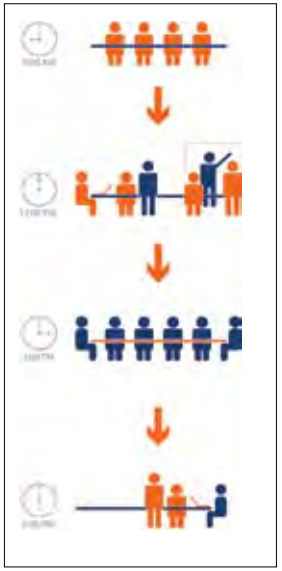
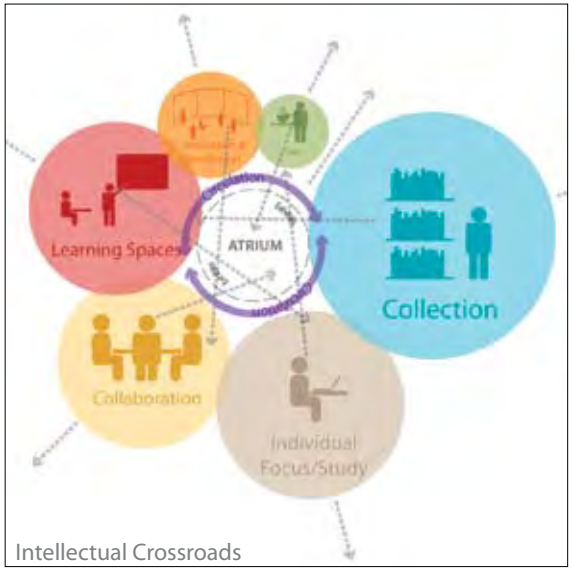
Alderman Library Planning and Assessment Study







Intellectual Crossroads

Project Formulation Report
Strategic Plannning Study for Alderman Library Renovation
Prepared for University of Virginia Libraries
by DEGW North America
10 September 2007

Alderman Library Planning and Assessment Study

University of Virginia | Charlottesville, Virginia
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Project Description

When he chose the Rotunda's Dome Room to be the site of the university's first library, Thomas Jefferson realized his vision of the library as central to the mission and function of the university. The library – in the heart of the academical village – was charged with stewarding the cultural record and inspiring learning and the creation of new knowledge. The library remained in the Rotunda until the collection outgrew that space. Built in 1938, Alderman Library, which stands within sight of the Rotunda, brought Jefferson's vision of the library into the twentieth century. As the largest library on Grounds, Alderman serves as the flagship building of the University of Virginia Library – a library recognized for its national leadership in digital humanities and superior customer service.

Over the years, the Alderman Library building has proved to be a durable, flexible structure that has allowed for many incremental improvements to be made in the last twenty five years. Indeed, the Library is now home to a bustling café, a beautifully renovated reading room, and an advanced technology lab to support innovative digital scholarship. These improvements have been made without altering the beloved and historic nature of the building, treasured by students and faculty alike. But now, at the beginning of the twenty-first century, the current state of the building infrastructure is inadequate to meet expanding demands on library services, projected increases in student and faculty populations, and anticipated growth in academic programs. The physical building faces a long list of daunting challenges, including aging systems and infrastructure, inflexible stack spaces, code compliance issues, and insufficient user space. Moreover, the building lacks a logical, transparent organization of programs necessary for the library to serve a twenty-first century University community.

As we consider the necessity of renovating Alderman Library, we see unprecedented opportunities to create a model twenty-first century research library. Forces of change in the world of university research libraries include extraordinary growth in available information resources, mass digitization efforts, and emerging forms of

digital scholarship in the humanities and social sciences that require new strategies for service and preservation. In this context, the library's traditional functions are changing and expanding, requiring more robust, flexible spaces and programs. The model twenty-first century research library will continue to house physical collections and provide quiet study space, but it will also foster collaboration, provide access to advanced technologies, inspire interdisciplinary connections, and encourage participation in a global environment. This plan offers a dual solution to the need to modernize Alderman's aging infrastructure and create a model library for the twenty-first century.

Purpose/Objectives

The purpose of this study is to develop a formulation plan for a phased capital project to renew the Alderman Library building and improve overall user space in the Central Library precinct, which includes Clemons Library, the Albert and Shirley Small Special Collections Library and the Mary and David Harrison Institute for American History, Literature, and Culture. The plan addresses both the challenges of Alderman Library's infrastructure and the need to create a twenty-first century research library. This plan honors Jefferson's commitment to the centrality of the library in the university setting, takes into account rapid advances in information technology, and will help the University achieve its established goals.

Relationship to Department and Institutional Plans

By enabling the transformation of Alderman Library's spaces and programs, the University will make significant strides toward accomplishing its major goals for academic infrastructure as outlined in the ten-year plan and the Commission on the Future of the University (COFU) Subcommittee on Academic Infrastructure.

One of the five initiatives (Initiative D) in the Ten-Year Academic plan states that the University must "strengthen library and information-technology resources that encourage new modes of learning, teaching, and research." As argued in the plan, the consequences for not acting are dire:

"...library services and information technology create an enabling environment that will redefine education and research for the new century, even as they help us honor and preserve the educational ideals and scholarship of the past. Universities that provide these resources will thrive. Universities that fail to provide these resources will wither. Simply to remain competitive, the University must invest in libraries and information technology."

In its 2007 draft report, COFU's Subcommittee on Academic Infrastructure makes the case that the University should "renew and reconfigure facilities that were designed and furnished to support twentieth-century modes of study and research." The Subcommittee recommends that "[t]he physical infrastructure must support robust technology and ubiquitous access to information and knowledge navigation services. Further, the infrastructure must be revitalized to provide inviting and inspiring physical spaces that foster collaboration and interactions among faculty members and students in a multi-disciplinary environment." The subcommittee also reports that information technology is rapidly altering in four areas: computation, simulation, visualization, and collaboration, and that each of these areas should be addressed in planning for academic infrastructure improvements.

This Alderman renewal plan specifically addresses the supporting strategies named in the Ten-Year Academic Plan and the COFU draft report by proposing to improve Alderman Library's physical infrastructure, create physical library spaces that foster collaboration and interactions between faculty and students, and establish the basis for a new center for digital scholarship in the humanities and social sciences.

Guiding Assumptions

The guiding assumptions of this plan are the following:

Aim to preserve Alderman building's historic quality by keeping the exterior facade and transforming only the interior spaces. Moreover, we should not create any additions that would alter the building's footprint.

Focus on the future and ongoing mission of the library to connect people with information and ideas and preserve the scholarly record.

Meet the University's operational needs for 2020 and beyond, aiming to make the building viable for the next 50 years.

Integrate the planning of building and operational strategies in a transparent, sensible way. The goal is to develop best practices in delivery of library services.

Build the proposed Ivy Stacks II facility prior to the renovation of Alderman.

Methodology

In October 2006, a planning team, consisting of members selected from the U.Va. Library administration, the Provost's office and DEGW,

was charged with developing a strategic plan for the renewal of Alderman Library.

A series of visioning workshops led by DEGW consultants, Shirley Dugdale and Elliot Felix, kicked off the process. At the workshops, focus groups of library constituents shared their ideas about Alderman Library and its future. Attendees included undergraduate students, graduate students, junior and senior faculty, university administrators, and library staff and administrators. James Hilton, Vice President and Chief Information Officer, and Karin Wittenborg, University Librarian, participated in a number of the workshops and provided critical input on projected collaborations between U.Va.'s Department of Information Technology and Communications and the library. These visioning workshops provided the planning team with fresh, immediate input to supplement the consultants' analysis of existing library surveys, collections analysis, and data.

Another key element of the strategic planning process involved the definition of generic space types – the essential building blocks that define the library's program needs.

This strategic plan also takes into account space character benchmarking and best practices.

Key Findings

1. The Alderman Library building is salvageable. Despite its worn condition, the core structure is sound and suitable for modernization. Replacement of the building, which would result in high cost and significant disruption, is not necessary.

2. Building upgrades and desired program changes can occur simultaneously. We can modify the building to accommodate the necessary operational upgrades.

3. We must act soon. If we fail to do so, we will face intractable challenges arising from the building's aging infrastructure and code compliance failures. We will also risk ending the next decade significantly behind our peers and lose the opportunity to create a model twenty-first century research library.

Key Principles of the Proposed Plan

This plan – the "Atrium/Old Stacks Replacement scheme" – offers a solution to achieve the vision of Alderman as an intellectual crossroads for the twenty-first century – an era in which research and learning is becoming increasingly *collaborative*, *interdisciplinary*, and *global* in nature.

We propose to create an atrium and replace the "Old" stacks zone with modern, flexible, tech-

nology-rich spaces. With these changes will come an ability to distribute program more freely and align with the ideal scenarios mapped in the vision workshops. Here are the key principles that establish the business goals of the library and its preferred path to achieve them:

Library as Intellectual Crossroads: The plan is organized around this central theme in order to affirm the role of the library as the place on grounds for interdisciplinary scholarship, collaboration, and interaction among users, staff, and collections. With the introduction of a powerful connective atrium element enabling better transparency and views of activity, clearer paths and orientation, space for events and exhibits, nearly 50% more collaborative space, and more special project and incubation space, the Atrium/Old Stacks Replacement scheme achieves a resolution of the crossroads concept.

The self-supporting Old Stacks zone will be removed and replaced by new floor slabs aligning with the main public floors. The loss of space in the existing mezzanines, which have low headroom not easily used for anything except book storage, is offset by the provision of more flexible and properly serviced new space. This study assumes that the "New" Stacks already in Alderman will remain unchanged, except for a possible alternative of removing perimeter slabs to create better user space within that zone.

This plan offers an opportunity to "recenter" the Library by removing the Old Stacks and restoring the ailing heart of the building. By focusing on renovating the deteriorated core of the building, we get the most gain for our effort. We replace the obsolete and dangerous Old Stacks with modern technology and new spaces for learning and collaboration.

Cascade of Support to Organize the Building Vertically: Navigating through Alderman and its collection can be a challenge as it lacks transparent organizational structure. Given the increasingly important role that library staff play, the way that expertise and support are configured throughout the building can provide the overall structure to assist in users' physical and intellectual navigation in Alderman. This structure is proposed as a cascade of expertise and support, drawn from patterns of use, which moves from the everyday to the expert. Free from some of the existing physical constraints of the Alderman building, the new spaces replacing the Old Stacks can be purpose-built and more readily organized according to a logical principle.

New Balance of User and Collections Space: One of the main goals for Alderman's future is to create more and better quality user space. By relocating the collection within the Old Stacks to off-grounds storage (and weeding the collec-

tion of unnecessary duplicates and volumes), more than 10% of the net area of Alderman can be reallocated from collections space to user space, providing additional, and more collaborative user space.

New Balance of Individual and Collaborative Space: In order to support the increasingly collaborative and team based work on the part of both students and researchers, more collaborative space is needed within Alderman. By providing a Scholars' Court at the base of the atrium and collaborative spaces that replace the Old Stacks area, the atrium scheme will realize the pressing demand for more and varied seating.

Strengthening U.Va.'s Digital Scholarship in the Humanities and Social Sciences: U.Va. is a national leader in digital scholarship in the humanities and social sciences because of its accomplished faculty, expert staff, promotion of innovative programs and commitment to "incubate" special projects within the Library. The creation of flexible experimental space with the Atrium scheme with high ceilings and advanced technology infrastructure for visualization will be a strategic asset, as will the configuration of the incubation space adjacent to it at the base of the atrium. With this plan will come tremendous increases in space for incubation and special projects and group study.

More Effective Space Use: The plan introduces concepts for using space more effectively by sharing space across groups and managing usage. For instance, conference spaces used by staff or special project groups during the day may be used by students at night.

Need for Flexibility: Given the pace of change within the Library and the need to plan for an uncertain future, flexibility is paramount. The plan introduces a freight elevator, clarifies circulation, and treats the reading rooms as open, flexible spaces. The Old Stacks zone is highly inflexible, and so its replacement with open, technologically-enabled space with large spans and raised floors provides clear advantages.

Support for Visualization and Display of Digital Scholarship: Rendering digital activity visible is a critical task for Alderman to be an intellectual crossroads. This kind of interactivity, digital serendipity, and showcasing of work help bring people together. The centralized atrium event space and the visualization zone within the Atrium/Old Stacks replacement scheme provides focused opportunities for this crucial support.

Support for Use of New Media and Digital Making: Meeting the demands brought on by nascent student learning traits and wide distribution of affordable digital making tools (e.g.:

iMovie) will be a challenge for all libraries in the future. With additional computing and staff space as well as more clearly organized support and alignment with Clemons, the Atrium/Old Stacks replacement scheme offers opportunities for Alderman to meet these challenges.

Improved Integration between Alderman and Clemons: It is crucial that Alderman and Clemons continue to be thought of in an integrated way in order to enhance potential synergies of staffing and user experience. The atrium scheme is well-suited to receive a physical connection to Clemons (proposed as an Alternate Intervention in Section X) and will become more integrated with Clemons by the realization of the support "cascade" concept in both buildings. The primary flow between them would be at the atrium level, activating the base of the atrium, and allowing staff experts involved with the enlarged digital media lab in Clemons on the second floor to work more closely with those supporting the visualization zone in Alderman.

Staff Space Strategies for Engagement, Distribution, and Integration: The plan incorporates concepts for staff to be more mobile and distributed throughout the library as space, collections, and staff are increasingly going to be scheduled in response to demand. The scheme assumes 4,000 sf of staff space will be shifted to the Ivy Stacks II facility. The atrium scheme has a net add of about 4,000 nsf. This additional staff space will allow for growth in headcount, strategic co-location of staff from other departments such as ITC, and a more flexible distribution of staff.

Sustainability Strategies: The atrium scheme aspires to three principles of a broader concept of sustainability: connection to nature, occupant comfort, and energy efficiency.

Project Objectives

The primary objective is to renew the Alderman Library building and program to meet projected needs for 2025 and beyond.

Specifically, the goal is to add and improve user space in the Alderman facility. In 2006, the overall library system saw an increase in gate counts, which exacerbates the problem of a deficiency of seating capacity. A 2002 library space study by Paulien & Associates found that only 18% of the student body is currently served, a statistic which falls well below levels of seating provided by the University's peers, such as the University of North Carolina – Chapel Hill, whose library seats nearly 25% of its student population.

Relationship to Library Program and Strategic Plan

The University's original library collection was selected by Thomas Jefferson, and Jefferson designed the Rotunda at the head of the central Lawn as the University's library. The collection remained in the Rotunda until it became too large for that space in the early twentieth century. Alderman Library was opened in 1938, and is named for the University's first President, Edwin A. Alderman, who served during the first three decades of the twentieth century. Shelving capacity was expanded in the 1960s with the addition of the "New Stacks" to the north end of the building. The current building is U.Va.'s largest library at roughly 300,000 GSF and capacity for roughly 2.5M volumes. It houses the general library collections in the social sciences and humanities, together with the library's depository collections of state, federal, and international documents, and it serves undergraduates, graduate students, and faculty in the humanities and social sciences at the University. In addition to reference services and general collections in those areas, the Government Information Resources, the Electronic Text Center and the Geostat Center (now merged into the recently-opened Scholars' Lab) are located in Alderman, as are the University Library administration and several library departments, including Acquisitions, Cataloguing, and Preservation. Alderman is the central facility in the University's network of libraries. The network includes

Special Collections and Clemons libraries immediately adjacent to Alderman, forming a central library precinct in close proximity to the student center at Newcomb Hall and the University bookstore. The planning study area centers on Alderman and Clemons, but also involves consideration of other libraries in the system and the Ivy Stacks, a remote collection shelving facility located on Old Ivy Road roughly one mile west of Central Grounds.

Alderman now plays an increasingly important role as a place for group study and project work. In addition, because common space is limited at U.Va., the individual study spaces in the Libraries offer one of the few places for quiet individual study and are in high demand. With the opening of the Albert and Shirley Small Special Collections Library in 2004, space in Alderman was made available and some reading rooms have been returned to their original use. Also, some re-stacking of staff functions was completed in 2005, moving "back of house" functions off the main customer levels to locations on lower levels that opened up. The latest change in space usage in Alderman is the opening of the Scholars' Lab, an area on the main level that has converted the former cataloging department area into one designed to support faculty and student use and creation of scholarly digital projects. The Scholars' Lab combines the services, staff, and equipment of the former E-Text and Geostat Centers. Alderman has historically served as an "incubator" to high-potential academic endeavors that operated outside the traditional departmental structure. For most of the twentieth century this involved individual scholarship, and Alderman provided offices to a number of distinguished academics, such as Dumas Malone when he was writing his histories of Jefferson. From the 1990s to the present, the incubator function became more digital and more team or project-oriented. Alderman now provides space (physical and electronic) for several digital study projects in history and the social sciences, including the Institute for Advanced Technology in the Humanities and the Virginia Center for Digital History. The Library continues to make a limited number of individual faculty studies available for those working on University-supported research projects with a digital focus or that require use of library materials that cannot be removed from the building.

The original stacks occupy the north end of the Alderman facility. They are an unusual design: unprotected steel columns support both the book shelves and the floor system of the stack wing. The structural integrity of the system in the event of fire has always been a concern and is part of the technical scope of the planning study. A stacks wing was added to the north side of Alderman in the 1960s, and has a con-

ventional floor system and non-structural shelving system. The building is air- conditioned, but does not provide filtration, humidity control, or other features which would help protect the collections. The scope of the study includes evaluation of the HVAC system in order that the library can better steward existing collections, increase thermal comfort for the users and staff, and achieve efficient energy use.

The building and its systems have been maintained fairly well over the years, but the infrastructure is now in dire need of modernization and redesign to address significant challenges, including:

- aging systems and infrastructure
- code compliance failures
- inflexible stack space
- insufficient user space
- aging furnishings and finishes
- difficulty of converting existing spaces to new functions or expanding with new university initiatives
- wayfinding and orientation difficulties
- the burden of compensating for deficiencies elsewhere on Grounds, i.e. graduate student office and study space, and poor sustainability performance.

The library has requested state funding for an addition to its automated storage facility, the "Ivy Stacks." When completed, the stacks expansion will allow roughly 600,000 volumes to be moved out of Alderman immediately, bringing Alderman to roughly 85% of capacity, a stable operating model. The stacks will then accommodate twenty years of normal collection growth, roughly 60,000 volumes per year, plus archival storage of special materials such as film. Through automation of the storage and retrieval functions, the current Ivy facility achieves a very satisfactory level of service providing requested materials to customers in a timely manner. The stacks expansion project also includes roughly 6,000 assignable SF for four technical groups presently located in Alderman: Preservation, Acquisitions, Cataloguing and Digital Library Production Services. Moving these groups to the Ivy Stacks facility will free roughly 4,500 ASF in Alderman.

Renewing Alderman Library's building fits the library's mission to:

Enable teaching, research and learning by providing easy on-site and remote access to needed materials, in all formats and languages;

Provide physical environments that are attractive, well-maintained, and flexible enough to support the collaborative and interdisciplinary study sought by the University academic community;

Collaborate with ITC, other University schools and units, and other institutions and agencies to better leverage our resources and to help address the "grand challenges" of higher education;

Develop, collect, preserve, and maintain digital scholarship

Relationship to University Mission and Institutional Objectives

As a leader among public institutions, the University supports research and scholarship in many academic disciplines, including the professional fields of medicine, law and business administration. The over 19,850 students attending the University work within a true meritocracy and live by an Honor Code unique among American universities. The University's School of Continuing Education, which has eight locations throughout the state, teaches courses to an additional 20,000 students. The University employs 11,600 permanent faculty and staff members and has an annual budget of $1.7 billion. Last year external support of research programs reached $150 million.
The University is one of a select group of 62 American and Canadian universities chosen for membership in the prestigious Association of American Universities.

The creation of a model twenty-first century library within sight of the Rotunda and "Academical Village" will help the University recruit top undergraduate and graduate students.
A recent survey by the Association of Higher Education Facilities Officers showed that students look carefully at facilities when choosing a college. In fact, more than half of respondents deemed the library to be "extremely important" or "very important" when they were selecting a college. Moreover, among factors that influence students' choice of college to attend, library facilities are second in importance only to facilities in their major field of study.

The proposal for renewal of Alderman Library is supported by the University's data for history and trends in population, for space condition, and for space need.

Population

The University's Six Year Plan and Ten Year Academic Plan anticipate growth of 1,100 undergraduates and at least 400 graduate students between 2005 and 2015, possibly up to 1,200. Of those overall totals, it is anticipated that roughly 800 of the new undergraduate positions and 57 graduate positions will be in the College. Over the 10 year period, this is an 8% increase in the 2005 population. The Sciences and the Arts will be emphasized in recruitment and program growth, although modest increases are expected in the programs of the Humanities and Social Sciences as well.

