relocated to Level 1, and in close proximity to Collections Management, Government Publications, and the Library Administrative offices. ILL will also have access to the Shipping & Receiving area on the same level. Their large work room will include a packaging area and supply space as well as computer workstations for researching data.

Government Information

The main offices for Government Information will remain on Level 1, near other Library Staff space. Their cart-intensive work will occur in a large, shared room designed with ample desk space. They will be located as close to the Government Docs collection as possible. As more and more government information is delivered digitally, the growth of this physical collection is likely to decrease. Colorado School of Mines will continue to fulfill their commitment as a member of the Federal Depository Library Program (FDLP) and participating in the Colorado State Government depository program.

Maps

The Map Collection at CSM has always been a truly unique collection that was started when the Library was first established in 1955. The Map Collection will continue to be accessible to users on Level 1, but the collection will be consolidated and located below the first floor mezzanine level. A new Maps Office will be centrally located among the collection for ease of assistance to patrons. A large cluster of 32 computer stations will also be located near Maps, and function as the geospatial data center supportive of GIS software, geospatial analysis instruction services, and other technology-infused features.

Preservation & Digital Initiatives

The long-term preservation of the current collection is critical. The Preservation Lab is not well-configured in its current location. The new lab will provide sufficient large/long tables, space for storage and supplies (including special collections supplies), deep open and closed shelves, and necessary equipment like a sink, fumehood, humidification chamber, cutters, and presses. A large interior window from the public corridor could display to students and patrons the delicate nature of the book repair process.

The development of a new Digital Lab will facilitate Mines' contributions to the institutional repository and expand the digital content-on-demand services the Library already provides. The Digital Lab will require space for books to be taken apart, binders stripped and scanned. It must be environmentally controlled and secure for the portable and costly equipment it houses, including table scanners, wide format scanner, and document cameras. The goal is for the newly redefined library to become the University's source for digital content services.

Conference Room

The staff conference room will be reserved for staff use only. It will be equipped with conference technology, web-cams, and digital displays. The conference room will be designed to accommodate 25 persons in a variety of table configurations for meetings, trainings, or other events.

Additional Program

STEAM Studio Space

Students have requested that the new library include casual zones such as media and gaming lounges, meditation space, and more. The renovated library will also incorporate multiple lecture and presentation rooms to support robust intellectual and artistic programming, an art gallery, and more. A place to design and create within the Library will occur in the STEAM Studio Space. Much like an art studio, this space will allow users to be a little dirty, and create their own models, assemble presentation boards for their courses, or merely prototype as they please.

STEAM Recording Studio / Presentation Lab

The new library will also provide a small recording studio to record instruments and music on-campus. The control room will allow for mixing and editing of recorded content, and the same room will be capable of converting to a one-touch studio for recording presentations. A green screen wall will be provided to allow for chromakeying.

Business Incubator

The business incubator will foster innovation and entrepreneurship between Mines faculty and students and the larger business community with research consultation services, conference facilities, a multimedia production studio, data visualization platforms, presentation practice space, and multiple office suites.

Geospatial Data Center

It has been estimated that 90% of all information involves a location component. The geospatial data center will support the geospatial needs of Mines scholarly endeavors with GIS software, geospatial analysis instruction services, a geospatial data visualization wall, and other technology-infused features.

Faculty Lounge

Mines faculty currently lack an informal gathering space on campus. The newly designed library has the potential to provide a warm, collegiate environment that brings faculty together to foster casual, cross-disciplinary connections in one of its general seating areas, during specific hours of the day. Though this space is not intended to be dedicated to this function, this should be revisited once funding is awarded to determine the best location in the renovated library to offer this flexibility of use.

Outdoor Study Areas

Of equal importance to the newly re-imagined interior spaces are the exterior spaces planned. A rooftop patio on the top floor and a substantial outdoor space associated with the new west entry will provide additional study and social space for students and patrons. The view of Mt. Zion's "M" from the Library's rooftop is unmatched.

TOTAL NSF AND GSF

The total program space requirements for all of the prioritized program spaces by the BAC is 80,272 GSF for the re-imagined Arthur Lakes Library, however the overall existing gross square feet available for the library is 76,789 GSF, therefore, we have identified several program spaces that can be combined into multi-purpose program spaces to maximize efficiency. It is planned that the majority of the existing library spaces will be fully renovated to update finishes and lighting, with several areas requiring more intensive renovation such as at the toilet rooms to meet current fixture requirements and accessibility requirements and to create the new grand stair. Existing MEP systems are mostly being maintained except as noted in the MEP narratives. Additionally, a small entry vestibule (200 GSF) on Level 1 along the western side of the 1979 building facing Maple Street will be added. An outdoor patio on Level 3 will also be added to the existing Library accessible through the new Level 3 multipurpose space, adding 2,800 sf of additional outdoor study space.

The following pages summarize the approved program for the Arthur Lakes Library Renovation.

PROGRAM

Colorado School of Mines

ARTHUR LAKES LIBRARY PROGRAM

July 27, 2018

	Existing Program	Existing Room Nos.	Quantity of Spaces	Stations/ Occupancy per Unit	NSF per Space	Proposed Program Total NSF	Notes
1 LOBBY / GENERAL SERVICES							
1.1 General Lobby	**248**					**500**	
Lobby Vestibule	51	203	2	-	100	200	Assuming two entrances
Lobby	197	C250E	1	-	300	300	
1.2 Exhibit / Student Art	**359**					**300**	
Display / Immersive Display	359	205	1	-	300	300	Utilized by Outreach/ Engagement, GIS, Business Incubator, Research Services, etc.
1.3 Book & Brew Café	**520**					**854**	
Café	382	201	1	-	200	200	Also serves as Catering Kitchen. Include public microwave. Consider long queuing line.
Table Seating	included above	-	1	8	200	200	
Lounge Seating	included above	-	1	6	240	240	
Manager's Office (semi-enclosed)	included in circ.	-	1	1	64	64	Adjacent to café. Cubicle is sufficient
Storage	138	200A	1	-	150	150	Ample shelving. More snack storage. Mop sink located on same floor.
1.4 Multi-Purpose Space	**2,160**					**2,800**	
Multi-purpose Room	2,052	219	1	100	2,500	2,500	Projection capabilities on both ends, enclosed space (doors), and standard podium.
Catering	-	-	1	-	150	150	
Furniture Storage	108	120A	1	-	150	150	For flexible tables and chairs storage.
1.5 Print / Plot / Copy Center	**0**					**120**	
Print / Copy Areas	-	(distributed)	3	-	40	120	One (Ore Print) per study level.
1.6 Seating	**2,918**					**11,705**	
General Seating	1,014	248	1	1	8,000	8,000	Sufficient power capabilities. Dual use for AMS/CASA Tutoring Space and a portion for Faculty Lounge space during certain hours.
Group Study (Small)	718	(multiple)	10	4	120	1,200	(10) existing. Dual use for AMS/CASA faculty office hours, Business Incubator Team Rooms, etc.
Group Study (Medium)	156	120A-M	4	6	180	720	(1) family friendly for non-traditional students.
Group Study (Large)	-	-	1	10	300	300	Use for Research Services Small Group Instruction. Accommodate Presentation Practice Recording/ Capabilities in each study space.
Graduate Study Rooms	216	(multiple)	3	4	120	360	
Conference Room	276	266B	1	25	625	625	For staff use, primarily.
Quiet Study	469	320-QAs	1	-	400	400	
Vending/Recycling	69	240	1	1	100	100	
24-hour Study Space	-	-	-	-	-	-	Component of General Seating.
SUBTOTAL Lobby / General Services	**6,205**					**16,279**	
2 FULFILLMENT							
2.1 Info Desk / Reserves	**1,285**					**1,056**	
Info/ Circulation Desk	820	200	-	-	-	-	
Service Positions	included above	-	2	1	80	160	(1) Tech Gadget Desk
Queue Space	included above	-	2	1	40	80	
Staff Workstation (open)	included above	-	1	1	48	48	Behind Info Desk
Graduate Student Workstation (open)	-	-	1	1	48	48	Behind Info Desk. For supervision & processing Prospector software.
Laptop Checkout Storage	included above	-	1	-	100	100	
Book Drop	included above	-	2	-	25	50	(1) at each main entrance.
Coordinator Office (enclosed)	116	200B	1	1	120	120	Direct visibility to Info Desk
Tech Office (enclosed)	238	222	1	1	100	100	
Work Area / Reshelving Area	included above	-	1	-	150	150	Toolkits & tech storage with lockable glass doors.
Storage (secure)	111	200C	1	-	200	200	
2.2 Interlibrary Loan	**634**					**488**	Moving to Rm. 123 in near future.
Intake / Outgoing & Lending / Work Area	634	227A/B	1	-	200	200	Include packaging area and packaging supplies.
Office (open)	included above	-	1	1	160	160	
Student Workstations (open)	included above	-	2	1	64	128	Computers
SUBTOTAL Fulfillment	**1,919**					**1,544**	

Colorado School of Mines

ARTHUR LAKES LIBRARY PROGRAM

July 27, 2018

	Existing Program	Existing Room Nos.	Quantity of Spaces	Stations/ Occupancy per Unit	NSF per Space	Proposed Program Total NSF	Notes
3 RESEARCH SERVICES, ENGAGEMENT/ OUTREACH, AND INSTRUCTION							
3.1 Reference / Research Services							
Reference Desk	see info/circ.	-	-	-	-	-	
Service Stations	-	-	2	1	80	160	
Queue Space	-	-	2	1	40	80	
Consultation Stations	-	-	2	2	80	160	Side by side consultation near reference desk.
Access Services/ Assessment Office	144	266A	1	1	120	120	
Outreach & Engagement Office	-	-	1	1	100	100	Near Info Desk. Adjacent to a 6-8 person room or table seating.
Comm. / Graphic Design Student Workstation	-	-	1	1	64	64	
Systems Librarian Office	73	300	1	1	120	120	Adjacent to computer storage space.
Instruction / Research Librarian Office	308	270A	1	1	120	120	Incl. (2) visitors chairs & sharable monitor.
Scholarly Communication/ Instruction Office	included above.	-	1	1	120	120	Incl. (2) visitors chairs & sharable monitor.
Storage	205	180A, 180B	1	-	120	120	
Storage (Schol Comm/ Research)	36	270B	-	-	-	-	Not needed.
SUBTOTAL Research Services, Engagement/Outreach, and Instruction	**766**					**1,164**	
4 LIBRARY ADMINSTRATION							
4.1 Administration & Staff Services							
Waiting Area	incl. below		1	-	80	80	Waiting for 2 visitors.
Executive Assistants' Offices (open)	313	305	2	1	64	128	(1) FT programs assistant with visitor chair at desk, (1) PT admin. assistant
Student Workspace (open)	-	-	1	1	40	40	Cubicle
Work area (open)	-	-	1	-	100	100	Utilize lockable cabinets.
Storage	8	305A	-	-	-	-	Included in Work Area
Director's Office (enclosed)	273	307	1	1	200	200	6-person Conference Table. Near public service side.
Office - Emeritus Faculty	54	320A	1	-	54	54	
Staff Lounge with Kitchenette	281	105	1	15	300	305	
Kitchenette	130	110	-	-	-	-	
SUBTOTAL Library Administration & Services	**1,059**					**907**	
5 COLLECTIONS, DISCOVERY & METADATA							
5.1 Collections Management	**1,879**						
Collection Management Offices	1,797	166	2	1	100	200	Appointment-type basis
Acquisitions Office	included above		1	1	100	100	
Staff Workstations	included above	-	3	1	100	300	Special Formats/ MetaData, E-Resources
Student Workstations	included above	-	3	1	64	192	(1) Cataloging/Eresources, (2) Acquisitions
Work Area	included above	-	1	-	200	200	
Book Sorting	included above	-	1	-	300	300	
Book Cart Storage	included above	-	4	-	40	160	Adjacent to work area.
Storage	82	166A	1	-	120	120	
SUBTOTAL Collections, Discovery & Metadata	**1,879**					**1,572**	
6 PRESERVATION							
6.1 Preservation							
Preservation Office (open)	171	170A	1	1	160	160	
Digital Initiatives Workstation (open)	-	-	1	1	100	100	Adjacent to Digital Lab
Student Workstation (open)	-	-	1	1	64	64	
Work Area / Preservation Lab	779	170,170B	1	-	400	400	Including fumehood, sink, cart storage, humidification chamber, cutters, open/closed shelves (deep), and presses. Need large/long tables for map repair, storage and supply space (incl. special collections). Secure for portable equipment. Lighting controls, space to disassemble/ strip binders, table scanners, wide format scanner, and document camera. No direct
Digital Lab	56	302	1	-	200	200	sunlight.
SUBTOTAL Preservation	**1,006**					**924**	

PROGRAM

	Existing Program	Existing Room Nos.	Quantity of Spaces	Stations/ Occupancy per Unit	NSF per Space	Proposed Program Total NSF	Notes
7 SPECIAL COLLECTIONS							
7.1 Special Collections							
Display	-	-	1	-	100	100	
Reading Room Service Point	-	-	1	1	100	100	
Reading Room Lockers	-	-	15	-	5	75	
Reading Room	-	-	1	20	600	600	With table seating
Instruction / Event Space	-	-	1	30	750	750	Board of Trustee level finishes
Archivist Workstation	-	-	1	1	100	100	Including multiple bookshelves and 2-person conf table.
Special Collections Office	360	180	1	1	120	120	
Student Workstation	-	-	1	1	64	64	
Work Area / Processing	-	-	1	-	200	200	Must be separate from Preservation Lab due to potential contamination donated gifts/items.
High Density Closed Collection Storage	-	-	1	1	800	800	
Special Collection Stacks	-	-	1	1	2,000	2,000	Combined Special Collections
Tel Ertl Oil Shale Repository	397	103	-	-	-	-	
High Density Vault	516	120C	-	-	-	-	
Thesis Storage	150	108	-	-	-	-	
Storage	73	120H	-	-	-	-	
Mining History Collection	1,099	184	-	-	-	-	
Colorado Room	616	308	-	-	-	-	
Colorado Room Closet	76	308A	-	-	-	-	
Rope Collection	273	309	-	-	-	-	Must be accessible to public.
Rope Collection Storage	15	309A	-	-	-	-	
SUBTOTAL Special Collections	**3,575**					**4,909**	
8 COLLECTIONS							
8.1 Collections							
Book Stacks (reduced by 40% for circulation)	12,874	(multiple)	1	1	4,000	4,000	Bulk of collection to be stored in compact shelving.
Journals Stacks	-	-	1	1	3,000	3,000	
Open Area (low ceiling height) - empty now	4,095	253	-	-	-	-	Already vacated stack area under mezzanine 2.
Government Publications - Browsable Collection	4,109	153	1	1	2,200	2,200	Reduction
Government Publications - High Density Storage	-	-	1	1	920	920	
Map Collection	3,845	129,148	1	1	3,200	3,200	Including compact shelving (500sf)
Storage	-	-	1	1	120	120	
SUBTOTAL Collections	**24,923**					**13,440**	
9 GOVERNMENT PUBLICATIONS							
9.1 Government Publications							Recently relocated to Rm. 166.
Staff Workstation	368	123	1	1	100	100	
Student Workstations	included above	-	2	1	64	128	Cart intensive work. Need deskspace and access.
Storage	-	-	1	-	100	100	
SUBTOTAL Government Publications	**368**					**328**	
10 MAPS							
10.1 Maps							
Map/ GIS Office	444	133	1	1	200	200	Large table and (3) chairs for consultations. Near Map Collections
Student Workstations	-	-	2	1	64	128	Adjacent to Work Area. Computer stations.
Work Area	-	-	1	-	200	200	Oversized processing space dedicated to maps.
Viewing/ GIS Workstations	-	-	3	1	30	90	GIS workstations, digital map displays
Storage (Rare maps)	included above	-	1	-	200	200	Possibly within Map Office.
SUBTOTAL Maps	**444**					**818**	
11 TUTORING & CLASSROOMS							
11.1 CASA & AMS Tutoring	**1,778**					**-**	
Tutoring Center (in Library)	1,778	270	1	-	1,000	-	Tutoring space currently shared by AMS & CASA. LCD Screen advertising tutors. Community & collaborative tables. See 1.6 General Seating area for shared space for Tutoring.
11.2 Library Instruction	**1,820**					**1,000**	
Instruction Space / Classrooms	1,820	119, 121	1	40	1,000	1,000	(1) 48-person table seating, (1) 55-tablet arm chairs.
SUBTOTAL Tutoring & Classrooms	**3,598**					**1,000**	
12 IT / COMPUTING / COPY CENTER							

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Colorado School of Mines

ARTHUR LAKES LIBRARY PROGRAM

July 27, 2018

	Existing Program	Existing Room Nos.	Quantity of Spaces	Stations/ Occupancy per Unit	NSF per Space	Proposed Program Total NSF	Notes
13 OTHER							
13.1 Center for Scholarly Communications						**0**	
Instruction Space	-	-	1	20	500	-	Collaborative work space. VR, technology-rich teaching space. See 11.2 - Library Instruction.
13.2 Business Incubator						**100**	
Co-working Space	-	-	1	20	400	-	See 1.6 General Seating and 1.5 Book & Brew.
Team Rooms	-	-	4	4	120	-	See 1.6 Group Study Rooms.
Mobile Unit Storage Space	-	-	1	-	100	100	Lockable, mobile cabinets
Industry Space / Lounge	-	-	1	-	200	-	See 1.6 General Seating and 1.5 Book & Brew
13.3 Creative Learning/ Interactive Classroom						**0**	
Active Learning Classroom	-	-	1	25	750	-	Multiple flat panel screens, group tables, whiteboards.See 11.2 Library Instruction.
13.4 STEAM Spaces						**1,340**	
Art Gallery	-	-	1	-	300	-	Digital & physical display space. See 1.3 Exhibit.
Performance / Concert Space	-	-	1	150	2,250	-	Slide Rulers (dance), concerts. Black Box-like. See 1.4 Mulit-purpose space for concerts. Green Center for Dance performances.
Architectural Studio Space / Poster Space	-	-	1	20	800	800	Account for locker/ project storage and supply storage in cabinets.
Locker Storage	-	-	10	-	10	-	For student project storage. To be included in the Studio Space, not separate.
Supply Storage	-	-	1	-	100	-	To be included in the Studio Space, not separate.
Photo/Video / Recording Studio	-	-	1	-	300	300	
Control Room / Isolation Booth	-	-	1	-	240	240	
13.5 Faculty Lounge						**0**	
Faculty Lounge & Kitchenette	-	-	1	30	600	-	Accommodate a portion of 1.6 General Seating to be dedicated to the faculty during certain hours of the day.
13.6 Geospatial Data Center						**0**	Adjacent to Map Collection. Computer Lab and tables where groups of 3-4 students collaborate.
Teaching Lab	-	-	1	50	1,750	-	See 12.1 Student Computer Stations. Locate 30+ computers adjacent to Maps Office & Collections for GIS Instruction.
13.7 Presentation Practice Room						**0**	
Presentation Space	-	-	1	-	200	-	See 1.6 Group Study Rooms. Accommodate cellphone video capabilities in each study room for presentation practice.
13.8 Reflection/ Decompression Space						**300**	
Quiet or Casual Reflection Room	-	-	1	-	300	300	
SUBTOTAL IT/ Computing	**0**					**1,740**	
13 BUILDING SUPPORT							
13.1 Building Support							
Server	-		1	-	100	100	
MDF	-		1	-	120	120	
IDF Closets	-		3	-	80	240	
Restrooms	-		1	-	1,339	1,339	
Staff Restroom - All Gender	-		1	-	100	100	
Lactation Room	-		1	-	80	80	
Jan. Closets	-		3	-	80	240	
Shipping/Receiving/Processing	233	160	1	-	240	240	
Loading Dock	127	160A	1	-	150	150	
SUBTOTAL Building Support	**360**					**2,609**	*Not included in Total NSF*
TOTAL Net Square Footage (NSF)	**48,189**					**47,895**	
Total Unassignable Area - 1.67% Efficiency (Proposed)		0.62754561				1.60	
TOTAL Building Envelope Gross Square Footage (GSF)	**76,789** *					**76,632**	
14 OUTDOOR AREAS							
14.1 Outdoor Areas	**0**						
Patio (Upper Level)	-		1	120	2880	2,880	
Table Seating	-		1	12	300	300	
Bench Seating (linear)	-		1	20	200	200	
SUBTOTAL Outdoor Areas	**0**					**3,380**	*Not included in Total NSF*

COLLECTIONS ASSESSMENT

The current physical collections at Arthur Lakes Library are distributed throughout all five levels in various parts of the library. In the proposed design, the collections have been concentrated to the inner core of the Library, relocating collections from perimeter spaces inboard. The importance of placing user/ public spaces next to natural daylight and views was the impetus to consolidating the collections. This includes the map collections that are contained in flat files on Level 1 and the Special Collections inventory which is located in 8 different locations in the current library. Consolidating most of the Special Collections into a secure room with compact shelving and relocating the maps underneath the Level 1 mezzanine will focus the collection to spaces with low-ceilings and allow for the higher ceiling spaces to function as much needed public space. This report assumes the collection will continue to move toward more digital and less physical resources.

Colorado School of Mines, Arthur Lakes Library

Seating Comparison

July 27, 2018

Level 1 Seating	Existing		Proposed
Soft Seating	6		30
Seats at Tables	134		113
Seats at Carrels	0		0
Group Study Rooms	7		23
Library Classroom	0		58
Public Computers	0		24
Miscellaneous Seats	58		28
TOTAL	**205**		**276**

Level 1M Seating	Existing		Proposed
Soft Seating	6		6
Seats at Tables	56		10
Seats at Carrels	0		0
Group Study Rooms	10		0
Library Classroom	0		0
Public Computers	0		0
Miscellaneous Seats	0		0
TOTAL	**72**		**16**

Level 2 Seating	Existing		Proposed
Soft Seating	22		73
Seats at Tables	217		170
Seats at Carrels	0		0
Group Study Rooms	10		99
Library Classroom	0		36
Public Computers	0		62
Miscellaneous Seats	0		35
TOTAL	**249**		**475**

Level 2M Seating	Existing		Proposed
Soft Seating	6		5
Seats at Tables	55		8
Seats at Carrels	0		0
Group Study Rooms	11		0
Library Classroom	0		0
Public Computers	0		0
Miscellaneous Seats	0		0
TOTAL	**72**		**13**

Level 3 Seating	Existing		Proposed
Soft Seating	5		16
Seats at Tables	20		136
Seats at Carrels	0		16
Group Study Rooms	10		11
Library Classroom	0		0
Public Computers	0		0
Miscellaneous Seats	0		0
TOTAL	**35**		**179**

TOTAL SEATING COUNT	**633**		**959**

SEATING COMPARISON

The new proposed design increases the overall seat count in the Library from the existing 633 seats to 959 seats, a increase of around 36 overall. At the current student population of 6,117 students, the reimagined Arthur Lakes Library will seat 15% of the students on campus.

The following chart illustrates a comparison of seat count and the distribution of different seating types on each level of the Library.

Level 1 Seating	Existing		Proposed
Soft Seating	6		30
Seats at Tables	134		113
Seats at Carrels	0		0
Group Study Rooms	7		23
Library Classroom	0		58
Public Computers	0		24
Miscellaneous Seats	58		28
TOTAL	**205**		**276**

Level 1M Seating	Existing		Proposed
Soft Seating	6		6
Seats at Tables	56		10
Seats at Carrels	0		0
Group Study Rooms	10		0
Library Classroom	0		0
Public Computers	0		0
Miscellaneous Seats	0		0
TOTAL	**72**		**16**

Level 2 Seating	Existing		Proposed
Soft Seating	22		73
Seats at Tables	217		170
Seats at Carrels	0		0
Group Study Rooms	10		99
Library Classroom	0		36
Public Computers	0		62
Miscellaneous Seats	0		35
TOTAL	**249**		**475**

Level 2M Seating	Existing		Proposed
Soft Seating	6		5
Seats at Tables	55		8
Seats at Carrels	0		0
Group Study Rooms	11		0
Library Classroom	0		0
Public Computers	0		0
Miscellaneous Seats	0		0
TOTAL	**72**		**13**

Level 3 Seating	Existing		Proposed
Soft Seating	5		16
Seats at Tables	20		136
Seats at Carrels	0		16
Group Study Rooms	10		11
Library Classroom	0		0
Public Computers	0		0
Miscellaneous Seats	0		0
TOTAL	**35**		**179**

TOTAL SEATING COUNT	**633**		**959**

2.4 INVESTIGATION OF ALTERNATE OPTIONS

The existing library mezzanines provide complicated challenges to any renovation goals. The floor to floor height at the existing mezzanines is 7'-8"H with the ceiling height at these areas only 7'-2", and the perimeter of the mezzanines even lower where the concrete beams reduce the available height to 6'-8". The mezzanines were analyzed for code deficiencies to determine whether they could be utilized for any program needs. The 2015 IBC, section 505.2 indicates that "The clear height above and below the mezzanine floor construction shall be not less than 7 feet", therefore, the majority of the mezzanine areas meet this requirement, with the exception of the perimeter structure, as long as any new lighting or HVAC distribution do not fall below 7'-0" AFF. In conversations with the AHJ, they will permit occupiable uses under the mezzanines as long the program areas under the mezzanines meet 2015 IBC section 505.1 limitations.

STRUCTURAL INTERVENTION OPTIONS

Despite of the AHJ's acceptance of the mezzanines, the low ceilings make for uncomfortable spaces that are not ideal for offices or student spaces, and are only practical for book shelves, therefore, restricting available program uses for a large area of the library. For this reason, the design team analyzed several options to determine if all, or portions of, the mezzanines could be removed which is summarized in the chart below with very rough early cost estimates for each option.

Option 01: This option included the removal of all of the 1979 portion of mezzanine 2M with an added option to remove a portion of the 1955 mezzanine 2M, added structure to accommodate an occupied roof and added a clerestory monitor at the 1979 roof. This option resulted in a loss of 4,884 SF. Ultimately it was determined that the loss of available net space in the building was not realistic as needed program space would need to be sacrificed.

Option 02: This option included the removal of both mezzanines 1M and 2M at the 1979 section with an added option to remove a portion of the 1955 mezzanines at both levels, and also included structure for an occupiable roof and clerestory monitor at the 1979 roof. This resulted in a loss of 9,782 SF which could not be justified by the BAC because it would reduce the available net space in the building significantly below the bare minimum program space needs.

Option 03: A third option was analyzed to remove a single column line down the center of the 2 mezzanines and at the 2nd floor from east to west to create a larger volume space that is approximately 16'-0" wide down the center of the library and to incorporate a new grand stair that would provide more clarity for wayfinding to the various levels in the building. The grand stair evolved to include an 'Occupiable Stair' to provide casual study and social areas along the length of the stair as well as provide a stair connection between the first floor through the 2nd floor mezzanine connecting the existing east entry with the new west level 01 entry. This option resulted in a loss of 3,200 SF which the BAC determined could be justified by creating multi-purposed program spaces to account for a minimal loss in square footage. This option became the preferred option as it minimizes the loss of square footage

STRUCTURAL INTERVENTION OPTIONS

Option	Description	Total Construction Costs	Space Implications
1	• Remove Upper 1977 Mezzanine • Create Occupied Roof • Add skylight	$857,328	Loss of 4,259 NSF
1A	**Plus** – Remove portion of upper 1953 Mezz	$211,322	Additional loss of 625 NSF
	Total Option 1	**$1,068,650**	
2	• Remove both 1977 Mezzanines • Create Occupied Roof • Add skylight	$1,437,155	Loss of 8,532 NSF
2A	**Plus** - Remove portion of both 1953 Mezzanines	$211,322	Additional loss of 1,250 NSF
	Total Option 2	**$1,648,477**	
3	Remove portion of 1977 and 1953 Mezzanines to create an occupied stair	**$926,379**	Loss of 3,200 NSF
4	• 3rd Floor Addition on 1977 roof • Remove both 1977 Mezzanines and portion of 1953 upper mezzanines • Add opening in new 3rd floor	**$3,824,035**	Additional 4,300 SF on level 3. Loss of 8,532 NSF (1 & 2 Mezz) **Net loss of 4,232 NSF**

but also creates more openness and visual connection. The conceptual design for the library renovation incorporated this strategy into the design.

Option 04: Option 4 added a 3rd floor addition to the 1979 existing structure to align with the existing 1955 3rd floor, in addition to option 02 above. While the addition would add 4,300 SF, there would also be a loss of 8,532 SF at the mezzanines, for an overall net loss of 4,232 SF. The overall cost for this option and significant loss of square footage made this option unrealistic.

ACCESSIBLE ENTRY OPTIONS

The design team also analyzed several options to provide an accessible entry for the library. The design team initially looked at an option to provide an accessible ramp at the existing east entry where the grade change from the street level is approximately 30 feet as previously mentioned, but from an accessible walk was approximately 15 feet. The option would have resulted in a complete retrofit of the existing historic stairs on site as well as the removal of mature pine trees and added a very imposing ramp system in front of the iconic historic entry. This option was ruled out by the campus for being too intrusive.

Two additional option for entries are outlined in the chart below with early rough cost estimates:

Option 01: This option provided a small vestibule addition at the level 01 west elevation integrated into the existing curtain wall system. The vestibule at this location allowed for an entry plaza that connects to the north terminus of the Maple Street pedestrian plaza and a new parking garage and plaza directly across the street. The level 01 entry provided ideal existing grades for approach to the new entry and requires the least complicated structural intervention and therefore is more cost effective. The drawback for this solution is that it provides 2 entries to the library on different levels requiring multiple stations for supervision. The BAC decided that locating the entries on 2 separate levels could be accommodated with the new floor plan options and the team decided to proceed with this direction.

Option 02: This strategy looked at improving the existing entry at the level 2 west bridge by shifting the vestibule out onto the bridge and creating a structure that is more visible to the south to pedestrians approaching the building. Providing both entries on the same level provided more convenience for supervision of the 2 entries from one vantage point in the center of the library, however, the existing bridge structure provided complicated structural limitations and made this option significantly more expensive.

PROJECT FUNDING ALTERNATES

In recent years, and during this program plan investigation, the Colorado School of Mines has explored several alternatives for funding improvements to the Arthur Lakes.

Currently there are two viable options for the library if no funds are available from the State of Colorado:

Funding Alternative A: The School of Mines does not currently have funding available to renovate the library at any level and it will continue to fall short in meeting students' needs in terms of study and collaboration space or up-to-date technology. In addition, the School's anticipated large growth in student enrollment over the next 10 years will increasingly tax the current library until funds are available from the State of Colorado for renovation.

Funding Alternative B: The library has partnered with the Mines Foundation to solicit possible donors from the Mines community to fund all or a portion of the proposed library renovation project. To date, no significant donations have been identified.

ACCESSIBLE ENTRY OPTIONS

Option	Description	Total Construction Costs	Location Implications
1	Lower Level West Entry: • Replace existing curtain wall in place • Entry vestibule addition • Canopy over vestibule • Plaza	$670,266	• Entry supervision on 2 different floors • Better grade access • Plaza could support coffee shop and activate that side of the building
2	2nd Floor Retrofit of existing bridge entry: • Addition to cover existing bridge area over lower level • Add a canopy to wrap the corner • Maintain existing bridge connection from building to grade	$883,822 Range ($878,000 - $899,000)	• 2 entries on one level for easier supervision • Utilize existing entry • Cover existing to avoid future water intrusion issues

3.1 DESIGN CRITERIA

ARCHITECTURAL NARRATIVE

This Program Plan advocates for the renovation of approximately 77,000 gross square foot (GSF) of the existing Arthur Lakes Library.

The reimagined library will involve varying levels of renovation throughout the existing facility. Some areas will need to undergo significant interior transformations and improvements, while others will require less investment to upgrade. The Design Team has defined these levels as minor, moderate and major renovation. Below are the definitions of each level:

- Minor – Replacement of finishes and light fixtures, depending on materiality. More of a cosmetic renovation.
- Moderate – Replacement of finishes, light fixtures, moving some partitions, and HVAC and power/data relocation.
- Major – A full gut renovation of the existing space and the installation of all new infrastructure.

A very small new entry vestibule will be the only addition to the existing facility on the western elevation at Level 1.

Exterior Materials

Minimal impact of the exterior facade is anticipated. As previously mentioned, only two minor interventions will involve the existing exterior facade. On Level 1, a glass entry vestibule will be added to the west elevation to provide a second, accessible entry to the Library. The vestibule for the new west entry at Level 1 will be integrated into the existing two story curtain wall system.

Landscape materials relating to the building materials and complimenting the entrances and interior spaces will also be incorporated into the existing building.

Conveying System

Elevator #1 in the 1955 section of the building is not recommended to include any scope of work for this renovation project.

Elevator #2 is recommended to be modernized to upgrade equipment to meet current elevator codes and upgrade the elevator cab finishes. The modernization scope should include life safety requirements for dedicated addressable smoke detection devices at each elevator lobby and smoke detection will also be required in the machine room and pit area. When the project moves forward into design, the design team should coordinate with the local AHJ to determine whether sprinklers in the machine room and pit area are required. Electrical upgrades should include a dedicated, circuit for cab lighting in the machine room and GFCI outlets will be installed in the hoistway and pit. In some instances, a new submersible power unit may require additional electrical work including disconnect/fuse sizing. If the local AHJ requires sprinklers, the project will require the addition of heat detectors at each sprinkler location and shunt trip operation. Machine room lighting will require 19 footcandles & the pit will require 10 footcandles of illumination. The hoistway and machine room will require fire rating of all penetrations and mitigation of any ledges or setbacks in excess of 4 inches. The modernization of the existing equipment will replace the main controls, power unit and door operation with modern microprocessor-based controls, a submersible power unit and a closed loop, linear drive door operator.

Interior Materials

Interior materials will be further developed during schematic design. Materials may include the following with latitude for adjustment to the current climate regarding construction budgeting. Mid-range materials have been used for estimating purposes.

- The grand stair is currently assumed to be hardwood risers and treads. New guardrails at the mezzanine to be stainless steel.
- Painted or tiled gypsum board on metal stud construction.
- Standard acoustical tile and/or painted gypsum board ceilings. A decorative dropped ceiling over the cafe would help set that space apart.
- Sufficient acoustical separation among spaces, especially between the recording studio, control room and the rest of the library.
- Carpeting in stack areas, corridors, collaborative & study spaces, office/staff areas, and third floor multi-purpose space.
- Hard surfaces such as terrazzo or tile on floors of entrances, toilet rooms, and cafe.
- Other interior finishes such as hardware, doors, and specialties will be consistent with the Mines campus standards.
- Replace guard rails to be code compliant. Replace flooring and nosing for visual contrast
- All new plumbing fixtures, partitions, flooring, all new finishes and lighting

Furniture

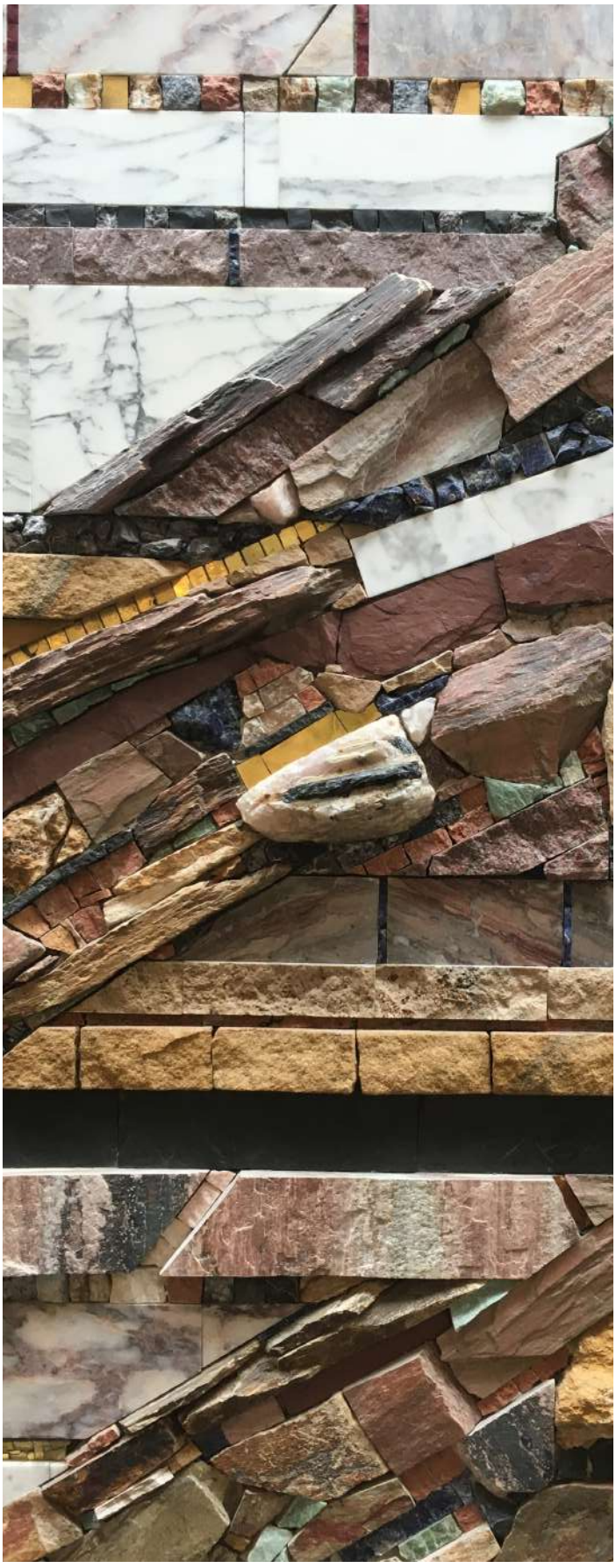
Furniture recommendations include a mix of several types of seating:

- Individual soft seating in a variety of general seating areas featuring work surfaces, power connections, and ottomans.
- Individual seating at contemporary study carrels or at continuous tables.
- Group seating at a variety of table types, sizes, and heights for collaboration, some including monitors for group work and presentations.
- Tables and seating on casters for classroom spaces to allow for flexibility and collaboration.
- Benching for touchdown seating near entrances or in the Book and Brew café.
- Minimum 8' x 8' workstations for library staff, and student workstations.
- Typical offices include: Desk with return, task chair, 1-2 guest chairs, 3' wide tall cabinet storage, and a bookcase.

Graphics, Signage and Wayfinding

Graphics, signage, and wayfinding recommendations include the following:

- ADA compliant signage as required by the building code.
- Large scale wall graphics to highlight specific uses and programs in the new library.
- Patterned or graphic privacy glazing at study rooms and conference rooms.
- Directory signage near stairs for wayfinding.
- Branding each floor or mezzanine to assist with wayfinding off the grand stair.



Artwork on Level 2

STRUCTURAL NARRATIVE

Existing Structure

The existing structure was designed in 1953 with a major addition designed in 1977. The 1953 structure consists of a three-story central portion with two story wings on the north and south. The roof framing system is a one-way concrete slab spanning to long span structural steel trusses supported by concrete columns and load bearing masonry walls. The typical floor structure is a one-way concrete slab and joist system supported by concrete beams spanning to concrete columns and load bearing masonry walls, except at stack areas and mezzanines where the floor system is a two-way flat plate supported by double angle columns. The 1953 building has a slab on grade floor typically with a structural slab over the mechanical tunnel around much of the perimeter. The existing foundations are spread footing foundations.

The 1977 addition consists of a two-story structure with two interstory mezzanines. The roof, mezzanines and second level floors are typically framed with two-way concrete flat plates supported by concrete columns. The exterior perimeter bay of the roof and second level is framed with a one-way slab and joist system supported by concrete beams spanning to concrete columns. The 1977 building slab on grade is a 5" thick two-way structural slab over void supported by drilled pier foundations. The first floor and stack areas including the mezzanine were designed for 150 psf live load, while the remainder of the second floor was designed for 100 psf. The roof was typically designed for 30 psf live load with 150 psf live load at mechanical areas.

No known structural distress has been observed by building users or facilities management other than corrosion of the steel supporting the masonry on the bridge.

Structural Scope of Work

The proposed project consists of an extensive renovation of the existing library including the addition of an interior entry vestibule and canopy on the west end of the building, construction of a grand stair and repurposing of the third floor as an assembly space.

Canopy and Interior Entry Vestibule

The new canopy will be a self-supporting structure framed with structural steel moment frames supporting roof deck. The columns will be supported by cantilevered grade beams with (2) new drilled piers at each grade beam. As the canopy is self-supporting, an expansion joint will be required at the interface between the existing structure and new canopy. The interior vestibule will be supported on the existing structural slab on void.

Grand Stair

The grand stair will require removal of a strip of the mezzanines and Level 2 in the 1977 building along with its supporting columns. These slab openings will be located such that adjacent spans do not require additional reinforcement. Stair #4 will also be removed to accommodate the new stair. The new stair will be structured as a concrete on metal pan stair or stair with precast treads supported by C12 stringers each side and centered spanning to channels on each side of each existing columns. At the level 2 mezzanine, a zone of floor slab (a bridge) connecting the north and south stack areas will be retained. As the columns below the "bridge" will be demolished, Fiber Reinforced Polymer (FRP) applied to the top, bottom and sides of the concrete beams on each side of the bridge will be required to strengthen the structure. Additionally, the opening for Stair #4 will be infilled at the second level mezzanine with a concrete slab on metal deck.

Due to the removal of the mezzanines and columns below, New steel beams will be added below the roof level to support the roof over the opening and will have bearing pads between the beam and the roof slab at previous column locations. Additionally, the concrete beam supporting the existing skylight will be reinforced top and bottom and sides with FRP over the removed column location extending back to columns on either side. To strengthen the existing columns for the new loads from the new steel beams, the existing columns will need to be strengthened, such as by adding shotcrete doweled to the supporting columns. The final column size at these 10 locations will be approximately 16"x16".

To access the grand stair from the 1953 building, a portion of the 1953 load bearing masonry west wall will be removed. New steel channels each side of the wall will be used to support the load bearing wall above the new opening and will be supported by HSS columns on each end extending down to the foundation wall below. Additionally, one cast-in-place column within the 1953 structure between Level 2 and Level 3 will be removed. To support the Level 3 column above, two steel channel beams will be needed below both Level 2 and Level 3 (one on each side of the adjacent columns) to transfer the loads at the demolished column. The steel channel beams will be supported by new HSS columns from Level 2 to Level 3.

Additionally, a portion of the Level 2 mezzanine in the 1953 structure will be removed to provide taller ceilings. This slab opening will be located such that the adjacent spans do not require additional reinforcement. The Level 3 floor above the demolished mezzanine will be re-supported with (3) W18 beams beneath the Level 3 floor spanning 27 feet to new HSS columns on each end placed adjacent to existing columns. The new HSS columns will extend the full height of the building. To support these HSS columns, 6 existing spread footing foundations will be enlarged. The Slab on grade will need to be removed and replaced as needed to modify these foundations.

Third Floor Repurposing

The new multipurpose use at Level 3 in the 1953 building is in an original book stack area. As the assembly live loads are less than original stack loads, no structural strengthening is required due to the change of use.

High Density Storage

High density shelving is to be relocated to the basement of the 1953 building and will be supported on the slab on grade. The slab on grade has the capacity to support the loads from the high density shelving. If the rails are mounted to the top of the existing slab on grade, ramping and floor infill between rails will be required. If a flat floor is desired, the existing slab on grade will be removed, soil excavated and slab replaced at an elevation to facilitate a flush floor.

MECHANICAL NARRATIVE

The current library building consists of the original building constructed in approximately 1953, as well as a building addition in 1977. Significant renovations to the mechanical systems occurred with the 1977 building addition project as well as a 1998 HVAC system renovation project. Much of the description of the current mechanical system came from a report by Shaffer, Baucom and Associates from 2012.

A. The mechanical system renovation for this project attempts to balance the building usage requirements with other factors such as Colorado School of Mines design and construction standards, occupant safety, first cost, operating costs, energy efficiency, life cycle costs, and system maintainability.

B. Within this narrative, the following is addressed:

1. Summary of Existing Mechanical Systems
2. Recommended HVAC System Upgrades
3. Recommended Fire Protection System Upgrades
4. Recommended Plumbing System Upgrades

Summary of Existing Mechanical Systems

A. General

The building mechanical systems that are currently in service generally date back to the 1977 and 1998 projects. As a result, many of the systems have been in service for approximately 14 to 35 years, and in some cases have served the building beyond the expected life estimates as defined by the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE). Some typical equipment life estimates are included in the following table for reference.

Equipment Item	Median Service Life (Years)
Air Handling Units	15
Diffusers, Grilles and Registers	27
Ductwork	30
VAV Terminal Boxes	20
Fans	15-25
Pumps	20
Chillers	Chillers
Shell and	24

B. Heating System

1. The building heating system utilizes campus steam and two shell-and-tube heat exchangers located in a basement level mechanical room to generate heating water for the building. The building is served by a 4" high pressure steam main (designed based on 125 psig steam pressure) and a 2-1/2" condensate main. The existing heat exchangers were installed as part of the 1977 renovation and addition project. Heating water circulation pumps, which were replaced in 1998, are used to circulate approximately 260 gpm of heating water throughout the building to various equipment, including air-handling units and other terminal heating devices. The east side of the existing building also includes perimeter radiant heating equipment (e.g. finned tube radiation).

C. Cooling System

1. The 1998 HVAC system upgrades project included a new 200 ton water-cooled rotary screw chiller and two new cooling towers. The chiller plant now also includes a water-cooled centrifugal chiller which was recently installed to replace a steam absorption chiller. The plant serves the library and several other nearby buildings. The chilled water plant is located in a separate small building immediately adjacent to the northwest corner of the Lakes Library Building.

2. A 720 gpm chilled water pump circulates water from the chiller plant building to the library building through underground piping to a basement level mechanical room.

D. Air Handling Systems

1. The building is served by five central-station air handling units (AHUs). A summary of each system is as follows:

a. AHU-I, Northwest Area: The northwest portion of the building is served by a 15,200 CFM variable-air-volume (VAV) air-handling unit with heating and chilled water coils. The AHU is located in a second floor mechanical room in the northwest corner of the building. The supply air ductwork is routed from the AHU to the various terminal VAV boxes and then ducted to the air devices. This system was installed as part of the 1977 renovation and addition project with the chilled water cooling coil being added in 1998 to replace the previous direct-expansion cooling coil (and associated air-cooled condensing unit).

b. AHU-2, Southwest Area: The southwest portion of the building is served by a 18,300 CFM VAV air-handling unit with heating and chilled water coils. The AHU is located in a second floor mechanical room in the southwest corner of the building. The supply air ductwork is routed fi om the AHU to the various terminal VAV boxes and then ducted to the air devices. This system was installed as part of the 1977 renovation and addition project with the chilled water cooling coil being added

in 1998 to replace the previous direct-expansion cooling coil (and associated air-cooled condensing unit).

c. AHU-3, 2nd Floor West Area: A portion of the west side of the second floor is served by a 1,900 CFM constant volume air handling unit with heating coil and direct-expansion (DX) cooling coil. An air-cooled condensing unit located on the roof provides cooling for the DX cooling coil. The AHU is located in the ceiling space north of the 2nd floor mechanical room for AHU-2. The supply air ductwork is routed from the AHU to the nearby air devices. This system was installed as part of the 1977 renovation.

d. AHU-4, Northeast Area: The northeast portion of the building is served by a 18,000 CFM VAV air-handling unit with heating and chilled water coils. The AHU is located on the roof to the north of the 3rd floor office area. The supply air ductwork is routed into the building from the AHU and connects to existing ductwork installed as part of the 1977 renovation project. New VAV terminal units and sound attenuators were installed as part of the 1998 renovation project to upgrade the VAV system and reduce the acoustical impacts to the spaces.

e. AHU-5, Southeast Area: The southeast portion of the building is served by a 18,000 CFM VAV air-handling unit with heating and chilled water coils. The AHU is located on the roof to the south of the 3rd floor office area. The supply air ductwork is routed into the building from the AHU and connects to existing ductwork installed as part of the 1977 renovation project. New VAV terminal units and sound attenuators were installed as part of the 1998 renovation project to upgrade the VAV system and reduce the acoustical impacts to the spaces.

E. Ductwork and Air Devices
1. The majority of the ductwork and air devices in the building were installed as part of the 1977 renovation and addition project. Limited sections of ductwork were modified as part of the 1998 project.

F. Exhaust Fans
1. Four roof-mounted exhaust fans totaling 1,350 CFM provide exhaust for restrooms and janitorial spaces in the building. The exhaust fans were installed as part of the 1997 renovation and addition project.

G. Temperature Control System
1. The building temperature control system was upgraded to a direct digital control (DDC) system from a pneumatic system as part of the 1998 innovation project. The equipment is manufactured by Staefa Controls. The major mechanical systems are connected to the central DDC system.

H. Fire Protection System
1. Based on a review of the existing building drawings, the original 1953 building includes a standpipe system in the stairwells, but the remaining building area is not sprinklered.

I. Plumbing
1. Two, 2-inch domestic water services provide domestic water to the building. The services are located on the north side of the building. One service is to the original 1953 building and the other service is for the 1977 building addition.

2. Domestic hot water is provided to the building with a steam-to-water domestic hot water generator located in a basement level mechanical room. The existing hot water generator was installed as part of the 1977 renovation project. A circulating pump located near the hot water generator circulates water around the building to maintain the temperature in the domestic hot water piping system.

3. Sanitary sewer piping exits the building in multiple locations along the north and west sides of the building. The original 1953 building has a single 4" main sanitary waste pipe exiting the north side of the building. The 1977 building addition includes multiple pipes exiting the west side of the building ranging in size from 2" to 4" before combining into a single 6" main sanitary sewer pipe to the northwest of the building.

4. The storm drainage system generally consists of 3" roof drains piped to downspout nozzles located around the perimeter of the building which discharge on grade. The 1977 addition also includes overflow drains that discharge out the side of the building to grade at the 2nd floor level.

HVAC System Revisions

A. General
There are still portions of the mechanical system which were installed in the 1977 project, which means that equipment is 41 years old. All that equipment has significantly exceeded its nominal projected life.

A significant portion of the mechanical system was installed in the 1998 renovation, which means that equipment is 20 years old. Due to budget constraints, it will not be feasible to replace any of the outdated equipment, except as noted below and where it interferes with the new renovations.

B. Heating System
1. The main heating plant, which generates heating water from campus steam, was renovated in 1998. The only two major components that remain from 1977 are the steam/water heat exchangers. These will be replaced with two new heat exchangers sized for approximately 2/3 of the anticipated load. New hydronic and steam components for the heaters will also be replaced. Associated pumps will remain.

2. Terminal VAV units will be provided with heating coils for zone temperature control.

3. Radiant heating (e.g. finned tube radiation) will be added to each remodeled perimeter zone that has floor-to-ceiling

windows.

4. It is assumed that the existing 4" steam service and 2.5" condensate service to the building will not need to be increased in size due to an increase in the heating load. The proposed changes will not significantly increase the heating load. However, this will need to be checked when the new design is prepared.

C. Chilled Water Cooling System
1. All the piping and equipment in the current chilled water plant was installed in 1998, which makes it 20 years old, with the exception of a new 275-ton chiller installed this year. The two cooling towers are scheduled to be refurbished this year with new fill material. It is recommended that no changes be made to the plant. The 20-year old equipment can still last for many more years with good maintenance.

2. It is assumed that the proposed library renovations will not sig ificantly increase the overall cooling load for the building, so the existing chillers can provide all the cooling needed. However, this will need to be checked when the new design is prepared.

D. Air Handling Systems
1. There are still three AHUs serving the building which were installed in 1977. These are AHU-1, AHU-2 and AHU-3. The other two units, AHU-4 and AHU-5, were installed in 1998. AHUs–1, 2, 4 and 5 will remain and be reused. AHU-3 is a small unit (only 1900 CFM) and will be removed because it is located in an area that will be remodeled. Air from the remaining AHUs can be redistributed to compensate for the loss of AHU-3.

E. Ductwork and Air Devices
1. It is recommended that the ductwork and air devices (grilles, registers and diffusers) be completely replaced in the areas being remodeled. Ductwork in non-remodeled areas can remain, including the main supply ducts connected to the AHUs.

2. VAV terminal units with reheat coils will be used for individual zone control, and be interconnected with baseboard radiation control valves where present. Duct liner is recommended for all low pressure supply (downstream of VAV boxes) and return ductwork to minimize acoustical impacts from the HVAC system. Duct-mounted sound attenuators can be utilized in specific areas where additional sound attenuation is necessary.

F. Exhaust Fans
1. The four existing general building exhaust fans serving restrooms, janitorial spaces, and other spaces requiring exhaust such as copy rooms and food service areas shall remain. They were replaced in 1998.

G. Temperature Control System
1. The entire building DDC system needs to be replaced. The current system, by Staefa Controls, is outdated and parts are no longer available. CSM has applied for funds to replace the system through the State Controlled Maintenance program and the work will not be done as part of this project.

H. Elevator Mechanical Rooms
1. One of the two existing elevators will be renovated. A new exhaust system, air-conditioning unit and sump pump shall be provided as needed.

I. Main Building Entrances
1. The new main building entrance on the west side and the remodeled main entrance on the east side shall be heated with fan coil units mounted in the ceiling with ductwork and grilles.

Fire Protection System Revisions

1. The proposed project does not have funding for fire sprinkler coverage throughout the building. The existing standpipe system in the stairs will be retained.

2. It has been suggested that the Special Collections area be protected with a dual-action pre-action sprinkler system due to the historical value of the collection. This will have to be evaluated once the project receives funding.

Plumbing System Revisions

1. It is recommended that all the plumbing fixtures in restrooms (toilets, lavatories, urinals) be replaced with new fixtures, since all restrooms will be remodeled to meet ADA standards.

2. Cold and hot domestic water piping will remain, except for revisions needed to connect to new plumbing fixtures. The water piping was replaced in 2014. The steam-powered water heater was replaced in 2012.

3. The sanitary sewer piping can remain, with modifications as needed to accommodate the revised plumbing fixture layout in the restrooms.

4. The storm drainage system can remain, except where it needs to be re-routed to accommodate the architectural changes.

ELECTRICAL NARRATIVE

General

A. The proposed Lakes Library renovation consists of a 44,388 NSF/71,021 GSF renovation of the existing building. Based on drawings furnished by the owner and a narrative from Shaffer, Baucom Engineers and Associates, the current library building consists of the original building constructed in approximately 1953, as well as a building addition in 1977. Significant renovations to the electrical systems occurred with the 1977 building addition project as well as a 1998 HVAC system upgrade project and a 2007 secondary power repairs project.

B. The electrical system renovation for this project attempts to balance the building utilization requirements with other factors such as, Colorado School of Mines design and construction standards, occupant safety, first cost, operating costs, energy efficiency, and system maintainability.

C. The following items are discussed:
- Electrical service
- Electrical distribution equipment
- Life safety power system
- Electrical Branch power
- Interior Lighting
- Fire Alarm
- Phasing
- Design Standards

Summary of Existing Electrical Systems

A. Electrical Service:

1. The building electrical service is from a Colorado School of Mines is a 1,000 kVA pad mounted transformer located in a vault plan north of the basement main electrical room. The transformer feeds a 1,600 ampere, 480Y/277 volt, 3 phase, 4 wire switchboard (MDC) that was installed as part of the 1977 addition. MDC is located at the plan northwest corner of the basement level. There is a 100 ampere fused switch for distributing the generator life safety system as well as a 100 ampere fused switch retired-in-place ahead of the a 1,600 ampere main fused switch. The main service switch is equipped with ground fault interruption. The MDC supports all of the electrical distribution equipment throughout the building (including feeds to the chiller plant) using molded case circuit breakers.

The most recent oil analysis (last year) indicated the transformer is in good condition. However, the transformer has no service access. It would likely need to be removed in pieces if a major failure were to occur, with no ready access for a replacement transformer. It is our understanding that funding for an exterior replacement is being pursued under the annual maintenance budget.

B. Electrical Distribution

1. There are eight 480Y/277 volt panel boards (including the two life safety panelboards and one in the chiller plant) and thirteen 208Y/120 volt panelboards. The project dates for the electrical distribution equipment are as follows.

a. Service Transformer: 1977

b. Service Entrance Switchboard (MDC): 1977

c. 480Y/277V Panelboards: 1977 for six (6), 1998 for one (1) chiller plant, sometime between 1998 and 2007 for one (1) life safety

d. 208Y/120V Panelboards: 1977 for three (3), 1998 for one (1) chiller plant, sometime between 1998 and 2007 for two (2) life safety, 2007 for three (3), and four (4) unknown vintage.

e. New chillers and electrical feeds: 2018

C. Power to receptacles, mechanical equipment, elevator equipment and lighting

1. Existing power to receptacles, mechanical equipment (except the chillers, which have a separate feed from the main distribution board), elevator equipment, and lighting are from local branch circuit panelboards.

D. Life Safety System

1. The 1977 documents indicate a 480Y/277 volt panelboard was added to the building and tapped ahead of the main switch to serve as the life safety power source. Sometime between 1998 and 2007 a 20 kW generator and two (2) automatic transfer switches were added. The generator supports the 1977 life safety panelboard (renamed from E to HEM-1) along with one (1) 480Y/277 volt panelboard (fed from the distribution section of the main switchboard) and two (2) 208Y/120 aloft panelboards fed from each of the respective 480Y/277 volt panelboards.

E. Interior Lighting

1. The building is illuminated with a variety of lamp sources and luminaire types. The lamping is a mixture of fluorescent and incandescent lamps. The luminaire types throughout the building are recessed and surface fluorescent, incandescent down lights, and track lighting. The lighting is connected at 120 volts (original area) and 277 volts in the 1977 addition/ renovation to panelboards throughout the building via lighting contactors.

2. The exit signs are incandescent. The egress lighting typically is part of the normal lighting sources for the area, with a few floodlight type battery packs. The egress and

exit lighting backup power source is the life safety engine-generation system.

F. Fire Alarm
1. The building has a Notifier 640 fire alarm control panel, with a system that consists of initiation devices such as smoke detectors, thermal detectors, manual pull stations, duct mounted smoke detectors for air handling equipment and annunciation devices. The existing smoke detectors were replaced in 2014.

Summary of Proposed Electrical System Renovation

A. Electrical Service:
1. The main service entrance switchboard is equipped with a main fused switch that requires annual maintenance and exercising. The maintenance tag indicated that the last service call was performed in 2007, so the equipment is overdue for maintenance if the tag is correct. Annual maintenance of the main distribution switchboard should be performed and the main disconnect switch should be exercised.

B. Electrical Distribution
1. The main electrical service and some of the distribution equipment is located on the basement level and does not appear to be impacted by the addition oi renovation. Therefore, the basement level equipment will remain. We did observe older panelboards in that were obsolete: PP-1, LA, HEM-1, and PP3A. Most of them are serving serving air-handler units. These panels would probably need to be entirely replaced if any components failed; as replacement parts and circuit breakers are not available from the manufacturer.

The conductors feeding these panelboards are also at or near end-of-life (typically 40 years). It's recommended that the conductors be tested and replaced as required when the panelboards are replaced. An electrical room will be required on each floor. Each of these electrical rooms will need to be a minimum of 6 foot by 8 foot with a 36 inch door swinging out.

C. Power to receptacles, mechanical equipment, elevator equipment, and lighting
1. The power to receptacles, new mechanical equipment, elevator equipment, and lighting will be from the main distribution switchboards and local branch circuit panelboards. Power to the new elevator controller will be via a shunt-trip circuit breaker interfaced with the fire alarm system.

2. We anticipate the addition of two new 120/208V panelboards, fed by 75 kVA copper transformers, to provide branch circuit power to new receptacle loads located throughout the library. The new equipment would be located in the two new electrical rooms. New 480V feeders to the electrical rooms would be provided via spare circuit breakers in the MDC. One new electrical room would be located on the level 01 and one on level 02.

3. General Requirements:
- Branch circuits will be provided with dedicated neutrals.
- Motors 1/3 HP and less will be 120V, single phase. Motors 1/2 HP and above will be 208V or 460V, one phase or three phase.
- All wire and bus will be copper. Minimum wire size will be No. 12 AWG for power and lighting circuits, and No. 14 AWG for control wiring.
- Electrical metallic tubing (EMT) with set screw couplers will be used and concealed in ceiling or wall cavities.
- Flexible metal conduit will be used for connections to equipment subject to movement, connections from the conduit system to an electrified furniture system and recessed lighting fixtures. Liquid-tight flexible metal conduit will be used in wet or damp locations and connections to motors (between a rigid conduit and terminal box on a motor),.
- Minimum conduit size will be 3/4 inch.
- GFCI receptacles will be provided in breakrooms, restrooms, mechanical rooms, and all other locations that are subject to water or were required by code.
- All conduit penetrations through rated walls and floors will be UL fire rated.

D. Life Safety System
1. The egress and exit lighting will be connected to the existing life safety engine generator system. The exit lighting will be continuously illuminated and the egress luminaires will be the same switch as the associated area lighting - using a UL924 relay to save energy. The exit signs will be LED type.

E. Interior Lighting
1. Only the lighting in the areas undergoing heavy remodel will be replaced, the existing lighting will remain in all other areas. The new lighting will be LED sourced.

2. The lighting control system will consist of a web based addressable digital control systems with distributed or panel based relay control modules. Occupancy sensors will be ceiling mounted and wall mounted. Occupancy sensors will be tied to the VAV boxes serving the same area to control temperature setbacks when spaces are unoccupied. The system will be designed to conform to the 2015 IECC.

3. The following minimum standards will be applied to the LED lighting systems:

- Minimum 50,000 hour life rated using IES LM-80-2008 testing Photometric testing using IES LM-79-2008 testing
- 3500K color temperature with 80+ CRI.
- Minimum efficiency of 85%
- Total harmonic distortion - 20% or lower Power factor of .9 or above.
- Dimmable with 0-10 volt control signal.

F. Fire Alarm

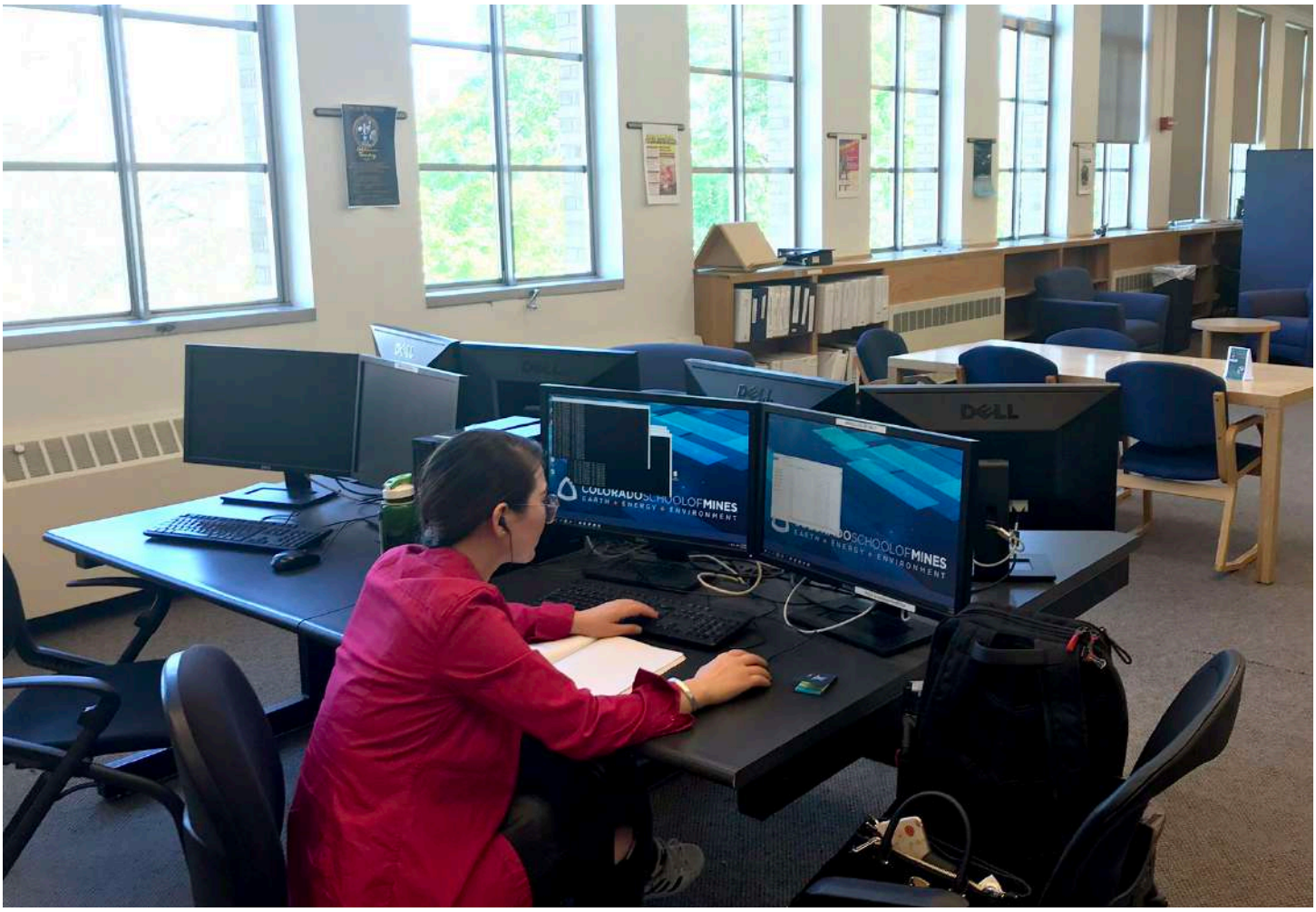
1. The existing fire alarm system will be re-used wherever possible; the existing detectors will be salvaged. Annunciation devices will be speaker/strobes with voice evacuation capability of being connected to the campus mass notification system. The fire alarm system will interface with the elevator controllers for recall and the shunt-trip device to remove power to the elevator machine. The fire alarm system will monitor the fire sprinkler system. Duct mounted smoke detectors will be interfaced with the air handling equipment to do shut down.

H. Phasing

1. The work will be performed in stages, with various areas of the library remaining open during construction. Refer to the architectural narrative for more information on the proposed sequence.

I. Design Standards

1. The project will follow the CSM Construction and Design Standards for the campus. The latest standards can be found using the link below.
https://inside.mines.edu/Construction_Standards



TECHNOLOGY NARRATIVE

AUDIOVISUAL SYSTEMS

Interactive Classroom

This classroom will include a flexible seating arrangement that is planned to facilitate both lecture as well as small group collaborative work. The space will feature two projection screens for lecture based activities.

In addition, flat panel displays for small group collaboration will be provided at each group workstation. Connectivity at each table will be provided such that a student can connect their own device to that local monitor as well as allow the facilitator to bring content from an individual monitor to the main room display.

Planned audiovisual source devices include a dedicated computer, laptop/personal device connections, document camera, auxiliary source devices.

A wired and wireless microphone system will be employed for speech reinforcement. Program source audio will be deployed on the front teaching wall and the speech reinforcement will use an overhead distributed loudspeaker system.

A touch panel control system will allow simplified control from the teaching station. The mobile teaching station will be located at the front of the room, away from the wall and facing the students with connectivity on either side of the projection screens. Additionally, the room will be outfitted with a hearing-assist system, in line with the current ADA recommendations for accessible design.

The following audiovisual components are planned:

Planned Audiovisual Components	
Display	• Two ceiling-mounted, motorized, projection screen • Two fixed, ceiling-mounted video projector • 6 to 8 Multiple flat panel displays
Input Sources	• Dedicated computer with dual output display card • Laptop connection • Auxiliary input for portable devices • Document camera • Wireless connection to the displays
Capture/Collaborate	Collaboration hardware/software for student connectivity to flat panel displays
Sound	• Wired lectern microphone • Wireless microphone system including lavaliere and handheld microphones • Distributed ceiling loudspeakers for speech reinforcement • Wall mounted speakers for program audio • ADA hearing assist system • Integrated speakers with displays for local program audio
Control	• Touch panel at the lectern for simplified control of audio, video, and lighting systems
Furnishings	• Lectern to house all source devices and user interfaces

General Seating – Classroom 1st Floor

This classroom will include a flexible seating arrangement that is planned to facilitate both lecture as well as small group collaborative work. The space will feature two projection screens for lecture based activities.

Planned audiovisual source devices include a dedicated computer, laptop/personal device connections, auxiliary source devices. A wired and wireless microphone system will be employed for speech reinforcement. Program source audio will be deployed on the front teaching wall and the speech reinforcement will use an overhead distributed loudspeaker system.

A touch panel control system will allow simplified control from the teaching station. The mobile teaching station will be located at the front of the room, away from the wall and facing the students with connectivity on either side of the projection screens. Additionally, the room will be outfitted with a hearing-assist system, in line with the current ADA recommendations for accessible design.

The following audiovisual components are planned:

Planned Audiovisual Components	
Display	• Two ceiling-mounted, motorized, projection screen • Two fixed, ceiling-mounted video projector
Input Sources	• Dedicated computer with dual output display card • Laptop connection • Auxiliary input for portable devices
Sound	• Wired lectern microphone • Wireless microphone system including lavaliere and handheld microphones • Distributed ceiling loudspeakers for speech reinforcement • Wall mounted speakers for program audio
Control	• Touch panel at the lectern for simplified control of audio, video, and lighting systems
Furnishings	• Lectern to house all source devices and user interfaces

Quiet Study – 3rd Floor

This room will include a flexible seating arrangement that is planned to facilitate both lecture as well as small group collaborative work. The space will feature two projection screens for lecture based activities.

Planned audiovisual source devices include a dedicated computer, laptop/personal device connections, auxiliary source devices. A wired and wireless microphone system will be employed for speech reinforcement. Program source audio will be deployed on the front teaching wall and the speech reinforcement will use an overhead distributed loudspeaker system.

A touch panel control system will allow simplified control from the teaching station. The mobile teaching station will be located at the front of the room, away from the wall and facing the students with connectivity on either side of the projection screens. Additionally, the room will be outfitted with a hearing-assist system, in line with the current ADA recommendations for accessible design.

The following audiovisual components are planned:

Planned Audiovisual Components	
Display	• Two ceiling-mounted, motorized, projection screen • Two fixed, ceiling-mounted video projector
Input Sources	• Dedicated computer with dual output display card • Laptop connection • Auxiliary input for portable devices
Sound	• Wired lectern microphone • Wireless microphone system including lavaliere and handheld microphones • Distributed ceiling loudspeakers for speech reinforcement • Wall mounted speakers for program audio
Control	• Touch panel at the lectern for simplified control of audio, video, and lighting systems
Furnishings	• Lectern to house all source devices and user interfaces

Café

This space will have three to four wall-mounted flat panel display utilizing CATV or Digital Signage as its input device.

The following audiovisual components are planned:

Planned Audiovisual Components	
Displays	• 3 to 4 wall mounted flat panel display
Input Sources	• CATV • Digital Signage
Capture/Collaborate	• None
Sound	• Loudspeakers integrated into flat panel display for stereo program audio

Large Group Study and Conference Room

The Large Group Study space will function as a meeting and collaboration space for mid-size groups. The space will feature one (1) projection screens and projectors. The study room will include a video conferencing system.

Planned audiovisual source devices include a dedicated computer, laptop/personal device connections and digital auxiliary source devices. A wireless collaboration device will allow faculty/students to connect their laptop or tablet device wirelessly to the projector, to share content and collaborate.

The sound system will support program audio through wall mounted loudspeakers flanking the screens and speech reinforcement through a distributed ceiling speaker system. Additionally, teleconferencing will be available in the large Group Study Room, supported by multiple microphones recessed into the conference table or ceiling.

A small touch panel will serve as the interface for controlling the audiovisual system. The touch panel will be recessed in the wall or a table–top touch panel.

The following audiovisual components are planned:

Level 2 Conference Room: Planned Audiovisual Components	
Display	• One (1) ceiling-mounted, motorized, projection screen. • One (1) fixed, ceiling-mounted video projector
Input Sources	• Dedicated computer with wireless keyboard and mouse • Auxiliary input for portable devices
Capture/Collaborate	• USB camera to support software-based videoconferencing codec • Wireless Collaboration Software
Sound	• Distributed ceiling loudspeakers for speech reinforcement • Wall Mounted loudspeakers for program audio • Tabletop or ceiling microphones
Control	• Wall-mounted touch panel
Furnishings	• Equipment rack located in credenza or furniture stand-alone rack

Small Group Study Space

These spaces will have one wall-mounted flat panel display. This display will have a wall panel for basic wired connectivity and also wireless BYOD connectivity, and a local wall-mounted pushbutton type controller.

The breakdown of audiovisual components are as follows:

Planned Audiovisual Components	
Displays	• One wall mounted flat panel display
Input Sources	• User devices • Laptop connection (digital only) • Wireless BYOD screen sharing
Capture/Collaborate	• None
Sound	• Loudspeakers integrated into flat panel display for stereo program audio
Control	• Wall-mounted push button controller
Furnishings	• None

STEAM Workshop

The STEAM Workshop will include a flexible seating arrangement that is planned to feature small group collaborative work. Wall mounted and cart mounted flat panel displays for small group collaboration will be provided throughout the room. Collaborative connectivity will be provided such that a student can connect their own device to a monitor as well as allow the facilitator to project content to each display.

Planned audiovisual source devices include a laptop/personal device connections. Program source audio will utilize the integrated speakers in the displays..

The breakdown of audiovisual components are as follows:

Planned Audiovisual Components	
Display	• 4 to 6 flat panel displays
Input Sources	• Auxiliary input for portable devices • Wireless connection to the displays
Capture/Collaborate	• Collaboration hardware/software for student connectivity to flat panel displays
Sound	• Integrated speakers with displays for local program audio

Multipurpose Room

The Multipurpose Room will include a flexible seating arrangement that is planned to facilitate both presentation/performance as well as dining activities. The space will feature two projection screens for presentation based activities.

Planned audiovisual source devices include a dedicated computer, laptop/personal device connections, auxiliary source devices.

A wired and wireless microphone system will be employed for speech reinforcement. Program source audio will be deployed on the front presentation wall and the speech reinforcement will use an overhead distributed loudspeaker system.

A touch panel control system will allow simplified control from the determined lectern locations. Additionally, the room will be outfitted with a hearing-assist system, in line with the current ADA recommendations for accessible design.

The breakdown of audiovisual components are as follows:

Planned Audiovisual Components	
Display	• Two ceiling-mounted, motorized, projection screens • Two fixed, ceiling-mounted video projectors
Input Sources	• Dedicated computer with dual output display card • Laptop connection • Auxiliary input for portable devices
Sound	• Wired lectern microphone • Wireless microphone system including lavaliere and handheld microphones • Distributed ceiling loudspeakers for speech reinforcement • Wall mounted speakers for program audio • ADA hearing assist system
Control	• Touch panel connectivity at the lectern locations for simplified control of audio, video, and lighting systems
Furnishings	• Mobile lectern • Equipment rack to house AV system hardware

INFORMATION TECHNOLOGY

Communications Infrastructure

Modern communication has evolved to encompass all aspects of our lives from voice to video. Information technology's prime objective is to facilitate communication and collaboration, and the transfer of information. Colorado School of Mines (Mines) students, faculty and staff have an expectation of instant, fast and stable connectivity with the building technology. They are technically adept and, as such, set high expectations for technology. Network resources will be critical to the research conducted from, on and around this building.

The communication infrastructure for the facility must be flexible enough to accommodate the varying space uses. Over its life, the communications infrastructure must be robust, capable to support technologies not yet conceived of. The communication infrastructure envisioned for the Arthur Miller Library renovation project will address items including:

- Pathways and Spaces
- Telecommunications Rooms
- Structured Cabling

All communications infrastructure design and installation shall comply with the Colorado School of Mine's most current telecommunications campus standards. Colorado School of Mines reference document:

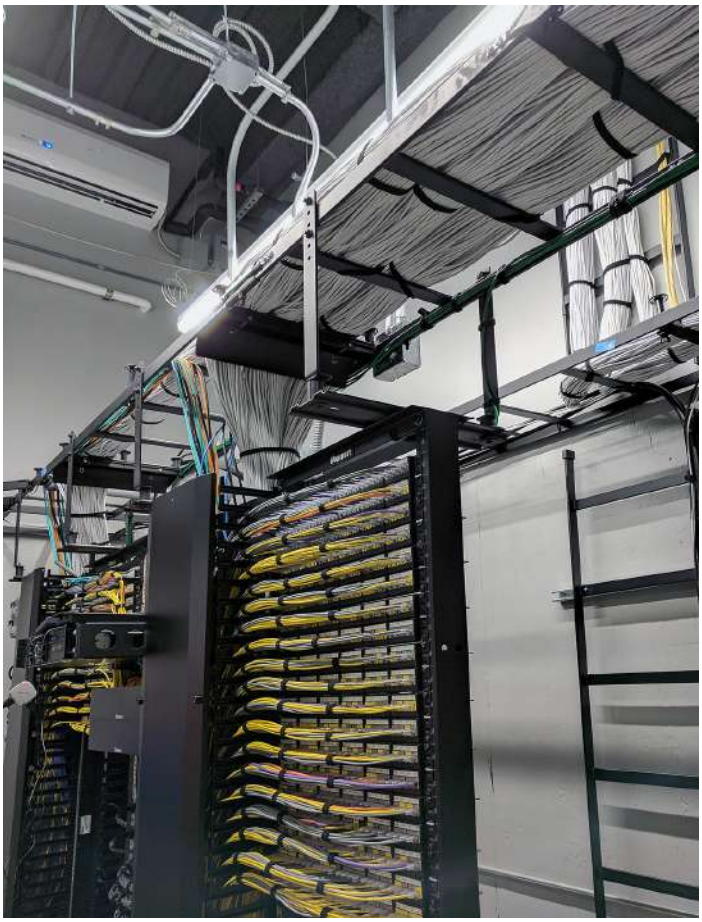
- Campus Standards, Section 16700 Telephone and Computer Cabling, Rev 5/12/2017

Pathways and Spaces

Information technologies require dedicated rooms on each floor to house equipment racks, network switches, optical fiber terminations, copper cabling patch panels, and so on. These spaces are known as Equipment Room (ER) and Telecommunications Rooms (TR). ERs & TRs provide for the organized and logical distribution of low voltage communications signals within a building and are specifically designed to be flexible and scalable. TRs provide value over an extended period of time as a distinct asset to the building and have an anticipated life cycle of up to 25 years. All TRs are designed following ANSI/TIA/EIA and BICSI standards along with recommendations and standards from Colorado School of Mines.

Primary Components

- Equipment Room (OSP Entry Facility)
  - Assume existing OSP cabling entry location to remain
- Telecom Rooms
  - New TR Room on each level, stacked (excluding mezzanines)
- Adequate TR floor space and growth potential
  - Minimum size 10'x10', with outswing door
  - Sized for (3) equipment racks
- Floor mounted equipment racks equipped with both vertical and horizontal wire management
- Overhead racking system to provide flexible cable management between racks, cabinets, and systems
- Patch panels for termination of fiber/copper backbone and horizontal copper cabling
- Independent telecommunications grounding system
- Dedicated 120V power circuits, minimum:
  - (1) 30A Emergency Power, twist-lock
  - (1) 30A Normal Power, twist-lock
- Dedicated HVAC systems – 24/7/365
  - Maintain average temperature 65 to 80 degrees F with relative humidity at 60%
- Existing communications connections from campus network to remain
- Fiber and copper connections between existing ER and Main TR
- Fiber and copper connections between Main TR and distributed TRs



Structured Cabling

Wired building network systems are known as structured cabling systems. Structured cabling systems originate in the Telecom Rooms and extend throughout the building from ER to TR (backbone) and from TR to the end users (horizontal). The backbone cabling system between Telecom Rooms consists of fiber and copper cables and connects each TR via home-run cables to a Main TR within the building. The horizontal cabling system consists of twisted pair Category 6A cables and is visible to the end user in the form of wall faceplate data connections. Main horizontal cabling routes to Telecom Rooms should be through a cable basket tray system, located in corridors pathways. All horizontal cabling must be properly supported and may utilize other approved support systems such as j-hooks installed on maximum 5' centers.

The wired building network system uses a common cable that supports all communications needs for various independent systems such as computer networks, voice system, surveillance, video, and building automation system. These diverse systems run on the same cable infrastructure, which offers ultimate flexibility; the same cabling supports all network requirements indifferent of the system.

Backbone Cable

Fiber cabling ideally will be terminated in rack mounted housings in order to provide complete flexibility for cross-connecting of various networks and equipment and to provide redundancy. Copper cabling should terminate at the rack on patch panels. This methodology permits cross-connection for devices requiring analog phone lines (like fax machines) by using simple patch cords instead of specialized tools. Copper tie-lines from rack patch panels to wall-mounted 110 blocks may also be incorporated into the backbone.

At minimum, intra-building backbone cabling must include the following:

- 12-strands of 50µ multimode (MM) OM3 fiber
- 12-strands of single mode (SM) fiber capable supporting 100 gbps
- 25-pair copper cable, CAT3
- CATV coaxial cabling distribution is not anticipated as a requirement for the facility, to be confirmed

Final backbone cabling requirements for the facility will be reviewed with Mines CCIT staff during the design phases of the project.

Horizontal Cable

All horizontal copper cabling is to be CAT6A, as dependent on current Mines CCIT standards. All areas of the building follow similar design standards regarding the number of cables per workspace as established by University standards along with industry codes, standards, and best practices. This aspect of the horizontal cabling design will be reviewed and further detailed later in the building design phase.

New horizontal copper cabling will be designed as required to serve the Library's renovated scope of work.

New horizontal cabling is planned to:

- Utilize CAT6A cabling at a minimum including all cabling, patch panels, patch cables, termination modules, and wiring blocks.
- Utilize CAT6A cabling for all wireless access points, including all associated patch panels, patch cables, termination modules, and wiring blocks.
- Terminate on rack-mounted patch panels regardless of the application using the cable – email, phone call, fax, video, etc.
- Utilize the same cable regardless of the device using the cable – computer, telephone, surveillance camera, etc.

Outlet Configurations

Preliminary definitions for the recommended work area outlet configurations are as follows:

- Standard faceplates shall have minimum 4 modular spaces and be provided with blanks for unutilized spaces.
- The "Data-Only" or "Voice-Only" Outlet consists of one (1) Category 6A cable. This outlet type will be used less frequently than a "Dual" Outlet and will support such specialty applications as stand-alone wall-mounted telephones, video projectors, flat panel displays, and surveillance cameras. These outlet types are typically characterized by specialty mounting heights and locations. Examples of required

"Voice-Only" outlets may include:
  - Wall telephones in elevator lobbies, hallways, classrooms, or other required areas
  - Emergency blue-light stations or EM call phones, if required
- The "Dual" Outlet consists of two (2) Category 6A cables on a single-gang faceplate.
- The "Triple" Outlet consists of three (3) Category 6A cables on a single-gang faceplate.
- The "Quad" Outlet consists of four (4) Category 6A cables on a single-gang faceplate.
- The "High Density" Outlet consists of six (6) or more Category 6A cables on a 6-port single-gang or dual-gang faceplate.
- A "Furniture Feed" consists of one (1) 4" square wall box to provide a pathway from the wall to the furniture system's raceway.
- "Specialty" Outlet variants will be adapted as needed for unique uses and locations not covered by the above listed configurations.
- Wireless Access Points (WAP) cabling will be provided with a "Dual" Category 6A outlet; one cable for console port connection and the other for the network uplink.

Patch Cable Assemblies

Effective patch "flow" is an integral part of the Structured Cabling System design to be planned according to the specific rack and wire management layouts.

- Patch cable assemblies will be provided and warranted as a part of the Structured Cabling System based upon a quantity twice that of the installed and available horizontal cabling channels plus an additional 5% to provide for varying needs at both cable ends.
- Patch cables will be color-coded according to Mines CCIT standards.
- Patch cables will be provided as part of the base building build-out.
- Patch cable installation will be performed by Mines CCIT staff.

Wireless Network

Wireless technologies have been embedded into modern society. Many wireless technologies are used every day such as radios, cellular phones, smart phones, tablet PCs and laptop computers.

Today's campus buildings must accommodate a wide range of user needs and expectations in order to foster free flowing access to various formats of information. Many campuses struggle with a desire to support the ever-evolving BYOD (Bring Your Own Device) environment that is now expected by students, faculty and staff.

For the Library renovation, data cabling infrastructure will be provided to support incorporation wireless network access, which will augment the traditional wired network. Access points are typically located below finished ceilings and will be activated as needed to provide full building-wide coverage. The wireless infrastructure design will be based on the latest TIA-802.11 standard (802.11ac) and is capable of adapting to and supporting future standards such as 802.11s wireless mesh networks, 802.11v with improved wireless network management, and 802.11aa video transport stream.

Power over Ethernet (PoE) technology is deployed to simplify installation and increase system flexibility by centrally locating all power requirements for wireless access points. This design methodology greatly increases the availability of network bandwidth by adding the capability of connecting to the network via multiple frequencies and channels. The ultimate goal of the wireless system design is to allow for wireless coverage for the entire facility, utilizing high density and dynamic load balancing wireless network standards.

The wireless network modeling design will be provided by Mines CCIT, and the access node data outlet layout will be incorporated into the structured cabling design documents, as directed by CCIT. It is requested that the Wi-Fi design layout be provided to the design team no later than the end of the Design Development phase. Data outlets for wireless access points are typically specified with a 20' service loop, to provide flexibility of final location during commissioning.

Mines CCTI will be handling the procurement and installation of all wireless network equipment.

ACOUSTICAL REVIEW

An Acoustic Review Report will be released later on in the project that will cover the acoustic design guidelines and recommendations for the project. It will address internal room acoustics, sound isolation and mechanical noise and vibration control.

For pricing efforts, there are a few important acoustical items that should be incorporated. To that end, the following aspects of acoustic design should be considered:

- Internal Room Acoustics –
- Mechanical Noise and Vibration Control –
  - Controlling unwanted sound and air turbulence that is generated by the building's mechanical systems. This will be especially important in the Auditorium to allow for critical listening. Internal duct lining and sound attenuators will most likely need to be incorporated to meet the recommended background noise levels. The maximum background noise level in the Recording Studio and Control Room should be NC 20.

UTILITIES / CIVIL NARRATIVES

Existing Conditions

The existing setting for the site improvements associated with the Colorado School of Mines Arthur Lakes Library will include a single main entrance accessing the building from Maple Street at the intersection of West Campus Road. This entry walk will serve double-duty providing access to the building as well as a plaza for visitors and students to both study and socialize. The entry configuration is likely to remain fairly simple as discussed later in this narrative and will be installed in a location that is currently a landscape zone between the road and the existing building. Arthur Lakes Library is located between Maple St and Illinois Street just south of 14th Street extended. While 14th Street does not currently connect to Maple St currently, the existing parking lot directly adjacent to and in north of the existing Library will be converted from the existing drive aisle and parking stalls to a new 2-way roadway and is anticipated to be complete prior to commencement of this Library renovation project. As such we anticipate the roadway connection to this northern wall of the library will be made as part of this preceding roadway project, but that minor improvements may be required to facilitate pedestrian access and sidewalks as well as minor improvements (if needed) to maintain access to the existing loading dock which will remain as a part of the completed library renovation. The existing landscape area within the construction zone of the proposed sidewalk / plaza improvements is primarily sod except for two large trees along maple that should be protected during construction and remain upon completion, as well as minor landscaping and rock mulch adjacent to and along the face of the existing building.

Directly adjacent to but not physically connected to the library is an existing central plant to the northwest of the library building. The central plant will remain in operation and shall be protected during the proposed construction associated with the library. Utility tunnels and process piping exit the Steam Plant to the west of the building and visual evidence exists of a tunnel below the sidewalk directly adjacent to and along the east side of Maple Street. This tunnel will remain in operation and it is anticipated it will not be impacted by the proposed construction but careful efforts during construction are recommended to avoid unintended damage. The exact depth of the tunnel is unknown, but it is anticipated it is likely directly below the sidewalk or a maximum of 12 in below the sidewalk.

The location of the plaza walkway will be further defined in the architectural drawings and narratives, but generally is anticipated to front on what currently is a glass wall along the western face of the existing building. The strategic location of this walkway will also compliment proposed improvements across the street on the west side of Maple St which will include construction of a new plaza supporting a new parking garage. At this time, we do not anticipate any improvements with in Maple Street either to extend the pedestrian themed paver system (which currently exists within the Maple Street roadway to the south of the site) or any improvements associated with the intersection enhancements identified as a part of the parking garage project.

In general, the grades slope from south to north and the installation of this walkway will result in excavation of approximately 2 feet on what will be the south edge of the sidewalk plaza. Based on visual observation and high-level review of existing topography it is believed that the landscape south of the proposed walk can likely be sloped to match existing grades with a maximum 4:1 slope avoiding the need for a new retaining wall unless desired for aesthetic reasons or to provide additional seating for the new plaza area. Further definition is provided in the proposed section of this narrative below.

Proposed Conditions

Grading

With the installation of the proposed sidewalk/plaza, we anticipate the need to excavate approximately 2 feet on the southern edge of the new walkway. This excavation will result in the need to match existing grades which we anticipate will be accomplished via a 4:1 slope in the landscape. However, implementation and installation of a short retaining wall could be considered if it is desired to provide an edge or seat wall for visitors and students. This 2-foot excavation will result in reduced cover on some existing utilities within the construction footprint including water mains, storm lines, and potentially some regulated utilities. However, the potential for regulated utilities appears relatively low given the location of the utility tunnel and the anticipation many of these utilities are within this tunnel. Further evaluation is recommended during formal design evaluation to gain a full understanding of the impact associated with the excavation required.

While a sloped landscape just off the southern edge of the walk is required and anticipated as a part of this project, if it is desired to install a short seat wall we anticipate this wall could and would be leveraged to retain this earth and would likely result in a modular block wall or concrete wall with below grade footing would be designed for functionality and visual

aesthetics to complement the existing building. Reference the architectural section of these plans and narratives for further information associated with this improvement.

In general, the proposed improvements are considered relatively minor in nature and we do not anticipate a heavy requirement for on-site detention, but we do believe that the slope of the walk will drain a maximum of 2% from south to north and that it will be designed to drain away from the building toward the Maple Street walk. The elevation of the sidewalk / plaza shall match the finish floor of the building resulting in the need to excavate directly adjacent to the building a small amount. All Slopes shall meet ADA requirements to provide an accessible path to and from the building, with a maximum cross slope of 2% and a maximum longitudinal slope of 5%.

The runoff created by this new impervious area will discharge into either an adjacent sod landscape zone resulting in the need to construct a small landscape swale and associated curb chase under the existing sidewalk (allowing discharge to drain into the gutter of the proposed 14th Street roadway), or to install area drain inlets with the intent to connect to a recently installed storm sewer in this area discharging into a storm sewer in Maple Street. This latter option is preferred to minimize overland flow and minimize the potential for saturated lawn areas or long-term icing on walkways.

Utilities

Within the footprint of proposed construction associated with this plaza we expect to find storm and sanitary lines approximately 3 to four feet deep, possibly more, irrigation lines and potentially some regulated utilities.

A formal utility locate survey is recommended prior to construction to verify all existing utilities in the vicinity to understand the extent of impact associated with construction. An existing utility tunnel running below the sidewalk parallel to and directly adjacent to the east side of Maple Street shall remain in place and shall not be impacted with this construction apart from potentially replacing the concrete walkway. While the utility tunnel houses several utilities, it is anticipated that the proposed plaza construction will have little, if any, impact on this tunnel. However, it is recommended that clear visual verification of the top of the tunnel be verified prior to construction to ensure grades and improvements can be accommodated. All process piping and regulated utilities within the tunnel shall remain not impacted with proposed improvements, and the utilities associated with the existing central plant shall remain uninterrupted.

Any improvement to the irrigation system shall be coordinated with and through Colorado School of Mines and verification of the storm sewer and sanitary sewer depths shall be verified prior to construction with survey and dips on pipe inverts.

Based on visual evidence of valve boxes in the field, the presence of an existing water main is apparent. This water-main might provide domestic and/or fire water for the Library and shall remain in place. If it becomes necessary to excavate over the top of any existing water-main, or service line, maintaining a minimum of 4.5 feet of cover is required. As such, prior to construction if utility locates identify existing water facilities, leveraging non-destructive potholing is recommended to identify the depth of these lines will provide background required to determine if a lowering is required.

Pavements

The proposed sidewalk improvements are anticipated to be concrete material installed in accordance with both Colorado School of Mines Standards as well as City of Golden and CDOT requirements. The concrete shall be a minimum of 4” thick for all pedestrian areas and if needed, shall be a minimum of 6” thick for any area that will receive vehicle loading. The concrete shall conform to CDOT Type P concrete specifications.

SITE LANDSCAPE NARRATIVE

Existing Site Analysis

The library sits at the heart of main campus, oriented towards Stratton & Kafadar Commons along Illinois Street. Its main entry is off a pedestrian walkway that leads to Guggenheim and Brown Halls. The site, while centrally located, has a single point of entry to the library on this eastern edge and currently turns it back to the main pedestrian plaza on its western side.

Existing Vehicular Circulation

To access the Library, vehicles currently can drop-off patrons directly in front of the main entrance along Illinois Street from the east, or from Maple Street they can access a parking lot along the north side of the Library (Lot S). Parking is reserved for relevant staff and service vehicles only. The loading dock is located on the northwest corner of the Library, and is accessed from Maple Street.

Existing Topography

The site around the Arthur Lakes Library slopes around the building from east to west (higher elevations along the east and a lower grade on the west. The main entry into the existing building on the east side enters on Level 2, while entry on the west side at grade enters at Level 1. A topographical survey by a registered engineer should be performed prior to design.

Proposed Site Design

The proposed design introduces a new entry on the west elevation of the 1979 addition, at ground level (entering on Level 1). The new entry will allow for ADA access to enter directly into the library, and those patrons will not be isolated to the Level 2 bridge to enter, as they do today. The new entry will also draw more students off the major pedestrian path along Maple Street and welcome the patrons who utilize the new parking garage across Maple.

A new plaza will be incorporated into the design of the new west entry. Pedestrian access will continue to enter from the existing east entry, but the west entry will likely serve the bulk of users and patrons with this new access point. The staff-only entrance on the north side will continue to serve as a secondary egress/access for staff.

Vehicular Circulation

The route for vehicular circulation to the site will remain largely unchanged with the renovation. In the next few months, the city of Golden has decided to re-open 14th Street as a right of way and extend it to the west, connecting it once again to Maple Street. Fourteenth street will allow two-way traffic, along the northern side of Lakes Library. The campus parking lot will be removed and an asphalt paved road, with no angled parking (but possibly parallel street parking) will be incorporated.

Loading and unloading will continue to occur at the loading dock on the northwest corner of the Library, and will require trucks to back-in to the dock off 14th Street.

Parking

A new parking garage at the intersection of Maple Street and West Campus is scheduled to begin construction this June 2018. The garage will add an additional 600 net spaces to the campus, and provide adequate parking and easy access to the Library and surrounding campus buildings. The parking garage is scheduled to be fully functional by the Fall 2019. Additional handicap parking spaces are anticipated along Maple Street to access the new Library entry along the west side.

Landscape Design

Landscaped zones will be minimally incorporated around the building as a buffer from adjacent hardscapes. Planned vegetation will be low-water, low-maintenance requirements vegetation, utilizing drip irrigation or emitters. Deciduous shade trees will be located to the northwest of the entry plaza thoroughfare. A 5'-6' wide cobble rock border around perimeter of building will incorporated where no entrances/exits occur.

SITE ANALYSIS LEGEND

- VEHICLE ROUTE
- PRIMARY PEDESTIRAN ROUTE
- SECONDARY PEDESTIRAN ROUTE
- PARKING ACCESS
- EXISTING BUILDING ENTRY
- X EXISTING BUILDING SERVICE ACCESS
- ACADEMIC BUILDING
- ADMINISTRATIVE BUILDING
- STUDENT LIFE
- STUDENT HOUSING

SUSTAINABLE DESIGN NARRATIVE

The Colorado School of Mines is a research-based university focused on energy and the environment; therefore it is a priority for the design team to upgrade the existing building by improving energy efficiency and indoor environmental quality where possible. Due to the nature of the project scope which does not include complete HVAC improvements, significant building envelope modifications the LEED version 4 BD+C for New Construction and Major Renovations is not applicable to the project. Perhaps better suited to the project scope and less cost prohibitive would be the application of the LEED version 4 ID+C for Commercial Interiors rating system. This rating system requires a minimum improvement in energy performance which may be precluded by the lack of scope impacting HVAC, envelope or lighting. Once a preliminary energy model has been performed it will be possible to know if the project can meet the minimum improvement in energy performance and therefore pursue certification under LEED. If the project cannot meet the minimum energy performance requirements the State of Colorado Office of the State Architect High Performance Certification Program allows for a waiver from LEED certification for projects whose scope doesn't include HVAC systems (please see following State HPCP Waiver).

Through this concept design study and a preliminary pass at the LEED v4 ID+C checklist, the design team's LEED Gold Rating might be a possibility for the Arthur Lakes Library Renovation once the project comes to fruition. It is important to note that the following checklist attempts to identify all possible points; it does not represent a target LEED rating. Once the project begins the Schematic Design phase, further cost/benefit analysis, energy modeling, systems design, and value engineering will occur and it is highly probable that LEED points achieved will differ from what is represented by this checklist.

LEED V4 FOR BD+C: COMMERCIAL INTERIORS

The following LEED version 4 ID+C draft scorecard shows a path to Gold Certification which may be attainable. The University has demonstrated the ability to achieve the Gold level of certification on campus buildings using the LEED for New Construction (LEED-NC) version 3 which was the basis for achievement of those credits that are similar under LEED version 4. Many of the credits shown as "?" on the draft scorecard are revised from LEED version 3 or new to the version 4 ID+C rating system.