Faculty growth over the same period is planned to be roughly 25% - 30%, or 160 – 190 FTEs. This rate is driven by a goal to move the student/faculty ratio from the present 17.7/1 to about 15/1, which better supports smaller class sizes and high levels of student and faculty interaction.

No formal plan is established for population growth for 2015 – 2025 but the working assumption is that it will continue at the same rate of roughly 10% per decade overall, and that the growth will be apportioned over the Schools about the same. In that scenario, growth in the College would be an additional 865 undergraduates and 59 graduate students, a total of 924, representing about 57% of the total growth in students university-wide. Faculty growth in this period would be 61 – sufficient to maintain the 15/1 student/faculty ratio.

Although the annual percentage of growth appears modest, the number of new students and faculty over the planning period – roughly 2,000 – will drive the need to modernize and/or add to facilities. The table below summarizes these growth projections for the College:

Planning Horizon	Previous Fall 1995	Existing Fall 2005	1 2015			2 2025		
POPULATION DETAIL	FTE	FTE**	FTE	05 -15 FTE Growth	05 - 15 % Growth (FTE)	FTE	15 -25 FTE Growth	15 - 25 % FTE Growth
College of Arts and Sciences								
Undergraduate	9,055.76	9846	10646	800	8.13%	11,511	865	8.13%
Graduate	1,685.70	1518	1575	57	3.75%	1,634	59	3.75%
Tot	11364	11364	12221	857	7.54%	13,145	924	7.56%
Faculty	573.40	642	802	160	24.93%	862	61	7.56%
Student/Faculty Ratio	19.82	17.71	15.24	n/a	n/a	15.24	n/a	n/a
Staff	338.80	441	474	33	7.51%	510	36	7.59%

Space Condition

In 2002, Paulien & Associates, Inc., an Academic Space Planning firm, was contracted to provide a Library Needs Analysis for the University of Virginia.

The study included an assessment of the condition of the library's space relative to norms at peer institutions. It also included an inventory of the library's current space, and developed guidelines per student that were based on a blend between an average of benchmarked peers and an empirical assessment of what worked at UVA.

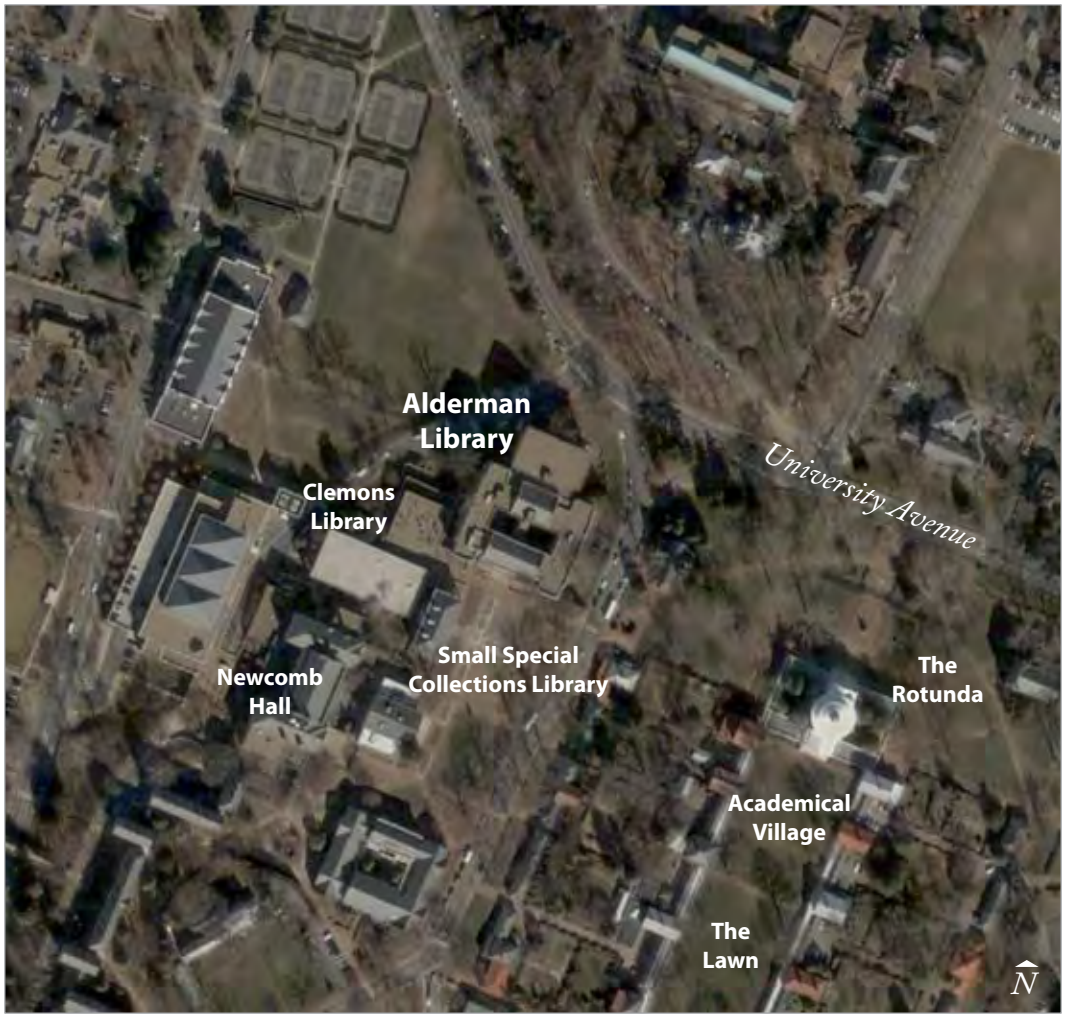
The consultants found in their benchmarking study that "the U.Va. library system is substantially short of space" when national standards and guidelines established by the Council of Educational Facility Planners, International (CEFPI) are used and when comparisons are made with peer institutions.

Need

The Paulien study calculated how much space the Library ought to have in key categories in order to meet the guidelines of space per student which were agreed upon as appropriate for UVA.

Empirical assessments of library seating in Alderman and Clemons confirm the findings of the Paulien study. These assessments have shown that there is insufficient seating, especially at peak periods of use, for example, exam periods.

Gate counts also indicate growing space problems for the library. In 2006, the Alderman Library saw an increase of 7.5% in the number of people passing through the security gates each day, which means that we have more and more people trying to find seats in a facility that has already been found to be deficient in this area. As the University's faculty, graduate and undergraduate student population increases and demand on library services grows, the stress on available library seating and services is only going to get worse. We know that there is not enough capacity for current and future user populations. In order for the library to meet its mission, it needs to be able to offer a wider variety of flexible spaces where users may study and collaborate.



Site and Context

Alderman Library, Clemons Library, and the Harrison Small Special Collections Library form a library precinct in the heart of the University. Because of the close physical and functional relationship of these three libraries, the entire precinct has been considered for the purposes of this study, in order to develop complementary facilities, collections, and areas of focus rather than unnecessarily redundant or competing ones. In addition to being close to each other, these libraries also have the virtue of proximity to the Newcomb Hall student center, the Academical Village, and the main entry to the University from University Avenue. Among them, Alderman Library is often the first building a visitor sees upon arriving at the University.

Within this precinct, Alderman Library is sited most prominently but built into the hillside to keep its mass low. This location means that Alderman Café is thus well-located as a convenient place to get coffee on Central Grounds and that at times, the Alderman circulation desk in Memorial Hall becomes the University's

de facto visitor's center. The location and original site strategy honor Jefferson's Lawn both in its spirit of integrating with the topography and in its stature as the sinking of the building allows for its height to remain below that of the Rotunda, the original library. But, the site of Alderman Library also has several key challenges: embedding the building into the hillside and thus entering in the fourth floor translates into increased chance of flooding (which has happened on several occasions in the past) as well as causing wayfinding and orientation difficulties.

Current Challenges of the Alderman Building

While a historic treasure on the UVa grounds, perhaps second only to the Academical Village in stature, the Alderman building faces several significant challenges to its continued prominence – at UVa and in the world. The Library and its staff are doing ground-breaking, innovative work now, but the facility constrains Library's success, plaguing Alderman with missed opportunities and failing to realize the full potential of the library's users and staff.

The building is urgently in need of improvement in several critical areas such as its dated infrastructure, code compliance, structural soundness, lack of high-quality user space, lack of flexibility, aging furnishing, wayfinding shortcomings, and poor sustainability performance. Taken together, these current challenges make a clear case for Alderman's renewal and must be addressed to secure the kind of future for Alderman Library that Jefferson would expect, if not mandate.

Aging Building Systems and Infrastructure

Aging facilities and infrastructure threaten Alderman Library's continued success. Alderman's infrastructure is comprised of generally dated systems that are difficult, not only to distribute throughout the building, but also to service and control. The electrical, information technology, HVAC, plumbing, and lighting systems are all in need of renewal in some way, and these shortcomings compromise the facility's performance from both user and operational perspectives.

Alderman's aging systems leave users often lacking power where they need it, increasingly important in our device-rich world. There is also a lack of robust wired and wireless network access, with the latter often blocked by the "Old" Stacks structure. The dated HVAC systems are a challenge for occupants' thermal comfort as well for Alderman's collection and energy usage. Much of Alderman's piping systems are corroded and there have even been user complaints about the taste of its drinking water. The lighting systems are in need of replacement; the

quality, quantity, and adjustability of lighting are essential for creating top-notch user space as well as for Alderman to improve its energy efficiency. Lastly, while the structure of Alderman is generally sound, the self-supporting stack configuration is itself a dated system warranting rethinking as it entails exposing hundreds of small steel members within what amounts to a tinder box of printed materials.

At present, Alderman's librarians and facilities staff are keeping it running practically through their sheer will, despite these facilities challenges. But, this cannot continue into the future. One example: there is no central control for the lighting in the "Old" stacks. So, rather than walk around and operate hundreds of switches, staff must use an electrical breaker panel to turn the lights on and off – subjecting the panel to a use for which it was not designed. As the future course for Alderman is charted, the historic character of Alderman should be maintained at all costs, but its historic systems must be renewed so that the library can prosper because of its facilities rather than in spite of them.

Code Compliance Challenges

Several significant code issues will need to be addressed in any future renovation of Alderman Library. The "Old Stacks" of the original 1938 buildings are an erector set of steel parts, supporting thin concrete floor slabs. The structural columns are 2" x 2" hollow posts with the electrical distribution system routed through their core. This system would seem to have a 0-hour fire-resistive rating, (It is a unique system and would have to be tested under laboratory conditions to evaluate its actual rating) which is extremely problematic, in as much as the associated square footage includes substantial elements of the building egress system. For this building to exist in its present configuration, height and footprint; this area should be constructed of building elements that have a minimum of 2-hour fire resistive ratings.

Code requires that an Assembly Occupancy with an occupant load of greater than 300 shall be provided with a main exit, which is of sufficient width to accommodate not less than one-half the occupant load. The main exit from the fourth floor at Memorial Hall is currently undersized. Additional egress is required from Memorial Hall.

Alderman Library also does not meet the requirements for accessible means of egress. Two accessible means of egress are required from every floor of Alderman Library, currently there is one accessible egress from the first, second and fourth floors and none from the third or fifth floors.

Several additional Americans with Disability Act (ADA) compliance issues emerged from our review of the facility. There are currently two elevators in Alderman Library, neither meets the ADA requirements for accessibility, primarily as a result of insufficient cab dimensions. ADA improvements have been throughout the facility, however, it was noted that the toilet improvements that have been made do not meet the needs of the current building occupants who require those facilities.

Structural Challenges

The "Old Stacks" in the original building presents structural issues whether removed, renovated or retained. It likely does not meet Code fire-rating requirements and any modification to the framing such as removing columns or areas of floor would require new framing and foundation work. It also appears that the interstitial floors in this system provide some bracing to the main building columns. The main building columns may require the addition of bracing if the old stack system is modified or removed.

Construction access to the old stacks area will be challenge for a renovation project. Although the roof structure over the stacks is independent of the stacks, it consists of clear span steel trusses and concrete planks that may require partial removal for crane access into the space. Side access for material removal or delivery of new materials may not be feasible.

Concerning interior building additions, the existing building does not likely meet the seismic design requirements of current building codes. If significant areas of new floor framing are added to the existing building, then either the entire building will require upgrading to current seismic design requirements, or the new floor framing will be required to be isolated and independent of the surrounding existing building. Structurally independent framing for interior additions is likely more practical, but may necessitate lateral elements such as shear walls, braced frames or rigid frames.

Deficiency of User Space

Like many buildings of its era, Alderman Library was designed around its collection; for example, Alderman's West wing is a literal translation of how materials would move up through the building. As the use and operation of libraries has evolved considerably since it opened in 1938, the need to shift emphasis from the collection to users is increasingly evident in this digital age. Thus, increasing the quantity, quality, and mix of user space underlie all the changes proposed for Alderman. There are three areas in which Alderman renovation needs are critical: accommodating users during peak periods, pro-

viding the appropriate settings for collaboration, and upgrading carrels for quiet, individual study. Alderman needs to be able to handle peak load periods such as mid-term and final exam times. Currently, these periods place undue burdens on the facility and present significant operational challenges to providing material, support, and space to users. Accommodating these periods entails two needs: first, additional seating to meet the growing campus population, and second, strategies for sharing space among different user groups such that demands can be better distributed across the facility during these peaks; for instance, by allowing conference rooms and other shared work spaces to serve as overflow study space.

There is currently little dedicated collaborative space in Alderman and only slightly more within the library precinct as a whole. For example, there no small group rooms within Alderman, the audiovisual viewing spaces in Clemons are in great demand, and there are few enclosed rooms or conversation-friendly zones. There are currently no areas with large shared screens and the mix of seating supports predominantly quiet individual study rather than supporting and encouraging collaboration. Though collaboration among students and faculty does occur in the library within some reading rooms and the café area, if Alderman is to fulfill its promise as an "intellectual crossroads," additional and re-configured user space will be needed.

The carrel spaces in Alderman are located within its "Old" and "New" stacks. They offer a traditional location for quiet, individual study and offer opportunities to, as one student put it, "find your nook and encamp there." While the historical character of these spaces and their isolated location are clearly beneficial, the carrels and the spaces they occupy present significant challenges, and in some cases liabilities, for the library. The carrels are in need of replacement in both the "Old" and "New" stacks and both spaces also lack lockable storage – a necessity expressed by all the grad students we talked to. As is the case throughout the library, getting power to operate devices like laptops and iPods is a challenge. The "Old" stacks carrels offer no access to natural light and the "New" stacks carrels have very limited light as they only have small (12" wide) windows located perpendicularly in the area between the brick façade and recessed stone panel. Within the "New" stacks, the carrels are poorly configured so that users must sit with their backs to the circulation aisle which is not only unnerving, but potentially unsafe. Within the these areas, the shelving is quite close to the perimeter, precluding carrels perpendicular to the façade or small tables.

Aging of Furnishings and Finishes

During a focus group with graduate and undergraduate students, one student characterized the state of Alderman's furniture and finishes:

"There is a difference between 'Good Old' and 'Bad Old' – 'Good Old' is the McGregor Room. 'Bad old' is your parents' basement." This statement speaks volumes about the need to update these aspects of Alderman but do so without letting go of the historical character. Alderman can "look 'classic' rather than just plain old." Now and into the future, Alderman must continue to reflect the history of the institution as well as give its visitors and users an impression of its future. This means not only that natural materials, warmth, details, and the volume of the pure, large reading rooms should be maintained, but also that modern materials and technologies must be integrated comfortably within the historic character of Alderman.

Inflexibility of Stack Space

The original center zone of Alderman Library is occupied by self-supporting stack floors. These stacks floors are only 7'-6" floor-to-floor in section (aligning at every main floor and the midway point) supported by 2 ¼" square exposed steel columns which are organized on a 5'-6" square grid. These columns not only directly support the shelving and the floor structure, but also serve as vertical electrical conduits with surface-mounted switches. In addtion to code-compliance issues, these closely-space columns and low ceiling height render the "old" stack space highly inflexible: it would be difficult to find alternate uses for the space, and its proportions do not enable easy sub-division or reconfiguration. This approximately 6000 square foot space sits at the heart of Alderman. As a central feature, its inflexibility represents a significant shortcoming in Alderman's ability to meet future needs, as well as a concern with regard to conformance to today's code standards.

Difficult Space to Convert to New Functions or Expand with New Initiatives

Another challenge of the space within Alderman is the difficulty of converting it for new initiatives. This is as much a function of the sizes and proportions of and relationships among space as their historic character. Alderman's plan is roughly an "H" with large reading rooms in the East and West Wings, the "Old" stacks infilling the Northern portion, and small connector zones between the two. In order to celebrate their historic and open character, subdividing the large reading rooms is not advisable. This, coupled with "H" plan and the inflexible stack space, means that there are few spaces within Alderman that can be easily converted without compromising either the operation, use, or character.

Wayfinding and Orientation Difficulties

Alderman Library's users often experience wayfinding and orientation difficulties which can impede their use of the library as well as its operation. Many of these challenges stem from the initial strategy of building into the hillside in order to limit the structure's height in comparison to the Rotunda. While this strategy does integrate the 300,000 gsf facility with the context, it means that one enters on the fourth floor, which can leave one disoriented as to what is on each level and where one is within the facility. This disorientation is compounded by the lack of an overarching vertical organization for the building. A representative experience would be the flow from loud to quiet space within Clemons. Because the building is relatively compartmentalized and often lacking transparency or porosity, it poses a barrier in creating visual or physical connections between spaces. This means that it can be difficult to find materials, other users, or even spaces in which to work - in the words of one student: "It feels like when you enter Alderman, the burden's on you." Lastly, because there is no clearly differentiated primary circulation within the building, the opportunities for chance encounters among students, faculty, and staff are decreased.

Summary of Existing Building Conditions

Architecture

Alderman Library is classified as an A-3 Assembly Occupancy. The building is substantially Type IB construction, with the notable exception of the Old Stacks, which has structural elements that may have 0-hour fire-resistive rating.

The most significant code issues in the existing facility relate to egress from the building. Code requires that an Assembly Occupancy with an occupant load of greater than 300 shall be provided with a main exit, which is of sufficient width to accommodate not less than one-half the occupant load. The main exit from the fourth floor at Memorial Hall is currently undersized. Alderman Library also does not meet the requirements for accessible means of egress. Two accessible means of egress are required from every floor of Alderman Library, currently there is one accessible egress from the first, second and fourth floors and none from the third or fifth floors.

There are currently two elevators in Alderman Library, neither meets the requirements for ADA accessibility, primarily as a result of insufficient cab dimensions. ADA improvements have been throughout the facility, however, it was noted that the toilet improvements that have been made do not meet the needs of the current building occupants who require those facilities.

Asbestos containing materials (ACMs)have been identified at multiple locations throughout the facility, including; pipe coverings, mudded joint packing and boiler tank insulation in mechanical spaces. ACMs are also in several user spaces, including; sprayed acoustic ceiling plaster in the Barrett and McGregor rooms and in floor tiles and mastic throughout the facility.

The exterior closure systems are in good condition, with the possible exception of the windows. The existing wood windows, primarily single glazed double hung units are in adequate condition, however, they have been outfitted with interior storm panels which are in poor condition; the system will require reevaluation and renewal.

The roof systems are in adequate condition at the present time, the sloped slate roofs have substantial additional life; however, the low-slope EPDM (synthetic rubber) roofs will require replacement in the next several years.

MEP FP

The original building and new stacks addition are primarily conditioned by a heating, ventilating and air conditioning system retrofitted to the buildings c. 1985. This system is generally described as a 4-pipe heating water (HW) and chilled water (CHW) system with more than thirty air handling units.

Low pressure steam (LPS) for humidification is generated by an electric boiler located in the new stacks basement. This boiler is relatively new – reportedly less than 10 years and in good condition.

Additional heating is provided by the original HW radiator system in the main building. The original manual control valves for the cast iron HW radiators suffer occasional leaks due to the age of the valve packing. There are no means for isolating individual radiators, thus requiring the shut-down of entire heating water loops for repairs. Control of the radiators is manual only and not interfaced with automatic temperature controls for the air handling units. Control of the radiator heating output is difficult due to old/worn/leaky radiator valves and connection to reheat loop (one of two top complaints from building occupants). This leads to energy waste and occupant discomfort.