LEED v4 for ID+C: Commercial Interiors
Project Checklist

Project Name: CSM Arthur Lakes Library
Date: 07/2018

Y	?	N			
		2	Credit	Integrative Process	2

1	17	0		**Location and Transportation**	18
			Credit	LEED for Neighborhood Development Location	18
	8		Credit	Surrounding Density and Diverse Uses	8
	7		Credit	Access to Quality Transit	7
1			Credit	Bicycle Facilities	1
	2		Credit	Reduced Parking Footprint	2

6	2	4		**Water Efficiency**	12
Y			Prereq	Indoor Water Use Reduction	Required
6	2	4	Credit	Indoor Water Use Reduction	12

2	20	16		**Energy and Atmosphere**	38
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Fundamental Refrigerant Management	Required
	4	1	Credit	Enhanced Commissioning	5
	10	15	Credit	Optimize Energy Performance	25
	2		Credit	Advanced Energy Metering	2
	3		Credit	Renewable Energy Production	3
	1		Credit	Enhanced Refrigerant Management	1
2			Credit	Green Power and Carbon Offsets	2

8	1	4		**Materials and Resources**	13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
1			Credit	Long-Term Commitment	1
2	1	1	Credit	Interiors Life-Cycle Impact Reduction	4
1		1	Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
1		1	Credit	Building Product Disclosure and Optimization - Sourcing of Raw Materials	2
1		1	Credit	Building Product Disclosure and Optimization - Material Ingredients	2
2			Credit	Construction and Demolition Waste Management	2

3	10	4		**Indoor Environmental Quality**	17
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
	2		Credit	Enhanced Indoor Air Quality Strategies	2
2	1		Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
	2		Credit	Indoor Air Quality Assessment	2
	1		Credit	Thermal Comfort	1
	2		Credit	Interior Lighting	2
		3	Credit	Daylight	3
		1	Credit	Quality Views	1
	2		Credit	Acoustic Performance	2

3	1	2		**Innovation**	6
2	1	2	Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

0	3	1		**Regional Priority for Zip Code 80401**	4
	1		Credit	Renewables or Optimize Energy	1
		1	Credit	Daylight	1
	1		Credit	Density or Reduced Parking	1
	1		Credit	Indoor Water Use Reduction (8 points)	1

23	54	33	**TOTALS**	Possible Points:	110

Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80+

CODE ANALYSIS

Zoning Classification: Campus of Colorado School of Mines
General: Three story existing building is not sprinklered, however, a fully sprinklered system will be added during the renovation. Off-Street Parking: Per Campus of CSM guidelines

OCCUPANCY TYPE

A-3 - IBC 303.4

INCIDENTAL USE AREAS:

- Mechanical Rooms: IBC TABLE 509
  Separation not required: No equip exceeding minimum criteria
- Storage: IBC TABLE 509
  Separation not required: Automatic fire-extinguishing system

CODES and REGULATIONS

- 2015 International Building Code (IBC)
- 2015 International Existing Building Code (IEBC)
- 2015 International Mechanical Code (IMC)
- 2015 International Energy Conservation Code (IECC)
- 2015 International Fuel Gas Code (IFGC)
- 2015 International Plumbing Code (IPC)
- 2017 National Electrical Code (NEC)
- ICC A117.1-2009 Accessibility Standards (I/A)

REGULATORY & NON-REGULATORY AGENCIES

- STATE ELECTRICAL BOARD - Dept. of Regulatory Agencies
- STATE PLUMBING BOARD - Dept. of Regulatory Agencies
- LOCAL HEALTH DEPARTMENT
- STATE BOILER INSPECTION
- STATE FIRE INSPECTION

IECC COMPLIANCE METHODS

- The requirements of ANSI/ASHRAE/IESNA 90.1 (Option One per IECC C401.2)

GENERAL BUILDING HEIGHTS & AREAS

- Allowable height, sprinklered building:
  55 ft + 20 ft = 75 ft IBC TABLE 504.3
- Allowable stories above grade, A-3 sprinklered:
  3 stories, IBC TABLE 504.4
- Actual height: Approximately 50 ft
- Actual number of stories above grade: 3
- Allowable area per floor (based on A-3 occupancy, with 2 or more stories above grade): 28,500 SF IBC TABLE 506.2.3
- Area increase available:
  28,000 SF + (9,200 SF x 75%) x 3 = 104,700 SF
- Maximum building area: 104,700 SF
- Actual Areas:

Level 1:	27,253 GSF
Level 1M:	7,598 GSF
Level 2:	27,261 GSF
Level 2M:	7,501 GSF
Level 3:	7,076 GSF
TOTAL:	**76,689 GSF**

CONSTRUCTION TYPE

- TYPE II-B. IBC TABLE 601

FIRE-RESISTIVE, RATED CONSTRUCTION

- Shafts: 1HR, IBC 707.3.1
- Passenger Elevator Hoistway: 1HR, IBC 708.14
- Elevator Lobby: Not required, IBC 3006.2, not greater than 3 stories
- Hoistway Venting: Not required, IBC 3006.2, not greater than 3 stories
- Stairway Enclosures: 1 HR, IBC 1023.2
- Stairway Roof Access: Not required, IBC 1009.13
- Floor Assemblies: 0 HR, IBC TABLE 601
- Roof Assemblies: 0 HR, IBC TABLE 601
- Structural Frame: 0 HR, IBC TABLE 601
- Exterior Load Bearing Walls: 0 HR, IBC TABLE 601
- Interior Load Bearing Walls: 0 HR, IBC TABLE 601
- Exterior Nonbearing Walls/Partitions: 0 HR, IBC TABLE 601
- Interior Partitions: 0 HR, IBC TABLE 601
- Corridors: 0 Hr, IBC TABLE 1020.1 with sprinkler
- Exterior Walls: 0 HR, IBC TABLE 601, greater than 30 ft separation
- Exterior Wall Openings: Unlimited Unprotected Openings, IBC TABLE 705.8, greater than 30 ft separation

FIRE PROTECTION SYSTEMS

- Sprinkler System: Throughout per NFPA 13
- Automatic Sprinkler System Increase: Yes, IBC 903.2.1.3
- Generator: Provided
- Fire Alarm System: Provided, IBC 907.2.1
- Shunt Trip: IBC CH 30
- Standpipes: Class 1, IBC 905.3.1 Exception 1
- Portable Fire Extinguishers: IBC 906.1, IFC
- Fire Alarm: IBC 907
- Smoke Control: Not required, IBC 909
- Smoke and Heat Vents: Not required, IBC 910.2

MEANS OF EGRESS

- Occupant load factor: IBC TABLE 1004.1.2
  LEVEL 1: 27,253 GSF, 408 occ + 76 occ mezz = 484 occ
  (LEVEL 1M: 7,312 GSF, 76 occ)
  LEVEL 2: 27,261 GSF, 598 occ + 84 mezz = 682 occ
  (LEVEL 2M: 7,501 GSF, 84 occ)
  LEVEL 3: 7,076 GSF, 497 occ
  TOTAL: 1,663 occs
- Concentrated chairs: 1:7 net
- Unconcentrated tables & chairs: 1:15 net
- Classrooms: 1:20 net
- Stack area: 1:100 gross
- Office: 1:100 gross
- Reading room: 1:50 net
- Storage, Mechanical: 1:300 gross

OCCUPANTS:

- Level 1 (including Mezzanine 1M): 484
- Level 2 (including Mezzanine 2M): 682
- Level 3: 497

REQUIRED MINIMUM CORRIDOR WIDTH:

- (484/3) OCC PER CORR X 0.2 IN (1ST FLOOR) = 32" REQUIRED, 150" PROVIDED, IBC 1005.1
- (682/2) OCC PER CORR X 0.2 IN (2ND FLOOR) = 69" REQUIRED, 92" PROVIDED, IBC 1005.1
- (497/2) OCC PER CORR X 0.2 IN (3RD FLOOR) = 50" REQUIRED, 116" PROVIDED, IBC 1005.1

REQUIRED MINIMUM STAIR WIDTH:

- 497 (3RD FLOOR) / 2 = 249 OCC PER STAIR X 0.2 IN = 50" REQUIRED, 52" PROVIDED
- 682 (2ND FLOOR) / 4 = 170 OCC PER STAIR X 0.2 IN = 34" REQUIRED (worst case scenario - 36" at West Existing Stair)
- 84 (2ND MEZZ) / 2 = 42 OCC PER STAIR X 0.2 IN = 9" REQUIRED, 40" PROVIDED

- Areas of Refuge: Not required, IBC 1007.3, Exception 1
- Exit Signs: Provided in compliance with IBC 1011
- Exit Sign Illumination: Provided in compliance with IBC 1011
- Exit Access: IBC 1014
- Exit through Intervening Spaces: IBC 1014.2
- Number of Exits from Room: 1 required if occ load <50, 2 required if occ load >50, IBC TABLE 1015.1
- Maximum Travel Distance to Exit: 250 ft with sprinkler system, IBC TABLE 1016.1
- Dead End Corridor: 20 ft, IBC 1018.4
- Exits Required per floor: 2 required levels 1 & 3, 3 required level 2. IBC TABLE 1021.1

INTERIOR FINISHES

Interior Wall and Ceiling Finish Requirements:

- Exit Enclosures and Passageway: B, IBC TABLE 803.9
- Corridors: B, IBC TABLE 803.9
- Rooms and Enclosed Spaces: C, TABLE 803.9

TOTAL PLUMBING FIXTURE COUNT

Plumbing Fixture requirements for occupant load:
M: 831, 1/125 occ = 7 toilets, lavs 1/200 occ = 5 lavs
W: 832, 1/65 occ = 13 toilets, lavs 1/200 occ = 5 lavs
DF 1/500 = 4 Drinking Fountains

PLUMBING FIXTURES PROVIDED:

LEVEL 1:	M: 3T/2L
	W: 5T/2L
	U: 1T/1L
LEVEL 2:	W: 3T/2L
	M: 3T/2L
LEVEL 3:	M: 3T/2L
	W: 4T/2L
TOTAL:	M: 9T/6L
	W+U: 13T/7L

LEVEL 1 = 27,253 GSF
408 occs
204M:1 /125 occ = 2 toilet , lavs 1/200 occs - 2 lav
204W: 1/65 occ = 4 toilets, lavs 1/200 occs = 2 lav
DF 1/500 - 1 DF

LEVEL 1 MEZZANINE = 7,318 GSF
76 ccs
38 M: 1 /125 occ = 1 toilet , lavs 1/200 occs - 1 lav
38 W: 1/65 occ = 1 toilets, lavs 1/200 occs = 1 lav
DF 1/500 - 1 DF

LEVEL 2 = 27,261 GSF
598 occs
299 M: 1 /125 occ = 3 toilet , lavs 1/200 occs - 2 lav
299 W: 1/65 occ = 5 toilets, lavs 1/200 occs = 2 lav
DF 1/500 - 1 DF

LEVEL 2 MEZZANINE = 7,501 GSF
84 occs
42 M: 1 /125 occ = 1 toilet , lavs 1/200 occs - 1 lav
42W: 1/65 occ = 1 toilets, lavs 1/200 occs = 1 lav
DF 1/500 - 1 DF

LEVEL 3 = 7,076 GSF
357 + 140 = 497 occs
248 M : 1 /125 occ = 2 toilet , lavs 1/200 occs - 1 lav
249 W: 1/65 occ = 4 toilets, lavs 1/200 occs = 1 lav
DF 1/500 - 1 DF

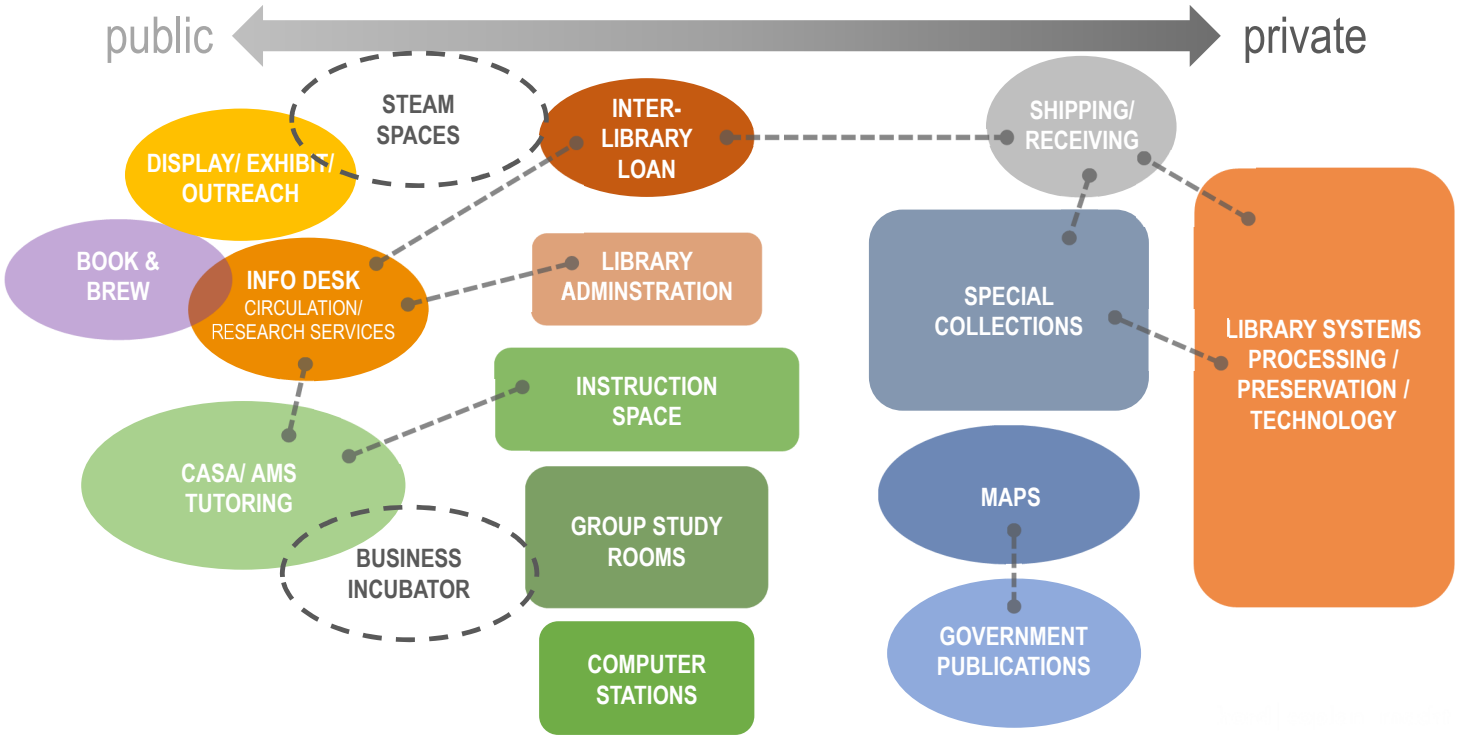
3.2 SPATIAL RELATIONSHIPS & ROOM SPECIFICATIONS

The adjacency diagram below illustrates the ideal layout for each programmatic component, as developed during the planning process. Adjacency diagrams are a tool that explores ideal adjacencies between functions and spaces. They illustrate the ideal scenario, regardless of building envelope limitations.

This adjacency diagram accounts for functional adjacencies while also incorporating the degree of public access each program component requires, or the lack of public access. When a department serves as a more "back of house" or supportive function in the library, their spaces can be more private, and less visible to users. The most public-facing functions are located on the left of the diagram, while the most private are shown on the far right.

This diagram assumes that the collection, general seating, copy areas and building support spaces will be in various locations throughout the facility; their ideal adjacencies are not as critical as those included below.

ADJACENCY DIAGRAM

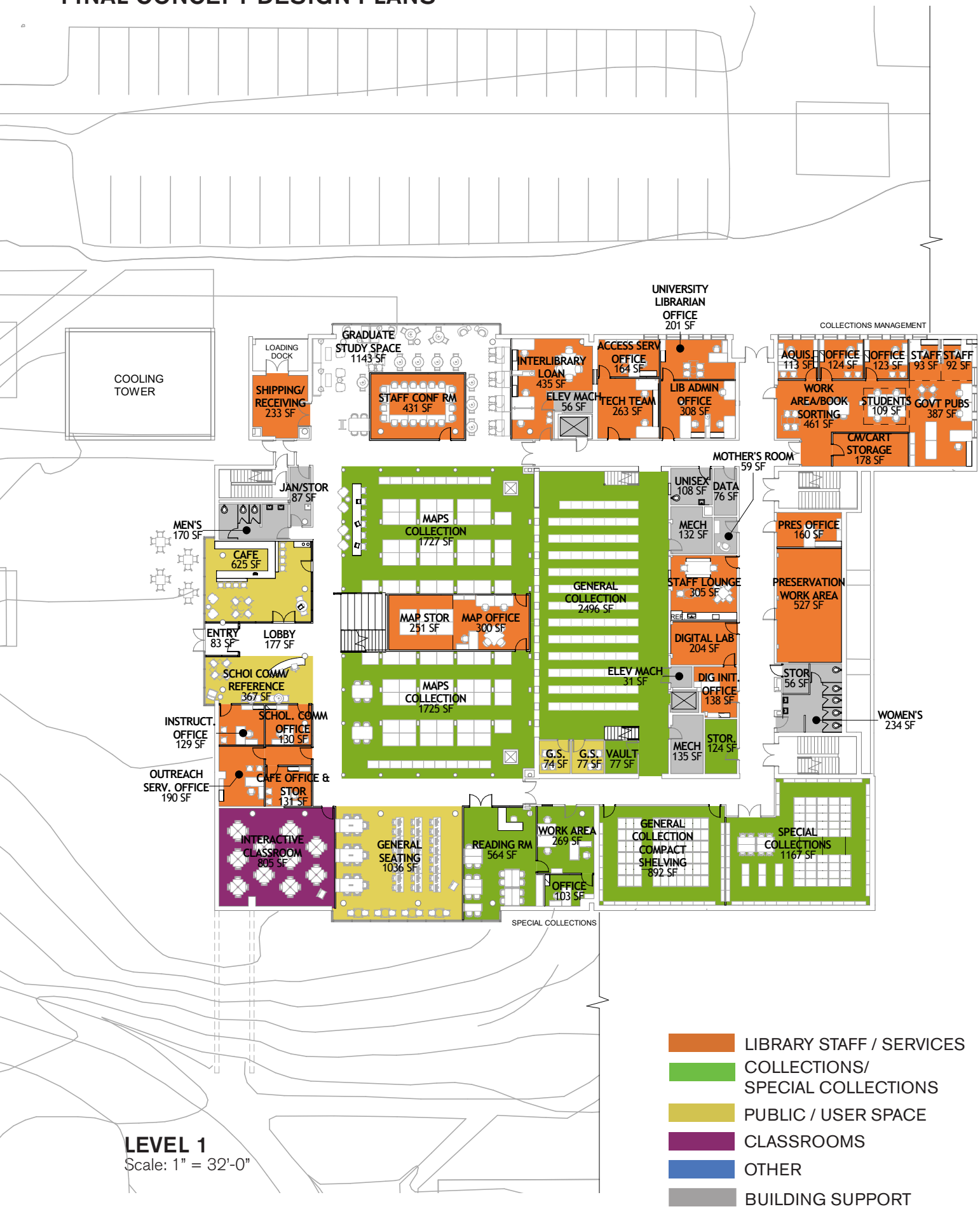


3.3 CONCEPT DESIGN

Conceptual site plan, floor plans, elevations, sections and renderings are included on the following pages.

FINAL CONCEPT SITE PLAN

FINAL CONCEPT DESIGN PLANS



LEVEL 1
Scale: 1" = 32'-0"

LEVEL 1 MEZZANINE

Scale: 1" = 32'-0"

FINAL CONCEPT DESIGN PLANS

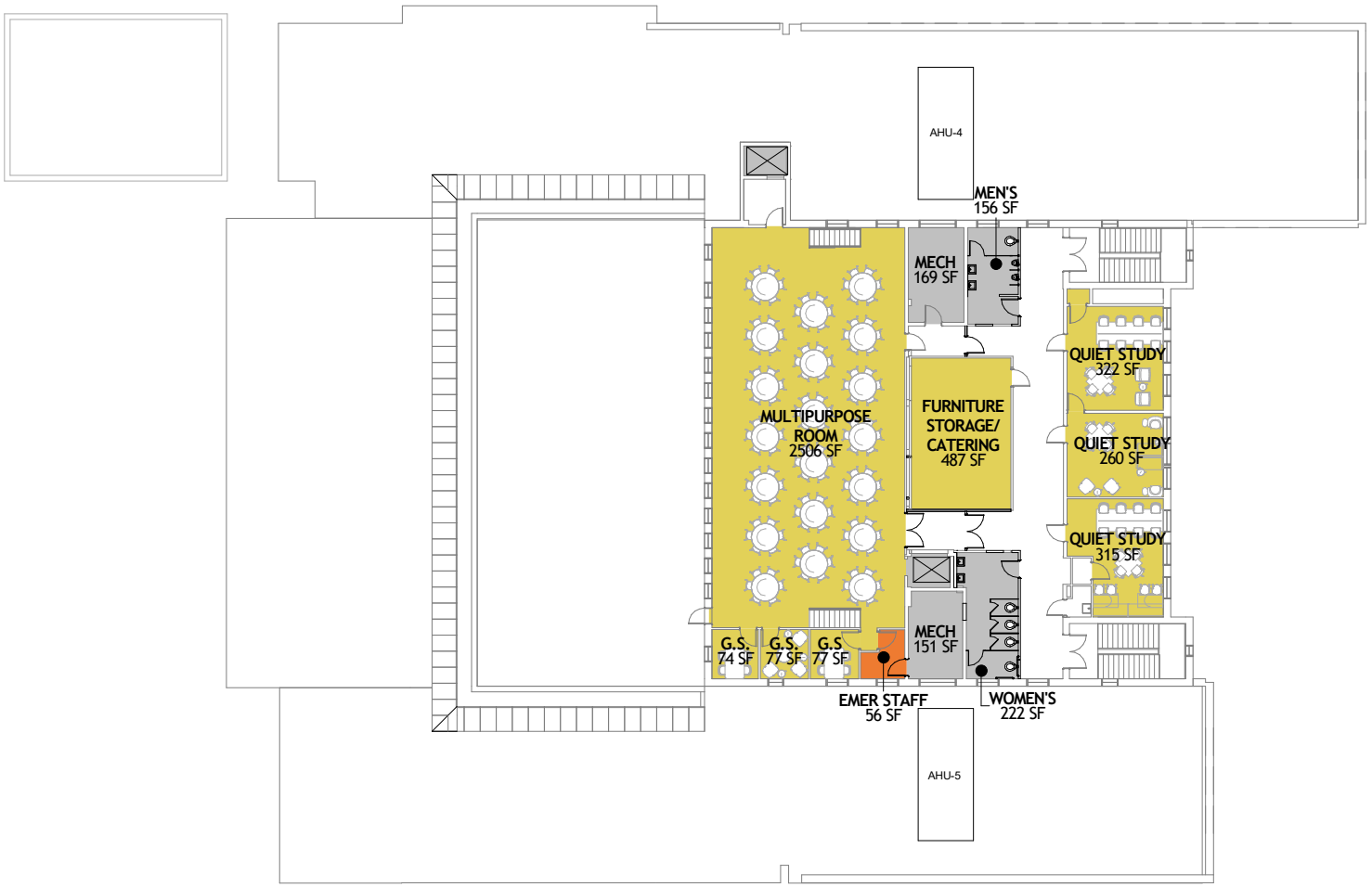
LEVEL 2

Scale: 1" = 32'-0"

LEVEL 2 MEZZANINE

Scale: 1" = 32'-0"

FINAL CONCEPT DESIGN PLANS



LIBRARY STAFF / SERVICES

COLLECTIONS/
SPECIAL COLLECTIONS

PUBLIC / USER SPACE

CLASSROOMS

OTHER

BUILDING SUPPORT

LEVEL 3
Scale: 1" = 32'-0"


ARTHUR LAKES LIBRARY

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Book and Brew

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3.4 PROJECT SCHEDULE, COST ESTIMATE & FINANCIAL ANALYSIS

STATE OF COLORADO
DEPARTMENT OF PERSONNEL & ADMINISTRATION
OFFICE OF THE STATE ARCHITECT

7/23/2018

FY 2019-20 CAPITAL CONSTRUCTION/CAPITAL RENEWAL PROJECT REQUEST- COST SUMMARY (CC/CR-CS)*					
(A)	**Funding Type:**	**General Funded**			
(B)	(1) **Agency/Institution:**	Colorado School of Mines	(2) **OSA Delegate Signature:**		Date
(C)	(1) **Project Title:**	LB Renovation	(2) **OSA Delegate Email:**		
(D)	(1) **Project Phase (__ of __):**	1 of 1	(2) **State Controller Project # (if applicable):**		
(E)	(1) **Project Type:**	Capital Construction (CC)	(2) **Agency/Institution Signature Approval:**		Date
(F)	(1) **Year First Requested:**	FY 2019 - 2020	(2) **OSA Review Signature:**		Date
(G)	(1) **Priority Number:**		(2) **Revision/Date: Indicate Yes or No. Provide submittal date.**		Date

(1)		(a) **Total Project Costs**	(b) **Total Prior Year Appropriation(s)**	(c) **Current Request FY 2019-2020**	(d) **Year Two Request FY 2020-21**	(e) **Year Three Request FY 2021-22**	(f) **Year Four Request FY 2022-23**	(g) **Year Five Request FY 2023-24**
	Land /Building Acquisition							
(2)	Land Acquisition	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(3)	Building Acquisition	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(4)	***Total Acquisition Costs***	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
	Professional Services							
(5)	Planning Documentation	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(6)	Site Surveys, Investigations, Reports	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(7)	Architectural/Engineering/ Basic	$ 1,218,325	$ -	**$ 1,218,325**	$ -	$ -	$ -	$ -
(8)	Code Review/Inspection	$ 65,000	$ -	**$ 65,000**	$ -	$ -	$ -	$ -
(9)	Construction Management	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(10)	Advertisements	$ 1,000	$ -	**$ 1,000**	$ -	$ -	$ -	$ -
(11)	Other (Specify)	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(12)	Inflation Cost for Professional Services	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(13)	Inflation Percentage Applied		0.00%	**0.00%**	0.00%	0.00%	0.00%	0.00%
(14)	***Total Professional Services***	$ 1,284,325	$ -	**$ 1,284,325**	$ -	$ -	$ -	$ -
	Construction or Improvement							
(15)	Infrastructure Service/Utilities	$ 25,000	$ -	**$ 25,000**	$ -	$ -	$ -	$ -
(16)	Infrastructure Site Improvements	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(17)	Structure/Systems/ Components							
(18)	Cost for New (GSF):	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(19)	New at $_____ X _____GSF							
(20)	Cost for Renovation (GSF):	$ 9,300,000	$ -	**$ 9,300,000**	$ -	$ -	$ -	$ -
(21)	Renovation at $_____ X _____GSF							
(22)	Cost for Capital Renewal (GSF):	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(23)	Renewal at $_____ X _____GSF							
(24)	Other (Specify)	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(25)	High Performance Certification Program	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(26)	Inflation for Construction	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(27)	Inflation Percentage Applied		0.00%	**0.00%**	0.00%	0.00%	0.00%	0.00%
(28)	***Total Construction Costs***	$ 9,325,000	$ -	**$ 9,325,000**	$ -	$ -	$ -	$ -
	Equipment and Furnishings							
(29)	Equipment	$ 100,000	$ -	**$ 100,000**	$ -	$ -	$ -	$ -
(30)	Furnishings	$ 1,000,000	$ -	**$ 1,000,000**	$ -	$ -	$ -	$ -
(31)	Communications	$ 125,000	$ -	**$ 125,000**	$ -	$ -	$ -	$ -
(32)	Inflation for Equipment & Furnishings	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(33)	Inflation Percentage Applied		0.00%	**0.00%**	0.00%	0.00%	0.00%	0.00%
(34)	***Total Equipment & Furnishings Cost***	**$ 1,225,000**	**$ -**	**$ 1,225,000**	**$ -**	**$ -**	**$ -**	**$ -**
	Miscellaneous							
(35)	Art in Public Places	$ -	$ -	**$ 100,000**	$ -	$ -	$ -	$ -
(36)	Relocation Costs	$ 30,000	$ -	**$ 30,000**	$ -	$ -	$ -	$ -
(37)	Other Costs [specify]	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(38)	Other Costs [specify]	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(39)	Other Costs [specify]	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(40)	Other Costs [specify]	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(41)	***Total Misc. Costs***	$ 130,000	$ -	**$ 130,000**	$ -	$ -	$ -	$ -
	Total Project Costs							
(42)	***Total Project Costs***	**$ 11,964,325**	**$ -**	**$ 11,964,325**	**$ -**	**$ -**	**$ -**	**$ -**
	Project Contingency							
(43)	5% for New	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(44)	10% for Renovation	$ 932,500	$ -	**$ 932,500**	$ -	$ -	$ -	$ -
(45)	***Total Contingency***	$ 932,500	$ -	**$ 932,500**	$ -	$ -	$ -	$ -
	Total Budget Request							
(46)	***Total Budget Request***	**$ 12,896,825**	**$ -**	**$ 12,896,825**	**$ -**	**$ -**	**$ -**	**$ -**
	Funding Source							
(47)	Capital Construction Fund (CCF)	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(48)	Cash Funds (CF)	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(49)	Reappropriated Funds (RF)	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(50)	Federal Funds (FF)	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
(51)	Highway Users Tax Fund (HUTF)	$ -	$ -	**$ -**	$ -	$ -	$ -	$ -
		$0	$0	$0	$0	$0	$0	$0

* Accompanies CC/CR-N Form

FUNDING SOURCES

This project is anticipated to be funded primarily by revenues from the State of Colorado. Colorado School of Mines does not have additional funds available for the renovation of Arthur Lakes Library.

PHASING

This program plan recommends an extensive renovation to the existing building. This report has assumed that the library functions currently housed in Arthur Lakes Library cannot be accommodated in a different building on campus during construction. Therefore, it is anticipated that all renovations must be under construction while the Library remains occupied, so a multi-phase construction project is anticipated. It is estimated that there will need to be 2 phases, however, a construction phasing plan should be coordinated with the Colorado School of Mines project manager early in the process to account for all user group needs.

SCHEDULE

Upon approval of this Program Plan by the Colorado Commission on Higher Education the intent is to submit the project to the State Capital Development Committee for funding by the 2019 Legislature. Escalation should be anticipated at a rate of 4% per year added to the general schedule but should be determined on an annual basis.

The following schedule assumes funding is available by the Summer of 2019. This project could proceed as a Design-Bid-Build or Construction Manager/General Contractor delivery. The nature of the phasing requirement in an occupied building for the renovation may make the CM/GC delivery method a beneficial direction as the CMGC contractor may identify efficiencies that could shorten the overall schedule and/or budget and minimize impact to occupants.

SCHEDULE DETAILS

May 2019:	Legislative Funding Approval
June-Aug. 2019:	Selection of the Arch/Eng Team
Sep.-Oct. 2019:	Confirm Programming/Concept Design
Oct.-Dec. 2019:	Schematic Design
Jan.-Apr. 2020:	Complete Design and Documentation
May 2020:	Permitting, Contractor Bidding and Negotiation
June 2020:	Phase 1 1979 section - HazMat Abatement
July 2020-Apr. 2021:	Phase 1 1979 section - Renovation and new west entry addition const. (10 months)
Apr. 2021:	Move occupants into renovated phase 1 section
May 2021:	Phase 2 1955 section - HazMat Abatement
June-Jan. 2022:	Phase 2 1955 section reno (8 months)
Jan. 2022:	Move occupants from temporary locations in phase 1 section into permanent locations into phase 2 section.
Jan. 2022:	Reimagined Arthur Lakes Library opens

SUMMARY - ROLLUP -

	Element		Total	Cost / SF
1	General Requirements - included below			
2	Sitework		$809,023	$12.35
3	Concrete		$88,389	$1.35
4	Masonry		$24,006	$0.37
5	Metals		$114,772	$1.75
6	Wood & Plastics		$14,472	$0.22
7	Thermal & Moisture		$45,901	$0.70
8	Doors & Windows		$217,496	$3.32
9	Finishes		$2,400,524	$36.66
10	Specialties		$319,152	$4.87
11	Equipment - provided by owner			
12	Furnishings		$286,015	$4.37
13	Special Construction - not included			
14	Conveying - scope removed			
15	Mechanical		$1,105,540	$16.88
16	Electrical		$1,410,432	$21.54
	Subtotal		$6,835,722	$104.39
	General Conditions	6.00%	$410,143	$6.26
	Subtotal		$7,245,865	$110.65
	General Requirements	4.25%	$307,949	$4.70
	Subtotal		$7,553,815	$115.35
	Bonds & Insurance	2.00%	$151,076	$2.31
	Subtotal		$7,704,891	$117.66
	Contractor's Fee	4.00%	$308,196	$4.71
	Subtotal		$8,013,087	$122.37
	Design Contingency	10.00%	$801,309	$12.24
	Subtotal		$8,814,395	$134.60
	Phasing	1.50%	$132,216	$2.02
	Subtotal		$8,946,611	$136.62
	Escalation - accounted for elsewhere, thus excluded			
	TOTAL ESTIMATED CONSTRUCTION COST		**$8,946,611**	**$136.62**

PROJECT COST ESTIMATE

DETAIL ELEMENTS - ROLLUP -

Element	Quantity	Unit	Unit Cost	Total
2 Sitework/Existing Conditions				
Demolition	65,484	sf	$8.29	542,985
MEP demolition	65,484	sf	$1.46	95,402
Heavy demolition - new stair region	1	ls	$84,726.00	84,726
Site demolition/clearing	6,500	sf	$0.46	3,000
Earthwork	6,500	sf	$1.88	$12,210
Site improvements	6,500	sf	$10.88	$70,700
Site utilities - assumed not required (already in place)				
Total - Sitework				**$809,023**
3 Concrete				
Modifications to new stair region	1	ls	$72,017.55	$72,018
General modified leveling compounds..etc	65,484	sf	$0.25	$16,371
Total - Concrete				**$88,389**
4 Masonry				
Modifications for new stair opening	1	ls	$24,005.85	$24,006
Total - Masonry				**$24,006**
5 Metals				
Modifications for new stair region - steel/reinforcement..etc	1	ls	$96,023.40	$96,023
Steel Modifications to ceilings, mep systems supports…etc.	65,484	sf	$0.29	$18,748
Total - Metals				**$114,772**
6 Wood & Plastics				
Interior blocking/misc. carpentry allowance	65,484		$0.22	$14,472
Total - Wood & Plastics				**$14,472**
7 Thermal & Moisture				
Roofing repairs, new penetrations..etc.	65,484		$0.70	$45,901
Total - Thermal & Moisture				**$45,901**
8 Doors & Windows				
Interior door modifications/replacements	65,484	sf	$1.81	$118,644
Interior glazing system additions/modifications	65,484	sf	$1.51	$98,852.15
Total - Doors & Windows				**$217,496**

DETAIL ELEMENTS - ROLLUP -

Element	Quantity	Unit	Unit Cost	Total
9 Finishes				
Finishes relative to new stair	1	ls	$288,070.20	$288,070
Finish upgrades to specialty spaces (service, café, bathrooms…etc)	65,484		$11.56	$757,140
Flooring materials - carpet systems	65,484	sf	$3.69	$241,927
Tile flooring systems	1,287	sf	$18.00	$23,166
Wall base materials - rubber	65,484	sf	$0.93	$60,967
Wall base materials - tile	287	lf	$20.00	$5,740
Interior partitions - varied assemblies	65,484	sf	$5.92	$387,590
Paint walls systems	65,484	sf	$3.18	$208,314
Ceilings - modifications/replacements	65,484	sf	$6.53	$427,611
Total - Finishes				**$2,400,524**
10 Specialties				
Visual displays/graphical integration/specialties - allowance	65,484	sf	$3.85	$252,228
Restroom specialties (partitions..etc)	1,287	sf	$40.00	$66,924
Total - Specialties				**$319,152**
12 Furnishings				
General use casework and carpentry replacements/modifications	65,484	sf	$1.26	$82,669
Specific new casework anticipated	65,484	sf	$2.36	$154,650
Window treatments - replacements	65,484	sf	$0.74	$48,696
Total - Furnishings				**$286,015**
14 Conveying				
Elevator Upgrades - not included in scope of work				
Total - Conveying				
15 Mechanical				
Plumbing/mechanical systems - modified from narratives to reduce costs	65,484	sf	$14.58	$954,840.09
Replace toilets/urinals/lavs in locations identified	65,484	sf	$2.30	$150,700.00
Upgrades to fire protection systems are excluded from scope of work				
DDC control upgrades are not included in scope of work				
Total - Mechanical				**$1,105,540**
16 Electrical				
Electrical service modifications	65,484	sf	$0.82	$53,588
Panels, feeders, convenience pwr, lighting and lighting controls	65,484	sf	$8.96	$586,887.40
Telephone, data, av rough-in	65,484	sf	$11.76	$769,957.01
Total - Electrical				**$1,410,432**

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1331 Nineteenth Street
Denver, Colorado 80202
303.607.0977

750 East Pratt Street, Suite 1100
Baltimore, Maryland 21202
410.837.7311

2000 Duke Street, Suite 120
Alexandria, Virginia 22314
571.388.7761

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COLORADO SCHOOL OF MINES

APPENDIX

ARTHUR LAKES LIBRARY RENOVATION

Colorado School of Mines
Golden, Colorado

July 2018

hord | coplan | macht

4.1 HAZARDOUS MATERIALS INVENTORY

RLH engineering, inc.

Facility Planning, Engineering, & Environmental Services

February 9, 2011

Mr. Tim Sweitzer
Colorado School of Mines
Environmental Health and Safety
Golden, Co 80401

SUBJECT: Limited Asbestos Survey Services for
Colorado School of Mines
Lakes Library
RLH Engineering Project Number 10086

Dear Tim,

This letter serves as our report for a Limited Asbestos Survey conducted at CSM Lakes Library, in preparation for a mechanical piping replacement project. The intent of this Survey was to identify Asbestos Containing Materials (ACMs) and that would need to be properly removed and disposed of prior to renovation of the facility. It is important to note that this report has been developed specifically for this renovation project and will not constitute a comprehensive asbestos survey that can be solely relied upon for future renovation projects. Only select materials in the basement mechanical room, building core adjacent to pipe risers, third floor mechanical rooms and select restrooms were assessed as part of this survey.

This report presents the results of the Survey conducted on December 3, 2010. An initial walkthrough of the facility was conducted to identify existing finishes, pipe systems and Homogeneous Areas/Materials. Where carpet or other sheet type flooring exists, spot checks under carpet were conducted to confirm substrate material type or if other flooring materials existed under carpet. This information was recorded on field-generated forms and floor plans. The condition and friability of each suspect Homogeneous ACM was assessed.

A Bulk-sampling Plan was developed based upon the type and quantity of suspect Homogeneous ACMs. The Bulk Sampling Plan determined the appropriate location and quantity of samples to be collected. Asbestos Bulk Samples were submitted to Reservoirs Environmental Services, Inc. (RESI) for PLM Analysis. RESI is a NIST/NVLAP-accredited laboratory.

Upon receipt of Laboratory Results, this Report was completed, including the attached documents, which include Floor Plan Drawings, Homogeneous Materials Report, Sample Report, Lab Reports, and RLH Certifications/Accreditations. The Floor Plans were generated in AutoCAD format, which

depict Homogeneous Material Locations, Sample Locations, and Locations of ACM or Assumed ACM.

SURVEY RESULTS

The inspection and laboratory results identified Asbestos Containing Material located within or on the facility. Material Descriptions, Locations, Approximate Quantities and Material Conditions are noted below. Material classifications are further defined by the following AHERA Material Condition Classifications:

1 – Damaged or Significantly Damaged TSI
2 – Damaged Friable Surfacing ACM
3 - Significantly Damaged Friable Surfacing ACM
4 – Damaged or Significantly Damaged Friable Miscellaneous ACM
5 – ACBM with Potential for Damage
6 – ACBM with Potential for Significant Damage
7 – Any Remaining Friable ACBM or Friable suspected ACBM

The following ACMs were identified:

ASBESTOS CONTAINING MATERIALS (ACMs)

Material	Description	Location(s)*	Approx. Quantity	Friability/Condition
Floor Tile	9”x 9” grey with white streaks floor tile (maroon border)	Room 120, Restroom 107, Room 220, Restroom 312	Unknown**	Non-friable, Good Condition AHERA Classification - 5
Floor Tile	9”x 9” maroon with red and yellow streaks floor tile	Room 120A	Unknown**	Non-friable, Good Condition AHERA Classification - 5
Pipe Covering Compound	Off-white sealant on fiberglass pipe insulation	Basement mechanical room and throughout mech. chases	Unknown**	Non-friable, Good Condition AHERA Classification - 5

*NOTE: Locations noted are specific to this Limited Survey and current scope of demolition/renovation. Materials may exist in other locations.

**NOTE: Total quantity of this material in the facility is unknown, only a portion of the facilty was assessed for this survey.

In addition, to the asbestos containing materials identified above, cove base adhesive was determined to contain trace asbestos (less than 1% asbestos, but greater than 0% asbestos).

Prior sampling information by CSM indicates mudded pipe fittings are “non-detect” for asbestos. Two samples of mudded fitting insulation were collected during this survey and confirmed the finding of “non-detect” for asbestos.

All other materials sampled during this survey were “non-detect” for asbestos are considered non-asbestos.

RECOMMENDATIONS

The following recommendations are made with respect to the ACMs identified in the facility:

- **Floor Tile, 9”x 9” Grey with White Streaks and 9”x 9” Maroon with Red and Yellow Streaks –** This material contains 4 -10% chrysotile asbestos, is non-friable and in good condition. The material is located in areas of relatively low impact use. The mastic adhesive adhering the floor tile to substrate in non-ACM, but some samples indicated trace asbestos. The material can remain in its current locations, unless it becomes damaged or will be impacted by renovation. In the event that this material needs to be removed, at a minimum, the removal should be performed as described in CO Reg. No. 8, Part B for Asbestos. Other requirements beyond this regulation may be recommended, depending upon the extent of removal or other project circumstances. Due to the potential presence of trace asbestos in the floor tile mastic, it is recommended that mastic adhesive be cleaned from concrete during any floor tile abatement effort.

- **Pipe Covering Compound** - This material contains 8% chrysotile asbestos, is non-friable and in good condition. The material may remain in its current locations so long as it is maintained in good condition, or renovation will impact the pipe insulation. In the event that the pipe insulation with sealant becomes damaged or needs to be removed for renovation, the material should be properly removed and disposed of by trained and certified asbestos abatement personnel. Removal of this non-friable material should be removed per Reg. 8 III.S.4 Other Non-friable Asbestos Containing Material. Removal of this material does not require an abatement enclosure, but should be conducted in a Regulated Area for OSHA compliance.

- **Cove Base Adhesive** - This material was determined to be non-friable and in good condition. The material contains trace asbestos (less than 1% asbestos, but greater than 0% asbestos) and is not regulated by EPA and CDPHE, but work impacting this material is regulated by OSHA. The material may remain in its current locations so long as it is maintained in good condition, or renovation will impact the adhesive. In the event that the cove base adhesive becomes damaged or needs to be removed for renovation, the material should be properly removed and disposed of by trained and certified asbestos abatement personnel. It is recommended that removal of this non-friable material should be removed per Reg. 8 III.S.4 Other Non-friable Asbestos Containing Material, except that the material does not need to be disposed of as asbestos containing waste material. Removal of this material does not require an abatement enclosure, but should be conducted in a Regulated Area for OSHA compliance.

EXCLUSIONS/LIMITATIONS

RLH Engineering, Inc. has performed this survey using state-of-the art techniques, in a manner that is consistent with the level of care and expertise exercised by individuals and firms in the Asbestos Inspection profession. RLH cannot guarantee that all ACMs and RBMs were identified and sampled by this Survey. Sampling for this Survey was performed using non-destructive methods whenever possible. This means that samples were taken in small amounts and in inconspicuous locations to prevent damage to the building finishes to the greatest extent possible. Accessible locations were inspected and sampled throughout, but materials were not significantly demolished to gain access to locations that were otherwise inaccessible. If, during the course of renovation or demolition, suspect materials not identified in this report are encountered, work should be stopped for additional assessment and sampling. Likewise, if materials identified in this report are encountered in locations not identified in this report, work should be stopped for additional assessment and/or sampling.

The intent of this Survey was to identify ACMs that would need to be properly removed and disposed of prior to renovation or demolition of the facility. Locations and quantities of materials discussed in this report are approximate. **This document should not be used as a bid document** for the removal, repair, encapsulation, enclosure, or Operations & Maintenance (O&M) of any ACM or RBM discussed in this report. Bid documents should, in general, include specific information regarding the location and materials to be abated, a description of specific work practices and procedures, contract document information, and other project specific information. In some cases, these documents need to be developed by EPA-accredited and CDPHE-certified personnel. Contact RLH Engineering in the event that these services are required.

SIGNATURES

This Survey was performed by RLH Engineering, Inc., a CDPHE-registered Asbestos Consultant (Reg. # 14755). Asbestos Bulk Samples were collected by RLH Project Manager Jeff Kirtley. Mr. Kirtley is currently accredited by the EPA and certified by CDPHE as an Asbestos Inspector. Copies of all appropriate accreditations and certifications are included with this report.

Please contact us if you have any questions regarding this report.

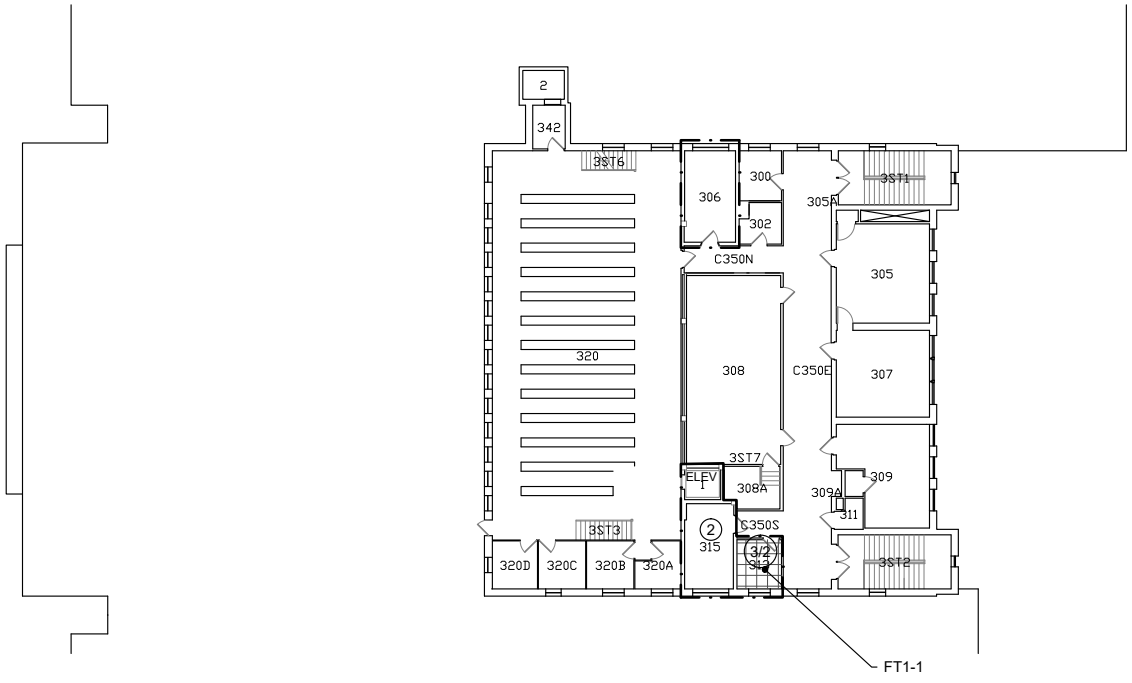
Sincerely,
RLH Engineering, Inc.

Jeff Kirtley, LEED AP
Project Manager
Asbestos Inspector #9683

Attachments: Floor Plan Drawings
Homogeneous Materials Report
Sample Report
Lab Reports
RLH Certifications/Accreditations

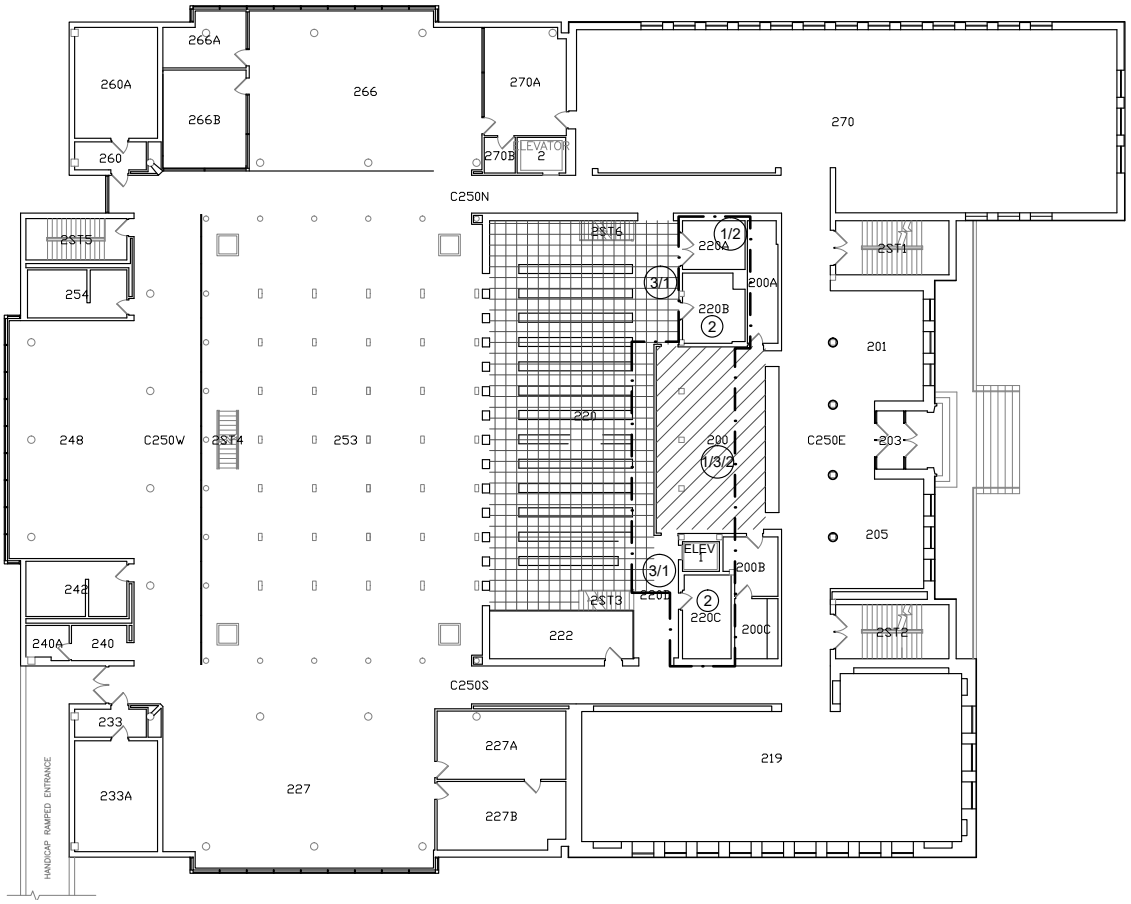
FIRST FLOOR PLAN

SCALE: 1/16"=1'-0"



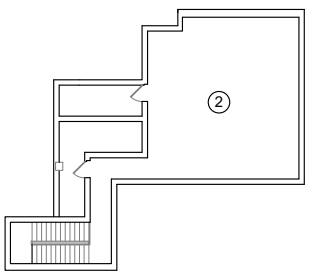
THIRD FLOOR PLAN

SCALE: 1/16"=1'-0"



SECOND FLOOR PLAN

SCALE: 1/16"=1'-0"



LEGEND

This symbol indicates the approximate location of ACM floor tile and trace ACM mastic under carpet

This symbol indicates the approximate location of ACM floor tile and trace ACM mastic

BASEMENT PLAN

SCALE: 1/16"=1'-0"

FLOORS

RLH engineering, inc.
Facility Planning, Engineering, & Environmental Services
541 East Garden Drive, Unit S
Windsor, Colorado 80550
Office (970) 686-5695
Fax (970) 686-5696

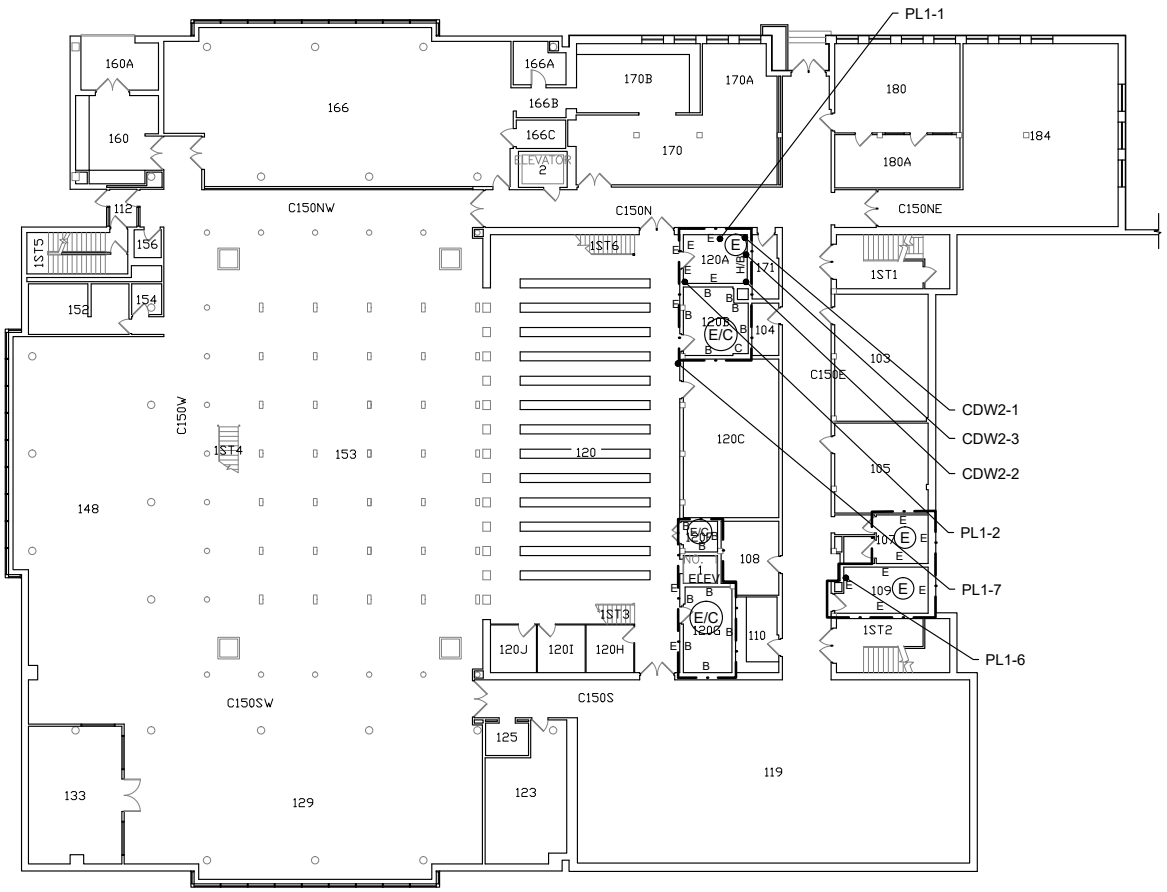
COLORADO SCHOOL OF MINES

LAKES LIBRARY

LIMITED ASBESTOS SURVEY

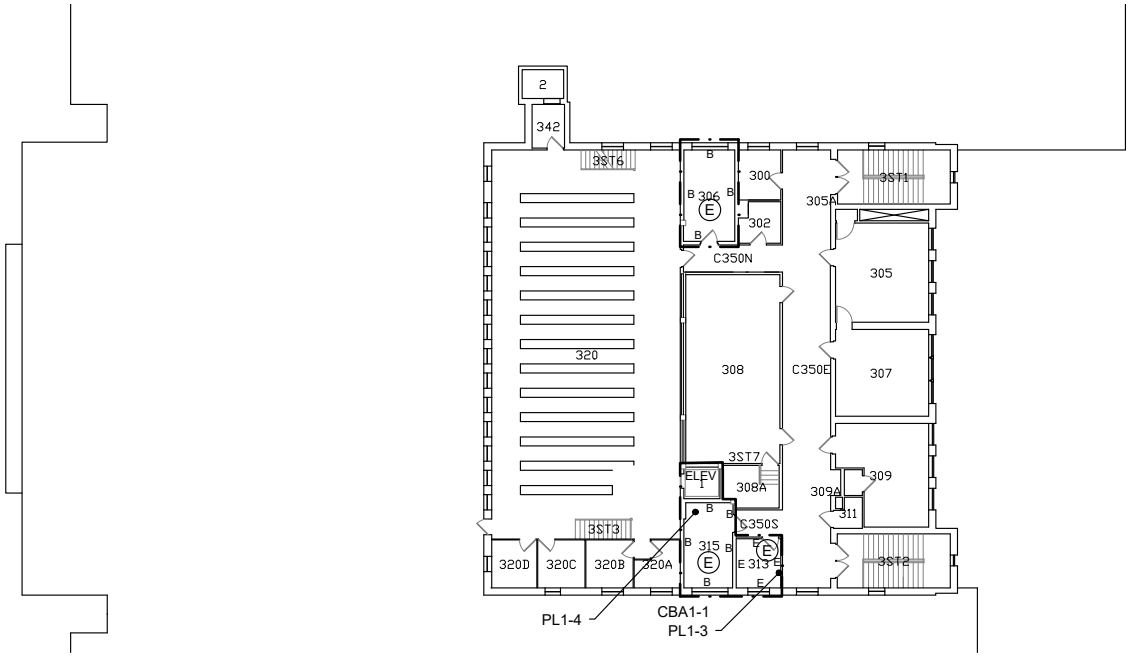
1523 ILLINOIS STREET
GOLDEN, COLORADO 80401