The mechanical systems are controlled by a hybrid pneumatic and electronic Johnson Metasys system. Electronic controls are monitored by the University Systems Control. The control systems do not allow implementation of adequate strategies for energy conservation. Humidifier high limit controls are unreliable and prone to failure. The control valves in piping at air handling units are leak frequently and repair parts are not available.

The 1985 heating, ventilation, and air conditioning (HVAC) systems retrofit might best be described as "shoe-horned" into the building, as the only major space programming change made at the time was to accommodate the central mechanical equipment in the basement of the new stacks. A few air handling units are installed in mechanical closets, and a few more in excavated but unfinished "dirt rooms." Beyond this, most of the air handlers are located above dropped ceilings.

The HVAC systems are well maintained and operating in a manner consistent with their age and within the capabilities of their type. In general, the chillers, cooling tower, pumps, piping, air handlers and ductwork are in fair-good condition for 20-year old equipment; the original converter, pumps, cast iron radiators and piping are in fair condition. While the system is not capable of maintaining con-

sistent indoor temperatures suitable for all occupants, there are no reports of excessive moisture that could lead to mold / mildew.

Air handling units and steam humidifiers located above dropped ceilings are difficult to maintain and service. Given current space programming, the zoning is inadequate to provide occupant comfort. The use of portable electric heaters is common, which then taxes the electrical system. Air handling units in the "dirt rooms" are subject to dust/dirt and occasional moisture intrusion. Storage space for filters is inadequate. The many differing sizes of air handlers require stores of many different sizes of filters. Many filters have to be stored in "dirt rooms" where they are subject to dirt/dust and moisture. Condensate drains leak and frequently clog.

Plumbing facilities are concentrated in restrooms at the south side of the building. Domestic water enters the building at the "dirt room" in the southwest corner of the second floor. Domestic hot water is produced by multiple electric water heaters in the vicinities of restrooms and fixtures. Domestic cold and hot water are distributed throughout the building in galvanized steel piping to restrooms on each level and other miscellaneous plumbing fixtures. The galvanized steel piping is corroded and prone to leaks at joints.

Sanitary waste and vent piping, and storm piping is cast iron. The flat roofs of the building have roof drains, but lack secondary (emergency) drains.

Plumbing fixture locations and associated piping are original to the building. Fixtures have been replaced with modern, low-water consumption type. While wheelchair-accessible lavatories exist, the water closet stalls and urinals may not comply with current American with Disabilities Act Accessibility Guidelines (ADAAG) requirements, due to installation constraints. The number of fixtures meets or exceeds code requirements, with the exception of water closets for females.

Occupants complain that potable water from drinking fountains is distasteful. This is likely due to the aged galvanized steel piping, which is prone to internal corrosion buildup. For this reason, individual filters are installed at some of the drinking fountains – an infringement of University policy. The filters have not alleviated the distastefulness.

No fire protection sprinkler or standpipe systems exist in this building. Protection of this building is not consistent with the University's policy of providing automatic fire protection of all buildings on campus.

Primary power is fed to the building from the University primary electrical system in two locations – one at the southeast corner of the main building, and one at the northeast corner. The service switchgear in the southeast first floor is rated 208/120V, 3 phase, 4000A. The service switchgear at the northeast corner is rated 480/277V, 3 phase, 1600A. The main switchgear at both services has just recently been replaced. One breaker in the 480V switchgear that feeds a sub-panel trips frequently and the breaker handle is broken due to frequent resetting.

Much of the original building's electrical distribution feeders, panelboards and branch circuits remain. Panelboards are old and worn. Replacement breakers are no longer available. Branch circuits are not segregated, well organized or documented. Loads connected to some breakers are unknown. Branch breakers are used to control lighting in the old stacks area, leading to excessive wear and tear on the breakers. Branch circuits and devices for plug loads are inadequate throughout the building. Some circuits are overloaded, some have simply shorted out and are no longer usable.

Switches and receptacles are old and worn. Locations of power outlets no longer meet the needs of the building use. Switches do not incorporate modern techniques and technologies, such as dual-switching, occupancy sensors, etc. Branch circuits in surface raceways have been added to alleviate some of these problems.

Lighting is predominantly fluorescent, of dated vintage (magnetic ballasts and T12 lamps). Many of the fixtures in stack areas have broken acrylic lenses. Control of the stacks lighting is inadequate and inconvenient for the staff. Emergency lighting units with batteries are used for egress lighting.

The fire alarm system has two main panels – one located in an office space at the second floor level. Initiating devices (manual pull stations, smoke detectors, heat detectors, duct detectors) and alarm devices (horns, horn/strobes) are located throughout the building.

There are two communications closets that serve the entire library, located in the old stacks 3M level in the southwest and southeast corners. From each closet there is a vertical chase to each floor of the old stacks by which cabling is fed to each floor of the library.

A closed circuit camera system exists at the first and second floors, originally intended to provide security for the special collections area (which has since been relocated).

Structure

The structural condition of the existing Alderman Library appears to be good. No major deficiencies or areas of structural concern that would require significant remedial work were noted. The existing floor and roof framing are functioning well. The concrete encased steel framing of the original building and the cast-in-place concrete framing of the building addition will likely satisfy Code fire-rating requirements for a renovated building. This condition would not apply to the old stack floor system in the original building. Structural capacity of the existing floor and roof framing for gravity loads appears to satisfy current building code design loads.

Summary of Existing Functions and Space Use

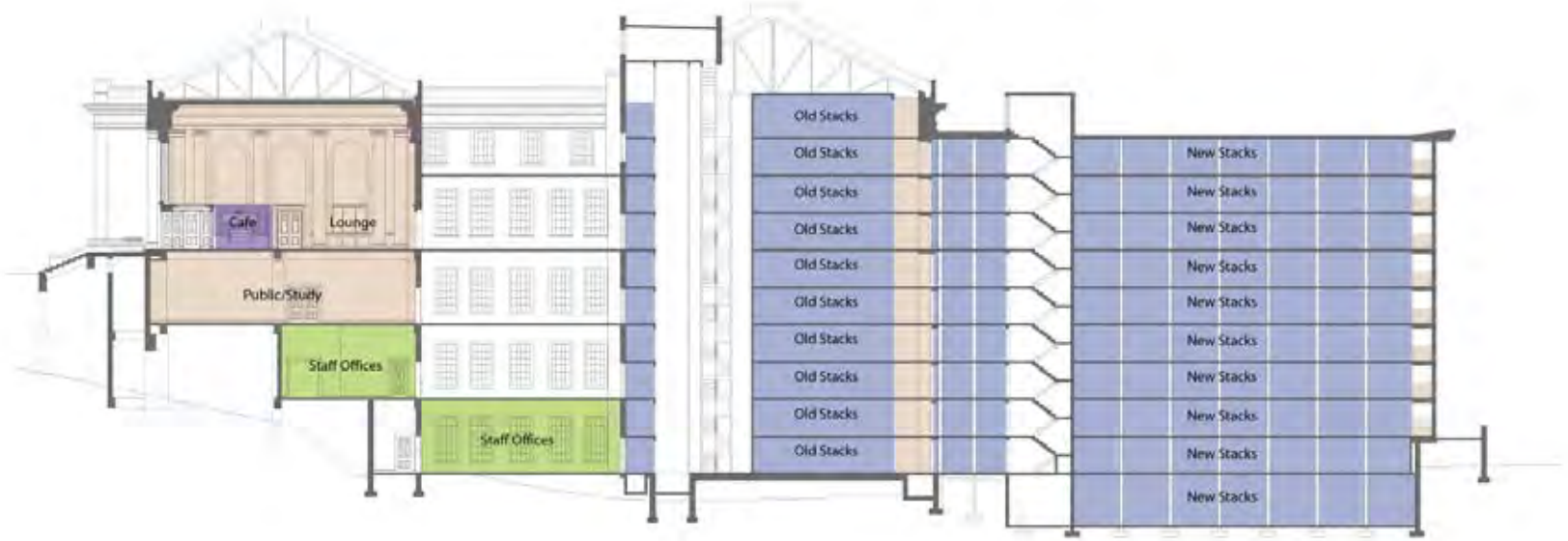
Existing functions in the Alderman complex are grouped into four main zones: the south front zone flanked by the East and West Wings, the "Old" stacks zone in the center, the "New" Stacks zone at the north, and the Clemons Library to the southwest.

The south front zone houses the primary public circulation zones that connect the East and West Wings:

On level 4, the large ceremonial space at the entry, Memorial Hall, with its high ceilings and tall windows on both sides;

On level 3, the Government Documents reading room and staff offices; and

On level 2, the broad corridor with exhibits that leads to the historic reading spaces in the East Wing, flanked by office space.



Existing Condition Longitudinal Section

The East Wing is composed of major historical reading rooms, topped by administrative offices on level 5:

On level 4, the Reference Reading Room

On level 3, Periodicals Reading Room, and

On level 2, the McGregor Room and the Barrett Room.

The West Wing is more mixed in function:

On level 5, offices for library administration, special projects and faculty studies,

On level 4, a reading room which has been recently converted into the Scholars' Lab and its associated offices,

On level 3, historic reading rooms consisting of the Map Room and Garnett Room along with a conference room and IATH offices, and

On level 2, a former reading room which was converted to Processing staff space.

On level 1 below the East Wing are two non-library functions, the Rare Book School and the Printing Services, and under the West Wing, some staff space for processing, facilities management and receiving. Both the "Old" and "New" Stacks have a low floor to floor height, creating mezzanine levels in between the main floor levels of the wings.

The entrance to Clemons Library is off the same public exterior circulation path and leads into the fourth floor of the building:

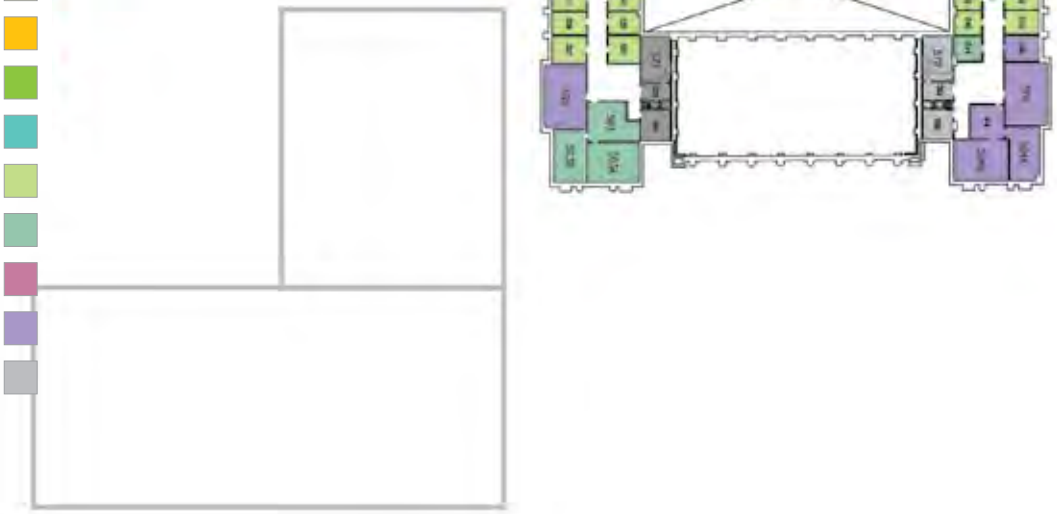
Level 4 houses collaborative work areas, computing clusters and the main service desk with staff offices,

Level 3 is the Robertson Media Center, with its service desk, viewing rooms, open media carrels and staff space. It also houses the Digital Media Lab.

Level 2 and 1 are predominantly quiet student study space with some stacks.

Legend

- Stacks
- Reference
- Microforms
- Government Docs
- Periodicals
- Maps
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Copier Zones
- Public Services
- Processing
- Staff Offices
- Support
- Media Services
- Non-Library Areas
- Maintenance/Mechanical



Key Space Attributes

- Existing "New" Stacks at North portion of building, with perimeter study carrels

- "Old" Self-supporting stacks at building core, with study carrels at North side

- Cellular library staff and special project offices, including open meeting areas

- No access to Memorial Hall (double-height space on Fourth Floor)

- Lightwells separated by enclosed bridge element, below

Existing Condition Fifth Floor

Legend

- Stacks
- Reference
- Microforms
- Government Docs
- Periodicals
- Maps
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Copier Zones
- Public Services
- Processing
- Staff Offices
- Support
- Media Services
- Non-Library Areas
- Maintenance/Mechanical

Key Space Attributes

- Memorial Hall on South face, including main entrance, circulation desk, lounge area, drop-in computing carrels, and Alderman Café

- Scholar's Lab and Library staff offices in West Wing with adjacent small group room and electronic classroom

- Reference Reading Room and staff space in East Wing and adjacent "connector" zone

- Existing "New" Stacks at North portion of building, with perimeter study carrels

- "Old" Self-supporting stacks at building core, with study carrels at North side

- Lightwells separated by enclosed bridge element

Clemons
- Main Entry Level with open plan study space, drop-in computing and support zone, and group-study booths at North face

- Circulation Desk and Staff space at East side

- Flexible group-study classroom at Northeast corner

Existing Condition Fourth Floor

Legend

- Stacks
- Reference
- Microforms
- Government Docs
- Periodicals
- Maps
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Copier Zones
- Public Services
- Processing
- Staff Offices
- Support
- Media Services
- Non-Library Areas
- Maintenance/Mechanical

Key Space Attributes

- Government Documents Reading room and associated staff at South

- Periodicals Reading Room in East Wing

- Historic Reading Rooms within East Wing: Garnett and Map Rooms

- Incubation space for IATH and Virginia Center for Digital History (in historic Taylor Room)

- Existing "New" Stacks at North portion of building, with perimeter study carrels

- "Old" Self-supporting stacks at building core, with study carrels at North side

- Lightwells separated by enclosed bridge element

Clemons

-Robertson Media Center and associated viewing stations, enclosed rooms, and staff space in main Wing

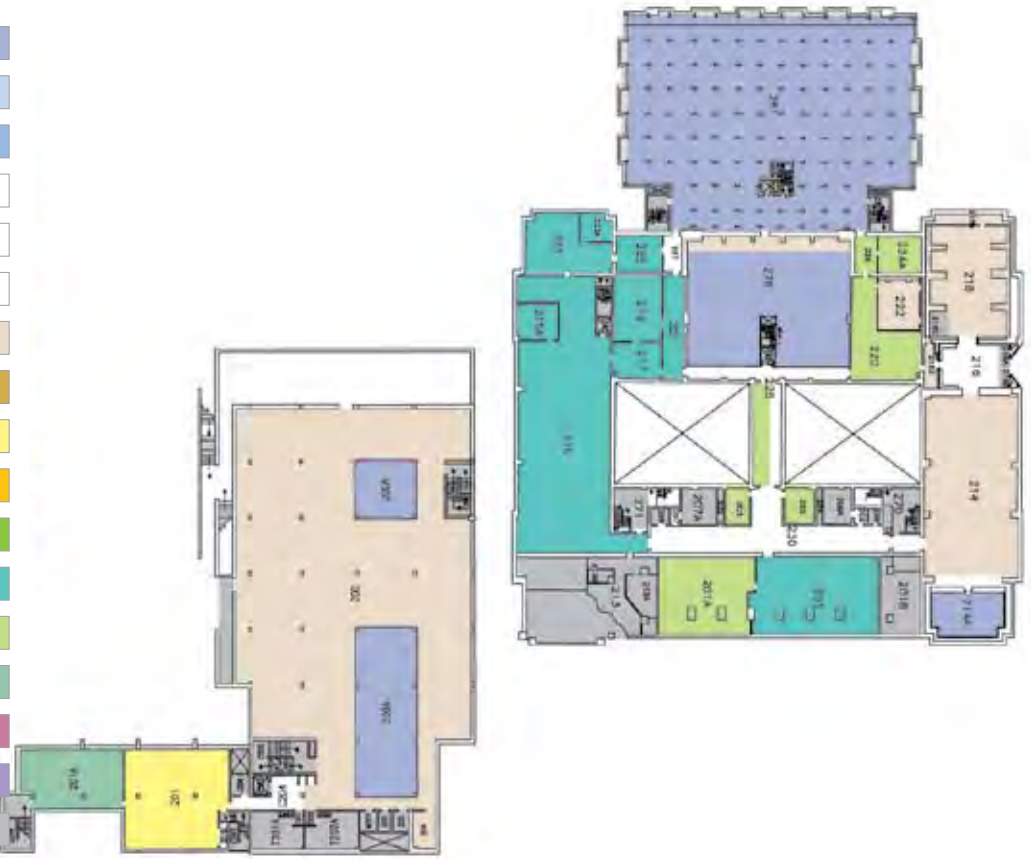
- West wing including Digital Media Lab and staff

- Mechanical / Service Space at South

Existing Condition Third Floor

Legend

- Stacks
- Reference
- Microforms
- Government Docs
- Periodicals
- Maps
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Copier Zones
- Public Services
- Processing
- Staff Offices
- Support
- Media Services
- Non-Library Areas
- Maintenance/Mechanical



Key Space Attributes

- Processing Staff space in West wing

- McGregor and Barrett historic reading rooms in East wing (formerly special collections spaces)

- Finance, Human Resources, and Digital Library Production Services staff space

- Existing "New" Stacks at North portion of building, with perimeter study carrels

- "Old" Self-supporting stacks at building core

- Partial Base of lightwells separated by enclosed bridge element

Clemons

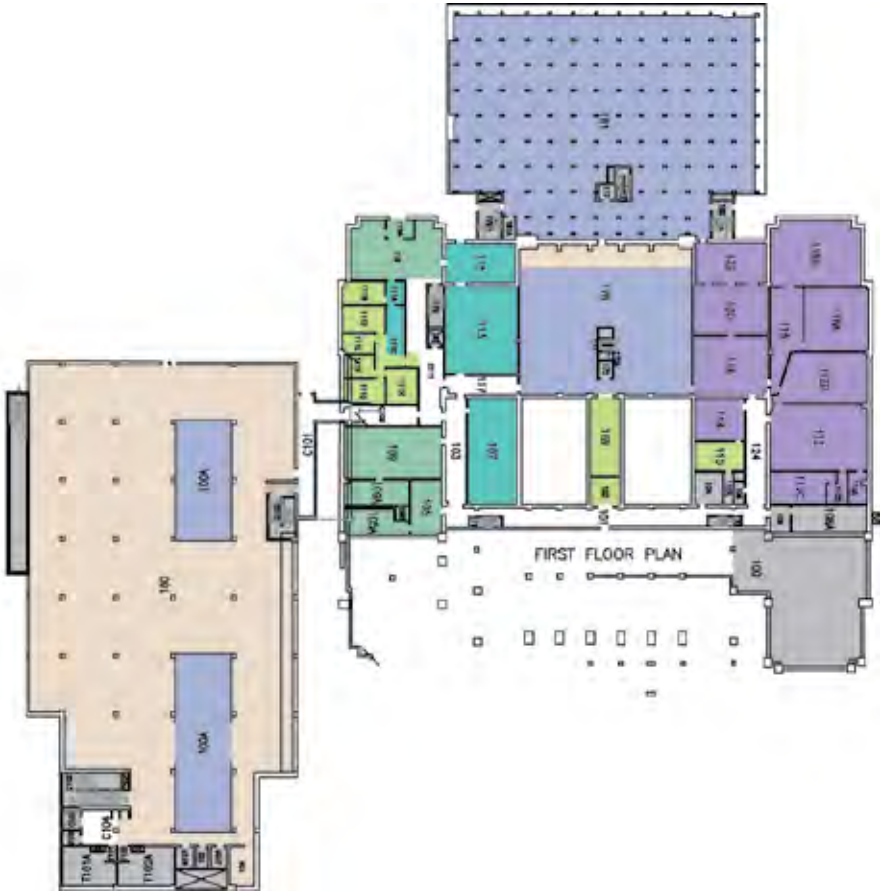
- Open plan study space with interspersed collection zone in main wing

- Large classroom in West wing

Existing Condition Second Floor

Legend

- Stacks
- Reference
- Microforms
- Government Docs
- Periodicals
- Maps
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Copier Zones
- Public Services
- Processing
- Staff Offices
- Support
- Media Services
- Non-Library Areas
- Maintenance/Mechanical



Key Space Attributes

- Printing Services and the Rare Book School located in East Wing and adjacent space

- Receiving space, operational staff space, and staff lounge in West wing and adjacent space

- Mechanical space and "Dirt Room" (exposed foundation beneath Memorial Hall) located on South Portion

- Existing "New" Stacks at North portion of building, with perimeter study carrels

- "Old" Self-supporting stacks at building core, with study carrels at North side

- Partial Base of lightwells separated by enclosed bridge element

Existing Condition First Floor

Alderman Library

Clemons Library

Although as a renovation this project does not involve site planning decisions, a number of issues arose when considering Alderman in its setting that influenced the proposed concept for renovation.

Planning for a Library Precinct

The Alderman Library building is part of a complex of three adjacent library buildings and is centrally located next to the Academical Village. Both Alderman and the recent Harrison Small Special Collections building front on a green, under which is the special collections collection shelving. Clemons Library fronts onto a paved entry terrace just to the west of Alderman, which offers some seating for good weather. Clemons functions as the 24/7 study facility patronized primarily by undergraduates, so tends to generate activity into the night. Clemons' entry level is at the fourth floor, similar to Alderman, with circulation moving down to the three levels below that. Clemons was designed to have as low a profile as possible and its lower levels are buried into the hillside, stepping out with terraces towards the north. The Small Special Collections building is self-contained and probably should not be connected into the complex because of the nature of its collections and more limited hours of operation, so the team did not explore any connection opportunities there.

Potential for Connection between Alderman and Clemons

Clemons Library's lower level floors are large open rectangles with their primary orientation towards north windows with little window area on east or west. The east façade, however, is very close to Alderman's west façade. Only a stepped areaway approximately XX feet wide separates them, offering great potential to connect levels between the two buildings. Connection would allow greater integration of staff, convenience for users, and perhaps encourage undergraduates to use the lower levels of Alderman for their research. An enclosed connection already exists at the First Floor level but can be used only by staff.

The slab elevations of the two buildings align most closely at the Second Floor level, with a

difference of only 2 feet (el. 540' in Alderman and el. 538' in Clemons), so connection with a slight ramp would be quite feasible. At the Third Floor, however, the difference in levels is greater (5 feet), so a ramp of 60 feet would be required to connect them. From preliminary study it appears that this ramp could best be accommodated in the zone between the buildings. Enclosing the zone between buildings is suggested, and various options were explored for that. The team's recommendation would be to glaze over the space between the buildings and add plantings at the ground level. The space adjacent to it on the First Floor would be renovated and views onto a small garden would enhance that work space.

Potential of the Terraces

The low profile of the Clemons building blends well into the landscape, but the existing terraces of Clemons are underutilized and fairly barren in appearance. This year the paving of the entry terrace will be repaired and replaced. There is also a proposal in the planning stages to add planters and more seating on the upper entry terrace. However, the lower level terraces are not used because access to them has been restricted to emergency egress only and their north exposure has discouraged investment in planting them. The team recommends that improvements to them be studied, including consideration of green roof surfacing which would present a much more pleasing view to those in both Clemons and Alderman. The print collection in Clemons is being reduced over time so the possibility of access to the terraces without endangering the collections is more feasible, assuming control points are installed between buildings anyway. Whether it would be worth capturing more seating area in the future by glazing over the terraces was yet another idea discussed.

However, to make the terraces more pleasant to use, it would be important to relocate the very noisy existing mechanical equipment at the loading dock area, which appears to be feasible given the campus-wide system changes currently under discussion. Eliminating this noise should be pursued regardless of the terrace issue as the constant cycling of the system on and off can be clearly heard inside Clemons and Alderman.

At Alderman the grand stair at the entry is predominant but there may be an opportunity to create a terrace seating area for spill out of activity from the café. If this was done on the right side of the façade under a tree, a new location for the bike racks would need to be found. Maintaining accommodations for bike riders is an important goal from a sustainability perspective.

Potential Connection to Newcomb Hall

One of the needs expressed by students in the focus groups and by university planning staff was for more study spaces where students can work in small groups and get access to more than vending machine food at night. Various proposals to expand student commons space on central grounds have been raised, but the proximity of Clemons to Newcomb Hall offers a great opportunity to connect the two buildings. Newcomb Hall is in the process of studying how to add more social study space with night food services at the north end of the building, but it would be relatively easy to provide a connector between the south door on the Fourth Floor of Clemons and the north side of Newcomb Hall. (There actually was a temporary connection recently during a period of construction.) Rather than insert a café into Clemons, which generates service circulation and food removal issues and starts to suggest competition for the Alderman cafe, it may be more advantageous to revitalize the seating areas in Clemons and provide the food services out of Newcomb, which would help to animate both buildings at night.

North Facade of Alderman

The north face of Alderman is predominantly the exterior of the "New" Stacks Addition, built in XX, and one of the first major structures visitors see as they approach the campus driving towards the Rotunda and the Academical Village. That part of the façade is not considered significant architecturally, and appears to be windowless except for slit windows to either side of the carrels. Whether this façade should be improved in the future to become a more iconic structure for both the University and the Library should be weighed against how much is needed to invest in renovation of the "New" Stacks building. There are proposals to relocate the road to the west of Alderman slightly, so this realignment should take into account long range planning for the Alderman site.

Service Circulation Issues

The existing loading area at the Alderman building is minimal but has been functional for many years. It may be possible to avoid having to do major changes there as less materials handling traffic is anticipated. It is anticipated that the collections in Alderman will be reduced and that the regular shipments for binding journals will lessen as electronic journals proliferate. Most material will be processed at Ivy Stacks in the future when processing staff s relocated there. Although more material kept at Ivy Stacks will need to be recalled via the LEO system (Library Express On-Grounds), it delivers books directly to faculty offices and probably in the future to students as well. How-

ever, the increase in recall traffic from Ivy Stacks may also increase shipments to Alderman for processing and pickup at the service desk there. This will require further analysis with the next phase of study to assess loading dock capacity.

Challenges for a 21st Century Library

Academic research libraries today are faced with great challenges to transform to support the university's mission of research and education in the 21st century. Profound changes in technology, methods of scholarship and teaching, research and even the processes of publication are constantly demanding resiliency and change on the part of libraries and their leadership. Many of these issues and trends were raised during the Alderman study in meetings with library staff and the building committee, and in focus groups with faculty and students. This section will briefly summarize some of the challenges and trends discussed in the course of the project which influenced the physical space planning decisions proposed for the future of Alderman Library.

In November 2006 the Association of College and Research Libraries (ACRL) convened a roundtable of experts both from and external to libraries to discuss these fundamental changes. ACRL summarized the group's observations and recommendations in their essay "Changing Roles of Academic and Research Libraries", which stated:

"…the years ahead constitute an age of transformation for academic and research libraries. At the outset of the twenty-first century, these institutions confront the need to reconceive and reconstruct the means by which they support faculty and students in research and education. The business of libraries can now be understood as one component of a rapidly evolving, almost wholly transformed environment in which information is proliferating at heretofore unimagined rates and in which the ability of academic libraries to deliver authenticated and reliable information is continuously challenged by new technologies."

—ACRL essay on "Changing Roles of Academic and Research Libraries", 2006

Changes in Scholarship, Research and Publication

Technological advances have stimulated great change in how scholars are conducting research, and the recent emergence of digital tools for the humanities and social sciences is promis-

ing to be an exciting catalyst to new types of innovation by Alderman's primary population. Not only using digital material but actively creating it, is becoming an important part of the ground breaking humanities and social science research projects being done at UVA. Research is being conducted in interdisciplinary teams, just as frequently with colleagues across the globe as with those on campus. As the rate of research discovery accelerates and the generation of information becomes explosive, librarians are challenged to organize and provide scholarly resources both within and across institutions. Speed of access to new research information is becoming a source of institutional advantage, not only for scientists but for all scholars as data and findings now circulate digitally among peers prior to publication.

Changes in How Collections are Used and Created

Now that students, faculty and researchers can access the library resources via the network from anywhere at any time, material can be searched and delivered on demand. For print resources, the LEO system for delivery direct to faculty offices has been very successful at UVA and enabled the Ivy Stacks to be developed off central grounds and the Library to leverage the use of its space for new functions. Although these systems lessen the need to come to the library to search the stacks and photocopy, work space in Alderman near the collections is still very much in demand and grad students still depend on it for their primary workspace. Demand for browsing of the physical collections will continue to decrease as electronic browsing capabilities become more robust and less journals are purchased and published in print form with increasing investment in electronic resources.

Users now expect to be active participants in knowledge creation as well as its use, and tools like wikis and open source repositories allow many to contribute to building knowledge bases. The growth in repurposing of digital material to create new products and perspectives, publication on demand and web-enabled discourse in blogs and other evolving tools raise great challenges for libraries to manage and preserve the discourse and knowledge created in the 21st century.

New User Demands

Ubiquitous access to information, long only a dream of technology pundits, is now becoming a reality. This ever increasing access and technology, coupled with related cultural shifts among user populations, means that libraries have to respond to a great many new user demands – and do so while also still fulfilling many of their traditional obligations. The overarching demand is that of access. Users want access to the library as

an institution; they expect libraries to be increasingly transparent in who they are and what they do. Users want speed and convenience in the Library's delivery of services and materials, befitting our 24/7, just-in-time, on-demand culture. Users also expect to have new tools to give them ever-increasing access to collections, to raw data, and to each other.

With this increased access comes the prospect of increased connectivity in complementary physical and virtual environments. This means wanting social spaces to study together or just in the company of others – to see and be seen. It means using new tools and settings for sharing ideas, project work, and information as part of an increasingly participatory culture. As libraries provide more and better access, they can meet the challenges of the 21st Century head-on.

Changes in Roles and Functions of Librarians

Librarians are being challenged to provide new kinds of services, from developing metadata systems for organizing and retrieving digital knowledge, to expanding their role in the teaching process. They are adapting to meet demand for new ways of delivering services, and are now leading experimentation with provision of reference services in virtual worlds. Management of institutional repositories is becoming an important role, as the rate of research productivity increases and librarians seek to define their retrospective responsibilities in a future of constantly changing and impermanent electronic resources. The pressure of constrained budgets, forcing difficult decisions and tradeoffs between print publications and digital resources, has become the norm as a context for this redefinition of roles.

"Libraries and librarians are fulcrums of academic productivity, with potential to expand both the range and depth of creative work that faculty and students undertake in any discipline. What has changed are the actions librarians perform and services they provide in carrying out these core functions. The challenge for libraries, their leadership and staff, is to recast their identities in relation to the changing modes of knowledge creation and dissemination, and in relation to the academic communities they serve."

—ACRL essay on "Changing Roles of Academic and Research Libraries", 2006

The Opportunities of New Partnerships

As technological developments enable new means to visualize data and the products of research, and research endeavors involve more complex teams, libraries have the opportunity to bring researchers together on a common shared ground. The future library can continue to stimulate innovation in information

sciences, by supporting research activists like IATH (Institute for Advanced Technologies in the Humanities) and forming new partnerships with the ITC leadership. Outreach and collaboration with other libraries will be important, as will hosting groups on campus. A key opportunity for Alderman will be the exploitation of the potential of the national cyberinfrastructure to support the humanities. The redevelopment of Alderman is a wonderful opportunity to model what a national center for this cyberinfrastructure should encompass.

Sustainability Goals

Universities have a unique role and responsibility within society to adopt and implement sustainability-minded practices. As creators and disseminators of knowledge and information, universities can set a positive example for integrating sustainability in all its activities. University libraries, then, which are storehouses and incubators of that knowledge, can play a role by acting as a testing ground and demonstration of how sustainability can be practiced everyday. From its design and construction to its daily operations, the library can be a centerpiece project for the university.

The Library as Place

"One of the most important strategic advantages of an academic library is space. It is often observed that the library inhabits the most desirable real estate on any college or university campus. Geographically and symbolically, it occupies the center of a community established to support the advancement and perpetuation of knowledge. The positioning of the library conveys a sense of intellectual common ground, a setting in which knowledge from a range of disciplines comes together in a single place. Known as a place of gathering and collection, the library embodies core academic values reflected in the domains of knowledge that faculty and students pursue. As a physical structure and hub of interaction, it affirms the value of sustained inquiry in particular fields, at the same time it affirms the need to understand knowledge as a whole—to impart context and synthesis to knowledge produced within particular fields of study.
An increasingly important role of the library in coming years will be to provide meeting space and support to foster communities of shared interest on campus. Some of the most exciting advancements in recent years have resulted from the combining of disciplinary approaches. New kinds of partnerships among scholars and their disciplines make it possible to ask questions and explore existing knowledge in different ways. Yet the growing interest in interdisciplinary pursuit has not tended to yield new allotments of space on university and college campuses. The library has the unique potential to provide common space to strengthen academic com-

munity and foster new developments in teaching and research within the institution. Beyond the provision of meeting space, the library's continuing appeal must derive from the new kinds of academic service functions it provides in support of teaching and learning as well as academic centers and research enterprises."
—ACRL essay on "Changing Roles of Academic and Research Libraries", 2006

Analysis of Space Needs Projected for User Seating

DEGW performed an analysis of the existing seating and projected demands for Alderman Library. What was once a straight-forward process of applying standards or heuristics to populations in order to arrive at theoretical seating demands has become increasingly complex. This complexity is due to two factors. First, libraries and their use are changing rapidly, rendering previously-accepted standards obsolete. For example, the Association of College and Research Libraries' (ACRL) 1995 standard of seating 25% of student headcount has been withdrawn and the Council of Educational Facility Planners, International's (CEFPI) standard used in the Paulien & Associates study in 2002 was updated in 2006 with drastically reduced seating demand percentages – from 25% to 12% of undergraduates. Secondly, the seating demands vary greatly by institution, curricula, student demographics, location, department affiliation, and institutional priorities can all have an affect on seating demands for libraries. Thus, there is no magic number that can be applied across institutions.

For the Alderman Library study, DEGW worked from the 2025 "Steady State" population growth projection dated 11 November 2006, from the University Provost's office and compared that to existing seating surveys conducted by the library. Primary and secondary populations we then developed based on analysis and discussion with the project team. The primary population was derived by prorating the projected College of Liberal Arts and Sciences (CLAS) populations according to the percentage of humanities and social science degrees offered, 67.7%. The secondary populations from non-CLAS schools, continuing education, and local community users were projected and prorated according to their assumed frequency of usage in comparison to a Humanities/Social Science user. For example, it was estimated that since Architecture and Engineering students each have their own discipline-specific library, they would only visit Alderman 40% as frequently as their CLAS Humanities / Social Science counterparts. This yielded a total projected population of 9,850 undergraduates, 2,173 graduate students, and 682 faculty members.

Four seating "standards" were then applied to the target projected population in order to demonstrate the vast differences between the standards and the need for a more nuanced approach. Based on how closely the two are related, Alderman and Clemons were considered simultaneously as on complex.

In the end, rather than apply a standard to the projected populations to inductively arrive at a seating demand, DEGW deduced the projected

University of Virginia Alderman Library Revitalization Study

SUMMARY OF POPULATION PROJECTIONS

	EXISTING			*PROJECTED 2025*			*ADJUSTMENT FACTORS*			*ADJUSTED POPULATION*		
	U Grad	*Grad*	*Faculty*	*U Grad*	*Grad*	*Faculty*	*U Grad*	*Grad*	*Faculty*	*U Grad*	*Grad*	*Faculty*
Primary Population												
College of Liberal Arts & Sciences												
"Sciences, Arts, Pre-Business"	**9,846**	**1,518**	**642**	11,511	1,634	862	67.7%	67.7%	67.7%	7,793	1,106	584
Estimated Secondary Populations												
School of Architecture	352	160	51	352	160	51	40.0%	25.0%	5.0%	141	40	3
Curry School of Education	99	1,145	99	99	1,165	102	25.0%	25.0%	5.0%	25	291	5
Darden School of Business	0	738	78	0	945	102	5.0%	5.0%	5.0%	0	47	5
School of Engineering	1,703	507	183	2,126	670	251	40.0%	25.0%	5.0%	850	168	13
School of Law	0	1,104	71	0	1,104	71	5.0%	5.0%	5.0%	0	55	4
McIntire School of Commerce	767	188	74	834	301	88	100.0%	100.0%	5.0%	834	301	4
School of Medicine	0	985	912	0	1,102	1,042	5.0%	5.0%	5.0%	0	55	52
School of Nursing	250	129	53	402	245	90	5.0%	5.0%	5.0%	20	12	5
Subtotal Secondary Populations										**1,870**	**970**	**90**
Plus 10% for Continuing & Prof'l Studies, visiting scholars, non-university, etc.										187	97	9
Total Secondary Populations										**2,057**	**1,067**	**99**
Total Projected Populations										**9,850**	**2,173**	**682**

SEATING CALCULATIONS

	PERCENTAGE			*SEATS and AREA REQ'D*		
	U Grad	*Grad*	*Faculty*	*U Grad*	*Grad*	*Faculty*
Standard 1: CEFPI (2006)						
(Council of Educational Facilities Planners Internatl)	12.0%	30.0%	5.0%	**1,182**	**652**	**34**
				Total Seats		**1,868**
				Total Area (sf)		**65,378**
Standard 2: ACRL 1995 (since been withdrawn)						
For "typical residential college"	25.0%	25.0%	n/a	**2,463**	**543**	**0**
				Total Seats		**3,006**
				Total Area (sf)		**90,170**

population demand in parallel with configuring the supply in the programming process. As the building program was reconfigured, every attempt was made to maximize the seating within the renovated building as well as maximize the portion of collaborative seating. This was done while targeting a demand range between the CEPFI theoretical demand of 1868 seats which is thought to be low with the somewhat conservative (now rescinded) ACRL theoretical demand of 3,006 seats at 25% of headcount (which was utilized in a Library summary presentation in 2002). Alderman and Clemons currently provide 2,664 seats. The proposed Atrium/Old Stacks replacement scheme provides 3,190 seats, acommodating over __% of the projected populations. The additional seating within this Atrium scheme exceeds the more demanding ACRL 1995 standard and provides the seating with a better mix of collaborative and individual seats, described later in this report.

Analysis of Space Needs Projected for Print Collections

Drawing from data provided by the Library's Management Information Systems (MIS) and Interlibrary Loans (ILL) departments as well as discussions with the project team over the course of the study, DEGW analyzed Alderman Library's collection needs. The library currently has a theoretical capacity of 2.414 million volumes, of which 746,180 volumes can be housed in the "Old" stacks compared with 1,622,780 volumes in the "New" stacks, assuming an average of about 10 volumes per linear feet of shelving (which includes the library's necessary working capacity). Through these discussions, it was determined that the forecasted need for housing print collections within Alderman is approximately two thirds of its present collection, or about 1.6million volumes. Taking this working capacity as baseline, DEGW then examined a number of different scenarios based on proposed and alternate changes to Alderman affecting its collection: installing sprinklers within the stacks, removing and replacing the "Old" stacks, and relocating the perimeter 4'-0" of shelving within the new stacks.

Impact of Sprinklers on Collection Capacity

The introduction of sprinklers within the "Old" and "New" Stacks is necessary to protect the collection as well the library occupants (who are protected more directly through fire alarm systems rather than fire suppression systems). The impact of installing these sprinklers is extremely dependent on code-interpretation, which cannot be finalized until a final design proposal is submitted for evaluation to the authorities having jurisdiction.