DRAWING #: 1
SHEET TITLE: ASBESTOS SURVEY
RLH Project #: 10086
DATE: DECEMBER 2010
CAD File:...\10086\CAD\LAKES LIBRARY_SURVEY.DWG



FIRST FLOOR PLAN

SCALE: 1/16"=1'-0"



THIRD FLOOR PLAN

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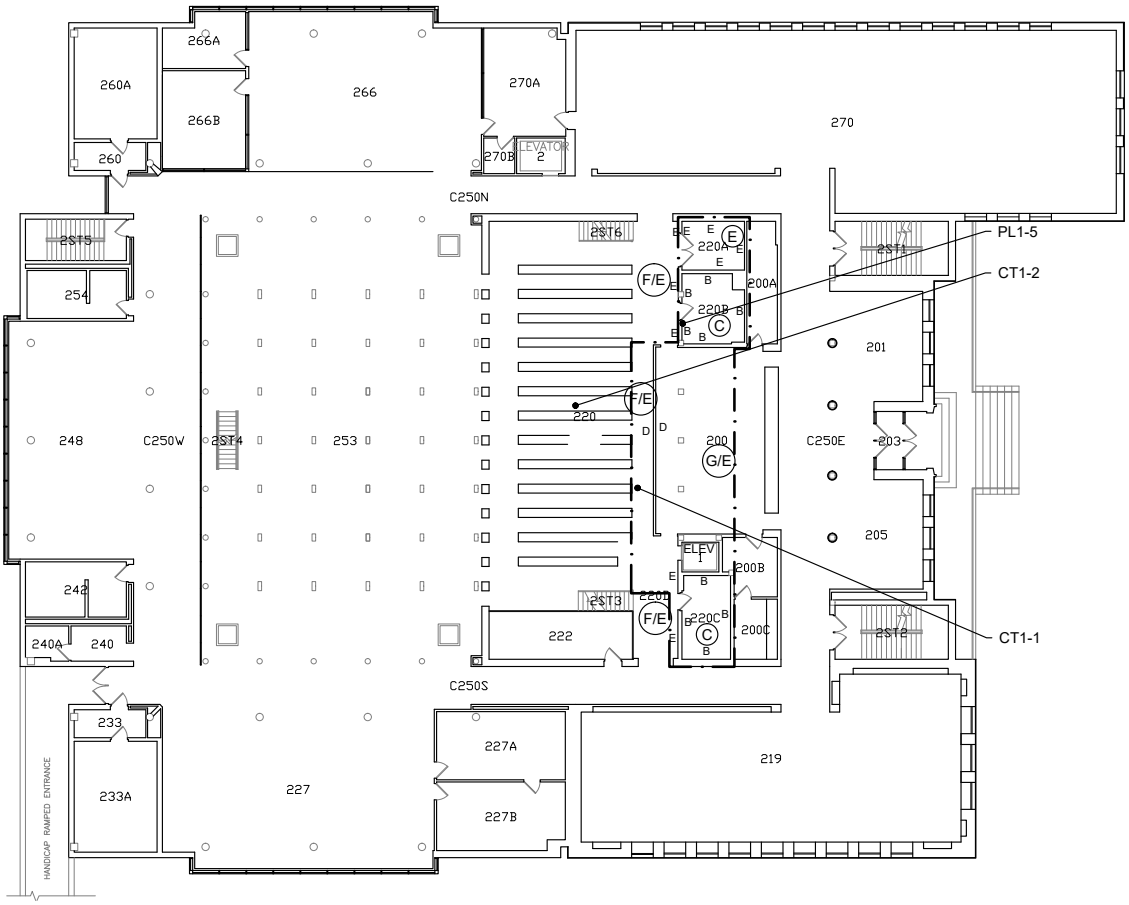
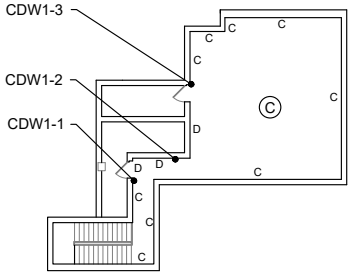


SECOND FLOOR PLAN

SCALE: 1/16"=1'-0"



BASEMENT PLAN

SCALE: 1/16"=1'-0"

CEILINGS & WALLS

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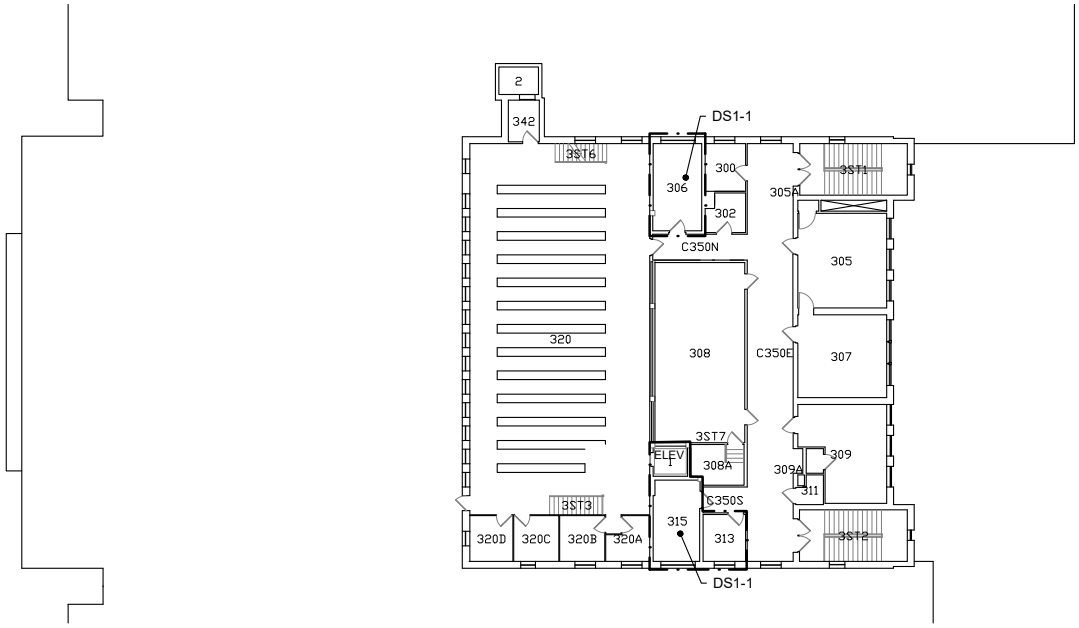
COLORADO SCHOOL OF MINES
LAKES LIBRARY
LIMITED ASBESTOS SURVEY

1523 ILLINOIS STREET
GOLDEN, COLORADO 80401

DRAWING #: 2
SHEET TITLE: ASBESTOS SURVEY
RLH Project #: 10086
DATE: DECEMBER 2010
CAD File:...\10086\CAD\LAKES LIBRARY_SURVEY.DWG

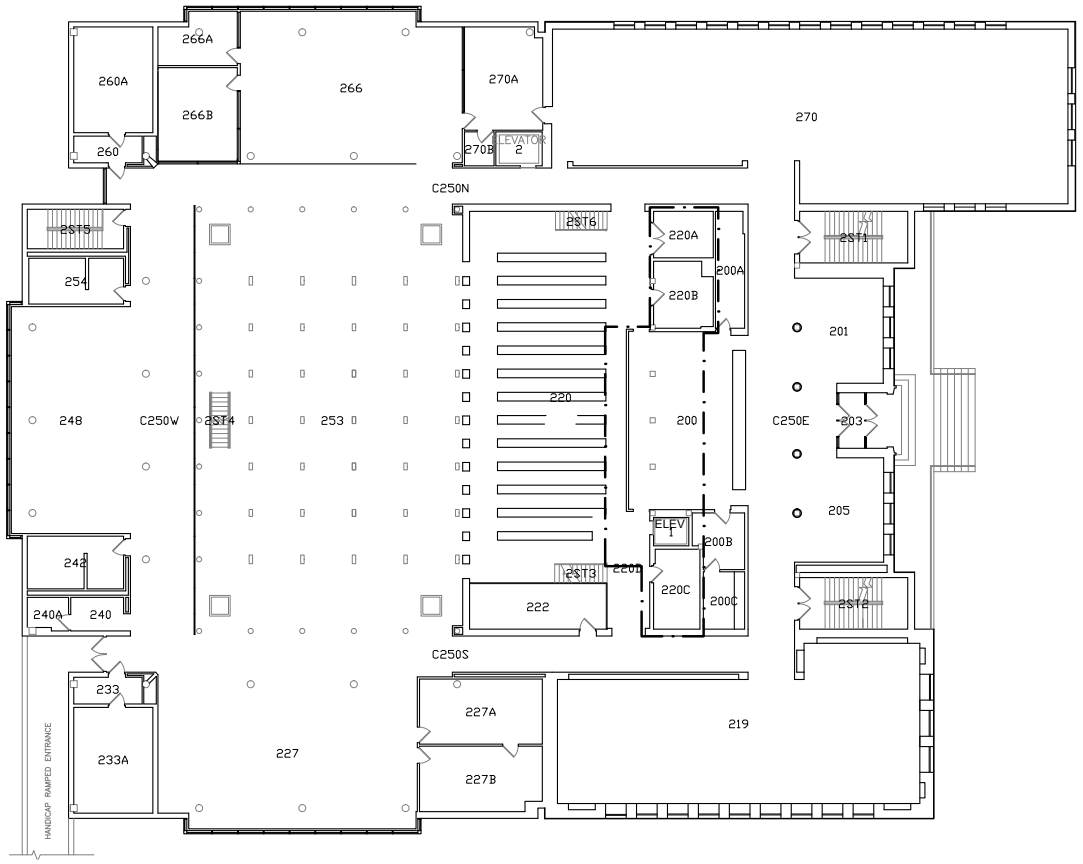
FIRST FLOOR PLAN

SCALE: 1/16"=1'-0"



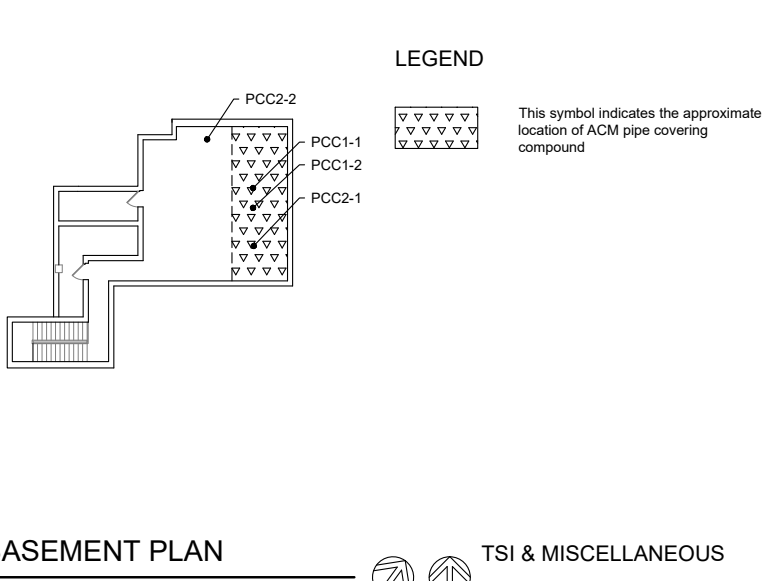
THIRD FLOOR PLAN

SCALE: 1/16"=1'-0"



SECOND FLOOR PLAN

SCALE: 1/16"=1'-0"



LEGEND

This symbol indicates the approximate location of ACM pipe covering compound

BASEMENT PLAN

SCALE: 1/16"=1'-0"

TSI & MISCELLANEOUS

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COLORADO SCHOOL OF MINES
LAKES LIBRARY
LIMITED ASBESTOS SURVEY

1523 ILLINOIS STREET
GOLDEN, COLORADO 80401

DRAWING #: 3
SHEET TITLE: ASBESTOS SURVEY
RLH Project #: 10086
DATE: DECEMBER 2010
CAD File:...\10086\CAD\LAKES LIBRARY_SURVEY.DWG

COLORADO SCHOOL OF MINES - LAKES LIBRARY

Homogeneous Materials - Floors

Code	Material	Sample Number	Quantity	ACM?
1	CARPET	NOT SAMPLED	~ ~	NON SUSPECT
2	CONCRETE	NOT SAMPLED	~ ~	NON SUSPECT
3	FLOOR TILE - 9"X 9" GREY WITH WHITE STREAKS (MAROON BORDER)	FT1-1, FT1-2	UNKNOWN*	TILE: YES MASTIC: TRACE
4	FLOOR TILE - 9"X 9" MAROON WITH RED & YELLOW STREAKS	FT2-1, FT2-2	UNKNOWN*	TILE: YES MASTIC: NO
5	TERAZZO	NOT SAMPLED	~ ~	NON SUSPECT

* TOTAL QUANTITY UNKNOWN, AS THIS SURVEY IS LIMITED TO SPECIFIC AREA OF ASSESMENT IN THE FACILITY

COLORADO SCHOOL OF MINES - LAKES LIBRARY

Homogeneous Materials - TSI & Miscellaneous

Material	Sample Number	Quantity	ACM?
MUDDED PIPE FITTINGS	PF1-1, PF1-2	UNKNOWN*	NO
PIPE COVERING COMPOUND (ORIG)	PCC1-1, PCC1-2	UNKNOWN*	YES
PIPE COVERING COMPOUND (NEW)	PCC2-1, PCC2-2	UNKNOWN*	NO
DUCT SEALANT	DS1-1, DS1-2	UNKNOWN*	NO
COVEBASE ADHESIVE	CBA1-1, PL1-3	UNKNOWN*	NO**

* TOTAL QUANTITY UNKNOWN, AS THIS SURVEY IS LIMITED TO SPECIFIC AREA OF ASSESMENT IN THE FACILITY

** MATERIAL CONTAINS 'TRACE' ASBESTOS, OSHA REGULATED MATERIAL

COLORADO SCHOOL OF MINES - LAKES LIBRARY

Homogeneous Materials - Ceilings & Walls

Code	Material	Sample Number	Quantity	ACM?
A	WOOD	NOT SAMPLED	~ ~	NON SUSPECT
B	BRICK/BLOCK	NOT SAMPLED	~ ~	NON SUSPECT
C	CONCRETE	NOT SAMPLED	~ ~	NON SUSPECT
D	DRYWALL (ORIG)	CDW1-1, CDW1-2, CDW1-3	UNKNOWN*, LESS THAN 1,000 SF IN AREA OF ASSESMENT	NO
E	PLASTER	PL1-1, PL1-2, PL1-3, PL1-4, PL1-5, PL1-6, PL1-7	UNKNOWN*, GREATERT THAN 5,000 SF IN AREA OF ASSESMENT	NO
F	CEILING TILE - 12"X 12" LINEAR HOLE PATTERN	CT1-1, CT1-2	UNKNOWN*	NO
G	CEILING TILE - 12"X 12" PINHOLE/FISSURE PATTERN	NOT SAMPLED	UNKNOWN*	NOT SAMPLED
H	DRYWALL (RENOV.)	CDW2-1, CDW2-2, CDW2-3	UNKNOWN*, LESS THAN 1,000 SF IN AREA OF ASSESMENT	NO

* TOTAL QUANTITY UNKNOWN, AS THIS SURVEY IS LIMITED TO SPECIFIC AREA OF ASSESMENT IN THE FACILITY

Colorado School of Mines
Library

RLH Engineering, Inc.
Project Number 10086
Dec-10
Page One

Sample ID Number	Material	Location	Results of Laboratory Analysis by Polarized Light Microscopy
Reservoirs #203424-1			
10086-1203-PL1-1	PLASTER	Room 120A, center of north wall	ND
10086-1203-PL1-2	PLASTER	Room 120A, southeast corner	ND
10086-1203-PL1-3	PLASTER	Restroom 313, east wall	plaster: ND covebase adhesive: trace chrysotile
10086-1203-PL1-4	PLASTER	Mech 315, northeast corner	ND
10086-1203-PL1-5	PLASTER	Room 220B, southwest corner	ND
10086-1203-PL1-6	PLASTER	Restroom 109, west wall	ND
10086-1203-PL1-7	PLASTER	Room 120, east wall, outside of room 120C	ND
10086-1203-CDW1-1	DRYWALL (ORIG)	Basement Mech Room, west wall in corridor between stairs and mech room	ND
10086-1203-CDW1-2	DRYWALL (ORIG)	Basement Mech Room, north wall in corridor between stairs and mech room	ND
10086-1203-CDW1-3	DRYWALL (ORIG)	Basement Mech Room, west wall	ND
10086-1203-CDW2-1	DRYWALL (RENOV.)	Room 120A, northeast corner, west face of column wrap	ND
10086-1203-CDW2-2	DRYWALL (RENOV.)	Room 120A, center of east wall	ND
10086-1203-CDW2-3	DRYWALL (RENOV.)	Room 120A, northeast corner, south face of column wrap	ND
10086-1203-CT1-1	CEILING TILE - 12"X 12" LINEAR HOLE PATTERN	Room 220, east side near Room 200	ND
10086-1203-CT1-2	CEILING TILE - 12"X 12" LINEAR HOLE PATTERN	Room 220, near center	ND
10086-1203-FT1-1	FLOOR TILE - 9"X 9" GREY WITH WHITE STREAKS (MAROON BORDER)	Restroom 313, near floor drain	tile: 10% chrysotile mastic: ND

Sample ID Number	Material	Location	Results of Laboratory Analysis by Polarized Light Microscopy
10086-1203-FT1-2	FLOOR TILE - 9"X 9" GREY WITH WHITE STREAKS (MAROON BORDER)	Room 120, notheast corner of stacks area	tile: 10% chrysotile mastic: trace chrysotile
10086-1203-FT2-1	FLOOR TILE - 9"X 9" MAROON WITH RED & YELLOW STREAKS	Room 120A, north end of room	tile: 8% chrysotile mastic: ND
10086-1203-FT2-2	FLOOR TILE - 9"X 9" MAROON WITH RED & YELLOW STREAKS	Room 120A, southwest corner	tile: 8% chrysotile mastic: ND
10086-1203-DS1-1	DUCT SEALANT	Mech 315, ductwork	ND
10086-1203-DS1-2	DUCT SEALANT	Mech 306, ductwork	ND
10086-1203-PF1-1	MUDDED PIPE FITTINGS	Room 120G, northeast corner	ND
10086-1203-PF1-2	MUDDED PIPE FITTINGS	Room 120G, southeast corner	ND
10086-1203-PCC1-1	PIPE COVERING COMPOUND (ORIG)	basement mech room, insualtion on expansion tank	8% chrysotile
10086-1203-PCC1-2	PIPE COVERING COMPOUND (ORIG)	basement mech room, insualtion on expansion tank	8% chrysotile
10086-1203-PCC2-1	PIPE COVERING COMPOUND (NEW)	basement mech room, boiler piping	ND
10086-1203-PCC2-2	PIPE COVERING COMPOUND (NEW)	basement mech room, boiler piping	ND
Aerobiology Lab #109187			
10086-1203-FT2-3	FLOOR TILE - 9"X 9" MAROON WITH RED & YELLOW STREAKS	Room 120A, north end of room	tile: 4% chrysotile mastic: trace chrysotile
10086-1203-CBA1-1	COVEBASE ADHESIVE	Restroom 313, east wall	tile: ND mastic: trace chrysotile

REI LAB Reservoirs Environmental, Inc.

December 6, 2010

Laboratory Code: **RES**
Subcontract Number: **NA**
Laboratory Report: **RES 203424-1**
Project # / P.O. # **10086**
Project Description: **CSM Lakes Library**

Jeff Kirtley
RLH Engineering
541 Garden Drive, Unit S
Windsor CO 80550

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 203424-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

Jeanne Spencer Orr
President

Analyst(s): _____
Paul D. LoScalzo Wenlong Liu
Michael Scales Rich Wegrzyn
Anita Grigg Robert R. Workman Jr.
Bethany Nichols

P: 303-964-1986
F: 303-477-4275
5801 Logan Street, Suite 100 Denver, CO 80216
1-866-RESI-ENV
www.reilab.com

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0

TDH Licensed Laboratory # 30-0136

TABLE PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 203424-1**
Client: **RLH Engineering**
Client Project Number / P.O.: **10086**
Client Project Description: **CSM Lakes Library**
Date Samples Received: **December 3, 2010**
Analysis Type: **PLM, Short Report**
Turnaround: **24 Hour**
Date Analyzed: **December 6, 2010**

Client Sample Number	Lab ID Number	Layer	Physical Description	Sub Part (%)	Asbestos Content: Mineral	Asbestos Content: Visual Estimate (%)	Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
10086-1203-PL1-1	EM 666275	A	White plaster w/ tan/gold paint	50		**ND**	0	100
		B	Pink granular plaster	50		**ND**	0	100
10086-1203-PL1-2	EM 666276	A	White plaster w/ white/pink paint	50		**ND**	0	100
		B	Pink granular plaster	50		**ND**	0	100
10086-1203-PL1-3	EM 666277	A	Brown resin	20	**Chrysotile**	**TR**	0	100
		B	White plaster	40		**ND**	0	100
		C	Pink perlitic plaster	40		**ND**	0	100
10086-1203-PL1-4	EM 666278	A	White plaster w/ brown/gold paint	50		**ND**	0	100
		B	Pink perlitic plaster	50		**ND**	0	100
10086-1203-PL1-5	EM 666279	A	White perlitic granular plaster	100		**ND**	0	100
10086-1203-PL1-6	EM 666280	A	Pink perlitic plaster	40		**ND**	0	100
		B	White plaster w/ gray/multi-colored paint	60		**ND**	0	100
10086-1203-PL1-7	EM 666281	A	White texture w/ white paint	10		**ND**	0	100
		B	Pink perlitic plaster	30		**ND**	0	100
		C	White plaster w/ white/pink paint	60		**ND**	0	100
10086-1203-CDW1-1	EM 666282	A	White paint	5		**ND**	0	100
		B	Tan/white drywall	95		**ND**	10	90

ND=None Detected
TR=Trace, <1% Visual Estimate
Trem-Act=Tremolite-Actinolite
Note: Further analysis by TEM is recommended for organically bound material (i.e. floor tile) if PLM results are≤1%.

Data QA

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0

TDH Licensed Laboratory # 30-0136

TABLE PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 203424-1**
Client: **RLH Engineering**
Client Project Number / P.O.: **10086**
Client Project Description: **CSM Lakes Library**
Date Samples Received: **December 3, 2010**
Analysis Type: **PLM, Short Report**
Turnaround: **24 Hour**
Date Analyzed: **December 6, 2010**

Client Sample Number	Lab ID Number	Layer	Physical Description	Sub Part (%)	Asbestos Content: Mineral	Asbestos Content: Visual Estimate (%)	Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
10086-1203-CDW1-2	EM 666283	A	White compound	5		**ND**	0	100
		B	Tan/white drywall	95		**ND**	10	90
10086-1203-CDW1-3	EM 666284	A	White paint	5		**ND**	0	100
		B	Tan/white drywall	95		**ND**	10	90
10086-1203-CDW2-1	EM 666285	A	Pink paint	3		**ND**	0	100
		B	Tan/white drywall	97		**ND**	10	90
10086-1203-CDW2-2	EM 666286	A	Pink paint	3		**ND**	0	100
		B	Tan/white drywall	97		**ND**	10	90
10086-1203-CDW2-3	EM 666287	A	White texture w/ pink/white paint	7		**ND**	0	100
		B	Tan/white drywall	93		**ND**	10	90
10086-1203-CT1-1	EM 666288	A	Brown mastic	30		**ND**	0	100
		B	White/tan ceiling tile	70		**ND**	70	30
10086-1203-CT1-2	EM 666289	A	Brown mastic	30		**ND**	0	100
		B	White/tan ceiling tile	70		**ND**	70	30
10086-1203-FT1-1	EM 666290	A	Black mastic	2		**ND**	0	100
		B	Gray tile	98	**Chrysotile**	**10**	0	90

ND=None Detected
TR=Trace, <1% Visual Estimate
Trem-Act=Tremolite-Actinolite
Note: Further analysis by TEM is recommended for organically bound material (i.e. floor tile) if PLM results are≤1%.

Data QA

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0

TDH Licensed Laboratory # 30-0136

TABLE PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 203424-1**
Client: **RLH Engineering**
Client Project Number / P.O.: **10086**
Client Project Description: **CSM Lakes Library**
Date Samples Received: **December 3, 2010**
Analysis Type: **PLM, Short Report**
Turnaround: **24 Hour**
Date Analyzed: **December 6, 2010**

Client Sample Number	Lab ID Number	LAYER	Physical Description	Sub Part (%)	Asbestos Content: Mineral	Asbestos Content: Visual Estimate (%)	Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
10086-1203-FT1-2	EM 666291	A	Black mastic	TR	**Chrysotile**	**TR**	0	100
		B	Gray tile	100	**Chrysotile**	**10**	0	90
10086-1203-FT2-1	EM 666292	A	White plaster w/ black mastic	3		**ND**	0	100
		B	Brown tile	97	**Chrysotile**	**8**	0	92
10086-1203-FT2-2	EM 666293	A	Black mastic	5		**ND**	0	100
		B	Brown tile	95	**Chrysotile**	**8**	0	92
10086-1203-DS1-1	EM 666294	A	Gray sealant	100		**ND**	0	100
10086-1203-DS1-2	EM 666295	A	Gray sealant	100		**ND**	0	100
10086-1203-PF1-1	EM 666296	A	White fibrous woven material w/ white resinous material	20		**ND**	50	50
		B	White/gray fibrous plaster	80		**ND**	15	85
10086-1203-PF1-2	EM 666297	A	White fibrous woven material w/ white resinous material	20		**ND**	50	50
		B	White/gray fibrous plaster	80		**ND**	15	85
10086-1203-PCC1-1	EM 666298	A	White fibrous material w/ silver foil	20		**ND**	50	50
		B	Yellow fibrous material	30		**ND**	95	5
		C	White resinous material	50	**Chrysotile**	**8**	0	92

ND=None Detected
TR=Trace, <1% Visual Estimate
Trem-Act=Tremolite-Actinolite
Note: Further analysis by TEM is recommended for organically bound material (i.e. floor tile) if PLM results are≤1%.

Data QA

RESERVOIRS ENVIRONMENTAL, INC.

NVLAP Lab Code 101896-0

TDH Licensed Laboratory # 30-0136

TABLE PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 203424-1**
Client: **RLH Engineering**
Client Project Number / P.O.: **10086**
Client Project Description: **CSM Lakes Library**
Date Samples Received: **December 3, 2010**
Analysis Type: **PLM, Short Report**
Turnaround: **24 Hour**
Date Analyzed: **December 6, 2010**

Client Sample Number	Lab ID Number	Layer	Physical Description	Sub Part (%)	Asbestos Content: Mineral	Asbestos Content: Visual Estimate (%)	Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
10086-1203-PCC1-2	EM 666299	A	White resinous material	50	**Chrysotile**	**8**	0	92
		B	White fibrous material w/ silver foil	50		**ND**	60	40
10086-1203-PCC2-1	EM 666300	A	Yellow fibrous material	20		**ND**	95	5
		B	White resinous material	80		**ND**	0	100
10086-1203-PCC2-2	EM 666301	A	White fibrous material w/ silver foil	10		**ND**	50	50
		B	Yellow fibrous material	10		**ND**	95	5
		C	White resinous material	80		**ND**	0	100

ND=None Detected
TR=Trace, <1% Visual Estimate
Trem-Act=Tremolite-Actinolite
Note: Further analysis by TEM is recommended for organically bound material (i.e. floor tile) if PLM results are≤1%.

Data QA

RES 203424

Due Date: 12·6·10
Due Time: 115

Reservoirs Environmental, Inc.

5801 Logan St. Denver, CO 80216 • Ph: 303 964-1986 • Fax 303-477-4275 • Toll Free 866 RES1-ENV
Pager : 303-509-2098

Page 1 of 2

INVOICE TO: (IF DIFFERENT)		CONTACT INFORMATION:	
Company: RLH ENG.	Company:	Contact: JEFF KIRTLEY	Contact:
Address:	Address:	Phone:	Phone:
		Fax:	Fax:
		Cell/pager: 303 210 1326	Cell/pager:
Project Number and/or P.O. #: 10086		Final Data Deliverable Email Address: rlh@rlhengineering.com	
Project Description/Location: CSM LAKES LIBRARY			

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm
PLM / PCM / TEM ___ RUSH (Same Day) ✓ PRIORITY (Next Day) ___ STANDARD
(Rush PCM = 2hr, TEM = 6hr.)

CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm
Metal(s) / Dust ___ RUSH ___ 24 hr. ___ 3-5 Day
RCRA 8 / Metals & Welding Fume Scan / TCLP ___ RUSH ___ 5 day ___ 10 day
Organics ___ 24 hr. ___ 3 day ___ 5 Day
Prior notification is required for RUSH turnarounds.

MICROBIOLOGY LABORATORY HOURS: Weekdays: 9am - 6pm
E.coli O157:H7, Coliforms, S.aureus ___ 24 hr. ___ 2 Day ___ 3-5 Day
Salmonella, Listeria, E.coli, APC ___ 48 hr. ___ 3-5 Day
Yeast : Mold ___ 3-5 Day ___ 7 Day

Turnaround times establish a laboratory priority, subject to laboratory volume and are not guaranteed. Additional fees apply for afterhours, weekends and holidays.

Special Instructions:

REQUESTED ANALYSIS

Client sample ID number (Sample ID's must be unique)	PLM - Short Report, Long report, Point Count	TEM - AHERA, Level II, 7402, ISO, +/-, Quant, Semi-quant, Micro-vac, ISO-Indirect Preps	PCM - 7400A, 7400B, OSHA	DUST - Total, Respirable	METALS - Analyte(s) RCRA 8, TCLP, Welding Fume, Metals Scan	ORGANICS - BTEX, MTBE, 8260, GRO, METH	MICROBIOLOGY: Salmonella: +/-	MICROBIOLOGY: E.coli O157:H7: +/-	MICROBIOLOGY: Listeria: +/-	MICROBIOLOGY: Aerobic Plate Count: +/- or Quantification	MICROBIOLOGY: E.coli: +/- or Quantification	MICROBIOLOGY: Coliforms: +/- or Quantification	MICROBIOLOGY: S.aureus: +/- or Quantification	MICROBIOLOGY: Yeast/Mold: +/- or Quantification	OTHER -	Sample Volume (L) / Area	Matrix Code	# Containers	Date Collected mm/dd/yy	Time Collected hh/mm a/p	EM Number (Laboratory Use Only)
1	10086-1203-PL1-1	✓																		666275
2	1-2																			76
3	1-3																			77
4	1-4																			78
5	1-5																			79
6	1-6																			80
7	1-7																			81
8	CDW 1-1																			82
9	1-2																			83
10	1-3																			84

VALID MATRIX CODES

Air = A	Bulk = B
Dust = D	Paint = P
Soil = S	Wipe = W
Swab = SW	F = Food
Drinking Water = DW	Waste Water = WW
O = Other	

ASTM E1792 approved wipe media only

LAB NOTES:

Number of samples received: ___ (Additional samples shall be listed on attached long form.)

NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: Date/Time: 12/3/10 1:15pm

Laboratory Use Only
Received By: Date/Time: 12·3·10 115 Carrier: Hand

Sample Condition: On Ice Yes / No Sealed Yes / No Intact Yes / No
Temp. (F°) ___

Results:	Contact	Page	Phone	Email	Fax	Date	Time	Initials	Contact	Page	Phone	Email	Fax	Date	Time	Initials
	Contact	Page	Phone	Email	Fax	Date	Time	Initials	Contact	Page	Phone	Email	Fax	Date	Time	Initials

REI LAB **Reservoirs Environmental, Inc.**

5801 Logan St. Denver, CO 80216 • Ph: 303 964-1986 • Fax 303-477-4275 • Toll Free :866 RESI-ENV

RES Job # 203424   Page 2 of 2

Submitted by: RLH ENG. 10086
CSM LAKES LIB.

VALID MATRIX CODES

Air = A	Bulk = B
Dust = D	Paint = P
Soil = S	Wipe = W
Swab = SW	F = Food
Drinking Water = DW	Waste Water = WW
O = Other	
ASTM E1792 approved wipe media only	

LAB NOTES:

REQUESTED ANALYSIS

No.	Client sample ID number (Sample ID's must be unique)	PLM - Short report, Long report, Point Count	TEM - AHERA, Level II, 7402, ISO, +/-, Quant, Semi-quant, Micro-vac, ISO-Indirect Preps	PCM - 7400A, 7400B, OSHA	DUST - Total, Respirable	METALS - Analyte(s) RCRA 8, TCLP, Welding Fume, Metals Scan	ORGANICS - BTEX, MTBE, 8260, GRO, METH	MICROBIOLOGY: Salmonella: +/-	E.coli O157:H7: +/-	Listeria: +/-	Aerobic Plate Count: +/- or Quantification	E.coli: +/- or Quantification	Coliforms: +/- or Quantification	S.aureus: +/- or Quantification	Yeast/Mold: +/- or Quantification	OTHER -	Sample Volume (L) / Area	Matrix Code	# Containers	Date Collected mm/dd/yy	Time Collected hh/mm a/p	EM Number (Laboratory Use Only)
11	10086-1703-CDW 2-1	X																				666285
12	2-2																					86
13	2-3																					87
14	CT 1-1																					88
15	CT 1-2																					89
16	FT 1-1																					90
17	1-2																					91
18	2-1																					92
19	2-2																					93
20	DS 1-1																					94
21	DS 1-2																					95
22	PF 1-1																					96
23	PF 1-2																					97
24	PCC 1-1																					98
25	1-2																					99
26	2-1																					300
27	2-2																					301
28																						
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40																						
41																						

AEROBIOLOGY LABORATORY ASSOCIATES, INCORPORATED
Denver, Colorado

13949 W. Colfax Ave
Suite 205
Lakewood, CO 80401
303.232.3746
www.aerobiology.net

Certificate of Analysis

Client Name	RLH Engineering, Inc.
Street address	541 E. Garden Dr. Unit 5
City, State ZIP	Windsor, CO 80550
Attn:	Jeff Kirtley
Client Project Name:	10086-1203

NVLAP Lab Code 200860-0

Date Collected:	12/03/10
Date Received:	12/03/10
Date Analyzed:	12/06/10
Date Reported:	12/06/10
Project ID:	109187
Job ID:	

Test Requested: **3002, Asbestos in Bulk Samples**
Method: Polarized Light Microscopy / Dispersion Staining (PLM), Method for the Determination of Asbestos in Bulk Building Materials. EPA-600/R-93/116, July 1993.

Sample Identification		Physical Description of Sample/Layer	Homo-geneous (Y/N)	Layer Percentage	Asbestos Detected	Asbestos Percentage	Non-Asbestos Fiber Percentage	Non-Fibrous Material Percentage	Matrix Material Composition
Client	Lab Sample Number								
10086-1203-FT2-3	**109187-1A**	**Brown Mastic w/ Gray Plaster**	**N**	**2%**	**CHRY**	**TR**		**100**	**G,C**
	109187-1B	**Brown Tile**	**N**	**98%**	**CHRY**	**4**		**96**	**B,C**
10086-1203-CBA1-1	109187-2A	White Plaster	N	5%	ND			100	G
	109187-2B	**Tan Mastic**	**N**	**95%**	**CHRY**	**TR**		**100**	

Adam Humphreys
Laboratory Analyst

Adam Humphreys
Asbestos Laboratory Supervisor

A = Amosite
AC = Actinolite
AN = Anthophyllite
CHRY=Chrysotile
CR = Crocidolite
TR = Tremolite
Trace=Less Than 1%
ND=None Detected

Q = Quartz
C = Carbonates
G = Gypsum
M = Mica
T = Tar
NTR = Non-Asbestiform TR
NAC = Non-Asbestiform AC

P = Perlite
B = Binder
D=Diatoms

Aerobiology Laboratory Associates, Incorporated
Denver, Colorado

13949 W. Colfax Ave
Suite 205
Lakewood, CO 80401
303.232.3746
www.aerobiology.net

Certificate of Analysis

RLH Engineering, Inc.
541 E. Garden Dr. Unit 5
Windsor, CO 80550
Jeff Kirtley
Client Project Name: 10086-1203

NVLAP Lab Code 200860-0

Date Collected:	12/03/10
Date Received:	12/03/10
Date Analyzed:	12/06/10
Date Reported:	12/06/10
Project ID:	109187
Job ID:	

General Notes

- **Negative** indicates no asbestos was detected; the method detection limit is 1%.
- **Trace** or "<1" indicates asbestos was identified in the sample, but the concentration is less than the method detection limit of 1%.
- All regulated asbestos minerals (i.e. chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite) were sought in every layer of each sample, but only those asbestos minerals detected are listed. Amosite is the common name for the asbestiform variety of the minerals cummingtonite and grunterite. Crocidolite is the common name used for the asbestiform variety of the mineral reibekite.
- Tile, vinyl, foam, plastic, and fine powder samples may contain asbestos fibers of such small diameter (< 0.25 microns in diameter) that these fibers cannot be detected by PLM. For such samples, more sensitive analytical methods (e.g. TEM, SEM, and XRD) are recommended if greater certainty about asbestos content is required. Semi-quantitative bulk TEM floor tile analysis is accepted under the NESHAPS regulations.
- These results are submitted pursuant to Aerobiology Laboratory Associates, Inc.'s current terms and conditions of sale, including the company's standard warranty and limitation of liability provisions. No responsibility or liability is assumed for the manner in which the results are used or interpreted.
- Unless notified in writing to return the samples covered by this report, Aerobiology Laboratory Associates, Inc. will store the samples for a minimum period of thirty (30) days before discarding. A shipping and handling charge will be assessed for the return of any samples.

Notes Required by NVLAP

- This report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government.
- This test report relates only to the items tested or calibrated.
- This report is not valid unless it bears the name of a NVLAP-approved signatory.
- Any reproduction of this document must include the entire document in order for the report to be valid.

STATE OF COLORADO

ASBESTOS CONSULTING FIRM

Colorado Department of Public Health
and Environment
Air Pollution Control Division

This certifies that

RLH Engineering, Inc.

Registration No. ACF - 14755

has met the registration requirements of 25-7-507, C.R.S. and the Air Quality Control Commission Regulation No. 8, Part B, and is hereby authorized to perform asbestos consulting activities as required under Regulation No. 8, Part B, in the state of Colorado.

Issued: January 30, 2010
Expires: January 30, 2011

Authorized APCD Representative

SEAL

STATE OF COLORADO

ASBESTOS CERTIFICATION*

Colorado Department of Public Health
and Environment
Air Pollution Control Division

This certifies that

Jeff Kirtley

Certification No: 9683

has met the requirements of 25-7-507, C.R.S. and Air Quality Control Commission Regulation No. 8, Part B, and is hereby certified by the state of Colorado in the following discipline:

Building Inspector*

Issued: 10/13/2010

Expires on: 10/13/2011

Authorized APCD Representative

** This certificate is valid only with the possession of a current Division-approved training course certification in the discipline specified above.*

CHC

COLORADO HAZARD CONTROL LLC

2727 West 92nd Avenue, Suite 10
Federal Heights, CO 80233
303.410.4941

140 West 29th Street, No. 327
Pueblo, CO 81008
719-225-0283

Certifies that

Jeff Kirtley

Has Successfully Completed the EPA- Approved Annual Asbestos Refresher Training Course Under Section 206 of the Toxic Substance Control Act (TSCA), Title II.

In:

BUILDING INSPECTOR

Course Date:	September 17, 2010
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Foothills Environmental, Inc.

Industrial Hygiene, Safety & Environmental Services

DRAFT

Asbestos Abatement Work Plan
Colorado School of Mines
Arthur Lakes Library
1410 Illinois Street
Golden, CO 80401

FEI Project Number: AS17253
October 13, 2017

ASBESTOS ABATEMENT WORK PLAN
COLORADO SCHOOL OF MINES
ARTHUR LAKES LIBRARY
1410 ILLINOIS STREET
GOLDEN, CO 80401

October 13, 2017

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Foothills Environmental, Inc.
Industrial Hygiene, Safety & Environmental Services

TABLE OF CONTENTS

LIST OF ATTACHMENTS

LIST OF DRAWINGS

Foothills Environmental, Inc.
Industrial Hygiene, Safety & Environmental Services

ASBESTOS ABATEMENT WORK PLAN
COLORADO SCHOOL OF MINES
ARTHUR LAKES LIBRARY
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1 INTRODUCTION

Foothills Environmental Inc. (FEI) conducted an asbestos investigation in October 2017 at the Arthur Lakes Library at Colorado School of Mines in Golden, Colorado (the Site). The purpose of this investigation was to supplement previous inspection information, and confirm locations and quantities of asbestos-containing materials (ACM) in the Library that may be impacted as part of planned partial renovation of the structure. The investigation was performed for Susan Miner, Architect in the Office of Design and Management, who represents the owner Colorado School of Mines (CSM). Abatement activities are expected to be performed prior to renovation, and it is the intent to have one contractor perform abatement and minor demolition activities to access materials for abatement. The inspection data dated September 15, and October 18, 2017 identified ACM transite chalk board and vinyl floor tiles, as well as Trace ACM in cove base mastic and carpet mastic. Laboratory reports are included in Attachment 1.

The intent of this project is to remove friable and non-friable ACM prior to commencement of renovation activities. Once abatement has been completed, renovation is expected to begin immediately.

2 SCOPE OF WORK FOR ABATEMENT

The work specified herein shall be the removal of ACM at the Site by an asbestos abatement company who is a current GAC holder using competent persons trained, knowledgeable, and qualified in the techniques of asbestos abatement and demolition of certain materials to access ACM for abatement. The abatement contractor (Contractor) hired to complete abatement must comply with all applicable federal, state, and local laws and regulations, and be capable of performing the work specified in this Work Plan. In addition, the Contractor is responsible for obtaining all necessary permits and making all required notifications including but not limited to the Colorado Department of Public Health and Environment (CDPHE), City of Golden, and Golden Fire Department.

2.1 Asbestos Materials To Be Removed

The following table lists locations, materials, percentage, and types of asbestos, as well as the approximate quantities of asbestos to be removed. Sample analyses laboratory results are included in Attachment 1 and material locations are indicated on drawings in Attachment 2.

TABLE 1
ACM to be removed from CSM Arthur Lakes Library, Golden, CO

Homogeneous Sampling Area	Material	Quantity	Asbestos Content
180-CB01	Green Chalk Board (Non-friable – miscellaneous)	1 Chalk Board in Room 180 64 sf	25% Chrysotile
FT04	12”x12” Tan floor tiles with black mastic (Non-friable – miscellaneous)	Room 200B 100 sf	Tile – 3 % Chrysotile Black Mastic – ND
NA*	Brown Cove Base Mastic (Non-friable – miscellaneous)	Room 200B 33 lf	Trace Chrysotile
NA*	12”x12” Gray floor tiles with black mastic (Non-friable – miscellaneous)	Room 180 (beneath cabinet) 80 sf	Tile – 10 % Chrysotile Black Mastic – ND
180-CM01	Carpet Mastic and Light Gray Floor Leveler (Non-friable – miscellaneous)	Room 180 320 sf	Trace (brown mastic)
NA*	Brown Cove Base and Tan Mastic (Non-friable – miscellaneous)	Room 180 25 lf	9% Chrysotile
Alternates			
NA*	Brown Cove Base Mastic (Non-friable – miscellaneous)	Room 119 223 lf	Trace in Brown Mastic
FT04	12”x12” Tan floor tiles with black mastic (Non-friable – miscellaneous)	Room 200C 80 sf	Tile – 3 % Chrysotile Black Mastic – ND
NA*	Brown Cove Base Mastic (Non-friable – miscellaneous)	Room 200C 36 lf	Trace Chrysotile

SF = Square Feet LF = Linear Feet *From CSM Sampling (Lab report in Attachment 1)

1. The quantities identified herein are APPROXIMATE. FEI and Contractor visited the site together during a pre-bid conference and walkthrough, and verified material quantities and site conditions. By doing so Contractor is familiar with site conditions and quantities of materials to be removed.
2. The contractor must make all notifications, obtain all permits, and request any variances that are required to perform the work.
3. Work includes removal and disposal of identified ACM and ACM contaminated materials.
4. Electrical and water services will be provided by Owner.

5. The Owner will provide access to the Site for equipment (staging areas to be determined during pre-construction conference) and allow temporary parking on the site. The Contractor is responsible for providing all equipment (materials, supplies, lifts for access to ACM for removal, and any scaffolding).
6. Scaffolding, if required, will require appropriate sign-off before use.
7. The Contractor is responsible for moving any remaining furniture, objects, fixtures, and any objects in the work area to access ACM for removal.
8. The Contractor is responsible for verifying that electrical lines are identified and are Locked Out and Tagged Out (LOTO) before work is completed near energized wires. Coordinate this with CSM or Representative.
9. The Contractor is responsible for demolition to access ACM where scheduled for removal.
10. Every effort was made to identify ACM materials; however, other ACM materials may be present beneath floor materials or otherwise hidden. Flooring materials (where identified) are to include all layers to subfloor. If discovered, bring new suspect materials to the attention of FEI prior to disturbance of those materials.

2.2 Standards And Primacy Of Rules

The following standards will be adopted as they pertain to asbestos abatement. In any instance where adopted standards are in conflict with each other, the most stringent shall apply.

1) Colorado Department of Public Health and Environment Regulation #8
2) 5CCR 1000-10 Part B asbestos handling, transportation, and storage
3) 29 CFR 1926.1101, the OSHA Construction Industry Asbestos Standard
4) 40 CFR 61 Subpart M, EPA's NESHAP Asbestos Standard
5) NIOSH/OSHA/EPA –"Occupational; Safety & Health Guidance Manual for Hazardous Waste Site Activities", Section 8-20; Heat Stress and Other Physiological Factors.
6) All other applicable laws, rules, and regulations, including but not limited to those relating to:
   Workers' Compensation Insurance;
   Liability Insurance
   All contract specifications and documentation

2.3 General Work Procedures

Friable ACM
If the work areas contain friable ACM it must be addressed accordingly. Full containments are expected for all friable materials. All other mechanical methods are prohibited without prior authorization by FEI. The following procedures must be followed at a minimum, but all work is to be performed according to Regulation No. 8, Occupational Safety and Health Administration (OSHA), Environmental Protection Agency (EPA), and all other applicable laws and regulations for removal and disposal of ACM:

- Securing Work Area
  - Work areas should be vacated and secured (where feasible) by scheduling, locking doors (from inside the area if possible) or other means. If this is not feasible, access to the work area should be restricted, such as by asbestos barrier tape around the perimeter of the work area and at access points. If barrier tape is used to denote a work area, it should be placed

5 to 10 feet (1.5 to 3 meters) outside of any polyethylene protection used in the work area. Install barrier tape by taping or tying it to fixed objects. Do not block access to any emergency exits and post OSHA required "danger" signs at all entrances to the work area. It might be desirable to have a visual barrier installed several feet in front of warning signs to avoid having warning signs readily visible to occupants. A "keep out of construction area" sign should be posted on visual barriers. A visual barrier would be arranged so that a person who goes past the visual barrier will then see required warning signs.

- General Abatement Sequence
  - The GAC shall conduct abatement activities in accordance with CDPHE Regulation No. 8 in the following mandatory sequence:

    1) Install critical barriers (pursuant to subsection III.I, Critical Barrier Installation)

    2) Establish negative pressure (pursuant to subsection III.J, Air Cleaning and Negative Pressure Requirements)

    Note: *The removal of non-ACM building materials and components may only take place after negative air pressure is established in the containment work areas.*

    3) Construct the decontamination area (pursuant to subsection III.K, Decontamination Area)

    4) Pre-clean surfaces (pursuant to subsection III.L, Pre-cleaning of Surfaces)

    5) Cover fixed objects (pursuant to subsection III.M, Covering Fixed Objects)

    6) Construct the containment (pursuant to subsection III.N, Containment Components)

    7) Conduct abatement (pursuant to subsection III.O, Abatement Methods)

    8) Conduct final visual inspection (pursuant to paragraph III.P.1. Final Visual Inspection)

    9) Conduct final clearance air monitoring (pursuant to paragraph III.P.3., Final Clearance Air Monitoring)

    10) Conduct the tear-down (pursuant to subsection III.Q., Tear-down)
- Respirators and Performing Fit Checks
  - The Contractor is required to have a respiratory protection program. Wearers should inspect their respirators before each use of the respirator. Fit checks should be performed in accordance with the Respiratory Protection Program by each worker each time they don a respirator. Both positive and negative pressure fit checks should be performed.
- Protective Clothing and Decontamination
  - Protective clothing for workers shall consist of disposable coveralls, gloves and boots. Coveralls should have hoods and booties attached. They should provide complete coverage of the body with the exception of hands and face.
  - Eye, hearing, and head protection should also be used where needed. Rubber slip-resistant boots or other non-slip footwear is to be worn for all activities. Steel-toed boots should be used in areas where foot hazards exist. Do not use coveralls with loose foot coverings for activities that involve climbing ladders or working on scaffolding.
  - Protective clothing shall be removed as follows:
    - HEPA vacuum all parts of protective clothing while standing at perimeter of decontamination unit. Enter decontamination unit and, leaving respirator in place, remove protective clothing and fold inside out as it is removed. Place clothing into

a disposal bag and label as ACM waste. Enter shower with respirator still in place and shower. After showering enter clean room and remove respirator.

- Personnel decontamination facilities shall consist of an Equipment (Dirty) Room, Shower, and a clean room constructed in accordance with Regulation #8 III.K Decontamination Unit.
- The Waste Load Out shall consist of two separate chambers constructed in accordance with Regulation #8 - III.N.3.
- All load-out and disposal procedures shall be in accordance with applicable federal, state, and local regulations and project specifications.

- Air Monitoring
  - Air monitoring during abatement activities shall consist of OSHA personal monitoring (conducted by Contractor), area monitoring and ambient air monitoring during removal activities (conducted by Owner or Owners representative).
  - All air monitor pumps shall be pre and post calibrated to a primary standard. Flow rates, times and areas/personnel sampled shall be recorded.
- Pre-cleaning Work Areas and Wet Wiping
  - Pre-cleaning of work areas shall be performed prior to the start of abatement work activities to remove accumulated debris and dust that could be disturbed during abatement work. Pre-cleaning shall include picking up dust and debris with a HEPA filtered vacuum, as well as wet wiping non-porous surfaces.
- Critical Barriers
  - All critical barriers will consist of 1 layer of 6-mil poly on all opening, windows and vents.
- Negative Pressure Ventilation
  - The GAC shall maintain a negative pressure differential of -0.02 inches of water in the regulated work areas in accordance with Regulation #8 III.J Air cleaning and Negative Pressure Requirements, until final visual and clearance air monitoring complete.

AIR CHANGE CALCULATIONS ***for a 2000 cfm negative air machine (NAM)***

$$\textit{AIR CHANGES} = \frac{A}{B \times C}$$

Where: A = Room volume in cubic feet (l x w x h)
B = 15 minutes
C = Estimated rated capacity of NAM (1,500 cfm)

- Containment Construction and Removal
  - Containments for the asbestos removal shall be constructed in accordance with CDPHE Regulation 8.
  - Danger signs will be posted at locations, and approaches to locations, where airborne concentrations of asbestos exceed or can reasonably be expected to exceed the PEL. Signs will be posted at a distance sufficiently far from the work area to permit an employee to read the sign and take the necessary protective measures to avoid exposure. Additional signs may need to be posted following construction of workplace containment barriers.
  - Removal of materials containing asbestos and contaminated with asbestos shall be performed in accordance with the Colorado Department of Public Health and Environment Regulation 8 III, Abatement, Renovation and Demolition Projects.
- Asbestos Waste Storage, Transportation and Disposal
  - Containerizing and transport of asbestos wastes shall be in accordance with applicable regulations.

- Asbestos waste that is not directly loaded into a dumpster may be temporally stored in the work area provided it is protected to prevent leakage.
- All ACM waste must be wrapped in two layers of 6 mil polyethylene sheeting or double-bagged in 6 mil polyethylene bags labeled with the appropriate OSHA label for asbestos and must also bear the generator label as required by EPA's 40 CFR 61 Subpart M NESHAP Standard.
- All asbestos generated waste will be transported directly from the work areas to a secured area (dumpster or truck).
- When asbestos waste is taken to the landfill, it will be transported in accordance with all applicable federal, state and local regulations

- Visual Inspection and Completing Air Monitoring
  - All interior surfaces of the work area will be free of visible dust and debris. The work area must pass a final visual inspection by a CDPHE Certified Air Monitoring Specialist (AMS) leaving only critical barriers in place.
  - If visible residue, dust or debris remains, it must be cleaned up using wet wiping and/or HEPA vacuuming before the visual inspection can continue.
  - FEI will check that no visible residue, dust or debris remains behind critical barriers in the removal area. Any gaps, holes, or openings shall be repaired by the abatement contractor prior to the completion of the visual inspection.
  - Upon passage of final visual inspection, FEI will conduct clearance air monitoring.
  - Clearance criteria for containment(s) shall be in accordance with CDPHE Regulation #8, Section III.P and shall use Phase Contrast Microscopy (PCM). A minimum of five (5) air samples will be collected from the work area with only critical barriers in place. Upon notification that clearance monitoring levels are acceptable, the Contractor may remove critical barriers and demobilize from the work area. If any samples collected for the final air test exceeds 0.01 f/cc the entire work area shall be re-cleaned immediately upon receipt of air test results. The abatement work area shall be re-tested and the costs associated for additional Final Clearance Air Monitoring shall be borne by the GAC at no additional cost to the building owner.

Non-friable ACM (flooring, transite and mastics)

Remove vinyl asbestos floor tile (VAT), transite and mastics and dispose of properly as asbestos-containing material. If mechanical means are used for removal of flooring or mastic, then follow Regulation No. 8 requirements for friable ACM removal. Refer to drawings for materials requiring removal as non-friable ACM or Trace.

- Work may be performed using critical barriers and negative air flow through a HEPA filter. The zone shall be secured against entry by any unauthorized or untrained person throughout the Work. Post warning signs and erect temporary barricades.

- Remove all moveable materials (appliances, furniture, equipment, debris) from the work area. Remove any binding strips and cove base, or other restrictive moldings from walls. VAT and mastic may be located under carpeting or other non-asbestos materials. Note: Overlying non-asbestos materials may be removed as non-asbestos debris as long as the underlying asbestos materials are not attached during removal.

- Remove VAT and mastic so that it does not become friable during removal. Remove floor tiles without breakage and place in disposal bags. Mist work area continuously with amended water whenever necessary to reduce airborne fiber counts. If the underlying substrate is not impervious, control excess water, so that leakage does not occur to underlying materials and floors.

- Removal of VAT/mastic may be performed with wet methods and hand scrapers. Heating and/or the application of dry ice may be used also. Power tools, grinders or other machines that may produce dust during removal of VAT/mastic are not allowed.

- Vinyl asbestos floor tile and mastic shall be removed down to existing floor with minimal damage to the floor. Never sand or dry scrape mastic. Use amended water. Remove saturated material in small sections. Use stiff bladed scraper to remove excess felt. HEPA vacuum each area as it is abated.

- Solvents may be used to remove mastic but odors shall not cause adverse effects to workers or occupants. The Contractor shall utilize the solvent in accordance with all manufacturer guidelines and OSHA regulations. FEI must review Safety Data Sheets (SDS) for solvent materials prior to use. Floors shall be washed with soap and water after use of solvents. If solvents cause adverse impact to occupants or workers, then the type of solvent shall be changed or discontinued. Contractor shall wash floor after use of solvents to remove any remaining residual solvent.

Clean the entire floor using a wet/dry vacuum cleaner equipped with a HEPA filtration system. Do not sweep. After removal of VAT and mastic adhesive, proceed with decontamination, and final inspection and testing of the Work Area as specified elsewhere in this section.

Clearance and Disposal

- Visual Inspection and Clearance Air Monitoring (friable ACM)
    - FEI shall conduct a visual inspection after final cleaning, prior to the removal of the critical barriers and negative air filtration.
    - FEI shall verify that no visible residue, dust or debris remains in the contained removal area and that all encapsulants, if applied, are dry.
    - If visible residue, dust or debris remains, it must be cleaned up using wet wiping and/or HEPA vacuuming before the visual inspection can continue.
    - Remainder of containment will be removed after passage of final visual inspection and air monitoring results are below 0.01 f/cc by PCM analysis (number and parameters dependent on size and type of materials removed).

- Visual Inspection and Clearance (non-friable ACM)
    - FEI shall conduct a visual inspection in controlled area after completion of removal of all non-friable ACM. Areas will be complete after passage of visual inspection and aggressive air monitoring results are below 0.01 f/cc by PCM analysis (minimum of 5 samples for each contained area). Roofing materials require only visual inspection.

- Waste Transportation, Storage and Disposal
  - Asbestos-containing waste material from the removal activities should be adequately wet in accordance with NESHAP requirements (40 CFR 61.150).
  - All waste should be labeled as required by federal, state and local regulations. Federal regulations requiring labeling of waste include OSHA regulations 29 CFR 1910.1200, 1910.1001 and 1926.1101, EPA's NESHAP regulation 40 CFR 61.150, and the Department of Transportation's Hazardous Materials Regulations 49 CFR 171 and 180.
  - Dispose of waste following procedures required by landfill. Provide waste manifests to FEI and CSM.

2.4 Safety And Logistic Considerations

- Each work area will be monitored utilizing phase contrast microscopy (PCM) as the analytical technique. All air monitoring will be conducted according to Regulation No. 8.

- Restrooms may only be used in areas where Contractor is currently working. If no restrooms are available, Contractor must provide temporary restrooms.

- Staging area for equipment and personnel will be at the closest entrance to each work area. A small truck for waste loadout may be parked at each entrance during load out of materials only. Schedule such activities with CSM or General Contractor. Security for any equipment and/or trucks left onsite is the responsibility of the contractor. CSM will not be responsible for theft or vandalism of Contractor's equipment left onsite.

- All electrical power utilized during the project will be on ground fault circuit interrupters (GFCI) whose power source is located outside the work area.

- The abatement contractor shall prepare and make available emergency egress for the facility. All contractor personnel shall receive emergency procedure orientation specific to the facility prior to initiation of abatement activities.

- Fire protection procedures:

1. No items capable of initiating or sustaining combustion (lighters, matches, torches, etc.) will be allowed in containment.
2. The use of flammable liquids is not permitted.
3. Any electricity utilized must be on Ground Fault Circuit Interrupters (GFCI).
4. A minimum of one, 2A: 20B: C rated fire extinguishers will be maintained on-site. There must be available at least one 2A: 20B: C rated fire extinguisher within a maximum travel distance of 50 feet from any point in the work area.
5. Workers will be trained in the use of fire extinguishers, emergency egress plans, basic fire safety, and emergency reporting procedures prior to work beginning.

6. All emergency exits will be labeled as such with tools available for breaching poly and keys in door locks where necessary.
7. The Contractor must implement an emergency action and fire prevention plan in accordance with 29 CFR 1910.38 Employee emergency plans and fire prevention plans.
8. The Contractor will make any required notifications to the Denver Fire Department regarding fire protection practices.

- Hours of work will be scheduled with Owner. There will be limitations on project hours for the duration of work. Coordinate work hours with CSM and General Contractor.

2.5 Inspections By Industrial Hygiene Representative

1. All inspections shall take place during normal working hours. All inspections shall be coordinated a minimum of 48 hours in advance with CSM.

2. If the inspection detects items to be corrected the area will be termed "failed" and will need to have corrective action taken by the Contractor.

3. Items of work requiring inspection sign-off by Industrial Hygiene Representative are:
   a. Pre-Abatement (Area Preparation/Containment) Inspection. Removal of asbestos and necessary demolition shall not take place until Industrial Hygiene Representative has inspected area preparation work and given approval.
   b. Final Visual Inspection - The area shall not be encapsulated or locked down until Industrial Hygiene Representative has inspected and given approval of the final cleaning and area decontamination. The containment must be completely dry, during the inspection with no water droplets, remains or saturation on polyethylene sheeting or other surfaces in the containment.

4. A punch list of items to be corrected resulting from a "failed" inspection, will be prepared jointly by the Contractor and Industrial Hygiene Representative prior to final acceptance of the project by the Industrial Hygiene Representative. Inspections shall in no way be construed as final or partial acceptance by Industrial Hygiene Representative. Any failure or omission of the Industrial Hygiene Representative to notify the Contractor of defective work shall not excuse Contractor for liability for such defective work.

5. It will be necessary that the Contractor successfully confine fiber release to the designated work area and within the (glovebag) enclosure. In meeting such obligations Industrial Hygiene Representative may increase the burdens and expense of the Contractor, his Sub-Contractors or employees, or the surety of them. Nothing in the performance of Industrial Hygiene Representative Services in connection with this project implies the undertaking for the benefit of, or which may be enforced by, the Contractor, his Sub-Contractors, or employees, or the

surety of any of them. It is not the function of Industrial Hygiene Representative to specify all of the means by which the Contractor will attain the intended results, nor to state all of the environmental conditions that must be present for the safety of workers who are employed to produce the intended results, or for the safety of others during construction.

6. The Contractor is required to remove all specified ACM and store it daily in labeled 55-gallon drums or other approved containers placed in the designated laydown area. The Owner shall sign all waste manifests prior to removal from the site. Any ACM, debris or contaminated materials, missed, not accessed or abated thoroughly, and later discovered by the Owner or Industrial Hygiene Representative, will be corrected by the Contractor at no cost to the General Contractor (Sturgeon).

7. The Industrial Hygiene Representative will provide final visual inspection for all work areas (enclosures). Air samples collected in a work area exceeding 0.01 fibers per cubic centimeter of air (f/cc) will require corrective action (See Section 2.4, Maximum Allowable Asbestos Level). Contractor may, on the approval of the Industrial Hygiene Representative, have TEM analysis run following PCM analysis that has exceeded 0.01 f/cc if it will not interfere with the project schedule. All costs associated with TEM analysis will be the sole responsibility of the Contractor.

2.6 Maximum Allowable Asbestos Level (MAAL)

Outside Work Area: If any air sample taken near the Work Area exceeds the CDPHE Maximum Allowable Asbestos Level (MAAL), the Contractor shall immediately and automatically stop all work except corrective action. The Industrial Hygiene Representative will work with the Contractor to determine the source of the high reading and work with the Contractor to determine a course of corrective action.

1. Maximum Allowable Asbestos Level
   a. Air monitoring shall be conducted during normal occupancy and samples shall not be collected in an aggressive manner.
   b. Where PCM is used as the method of analysis the standard is 0.01 f/cc, which is equivalent to 10,000 fibers per cubic meter of air (f/m^3). The NIOSH 7400 Method shall be used to analyze samples. The number of samples to be taken shall be determined by the certified air monitoring specialist. Where TEM is used as the method of analysis, the standard is 70 structures/millimeter^2 (s/mm^2). TEM analysis shall be conducted pursuant to the protocol in 40 C.F.R. Part 763, Appendix A to Subpart E (EPA 1995).
   c. All air monitoring collected for MAAL purposes shall be performed by the General Contractor's representative who is independent of the Abatement Contractor to avoid possible conflict of interest.

2. In the event that airborne fiber levels outside a Work Area exceed the MAAL when analyzed by PCM (when verified by TEM), the Contractor shall comply with CDPHE requirements for Minor Asbestos Spills (Regulation 8 III.T.2). If the high reading was the result of a failure of Work Area isolation measures initiate the following additional actions:

a. Immediately erect secondary barriers to isolate the affected area from the balance of the building. Erect Critical Barriers at the next existing structural isolation of the involved space (e.g. wall, ceiling, floor). Impart negative pressure in the enclosed area.
b. Decontaminate the affected area.
c. Require that respiratory protection be worn in affected area until area is cleared for re-occupancy.
d. Leave Critical Barriers in place until completion of work and insure that the operation of the pressure differential system in the Work Area results in a flow of air from the balance of the building into the affected area.
e. After passage of Visual Inspection in the Work Area remove barriers separating the work area from the affected area. Final air samples will be taken within the affected area.

3. Elevated Ambient Levels – Industrial Hygiene representative will collect air samples in the general work areas prior to work beginning and analyze by PCM. If the analytical result exceeds the 70 s/mm^2 by TEM or 0.01 f/cc by PCM, whichever is applicable, then the existing level determined by the results of sampling will be the MAAL.

4. In the event that areas beyond the work area become contaminated with asbestos, asbestos-containing dust/debris, and/or visible emissions from the work area, the Contractor shall be responsible for all costs associated with cleaning and subsequent testing (visual inspection, air sampling and bulk analysis) of these areas.
5. If the high reading was the result of other causes, initiate corrective action as required by the applicable regulations at the direction of the Owner.

Effect on Contract Sum: Complete corrective work with no change in the Contract Sum if high airborne fiber counts were caused by Contractor's activities. The Contract Sum and schedule will be adjusted for additional work caused by high airborne fiber counts beyond the Contractor's control. Contractor is responsible for all costs associated with TEM verification where PCM samples exceed 0.01 f/cc, and any subsequent cleaning and additional sampling costs regardless of TEM sample results.

3 SCHEDULE FOR ABATEMENT/DEMOLITION

The project is scheduled to begin October 23, 2017 and removal is to be completed in 10 work days by November 03, 2017.

4 ABATEMENT SUBMITTALS

The following sections detail required submittals for the project.

4.1 Project Design

If required, prepare a Project Design as required by Regulation No. 8. Include in the plan the general locations and layouts of decontamination areas, air change calculations, the sequencing of

asbestos work (containments and work areas), methods to be used to assure the safety of building occupants and visitors to the site, disposal plan including staging and waste loadout procedures, and location of approved disposal site. The Project Design must be signed by a CDPHE certified Project Designer. The Contractor is solely responsible for construction means, methods, techniques and sequences, and procedures with respect to complying with applicable regulations.

4.2 Abatement Technical Submittals

The Contractor shall submit all technical documentation prior to start of work as specified in this section using the list and schedule provided below.

- ✓ Copies of all worker AHERA / STATE certifications.
- ✓ Copies of all worker asbestos medical evaluations.
- ✓ Copies of all worker respirator fit tests.
- ✓ Copies of MSDS for all chemicals (spray-glue, encapsulant, surfactant etc.) that will be used
- ✓ Copy of Employee Safety Training Matrix
- ✓ Copy of Job Safety Analysis (JSA).
- ✓ Asbestos waste receipt / total (post project).

5 PROJECT COORDINATION

The intent of this project is to remove and dispose of friable and non-friable ACM prior to planned renovation. The Contractor shall execute work under this Contract with minimal disturbance to nearby facility activities. A schedule shall be coordinated with CSM to minimize effects of abatement operations and possible interruptions of power or water. Coordination shall include informal meetings with CSM and onsite representatives such as the following:

- **Inspect** areas in which work will be performed, prior to commencement of work. Prepare a listing of damage to structure, surfaces, and equipment or of surrounding properties, which could be misconstrued as damage resulting from the work. Contractor may photograph or videotape existing conditions as necessary to document conditions. Submit to the CSM for record purposes prior to starting work.

- **Informal Pre-construction Conference** to be convened by FEI or IH representative, if desired, prior to start of any work. The conference will be scheduled before start of construction, at a time convenient to CSM, but no later than the day of the start of the project. Meet at the project site, or as otherwise directed. Authorized representatives of CSM may be in attendance. An authorized representative of the Contractor and project supervisor and other concerned parties shall attend the conference. All participants at the conference shall be familiar with the Project and authorized to conclude matters relating to the Work.

- **Project Closeout**- Before demobilization from the Site, a project punchlist may be requested, completed and accepted by CSM and/or Representative. The punchlist shall state that each item

has been completed or otherwise resolved for acceptance, and shall be endorsed and dated prior to demobilization.

6 PROJECT CLOSEOUT

Before requesting final inspection for certification of final acceptance and final payment, complete the following (known exceptions must be listed in the request):

- ✓ Submit final payment request with final releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations, where required.
- ✓ Submit copy of Owner's Representative final inspection report of itemized work to be completed or corrected, stating that each item has been completed or otherwise resolved for acceptance, endorsed and dated by Owner's Representative.
- ✓ Submit lien release by subcontractors.
- ✓ Submit consent of surety to final payment.
- ✓ Submit final liquidated damages settlement statement.
- ✓ Submit evidence of final, continuing insurance coverage complying with insurance requirements.
- ✓ Submit final closeout report with all permits, waste manifests, daily logs and other submittals called for in this document.
- ✓ A post-demolition existing conditions map will be the deliverable from the demolition operator including (locations of abandoned utilities to remain).

Final Inspection:

The Owner's Representative and Owner will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to CSM.

Upon completion of this inspection, CSM will prepare a Notice of Acceptance, or the Owner's Representative will advise the Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.

If necessary, inspection will be repeated.

Re-inspections:

Should CSM be required to perform more than one final inspection because of failure of Work to comply with original certifications of Contractor, CSM may compensate Owner's Representative for additional services, and deduct amount paid from final payment to Contractor.

Warranties:

The Contractor and each Subcontractor shall remedy any defects due to faulty materials or workmanship, and pay for any damage to other work resulting there from, which shall appear in their work within a period of one year from the date of Notice of Acceptance and in accordance with the terms of any special warranties provided in the contract. CSM shall give notice of observed defects with reasonable promptness.

7 QUALIFICATIONS AND LIMITATIONS

FEI completed this investigation and work plan in a manner consistent with current professional practices. The assessment was limited to sampling locations and analyses described in the report provided by the client. No other sampling or analyses were conducted during this investigation. Only readily accessible spaces were inspected; therefore, it is possible that ACM may still exist in areas that were inaccessible during the progress of the project. It is possible that additional reports or investigations could alter the conclusions of this assessment.

Procedures are prepared for use by the Contractor, but do not limit the Contractor from performing its work according to any regulations not included in this document.

This report is intended for use only by the client or its designees. Any future use of this report by anyone other than the above-referenced client will require authorization by FEI.

Foothills Environmental, Inc.
Industrial Hygiene, Safety & Environmental Services

ATTACHMENT 1

ASBESTOS ANALYTICAL RESULTS

Susan Miner

From: Lee Ann Underwood
Sent: Monday, September 18, 2017 2:35 PM
To: Susan Miner
Cc: Kyle Filkins
Subject: Asbestos Survey at the Library
Attachments: Ln123441.pdf

Hi Susan,

Kyle asked me to share the results of the samples collected at the library on September 15th in support of an upcoming renovation project. It is my understanding that Kyle was not able to sample all of the materials that may be disturbed during the renovation but will address this when he returns.

Twenty samples were collected and analyzed for asbestos. Seven of those samples came back positive for asbestos. The location and type of material sampled are indicated below. In some locations more than one sample was collected of a material. Samples that were positive for asbestos are indicated in red. A copy of the sample analysis report is attached for your reference.

Room 119

- Drywall
- Drywall compound
- Cove base mastic – Brown mastic has trace levels, <1% Chrysotile

Room 180

- Drywall compound
- Plaster
- Cove base and mastic – Brown cove base has 9% Chrysotile (2 samples collected and both were positive for asbestos)
- Floor tile with mastic – Gray floor tile has 10% Chrysotile
- Carpet mastic – Brown mastic has trace levels of <1% Chrysotile

Room 200B

- Drywall
- Drywall compound

Room 200C

- Floor tile – Tan 12X12 tile has 2% Chrysotile
- Drywall and drywall compound
- Cove base
- Cove base mastic – Brown mastic has trace levels, <1% Chrysotile
- Textured wall material

Room 222

- Drywall and drywall compound
- Carpet mastic
- Plaster with texture material

FRS Geotech, Inc.
1441 W. 46th Ave, Ste. 14
Denver, CO 80211-2338

Phone: (303) 477-2559
(800) 386-3136
FAX: (303) 477-2580
e-mail: frsgeo@ix.netcom.com

September 18, 2017

Mr. Kyle Filkins
Environmental Health and Safety
Colorado School of Mines
1500 Illinois St.
Golden, CO 80401

Re: Project: Arthur Lakes Library

FRS Lab Number 123441

Dear Mr. Kyle Filkins:

The bulk samples submitted to FRS Geotech, Inc. have been analyzed by polarized light microscopy (PLM), the EPA-recommended method for determination of fibrous constituents in building materials. The percent of asbestos contained in the samples is a visual estimation based upon comparisons with published charts. The results of these analyses are summarized in the enclosed table. This report relates only to the items received and tested by our laboratory. According to requirements set by the National Institute of Standards and Technology/NVLAP, this report must not be used by the client to claim certification, approval, or endorsement by NVLAP, NIST, or any agency of the Federal Government. Also, NVLAP guidelines specify that this report should not be reproduced, except in full, without the written approval of FRS.

A copy of your Chain of Custody is attached for your convenience. This report is considered highly confidential. Results will not be discussed with any person not associated with you.

Please call if you have any questions about this work.

Sincerely,

David A. Schroeder, Ph.D.
Data Controller

Enclosures

NVLAP Accredited Lab #102078-0

FRS GEOTECH, INC.
1441 W. 46th Avenue, Ste. 14
Denver, CO 80211-2338

RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

Phone: (303) 477-2559
(800) 386-3136
Fax: (303) 477-2580
e-mail: frsgeo@ix.netcom.com

Client: **Environmental Health and Safety**
Project: **Arthur Lakes Library**

Lab No.: **123441**

Sample No. [layer] / Description	Volume (%)	Sample Date	Nonasbestos Fibrous Material (%)	Asbestos Minerals (%)	Summary (%)	
ASB-20170915-01 White plaster w/texture, paint--rm 119 north wall [white]	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	None Detected -- 100
ASB-20170915-02* Cove base mastic, brown and tan--rm 119 north wall [2 layers]	Composite (100%)	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Trace <1% Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	Trace <1% -- 99
ASB-20170915-02 [A] [Brown mastic]	Layer vol. = 50%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Trace <1% Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	Trace <1% -- 99
ASB-20170915-02 [B] [Tan mastic]	Layer vol. = 50%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	None Detected -- 100
ASB-20170915-03 White compound--rm 119 south wall	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	None Detected -- 100
ASB-20170915-04 Compound w/white paint--rm 180 north wall [white]	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	None Detected -- 100

* Composite analysis (multilayered sample, see individual layer analyses).

Analyst(s): Chris Carbino

Completed: 09/18/2017

FRS GEOTECH, INC.
1441 W. 46th Avenue, Ste. 14
Denver, CO 80211-2338

RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

Phone: (303) 477-2559
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e-mail: frsgeo@ix.netcom.com

Client: **Environmental Health and Safety**
Project: **Arthur Lakes Library**

Lab No.: **123441**

Sample No. [layer] / Description	Volume (%)	Sample Date	Nonasbestos Fibrous Material (%)	Asbestos Minerals (%)		Summary (%)	
ASB-20170915-05 Plaster--rm 180 east wall [white]	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.		Total Asbestos: Other Fibrous Material Nonfibrous Material	None Detected -- 100
ASB-20170915-06* Brown cove base w/gold mastic--rm 180 east wall [2 layers]	Composite (100%)	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	9	Total Asbestos: Other Fibrous Material Nonfibrous Material	9 -- 91
ASB-20170915-06 [A] [Brown cove base/tile]	Layer vol. = 99%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	9	Total Asbestos: Other Fibrous Material Nonfibrous Material	9 -- 91
ASB-20170915-06 [B] [Tan mastic]	Layer vol. = 1%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.		Total Asbestos: Other Fibrous Material Nonfibrous Material	None Detected -- 100

* Composite analysis (multilayered sample, see individual layer analyses).

Analyst(s): Chris Carbino

Completed: 09/18/2017

FRS GEOTECH, INC.
1441 W. 46th Avenue, Ste. 14
Denver, CO 80211-2338

RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

Phone: (303) 477-2559
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Client: **Environmental Health and Safety**
Project: **Arthur Lakes Library**

Lab No.: **123441**

Sample No. [layer] / Description	Volume (%)	Sample Date	Nonasbestos Fibrous Material (%)	Asbestos Minerals (%)	Summary (%)	
ASB-20170915-07*	Composite (100%)	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile 10 Crocidolite Trem./Act.	**Total Asbestos:**	10
Floor tile w/mastic--rm 180 under east cabinets [2 layers]					Other Fibrous Material	--
					Nonfibrous Material	90
ASB-20170915-07 [A]	Layer vol. = 99%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile 10 Crocidolite Trem./Act.	**Total Asbestos:**	10
[Gray floor tile]					Other Fibrous Material	--
					Nonfibrous Material	90
ASB-20170915-07 [B]	Layer vol. = 1%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	**Total Asbestos:**	None Detected
[Black mastic]					Other Fibrous Material	--
					Nonfibrous Material	100
ASB-20170915-08*	Composite (100%)	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Trace <1% Crocidolite Trem./Act.	**Total Asbestos:**	Trace <1%
Yellow carpet mastic w/brown layer--rm 180 [2 layers]					Other Fibrous Material	--
					Nonfibrous Material	99
ASB-20170915-08 [A]	Layer vol. = 50%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Trace <1% Crocidolite Trem./Act.	**Total Asbestos:**	Trace <1%
[Brown mastic]					Other Fibrous Material	--
					Nonfibrous Material	99
ASB-20170915-08 [B]	Layer vol. = 50%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	**Total Asbestos:**	None Detected
[Tan mastic]					Other Fibrous Material	--
					Nonfibrous Material	100

* Composite analysis (multilayered sample, see individual layer analyses).

Analyst(s): Chris Carbino

Completed: 09/18/2017

FRS GEOTECH, INC.
1441 W. 46th Avenue, Ste. 14
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RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

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Project: **Arthur Lakes Library**

Lab No.: **123441**

Sample No. [layer] / Description	Volume (%)	Sample Date	Nonasbestos Fibrous Material (%)	Asbestos Minerals (%)	Summary (%)
ASB-20170915-09 Brown cove base--rm 180 east wall	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile 9 Crocidolite Trem./Act.	Total Asbestos: 9 Other Fibrous Material -- Nonfibrous Material 91
ASB-20170915-10 Drywall w/paper--rm 200B east wall [white]	100%	09/15/17	Fiberglass 2 Cellulose 8 Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: None Detected Other Fibrous Material 10 Nonfibrous Material 90
ASB-20170915-11 Drywall--rm 200B east wall [white with texture and paint]	100%	09/15/17	Fiberglass 2 Cellulose 8 Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: None Detected Other Fibrous Material 10 Nonfibrous Material 90
ASB-20170915-12 Compound--rm 200B east wall [white]	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: None Detected Other Fibrous Material -- Nonfibrous Material 100
ASB-20170915-13 Tan 12x12 floor tile--rm 200C	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile 2 Crocidolite Trem./Act.	Total Asbestos: 2 Other Fibrous Material -- Nonfibrous Material 98

* Composite analysis (multilayered sample, see individual layer analyses).

Analyst(s): Chris Carbino

Completed: 09/18/2017

FRS GEOTECH, INC.
1441 W. 46th Avenue, Ste. 14
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RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

Phone: (303) 477-2559
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Client: **Environmental Health and Safety**
Project: **Arthur Lakes Library**

Lab No.: **123441**

Sample No. [layer] / Description	Volume (%)	Sample Date	Nonasbestos Fibrous Material (%)	Asbestos Minerals (%)	Summary (%)
ASB-20170915-14*	Composite (100%)	09/15/17	Fiberglass 2 Cellulose 9 Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: None Detected Other Fibrous Material 11 Nonfibrous Material 89
Drywall--rm 200C east wall [4 layers]					
ASB-20170915-14 [A]	Layer vol. = 90%	09/15/17	Fiberglass 2 Cellulose 8 Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: None Detected Other Fibrous Material 10 Nonfibrous Material 90
[White drywall]					
ASB-20170915-14 [B]	Layer vol. = 4%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: None Detected Other Fibrous Material -- Nonfibrous Material 100
[White joint compound]					
ASB-20170915-14 [C]	Layer vol. = 2%	09/15/17	Fiberglass Cellulose 95 Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: None Detected Other Fibrous Material 95 Nonfibrous Material 5
[Off-white tape]					
ASB-20170915-14 [D]	Layer vol. = 4%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: None Detected Other Fibrous Material -- Nonfibrous Material 100
[White texture]					
ASB-20170915-15	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: None Detected Other Fibrous Material -- Nonfibrous Material 100
Tan cove base--rm 200C					

* Composite analysis (multilayered sample, see individual layer analyses).

Analyst(s): Chris Carbino

Completed: 09/18/2017

FRS GEOTECH, INC.
1441 W. 46th Avenue, Ste. 14
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RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

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Client: **Environmental Health and Safety**
Project: **Arthur Lakes Library**

Lab No.: **123441**

Sample No. [layer] / Description	Volume (%)	Sample Date	Nonasbestos Fibrous Material (%)	Asbestos Minerals (%)	Summary (%)	
ASB-20170915-16*	Composite (100%)	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Trace <1% Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	Trace <1% -- 99
Cove base mastic, tan and brown--rm 200C [2 layers]						
ASB-20170915-16 [A]	Layer vol. = 50%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	None Detected -- 100
[Tan mastic]						
ASB-20170915-16 [B]	Layer vol. = 50%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Trace <1% Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	Trace <1% -- 99
[Brown mastic]						
ASB-20170915-17	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	None Detected -- 100
Texture wall material--rm 200C east wall [white]						
ASB-20170915-18	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	None Detected -- 100
Drywall w/compound--office 222 north wall [tan/white]						
ASB-20170915-19	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos: Other Fibrous Material Nonfibrous Material	None Detected -- 100
Gold carpet mastic--office 222						

* Composite analysis (multilayered sample, see individual layer analyses).

Analyst(s): Chris Carbino

Completed: 09/18/2017

FRS GEOTECH, INC.
1441 W. 46th Avenue, Ste. 14
Denver, CO 80211-2338

RESULTS OF BULK ASBESTOS SAMPLE ANALYSIS BY POLARIZED LIGHT MICROSCOPY (PLM) EPA-600/R-93/116

Phone: (303) 477-2559
(800) 386-3136
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Client: **Environmental Health and Safety**
Project: **Arthur Lakes Library**

Lab No.: **123441**

Sample No. [layer] / Description	Volume (%)	Sample Date	Nonasbestos Fibrous Material (%)	Asbestos Minerals (%)	Summary (%)	
ASB-20170915-20	100%	09/15/17	Fiberglass Cellulose Synthetics Others .	Amosite Anthophyllite Chrysotile Crocidolite Trem./Act.	Total Asbestos:	None Detected
Plaster w/texture material--office 222 south wall [white]					Other Fibrous Material	--
					Nonfibrous Material	100

* Composite analysis (multilayered sample, see individual layer analyses).

Analyst(s): Chris Carbino

Completed: 09/18/2017

REI LAB **Reservoirs Environmental, Inc.**

October 11, 2017

Subcontract Number: **NA**
Laboratory Report: **RES 391797-1**
Project # / P.O. # **AS17253**
Project Description: **CSM - Library**

Dan Benecke
Foothills Environmental, Inc. (Lakewood)
11099 W. 8th Avenue
Lakewood CO 80215

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 391797-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

Nicole Castillo
Nicole Castillo for

Jeanne Spencer
President

RESERVOIRS ENVIRONMENTAL INC.

NVLAP Lab Code 101896-0

TABLE: PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 391797-1**
Client: **Foothills Environmental, Inc. (Lakewood)**
Client Project Number / P.O.: **AS17253**
Client Project Description: **CSM - Library**
Date Samples Received: **October 11, 2017**
Method: **EPA 600/R-93/116 - Short Report, Bulk**
Turnaround: **2 Hour**
Date Samples Analyzed: **October 11, 2017**

ND=None Detected
TR=Trace, <1% Visual Estimate
Trem/Act=Tremolite/Actinolite

Client Sample Number	Lab ID Number	LAYER	Physical Description	Sub Part (%)	Asbestos Content: Mineral	Asbestos Content: Visual Estimate (%)	Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
SE-STW-PL01-04	EM 1945670	A	White plaster w/ tan paint	25		ND	0	100
		B	Pink perlitic plaster	75		ND	0	100
SE-STW-CDW-01	EM 1945671	A	White tape	10		ND	95	5
		B	White compound w/ tan paint	25		ND	0	100
		C	White compound w/ white paint	25		ND	0	100
		D	White joint compound	40		ND	0	100

TEM Analysis recommended for organically bound material (i.e. floor tile) if PLM results are <1%.

Liu Wenlong

Analyst / Data QA

Due Date: 10.11.17
Due Time: —

Reservoirs Environmental, Inc.

REI LAB

5801 Logan St. Denver, CO 80216 • Ph: 303 964-1986 • Fax 303-477-4275 • Toll Free :866 RESI-ENV

RES 391797

After Hours Cell Phone: 720-339-9228

INVOICE TO: (IF DIFFERENT)

Company:	Foothills Environmental, Inc.
Address:	11099 W. 8th Avenue
	Lakewood, CO 80215
Company:	
Address:	

CONTACT INFORMATION:

Contact:	Dan Benecke
Phone:	
Fax:	
Cell/pager:	720-471-2642
Contact:	
Phone:	
Fax:	
Cell/pager:	

Project Number and/or P.O. #: A517253

Project Description/Location: CSM - LIBRARY

Final Data Deliverable Email Address: dan@foothillsusa.com

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm & Sat. 8am - 5pm

PLM / PCM / TEM — X RUSH (Same Day) ___ PRIORITY (Next Day) ___ STANDARD (3-5 Day)
(Rush PCM = 2hr, TEM = 6hr.)

CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm

Metal(s) / Dust** ___ RUSH ___ 24 hr. ___ 3-5 Day
RCRA 8 / Metals & Welding Fume Scan / TCLP** ___ RUSH (3 Day) ___ 5 Day ___ 10 Day
Organics ___ 24 hr. ___ 3 day ___ 5 Day

Prior notification is required for RUSH turnarounds.

MICROBIOLOGY LABORATORY HOURS: Weekdays: 9am - 6pm

E.coli and/or Coliforms* ___ 24-48 Hour Other: _____
Pathogens* ___ 24-48 Hour
Microbial Growth* ___ 5-10 Day
Legionella ___ 10 Day
Mold ___ RUSH ___ 24 Hr ___ 48 Hr ___ 3 Day ___ 5 Day

TAT dependent on speed of microbial growth.

Turnaround times establish a laboratory priority, subject to laboratory volume and are not guaranteed. Additional fees apply for afterhours, weekends and holidays.

Special Instructions:

REQUESTED ANALYSIS

MICROBIOLOGY

Client sample ID number (Sample ID's must be unique)	PLM - Short report, Point Count, Long report, Qualitative	TEM - AHERA, Level II, 7402, ISO, +/- (Air, Bulk or Dust), Quant, Semi-Quant, Micro-vac, ISO-Indirect Preps	PCM - 7400A, 7400B, OSHA	LUST - Total, Respirable	METALS - Analyte(s) RCRA 8, TCLP, Welding Fume, Metals Scan, pH	ORGANICS - METH, TSS	Pathogens: Aerobic Plate Count, Salmonella, E.coli O157:H7, Listeria, S.aureus, Campylobacter: +/- or Quantification	E.coli and/or Coliforms: +/- or Quantification	Microbial Growth: Aerobic Plate Count ID, Bacteria or Y & M: +/- or Quantification	Legionella: +/- or Quantification	Other: Bioburden, LAL or Environmental	Mold: Spore Trap or Bulk: +/-, Identification, Quantification	SAMPLER'S INITIALS OR OTHER NOTES:	Sample Volume (L) / Area	Matrix Code	# Containers	Date Collected mm/dd/yy	Time Collected hh/mm a/p	EM Number (Laboratory Use Only)
1 SE-5TW-PL01-04	X														B	1	10/10/17		194567
2 SE-5TW-CDW-01	X														B	1	10/10/17		71
3																			
4																			
5																			
6																			
7																			
8																			
9																			
10																			
11																			
12																			
13																			

VALID MATRIX CODES

Air = A	Bulk = B
Dust = D	Paint = P
Soil = S	Wipe = W
Swab = SW	F = Food
Drinking Water = DW	Waste Water = WW
O = Other	

ASTM E1792 approved wipe media only

LAB NOTES:

Number of samples received: _____ (Additional samples shall be listed on attached long form.)

NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: _____ Date/Time: 10/11/17 8:10

Laboratory Use Only
Received By: _____ Date/Time: 10.11.17 @ 810 Carrier: Hand / FedEx / UPS / USPS / Drop Box / Courier

Sample Condition: Temp. (F°) _____ On Ice Yes / No Sealed Yes / No Intact Yes / No

Results:												
	Contact	Phone Email Fax	Date	Time	Initials	Contact	Phone Email Fax	Date	Time	Initials
	Contact	Phone Email Fax	Date	Time	Initials	Contact	Phone Email Fax	Date	Time	Initials

4/2014 version 1

REI LAB **Reservoirs Environmental, Inc.**

October 6, 2017

Subcontract Number: **NA**
Laboratory Report: **RES 391490-1**
Project # / P.O. # **AS17253**
Project Description: **CSM-Library**

Dan Benecke
Foothills Environmental, Inc. (Lakewood)
11099 W. 8th Avenue
Lakewood CO 80215

Dear Customer,

Reservoirs Environmental, Inc. is an analytical laboratory accredited for the analysis of Industrial Hygiene and Environmental matrices by the National Voluntary Laboratory Accreditation Program (NVLAP), Lab Code 101896-0 for Transmission Electron Microscopy (TEM) and Polarized Light Microscopy (PLM) analysis and the American Industrial Hygiene Association (AIHA), Lab ID 101533 - Accreditation Certificate #480 for Phase Contrast Microscopy (PCM) analysis. This laboratory is currently proficient in both Proficiency Testing and PAT programs respectively.

Reservoirs Environmental, Inc. has analyzed the following samples for asbestos content as per your request. The analysis has been completed in general accordance with the appropriate methodology as stated in the attached analysis table. The results have been submitted to your office.

RES 391490-1 is the job number assigned to this study. This report is considered highly confidential and the sole property of the customer. Reservoirs Environmental, Inc. will not discuss any part of this study with personnel other than those of the client. The results described in this report only apply to the samples analyzed. This report must not be used to claim endorsement of products or analytical results by NVLAP or any agency of the U.S. Government. This report shall not be reproduced except in full, without written approval from Reservoirs Environmental, Inc. Samples will be disposed of after sixty days unless longer storage is requested. If you have any questions about this report, please feel free to call 303-964-1986.

Sincerely,

Elisa Mari for

Jeanne Spencer
President

RESERVOIRS ENVIRONMENTAL INC.

NVLAP Lab Code 101896-0

TABLE: PLM BULK ANALYSIS, PERCENTAGE COMPOSITION BY VOLUME

RES Job Number: **RES 391490-1**
Client: **Foothills Environmental, Inc. (Lakewood)**
Client Project Number / P.O.: **AS17253**
Client Project Description: **CSM-Library**
Date Samples Received: **October 06, 2017**
Method: **EPA 600/R-93/116 - Short Report, Bulk**
Turnaround: **24 Hour**
Date Samples Analyzed: **October 06, 2017**

ND=None Detected
TR=Trace, <1% Visual Estimate
Trem/Act=Tremolite/Actinolite

Client Sample Number	Lab ID Number	Layer	Physical Description	Sub Part (%)	Asbestos Content: Mineral	Asbestos Content: Visual Estimate (%)	Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
180-CB01-01	EM 1967014	A	Green paint	20		**ND**	0	100
		B	Gray fibrous cementitious material	80	**Chrysotile**	**25**	0	75
171-PL01-01	EM 1967015	A	White plaster w/ off white paint	20		**ND**	0	100
		B	Pink granular perlitic plaster	80		**ND**	0	100
110-PL01-02	EM 1967016	A	White plaster w/ white/multi-colored paint	40		**ND**	0	100
		B	Pink granular perlitic plaster	60		**ND**	0	100
104-PL01-03	EM 1967017	A	White plaster w/ white/multi-colored paint	50		**ND**	0	100
		B	Pink granular perlitic plaster	50		**ND**	0	100
120-ED01-01	EM 1967018	A	Brown mastic	100		**ND**	0	100
200C-FT01-01	EM 1967019	A	Black mastic w/ gray leveling compound	10		**ND**	0	100
		B	Off white/gray tile	90	**Chrysotile**	**3**	0	97

TEM Analysis recommended for organically bound material (i.e. floor tile) if PLM results are <1%.

P: 303-964-1986
F: 303-477-4275

5801 Logan Street, Suite 100, Denver, CO 80216

1-866-RESI-ENV
www.reilab.com

RESERVOIRS ENVIRONMENTAL INC.

NVLAP Lab Code 101896-0

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TR=Trace, <1% Visual Estimate
Trem/Act=Tremolite/Actinolite

Client Sample Number	Lab ID Number	LAYER	Physical Description	Sub Part (%)	Asbestos Content: Mineral	Asbestos Content: Visual Estimate (%)	Non Asbestos Fibrous Components (%)	Non-Fibrous Components (%)
C250E-CDW01-01	EM 1967020	A	Tan resinous compound w/ gray paint	3		ND	0	100
		B	White compound w/ tan paint	4		ND	0	100
		C	White compound	10		ND	0	100
		D	Pink/tan drywall	83		ND	12	88
222-GD02-01	EM 1967021	A	Brown mastic w/ tan fibrous material	100		ND	93	7
119-CM01-01	EM 1967022	A	Yellow mastic	10		ND	0	100
		B	Gray leveling compound	90		ND	0	100
180-FM02-01	EM 1967023	A	Yellow mastic	10		ND	0	100
		B	Black mastic	40		ND	0	100
		C	Gray leveling compound	50		ND	0	100

TEM Analysis recommended for organically bound material (i.e. floor tile) if PLM results are <1%.

Que Pham
Analyst / Data QA

Due Date: 10-7
Due Time: _____

REI LAB Reservoirs Environmental, Inc.

5801 Logan St. Denver, CO 80216 • Ph: 303 964-1986 • Fax 303-477-4275 • Toll Free :866 RESI-ENV

RES 391490

After Hours Cell Phone: 720-339-9228

INVOICE TO: (IF DIFFERENT)		CONTACT INFORMATION:	
Company: Foothills Environmental, Inc.	Company:	Contact: Dan Benecke	Contact:
Address: 11099 W. 8th Avenue	Address:	Phone:	Phone:
Lakewood, CO 80215		Fax:	Fax:
		Cell/pager: 720-471-2642	Cell/pager:
Project Number and/or P.O. #: AS17253		Final Data Deliverable ~~Email Address~~: dan@foothillsusa.com	
Project Description/Location: CSM - LIBRARY			

ASBESTOS LABORATORY HOURS: Weekdays: 7am - 7pm & Sat. 8am - 5pm

PLM / PCM / TEM ___RUSH (Same Day) X PRIORITY (Next Day) ___STANDARD (3-5 Day)
(Rush PCM = 2hr, TEM = 6hr.)

CHEMISTRY LABORATORY HOURS: Weekdays: 8am - 5pm

Metal(s) / Dust** ___RUSH ___24 hr. ___3-5 Day
RCRA 8 / Metals & Welding Fume Scan / TCLP** ___RUSH (3 Day) ___5 Day ___10 Day
Organics ___24 hr. ___3 day ___5 Day
Prior notification is required for RUSH turnarounds.

MICROBIOLOGY LABORATORY HOURS: Weekdays: 9am - 6pm

E.coli and/or Coliforms* ___24-48 Hour Other: _____
Pathogens* ___24-48 Hour
Microbial Growth* ___5-10 Day
Legionella ___10 Day
Mold ___RUSH ___24 Hr ___48 Hr ___3 Day ___5 Day
TAT dependent on speed of microbial growth.

Turnaround times establish a laboratory priority, subject to laboratory volume and are not guaranteed. Additional fees apply for afterhours, weekends and holidays.

Special Instructions:

REQUESTED ANALYSIS

Client sample ID number (Sample ID's must be unique)	PLM - Short report, Point Count, Long report, Qualitative	TEM - AHERA, Level II, 7402, ISO, +/- (Air, Bulk or Dust), Quant, Semi-Quant, Micro-vac, ISO-Indirect Preps	PCM - 7400A, 7400B, OSHA	DUST - Total, Respirable	METALS - Analyte(s) RCRA 8, TCLP, Welding Fume, Metals Scan, pH	ORGANICS - METH, TSS	MICROBIOLOGY: Pathogens: Aerobic Plate Count, Salmonella, E.coli O157:H7, Listeria, S.aureus, Camphlobacter: +/- or Quantification	MICROBIOLOGY: E.coli and/or Coliforms: +/- or Quantification	MICROBIOLOGY: Microbial Growth: Aerobic Plate Count ID, Bacteria or Y & M: +/- or Quantification	MICROBIOLOGY: Legionella: +/- or Quantification	MICROBIOLOGY: Other: Bioburden, LAL or Environmental	MICROBIOLOGY: Mold: Spore Trap or Bulk: +/-, Identification, Quantification	SAMPLER'S INITIALS OR OTHER NOTES:	Sample Volume (L) / Area	Matrix Code	# Containers	Date Collected mm/dd/yy	Time Collected hh/mm a/p	EM Number (Laboratory Use Only)
1 180-CB01-01	X																		196401
2 171-PL01-01																			5
3 110-PL01-02																			6
4 104-PL01-03																			7
5 120-BD01-01																			8
6 200C-FT01-01																			9
7 C250E-CD101-01																			20
8 222-GD02-01																			1
9 119-CM01-01																			2
10 183-FM01-01																			3
11																			
12																			
13																			

VALID MATRIX CODES

Air = A	Bulk = B
Dust = D	Paint = P
Soil = S	Wipe = W
Swab = SW	F = Food
Drinking Water = DW	Waste Water = WW
O = Other	

ASTM E1792 approved wipe media only

LAB NOTES:

Number of samples received: 10 (Additional samples shall be listed on attached long form.)

NOTE: REI will analyze incoming samples based upon information received and will not be responsible for errors or omissions in calculations resulting from the inaccuracy of original data. By signing client/company representative agrees that submission of the following samples for requested analysis as indicated on this Chain of Custody shall constitute an analytical services agreement with payment terms of NET 30 days, failure to comply with payment terms may result in a 1.5% monthly interest surcharge.