ALDERMAN SHELVING CAPACITIES										
Floor					*Old stacks (linear ft)*	*New Stacks (linear ft)*	*Reading Rooms (linear feet)*	*Volumes (Estimated at 10v/lf)*	*Remarks*	
5M					7,635			76,355	Notes:	
5 old					8,265			82,652	1. Black figures provided by MIS	
5 new						15,848		158,483	2. Blue figures provided by C. Oberlander	
4M old					7,884			78,841	from survey 1/28/05	
4M new						13,224		132,238		
4 old					6,299			62,993		
4 new						18,238		182,379		
3M old					7,998			79,982		
3M new						19,468		194,682		
3 old					5,356			53,558		
3 new						17,905		179,049		
2M old					9,848			98,478		
2M new						20,128		201,280		
2 old					4,196			41,962		
2 new						18,647		186,465		
1M old					3,237			32,366		
1M new						18,620		186,203		
1old					8,766			87,659		
1 new						18,488		184,877		
Tibetan(1)					1,985			19,853		
Tibetan (5)					408			4,080		
Asian Reference					55			550		
Basement						1,713		17,127		
Reshelving					2,686			26,858		
Reference							3,100	31,000		
McGregor Room							1,441	14,410		
TOTAL (linear ft)	**204,070**	63,141	31%	69%	**74,618**	**162,278**		**2,414,378**	***Theoretical capacity***	

CHANGES TO COLLECTION CAPACITY	*Old Stacks*	*New Stacks*	*Volumes*	
Item 1 (Required): <CONSERVATIVE> Removal of top shelves for sprinklering building (assume loss of 1/6 of Old Stacks, 1/6 in New Stacks)	-12,436	-27,046	-394,828	*18" clear req'd at EVERY shelf. Note: Limits # of 14" tall shelves.*
Item 1a (Required): <REASONABLE> Removal of every other top shelf for sprinklering building (assume loss of 1/12 of Old Stacks, 1/12 in New Stacks)	-6,218	-13,523	-197,414	*18" clear req'd at EVERY OTHER shelf. Note: Limits # of 14" tall shelves.*
Item 1b (Required): <OPTIMISTIC> Run sprinklers down center of EACH aisle, leave collections intact	0	0	0	*Need to verify with ASBO*
Item 2 (Optional): Relocate Portion of Perimeter Collection in New Stacks to create additional user space		-28,044	-280,440	
Item 3 (Optional): Remove Old Stacks	-74,618		-746,185	

COLLECTIONS SCENARIOS	
"Conservative" Baseline Scenario 1 - Items 1 and 2	**1,739,110**
"Reasonable" Baseline Scenario - Items 1a and 2	**1,936,524**
"Optimistic" Baseline Scenario - Items 1b and 2	**2,133,938**
"Reasonable" Atrium / Old Stacks Replacement - Items 1a, 2, and 3	**1,532,961**
Reference: 66% of Current Collection	**1,593,489**

Three possible cases were identified. First, a best-case scenario (from the collections standpoint) would install sprinklers down the center of the row, which has no impact on the collection and could even be installed with the collections in place, as was the case at Columbia's Butler Library. Second, a more reasonable scenario (involving fewer sprinklers) would remove the top 18" of shelving and install the sprinklers above every other shelf, which reduces the capacity by approximately 200,000 volumes. Third, the most conservative scenario, would be to reduce all shelving to 18" from the ceiling and install sprinklers above every shelf, which reduces the capacity by approximately 400,000 volumes. It should be noted that any option that reduces the overall shelving height will also limit the flexibility of shelving options because of the constraints of the shelving system, meaning only one or two shelves could be maintained at the current ~14" height (See diagram).

Removal of the "Old" Stacks

If the "Old" stacks zone is removed, the approximately 40,000 nsf of "Old" stacks space would be demolished and rebuilt in a new configuration in order to transform what is currently an inflexible, non-complying, and potentially unneeded collection space into a series of highly flexible user spaces designed with technology infrastructure. The removal of the "Old" stacks would remove all ~745,000 volume capacity, or slightly less than a third of the theoretical capacity.

Removal of the Perimeter Mezzanine Slides

To create, high quality, double-height and daylit user spaces for carrels at the perimeter of the "New" stacks, the removal of the perimeter slabs at the mezzanine levels is proposed as a possible option." To create these double-height spaces, a portion of the shelving in the "New" stacks must be removed and the associated collections relocated either within the stacks or to off-grounds storage. Assuming a 4'-0" (or 1 bay) reduction of ranges on the "full" floors and a 8'-0" (or 2 bay) reduction of ranges at the mezzanine floors to create a perimeter aisle, the theoretical shelving capacity of the "New" stacks would be reduced by approximately 280,000 volumes, for the North, West, and East faces combined. Thus, if this option were pursued along with the sprinklers and "old" stacks replacement, the library would be 100,000 volumes under its target capacity. However, the perimeter slab option could be pursued on the North face only, yielding a capacity of 1.66 million volumes, slightly above the two-thirds target.

Analysis of Staff Space Needs

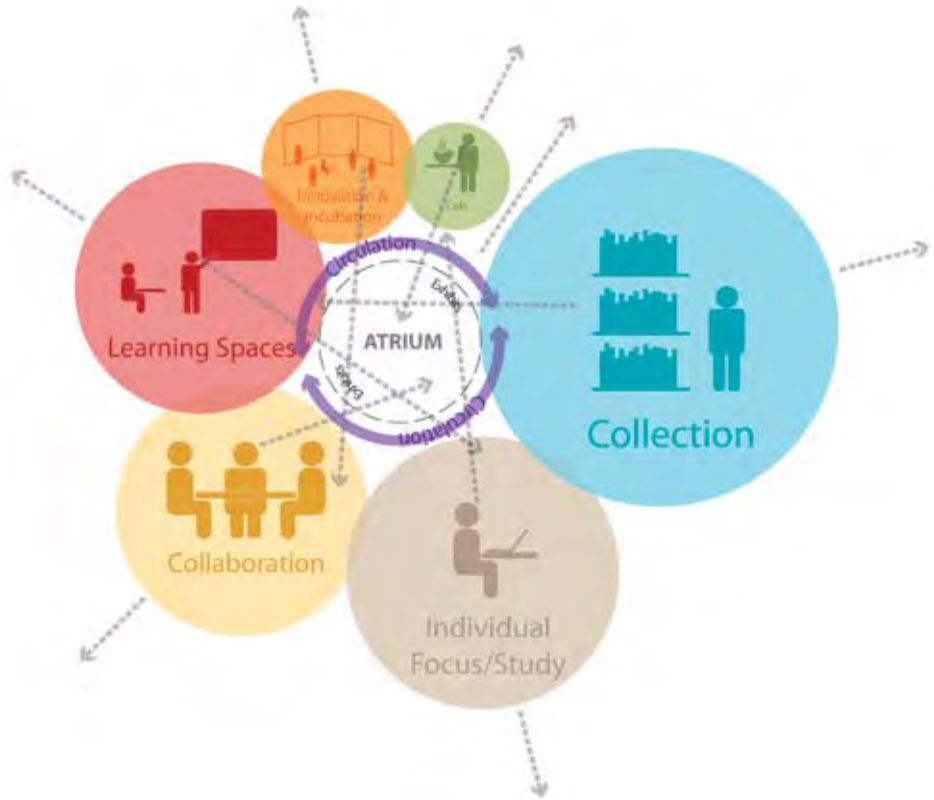
Staff space needs for each group of library staff were estimated based on where the library anticipated growth to occur in order to provide for new types or levels of services, especially related to development of digital services. It was concluded that it was very difficult to estimate staffing a decade into the future given such fundamental change in the library's operation. Because the intent of this study was to develop a master plan rather than a full program, the estimates should be viewed as preliminary, intended to test the vision concepts. Greater collaboration between library staff and ITC staff in the future was discussed, but confirmation of estimated ITC staff that might be co-located with staff in the Alderman building is still to be defined.

Some areas were assumed to require less people in the future, e.g. the number of circulation staff in Alderman will reduce as the collections' presence in Alderman is reduced. It was assumed that the processing groups will be relocated to Ivy Stacks, along with the ILL processing staff.

New Strategies for Staff Space

To serve new roles, the library's staff will need space that enables them to work together more effectively, to be more accessible where needed to serve users better, and to be resilient in the face of the increasing challenges of new technologies and systems. More flexible workplace settings will enable the library to work in teams and respond to changing organizational demands. As the work of librarians continue to shift from print-oriented processing to management of digital resources, staff will take on new skills and working relationships.

The library's highest priorities for space assignment are to create space to foster new services for users, to provide more and better user work spaces, and to encourage the development of innovative new digital tools and services to support scholarship and research. In order to achieve this, it became clear to the planning team that the processing and ILL staff that did not need physical interface with users could be located off grounds. Relocation of processing staff to Ivy is a prerequisite to freeing up a critical mass of space in Alderman to achieve all those goals.



Intellectual Crossroads

Key Program Concepts and Space Strategies

The Library as Intellectual Crossroads

The vision for Alderman Library is that of an intellectual crossroads, a place where students, faculty, and staff come together. As users come to Alderman increasingly for the people within the library – colleagues, collaborators, and staff – as much as its collection, the library must be organized in order to create connections between people, ideas, and places. It must foster interdisciplinary research in an engaged, yet neutral setting, and it should promote the chance encounter in a place to "see and be seen" in addition to focused, sustained collaboration.

Paramount in positioning Alderman as an intellectual crossroads is a focus on its users. This means rebalancing the proportion of space dedicated to users and collections and focusing on providing support for users as they navigate the knowledge embodied in the collection, in its ever-increasing diversity of media, perspectives, and origins. It means creating more collaborative space within the library for spontaneous as well as scheduled work – for those at the library and those connecting to it from across grounds or across the Atlantic while on a study abroad program. Lastly, it means using programming strategically so that elements

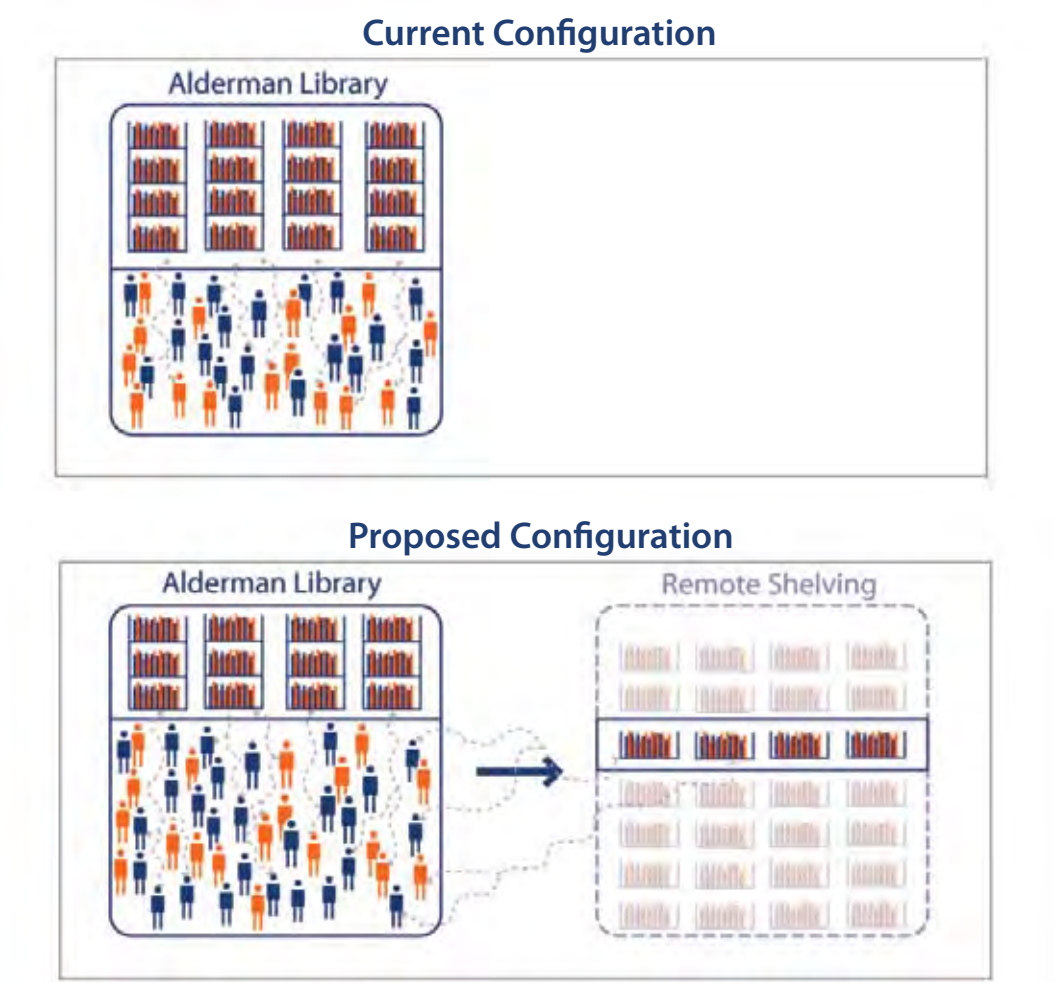
Cascade of Expertise

like food service, exhibitions, and events can help draw people together within Alderman.

A Cascade of Expertise and Support

Navigating through Alderman and its collection can be a challenge as it lacks a "big idea" as to how it is organized vertically. Given the increasingly important role that library staff are playing, the way expertise and support are configured throughout the building can provide the overall structure to assist in users' physical and intellectual navigation in Alderman. In addition to an improved user experience, strategically locating staff synchronizes the kind of questions that staff is likely to get with their level of expertise and experience.

This structure is proposed as a cascade of expertise and support, drawn from patterns of use, which moves from the everyday to the expert. Upon entering at the fourth floor, users find more mobile staff, ready to address the drop-in user over short durations by providing broad



A New Balance of User and Collections Space

consultation and services. Moving down to the third floor, into spaces like the Scholar's Lab, users receive proactive and just-in-time support in a setting that couples technological expertise with subject-oriented expertise. The second floor is dedicated to more focused consultation, happening over sustained engagements with staff that are more likely to be scheduled.

A New Balance of User and Collections Space

In order to serve its users effectively now and into the future, Alderman Library needs a new balance of user and collections space. Building on the success of the Library Express On-Grounds (LEO) delivery service and with the elimination of duplicate volumes, the rise of remote and virtual access, print-on-demand technologies, and ongoing innovation in digital browsing technologies such as Google Book Search, less space is needed for physical volumes within the Library on central grounds. While the physical book will continue to play an essential role for Alderman, particularly as it is complemented by new media and expert staff, these reduced space needs offer many opportunities to create more and better quality user space within Alderman.

This new balance is also enabled and complemented by the University's existing remote shelving facility with an 750,000 volume capacity, the "Ivy Stacks," and its planned addition,

University of Virginia Alderman Library Study

Seating Calculation | Atrium Scheme

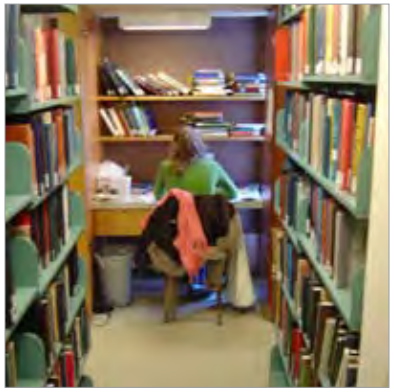
Space	Area	Area/Seat	Seats	Collaborative Multiplier	Individual Multiplier	Collaborative Seats	Individual Seats
Fifth Floor							
Carrels in stacks	1060	45	24	0.10	0.90	2	21
Grad Student Scholarship Center	2290	45	51	0.50	0.50	25	25
Meeting Rooms	970	25	39	1.00	0.00	39	0
Fourth Floor							
Carrels in stacks	2120	45	47	0.10	0.90	5	42
Info Communities Reading Rooms	12030	62	195	0.50	0.50	98	98
Gateway Hub	2780	45	62	0.20	0.80	12	49
Classrooms	730	30	24	1.00	0.00	24	0
Memorial Hall	2900	32	92	0.67	0.33	61	31
Atrium balcony	300	25	12	0.20	0.80	2	10
Third Floor							
Carrels in stacks	2120	45	47	0.10	0.90	5	42
Garnett Room	520	87	6	0.00	1.00	0	6
Periodicals Reading Room	870	58	15	0.00	1.00	0	15
Reading/Seminar Room	1380	58	24	0.10	1.00	2	24
Taylor Room	855	33	26	0.00	1.00	0	26
Scholars' Lab	2890	45	64	0.10	0.90	6	58
East Reading Room	6380	55	117	0.20	0.80	23	94
Small Group Meeting/Study areas	4640	35	133	1.00	0.00	133	0
Atrium balcony	300	25	12	0.00	1.00	0	12
Second Floor							
Carrels in stacks	2120	45	47	0.10	0.90	5	42
Innovation/Play Visualization Lab	2830	60	47	0.80	0.20	38	9
Mount Vernon Room	340	31	11	1.00	0.00	11	0
BarrettRoom	2020	58	35	0.00	1.00	0	35
Scholars' Court Atrium	5150	61	85	0.67	0.33	57	28
Classrooms	1520	30	51	1.00	0.00	51	0
Meeting Rooms	1020	34	30	1.00	0.00	30	0
McGregor Room	2780	51	55	0.00	1.00	0	55
First Floor							
Carrels in stacks	2120	45	47	0.10	0.90	5	42
Meeting Room	1170	39	30	1.00	0.00	30	0
				total		**664**	**765**
				percentages		**46%**	**54%**

University of Virginia Alderman Library Study

Seating Calculation | Baseline Scheme

Space	Area	Area/Seat	Seats	Collaborative Multiplier	Individual Multiplier	Collaborative Seats	Individual Seats
Fifth Floor							
Carrels in stacks	2160	45	42	0.10	0.90	4	38
Meeting Rooms	580	45	13	1.00	0.00	13	0
Fourth Floor							
Carrels in stacks	3220	50	64	0.10	0.90	6	58
Scholars' Lab	5650	67	84	0.10	0.90	8	76
Reference Reading Room	6380	91	70	0.00	1.00	0	70
Classrooms	730	30	24	1.00	0.00	24	0
Memorial Hall	2900	32	92	0.67	0.33	61	31
Third Floor							
Carrels in stacks	3220	50	64	0.10	0.90	6	58
Garnett Room	520	87	6	0.00	1.00	0	6
Reading Room	6380	55	117	0.00	1.00	0	117
Periodicals Reading Room	2400	46	52	0.00	1.00	0	52
Collaboration Zone	4640	35	133	1.00	0.00	133	0
Second Floor							
Carrels in stacks	3220	50	64	0.10	0.90	6	58
Mount Vernon Room	340	31	11	1.00	0.00	11	0
Barrett Room	2020	58	35	0.00	1.00	0	35
Quiet Reading Room	3520	58	61	0.00	1.00	0	61
Meeting Rooms	2060	35	59	1.00	0.00	59	0
McGregor Room	2780	51	55	0.00	1.00	0	55
First Floor							
Carrels in stacks	2120	44	48	0.10	0.90	5	43
				total		**338**	**757**
				percentages		**31%**	**69%**

Social space at Alderman



Quiet study space at Alderman

with a capacity of 2 million volumes. By moving a portion of the collection to remote shelving, as well as the staff most closely-associated with the handling and processing of the collection, such as processing, cataloging and acquisitions, space within Alderman is opened up for new uses while still allowing easy access to these remote items virtually or physically through the LEO system – which is also planned for extension to the graduate student community. This creates user space in addition to operational efficiencies as resource-intensive shelving zones are converted. Reorienting the library's space more toward the people within it rather than its collections, Alderman will be positioned to meet its challenges as a leading 21st Century Library.

A New Balance of Individual and Collaborative Space

In a meeting with students, they noted that there are really "two Aldermans" - one is represented by Memorial Hall that is a social space with a loud café, clustering of people, and a lot of activity, and the second is the variety of quiet study spaces throughout the building, where students have a "cubby-hole mentality" in which "you find your nook and encamp there." In order to respond to more collaborative, project-based curricula and sustain a welcoming environment for undergraduate and graduate students alike, there really need to be "three Aldermans": first, the social space to see and be seen; second, the individual spaces within reading rooms and at carrels; and thirdly, collaborative space – somewhere between the other two in terms of atmosphere. This collaborative space is an essential component to Alderman Library's continued success and for achieving its vision of an Intellectual Crossroads. Though collaborative space does exist at Alderman, students do not mention them as a key element of the library. This is telling of its relative paucity and the need to rebalance the proportion of individual and collaborative spaces, without losing the quirky qualities of all of Alderman's nooks and niches for individuals. Formalizing the Library's commitment to collaboration will allow it to accommodate research and study activities with equal facility. As there are as many different ways to work as there are users, a diversity of space types is also important. Collaborative spaces should be bookable (online and in-person) as well reserved for spontaneous, first-come-first-serve utilization. These spaces should be both enclosed and equipped rooms of various shapes, sizes, and sub-divisibility as well as open areas that are conversation-friendly and supported with shared displays and a variety of seating types. By creating formalized collaboration spaces with Alderman and the policies, protocol, staff and systems to support them, the Library will be in a better position to support and welcome its users.

Strengthen UVA's National Leadership in Digital Scholarship for the Humanities and Social Sciences

UVA has achieved national prominence as a leader in initiatives to promote digital scholarship in the humanities and social sciences. The vision for Alderman is for the Library to continue to encourage and foster the growth of these emerging initiatives by increasing space available for interdisciplinary projects, by providing better staff distribution for their support, and by creating shared facilities for the visualization of the products of these initiatives.

The recent 2006 report of the American Council of Learned Societies (ACSL) Commission on Cyberinfrastructure for the Humanities and Social Sciences includes recommendations for development of a national cyberinfrastructure and urges the establishment of "national centers to support scholarship that contributes to and exploits cyberinfrastructure," similar to those that now support the sciences. These centers are yet to be defined—conceived as federated, interdisciplinary laboratories which vary in their focus, e.g. on methods or tools for knowledge discovery, visualization and data mining, issues of copyrighted materials, the curation of unique materials, or confidential data integral for social science research.