Relinquished By: _____ Date/Time: 10/6 9:10

Laboratory Use Only
Received By: _____ Date/Time: 10.6.17 9:10 Carrier: Hand / FedEx / UPS / USPS / Drop Box / Courier

Sample Condition: On Ice Yes / No Sealed Yes / No Intact Yes / No
Temp. (F°) _____

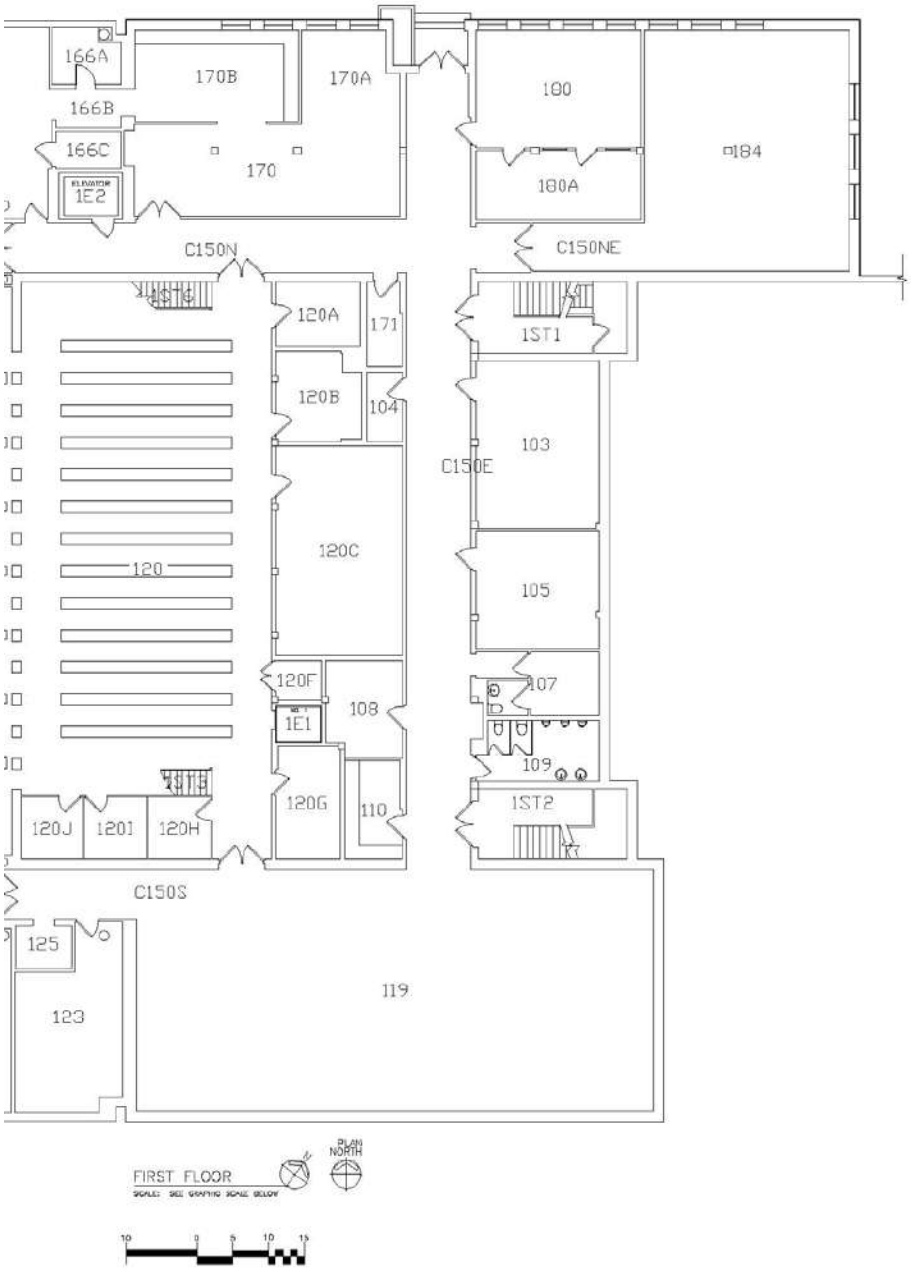
Results:	Contact	Phone Email Fax	Date	Time	Initials	Contact	Phone Email Fax	Date	Time	Initials
	Contact	Phone Email Fax	Date	Time	Initials	Contact	Phone Email Fax	Date	Time	Initials

4-2014 version 1

ATTACHMENT 2

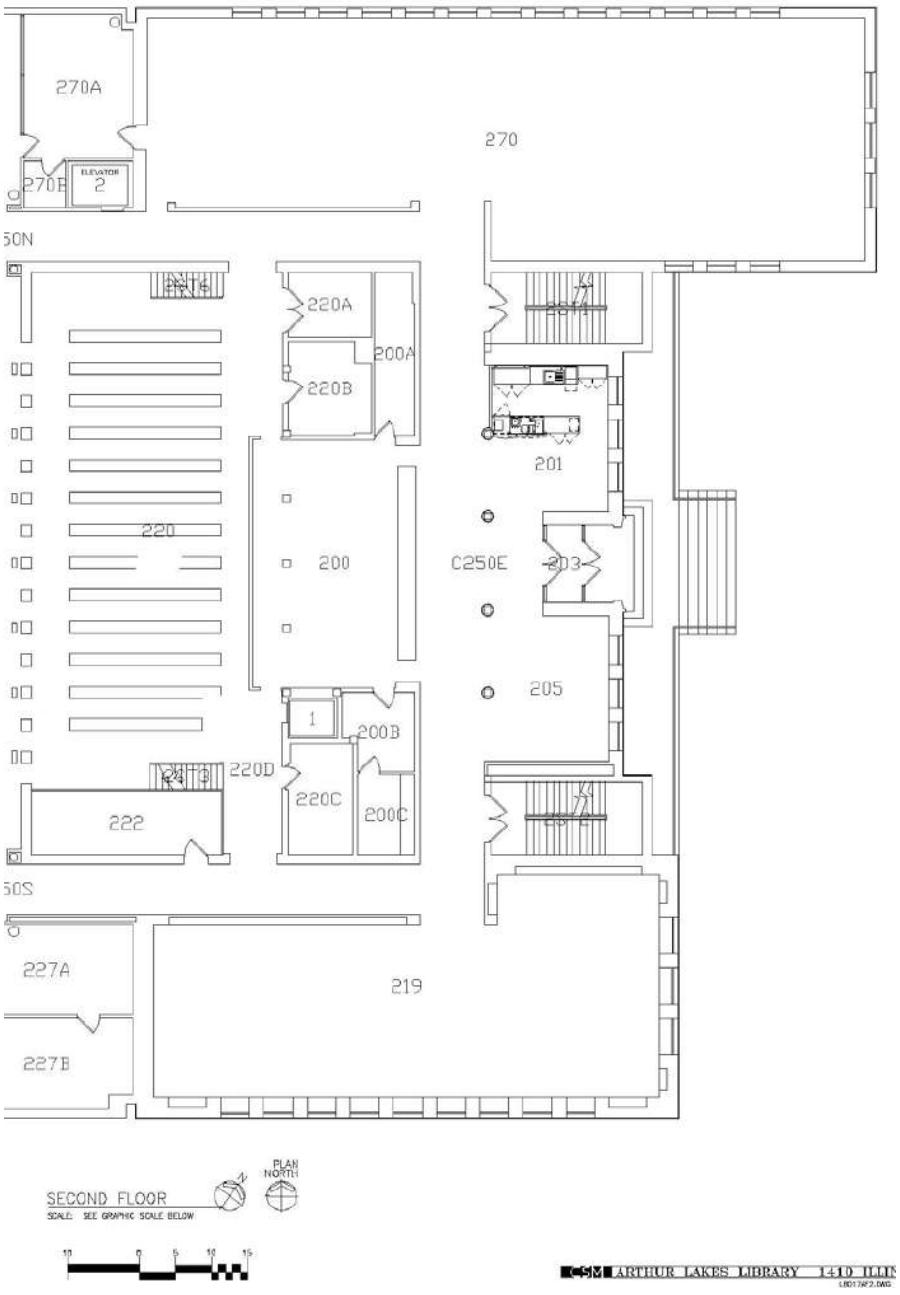
DRAWINGS

FIRST FLOOR SAMPLE LOCATIONS



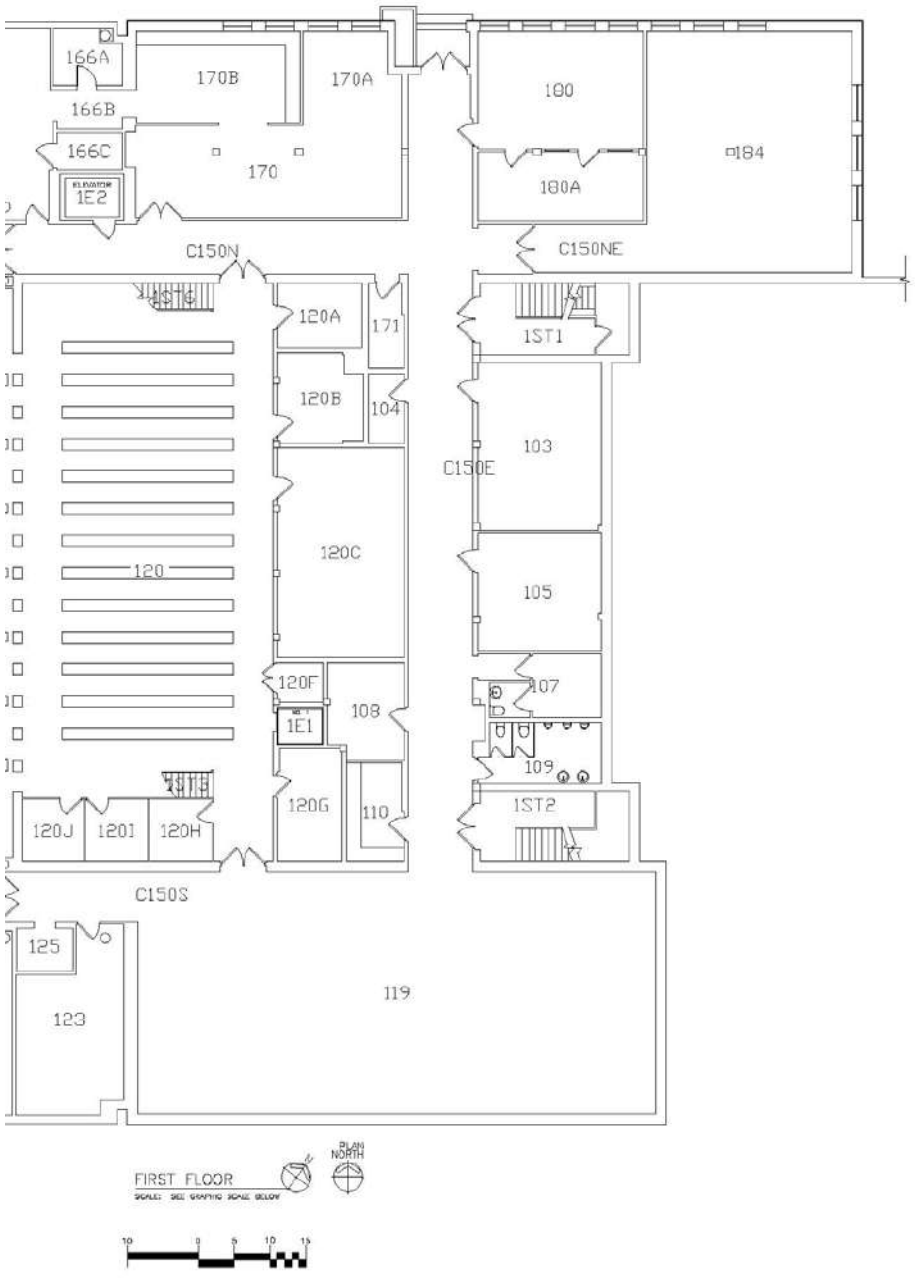
ARTHUR LAKES LIBRARY COLORADO SCHOOL OF MINES GOLDEN, COLORADO (Not to Scale)	FEI Project #AS17253	Date:10/13/17	Figure 1
	Approved by:NV	Drawn By:DMB	
	Foothills Environmental, Inc. 11099 W 8th Avenue Lakewood, CO 80215		

SECOND FLOOR SAMPLE LOCATIONS



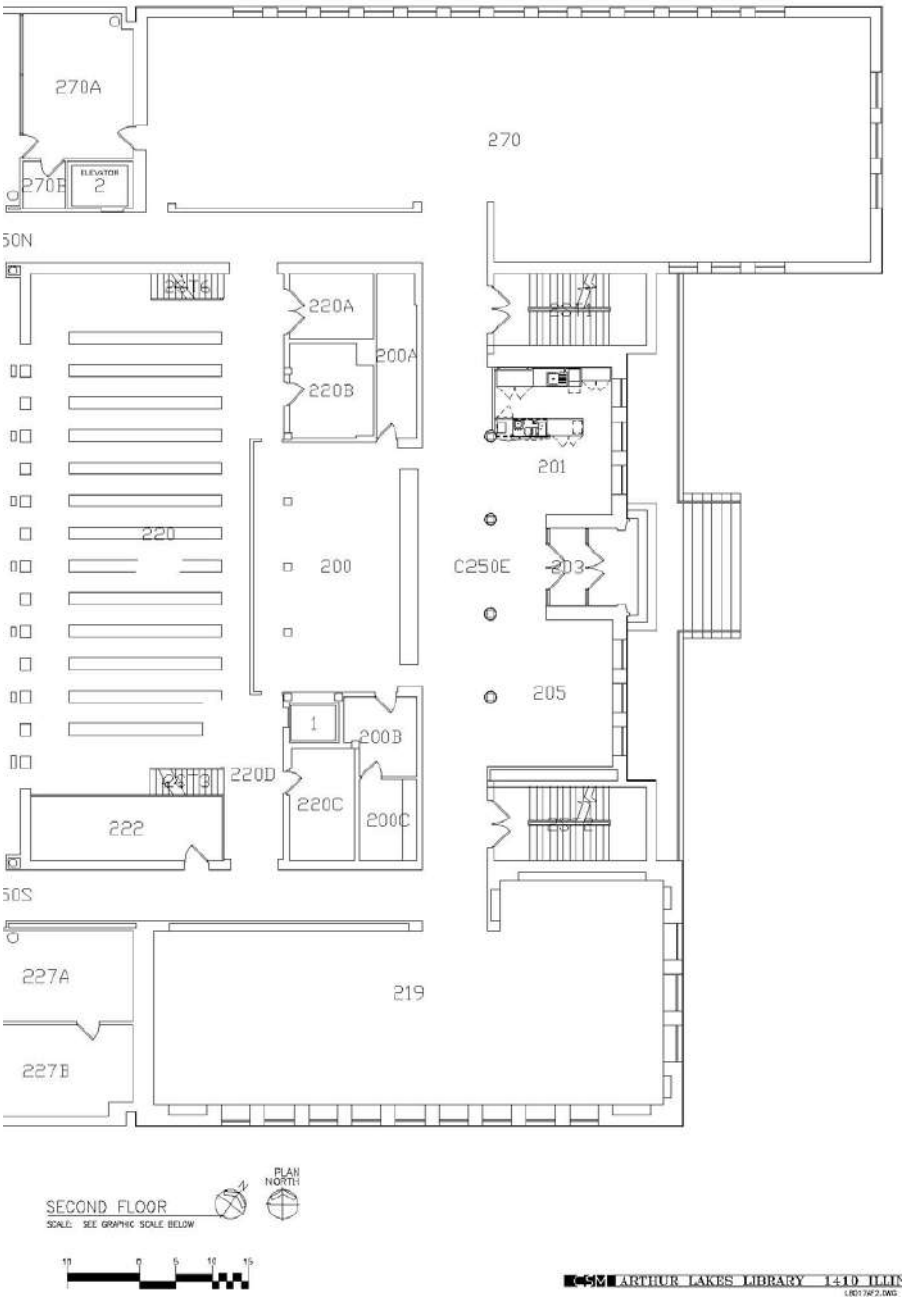
ARTHUR LAKES LIBRARY COLORADO SCHOOL OF MINES GOLDEN, COLORADO (Not to Scale)	FEI Project #AS17253	Date:10/13/17	Figure 2
	Approved by:NV	Drawn By:DMB	
	Foothills Environmental, Inc. 11099 W 8th Avenue Lakewood, CO 80215		

FIRST FLOOR MATERIAL LOCATIONS



ARTHUR LAKES LIBRARY COLORADO SCHOOL OF MINES GOLDEN, COLORADO (Not to Scale)	FEI Project #AS17253	Date:10/13/17	Figure 3
	Approved by:NV	Drawn By:DMB	
	Foothills Environmental, Inc. 11099 W 8th Avenue Lakewood, CO 80215		

SECOND FLOOR MATERIAL LOCATIONS



ARTHUR LAKES LIBRARY COLORADO SCHOOL OF MINES GOLDEN, COLORADO (Not to Scale)	FEI Project #AS17253	Date:10/13/17	Figure 4
	Approved by:NV	Drawn By:DMB	
	Foothills Environmental, Inc. 11099 W 8th Avenue Lakewood, CO 80215		

Foothills Environmental, Inc.
Industrial Hygiene, Safety & Environmental Services

ATTACHMENT 3

PHOTOGRAPHS

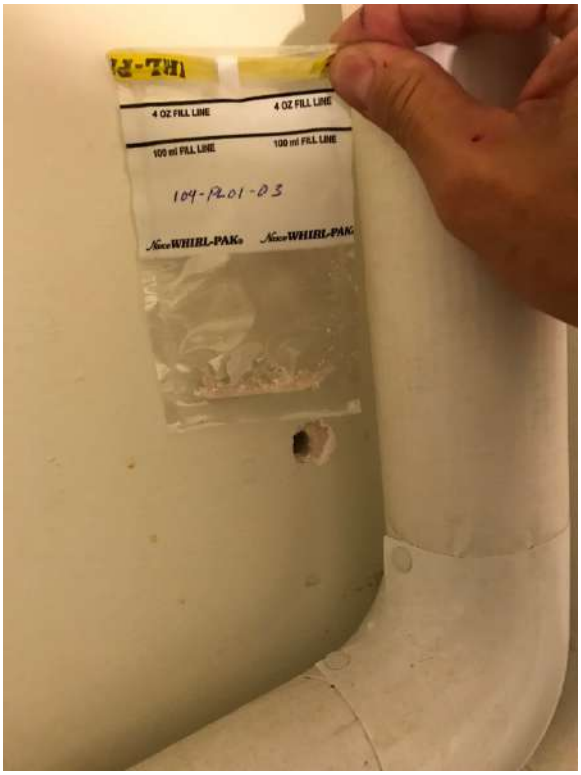
Sample C250E-CDW01-01, Composite Drywall and Joint Compound - ND

Sample 220C-FT01-01 – ND in Black Mastic and leveler, 3% Chrysotile in Tile

Sample 222-GD02-01 – None Detected

Sample 120-GD01-01 –None Detected

Sample 171-PL01-01 – None Detected



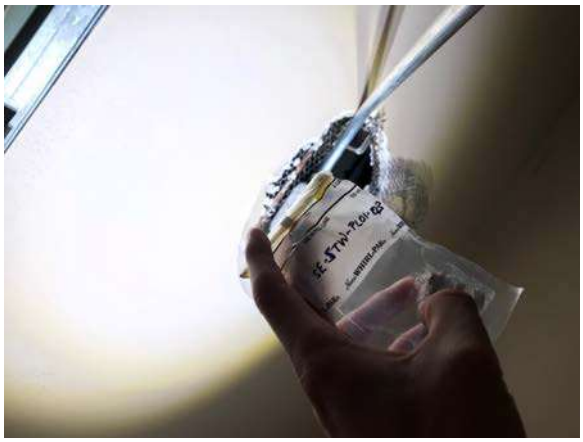
Sample 104-PL01-03 – None Detected

Sample 110-PL01-02 – None Detected

Sample 180-CB01-01 – 25% Chrysotile

Sample 119-CM01-01 – None Detected


View of Room 180 Carpet – Trace ACM in Mastic


Sample SE-STW-PL01-04 – None Detected, in SE stairwell HVAC chase

View of Room 180 Cabinets to be removed with ACM floor tiles beneath – chalkboard also to be removed

Foothills Environmental, Inc.
Industrial Hygiene, Safety & Environmental Services

ATTACHMENT 4

CERTIFICATES

Colorado Department
of Public Health
and Environment

ASBESTOS CONSULTING FIRM

This certifies that

Foothills Environmental, Inc.

Registration No.: ACF - 14925

has met the registration requirements of 25-7-507, C.R.S. and the Air Quality Control Commission Regulation No. 8, Part B, and is hereby authorized to perform asbestos consulting activities as required under Regulation No 8, Part B, in the state of Colorado.

Issued: January 30, 2017
Expires: January 30, 2018

Authorized APCD Representative

SEAL

Colorado Department
of Public Health
and Environment

ASBESTOS CERTIFICATION*

This certifies that

Daniel M. Benecke

Certification No.: 1947

has met the requirements of 25-7-507, C.R.S. and Air Quality Control Commission Regulation No. 8, Part B, and is hereby certified by the state of Colorado in the following discipline:

Building Inspector*

Issued: **January 19, 2017**

Expires: **January 19, 2018**

**** This certificate is valid only with the possession of a current Division-approved training course certification in the discipline specified above.***

Authorized APCD Representative

SEAL

CHC TRAINING

1775 West 55th Avenue
Denver, CO 80221
303.410.4941
trainingchc.com

CHC TRAINING, LLC
2015

Certifies that

Dan Benecke
1947

Has Successfully Completed the EPA- Approved Annual Asbestos Refresher Training Course Under Section 206 of the Toxic Substance Control Act (TSCA), Title II.

BUILDING INSPECTOR

Course Date: February 10, 2017
Certificate No.: R17-0240-AI-CO
No. of Hours: 4
Expiration Date: February 10, 2018

Certification not valid without watermark

Frank Hulce

Frank Hulce - Instructor

Danaya Benedetto

Danaya Benedetto- Training Program Manager

CHC TRAINING

1775 West 55th Avenue
Denver, CO 80221
303.410.4941
trainingchc.com

CHC TRAINING, LLC 2015

Certificate of Completion

presented to

Dan Benecke

1947

in recognition of satisfactory completion of an EPA Approved Asbestos Hazard Emergency Response Act refresher course of instruction under Section 206 of the Toxic Substance Control Act (TSCA) and Colorado Regulation No. 8 entitled

AHERA Project Designer Training

Course Date	February 9, 2017
Certificate No.	R17-0224-APD-CO
No. of Hours	8
Expiration Date	February 9, 2018

Certification not valid without watermark

Frank Hulce

Frank Hulce - Instructor

Danaya Benedetto

Danaya Benedetto- Training Program Manager

Colorado Department
of Public Health
and Environment

ASBESTOS CERTIFICATION*

This certifies that

Daniel M. Benecke

Certification No.: 1947

has met the requirements of 25-7-507, C.R.S. and Air Quality Control Commission Regulation No. 8, Part B, and is hereby certified by the state of Colorado in the following discipline:

Project Designer*

Issued: **January 19, 2017**

Expires: **January 19, 2018**

**** This certificate is valid only with the possession of a current Division-approved training course certification in the discipline specified above.***

Authorized APCD Representative

SEAL

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Lakes Library 11/27/2013

Facility Audit Overview

An audit was conducted to assess the physical condition of the Lakes Library building and utility systems. The results of the audit provide a score defined as the Facility Condition Index (FCI). In basic terms, it is the repair cost divided by the replacement value.

The audit results provide a useful tool for facility planning. The magnitude of building system deficiencies is identified and summarized on score sheets. The deficiencies can be prioritized by individual system or by building and used to justify funding requests for Controlled Maintenance and Capital Construction. The audit results give the campus administration an indication of the usefulness and long-term outlooks for the campus' physical assets.

Audit Data

Summary sheets were prepared for each component used in calculating the FCI. The summary sheets provide the following information:

Facility Identification- the facility is identified by building name, year built, and replacement cost.

Building Evaluation Table- the building evaluation table summarizes the audit data for the building. It contains the following:

Component- each building is broken down and scored by major components including the foundation, roof, plumbing, etc. These components will vary from building to building (e.g., all buildings do not have elevators.)

Component Condition Value Multiplier- the auditor rates each building component as to how the current condition has deteriorated from the new condition. A score of 10 would indicate that no deterioration has taken place and the component is in the same condition as it was when it was new. The rating is a subjective score assigned by the audit team.

Component Percentage of Total Cost- is the fraction of the buildings cost associated with the component based on the RS Means Square Footage Costs. For example, a roof with a multiplier of 8 means that the cost of the roof is 8% of the total building cost. The sum of all the factors by definition would add up to 100%.

Component Current Value- is determined by multiplying the Component Condition Value Multiplier by the Component Percentage of Total Cost

for each component. This is a measure of how a component relates to the overall building condition.

Component Estimated Useful Life Remaining- is based on the RS Means Facilities Maintenance and Repair Cost Data estimated useful life. It is calculated by subtracting the component age from the estimated useful life. It gives an indication of how close the component is to needing replacement.

Overall Building Rating- is an average of the Component Condition Value Multiplier in %. A new building would rate 100%.

Facilities Condition Index (FCI)- is a comparative indicator of the relative condition of facilities. The FCI is expressed as a ratio of the cost of remedying maintenance deficiencies to the current replacement value. The FCI provides a method of measurement to determine the relative condition index of a single building, group of buildings, or the total facility (physical plant). This calculation also provides the facility professional a corresponding rule of thumb for the annual reinvestment rate (funding percentage) to prevent further accumulation of deferred maintenance deficiencies. A new building will have an FCI of 99.

$$FCI=1-\frac{\text{Replacement cost-Current value}}{\text{Replacement cost}} \times 100$$

General Notes on the Audit Data

The audit provides a valuable assessment of the condition of the physical asset. The data gathered provides a benchmark for the present condition of the building and can easily be updated. It should be noted that the rating score for each building component is a subjective score assigned by the audit team. The same personnel were used to score particular building components in each building so that the scoring criteria would be consistent. This makes the results very accurate for relative comparisons between buildings. While the relative scoring is very accurate, the absolute scoring and resulting FCI should be recognized as having a subjective component.

Another important item to recognize is that the replacement cost should be distinguished from actual construction project costs. For example, a building may have a replacement cost for plumbing of $24,000. This cost would provide for repairing and/or replacing plumbing piping, valves, and fixtures to restore the system to the condition that it was when the building was new. However, the replacement cost does not include cost for drywall, painting, floor covering, ceiling, and roof repairs that could be required to gain access to the plumbing components or the cost of meeting current code. The replacement cost is a good order of magnitude measure and is valuable when comparing relative costs between buildings or systems.

Summary
The Lakes Library is located at 1410 Illinois Street. Built in 1953 the Library received a 37,660 gross square foot addition in 1979. The 1953 and 1979 buildings are 3 stories tall and include 2 mezzanines to yield 5 floors of stacks. Classified as type II construction the 79,774 gross square foot building is constructed with reinforced concrete floors, columns, and beams with a brick and concrete panel veneer exterior. The 2013 replacement value was $19,317,000. Utilities to the building are from CSM and the city of Golden. The CSM 13.2kV electrical distribution system, through switch S7, supplies power to a 1000 kVA 480/277 volt transformer, T-7, to the main distribution panels. A 40 kW 480V emergency generator feeds the life safety and stand by loads during a power failure. CSM provides steam for building heat and cooling is from chiller plant 4 containing one electric and one absorption chiller. The city of Golden Colorado supplies water and sewer service.

The Library has had numerous renovations and improvements over the years.

- 2013 New security system and site drainage improvements
- 2011 Coffee bar added
- 2010 Gutters and heat tape installed for the main entrance, domestic water pipe replaced in the 1953 building
- 2009 Skylight replaced and window resealed
- 2007 Secondary electrical upgrades
- 2003 Fire alarm system upgrade and standpipe install
- 1998 HVAC upgrade for chilled water
- AHU 4 and 5 installed, hot water heat fin tube replaced steam radiators, Chiller plant 4 built, Steafa DDC controls replaced pneumatic controls, Fire alarm upgraded with new horns/strobes, smoke detectors, and a shunt trip
- 1995 Built up roof replacement, new elevator installed
- 1979 New 37,660 gsf addition, 14th street closed for a parking lot, new HVAC controls installed
- 1977 modified roof replacement.

Deficiencies (in order of priority)

- Smoke detectors
- Concrete at the East entrance
- HVAC DDC controls
- Elevators
- Storm piping in the 1953 building
- Roof on the upper section
- Exterior slab wall veneer
- Windows including the West curtain wall
- Asbestos floor tiles
- Ceiling tiles

Audit Files

The complete audit and photographs are located at:
I:\Facilities Management\Facilities Management\Commissionings\Facility Audit\Library 12-13

The facilities audit completed on January 8, 2014 rated the components that make up the substructure, superstructure, exterior enclosure, roof, interior, plumbing, HVAC, fire protection, and electrical. The CSM target FCI is 85%, Lakes Library scored 73.3% with a capital renewal target of $2,260,321. The audit evaluation score does not include site work receiving a 71.5% rating.

BUILDING EVALUATION SUMMARY

Building Information

Facility Name:	***Library***	Building Code	***LL***
Date:	*1/8/2014*	Auditor	*B Slavik/ M Ray*
Year Constructed:	*1953/1979*		
Gross Sq. Ft:	*79,774*	Net Sq. Feet	*73,468*
Replacement Value	$19,317,000.00		

Component Rating

Component	Building Component Percentage of Total Cost	Building Component Replacement Cost ($)	Building Component Condition Value Multiplier	Building Component Current Value	Building Component Capital Renewal Target FCI=85.00	Building Component Estimated Useful Life (years)	Building Component Age (years)	Building Component Useful Life Remaining
Substructure	*7.10*	*$1,371,507*	*7.13*	*$977,884*	*$187,896*	*75*	*61 and 35*	*14 and 40*
Superstructure	*13.20*	*$2,549,844*	*7.75*	*$1,976,129*	*$191,238*	*50*	*61 and 35*	*-11 and 15*
Exterior Enclosure	*17.60*	*$3,399,792*	*6.98*	*$2,373,055*	*$516,768*	*50*	*61 and 35*	*-11 and 15*
Roofing	*2.40*	*$463,608*	*7.79*	*$361,151*	*$32,916*	*70 to 20*	*61, 37 and 19*	*9,6 and-12*
Interiors	*14.30*	*$2,762,331*	*7.71*	*$2,129,757*	*$218,224*	*20*	*61 to 1*	*-41 and 19*
Conveying	*7.20*	*$1,390,824*	*5.61*	*$780,252*	*$401,948*	*23*	*61 and 19*	*-38 and 4*
Plumbing	*5.50*	*$1,062,435*	*7.05*	*$749,017*	*$154,053*	*25*	*61 to 2*	*-36 to 23*
HVAC	*18.20*	*$3,515,694*	*7.48*	*$2,629,739*	*$358,601*	*25*	*61 to 16*	*-36 to 9*
Fire Protection	*2.40*	*$463,608*	*8.50*	*$394,067*	*$0*	*50*	*10*	*40*
Electrical	*12.10*	*$2,337,357*	*7.65*	*$1,788,078*	*$198,675*	*35*	*61 to 7*	*-26 to 28*
TOTALS	***100.00***	***$19,317,000***		***$14,159,129***	***$2,260,321***			

FCI=Repair cost/Replacement value: **73.30**
Building Capital Renewal Target **$2,260,321**
FCI=85.00

4.3 DESIGN PROGRESS MEETING MINUTES

MARCH 19

1:30 - 3:00 PM BUILDING ADVISORY COMM

Attendees:

Jurgen Brune	Undergraduate Students (USG)
Beth Zecca	MN
Paul Martin	AMS
Carol Smith	Library
Patricia Andersen	Library
Colin Terry	Student Life
Amy Argyris	Student Life / CASA
Paula Farca	HASS
Susan Miner	ODC
Meaghan Guyader	CEE/ GSG
Toni Leflen	AA / HASS
Swey Swift	USG
Chris Cocallas	ODC
Gwen Gilley	HCM
Craig Welsh	HCM
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Introductions

2) Project History Review & Study Comparisons

- HCM presented the history of the project thus far, with interviews beginning in 2016 and evolving in 2017 by Carol and her team.
- Carol commented on the use of the words 'salon' and 'nexus'.
- The Library has been involved with the "Pathways of Distinction" proposals. The Board of Trustees will choose what resources will be allotted to which Pathways.
- There will be no relocation of the Geology Museum at the moment.
- Most campus makerspaces are going into the Innovation Hub, so the Library's makerspace may be accounted for in the Hub.
- Suggested New Program - GIS, faculty lounge, graduate student lounge, library instructional classrooms, café, and STEAM spaces.
- Expanded study spaces are a priority: quiet, with outlets
- At this time, Student Services could be in the Library or they could be located elsewhere.
- The graduate students want the Library building to expand. They would like this committee to determine how that is feasible.
  - Colin added that the question has been asked and the answered 'no'.
  - Susan (CSM) suggests a separate meeting to ask administration why can't the building expand?

3) Opportunities

- HCM posed the question to each of the BAC members: *What would make this project a success?*
- The following were the responses from the committee:
  - Connectivity to campus
  - Nexus, hub, transects. Transparency of systems in the space.
  - Collections, books. How do we do high capacity? What also exists in other buildings should be taken into account. Can functions be relocated? More student space is needed; what is unique about the student space in the Library?
  - Accessibility of resources
  - A place you want to meet others
  - A place students can be proud of
  - Community. Students want to be in the company of others.
  - Make sure everyone has a voice; community involvement (including Golden).
  - Whatever students need, mostly quiet study space. The classrooms that were added took up a good amount of the study space.
  - Need space for a digital lab. Faculty/staff space is needed.
  - It is also about faculty; neutral space to meet others.

- HCM posed the question to each of the BAC members: - *What needs to be solved with the Library renovation?*
- The following were the responses from the committee:
  - Space should be more modern, enjoyable, ADA compliant. We should embrace ADA.
  - Zoning, quiet space.
  - More usable stack space. There are too many existing hallways, circulation space should be organized better.
  - The entry should be where most of the students come from on campus, most likely the current ADA entrance.
  - Most first year students do not think about coming to the Library; there should be something to 'draw' them in.
  - Aesthetics, multiple entries. Walkability has been improved on campus and the Library needs to tie into this also.
  - The entrances should fit into what's in the campus master plan; we should have the info by mid-April.

Additional discussion and comments:

- CSM posed the questions: Do we have the money to do all this? What are the priorities?
- Chris responded that as of now, the budget is between $5 -10 million, say it is $8 million. If more is wanted, the program plan would need to be completed by June and submitted to the State for funding consideration next year. The budget process could take two years. He added that this question may be for a separate committee to determine.
- Carol requested that the advisory committee meetings should be open to the public. Chris clarified that they cannot be public because it will be difficult to manage.
- It was added that students are concerned about the usability of the space during construction. Can it be phased?
- Carol add that she would like to see Tutoring and Testing in the Library.

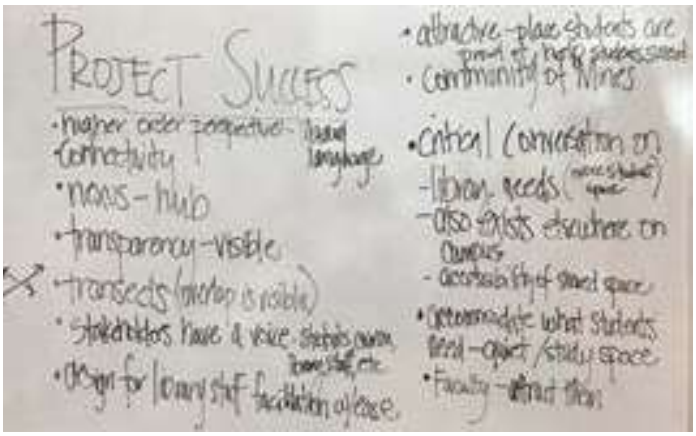
4) Project Schedule

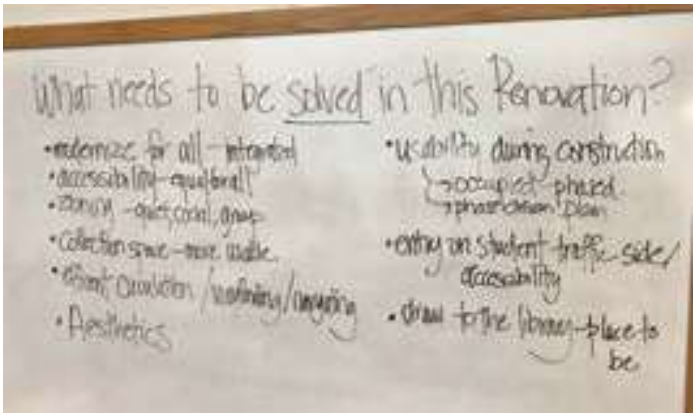
- HCM asked the BAC which additional user groups they should interview for the project. The BAC suggested Special Collections, Scholar Group, and STEAM (Toni is head of STEAM).
- Chris clarified that the committee needs to decide if they want the smaller project vs. the larger project. This will affect timing and duration of the project significantly.

5) Next Steps

- HCM used the physical model of the Arthur Lakes Library and the 'game pieces' that represent program space to discuss how we will discuss programmatic space in future meetings.
- The next BAC meeting is in CoorsTek Monday April 2, 2018 at 1:30pm.

- The meeting was adjourned at 3:00 pm.





APRIL 2

1:30 - 3:00 PM BUILDING ADVISORY COMM

Attendees:	
Patricia Andersen	Library
Sevy Swift	USG
Meaghan Guyader	CEE/ GSG
Colin Terry	Student Life
Amy Argyris	Student Life / CASA
Beth Zecca	Library
Carol Smith	Library
Paul Martin	AMS
Jurgen Brune	Prof of Practice / Assoc Dept Head
Chris Cocallas	ODC
Gwen Gilley	HCM
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Role of the BAC

- Chris started the meeting by discussing the role of the Building Advisory Committee in developing any project on campus. He described the development of a program plan and design that meets the requirements (within the budget limitations) of the Colorado School of Mines. The BAC recommends a program plan and design to the Exec utive Committee and the Board of Trustees. Chris clarified that the Executive Committee will be reviewing every Program Plan prior to the submittal to the Board of Trustees, which will be the standard procedure for all projects moving forward. Once the Program Plan is approved, it will be submitted to the State for funding approval.
- Chris stated that the deadline to submit to the State for FY 2019-2020 is between early June and late July. Chris will confirm the deadline for 2018 prior to the next meeting.
- Chris explained that the Colorado School of Mines Campus has their own 5-year Plan of projects and project requests that they re-visit each year. This Arthur Lakes Library Renovation project will need to be placed in the context of the other campus projects planned.

2) Project Update

- Chris added that the Executive Committee has requested that the design team conduct a benchmarking study of Peer Institutions of Comparable Size and Curriculum. This will help to determine that the campus' capital needs and limited resources are directed appropriately and to inform the programmatic functions of the Library.
- Chris discussed the project budget. The project budget is $10 million maximum, which includes soft costs. Considering the current Arthur Lakes Library is around 76,000 GSF, this budget translates to: $132/SF (Project Cost) or $105/ SF (Construction Cost). The limited budget will require the scope to be prioritized during the planning process.
- Chris also mentioned that coordinating with the overall Campus Master Plan, though not ideal in timing with the Library Programming effort, will be essential, so no spaces are duplicated in either effort.

3) Program Success

- HCM reviewed the statements and goals discussed in the last meeting as to what project success looks like and what needs to be solved in this renovation.

4) Programming Update

- HCM reviewed the current size of the Existing Arthur Lakes Library Building:
  - Total GSF = 76,800 GSF
  - Total ASF = 49,400 NSF
  - Compromised Mezzanine SF = ~20,000 GSF on 4 levels
- HCM added that the program document (illustrating the 2016 Study Discussions), in its current format, totals 101,000 GSF and 63,100 NSF. This version includes all of CASA's functions moving to the Library (including Tutoring Space), AMS, the Testing Center and the Writing Center. These spaces total approximately 8,900 NSF. The design team understands that these spaces will potentially be located in the Green Center, not Lakes Library.

- Colin asked to clarify the difference between the Tutoring Space that CASA and AMS share in the Library (currently around 1,800 SF), and the office space/functions of CASA as a Student Service on campus. The design team should be aware of the difference when planning.
- HCM walked the group through the current status of the Program Document. The following comments were noted by the design team:
  - Carol mentioned that the Monograph weeding is complete. She will continue to provide more updated information on the collection to the HCM team.
  - The students very much want a space in the Library that could be opened 24/7. This space should include computers and a copy center to be useful after hours.
  - Carol mentioned there are already efforts in place to separate the Reference Desk from the Circulation Desk.
  - Carol highlighted that Scholarly Communications, Reference/ Research consultations, Engagement and Instruction will all be located in one location soon in the current library.
  - Laptop check-out currently occurs on campus through CCIT.
  - The Book Sale has been eliminated, so no storage space needs to be allotted to it.
  - ILL is currently moving downstairs in the Library.
  - A few ideas for STEAM program to be included in the reimagined Library could be a black box, lecture space, etc. Carol clarified that these spaces are "Intentionally STEAM."
  - The program does not include additional functions discussed in the 2017 strategic planning effort, and this is a next step in the process.
- HCM reviewed the list of proposed User Interviews to conduct during the programming effort. The BAC agreed on the list, and added that the design team should meet with Warner Kuhr, Director of the future Mines Innovation Hub as well.

5) Next Steps

- Carol mentioned that she will be meeting with her representative at the Mines Foundation Tuesday (4/3) morning to discuss fundraising potential for this project.
- HCM will meet with the Structural Engineer to discuss potential ways to modify the existing mezzanine levels, due to their short floor to floor height and compromised use.
- HCM will update the Project Schedule with a tentative programming completion date of June 15th. HCM will then distribute to the BAC prior to the next meeting.
- HCM will also develop a proposed Peer Institution list to conduct the benchmarking study, and will forward to Mines for comment.

- The meeting was adjourned at 3:00 pm.

APRIL 30

1:30 - 3:00 PM BUILDING ADVISORY COMM

Attendees:	
Swey Swift	USG
Meaghan Guyader	CEE/ GSG
Amy Argyris	Student Life / CASA
Carol Smith	Library
Jurgen Brune	Undergraduate Students (USG)
Paula Farca	HASS
Chris Cocallas	ODC
Susan Miner	ODC
Gwen Gilley	HCM
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Benchmarking Study

- HCM will also develop a proposed Peer Institution list to conduct the benchmarking study, and will forward to Mines for comment.
- a. Structural options (cost, etc)
- 2. G.C
- a. Geophysics
- b. 50% Conferencing
- c. 50% Generic use – grad/office
- CASA - Staying put
- ii. Writing
- iii. Testing
- iv. M.P way down the road
- v. Student Success Center
- - $112K
- - 66K SF Mines space
- - Daycare?
- - Provost search
- - Summer
- o Grad next Fri 5/11
- o Classes start 5/14
- ☒ Grad GSG
- ☒ Undergrad
- - Diversity/Inclusion/Access
-
- - Ph. 1: $2.3 mil
- - Ph. 2: Up to $107-8 K
- - Ph. 3: Addition
-

2) Review Structural Options

- HCM reviewed
- HCM will meet with the Structural Engineer to discuss potential ways to modify the existing mezzanine levels, due to their short floor to floor height and compromised use.

3) Review Remaining Schedule & User Group Meetings

- HCM reviewed the statements and goals discussed in the last meeting as to what project success looks like and what needs to be solved in this renovation.

4) Programming Update

- with Warner Kuhr, Director of the future Mines Innovation Hub as well.

5) Next Steps

- HCM will update the Project Schedule with a tentative programming completion date of June 15th. HCM will then distribute to the BAC prior to the next meeting.
-
- The meeting was adjourned at 3:00 pm.

USER GROUP SCHEDULE

May 14

10:30 - 11:15 AM	COLLECTIONS / DISCOVERY / METADATA & LIBRARY SERVICES
11:15 - 12:00 PM	RESEARCH SERVICES / OUTREACH / ENGAGEMENT / INSTRUCTION / SCHOLARLY COMMUNICATIONS
1:00 - 1:30 PM	FULFILLMENT - CIRCULATION / ILL
1:30 - 2:30 PM	STEAM
2:30 - 3:15 PM	PRESERVATION / SPECIAL COLLECTIONS

MAY 15

8:30 - 9:00 AM	CASA / TUTORING CENTER
9:30 - 10:00 AM	LIBRARY ADMINISTRATION & BOOK & BREW
10:00 - 11:00 AM	BUSINESS INCUBATOR

Over the course of two days, the Design Team interviewed a variety of groups related to the Arthur Lakes Library to understand their needs, future needs, future growth and appropriate/critical adjacencies. During each session, each group was asked similar questions to the way they function today, and what they would like to see changed in the new library Master Plan. The following topics were discussed in each session related to their current/ future spaces:

- Utilize your Space
- Function
  - Hours of Operation & Available to Students
  - Staff Count, Student Worker Count & Officing Needs
  - Meeting/Conferencing Needs
  - Visibility to Students / Access
  - Storage Needs (Shared or Secure)
  - Future Growth Anticipated
- Existing Space
  - Likes & Dislikes
  - What is Missing? What can be condensed? What needs more space?
- Areas for Overlap/ Co-location/ Multipurpose Uses
- Special requirements or equipment

MAY 14

10:30 - 11:15 AM

COLLECTIONS / DISCOVERY / METADATA & LIBRARY SERVICES

Attendees:

Lisa Dunn	Research Librarian, Special Collections Manager
Patricia Andersen	Access Services, Assessment Librarian
Lisa Nickum	Cataloging Management / Systems
Karen Pfiffner	Government Information
Christine Baker	Collection Management (Special Formats Metadata Librarian)
Chris Thiry	Research Collection Management (Map & GIS Librarian)
Laura Guy	Systems Librarian
Stephen Katz	Acquisitions (Head of Acq & Serials)
Carol Smith	University Librarian
Chris Cocallas	ODC
Susan Miner	ODC
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Cataloging Management & Systems (Lisa Nickum)

- Hours - 9-6pm.
- Not available to students
- Reference work - some in the office
- Appointment-type basis
- Staff - (1) Student Worker shared with E-Resources Librarian (Ana)
- Meeting Space - Cataloging has more on-on-one meetings. Example with Laura weekly.
- Office Location: Rm. 180 in open cubicle shared with Lisa Dunn.
- Storage Needs: A lot of computers equipment.
- Future Growth: Unknown.
- Likes the spaciousness of current space and her stand-up/ sit-down desk.
- In future, it would make sense for her office to be co-located with others who deal with technology (Laura Guy, Lisa, Ye, Anna, and Karen.

2) Government Information (Karen Pfiffner)

- Hours: 8-5pm Open to Public during Library Hours
- Office Location: Rm 166 near Mail Room. (2) Cubicles - one for Karen, and one for student worker.
- Cart intensive work. Need deskspace and access. Would like to be near Government Docs collection.
- Some interaction with students.
- Meeting Space: Typically meet at her desk. When privacy is needed, she often utilizes the faculty lounge for reviews, etc.
- Storage: 100 boxes of materials have been placed in 180 and 120l (Vault).
- Most government info is coming out online, but have agreements with the state of Colorado, Department of Engineering= and USGS.
- Likes the daylight she currently has and more room.
- Student space is currently not adequate and more is needed. 2-3 students at one time can be working.
- No special equipment / requirements.

3) Special Formats/Metadata (Christine Baker)

- 80% of her work is online. Need space for some physical storage.
- Hours: M-F 8-5pm
- No visibility needed with students.
- Office Location: Rm. 166. Very cramped with (5) cubicles. Might be hiring a student for Christine's area.
- Meeting Space: Large Collection Management meetings occur with 6-8 ppl.
- Storage Needs: Not a lot of need.
- (2) student workers.
- Like direct views to exterior, but enclosed would be nice.
- More space for storage and layout space.
- Work closely with Special Collections. Need to be close to Stephen Katz and Anna.
- Carol mentioned that technical services requires a lot of

intensive, solo-mode work, which is hard with distractions.

4) Maps & GIS (Chris Thiry)

- Completes a lot of Collection Management. Lives in the research and reference spaces.
- Hours: 8-4:30pm M-F.
- Office Location: Rm. 133. A large amount of items are stored in his office - rare map stacks. Mats for processing maps. Requires large spread out space in office. Large work area required.
- (1) Staff, (2-3) students simultaneously helping at times. They complete processing work and filing in the area. When a computer is needed, they have to utilize lab computers, if open.
- Collection Space: Mostly in Rm. 129 (compact shelving) & 148 spaces.
- Meeting Space: Reference consulting occurs in his office, and additional seats and table are needed in his office
- Visibility to students is key to see and catch questions .
- Storage: 120I - Storage for gifts that are donated in bulk nee to separate them.
- Future Growth - Depends on the gifts they may receive in the future.
- Likes the adjacency to the collection. Need better large tables for visitors and students.
- Missing learning/ teaching research space.

5) Systems Librarian (Laura Guy)

- Office Location: Rm. 300 (just recently moved there and is a challenge due to its size to work productively). Planned to move to Rm. 270 eventually.
- Hours: 6:30-5pm M-Th. Commonly works remotely from home.
- Should be located close to the IT Help Desk, and near Ore Print.
- Conducts webinars online, commonly instructing from office.
- Storage Needs: Responsible for all hardware used by staff use. Not including the 30 computer lab. Constantly rotating hardware. Need space for spare parts. Proximity to Rms 180A-B, and 120H where they are currently stored.
- Meeting Space: Frequently meets 2 ppl with IT.
- No Future Growth anticipated
- Dislikes current office because it's uncomfortable, remote and isolated on the 3rd level.
- Collaborated with everyone on staff.
- *Added Notes (5/25/2018):*
  - The systems area needs sufficient office space to work and store hardware (both hardware parts and entire computers/monitors) in a secure area.
  - Work includes a staff workstation, a test workstation desk (second desk for testing software), a third area for building computers when needed, a small meeting area with a table and chairs that has a large screen monitor on the wall for meetings and collaboration. I did have these things in 180. What 180 did not have was proximity to the main lab and TSC Satellite. That would be preferred moving forward and would benefit future Systems people.
  - I also would like a large soft chair like I had in room 180, and which is now residing with someone else.

6) Acquisitions (Steve Katz)

- Role is procurement / accounts payable.
- Office Location: Rm 166 in cubicle. Need for privacy

because he is dealing with money and materials.

- (3) Student Workers. All processing materials, handling, labeling and shelving. (2) Student Workstations needed.
- Meeting Space: Meets with vendors and people wanting to gift/donate items. (1-2) ppl meetings he oftentimes uses ropes room for these meetings, for privacy.
- No need to be visible to students.
- Storage Needs: Largest issue is space for physical materials, books, serials. Need storage space especially for gifts and an area for processing.
- Shipping & Receiving is currently adequate for needs.
- Likes to be near daylight in current space.
- Dislikes student space because it's too crowded and little. Despise printer noise near him. Bell for deliveries is loud.
- Need to be closely located to Anna (E Resources). Need his own printer, currently utilizes Karen's scanner/printer.

MAY 14

11:15 - 12:00 PM

RESEARCH SERVICES / OUTREACH / ENGAGEMENT / INSTRUCTION / SCHOLARLY COMMUNICATIONS

Attendees:	
Lisa Dunn	Research Librarian, Special Collections Manager
Patricia Andersen	Access Services, Assessment Librarian
Ye Li	Scholarly Communications Librarian
Chris Thiry	Research Collection Management (Map & GIS Librarian)
Gyasi Evans	Outreach / Engagement Librarian
Brianna Buljung	Instruction & Research Librarian
Carol Smith	University Librarian
Chris Cocallas	ODC
Susan Miner	ODC
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Scholarly Communications (Ye Li)

- Hours: 730-430pm / 8-5pm. Appointment based meetings.
- Collaborates with (1-2) student workers. Currently they don't have cubicles.
- Meeting Space: Must have space to meet with 2-3 people. Utilize technology (big screen or laptop), flexible furniture to reconfigure into mini-instruction, group work, etc. At times, (3-7) ppl in groups.
- Often conducts virtual meetings via her computer over skype, etc.
- Reference model - Scholarly Communications is not a separate thing, but a way to describe their service. It's user-focused - understanding user needs, collaborating space, and to allow for new possibilities. Utilizes VR, virtualization, instruction spaces with technology at students' fingertips.
- Research, instruction, simple
- Future Growth- 2 people joining her group further down the road.
- Storage space: Not much needed for personal needs. Technology is for flexibility, laptop storage/charging.
- Adjacency is needed with Brianna (Instruction) and Gyasi (Outreach/ Engagement).

2) Instruction & Research (Brianna Buljung)

- Hours 8-5pm.
- Office Location: Shared office with Ye Li in Rm. 270A. (1) Staff, and (1) student intern at times. Current desk is not ideal, need monitor that turns and can be shared with visiting student(s) or faculty.
- Needs to be visible to students and close to the instruction spaces. Conducts follow-up meetings after classes and consultations.
- Storage Needs: Small equipment for instruction use including power cords, markers and poster boards.
- Meeting space: Meeting with individuals and small groups up to 5 students or faculty. The Intro to Design course (previously EPICS) meets one week a semester with 5 students and 1 librarian in meetings run concurrently in the Boettcher Room and library conference room (226 B/ Fishbowl). This makes both rooms largely unavailable for other instruction, events or meetings during that week. Up to 3 sessions run concurrently and each group needs a quiet space with computer connectivity and projection. Other classes, such as Natural Resources Economics are encouraging or requiring individual student meetings with a librarian at various points during the semester. Taking over the conference room or using our offices are not ideal for these meetings because of impact to office mates and scheduling of other meetings and events– small meeting rooms, like those suggested for the glass wall project, are much better suited to this time of work with students.
- Future Growth is (2) more instruction librarians - (1) a First Year Experience Librarian would be shared with Gyasi, and (1) an Online Instruction Librarian, works with online students.
- Prefers desk to face door (as opposed to back towards the door) and moved desk to accommodate this, removing some capability to meet with students at my desk.
- Current teaching happens in the following spaces:
  - Boettcher Room - Works but there is a need for more power throughout the entire room. Seats 25 ppl on the east side, 40 ppl on the west side of room but there is no

projection equipment on the larger side limiting its use as a classroom. They utilize for full classes, small group meetings (see EPICS above), and events & it is used for independent student work when at least (1) side is not in use. Typically, students have to be kicked out, or asked to move to the other side of the room for events. Must account for transition for room set-up, between study set-up (tables and chairs)and concert/event set-up (concert chairs). Nothing can be scheduled back to back if a change of room configuration is required.

- Lost Rm. 119 to scheduled classroom spaces while Green Center is being renovated. Rms 119 & 121 would be good to use as instruction classrooms following Green renovation. Though, there is not enough power in those rooms as well. Would prefer for 119 to remain as is, flexible classroom space with chairs that move easily to accommodate rows or group work. Would like (1) lab-enabled classroom, similar to CoorsTek Rm. 130. Room 121 would be ideal for this, computer would accommodate GiS and other software needed for instruction.

3) Outreach / Engagement / Reference (Gyasi Evans)

- Office Location: Cubicle in shared office Rm. 227B with ILL. Would like to be visible and not too far away. Office space currently has no ceilings and noise is carried. Not good for meeting space or conversations. Currently shares office with Wendy Shortridge. Wendy is moving downstairs to Rm. 123.
- Working with clients - Groups of (5-30) people. Mondays there is a program of (10-35) people. Book discussions are capped at 70 people.
- Hours 7:30-4:30pm M-F, unless events or programming occurs outside of these hours. Needs to be available at all times.
- Meeting Space:
  - Boettcher Room. Projection capabilities on opposite end would be nice. The podium is not currently the CSM standard.
  - (2) new classrooms have different availability. Student groups use these rooms in the evening.
- Display at Entry - Would be nice to have a table at the front door for outreach to engage. Book & Brew is too loud. Highlight exhibits through technology. Need hanging display space near Library Circulation. Sherry manages this.
- Meeting Space: Works with (5-7) ppl committee to discuss spaces for events. Need for whiteboards and LCD screen.
- Storage Needs: Storage for concert chairs currently are housed in Rm. 120A on first floor. Also, need storage for swag items which are currently held in Rm 308A. All consolidated in one location would b e ideal.
- Future growth depending on outreach.
- (1) Student Worker - Graphics Workstation. Student works 3x a week for 3-4 hours = 10 hours a week.

4) Maps & GIS (Chris Thiry)

- Office Location: Rm. 133. Currently there is no space for consultations.
- Related GIS needs.
- Need a 20-50 person classroom adjacent to the collection for working specifically with maps. Classes of 15 now gets tight. Currently not enough technology or a wall to project.
- GIS teaching will require available technology and built-in lab with computers. Groups of 3-4 students would work around a table when teaching.
- Flexible, modular. Data visualization wall.

5) Reference Desk (Lisa Dunn)

- The Reference Desk needs to be visible and in highly trafficked area. Currently too much noise traffic, too close to outreach events and unable to have confidential conversations. Most are one-on-one consultations at the counter. Also, use two terminals in exhibit area for walk-ins.
- Most librarians work reference as their responsibility. “Book a Librarian” happens in semi/enclosed rooms. (9) ppl cover reference with 40-45 hours fully staffed - one staffed at a time. Currently there are no student workers trained for Reference.

- Functions 8-5pm M-F. Maybe weekends in the future. A lot of reference help is completely virtual.
- Meeting space: Reference meeting weekly 10-12 people
- Conference – better keep abilities for video conferencing.
- Visibility to students is important and access. But also focus on work not to be interrupted by people.
- Reference Services Consultations – one-on-one small group conversations. Side by side consultation with monitors. 3-6 people when consulting groups. Reference interns still need a desk.
- Reference has moved 5 times recently, and everything needs to be flexible. Space and furniture has always been a barrier. Should define the new space with permanence but need to be movable in the future.
- Adjacency to tutoring space is attractive. Research events, writing center, and reference librarians. Having services adjacent/co-located.
- Likes – In their current location they can see and be seen, can ask if they need help and visibility is important. Public terminals adjacent is important
- Dislikes – noise/crowds/traffic. The desk is a barrier!
- Office Location: Rm 188 and is shared with Lisa Nickum Not ideal office location because everyone else is located on the second floor.
- Video conferencing and more electrical outlets are needed.

MAY 14

1 - 1:30 PM

FULFILLMENT - CIRCULATION / ILL

Attendees:	
Lisa Dunn	Research Librarian, Special Collections Manager
Patricia Andersen	Access Services, Assessment Librarian
Tim Ramstetter	Library Tech III
Wendy Shortridge	Interlibrary Loan Coordinator
Robyn Copeland	Circulation Coordinator
Carol Smith	University Librarian
Chris Cocallas	ODC
Susan Miner	ODC
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Circulation (Robyn Copeland)

- 104-hour schedule.
- Total Staff
  - (41) student assistants.
  - (1) Tim
  - (1) Robyn
- Need a full-time desk for staff behind circulation counter.
- (2) student workstations at circulation desk
- Tech Gadget Desk is service point for technology. Currently they have go-pro cameras, webcams, chargers, laptops storage for staffed only.
- Eventually they would like self checkout laptops.
- Office Location: Robyn's is Rm. 200B (used to be closet) with small storage Rm 200C closet. Tim's office is Rm. 222 (no natural light). Visibility and access is needed.
- Storage needs: Laptops in large storage cabinet. Technology for tool collection and inventor toolkits (recently ordered 4 new ones) need to be right at the desk. Possibly glass doors to see what is available but lockable
- Room 120A where they store (60) concert chairs. Set-up takes time for book talks, lectures, etc.
- Like - Co-located with ILL (same floor) since they are both in Fulfillment.
- Dislike Book & Brew because they are so loud.

2) Interlibrary Loan (Wendy Shortridge)

- ILL controls borrowing and other resource lending/ exchange, domestically and internationally. Last year, they processed 8000 requests.
- Office Location: Rm. 227A/B, moving to Rm. 123 where they will get new furniture.
- Work room needs packaging area and space for packaging supplies. Detail oriented, concentrated computer work where they are typically researching data.
- Hours 8-4:30pm M-F
- Total Staff:
  - (1) Staff
  - (3) ILL students workers
  - (1) Communications/ Graphic Designer
- Meeting Needs: One-on-one with ILL users.
- ILL not necessarily linked to circulation.
- Future growth is anticipated.
- Like – window views, and as concert coordinator, they can see unloading/loading happen at handicap ramp area. Proximity to mail room now.
- *Added Notes (5/25/2018):* Wendy stressed the need for all Library staff to be located on the same floor for practicality and building a sense of community amongst staff. It's probably not possible in the Library's current footprint but desirable

3) Circulation (Tim Ramstetter)

- Recently re-engaged Prospector (catalog software) needs, which is separate from ILL. Graduate student workers will process in the evenings as well as monitoring students staff after hours. Need (1) graduate student desk behind circulation counter, separate from (1) supervisor.
- Carol added that the Provost agreed to hire (1) new part-time evening and weekends Reference Librarian and they will also need to be responsible for supervising after hours staff.
- Back wall storage - Lagonda Course Reserves, Toolbox Collection.
- Room scheduling happens utilizing LibCal by Springshare. Staff prints out daily schedule for group study room reservations.

MAY 14

1:30 - 2:30 PM

STEAM

Attendees:

Lisa Dunn	Research Librarian, Special Collections Manager
Patricia Andersen	Access Services, Assessment Librarian
Sherry Muniz	Preservation
Sevy Swift	USG
Bob Klimek	Music Faculty
Paula Farca	HASS Faculty Senate
Toni Lefton	STEAM
Melanie Brandt	Co-Director of Writing Center
Gyasi Evans	Outreach / Engagement Librarian
Brianna Buljung	Instruction & Research Librarian
Carol Smith	University Librarian
Chris Cocallas	ODC
Susan Miner	ODC
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) STEAM Brainstorming

Carol Smith

- Carol described advancing the mission on multiple fronts. Engagement in a more fuller, riche, broader experience. Arts make it a better STEM researcher.
- The Library is a communication platform.

Paula Farca

- Paula has used the Library for exhibits. Creative components have been on display. She believes the arts add to a well-rounded education.
- Flexibility (like at CoorsTek - walls are retractable) and exhibit space for projects, materials, etc and a dark room.

Toni Lefton

- Toni described the ideal STEAM space as an "architectural studio space." Including big tables, 3D printers, drafting tables, potter's wheels and space to store supplies.
- The space should be multifunctional and provide an artistic, liberal arts component.
- Possibly we could double the darkroom/recording studio functions.

Bob Klimek

- Location, location, location is one of the best features of the Library.
- Students could stumble upon opportunities where engineering is an art form. For example, they can provide beginner courses for instruments. There is a spare grand piano for the library in the Music Department.
- Space is needed for performances - dance space with appropriate wood floors. The Dance Team (Slide Rulers) practices in CoorsTek.
- Mixing station – better software is needed and the space is half the size of the Fishbowl. Must isolate.
- Instrument design – currently there is no work space for this function. Area with the control room for music studio. (2) media stations and proper acoustic properties to bring the audio and visual components together.
- Musical scores are moving into the Library to Rm. 120A-M.

Brianna Buljung

- Closing the loop and coming full circle with the arts.
- Exhibit the Trade Fair from the EPICs Class, the mural from the Mental Health Fair
- The entrance must accommodate large items like the hyperloop pod for final project display

Gyasi Evans

- Allowing for the production of art and programming to support it. Must make space and availability for art.
- Intro classes, display space for patrons and community members to visit. Currently there are (51) people in the Town and Gown Book Club.

Sevy Swift

- STEAM aspects to program:
  - Darkroom/mixing studio
  - Noise isolation
  - Podcast/ Instrumental creation
  - Performance Space
  - Poster workspace and supply space
- Not just for art but a place that it intersects

Melanie Brandt

- "Stumble upon aspect"
- Social element to the library should be added.
- Hub for STEAM.
- People can get casually involved and engage with different materials.
- Casual, decompression, destressing zone
- "STEAM VENT" – in the student center, community aspect, relaxing space near the Bookstore. This should be moved to the Library.

Toni Lefton

- Toni teaches a course called the "Art of Communication Science. Their project is to create posters, mock-ups, story boarding exercise, and display their work.
- Create a gallery space with digital displays.
- The "Literacy journal for the Arts" recently held its opening at the Foothills Art Center reception for 150-200 people.
- STEAM spaces need to be technology-enabled,
- The Boettcher Room is beloved, and the presence of books is important.

Sherry Muniz

- Multi-purpose and flexible.
- Screens and technology-induced.

Bob Klimek

- Outside displays along outdoor spaces. Carol added that these spaces are also important..

MAY 14

2:30 - 3:15 PM

PRESERVATION / SPECIAL COLLECTIONS

Attendees:	
Lisa Dunn	Research Librarian, Special Collections Manager
Patricia Andersen	Access Services, Assessment Librarian
Sherry Muniz	Preservation
Nick Iwanicki	Archives/ Special Collections
Carol Smith	University Librarian
Chris Cocallas	ODC
Susan Miner	ODC
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Special Collections (Nick Iwanicki and Lisa Dunn)

- Nick is the Archivist and Interim Museum Director.
- Office Location: He occupies around 120 sf in Rm. 170 with Preservation. He processing collections, and needs a bookshelf in addition to his desk.
- Meeting Space: His meetings take place in Special Collections Rm 184 when he covers open hours.
- (1) Staff, and possibly (1) student worker. Table adjacent to his desk is good for two people to complete work.
- Storage: The Special Collections are disbursed in 10 separate rooms (Mining Rm. 184, CSM Rm. 308, Tell Ertl Oil Shale Repository Rm. 186, Rope Rm 309, Office Rm 180, Intake Rm 180A, map cabinets, preservation, and Vault Rm. 120).
- He taught CSM 101 History utilizing a book cart. Archival materials need to be accessible to the students and community.
- Adjacency to Shipping/ Receiving
  - Rm. 180A is full of items process/ being processed
  - Rm. 108 will be filled with items being accepted
- Processing – inventory/ weeding = spreading stuff out to process and cannot be opened in Preservation due to concerns regarding contamination. Secure storage is needed. Compact shelving is full.
- 4,100 LF of materials not including unprocessed gifts
- (1) Reading Room (Mining Rm. 184)
- (1) Donor stipulated Rm 309 - Patrons must have direct access--the ability to browse through shelves and pull materials of interest--not something allowed in the other collections.
- (2) rooms of Closed Collections that must be secure.
- All (4) special collections spaces must be in secured spaces; storage and processing rooms must also be secured from the public.
- Environmental Control is needed in these rooms.
- The collection needs to be discoverable, Need staff space.
- Ideal layout:
  - Entry space with reading tables
  - Next space are the collections with high-density shelving.
  - Next, an Event / Instruction space that has a Board of Trustees type-finishes. Preservation, the Digital Lab, and Offices should be adjacent.

2) Preservation (Sherry Muniz)

- Preservation - (1) student worker – collaborating with museum, virtual and physical
- Hours: 7-4 pm
- (2) Student workers in Preservation, Digital Lab - (1) student worker
- Current space is not well configured. They need a lot of large/long tables, space for storage and supplies.
- Map Repair, sink, fumehood, humidification chamber, cutters, open shelves and closed shelves (deeper than normal), presses, supplies for special collections
- Digital Lab is Rm. 166 - Beth Zecca occupies the right corner of the suite, and has adequate space as of now. They need space to take apart, strip binders to scan. They bind 130 titles a year.
- They must be located near collection management and Digital lab near Preservation.
- A space visible to students where they can prepare and display their book repair process.
- Digital lab environmentally controlled and secured with portable equipment.
- Table scanners, wide format scanner, document camera.
- Storage needs: More than piled up cubicle.
- Future staff needed for processing. DU Interns for archival.
- No direct sunlight should be anticipated, and shelving and high density shelving is needed.

MAY 15

8:30 - 9:00 AM

CASA / TUTORING CENTER

Attendees:

Patricia Andersen	Access Services, Assessment Librarian
Colin Terry	CASA / Associate Dean of Students
Carol Smith	University Librarian
Chris Cocallas	ODC
Susan Miner	ODC
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) CASA Tutoring Space

- CASA M-Friday and Saturday. AMS is Monday-Thursday.
- There is a beauty in simplicity. The space and size must be adequate.
- CASA hopes to continue their partnership with the Library.
- Tutoring ebbs and flows in quantity of students utilizing it throughout a given week.
- CASA has (38) faculty they pay to hold office hours in their facility. If this came to the Library, 3-4 faculty offices could be shared.
- Adjacency of Tutoring Space to Research/ Reference Services.
- Collaborative tables that are flexible where students can spread out. Flat panel screen for advertising tutors on duty.
- Community tables in Brown Hall are popular.
- Tech-free zones and Quiet Rooms where students can decompress with casual space and chairs, closed off. These spaces are proven to decrease behavioral issues, especially with students on the spectrum.

MAY 15

9:30 - 10:00 AM

LIBRARY ADMINISTRATION & BOOK & BREW

Attendees:

Patricia Andersen	Access Services, Assessment Librarian
Dinae Baker	Book & Brew Manager
Sharon Dehmlow	Program Assistant (temporary)
Sevy Swift	USG
Carol Smith	University Librarian
Chris Cocallas	ODC
Susan Miner	ODC
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Library Administration (Carol Smith)

- Office Location: Rm 307. Carol needs more access to faculty and students, and should be located on the public service side with windows preferably. Prefers 6-person meeting table in office for standing meetings.
- The Provost has agreed for (2) administration positions = (1) full-time programs assistant, (1) part-time administrative assistant, and (1) student staff
- Reception area will need (3) desks in Executive Assistant space due to 3 people in the office. Visitors chair next to programming desk. Space for two printers, supplies and secure cabinets for personnel files.
- Staff toilet room, lactation room and family friendly study spaces should also be considered in the new Library.

2) Book & Brew (Dinae Baker)

- Barista's space is not large enough. There is a need for more counter space. Lacking employee worker space behind the counter for (2) when not busy.
- More seats for students would be preferred as more of a social setting.
- Microwave for public use is popular.
- Ice machine functions like a home bar. Does not keep up with need and Dinae has to go to Sodexo to get more ice. The chest freezer is located in Rm. 280.
- Cash register.
- Double-head espresso machine is currently not being used, but would could use single and double espresso machines to use simultaneously to keep up with demand. Work fridge location is under cash register = not ideal.
- Storage: Rm 308A store supplies.
- Recently added snacks, but do not have space for more food. More storage is needed to provide more food options.
- Hours: School year Sun 11-9, Mon-Thurs 7:30-9, Fri 7:30-5 & Sat 9-4. Summer open 8-3 PM and no weekends. During finals, no students were willing to sign up for late night hours.
- Staff: 32-36 students workers per year. (2) are staffed at a time. Dinae's desk needs to be adjacent to Cafe.
- Uses closet for quiet moments and private conversations.
- Sound travels to the Boettcher Room.
- Queuing line gets out of hand and sometimes blocks main entry to Library.

MAY 15

10:00 - 11:00 AM

BUSINESS INCUBATOR

Attendees:	
Patricia Andersen	Access Services, Assessment Librarian
Sevy Swift	USG
Dinae Baker	Book & Brew Manager
Sharon Dehmlow	Program Assistant (temporary)
Werner Kuhr	Academic Affairs, Director
Sid Saleh	Econ & Business T Assoc. Professor
Carol Smith	University Librarian
Chris Cocallas	ODC
Susan Miner	ODC
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Business Incubator Brainstorming

- Carol read the business backgrounds and business support. H&R Block in Kansas City library has entrepreneurial space.
- Strategic orientation – multi-disciplinary connections and industry connections. This is a part of the Pathways of Distinction – STEAM Business.
- Conf/teleconference
- Multimedia
- GIS Analysis Service
- Presentation Practice Area
- Office Incubator suite
- Real world entrepreneurship applications in Book & Brew and Museum Store.
- Makerspace for Capstone/ Cornerstone will be located in new Innovation Hub. The dirty space will be around 10,000 sf for Cornerstone and 10,000 sf for Capstone.
- Co-working space within Library for real world experience, business research and synergies.
- Werner mentioned it does not need to be branded as 'Center. Access to all types of spaces would be open to everyone.
- Beta test/ prototype of this could occur in the Library.
- Team meetings – start startups, social impact projects. Currently there are (12) teams taking part in the program.
- Industry mentors – shared space
- Lockers to keep there items in, or possibly lockable cabinets on wheels.
- Teams of 4-6 people meet with mentors.
- Need technology with whiteboards (MC squared) and posted notes.
- Telepresence/ Video Production – video, green screen, video editing facility, and printing.
- Quiet room for pitching.
- Visibility = video wall.

MAY 21

1:30 - 3:00 PM BUILDING ADVISORY COMM

Attendees:	
Sevy Swift	USG
Meaghan Guyader	GSG
Amy Argyris	Student Life / CASA
Carol Smith	University Librarian
Beth Zecca	Digital Initiatives Specialist
Patricia Andersen	Access Services, Assessment Librarian
Jurgen Brune	Prof of Practice/ Assoc Dept Head
Paula Farca	HASS
Chris Cocallas	ODC
Gwen Gilley	HCM
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Program Update

- HCM presented
- Comments on Additional Program Options:
  - GIS Data Center - Can be incorporated into the Maps area.
  - Presentation Practic eSpacie - Could utilzie a Group Study Room to film.
- Programs that Carol woudl like to request for reconsideration:
  - Business Incubator
  - Faculty Lounge
  - Photo / Video / Recording Studio (STEAM Space) beucase there is no space on campus for all students to utilze such a space.
  - Missing Programs:
  - Graduate Study Rooms
  - Casual (or Quiet) Reflection / Decompression Space
  - Business Incubaotr - integrated into other program sapces, not requiring dedicated space.
  - Comments to Adjacency Diagrams:
  - Scholarly Communications should be near research / instructional space.s
  - Maps and Gov Publication need to be adjacent.
  - Noisy Floor should be 2nd Floor.

2) Project Budget

- HCM reviewed Structural Options & Cost Implications
- HCM will meet with the Structural Engineer to discuss potential ways to modify the existing mezzanine levels, due to their short floor to floor height and compromised use.

3) Project Schedule

- HCM reviewed the Review Key Milestones & Schedule Overview
- statements and goals discussed in the last meeting as to what project success looks like and what needs to be solved in this renovation.

4) Next Steps

- HCM will develop 2-3 Conceptual Design Options for our next meeting, tentatively scheduled for June 1st (prior to Carol's two-week vacation).
- HCM to present 2-3 options to Library Staff, June 6th to gain feedback.

- The meeting was adjourned early at 2:40 pm.

JUNE 4

1:00 - 2:30 PM BUILDING ADVISORY COMM

Attendees:	
Meaghan Guyader	GSG
Nick Wagner	USG
Amy Argyris	Student Life / CASA
Carol Smith	University Librarian
Beth Zecca	Digital Initiatives Specialist
Patricia Andersen	Access Services, Assessment Librarian
Paula Farca	HASS
Chris Cocallas	ODC
Susan Miner	ODC
Gwen Gilley	HCM
Cade Hammers	HCM
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Program Update

- The Design Team presented the consolidated program, and walked the Committee through the 3 Options. Then, each option was discussed as a group with Pros & Cons.

Option 1 - Follow the Slope

- Special Collections should be a closed stack because it is locked most of the time. Daylight and climate control must be controlled as well.
- Info desk should be closer to Research Services.
- Instruction should be near the Classrooms.
- Staff Lounge should not be located on the quiet floor - Level 3. It will be a loud space and likely they will disrupt the quiet.
- ILL should be near the mail room for convenience, or near the elevator if on Level 2.
- The Copy Room will be moving from Guggenheim into the Library. HCM Team to get more info on their needs.

- Keep Research Services and Maps away from Cafe for noise control.
- The Cafe may want to be on the East side of the Library, to service users along that path, considering there are significant food service locations along the Maple Street path.
- Pros - Keeping the classrooms is good. The open stair is nice and the maps location & maps office is good.

Option 2 - Latitude & Longitude

- The Business Incubator needs a dedicated space.
- Reference should be a quiet space, and not part of Circulation/ Info Desk.
- Preservation could allow for conservation on display, like the Smithsonian.
- Move the Recording Studio to Level 2, near STEAM.
- The Staff Entry/Exit should be located near the STEAM space.
- ILL should be located near Collections.
- Keep the Cafe on Main Level.
- Co-locating staff areas is preferred to the Committee.
- The Design Team needs to be cautious of the noise zoning/functional zoning in all options.

- Pros: Cafe on the Level 2 (main), good visibility foro service points, Multi-purpose at Boettcher near Cafe for catering, and good functional/ noise zoning. Special Collections on Level 1, and isolates staff.

Option 3 - Core & Perimeter

- Business Incubator is shown near Scholarly Communications
- Corner nodes could block circulation.
- Level 1 should be for all loud activities like the Staff Lounge.
- Not ideal to have the Reflection/Decompression space next to the Staff Lounge.
- Prefer the entire Collection be browsable, and does not need to be secured (except for the Special Collections).
- The BAC asked about the hallway square footage totals, and HCM added they can follow up with a comparison of them to the current existing totals.
- Level 3 peeked interest for being open and flexible for after hours or special events.
- Keeping the 24/7 space on Level 2 is good for convenience. Level 3 does not seem doable for this function, mainly due to ease of access within the building.

- Cafe on Level 3 does not make sense, it will likely not 'draw' people to stop for coffee due to its deep location in the building.

Conclusion of the Committee for Preferred Option:

Option 1 Follow the Slope for the staircase, with Option 2 program adjacencies. HCM will develop a combined option to present to the Library Staff next Friday, June 8.

The BAC Requested that the HCM Team forward the following:

- Updated pie chart showing all optional spaces, illustrating dedicated vs. shared space programs.
- Forward program plan examples to the Committee.
- An updated adjacency plan.
- Combine our plaza with the Mines Garage Plan across Maple Street.
- In the future, the Design Team should consider including footprint for addition. And, developing a rendering of "eye candy" for fundraising and donor opportunities

2) Project Budget

- HCM reviewed the previous Structural Options & Cost Implications discussed in the last meeting. But, further elaborated on the totals of certain options.
- HCM introduced new pricing on multiple entry options. Option 1 was a Level 1 West Entry (replacing the curtain wall in place, adding an entry vestibule & canopy over the entry, and developing a plaza space outside the new entry. The estimated total construction cost was around $670K. Option 2 described a Level 2 Retrofit of the existing "Bridge" entry - adding an addition to cover the existing entry, a canopy to wrap the corner, and to maintain the bridge connection from building to grade on the south side. This option was estimated to be a cost range of $878K-899K for construction costs.
- HCM further presented a sampling of costs that could be anticipated, mixing a variety of renovation levels (minor, moderate, and major) to provide the BAC an idea of costs

implications on the Renovation Scope. See powerpoint for further details.

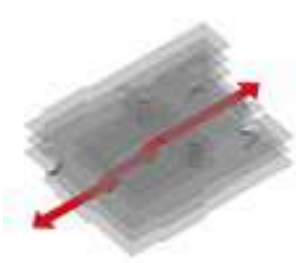
3) Project Schedule

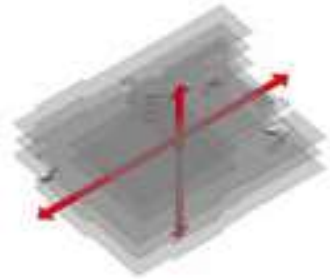
- HCM reviewed the next few milestones, and schedule for the remaining Program Plan due to the State on July 28th.

4) Next Steps

- HCM will combine the most successful components of all 3 Conceptual Design Options prior to a Library Staff meeting on Friday, June 8th, to gain feedback from the Staff.
- Upon Carol's return, the next BAC is scheduled for June 18th where the Design Team will present initial views and perspectives of the preferred plan option for discussion. And identify the components of the Program Plan that have been completed up until that point.

The meeting was adjourned late around 4pm.





JUNE 5

10:00 - 11:00 AM FACILITIES MANG. MEETING

Attendees:

Mike Willey	Facilities Management
Mike Ray	Facilities Management
Bob Slavik	Facilities Management
Bruce Osburn	RMH Group
Rick Phillips	RMH Group
Chris Cocallas	ODC
Susan Miner	ODC
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Review of Existing Conditions of Lakes Library with Facilities Management staff.

Background Information:

- Existing Documents (for Design Team Reference – HCM already has copies):
  - Schaffer Baucom completed an Engineering report in 2012, as part of the AMD Report.
  - Asbestos Report - Most of the 9x9 floor tile contains asbestos. And, pipe covering in the basement of the mechanical room and throughout the mechanical chases contain asbestos.
  - McKinstry's Electrical Upgrades - This is a "shared savings project" with McKinstry.
- Documents requested from Mines, not yet obtained by the Design Team:
  - A newer Asbestos Report – Susan Miner mentioned she had another, more recent report she will forward. The report will show most of the asbestos was abated.
  - Campus Lighting Upgrades (McKinstry's project). Mines to forward Report to team.
  - Fire Alarm Replacements (2017) - Mike to follow-up with WHAT exactly was replaced.
- Chris Cocallas asked the FM staff if the building was working at this moment in time. Mike Willey stated that it's working. He added that the AHUs have been on the deferred maintenance list since he joined the mines team.
- Chris described the potential project the HCM team is planning in a reimagined Arthur Lakes Library. Essentially, the goal is to gain more student and study space – mostly along the perimeter. He added that with a $10M Project Cost budget, the goal is to renovate the minimum needs when it comes to building infrastructure.
- The Lower Level (lowest level under the 1977 addition) houses the hot water system, domestic hot water heater, and air compressor.

The following components were discussed by the group, and their existing conditions and replacement/upgrade timelines documented by the Mines Facilities Management team were relayed to the Design Team. They are broken out by system, not necessarily in the order they were discussed in the meeting.

Mechanical

- Heat & Water Systems
  - Heating water system, pumps, heat exchange in the 1977 Building.
    - 1998 – Heating Water System was replaced, except for steam-to-water heat exchangers.
    - 2012 – Domestic water replaced.
  - Need new heat exchanger (40+ years).
  - What is the condition of the pipe?
  - Expansion tank was replaced.
  - 20 years is the life expectancy of a pump.
- 2000 - Replaced Steam and Heat.
- Whole building is the plenum. Intakes are near the docks. The mechanical rooms in the 1953 building are the return air plenums for the new 1998 AHU. Supply ducts are the (4) ducts in the 1977.
- AHU's
  - AHUs 4 & 5 - 1998 Mechanical Dwgs illustrate. They were the last AHUs to be replaced. Chilled water coils. Should last 30 years.
  - A2 1 & 2 - Mechanical units on the roof were built-in-place (SW/ NW corners of 1977 building). Original to the

1977 building.

- Mechanical Units above Toilet Rooms (1977 building).
- AHU (above the Reading Room) is a fan coil unit (2,000 CFM) and serves the Reading Room. Installed in 1998.

- AHU – Rooftop Units on Level 2 - 1998 are in decent shape. Two more years.
  - Added Chilled Water Coils in old AHU's.
  - Added Chilled Water, prior there was no cooling.
- Chiller –
  - McKinstry just replaced the existing absorption chiller with two (2) 200-ton electric screw chillers.
- Temperature Controls
  - Capital Request – Mike Willey believed that the replacement of the DDC (direct digital controls) System in Arthur Lakes Library are included in Mike Bowker's State Capital Request for Deferred Maintenance. Mike Bower confirmed (he stepped into our meeting briefly) that this was not funded this year, but he will resubmit in the next cycle –The request didn't make it on to the Long Bill. Next July 2019 will be the next time we find out if it gets approved. Hence, the controls might get upgraded prior to the renovation of the Library.
- Program Plan should include:
  - Mechanical upgrades in the Special Collections space.
  - Increasing of occupancy and increase in computer workstations will impact mechanical systems.

Plumbing

- 2010 - Domestic water piping was replaced. A galvanized study occurred everywhere – including cold and hot water piping.
- Domestic Water Heat Exchanger – replaced in 2012. Steamed and Ajax cell and tube.
- Fixtures
  - The fixtures are all in good shape. They replaced the flush valves and faucets.
- 2014 – Storm water piping in the 1953 building. Threaded and leaks. Was not replaced when the other piping was replaced.

Electrical

- Electrical Service
  - 2007 - Electrical Upgrade was completed. They replaced old panels and placed some new ones in the tunnel. Secondary Upgrades.
  - Transformer
    - The existing Westinghouse 1,000 KVA transformer (1976) tested fine and is lightly-loaded from the oil samples conducted last year.
    - Mines stated it would be nice to replace the transformer if necessary, and make it more accessible (it is currently located on the lowest level). Facilities Management assumes it's listed on future controlled maintenance.
    - Bruce estimated that it would cost around $200K to replace and install a new transformer, plus dealing with the removal of the existing one. There is no direct access to the existing transformer so it will need to be cut apart to be removed.
  - 2009 – The last time they had service done and checked the breakers. The breakers currently have a Pringle switch main disconnect, which is not ideal but not necessary to replace until there are issues with it.
  - 2008 – RMH completed secondary. Main switchgear was existing. LEM added a couple panels.
  - Bruce walked through the building two years ago, and he found a collection of panel boards - some very old (original 1953) and some very new. Mines replaces panelboards when spare parts are not available anymore.
    - Bruce recommended that they may have to replace 50% of the existing panels, due to adding more load in the reimagined Library. He anticipates 4-6 to be replaced.
  - RMH will tour the existing Arthur Lakes Library again, specifically to locate receptacle locations.
- Lighting Systems
  - Lighting upgrades are occurring in the Library, where they are switching out fixtures to LED. The existing

fixture lenses are not replaceable in the future. They will remove the ballast, 277 on the tombstones, with LED tube inside the fixtures.

- Lighting Counts –
  - Total of (1,900) existing fixtures.
  - (1,700) fixtures are being replaced.
  - (1,500) they are re-lamping to TLED Type 8.
  - Converting (8) from an 8' to 4' TLEDs.
  - (130) Screw-in they will replace with LEDs.
  - (26) HID Retrofits.
  - All incandescent and fluorescents are being replaced.
- Fire Alarm System
  - 1998 - Detectors (and horn/ strobes) were replaced. Detectors typically have a 7-year lifespan. New power supply cabinet.
    - A Notifier 640 FACP was installed. CSM needs to submit the installation date of the detectors. No information on horn/strobes was available.
  - 2003 – Fire Alarm System and a standpipe was installed.
  - 2014 – Smoke Detectors were outdated. Just replaced them. Horn/strobes needed replacement?

Architectural Components

- Loading Dock
  - Chris will try to not allow any parking on the new 14th Street design and look at the option of a drive lane for loading and unloading instead. Possibly a pull-in or lift.
- Elevators
  - Elev. #1 – Original to the building.
  - Elev. #2 – An old Hydraulic Elevator. Installed in 1993, and bridged to the 1977 Building.
    - State remove the 'grandfathered in" option and you now must install Fire Recall Systems throughout.
- Windows
  - The windows are not in good condition and are the original steel, historic windows in the 1953 building. They do not seal and provide little energy efficiency. The original caulk likely contains asbestos.
  - The windows in 1977 building are likely single pane and have been caulked multiple times. It was mentioned that the west elevation curtain wall (1977 building) has leaked before.
- Bridge
  - Mines has not had issues with groundwater, except for the leaks along the Bridge into Level 1.
- Roof
  - 1979 built-up roof was replaced in 1995.
  - 1953 has not been replaced. The tile is only around the perimeter of the roof, and they are original.
- Skylights – They were replaced in 2009
- Gutters – They were replaced in 2010.
  - The gutters (in the 1953 building along the west, north and south sides) enter the building in a strange way, which causes ice to form and in the past obstructed the main entry on the East side. The gutter design is failing.

2) Next Steps

- HCM and the engineers from RMH Group will pull together a list of necesary upgrades, replacements and/ or challenges related to the existing building. This list will illustrate those items that will be included in the scope of this project, and submitted to the State of Colorado for funding on July 28th in this Program Plan.
- HCM will set up a time for The Sextant Group to meet with the CCIT group to discuss the current wireless and technology infrastructure in the Library.
- RMH Group will walk the Lakes Library in the coming weeks to verify the current status of mechanical and electrical related components, specifically current receptacle locations, data ports and lighting.

The meeting was adjourned around 11am.

JUNE 8

1:30 - 3:00 PM

LIBRARY STAFF MEETING

Attendees:	
Robyn Copeland	Circulation Coordinator
Lisa Dunn	Research Librarian, Special Collections Manager
Patricia Andersen	Access Services, Assessment Librarian
Karen Pfiffner	Government Information
Christine Baker	Collection Management (Special Formats Metadata Librarian)
Stephen Katz	Acquisitions (Head of Acq & Serials)
Ye Li	Scholarly Communications Librarian
Brianna Buljung	Instruction & Research Librarian
Tim Ramstetter	Library Tech III
Beth Zecca	Digital Lab
Sherry Muniz	Preservation
Nick Iwanicki	Archives/ Special Collections
Wendy Shortridge	Interlibrary Loan Coordinator
Dinae Baker	Book & Brew Manager
Chris Cocallas	ODC
Susan Miner	ODC
Gwen Gilley	HCM
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Program Update

- The Design Team presented the consolidated program, and walked the Library Staff through the BAC decision process.

2) Concept Design

Combined Option

- Reference Desk is not staffed at all times. May be a concern if they are monitoring the second, lower level entry.
- ADA Access should be maintained along the Bridge, due to the large incline up the hill (along Maple Street) headed south. If ADA patrons can exit from the Bridge, equal with Level 2 it will prevent them from having to climb the steep hill after exiting from the lower Level 1.
- Staff expressed that they would like to open up the West Elevation more to take advantage of the great views.
- The Copy Center should be located closer to computers. The staff recommended possibly locating it in the existing Shipping/Receiving room where they could utilize their own Loading Dock.
- The Staff questioned if the ILL was too large.
- Staff asked if the Mail Room was included in the program. HCM team to add.
- The Cafe was determined to be too far from the entry. Dinae mentioned that she will likely loose 1/3 of her business because the cafe is not located by a main entry door, as it is currently. Design team agreed, and will continue to study the best location.
- Collect Management Office should be near the Government Pubs stacks. Also, Gov Pubs would prefer to be located on one level. High density stacks would be appropriate for part of this collection if necessary.

3) Project Schedule

- HCM reviewed the next few milestones, and schedule for the remaining Program Plan due to the State on July 28th.

4) Next Steps

- HCM further develop the combined concept, keeping in mind the feedback gained from the Library Staff.

The meeting was adjourned around 3pm

JUNE 18

1:30 - 3:00 PM BUILDING ADVISORY COMM

Attendees:	
Meaghan Guyader	GSG
Sevy Swift	USG
Amy Argyris	Student Life / CASA
Jurgen Brune	Prof of Practice/ Assoc Dept Head
Paul Martin	AMS
Carol Smith	University Librarian
Beth Zecca	Digital Initiatives Specialist
Patricia Andersen	Access Services, Assessment Librarian
Chris Cocallas	ODC
Susan Miner	ODC
Gwen Gilley	HCM
Mecayla Cobb	HCM

On the following pages are a summary of the responses noted from the group discussion and additional comments.

1) Concept Design

HCM team walked the BAC through the latest conceptual design plans. The following are the Committee's comments in regards to the presented plans upon initial review.

- Level 3 Comments:
  - There is no need for a Decompression / Reflection Space due to the existing "STEAM Vent" space located in the Student Center. Likely, the Quiet Study Area could be utilized for both functions, without a separating wall. Sevy recommended the Library place bean bag chairs in the Quiet Area, due to their popularity with students.
  - Multipurpose Space - HCM to confirm that additional structure is not required to support the new assembly space on Level 3.
  - The Committee reminded the design team make sure to dedicate space for Graduate Student Study, more for individual or two-person groups, as described by Meaghan.
- Level 2 Comments:
  - The BAC was happy that the entire floor was truly dedicated to student study space, including the Tutoring Space.
  - The Conference Room is not in an ideal location due to noise the library staff makes entering and exiting the conference room. Consider relocating.
  - The Recording Studio is proposed near the existing Elevator that is known to be loud. Design team to make note of acoustical concerns in Program Plan.
  - Boettcher - The BAC asked if the existing shelves should be removed. HCM to study.
  - Level 2 space between circulation desk and new stair could be a storage space for the circulation and reference desks.
  - Carol remarked that the move of the Campus Copy Center was not ideal, due to the likely sacrifice of square footage for other library functions. HCM to study a compromise.
  - Carol's office has no windows. She would prefer to have windows in the Library Administration suite.
- Level 1 Comments:
  - Reference Desk can be separate from Research Services Offices. Reference Desk should move to Level 2 next to the Circ/ Info Desk. Keep the Research Services offices on Level 1 to monitor traffic entering from the new entry.
  - Design team needs to add Gyasi's office - Outreach and Engagement. Should locate where Patricia's office is currently proposed, near Reference/ Research Services.

- The BAC felt the cafe should be located on Level 1, near the new entry to maximize business along Maple Street. HCM team to relocate to Level 1.
- Government Publications needs to be located near Maps. Their offices should also be located on the same floor as their collection.
- Map Storage - Carol was concerned that there may not be enough space for the Map Collections underneath Mezzanine 1. She will share a white paper written by Chris Thiry regarding how his collection should be housed.
- Carol asked if the HCM Team had planned for the shelving to be not completely to capacity on all shelves, and the Design Team confirmed that they considered the capacity at only 85% full, not 100% to account for growth and needed space.
- Preservation has requested windows / daylight in her office space, if it is not possible in the work area. The Design team will look at moving her desk space into Collections Management.
- The committee asked about possible seating spaces below the mezzanines on the edges, to make up for the loss of existing study rooms on the mezzanine floors.
- The BAC felt that the second loading dock was not necessary, and the Design Team should merely maintain the existing dock.
- Carol proposed the Prospectus and ILL be located closer to the Loading Dock. Prospectus is a consortium that Mines just recently re-joined. Additional student workers would need to be accounted for, but the ILL would utilize the space during the daytime, and the graduate students would use the same space during the evening hours.
- Carol reminded the Design Team to anticipate future growth in library staff. HCM Team to add.

Renderings - Quality and Views

- The Design Team presented the three views they will develop for the final Program Plan report and also provided sample renderings to the level of quality and conceptual detail the Arthur Lakes renderings will emulate.

2) Project Budget

- HCM briefly revisited the early pricing discussion reminding the BAC of the costing exercise ahead and how critical decisions will need to be made to maintain the $8.5M total construction cost/ $10M total project cost targets.

3) Project Schedule

- HCM reviewed the first Draft Report date of July 2nd, and the schedule for the remaining Program Plan due to the State on July 28th.

4) Next Steps

- HCM will incorporate the comments made by the BAC and forward updated plans to committee members. They will also finalizes the draft report over the next two weeks prior to submitting to Miens.

The meeting was adjourned a little after 3pm.

JULY 2

1:30 - 3:00 PM BUILDING ADVISORY COMM

Attendees:	
Sevy Swift	USG
Amy Argyris	Student Life / CASA
Jurgen Brune	Prof of Practice & Assoc Dept Head
Paul Martin	AMS
Carol Smith	University Librarian
Beth Zecca	Digital Initiatives Specialist
Patricia Andersen	Access Services, Assessment Librarian
Susan Miner	ODC
Gwen Gilley	HCM

HCM reviewed a 95% draft of the library program plan with the committee in preparation for a two-week review period by the BAC. Comments and requested revisions are as follows

1) 95% Library Programming Draft for Review

HCM team walked the BAC through the latest conceptual design plans. The following are the Committee's comments in regards to the presented plans upon initial review.

- Carol requested that a building wide speaker system be included to accommodate announcements. Susan indicated this may be possible with the fire alarm addressable system. HCM to coordinate with consultants to determine if a system needs to be added to supplement the fire alarm addressable system.
- Susan found that the phasing schedule was referring to the incorrect years and should be updated to be complete in 2022, not 2021
- The BAC will review the document and send review comments to HCM by Friday July 13th so that HCM can review prior to the BAC meeting on Monday July 16th.
- Remove Systems Librarian office from Collections Management area
- Decrease size of Interlibrary Loan office
- Special Collections: Remove emergency exit (flood risk; not

2) Summary of Desired Changes to Library Floor Plans

Carol reviewed some plan revisions that the library team would like incorporated into the final programming document as summarized below.

LEVEL 01 – *Beginning clockwise from upper-left corner of diagram below.*

- Replace Copy Center & loading dock with a Faculty Lounge. Locate loading dock outside Collections Management.
- Replace General Seating area adjacent to Copy Center with Graduate Study Lounge (walled, Blaster Card access)
- Library Staff Conference Room (moved from 2nd floor)
- Increase size of Library Administrative Office, to include a private conference space
- Replace Government Publications with a "Tech Team" office
- Move Government Publications Into Collections Management area
- Remove Systems Librarian office from Collections Management area
- Decrease size of Interlibrary Loan office
- Special Collections: Remove emergency exit (flood risk; not accessible to general users)
- Switch locations of General Seating and Interactive Classroom spaces at bottom of diagram
- Relabel Stor/Future Office as Assessment (Patricia Andersen's office)
- Relabel Scholarly Comm as Scholarly Comm/Reference. Wall it in for sound. Needs small ref desk point of service outside the walled area.

LEVEL 01

LEVEL 02 – *Beginning clockwise from upper-left corner of diagram*

- Relabel Outreach/Engagement Office as Group Study Room
- Relabel Ref Desk as Data Vis/Exhibit Area
- Relabel Conference Room as either Silent Room or Large Group Study Room
- Retain the ramp as ADA access and emergency exit door

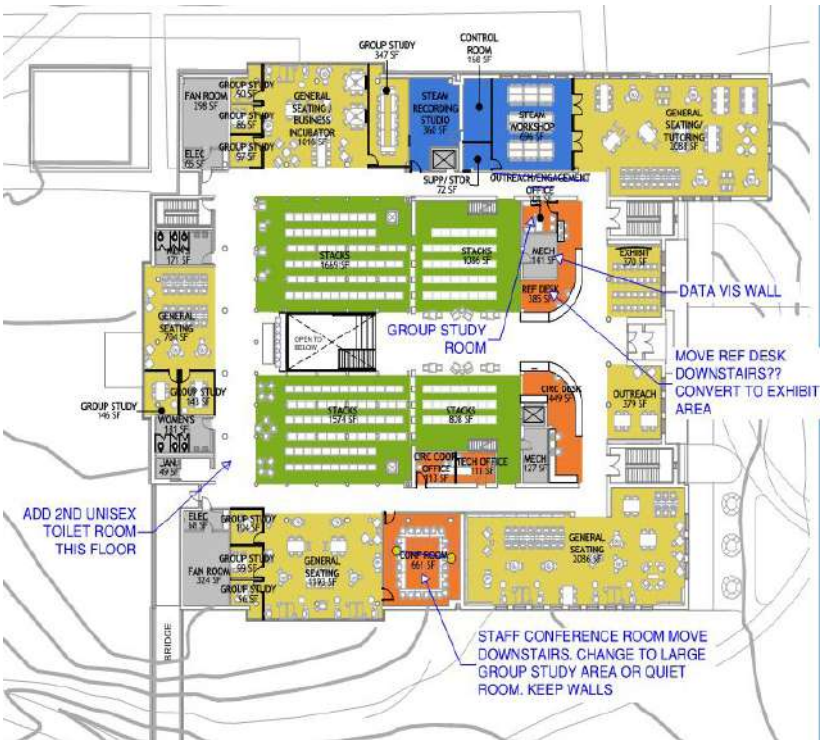
LEVEL 03

- Add 24/7 access point
- Add deep quiet/reflection space

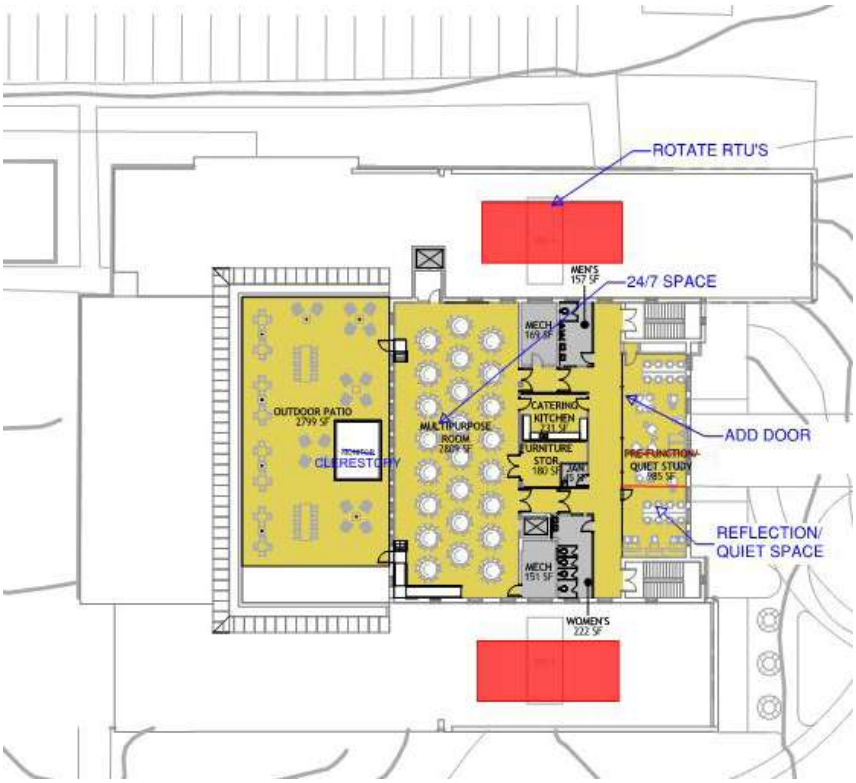
3) Next Steps

- The cost estimate for the conceptual design will be received on Tuesday July 10th and will be sent to the AC for their review. If there is a budget issue at that time HCM will schedule a meeting with the BAC to review options to better align with the budget.
- The next BAC will be Monday July 16th at 1:30 to review the BAC review comments in preparation for HCM finalizing the programming document
- 100% finalized program document due to Mines 07.23.2018
- Mines to submit program document and funding request to the State 07.28.2018

End of Meeting Minutes



LEVEL 02


ROTATE RTU'S
MEN'S
157 SF
24/7 SPACE
MECH
169 SF
OUTDOOR PATIO
2799 SF
CLERESTORY
MULTIPURPOSE
ROOM
2629 SF
CATERING
KITCHEN
231 SF
FURNITURE
STOR.
180 SF
ADD DOOR
PRE-FUNCTION/
QUIET STUDY
985 SF
REFLECTION/
QUIET SPACE
MECH
151 SF
WOMEN'S
222 SF

LEVEL 03

4.4 CONCEPTUAL DEVELOPMENT

Each of these concept studies were based on the consolidated program included in the Program Plan. Each scheme proposes distinct design concepts that tackle the challenges of navigating the current library, accommodating new programs, or distributing distinct noise levels to different floors. None of the options propose any additional square footage added to the existing Library.

OPTION 1 - "FOLLOW THE SLOPE"

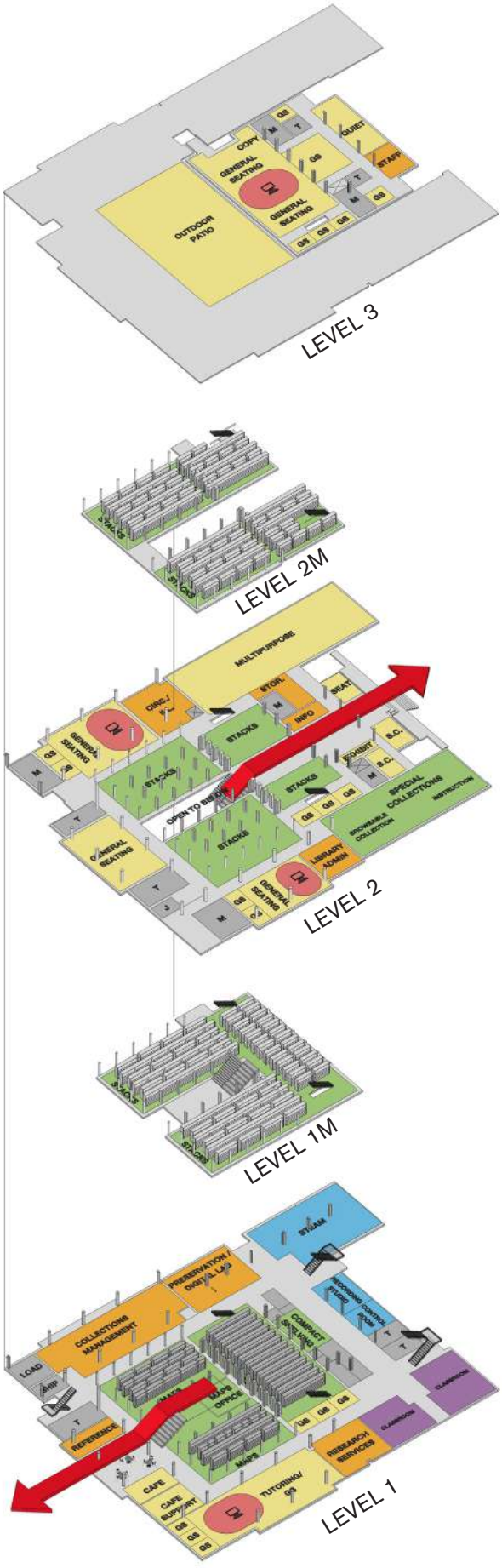
This option incorporated a new grand stair that would cut through the existing central stack areas, similar to the way the ground plane slopes around the Library from east to west. This new central, occupiable stair would improve the connectedness, wayfinding and visibility between floors as one navigates the Library. This option proposes a new entrance on Level 1 while maintaining the main entry at Level 2. The following is a list of pros and cons discussed by the BAC.

PROs

- Centralized, navigating stair connecting entries on multiple levels. "See and be seen" component. Sloping street concept.
- Double height (15' floor to floor) space at both entries to be more welcoming & inviting.
- Cafe utilizes outdoor patio & creates activity on Level 1 from student-trafficked Maple St.
- Multipurpose Space utilizes maximum, column-free space with clean proportions & great view.
- Research Services directly adjacent to Instruction/Classrooms.
- Level 3 dedicated to student seating & study spaces.
- Outdoor space on Levels 1 & 3.
- Skylight brings daylight into inner core of Library on multiple floors.
- Special Collection utilizes sophisticated Boettcher Room & has prominent exhibit area near Level 2 entry.
- STEAM retains secondary entry / loading & unloading.

CONs

- Intervention only eliminates mezzanine in limited areas.
- Split between Circulation & Research Services on different levels.
- Maps adjacent to louder Cafe off of Maple Street entrance.
- Must consolidate Collections & create more high density space.
- Assuming higher efficiency is attainable in consolidation of collections.



LIBRARY STAFF / SERVICES

COLLECTIONS/
SPECIAL COLLECTIONS

PUBLIC / USER SPACE

CLASSROOMS

OTHER

BUILDING SUPPORT

OPTION 2 - "LATITUDE & LONGITUDE"

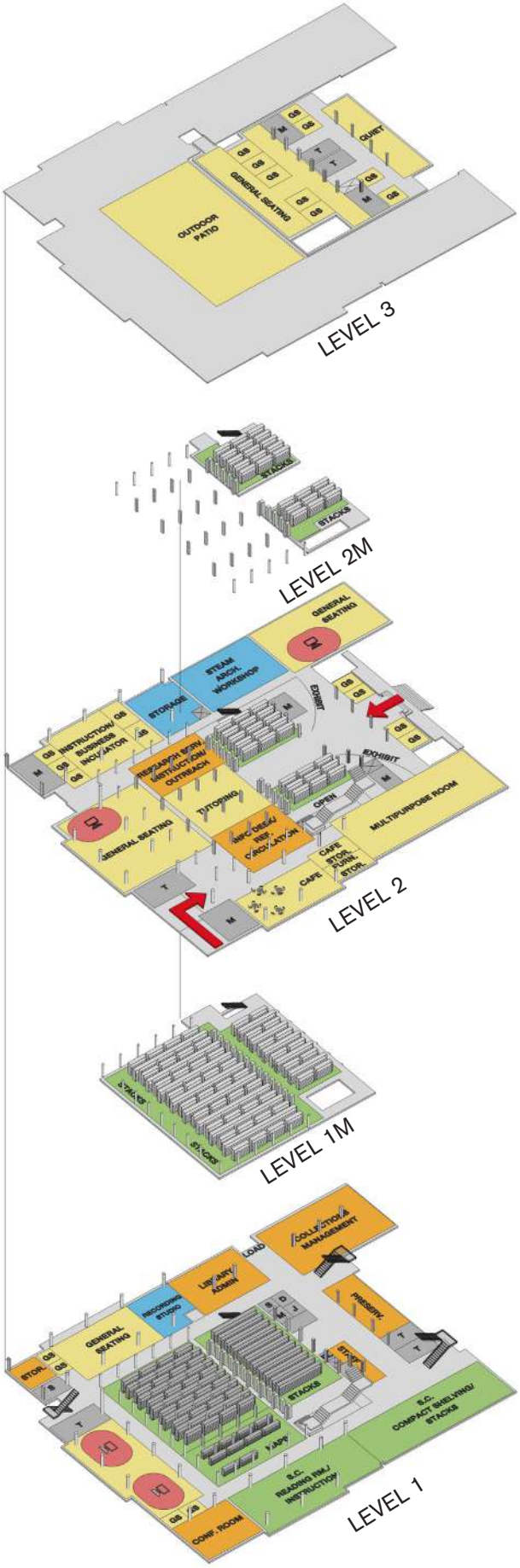
This conceptual option improves the connections between spaces in the Library both vertically and horizontally in its design. Horizontally, this scheme proposes two entries, both located on Level 2 providing ease of access from both directions on campus. Vertically, a new stair is carved out in the center of the building, connecting all 5 levels efficiently together. The following is a list of pros and cons discussed by the BAC.