Flexible work lounge at the BBC

In rethinking Alderman, UVA has a great opportunity to demonstrate components of a model national center, and in so doing, potentially position UVA to become one of them. In addition to creating more and better user seating, a high priority should be to create incubator space to be a catalyst and university support center for these types of new activities —creating, in the words of Georgetown University Provost James O'Donnell, "zones of experimentation and innovation for humanists." Karin Wittenborg served on the initial Council on Library and Information Resources (CLIR) panel to develop an action plan, and the 2008 annual session of the Scholarly Communication Institute will be held at UVA to discuss the report and development of national centers.

More Effective Space Use

In addition to reprogramming Alderman to create space for priority uses, achieving enhanced utilization of new and existing library space will contribute to its ability to flexibly meet its operational demands, foster collaboration and connections, and distribute the peak loads on the building. The strategy for achieving this higher utilization is to share targeted spaces across groups; for example, a conference room might be used by staff or researchers within 'incubation' spaces during the day, but then, rather than locked up and laying fallow in the evening,

More Effective Space Use

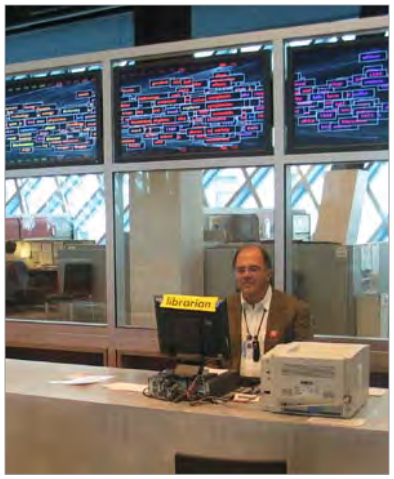
they could be utilized by students. This kind of sharing across groups requires the right protocols to be put in place, and often the design space itself can communicate how it should be used. The McGregor room is a notable example. It also necessitates an additional space management function by the library to achieve the more effective utilization.

This sharing of space across groups will also support direction for Alderman that space, expertise, and collections be 'scheduled' not only as a way of utilizing space more effectively, but also to create connections, allow the Library to more be responsive to current trends and current events, and to gather and employ diverse and complementary media around a subject or issue. The notion of sharing and scheduling space in this manner borrows from established thinking about the workplace, where organizations have embraced new ways of working that permit people to be more mobile, and space is trending toward more sharing and less individual ownership. A more ambitious adoption of these concepts might also include the sharing of individual workspace, if appropriate and adequately supported through policies, protocols, and technologies. Through sharing, scheduling, and managing space – both common spaces like meeting rooms as well as perhaps some individual space – Alderman can achieve more effective usage of its space and help meet the demands of its users.

Need for Flexibility

Libraries are changing at an incredible pace. Technological innovation of devices, media, and services; evolving pedagogies; student demographics; and interdisciplinary scholarship – to name a few – all make for an uncertain future, and so the need for flexibility within the library has never been greater. Flexibility can be interpreted in many ways, but at its most basic level, flexibility means having the greatest number of options available for the use of space - anything that limits what can be done within a space or facility in the future thus makes it less flexible.

In developing the flexibility strategy for Alderman Library, DEGW has drawn upon our experience in designing for change for rapidly evolving organizations like Google, an company that has doubled in size every year of its existence and grappled with the spatial implications of that growth. For Google, flexibility means developing standards and modular/reconfigurable solutions (where appropriate). It also means designing for space to be as open as possible and defining space with tactics like lighting, materials, and color more so than full-enclosures so that partitions need not be demolished when a change must be made. When partitions are called for, design with convertibility in mind is a must so that, for example, meeting rooms can become offices simply by changing the furniture.



Display of user searches at the Seattle Public Library

These principles, along with limiting the amount of specialized space, helped Google manage their growth and cope with change.

Within Alderman Library the need for flexibility in user, staff, and operational/service spaces is paramount. This means employing strategies that increase the number of ways to utilize space and subdivide it, programmatically and/or physically, in different configurations over time. With the conclusion that library services and collections are rapidly changing also comes the conclusion that the space that houses them must also be able to be easily reconfigured, and this means that it must be easy to move materials – collection, furniture, technology – around the facility. This need is proposed to be met vertically with the insertion of a large freight elevator at the Northwest corner of the building and horizontally with a formalized loop of circulation around the lightwells or atrium. The last key aspect of flexibility for Alderman is creating ubiquitous access to power and data. Together, these strategies will provide Alderman with the ability to meet the challenges facing the 21st Century library – both those which can be forecasted as well as those which are unforeseen.

Support for Visualization and Display of Digital Scholarship

The support for visualization and the display of digital research and activities is an essential part of Alderman's drive to become the intellectual crossroads of the University. Research problems are becoming increasingly complex and interdisciplinary. In order to support this, sophisticated and innovative visualizations of complex data are necessary to understand and work through problems as well as provide the common ground that allows remote collaborators to actively contribute. Alderman can lead the way in providing facilities, technology, and expertise to support advanced visualization activities – be they in pursuit of visualizing a problem or in spaces that help visualize and connect with colleagues, such as Access Grid and Telepresence technologies.

The display of digital activity is fast-becoming a fundamental need of our age. While we were once tied to physical spaces to interact with people and materials, we are now in the midst of exponential growth of remote access capabilities to both of these. In order to remain important places, libraries must adapt by creating opportunities for people to interact with each other and with knowledge contained with a variety of media. This means rendering the digital in physical form. Users become more aware of others, conversation and thought are stimulated, and shared

experiences are created. Some effective examples include the Seattle public library, where patrons can see the catalog searches in real-time above the circulation desk or at the reception spaces of all of Google's offices where the global search queue is displayed real-time. Not only do these examples provide a means for people to interact, but they also showcase *work* - a particularly important trait for Alderman given its significant accomplishments in the digital humanities. Alderman must exploit every opportunity to make visible these ground-breaking achievements, as well as more everyday activity, in order to create occasions for interactions and chance encounters – between users, collections, and staff.

Support for New Uses of Media

Support for uses of new media and the growth of 'digital making' is critical for Alderman's continued success and leadership among top-tier universities. As the 'net-generation' of students comes to dominate undergraduate and then graduate student populations, libraries need to respond to their learning traits. They are media-fluent multitaskers. They inhabit a device-rich world in which they often bring their own toolkit with them, including laptops, ipods, webcams, external diskdrives, mobile phones, digital cameras, and videocameras. They are also more experimental than their predecessors, especially when it comes to new media and technologies. These demographic shifts, coupled with the increasingly wide distribution of affordable hardware and software for media work and the rise of project-based, collaborative learning, necessitate a new level of support within the library. This means more staff with high-level technological expertise (as well as potential collocation with ITC staff), better IT infrastructure to support high-bandwith and data-heavy media work, as well more space and equipment to support collaborative work on projects and access to just out-of-reach technologies. That the library is already responding to these trends sets a positive direction for the future; for example, a series of student-produced podcasts reviewing notable bridges for a structural engineering course was developed in the Clemons Digital Media Lab earlier this year. This kind of advanced work and specialized support facilities and expertise will become commonplace with a year or two, and so the library must redouble its support to stay ahead of the curve.

Improved Integration of Clemons and Alderman Libraries

That Alderman, Clemons, and the Small Special collections library form a library precinct on central grounds offers many opportunities. As these three libraries evolve, they should be more integrated over time. In many ways the libraries are already headed in this direction; for example,

Alderman and Clemons have recently been administratively unified through organizational shifts within the library. The programming, operation, and use of library space now need to coincide and support this trend toward integration.

Integration may be achieved programmatically, physically, and operational, and the advantages are substantial. The more integrated these libraries become, more seamless the user experience for students, faculty, and visitors. This will also allow the libraries to share the demands during peak loads such as at exam time. Additionally, connectivity will create operational efficiencies for staffing. As the organizational alignment is underway, the principal means of connecting the libraries explored within this study are physical connections between Alderman and Clemons as well as programmatic coordination among the three facilities, including avoiding unnecessarily redundant space types as well as aligning functions within Alderman and Clemons to clarify the building organization users and capitalize on the potential of physically connecting the two libraries.

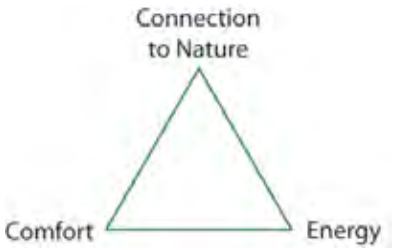
Staff Space Strategies for Engagement, Distribution, and Integration

With access to the library collections increasingly possible from outside its walls and the ever-expanding complexity of navigating through the landscape of media, services, devices, and content, library staff are playing an even more pivotal role, and indeed are one of principal reasons for users to physically come to the library. With this role and complexity comes the need for strategies for the engagement, distribution, and integration of staff and their space within the library. These strategies fall into two main categories: first, adopting new conventions in the use of time and space, often enabled through technological innovation and cultural shifts, and second, applying to staff space lessons learned in the corporate workplace, many of which DEGW has pioneered in recent years.

Throughout Alderman library, new conventions in using space can be adopted in order to support its staff in adeptly facilitating knowledge navigation. This means that just has space and collections become more "scheduled" through reservable rooms and on-demand collections like course reserves or issue-based collections, expertise can also be scheduled; for instance to meet physically and/or virtually with users. Librarians can also be more mobile as a way of distributing their expertise rather than tying it to a service desk. To achieve this kind of paradigm shift, the library can look to external examples: for instance, in Apple stores employees are now equipped with handheld checkout devices that swipe credit cards and email receipts so the checkout is wherever the customer is

rather than only at the counter. Just as the library patrons are increasingly engaged in collaborative and interdisciplinary enterprises, so too are librarians. The co-location of library and ITC staff among Alderman and Clemons libraries should also be considered a crucial element for the staff spaces within the library, as well as those spaces that help connect librarians with their external colleagues and collaborators, such as video/conference rooms.

The dedicated staff space within the library can also learn from recent and commonly-accepted innovations in the corporate workplace. These new ways of working may not be applicable for all groups, but for those who are open to change, there are many potential benefits and opportunities offered. First, the workplace is trending toward more shared space and less individual, "owned" space, and this has the potential for greater knowledge sharing and communication as well as more efficient space utilization. Second, with the introduction of more shared space comes the possibility of creating a more diverse range of interdependent settings in which staff can work – including open areas, small rooms for focused work, informal lounge and café spaces, and meeting spaces. Finally, with this diverse range of settings and better technology come increased potential for internal and external mobility and new conventions for using space differently over time; for instance zoning office areas by activity or noise rather than according to a group a people assigned to it. Lastly, all these innovations when coupled with the right policies and protocols allow for a better work/life balance as staff have the opportunity to connect virtually as well as choose the appropriate setting for how they want to work and whom they are working with. Taken together, these proven strategies for the corporate workplace, offer opportunities to inform staff spaces within Alderman and better support their crucial work in the library.



Sustainability Approach

Sustainability Strategies

The University of Virginia is committed to sustainability, and so the renovation and renewal of Alderman Library will help the university demonstrate that commitment and achieve its sustainability goals. The sustainability strategies for Alderman, developed in collaboration with Buro Happold, address the broader view of sustainability that goes beyond simple energy efficient to also address larger ethical questions about each building's responsibility to its occupants, its environment, and the earth.

These strategies fall in three principal areas: connection to nature, comfort, and energy. First, library occupants should have contact with daylight, weather, and seasons to provide visual relief during periods of concentration as well as to promote social interaction. Second, the comfort of occupants should be assured in

order to create a satisfying and healthy environment for work and learning, and this entails addressing thermal, acoustics, odors, and ergonomic aspects of design. Third, Alderman should focus on reducing its energy use and carbon footprint as well as its emissions, directly or indirectly, of greenhouse gases.

In addition to these high-level strategies that should inform the renovation of Alderman in all aspects and at all scales, there are a number of proposed tactics that are specifically recommended for the library to achieve its sustainability goals. In order to create connections with nature, Alderman can take advantages of Charlottesville's favorable climate and create a series of outdoor study spaces adjacent to the library; for instance, outdoor seating for the Alderman Café. For energy efficiency, occupancy and daylight sensors are recommended. The use of green roofs within the existing light courts will not only aesthetically improve a current eyesore, but also reduce run-off and turn adjacent exterior spaces into pleasant, usable places. For the option to enclose these light wells as an atrium, the potential for naturally-ventilating that space during portions of the spring and fall can also be pursued. Last, in selecting materials, not only should efforts be made to source the materials according to sustainable standards, for instance relating to local production, off-gasing, and sustainable harvesting, but also design should allow issues of durability and longevity take precedence over efficiency – often more-cost effective products up front can have shorter lifecycles and require earlier replacement that has financial and environmental costs in the long term.

Summary of Space Types Characteristics

To build a discussion on the various space strategies available for constructing the programmatic elements that will make up the Alderman Library, the following matrix of space type characteristics provides a framework for understanding space. A number of categories exist for describing the range of proposed learning environments. Those categories define characteristics such as room capacity, technology-based amenities, the availability of specialized consultation, the degree of users' ownership over space. Every category consists of four characteristics that each represent a varying degree of the same environmental quality. Viewed as an ensemble, the characteristics paint a picture of the unique personalities of the various programmatic space types.

Group Size

Individual

1 person

Small Group

2-6 people

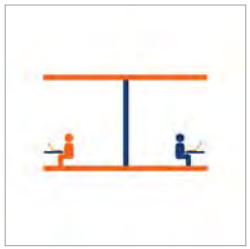
Medium Group

7-12 people

Large Group

13+ people

Boundary

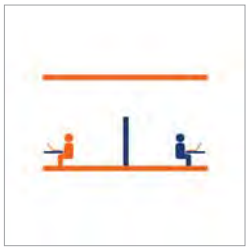


Total

Provides for an enclosed room

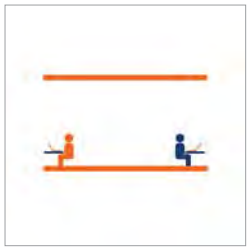
Major

Use of partitions and screens to divide space



Minor

Accommodates for furniture groupings, low screens, plants as dividers



None

Provides open area with no visible separation from adjacent settings

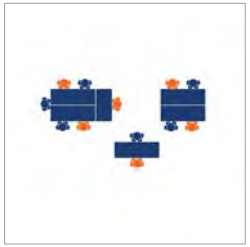
Flexibility

Fixed

Fixed furniture or technology limits possibilities for other uses

Moderate

Furniture/technology can be reconfigured by staff for alternate uses



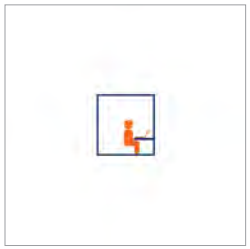
Configurable

Configuration allows for alternate uses, time shared by different groups

Flexible

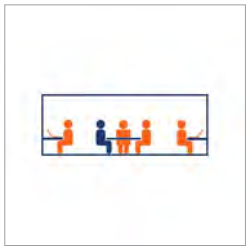
Users can reconfigure space and technology at will for other activities

Ownership



Dedicated

Provides for enclosed offices



Shared

Accommodate for multiple occupants, suites

Flexible/On Demand

Accommodate for reservable group rooms

Public

Accommodate for shared space/common

Technology

Basic

Accommodate for wireless access

Enhanced

Accommodate for data projector, smart board, large display device

Advanced

Accommodate for multi-screen displays, Access Grid, node, etc.

Experimental

Accommodate for immersive or simulation environment

Collections

Browsable

Print volumes stored on regular stacks on grounds

Closed

Virtual browsing only, with print volumes retrieved upon request

Print On Demand

Virtual browsing with physical volumes available for printing on a limited basis

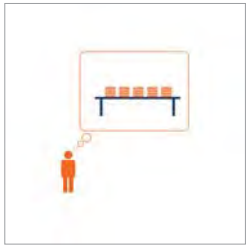
Virtual

Collection accessible via networks or onsite with licensing limitations

Consultation

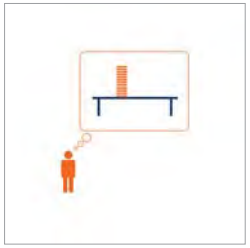
Limited

Limited or no expertise



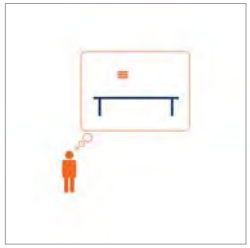
Broad

Broad, generalized knowledge available for user reference



Subject-Oriented

Expertise available for subject-oriented studies



Focused

Specialized knowledge available for more focused inquiries

Teaching

One-on-One

Accommodate for one-on-one op-

Seminar/Screenings

Accommodate for seminar discussion/ small group screenings

Group Presentation

Accommodate for group presentation

Interactive

Accommodate for interactive workshops

Atmosphere

Formal

Conventional setting configured for research or work

Cyclical

Ambiance can change with time of day, activity protocols, lighting, etc

Versatile

Setting can be used for both formal and informal activities depending on configuration and user requirements

Informal

Accommodate for casual settings for research, work, and social activities

Interaction

None

Accommodate for individual work, quiet study

Collaborative

Accommodate for work with others in small groups, consultation

Interactive

Accommodate for group meetings, seminars, presentations

Social

Accommodate for active informal social space

Programmatic Space Types

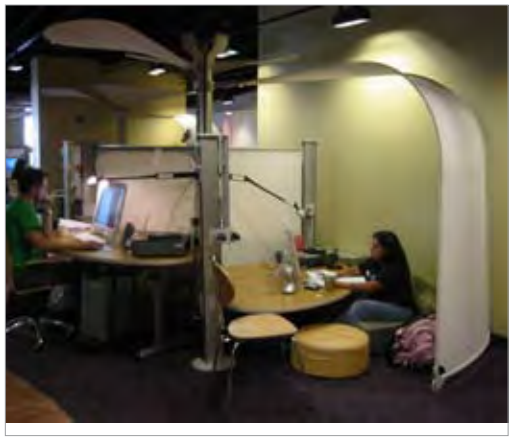
The strength of the vision for Alderman Library rests on its ability to serve multiple roles for its diverse user groups. As an intellectual crossroads, the library will act as a magnet for students, faculty, and staff. These groups have a wide range of needs and the library will have a correspondingly varied set of environments to accommodate work, study, meeting, collaboration, socializing, and many other activities.

The following section outlines a series of environments that are customized to suit the variety of activities that will take place in the future Alderman Library. Each page describes a particular design strategy for a number of different spaces within the library. Along with descriptive text and imagery from similar environments found in other educational institutions, the space's physical and programmatic attributes are defined within the parameters of the taxonomy of space type characteristics. These programmatic space type sheets thereby give a snapshot of how each unique environment is configured to foster a range of activities and complement one another to provide a comprehensive center for learning for the University of Virginia.

These space types include:

- Gateway Hub
- Scholars' Lab
- Digital Media Lab
- Innovation/Play
- Scholars' Court
- Conference/Breakout Room
- Learning Spaces/Classrooms
- Group Study/ Collaboration
- Information Communities Reading Rooms
- Carrel Space
- Collections Space
- Graduate Student Scholarship Center
- Research and Scholarship Support Center

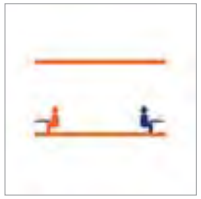
Gateway Hub

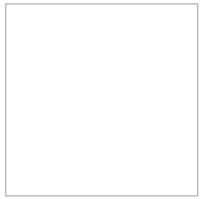
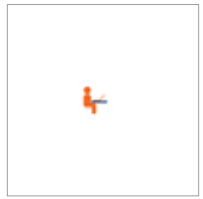


Emory University | Cox Computing Center

University of Chicago | USITE Crerar- Crerar Library

The Gateway Hub provides users with walk-up and immediate technology needs, serving individuals and a large traffic nexus. There is little expertise available for user assistance, if any. The technological assets found at the Gateway Hub are generalized and common, consisting primarily of walk-up terminals with limited sit-down work areas. This facility provides services such as printers, multi-function copiers, and "personal binding" workplaces. The space is characterized by a mix of workstations of walk-up and sit-down variety. Furthermore, the Gateway Hub is divided into four areas: a printing zone, copying zone, collation zone, and a work zone.

Group Size	Boundary	Flexibility	Ownership	Technology
				
Individual	**None**	**Configurable**	**Public**	**Enhanced**

Collections	Consultation	Teaching	Atmosphere	Interaction
				
Print On Demand	**Limited**	**N/A**	**Informal**	**None**

DEGW

Scholars' Lab

Vassar College | Media Cloisters- Thompson Library

Stanford University | Collaboration Area- Meyer Library

The Scholars' Lab is meant to provide user assistance on short-term scholarly projects. Service is provided on a just-in-time basis, emphasizing a casual collaborative atmosphere. The Scholars' Lab is a social, as well as scholarly, destination and complementsthe Digital Media Lab.

The type of expertise found at the Scholars' Lab draws on a broad range of topics and is provided "when you need it." With an emphasis on scholarly needs, the Scholars' Lab is modeled on the concept of a service desk from which consultants dispatch out into the space. In this manner, support is proactive, as consultants see problems as they arise and quickly respond.

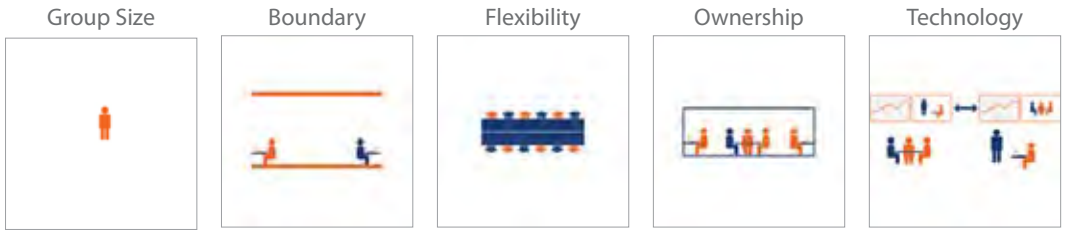
The technological assets available at the Scholars' Lab are generalized and common, consisting primarily of walk-up terminals with a limited number of sit-down work areas. Output amenities such as printers, multi-function copiers, and "personal binding" workspaces are also provided.

The space is characterized by a mix of workstations of the walk-up and sit-down variety. Line-of-sight from staff is also key to proactive support. Furthermore, the Scholars' Lab can be understood as being divided into four areas: a printing zone, copying zone, collation zone, and a work zone.

Digital Media Lab

Full Sail Education | Student Video Editing Studio

University of Pennsylvania | Weigle Information Commons



Typically a complement to services found at the Scholars' Lab, the Digital Media Lab is focused on digital media production, primarily serving individuals and small groups on a just-in-time basis. Service expertise is broad in nature and is delivered from a service desk as well as from consultants that are dispatched out into the lab space to provide more immediate, proactive service.

The technology available at the Digital Media Labs gives users tools for digital media production and authoring, making accessible equipment that is usually just out of reach of the average user. These tools include scanners, digital video equipment, audio equipment, large-screen displays, higher-performing workstations, and specialized software.

The space in a Digital Media Lab is studio-oriented and semi-private, including acoustically separated breakout areas. In addition, access is given to screening spaces for the review of digitally-produced media.

Innovation/Play Zone

Multitouch Table | Jeff Han- NYU

Argonne National Laboratory | Access Grid

Innovation/Play Zone spaces focus on exploration, discovery, creativity, and innovation. They showcase innovative projects, new media, and new technologies, all informing "on the horizon" visuaization needs. Users of this type of space have highly specialized needs. Correspondingly, the expertise available consists of subject matter experts and technology specialists, both acting as "idea consultants."

Innovation/Play spaces also provide access to the latest technology and demonstration equipment. Their use is specialized and requires trained expertise. Due to their advanced nature, use of the equipment must be scheduled ahead of time.

The space found at Innovation/Play spaces is a highly flexible mix of areas with distinct characteristics. "Black-box" configurable spaces are often provided. In addition, there is room for localized "back of house" IT systems.

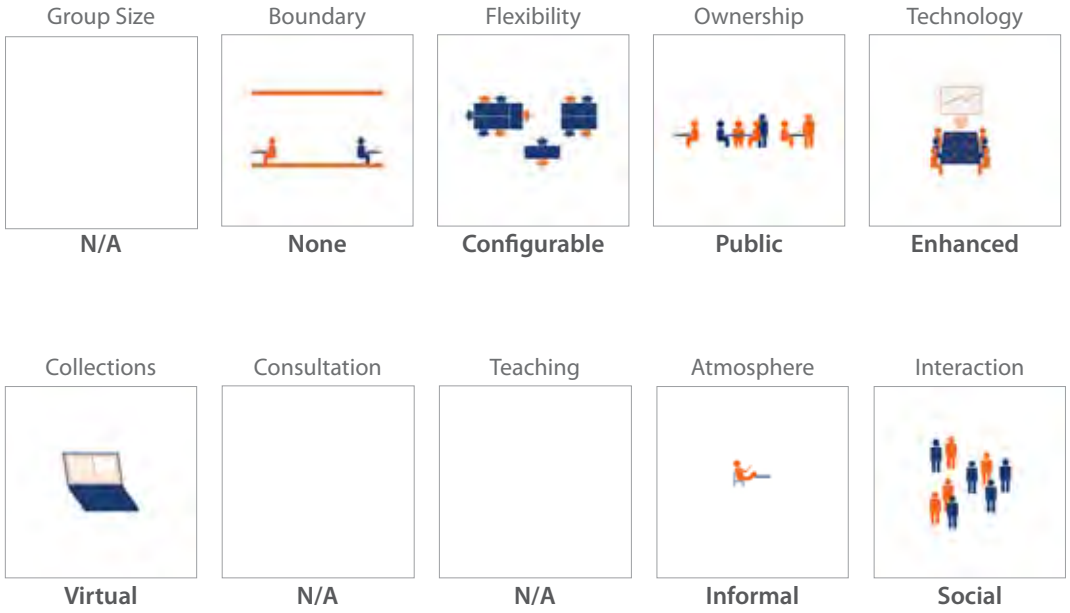
Group Size	Boundary	Flexibility	Ownership	Technology
				
Small Group	**Total**	**Flexible**	**Flexible/On Demand**	**Experimental**

Collections	Consultation	Teaching	Atmosphere	Interaction
				
Virtual	**Focused**	**Seminar/Screenings**	**Versatile**	**Interactive**

Scholars' Court

Johns Hopkins University | School of Public Health

Harvard University | Kennedy School of Government

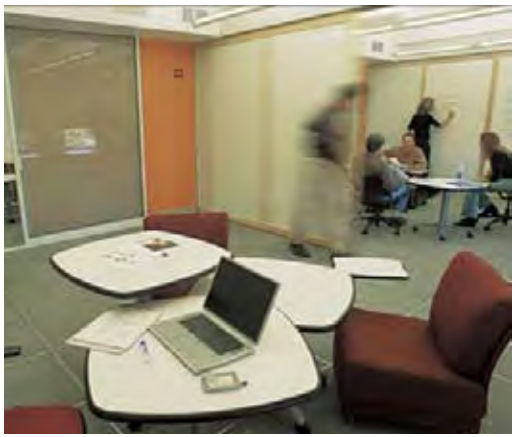


The concept of a Scholars' Court at the core of Alderman is the second key space which will enable the intellectual crossroads vision. Complementing Memorial Hall's busy activity as a casual social center, a Scholars' Court on the second floor can attract scholars for quiet collaborative conversation—a major advantage of a scheme which encloses the light courts. Adjacent to the incubation work areas and the "innovation play" zone in the new central core, it functions as a breakout space serving the conferencing zone. It should offer comfortable café and lounge seating for lingering after meetings or even seminars with movable chairs. As a venue for simple afternoon teas it can help to bring researchers, faculty and graduate students together and provide a place to share insights about innovations in digital scholarship.

Its high visibility from all parts of the building should be leveraged to make visible the products of research, whether through large screens for video projection, smaller display screens for group work or flexible exhibit structures. The corners can be set up as flexible group video viewing lounges, perhaps with international news feeds from the four corners of the globe—echoing Thomas Jefferson's entry hall at Monticello which displayed artifacts and maps to convey knowledge of faraway places to his visitors.

Conference/Breakout

Northwestern University | InfoCommons- Main Library



Stanford University | Center for Innovation in Learning

Conference/breakout rooms play multiple roles in accommodating conferences, meetings, learning activities, social events, etc. They are served by on-call support, which provides logistical assistance with guest events. The technology found at conference/breakout rooms supports a variety of learning and dissemination modes, which can take place in both the physical and virtual worlds, aided by tools such as the AccessGrid and video conferencing. Conference/breakout rooms are configurable meeting spaces that allow users to quickly express and share ideas. They include common breakout areas and have catering support areas for group gatherings.

Group Size	Boundary	Flexibility	Ownership	Technology
				
Medium Group	**Total**	**Configurable**	**Flexible/On Demand**	**Advanced**

Collections	Consultation	Teaching	Atmosphere	Interaction
				
Virtual	**Subject-Oriented**	**Seminar/Screenings**	**Versatile**	**Interactive**

Learning Spaces/Classrooms

Long seen as the traditional venue for learning, learning spaces/classrooms emphasize content use. They typically enjoy on-call support for any logistical needs and host content experts to assist with materials. Technology found in learning spaces/classrooms supports a variety of learning and dissemination modes. The technology, adaptable to different needs, usually supports learning and pedagogy by enhancing the use of materials and does not drive the classroom space. Classrooms are places to quickly share and express ideas. The spaces are configurable and easily changed, providing common break out areas and support space to facilitate rapid material and technology reconfiguration when needed.

MIT | Stata Center

University of Chicago | USITE Crerar Computing Center

DEGW

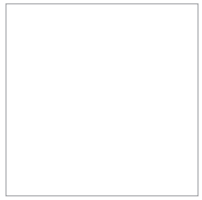
Group Study/Collaboration

Group study/collaboration spaces are venues for small group interaction and team-based projects. There is little expertise available for user assistance, if any, but the spaces are equipped with technology and designed in a manner to aide users. Large-screen displays and other integrated tools help foster a collaborative atmosphere, supported by proximity to printers and copiers. The spaces come in a variety of configurations to be responsive to the range of collaborative needs and styles of group work.

TeamSpot Collaboration Software

University of Arizona | Information Commons
Integrated Learning Center

Group Size	Boundary	Flexibility	Ownership	Technology
				
Medium Group	**Major**	**Flexible**	**Flexible/On Demand**	**Enhanced**

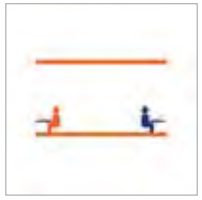
Collections	Consultation	Teaching	Atmosphere	Interaction
				
Virtual	**Broad**	**N/A**	**Formal**	**Collaborative**

Information Communities Reading Room

Rhode Island School of Design | Fleet Library

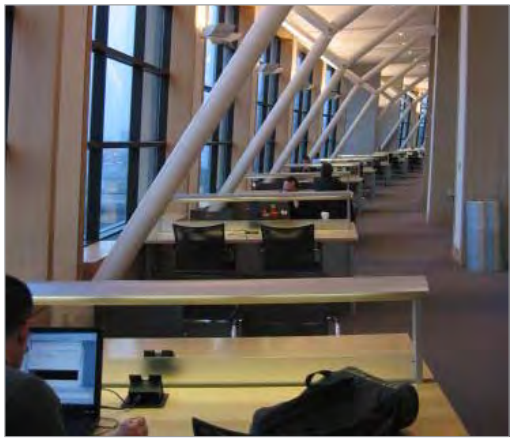
Columbia University | Butler Library

Information Communities Reading Rooms focus on work with digital materials and act as a social and scholarly destination. The available expertise emphasizes a broad body of knowledge accessible when it is needed, provided via a service desk or with consultants that are dispatched out into the space. These facilities respond to contemporary user demands, providing a mixture of individual and group-oriented technologies are available for users, who also take advantage of a rich sensory environment. Access is also available to mobile collections, enabling users to expand their resources for research. These rooms are also designed for comfort, providing multiples spaces and zones that allow every user to find their own niche. These rooms reflect the past, exist in the present, and look forward to the future.

Group Size	Boundary	Flexibility	Ownership	Technology
				
Individual	**None**	**Configurable**	**Public**	**Basic**

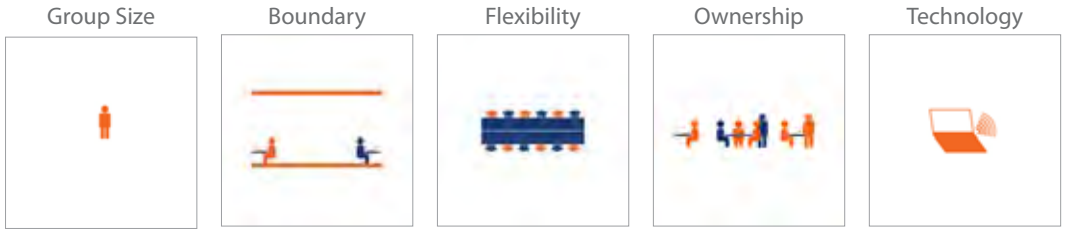
Collections	Consultation	Teaching	Atmosphere	Interaction
				
Print On Demand	**Broad**	**N/A**	**Versatile**	**Collaborative**

Carrel Space



Salt Lake City Public LIbrary | Study Carrels

Howard University | Louis Stokes Health Sciences Library



Traditionally, carrels in the stacks have provided quiet individual workspace for concentrated research and writing. Carrels ideally should be located near windows for natural light and views, and oriented so users do not have their back to the circulation path.

All carrels need to provide several power receptacle for use of laptops along with several other devices right at the desktop surface, to avoid trailing wires.

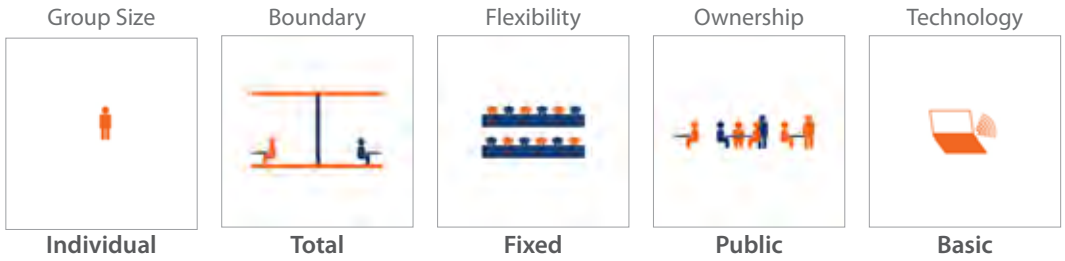
To utilize space more effectively, it is proposed with the future space strategy that carrels not be dedicated but bookable on demand over the network. These would be complemented by clusters of lockable storage cubbies or trolleys for graduate students' personal materials. Additional non-assigned storage units should be provided for other students who may wish to leave their laptop and other devices for awhile as they search the stacks or take a break in the café.

Lighting quality in the work areas needs to be carefully studied, with user controls at task lights.

Collections Space

University of California, Berkeley | Main Stacks

Duke University | Bostock Library



Stack spaces will continue to house the open print collections and quiet secluded carrels along the perimeters. As bound journals and lesser used materials are moved out to the Ivy Stacks facility, the collection remaining will be carefully selected to provide maximum value on grounds and browsing opportunities for those who wish it.

Although served by virtual reference services, stack zones will not staffed except for reshelving activity by Circulation Services staff, so security and the concern students feel about isolation is a factor, although not really a threat on this campus. Efficient staging areas and the flow of carts needs to be considered in the planning.

The renovated stacks zones need to be wired for better power distribution, as well as wired and wireless network access, including more distributed terminals for catalog checks while browsing.

The stack spaces need good lighting, fire protection and a coherent collection distribution with clearly discernable logic. Because of the constraints of existing structural column grids and ranges, shelving aisles may not be able to conform to ADA requirements.

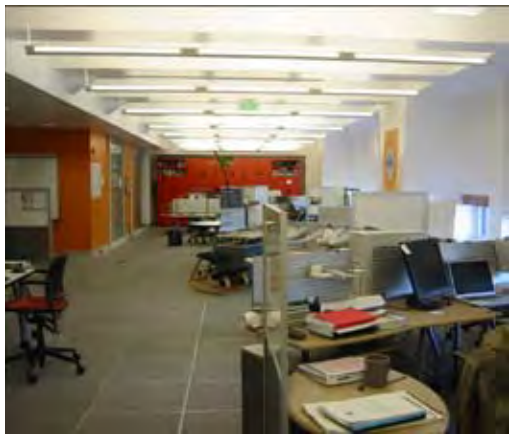
Graduate Student Scholarship Center

This would be a dedicated meeting ground for graduate students doing dissertations to meet and share experiences. The main lounge area would be used for meeting, complemented by a quiet zone with shared workstations and lockable cabinets for research materials, a book collection on how to develop dissertations, and some small enclosed "focus" rooms for 1 or 2 people to do concentrated work together. This will address the current lack of facilities to support graduate students.

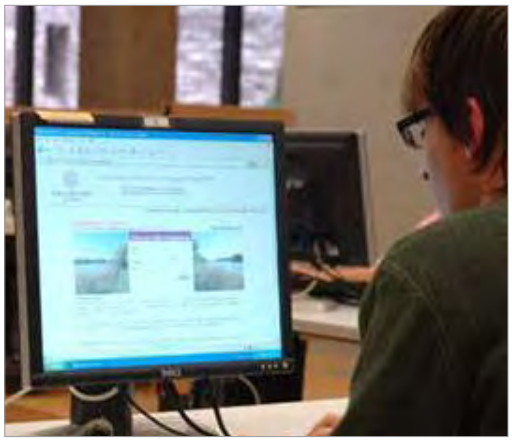
Johns Hopkins University | School of Public Health

University of Virginia | School of Law

Research & Scholarship Support Center



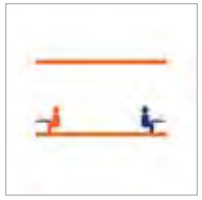
Stanford University | Center for Innovation in Learning

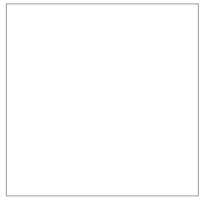


Northwestern University | InfoCommons- Main Library

This program concept is for a "one-stop" services center, expanding on the popular and growing Scholars' Lab services. It would be a place to get a number of services, including scholarship technology advising, consisting of consulting services on how to use the emerging cyberinfrastructure to best advantage in one's research, with referrals to IT experts.

Also available would be IP consultation, which gives students access to advice on copyright and intellectual property issues in the use of material to create new scholarly products. Additionally, digital repository consulting and management would show users how to find, use, and contribute to UVA depository materials. Other services can include advising on grant proposal development and dissertation support.

Group Size	Boundary	Flexibility	Ownership	Technology
				
Individual	**None**	**Configurable**	**Public**	**Basic**

Collections	Consultation	Teaching	Atmosphere	Interaction
				
Print On Demand	**Broad**	**N/A**	**Versatile**	**Collaborative**

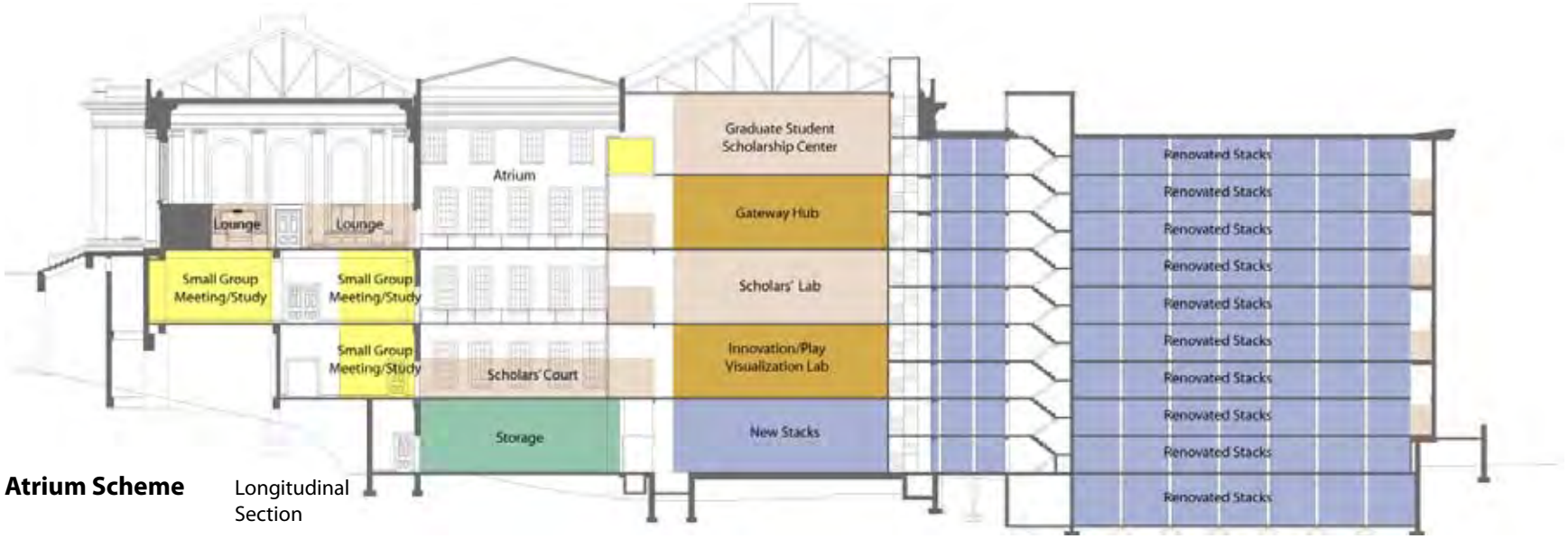
VII. Proposed Strategic Plan for Alderman Library

The strategic planning study of Alderman Library evaluated two alternatives simultaneously: one approach represented the "baseline" for minimum preparedness to upgrade building systems to 21st Century standards, as well as compliance with life, safety, and environmental codes. The other approach built on this established minimum or baseline scope, but also proposes changesto the programming of the building to meet the challenges and expectations of 21st Century student life. It is this more comprehensive approach that is recommended in this report. Other alternative interventions that the Library might consider are detailed in Section VIII, on Alternatives Considered.