PROs

- Multiple entries on same Level 2 from both directions of campus. Double height (15' floor to floor) space from entry to entry through the center.
- New celebrated, and more welcoming Maple Street entry and bridge element.
- Exhibit space off of Illinois St entry.
- One stair more clearly connecting all 5 levels.
- Cafe and Multipurpose adjacency can allow for catering for events easily.
- Relocated Collections Management & Library Admin, for more privacy & potential new loading dock. Freeing up Northeast corner for student seating.
- Special Collections & Preservations on Level 1, with potential for displaying book repair/ preserve process.
- Level 3 is dedicated to student study space. Potential 24/7 space with necessary amenities.

CONs

- Info/Reference Desk are not immediately adjacent to both entries, for monitoring & guidance purposes.
- Cafe near Desks, noise levels need to be addressed.
- Connecting stair is not immediately visible from central spine of Library.
- Special collections on south elevation.
- Either collections or additional program space will be necessary to achieve this option.



LIBRARY STAFF / SERVICES

COLLECTIONS/
SPECIAL COLLECTIONS

PUBLIC / USER SPACE

CLASSROOMS

OTHER

BUILDING SUPPORT

OPTION 3 - "CORE & PERIMETER"

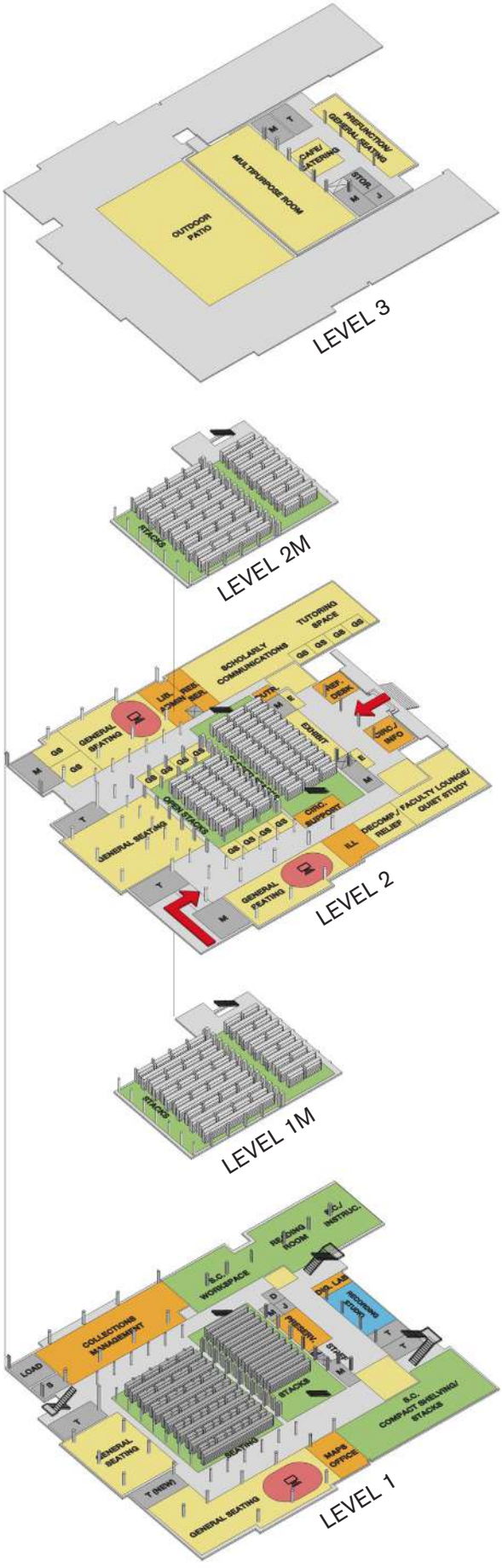
In this option, a clear parti of core and perimeter was developed. Simply stated, the collections, which fundamentally is the heart of every library, are focused to the center or core of the existing Library, while the user /public spaces are distributed along its perimeter - much like an apple. Similar to Option 2, this scheme proposes two entries, both located on Level 2. The following is a list of pros and cons discussed by the BAC.

PROs

- Exhibit & visible collections upon entry from Illinois St.
- Contain the collection as the heart of the Library. Display its sense of history and uniquely Mines archives.
- Ability to secure collection, and possibly preserve parts for staff access only.
- Develop a ring of nodes around a loop model. Collection densely housed in the center, seating/ study space around perimeter.
- Multipurpose Space takes advantage of Level 3 and its views and column-free space. When not scheduled, Cafe attracts students to Level 2. Cafe & Catering possible on this level.
- Special Collections could have potentially its own dedicated entry on Level 1, off 14th Street.
- Group study spaces with 15' floor to floor where mezzanine currently restricts use. Minor intervention, for maximum use.

CONs

- Maple Street entry becomes secondary entry, with Info/ Reference Desks focused to Illinois St entry.
- Level 1 maintains secondary, slightly isolated status.
- Not a clear navigation route, outside of the loop-model.
- Collection still occupies a significant amount of space in Library.



4.5 BENCHMARKING STUDY

The reimagined Arthur Lakes Library (ALL) needs to continue to serve as the academic hub for Colorado School of Mines and the broader Golden community. To continue to compete with its peer institutions, Mines must use such institutions as Worcester Polytechnic Institute (WPI), Rensselaer Polytechnic Institute (RPI), and Missouri University of Science and Technology (MS&T), as a point of reference to remain competitive and continue to attract students. Mines Leadership requested the Design Team complete a benchmarking study to determine where to apply capital funds and to determine what programmatic components their peers are offering in their libraries.

On the following pages, Hord Coplan Macht compared multiple metrics and established key takeaways that aided in the design of the reimagined Arthur Lakes Library. The 1967 Wilson Library at MS&T recently went through a Program Plan exercise for the renovation of their library (similar in size to Arthur Lakes) and are awaiting state funding to implement their project. WPI's Gordon Library (built in 1967) and RPI's Folsom Library (built in 1976) have completed only minor renovations since their inception. While each library and its offerings are specific to the institution it serves, there are key indicators that can be measured against one another. These metrics are used to compare the distribution of spaces dedicated to user/public space, collections and staff/administration support space. The goal for the proposed ALL is to increase the user/ public spaces to 55% of the total area of the library, increasing by almost 30% compared to the existing percentage.

hord | coplan | macht

Benchmarking - Academic Libraries

5/13/2018

Comparable Stats	Missouri University of Science & Technology (Existing - Rolla Campus)	Worcester Polytechnic Institute	Rensselaer Polytechnic Institute	Colorado School of Mines (Existing)
Student Enrollment	7,969	6,428	7,527	6,117
Undergraduate	6,801	4,337	6,314	4,757
Graduate	1,168	2,091	1,213	1,286
IPEDS FTE (on-campus-Fall 2016)	6,967	5,722	7,277	5,850
Endowment	$176,000,000	$307,700,000	$629,728,000	$286,000,000
Gradation Rate (students graduating within 6 years)*	64%	86%	83%	75%
Students Living in On-Campus Housing*	30%	57%	57%	28%
Tuition (in-state)	$9,628	$48,628	$52,305	$15,690
Tuition (out-of-state)	$27,701	-	-	$34,020
Room and Board (in-state)	$9,935	$14,716	$14,960	$16,700
Room and Board (out-of-state)	$9,935	-	-	$16,700
LIBRARIES				
Total Bldg GSF	91,975	67,113	91,385	76,789
Total NSF / ASF	57,682	47,753	56,184	48,189
Efficiency	0.63	0.71	0.61	0.63
Seat Count per FTE	10%	13%	11%	11%
Space Distribution by Function				
Public / User Space	44%	51%	42%	25%
Collection Space	34%	36%	52%	59%
Administrative/Staff Space	10%	11%	6%	15%
Other	12%	3%		

**www.collegedata.com*

Benchmarking - Academic Libraries

5/10/2018

Institution	Missouri University of Science & Technology		Worcester Polytechnic Institute	Rensselaer Polytechnic Institute	Colorado School of Mines	
	(Existing - Rolla Campus)	*(Proposed - March 2016)*	Existing	Existing	(Existing)	*(Proposed- 2018)*
Library Name	**Curtis Laws Wilson Library**	-	**George C Gordon Library**	**Folsom Library**	**Arthur Lakes Library**	-
Location	Rolla, MO	-	Worcester, MA	Troy, NY	Golden, CO	-
	Website	-	Website	Website	Website	-
Library Director	John Furlong	-	Anna Gold	Andrew White	Carol Smith	-
Total Building (GSF)	**91,975**	**94,643**	**67,113**	**91,385**	**76,789**	**87,568**
Total Building ASF	57,682	57,420	47,753	56,184	48,189	58,780
Efficiency	0.627	0.607	0.712	0.615	0.628	0.671
Year Built	1967	-	1967	1976	1955	-
Year of Last Reno/Addition	1997	Study 2016	6/2016 (HVAC Upgrades)	12/2005 (10,279 SF)	1975	Study 2018
Construction Cost	-	$5,597,650 (6-phase Construction over 53 mos.)	-	$521,750	-	$8,000,000
Project Cost	-	$10,318,125	-	-	-	$10,000,000
Building Hours/ Week (168 hrs. per week)	106.5	-	107	115.5	105.5	-
Café Hours/Week (168 hrs. per week)	69	-	58	57	80.5	-
Space Drivers						
Public / User Space	44%	44%	51%	42%	25%	55%
Collection Space	34%	35%	36%	52%	59%	33%
Administrative/Staff Space	10%	10%	11%	6%	15%	12%
Other	12%	11%	3%			
TOTAL	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**
Circulation Statistics						*post weeding*
Total Res / Collection Inventory	**397,100**	-	**208,650**	**470,225**	**615,956**	**566,987**
Total Collection Circulated						
FY 2017	39,125	-	5,992	11,119	14,200	-
FY 2016	37,984	-	8,840	12,568	15,813	-
FY 2015	26,027	-	9,500	16,592	15,300	-
FY 2014	18,063	-	9,602	19,803	19,607	-
FY 2013	17,984	-	10,890	24,392	23,161	-
Seat Counts			**did not include conference room seating.*	**only had chair/seat counts. Did not include conference rooms or café seating.*		
Table Seating	290	292	273	678	489	
Lounge/Soft Seating	76	185	46	*	45	
Carrel Seating	154	109	60	145	-	
Group Study Seating	92	138	111	-	41	
Computer Stations	6	6	229	-	-	
Conference/ Telepresence Rooms	90	90	*	-	58	
Classroom	-	23	-	-	-	
Misc	20		6	-	-	
TOTAL	**728**	**843**	**725**	**823**	**633**	**800**
Quiet	360	514				
Not Quiet	368	329				
ASF per FTE	8.28		8.35	7.72	8.24	8.05
Seating per FTE	10.45%	12.10%	12.67%	11.31%	10.82%	10.95%
Staff Counts						
Library Staff	22	-	21	13	22	29
ITS Staff	0	-	12	1	-	
Student Assistants	25	-	40	31		
Other	-	-	-	-		
TOTAL	**47**	**0**	**73**	**45**	**22**	**29**

Benchmarking - Academic Libraries

Institution	Missouri University of Science & Technology				Worcester Polytechnic Institute		Rensselaer Polytechnic Institute		Colorado School of Mines			
	(Existing - Rolla Campus)		(Proposed - March 2016)		Existing		Existing		(Existing)		(Proposed- 2018)	
Programmatic Categories	**Quantity/Name**	**SF**	**Quantity/Name**	**SF**	**Quantity/Name**	**SF**	**Quantity/Name**	**SF**	**Quantity/Name**	**SF**	**Quantity/Name**	**SF**
Lobby		-		-		594		1,510		248		500
Circulation / Info Desk		855		600		637		862		820	Service, Queuing, Laptop, Book Drop	876
Consultation Room			(2) @ 75 sf each	150		-				-	(2) @ 80 sf each	160
Tech Services / Administrative Space		5,146		5,255		4,396		2,351		6,621		6,196
Collections		19,221		19,220		13,617	(decreased by 30% for circulation)	27,690	Book, Serials, Gov Pub, Map, Ref	24,923	Book, Serials, Gov Pub, Map, Ref	14,240
Special Collections	Univ Archives	595	Univ Archives	595	Dickens' Reading Room, Gladwin Gallery, Office, Compact Shelving, Storage	3,548	Archives	1,739		3,575		4,909
General Seating										1,014		8,000
Public Computing	-	932	-	150		3,274	Computers	2,189	Computers	1,234		270
Collaborative, Open Seating	-	2,987	-	2,200	Group Study Area	2,537	Open Reading	11,851				
Other	"Living Room"	485	"Living Room" cozy seating & leisure collection	485	Bloomberg Stations	706	Individual Study Area	1,204	Print/ Copy Ctr	distributed	Print/ Copy Center	120
	Games	200	Games	200	Individual Study Area	2,700						
	Quiet Open Study	10,626	Quiet Open Study	7,500	Quiet Open Study	1,644			Quiet Study	469	Quiet Study	400
	Dogbone Design	420	Dogbone Design	420		-						
	Quick Print Stations	120	Quick Print Stations	240	Print / Scanning	396						
	State Historical	574	State Historical	575								
Group Study Rooms	(8) 4-person	2,112	(33) Avg Size 90 sf	2,970	"Tech Suites" (1) 386 sf (6) 150 sf (3) 220 sf	1,807	Small (22) @ 70 sf average Large (5) @ 159 sf average	2,330	(11) Study Rooms @ 80 sf avg (3) Grad Study @ 72 sf avg	1,090	(10) 4-person (6) 6-person (2) 10-person (3) Grad Study	3,240
Conference Rooms	(3) 20-person (1) Telepresence	2,981	(3) 20-person (1) Telepresence	2,585	Gordon Conf Rm (25)	729	Fischbach Rm (1039 sf) Krause Lounge (509) Rm 213 (349 sf)	2,306	(1) Conf Room	276	(1) 25-person	625
Computer Lab		-		-	Multimedia Lab (21 computers)	1,005		679		1,213		2,700
Café	Miner Break Café	609	Miner Break Café	610	Class of 1970	760	Library Café	1,473	Book & Brew	520	Book & Brew	854
Exhibit / Gallery		-	(Distributed)	-	Scott Room	892	(Distributed)			359	Immersive Disp	300
Classrooms / Active Learning/ Instruction		527		900	Digital Scholarship Lab, Anderson Lab B, FLIP Space (Flexible Learning and Instruction Place)	2,435			Instructional Classrooms	1,820	Library Instruction	1,820
Community Space / Visualization Wall		427		430					Boettcher Rm.	2,160	Multipurpose	2,800
IT Help	IT Help/Call Center	705	IT Help/Call Center	1,350		686					Tech Support / Storage	300
Student Services												
Presentation Practice Room	-	-	Accom. 6-12	300	-	-					Pres. Prac Room	200
Other	Graduate Resource Room		Graduate Resource Room	800	ATC - Academic Technology Center	2,157			CASA, AMS Tutoring Space	1,778	CASA, AMS Tutoring Space	1,000
	Computer Learning Centers (CLC)	1,440	Computer Learning Centers (CLC)	2,000	Morgan Teaching & Learning Ctr	328					GIS Data Center	1,750
Scholarly Research / Commun.					Library Academic Strategies	1,649					Scholary Comm	500
Makerspace			3D Scanner	1,400							Reflection / Decompression Space	300
Other											Faculty Lounge	600
	Swing Space	3,740	Swing Space (?)	3,575	Studio@Gordon (30-50) ppl	1,256					Business Incubator	1,180
	VCC (Video Communications Center)	2,980	VCC (Video Communications Center)	2,910					Vending	69	Vending	100
											STEAM Spaces	4,090
											Creative Learning/ Classroom	750
Service (not included in Total ASF)		1,089		5,680				7,462				
TOTAL ASF		**57,682**		**57,420**		**47,753**		**56,184**		**48,189**		**58,780**

4.6 THIRD PARTY REVIEW

BRET JOHNSON ARCHITECTURE
2304 YOSEMITE STREET
DENVER, COLORADO 80238
720.341.0392

July 18, 2018

Susan Miner
Colorado School of Mines
Capital Planning and Construction
1801 19th Street
Golden, CO 80401

RE: Lakes Library
Program Plan Third-Party Review

Dear Susan,

Bret Johnson Architecture has reviewed the Arthur Lakes Library Renovation Program Plan dated July 2018 and has the following observations:

1. It would be helpful if the photo on page 7 identified the project site and future parking garage as described in the preceding text, as well as Maple and Illinois Streets.
2. Page 25 has an incomplete sentence regarding the "small entry vestibule on level 1".
3. It appears that there is an incorrect word in the 3rd sentence of the first paragraph. "impetuous" should be "impetus."
4. Page 34: Should the discussion about a dedicated fusible circuit for elevator cab lighting refer to a 120V circuit?
5. Page 34: The 1953 building uses existing corridors for return air. The code implications for a major renovation should be reviewed.
6. Page 40: The section on fire protection system upgrades should discuss any requirements for the special collections area. A pre-action system may be advisable in that space.
7. Page 43: Coordinate Section C "Power to receptacles, mechanical equipment, elevator equipment, and lighting" with the elevator section of the architectural narrative regarding shunt-trips.
8. It would be helpful if the AV section provided a definition at the first use of acronyms.
9. The meeting notes should be reviewed for typos.
10. Consideration should be given to a more developed discussion about phasing. While the intention is to keep the library operational during construction, such phasing will affect construction costs. It may also be necessary to relocate some services or portions of the collection off-site. In particular, it may be advisable to relocate the special collections during construction to avoid possible damage. Those costs should be planned for in the project budget.

Overall, the Program Plan is well thought out. The proposed solution is to be lauded for the new first floor entry on the west side, which provides a universal design solution for access to the library, while preserving the historic east entry.

BRET JOHNSON
ARCHITECTURE
2304 YOSEMITE STREET
DENVER, COLORADO 80238
720.341.0392

The statements made above are my professional opinion, and are not intended to warrant the accuracy or give approval of the Program Plan contents in whole or in part. My license to practice architecture in the State of Colorado is No. 00202540. My current registration expires on October 31, 2019.

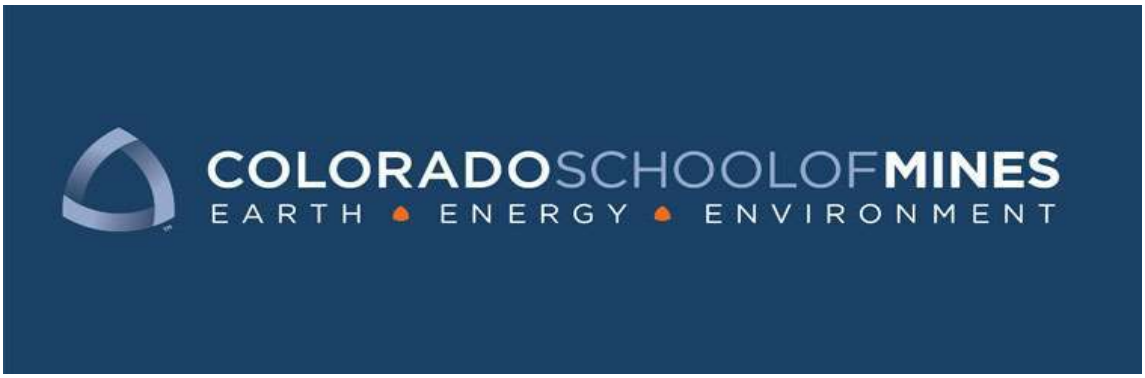
Sincerely,

Bret Johnson, AIA
Principal
Bret Johnson Architecture

CUMMING
Building Value Through Expertise

Arthur Lakes Library
Golden, Colorado

Programmatic
7/26/2018 - R4
Cumming Project No. 16-01275.00



Prepared for HCM Architects

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383 INVERNESS PARKWAY, SUITE 240 • ENGLEWOOD • COLORADO • 80112
PHONE: 303-948-7224 • FAX: 303-948-7230

TABLE OF CONTENTS

EXECUTIVE SUMMARY

1.1 Introduction

This estimate has been prepared, pursuant to an agreement between HCM Architects and Cumming, for the purpose of establishing a probable cost of construction at the conceptual design stage.

The project scope encompasses the renovation of the Arthur Lakes Library per the specified levels indicated upon the proposed drawings

1.2 Cost Estimation Breakdown

The total estimated construction cost within our cost report is summarized below:

Description		Low Range	Mid Range	High Range
A. Direct Costs				
A1 - Direct Cost of Construction - Building		$6,521,557	$6,749,812	$7,424,793
A2 - Direct Cost of Construction - Site		$83,005	$85,910	$94,501
Subtotal Direct Costs - Building		**$6,521,557**	**$6,749,812**	**$7,424,793**
Subtotal Direct Costs - Site		**$83,005**	**$85,910**	**$94,501**
B. Indirect Costs				
B1 - GCs Building	6.00%	$391,293	$404,989	$445,488
B2 - GCs Site	6.00%	$4,980	$5,155	$5,670
B3 - GRs Building	4.25%	$293,796	$304,079	$334,487
B4 - GRs Site	4.25%	$3,739	$3,870	$4,257
B5 - Bonds & Insurance Building	2.00%	$144,133	$149,178	$164,095
B6 - Bonds & Insurance Site	2.00%	$1,834	$1,899	$2,089
B7 - GC Fee Building	4.00%	$294,031	$304,322	$334,755
B8 - GC Fee Site	4.00%	$3,742	$3,873	$4,261
B9 - Design Contingency Building	10.00%	$764,481	$791,238	$870,362
B10 - Design Contingency Site	10.00%	$9,730	$10,071	$11,078
B11 - Phasing Building	1.50%	$126,139	$130,554	$143,610
B12 - Phasing Site	1.50%	$1,605	$1,662	$1,828
B13 - Escalation Building -	NIC			
B14 - Escalation Site -	NIC			
Subtotal Indirect Costs - Building		**$2,013,874**	**$2,084,360**	**$2,292,796**
Subtotal Indirect Costs - Site		**$25,632**	**$26,529**	**$29,182**
Total Construction Costs - Building		**$8,535,431**	**$8,834,171**	**$9,717,588**
Total Construction Costs - Site		**$108,637**	**$112,439**	**$123,683**
Total Construction Costs - Building + Site		**$8,644,068**	**$8,946,611**	**$9,841,272**

1.3 Project Schedule

	Start	Finish	Duration
Design & Engineering	May-19	Apr-20	12 months
Construction	Jun-20	Jan-22	20 months

1.4 Key Assumptions & Exclusions

This document should be read in association with Appendix 1, which outline assumptions, project understanding, approach, and cost management methodology. Key assumptions built into the above cost breakdown include

Key Assumptions
- CM@Risk

Key Exclusions
- Project Soft Costs

- Design Assist MEP Trades
- Two Phase Construction (1.5% Add per Added Phase)
- Demolition Included
- 10% Design Contingency Included Here-in

- Department Relocation
- Seismic Upgrades (if Required)
- AV Equipment
- Structural Modifications Beyond that Identified Here-in
- Demolition/Replacement of Existing Curtain Wall (Entry)
- All Elevator Upgrades
- Any Renovations to 3rd Floor
- Lighting Beyond 200K Allowance
- (2) New Airhandlers - No Replacement Assumed Needed
- PA System
- 3rd Floor Scope Excluded
- New Vestibule Entry - Has Become Inboard Condition
- Escalation is accounted for elsewhere and thus excluded

CSM - Arthur Lakes Library
Golden, CO.
Programmatic - ROM

Project # 16-01275.00
07/26/18

SUMMARY - ROLLUP -

Element		Total	Cost / SF
1 General Requirements - included below			
2 Sitework		$809,023	$12.35
3 Concrete		$88,389	$1.35
4 Masonry		$24,006	$0.37
5 Metals		$114,772	$1.75
6 Wood & Plastics		$14,472	$0.22
7 Thermal & Moisture		$45,901	$0.70
8 Doors & Windows		$217,496	$3.32
9 Finishes		$2,400,524	$36.66
10 Specialties		$319,152	$4.87
11 Equipment - provided by owner			
12 Furnishings		$286,015	$4.37
13 Special Construction - not included			
14 Conveying - scope removed			
15 Mechanical		$1,105,540	$16.88
16 Electrical		$1,410,432	$21.54
Subtotal		$6,835,722	$104.39
General Conditions	6.00%	$410,143	$6.26
Subtotal		$7,245,865	$110.65
General Requirements	4.25%	$307,949	$4.70
Subtotal		$7,553,815	$115.35
Bonds & Insurance	2.00%	$151,076	$2.31
Subtotal		$7,704,891	$117.66
Contractor's Fee	4.00%	$308,196	$4.71
Subtotal		$8,013,087	$122.37
Design Contingency	10.00%	$801,309	$12.24
Subtotal		$8,814,395	$134.60
Phasing	1.50%	$132,216	$2.02
Subtotal		$8,946,611	$136.62
Escalation - accounted for elsewhere, thus excluded			
TOTAL ESTIMATED CONSTRUCTION COST		**$8,946,611**	**$136.62**

Total Area: 65,484 SF

DETAIL ELEMENTS - ROLLUP -

Element	Quantity	Unit	Unit Cost	Total
2 Sitework/Existing Conditions				
Demolition	65,484	sf	$8.29	542,985
MEP demolition	65,484	sf	$1.46	95,402
Heavy demolition - new stair region	1	ls	$84,726.00	84,726
Site demolition/clearing	6,500	sf	$0.46	3,000
Earthwork	6,500	sf	$1.88	$12,210
Site improvements	6,500	sf	$10.88	$70,700
Site utilities - assumed not required (already in place)				
Total - Sitework				**$809,023**
3 Concrete				
Modifications to new stair region	1	ls	$72,017.55	$72,018
General modified leveling compounds..etc	65,484	sf	$0.25	$16,371
Total - Concrete				**$88,389**
4 Masonry				
Modifications for new stair opening	1	ls	$24,005.85	$24,006
Total - Masonry				**$24,006**
5 Metals				
Modifications for new stair region - steel/reinforcement..etc	1	ls	$96,023.40	$96,023
Steel Modifications to ceilings, mep systems supports…etc.	65,484	sf	$0.29	$18,748
Total - Metals				**$114,772**
6 Wood & Plastics				
Interior blocking/misc. carpentry allowance	65,484		$0.22	$14,472
Total - Wood & Plastics				**$14,472**
7 Thermal & Moisture				
Roofing repairs, new penetrations..etc.	65,484		$0.70	$45,901
Total - Thermal & Moisture				**$45,901**
8 Doors & Windows				
Interior door modifications/replacements	65,484	sf	$1.81	$118,644
Interior glazing system additions/modifications	65,484	sf	$1.51	$98,852.15
Total - Doors & Windows				**$217,496**

DETAIL ELEMENTS - ROLLUP -

Element	Quantity	Unit	Unit Cost	Total
9 Finishes				
Finishes relative to new stair	1	ls	$288,070.20	$288,070
Finish upgrades to specialty spaces (service, café, bathrooms...etc)	65,484		$11.56	$757,140
Flooring materials - carpet systems	65,484	sf	$3.69	$241,927
Tile flooring systems	1,287	sf	$18.00	$23,166
Wall base materials - rubber	65,484	sf	$0.93	$60,967
Wall base materials - tile	287	lf	$20.00	$5,740
Interior partitions - varied assemblies	65,484	sf	$5.92	$387,590
Paint walls systems	65,484	sf	$3.18	$208,314
Ceilings - modifications/replacements	65,484	sf	$6.53	$427,611
Total - Finishes				**$2,400,524**
10 Specialties				
Visual displays/graphical integration/specialties - allowance	65,484	sf	$3.85	$252,228
Restroom specialties (partitions..etc)	1,287	sf	$40.00	$66,924
Total - Specialties				**$319,152**
12 Furnishings				
General use casework and carpentry replacements/modifications	65,484	sf	$1.26	$82,669
Specific new casework anticipated	65,484	sf	$2.36	$154,650
Window treatments - replacements	65,484	sf	$0.74	$48,696
Total - Furnishings				**$286,015**
14 Conveying				
Elevator Upgrades - not included in scope of work				
Total - Conveying				
15 Mechanical				
Plumbing/mechanical systems - modified from narratives to reduce costs	65,484	sf	$14.58	$954,840.09
Replace toilets/urinals/lavs in locations identified	65,484	sf	$2.30	$150,700.00
Upgrades to fire protection systems are excluded from scope of work				
DDC control upgrades are not included in scope of work				
Total - Mechanical				**$1,105,540**
16 Electrical				
Electrical service modifications	65,484	sf	$0.82	$53,588
Panels, feeders, convenience pwr, lighting and lighting controls	65,484	sf	$8.96	$586,887.40
Telephone, data, av rough-in	65,484	sf	$11.76	$769,957.01
Total - Electrical				**$1,410,432**

SCHEDULE OF AREAS AND CONTROL QUANTITIES

Schedule of Areas	Program Area	Total GSF
1. Enclosed Areas (x 100%)		
Level 1	25,587	25,587
Level 1 Mezzanine	7,962	7,962
Level 2	23,869	23,869
Level 2 Mezzanine	8,066	8,066
Level 3 - Scope Removed	6,272	6,272
Total Enclosed	71,756	71,756
2. Unenclosed Areas		
Level 3 Outdoor Roof Deck	3,428	3,428
Total Unenclosed	3,428	3,428
Total Gross Floor Area	75,184	75,184

SUMMARY - PROGRAMMATIC COSTS

Element	Area	Cost per SF	Total Cost
A - Programmatic Model			
Level 1 Components			
Work Area Book Sorting -	1,705	$119	$203,481
Interior Stair Wells (2)	1,174	$181	$212,976
Preservation/Book Storage	693	$114	$78,681
Restrooms	526	$417	$219,354
Special Collections	2,068	$116	$238,931
Staff Lounge/Digital Lab Region	771	$137	$105,757
Stacks	5,223	$20	$105,061
Interlibrary Loan/Gov Pubs/Admin/Librarian Office	1,514	$116	$174,961
General Seating	1,765	$127	$224,167
Maps	4,350	$73	$318,037
General Seating/Reading	1,977	$109	$214,893
Interactive Classroom Region	1,382	$140	$193,535
Café/Scholarly Comm	940	$257.99	$242,507
Entry Vestibule	210	$894	$187,662
Corridor	4,080	$53	$214,547
Elevator	36		
Level 1 Mezzanine Components			
Stacks	13,629	$25	$343,195
Level 2 Components			
General Seating/Exhibit/Outreach	7,840	$86	$670,615
Circ Desk/Ref Desk	1,120	$241	$269,908
Stacks	10,540	$32	$332,234
Stair Opening	1,600	$134	$214,595
Conference Room/Group Studies	1,869	$149	$278,040
Restrooms	375	$421	$157,804
Recording Studio/Control Room	533	$165	$87,788
Steam Workshop	772	$113	$86,959
Corridor	4,264	$53	$224,223
Level 2 Mezzanine Components			
Removal of Stairs	80	$119	$9,500
Stacks	11,783	$18	$208,450
Stair Opening	1,400	$134	$187,770
Level 3 Components			
Clerestory Monitor (Adjacent Finishes Only)	210		
Outdoor Patio	3,321		
Multi Purpose Room	2,841		
Catering Kitchen	270		
Furniture Storage	390		
Restrooms (Added Mens as Well)	386	$377	$145,584
Pre-function Study	970		
Corridor(s)	743	$45	$33,753
Misc Structural Items			
Guardrails Where Indicated	Included in number below		
Structural Modifications for Demolition, New Stair Placement and Clerestory Skylight	1	$564,843	$564,843
Structural Modifications for Entry to 3rd floor Balcony	1		
Structural Curbs for New AHU's	3		
Sitework			
Site demolition / clearing - revised to match modeling concept	1	$3,000	$3,000
Earthwork component - revised to match modeling concept	1	$12,210	$12,210
Decorative hardscapes, vegetation, outdoor seating, seat walls...etc	1	$70,700	$70,700
Subtotal		$6,835,722	$104
General Conditions	6.0%	$410,143	$6
Subtotal		$7,245,865	$111

SUMMARY - PROGRAMMATIC COSTS

Element	Area	Cost per SF	Total Cost
General Requirements	4.25%	$307,949	$5
Subtotal		$7,553,814	$115
Bonds & Insurance	2.0%	$151,076	$2
Subtotal		$7,704,890	$118
Contractor's Fee	4.00%	$308,196	$5
Subtotal		$8,013,086	$122
Design Contingency	10.0%	$801,309	$12
Subtotal		$8,814,395	$135
Phasing	1.5%	$132,216	$2
Subtotal		$8,946,611	$137
Escalation - accounted for elsewhere			
TOTAL ESTIMATED CONSTRUCTION COST - MID-RANGE		**$8,946,611**	**$137**
TOTAL ESTIMATED CONSTRUCTION COST - LOW RANGE		**$8,644,068**	**$132**
TOTAL ESTIMATED CONSTRUCTION COST - HIGH-RANGE		**$9,841,272**	**$150**

DETAIL ELEMENTS - PROGRAMMATIC AREA COSTS

	Quantity	Unit	Unit Cost	Total
A -Programmatic Estimate				
Individual Program Elements				
Level 1				
Work Area Book Sorting -				
Library staff/services (moderate renovation) - non casework region	1,332	sf	$113.54	$151,231
Library staff/services (moderate renovation) - ind. office regions w/ casework	373	sf	$113.54	$42,349
Casework adder - allowance for shelving units (desks assumed ffe)	18	lf	$550.00	$9,900
Interior Stair Wells (2)				
Stairs systems - (minor renovation) - treads/landings/paint...etc	1,174	sf	$24.00	$28,176
Assume improvement to firerating of wall assembly (wall area)	7,800	sf	$16.00	$124,800
Possible modification to stringer/landing positioning - allowance	12	flt	$5,000.00	$60,000
Preservation/Book Storage				
Preservation work area (moderate renovation) - non casework	533	sf	$113.54	$60,515
CM book storage area (moderate renovation) - non casework	160	sf	$113.54	$18,166
Restrooms				
Restrooms (gut renovation) - replace all fixtures	526	sf	$289.08	$152,054
Replace toilets	8	ea	$4,300.00	$34,400
Replace lavatories	7	ea	$2,500.00	$17,500
Replace urinals	3	ea	$4,300.00	$12,900
Replace janitors closet	1	ea	$2,500.00	$2,500
Special Collections				
Special collections (moderate renovation) - casework assumed existing	2,068	sf	$115.54	$238,931
Staff Lounge/Digital Lab Region				
Staff Lounge (moderate renovation) - casework assumed new (15 lf)	305	sf	$119.06	$36,314
Casework adder - assume base, uppers, and solid surface tops/backsplash	15	lf	$725.00	$10,875
Sink Replacement	1	ea	$2,500.00	$2,500
Garbage disposal - allowance	1	ea	$500.00	$500
Dishwasher - allowance	1	ea	$1,295.00	$1,295
Microwave - allowance	1	ea	$500.00	$500
Refrigerator w/ water line - allowance	1	ea	$2,500.00	$2,500
Appliance provided by owner	1	ls	-$4,295.00	-$4,295
Digital lab (moderate renovation) -	204	sf	$113.54	$23,162
Digital int. office (moderate renovation) - casework assumed new (12lf)	138	sf	$113.54	$15,668
Casework adder - shelving systems only	7	lf	$550.00	$3,850
storage (moderate renovation) - shelving assumed ffe	124	sf	$103.94	$12,888
Stacks				
Stacks (minor renovation) - casework assumed existing	2,496	sf	$55.28	$137,972
Demo, carpet, paint, MEP only	2,496	sf	-$18.05	-$45,059
GS offices - (minor renovation) - no casework included	231	sf	$52.59	$12,147
Interlibrary Loan/Gov Pubs/Admin/Librarian Office				
Interlibrary Loan (moderate renovation) - no casework req'd	511	sf	$113.54	$58,017
Gov. publications (moderate renovation) - no casework req'd	434	sf	$113.54	$49,275
University librarian office (moderate renovation) - no casework req'd	156	sf	$113.54	$17,712
Librarian admin. office (moderate renovation) - no casework req'd	353	sf	$113.54	$40,079
Elevator vestibule (gut renovation)	60	sf	$164.63	$9,878
General Seating				
General seating (moderate renovation) - no casework included, enhanced ceiling/walls	1,532	sf	$131.23	$201,040
Campus copy center (minor renovation) - Assume casework req'd	233	sf	$52.59	$12,252
Casework allowance - base and wall cabinets - ss tops	15	lf	$725.00	$10,875
Maps				
Maps (minor renovation) - region poses challenges with stacks	3,506	sf	$58.43	$204,838
Maps office (gut renovation) - region of floor removal / stair insertion	844	sf	$134.12	$113,199
General Seating/Reading				
General seating (minor renovation) - no casework included	1,040	sf	$78.74	$81,885

DETAIL ELEMENTS - PROGRAMMATIC AREA COSTS

	Quantity	Unit	Unit Cost	Total
Reading room (moderate renovation) - casework adder included for service desk	564	sf	$115.54	$65,163
Casework adder - service desk, all others assumed ffe	10	lf	$800.00	$8,000
Casework adder - shelving system	9	lf	$550.00	$4,950
Work area (moderate renovation) - casework adder included	270	sf	$115.54	$31,195
Casework adder - service desk, all others assumed ffe	12	lf	$800.00	$9,600
Office (moderate renovation) - casework adder included	103	sf	$115.54	$11,900
Casework adder - shelving system	4	lf	$550.00	$2,200
Interactive Classroom Region				
Interactive classroom region (moderate renovation) - no casework	810	sf	$146.53	$118,691
Instruction office (moderate renovation) - casework adder below	129	sf	$113.54	$14,646
Casework adder - shelving systems - others assumed ffe	6	lf	$550.00	$3,300
Cafe office (moderate renovation) - no casework	190	sf	$113.54	$21,572
Outreach office (moderate renovation) - casework adder below	127	sf	$113.54	$14,419
Casework adder - shelving systems - others assumed ffe	6	lf	$550.00	$3,300
School comm office (moderate renovation) - no casework	126	sf	$113.54	$14,306
Casework adder - shelving systems - others assumed ffe	6	lf	$550.00	$3,300
Café/Scholarly Comm				
Café region - (gut renovation) - casework included, but no furniture	550	sf	$360.41	$198,228
Scholarly comm. (moderate renovation) - no casework	390	sf	$113.54	$44,279
Entry Vestibule				
Entry vestibule w/ canopy (new construction)	210	sf	$1,650.00	$346,500
Remove vestibule and construct internal vest. (add new doors, canopy…etc)	1	ls	-$158,838.00	-$158,838
Corridor				
Corridor (minor renovation)	4,080	sf	$52.59	$214,547
Elevator				
Upgrade Elevator #2 - cab allowance	1	ea	$10,000.00	$10,000
Reduction in elevator upgrades	1	ea	-$10,000.00	-$10,000
Level 1 Mezzanine				
Stacks				
Stacks (minor renovation) - casework assumed existing	6,234	sf	$55.28	$344,599
Remove all finishes but MEP	6,234	sf	-$21.27	-$132,577
Region of floor removal for new stair (gut renovation)	860	sf	$134.12	$115,345
GS offices (minor renovation)	301	sf	$52.59	$15,828
Level 2				
General Seating/Exhibit/Outreach				
General seating region (minor renovation) - casework assumed existing	6,824	sf	$78.74	$537,288
General seating / incubator (moderate renovation) - casework assumed existing	1,016	sf	$131.23	$133,327
Circ Desk/Ref Desk				
Circulation Desk (moderate renovation) - new casework + fixtures	540	sf	$165.54	$89,393
Casework adder - service desk	35	lf	$950.00	$33,250
Casework adder - back desk	17	lf	$600.00	$10,200
Reference Desk (moderate renovation) - new casework + fixtures	580	sf	$165.54	$96,015
Casework adder - service desk	35	lf	$950.00	$33,250
Casework adder - back desk	13	lf	$600.00	$7,800
Stacks				
Stacks (moderate renovation) - casework assumed existing	1,905	sf	$115.54	$220,098
Stacks (minor renovation) - casework assumed existing	3,253	sf	$55.28	$179,817
Demo, Carpet, Paint, MEP Only	5,158	sf	-$18.05	-$93,114
Circ offices (moderate renovation) - casework assumed existing	224	sf	$113.54	$25,432
Stair Opening				
Stair region (gut renovation) - casework assumed existing	960	sf	$134.12	$128,757
Stack region (gut renovation) - casework assumed existing	640	sf	$134.12	$85,838
Conference Room/Group Studies				

DETAIL ELEMENTS - PROGRAMMATIC AREA COSTS

	Quantity	Unit	Unit Cost	Total
Conference room (moderate renovation) - casework not included	661	sf	$213.14	$140,887
Group studies (moderate renovation)	1,208	sf	$113.54	$137,153
Restrooms				
Restrooms (gut renovation) - replace all fixtures	375	sf	$289.08	$108,404
Replace toilets	6	ea	$4,300.00	$25,800
Replace lavatories	6	ea	$2,500.00	$15,000
Replace urinals	2	ea	$4,300.00	$8,600
Recording Studio/Control Room				
Recording studio/control room (gut renovation) - allowance - assumed not professional grade	365	sf	$361.70	$132,022
Control Room	168	sf	$361.70	$60,766
Change this renovation to Stnd. Gut - Funds not available for Prof. Sound Studio	1	ls	-$105,000.00	-$105,000
Steam Workshop				
Steam workshop (moderate renovation)	700	sf	$113.54	$79,476
Supply/storage (moderate renovation)	72	sf	$103.94	$7,483
Corridor				
Corridor (minor renovation)	4,264	sf	$52.59	$224,223
Level 2 Mezzanine				
Removal of Stairs				
Remove intermediate stairs and patch 3rd floor openings (70 sf)	2	ea	$4,750.00	$9,500
Stacks				
Stacks (minor renovation) - casework assumed existing	5,778	sf	$55.28	$319,393
Remove all finishes but MEP	5,778	sf	-$21.27	-$122,879
GS offices (minor renovation) - casework assumed existing	227	sf	$52.59	$11,937
Stair Opening				
Stair region (gut renovation) - casework assumed existing	1,400	sf	$134.12	$187,770
Level 3				
Clerestory Monitor (Adjacent Finishes Only)				
Add clerestory monitor - (moderate renovation) finish costs for adjacent region only	210	sf	$52.59	$11,043
Clerestory has been removed	210	sf	-$52.59	-$11,043
Outdoor Patio				
Raised pedestal patio decking system - allowance	3,221	sf	$35.00	$112,735
Remove outdoor patio pedestal pavers	3,221	sf	-$35.00	-$112,735
Outdoor patio furniture allowance	3,221	sf	$10.00	$32,210
Remove outdoor patio furniture	3,221	sf	-$10.00	-$32,210
Removal of existing mechanical curbs	2	ea	$1,750.00	$3,500
Leave mechanical curbs in place	2	ea	-$1,750.00	-$3,500
New ramp and stairs for patio access	100	sf	$150.00	$15,000
Remove new ramp and stairs for patio access	100	sf	-$150.00	-$15,000
Multi Purpose Room				
Multipurpose room (moderate renovation)	2,841	sf	$131.23	$372,816
Remove all work within the region	2,841	sf	-$131.23	-$372,816
Catering Kitchen				
Catering kitchen (gut renovation) - casework adder below, sink for small catering	270	sf	$290.00	$78,300
Casework adder - kitchen base cabinets and upper -	27	lf	$800.00	$21,600
Appliance package allowance	1	ls	$7,500.00	$7,500
Remove appliances - owner furnished	1	ls	-$7,500.00	-$7,500
Remove scope of work for catering kitchen	1	ls	-$99,900.00	-$99,900
Furniture Storage				
Furniture storage (moderate renovation)	390	sf	$103.94	$40,535
Removal of furniture storage scope	390	sf	-$103.94	-$40,535
Restrooms (Added Mens as Well)				
Restrooms (gut renovation) - replace all fixtures	386	sf	$289.08	$111,584

DETAIL ELEMENTS - PROGRAMMATIC AREA COSTS

	Quantity	Unit	Unit Cost	Total
Replace toilets	3	ea	$4,300.00	$12,900
Replace lavatories	4	ea	$2,500.00	$10,000
Replace urinals	2	ea	$4,300.00	$8,600
Replace janitor sink	1	ea	$2,500.00	$2,500
Pre-function Study				
Prefunction/study (moderate renovation)	970	sf	$115.54	$112,071
Removal of prefunction study scope	970	sf	-$115.54	-$112,071
Corridor / New Vestibule				
Corridor (minor renovation)	743	sf	$52.59	$39,071
Replace patterned glass	252	sf	$35.00	$8,820
Corridor (add new vestibule)	190	sf	$131.23	$24,933
Removal of corridor scope	743	sf	-$52.59	-$39,071
Structural/Site Modifications				
Misc Items				
Guard rails where indicated	included in model already			
Structural modifications for demolition, new stair placement and clerestory skylight	1	ls	$790,000.00	$790,000
Remove clerestory skylight @ roof	1	ls	-$105,157.00	-$105,157
Remove FRP reinforcement @ roof	1	ls	-$120,000.00	-$120,000
Structural modifications for entry to 3rd floor balcony	1	ls	$18,500.00	$18,500
Do not make structural modifications for entry to 3rd floor balcony	1	ls	-$18,500.00	-$18,500
Structural curbs for new AHU's	2	ea	$3,000.00	$6,000
Remove structural curbs for air handlers (removed)	2	ea	-$3,000.00	-$6,000
Sitework				
Site demolition / clearing - revised to match modeling concept	1	ls	$3,000.00	$3,000
Earthwork component - revised to match modeling concept	1	ls	$12,210.00	$12,210
Decorative hardscapes, vegetation, outdoor seating, seat walls…etc	1	ls	$95,700.00	$95,700
Reduction in scope - smaller walks, std. concrete….etc	1	ls	-$25,000.00	-$25,000

APPENDIX 1 - SCOPE ASSUMPTIONS

Description	Assumed Scope
General Project Info	- Escalation is excluded - accounted for elsewhere. - Local GC laydown / compound area within proximity. - Local trade parking available both onsite (partial) and offsite. - All sub trades to be competitively bid. - Labor pool from Golden/Denver metro area.
Detailed Assumptions	
1. Substructure / Foundations	- Selective excavation and off haul for site improvements included here-in. - No new foundations assumed required.
2. Structure	- Temporary shoring included for slab removal. - Structural steel systems at renovated regions assumed per structural narrative/drawings. - FRP reinforcement wrap counts never specified @ reinforced beams - provided here-in as allowance. - FRP reinforcement layers at roof excluded. - New stair assumed to be constructed of bent plate/channels.
3. Envelope / Roofing	- Existing Curtainwall is to be left in place with modifications for roof tie-in only. New vestibule excluded from scope. - Existing roofing membrane assumed adequate for re-use. If new becomes required - add costs to result. - Roof pedestal system and pedestrian roof access are excluded from scope. This includes FRP reinforcement @ roof. - Aluminum framed skylight assumed at roof is excluded.
4. Interiors	- Metal stud framed interior construction when needed. - HM frame(s), solid core wood panel interior door sets where needed - most doors assumed adequate for re-use. - Floors: sheet vinyl, VCT, sealed concrete, carpet ($33/sy), porcelain tile, and minimal wood. - Ceilings / soffits: ACT tile replacement only - 65%, Full ACT/grid replacement - 20%, gypsum board - 15%, minimal wood plank - Walls: paint, porcelain tile, minimal back painted glass or arch. decorative finish. - Moisture mitigation assumed not required - - Enamel or powder coated restroom cubicles and fixed RR specialties. - Wood casework, solid surface and quartz finished tops. All other casework is excluded that is not identified here-in. - Visual accessories - projection screens, marker boards, interactive way finding. - TV brackets, markerboards, tackboards. - Code required signage. - Equipment for Café placed as 10K allowance. All other ffe/equipment assumed by others - Furnishings - fixed and premium operable blinds, entry mats placed in modeled costs - Estimate excludes all casework not identified here-in - assumed FFE (movable shelving stacks, stack shelving...etc.)
5. Vert. Transportation	- Bent plate / wooden tread stairs assumed for grand staircase. Glass rails included as guardrails. - Ramps / railings at 3rd floor now excluded from scope of work. - All elevator finishes are excluded.
6. Plumbing	- All bathroom fixtures (toilets, urinals, lavs) within the renovation regions are replaced - ADA standards. 3rd floor excluded. - Storm drainage piping excluded - removed in VE.
7. HVAC	- Equipment installed in 1977 assumed in need of replacement - estimate excludes such. - New AHU's excluded from scope of work. - Estimate excludes 1977 steam/hot water heat exchangers. - Estimate provides new terminal VAV units in 1953 portion, yet excludes such in 1977 section. - Radiant finned tube in renovated regions + replaced equipment assumed within estimate. - Existing exhaust fans to remain as is - reroute ducting to conform to new layouts.

APPENDIX 1 - SCOPE ASSUMPTIONS

Description	Assumed Scope
8. Electrical	- Distribution equipment (panel boards and conductors) serving airhandlers are assumed in need of replacement. - (2) new electrical rooms assumed here-in. - (2) new 120/208V panel boards fed by 75 kva transformers to provide power to new loads - Full fire alarm system upgrades excluded - piece work. - All lighting is excluded - 200K allowance only. - New lighting web based digital controls are excluded from project. - Lifesafety and egress lighting upgrades excluded. - AV rough-in provided within estimate - all associated equipment is excluded - assumed part of FFE.
9. Fire Protection	- Fire protection upgrades excluded from scope of work.
10. Sitework	- Demolition of existing greenscape and hard paving as required. - Demolition of existing utilities is excluded from modeling. - Dewatering allowances. - Temporary path of travel, traffic management, and utility re-routes. - On site grading / cut and fill, erosion control measures included here-in. - Existing parking / roadway overlay is excluded - assumed adequate for use. - Pedestrian circulation - std. concrete paving for 12' width of exterior concrete walkways. - Existing promenade connectivity improvements. - Reduced landscaping (seeding and mulch to outlying areas). - Off site improvements - perimeter sidewalk, turn lanes, and signalization. - New wet utility distribution and connections are excluded. - Concrete retaining/seat walls are excluded. Assumed not necessary. - Off site adjustments / connections are excluded.
11. Exclusions	- Upgrades to steam and condensate service sizes. - Utility tunnels. - Monument signage. - Modifications to chilled water plant. - AHU replacement/upgrades. - Modifications to general exhaust fans - assumed to remain. - New roofing membrane at rooftop patio. - FRP reinforcement at rooftop patio. - Escalation - accounted for elsewhere. - 3rd floor scope of work is excluded. - Add on entry vestibule is excluded. - Skylight and occupiable rooftop is excluded. - New elevators or system upgrades. - Sound Room Improvements - assumed std. gut space. - Phasing beyond the allocated (2) here-in. - Relocation services or any other costs relative to shifting departments - assumed by CSM. - Motorized projectors and all AV equipment assumed part of FFE (excluded from estimate). - All sound control room equipment assumed excluded and part of FFE. - All steam, conference, and group study AV equipment excluded - assumed FFE. - IT rough in / backbone cabling included - all equipment/racks assumed FFE.

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