Proposed Strategic Plan: Atrium Scheme

The proposed scheme positions the library to achieve its vision of an intellectual crossroads. It does this by creating a more flexible, collaborative, and connected library than is achievable under the baseline scope definition that precludes major structural, enclosure, or building massing changes. The recommendations for building systems, programs, services, and collections that follow represent a direction for the Library to most fully realize its mission and meet future challenges.

As in the baseline approach, many of Alderman's building systems are in need of modernization and will be updated to current standards and practices, including the installation of fire suppression sprinkler systems. Power and data will also be upgraded by improving/adding ubiquitous wireless coverage and by using a 12'-0" by 12'-0" power grid within large open spaces like reading rooms to ensure that no seat is more than 6'-0" from an outlet and most furniture can then be powered from below. Also, in order to provide the library with the flexibility to easily move collections, furniture, and technology



Atrium Scheme Longitudinal Section

Genzyme Center

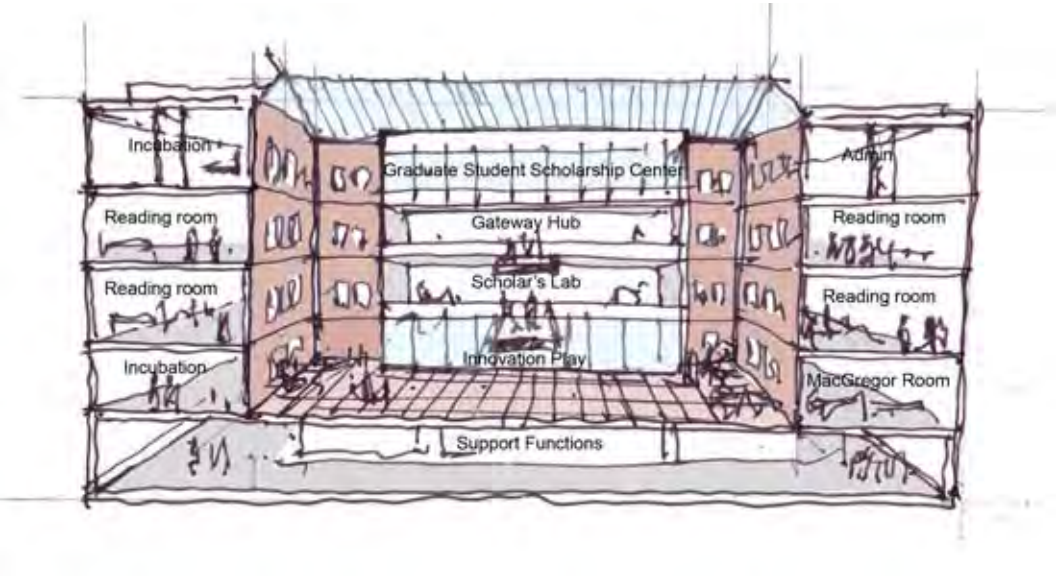
Minneapolis Central Library

around in the future, a freight elevator is proposed in the Northwest corner of the building, punched through the small portion of slab that was in-filled when the "New" stacks building extension was added. These systems upgrades as well as programmatic changes will translate into interior renovations that affect furnishings, finishes, lighting, partitions, slabs (in some unique cases), services, and collections.

In addition to these building upgrades, two significant building changes are proposed and are the key differences from the baseline scheme: first, the demolition of the "Old" stacks and rebuilding in its place of +/- 24,000 nsf of new and highly flexible space near the center of the building. This zone can be rebuilt from scratch to current standards including 21st Century services and distribution, large column bays and raised floors for flexibility, and visual connection to most of the building through the second key change, the creation of a sky-lit atrium over the existing light wells. By demolishing the brick-enclosed bridges in favor of new open-air bridges, infilling parts of the level 2 floors to create a single base floor, and introducing a generous "racetrack" circulation around the atrium, a central, unifying space is created. This space, with the Scholar's Court at its base, is a microcosm for the library as a whole, an intellectual crossroads.

With these changes, approximately 20,000 gsf of "Old" stacks mezzanine area is deducted, but 6,000 gsf of interior space is added through the atrium. Despite the smaller net area than the baseline scheme, space is more easily programmed within the Atrium scheme as the 24,000 nsf replacing the "Old" stacks can be redistributed among non-collections program areas. The result is a significant gain in user seating of 60% (from 881 to 1,408), a large increase in public study space of 73% (from 27,500 nsf to 47,500 nsf), and the addition of about 11,400 nsf of collaborative space on Levels 2 and 3 South. These programmatic changes are enabled not only by the removal of the "Old" stacks and introduction of the atrium space, but also by the relocation to Ivy Stacks of collection-associated staff like cataloguing, acquisitions, processing, and preservation and by the aforementioned changes to the government documents area as described under the baseline scheme descriptions.

Programmatically, the building is organized around a cascade of support from the everyday, just-in-time, drop-in environment on level 4; down to a more subject-focused scholarship and just-in-time support model on level 3; down to the realm of experts on level 2 which is geared toward advanced research, scheduled, and longer-term assistance and collaboration. This "cascade" is perhaps most visible within the rebuilt



Exploded Section

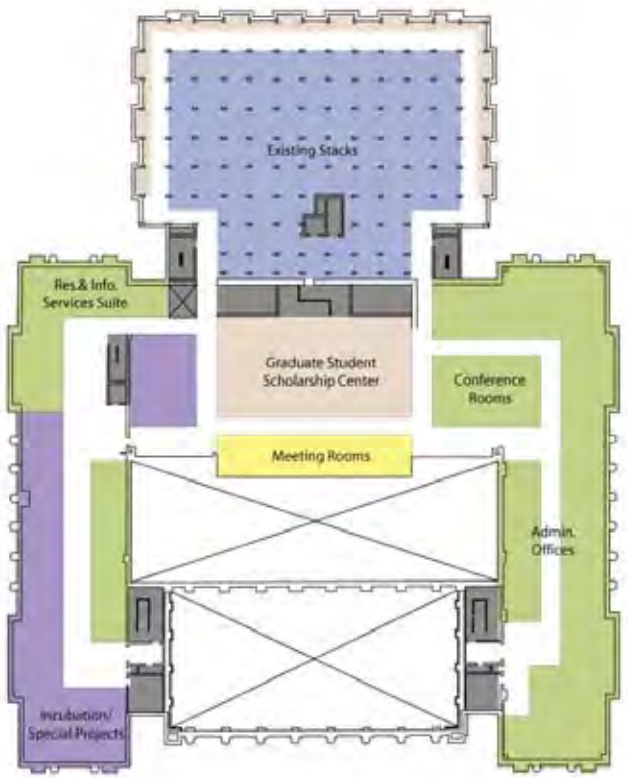
"old" stacks zone with a sophisticated Visualization/Innovation/Play space at level 2, the relocated Scholar's lab at level 3 combining technological and subject-specific support, and the Gateway Hub at level 4 which provides a more self-service, drop-in computing environment.

Within this cascade framework, strategic new programs are proposed to help Alderman achieve its vision. These include: more collaborative space and seating, event and exhibit space to showcase work and draw people together, reconfigured reading rooms organized to support and respond to information communities, and a Graduate Student Scholarship center. While these new programs are added, the historic reading rooms remain either largely untouched or restored in order to clearly preserve Alderman's history and character so that it can comfortably look to the past and move in the future.

In the Atrium / "Old" Stacks replacement scheme, Alderman's collection will be 135,000 to 270,000 volumes with the addition of sprinklers in the "New" stacks and by approximately 280,000 volumes to create high-quality user space at the perimeter of the "New" stacks." Additionally, the removal of the "Old" stacks means that about 750,000 volumes would be relocated and/or removed (e.g. in the case of duplicate journal runs), leaving the facility about 60,000 under its target if all three impacts were to coincide at their worst cases. To achieve the target of 1.6 million volumes on-site, either the perimeter relocation would only happen at about three-quarters of the perimeter areas or the less conservative sprinkler approach would have to be the case, and both of these are practical and possible. Thus, it is probable that the library could modernize its systems, reconfigure its infrastructure, and continue to innovate in its services and operations while still meeting user needs by retaining the core browsable print-collections within the library.

Legend

- Stacks
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Public Services
- Staff Offices
- Support
- Media Services
- Incubation/Special Projects
- Maintenance/Mechanical



Key Space Attributes

-"New" stacks building remain

-Staff areas consolidated to East Wing

-New skylit staff conference areas on East Wing

-Incubation/non-library areas expanded, located on West Wing, with space for co-located staff

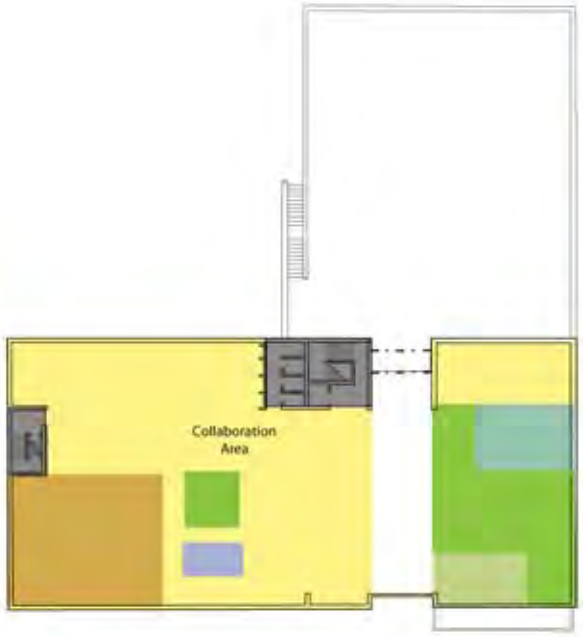
-Potential for skylights in key areas (e.g. conference rooms)

-Center zone replacing "Old" stacks to beused for Graduate Student Scholarship Center, with carrels and meeting rooms (shared usage) facing atrium

Atrium Scheme Fifth Floor

Legend

- Stacks
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Public Services
- Staff Offices
- Support
- Media Services
- Incubation/Special Projects
- Maintenance/Mechanical



Atrium Scheme Fourth Floor

Key Space Attributes

-Reference Reading Room and West Wing (formerly Scholar's Lab) renewed as Information Communities Reading Rooms (themed, mobile collection, small groups)

-Staff consistently located at southern end of Reading Rooms and Northern niches

-Gateway Hub created in new infill building

-Café relocated along south wall

-Lounge and exhibit area along front façade, with add'l doors for egress

-Reduced Front service desk (some functions distributed to Reading Rooms)

Legend

- Stacks
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Public Services
- Staff Offices
- Support
- Media Services
- Incubation/Special Projects
- Maintenance/Mechanical

Atrium Scheme Third Floor

Key Space Attributes

-Periodicals Reading Room renovated, focus more on collaborative study (mix of group and individual) with staff at south and niche areas

-West wing used for IT Staff, Renovated Map Room, and Scholarship Support Center

-Small group zone created at south side with open area at areaway windows and enclosed rooms on light-wells

-Scholars' Lab in new center zone

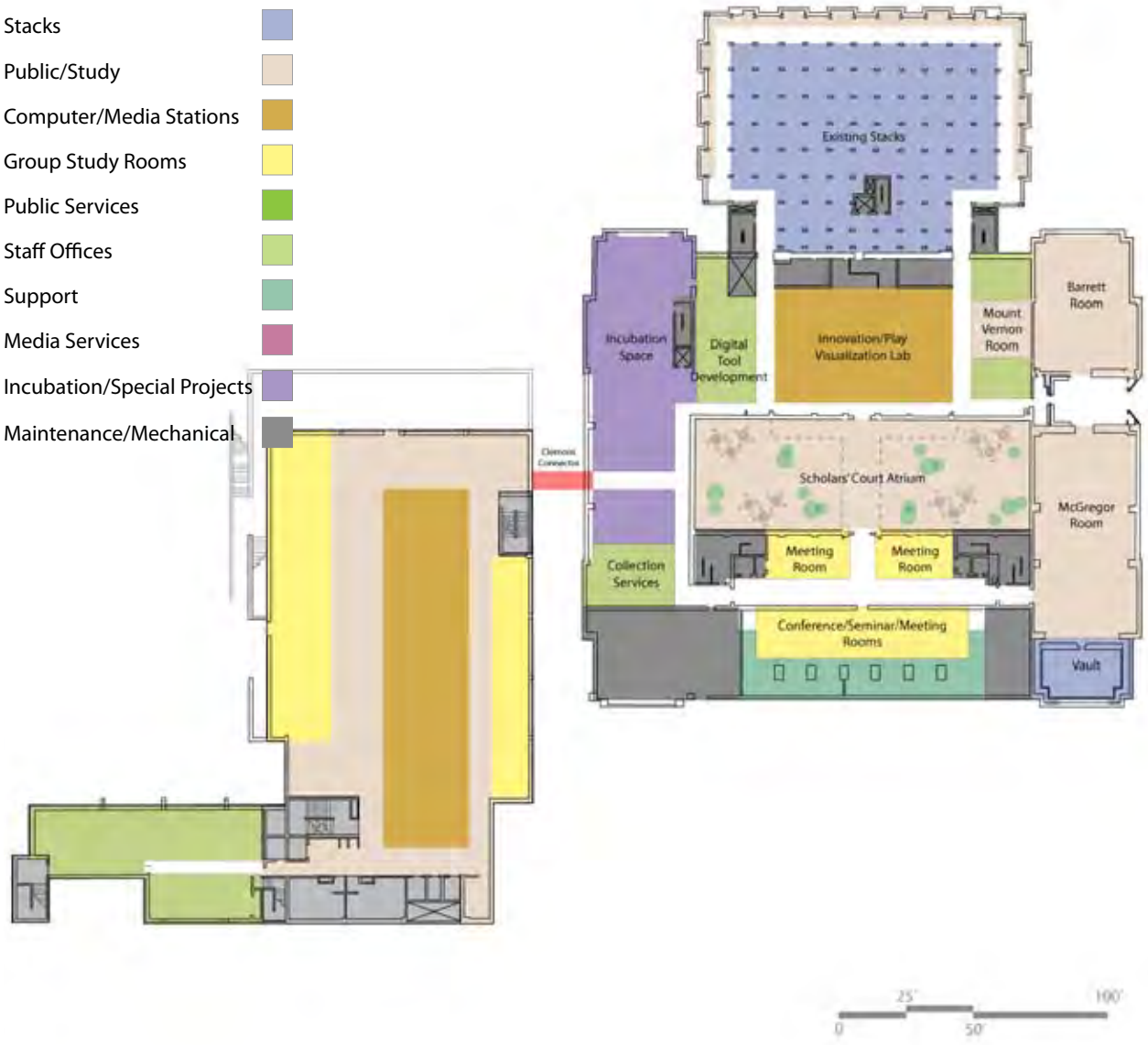
-Garnett and Taylor Rooms Remain

-Expanded incubation Space (e.g.: IATH)

-Recommended Clemons Connector to allow for better flow for users and staff between Scholars' Lab and Media Center

Legend

- Stacks
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Public Services
- Staff Offices
- Support
- Media Services
- Incubation/Special Projects
- Maintenance/Mechanical



Key Space Attributes

-Barrett and McGregor Rooms remain, with vault converted to film archive

-Base of atrium as "Scholar's Court" with seating and small group areas and displays

-Processing area relocated.

-West Wing used for expanded incubation space and staff

-Center zone as Innovation/play zone with digital tool development staff co-located

-Conference/Seminar Rooms at south side

-Toilets relocated to rear of Southern Wing, with storage (Staff relocated to Level 5 / Ivy Stacks)

-Recommended Clemons connector to allow better flow for users and staff between Digital Media Lab and Innovation/Visualization zone

Atrium Scheme Second Floor

Legend

- Stacks
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Public Services
- Staff Offices
- Support
- Media Services
- Incubation/Special Projects
- Maintenance/Mechanical

Key Space Attributes

-Expanded / Relocated Rare Book School stacks and meeting/office space

-New Stacks ranges pulled back - double-height user space on 3 sides

-Light-wells in-filled to create atrium base, area created used for storage and RBS conference + exhibit

-New core with shafts + stairs at "New" stacks transition

-Base of "old stacks" replacement used for stacks

-LEO, Facilities, Business Services re-main and ILL/IT offices relocated to SW Corner overlooking connector garden

-Printing Services remains in place

-Maintain existing connector to Clemons for staff only

Atrium Scheme First Floor

Notes on Buildings Systems/Infrastructure Changes

Recommended Architectural Interventions:

All the system improvements outlined previously in the Baseline Scheme would be provided in this scheme as well as the following additional work:

-A skylight would be installed over the two existing light wells to create and enclosed atrium.

-The entire Old Stacks structure would be removed, and new infill construction would be build in its place from the ground floor to the fifth floor, capped with a new roof system. The five new floors, aligned with the existing main floors would be concentrated, high technology spaces, to include; the Graduate Scholarship Center, the Information Center/Computing Hub, Scholar's Lab, Innovation/ Play Zone and a new stacks area at the first floor.
-A new bridge would be built, through the newly created atrium space at the third and fourth floors.

-A new open court floor area would be created at the second level base of the atrium, with loose tables, café seating and lounge areas intermixed with collaboration areas. This new floor construction would create additional enclosed service and support spaces on the first floor.

Recommended Mechanical, Plumbing, Fire Protection and Electrical Interventions:

All the system improvements outlined previously in the Baseline Scheme would be provided in this scheme, with the following exceptions:

-Old Stacks: Rebuild the air handler located in the attic that serves this space. The new air handler will be variable air volume and will incorporate energy recovery for outside air, economizer cycle and humidification. Replace existing ducts with new vertical duct risers established in the renovated core to deliver air to each level, and new horizontal ducts to distribute air throughout each level of the renovated core and surrounding spaces.

-Atrium: This space will be served by a separate air handler located in the new stacks basement. The new air handler will be variable air volume and will incorporate energy recovery for outside air, economizer cycle and humidification. New ducts will distribute air horizontally through the new stacks basement to new vertical risers up through the the enclosed light well. In economizer mode, air will be relieved through the new atrium roof. The atrium also will serve as a means for relieving natural ventilation from the spaces surrounding it.

Since the old stacks area will be removed, the

telecommunication systems will be removed in their entirety. The new system will incorporate all features required for a fully integrated building. Considerations include:

-Establish at least two telecommunications closets, optimally located in the southwest and southeast sides of the rebuilt old stacks area.

-Each IT closet should be sized 8' x 10' and have access from the public corridor. Year-round air conditioning will be required.

-New CAT 6 (or 6e) cabling for network drops and RG6 cabling for CATV drops.

-Ladder-type cable trays for cable management above corridor ceilings that run the length of the corridors.

Recommended Structural Interventions:

All structural work outlined in the Baseline Scheme would be provided in this scheme.

-Removing and replacing the old stack system would require new foundations for columns on a larger grid. Removing old stacks may require additional bracing of building columns.

-Atrium roof framing at light wells likely would require reinforcing of existing building columns.

-The new bridge floor framing may require lateral bracing and structural isolation from surrounding building to prevent seismic upgrade of the entire structure. To minimize column intrusion into the spaces, double cantilevered beams on a large column grid would be utilized.

-The enclosed connector structure would be structurally independent of Alderman with an expansion joint. The new connector may require deep foundations and grade beams. Foundations will be coordinated to avoid existing construction.

Summary of Cost Estimate Assumptions

OPTION 2 ATRIUM

Interior Renovations Costs:

- Interior Finish Matrix	$30,487,006
- 5 Stop Elevator	$340,000
- Flat Roof Replacement	$300,000
- HAZMAT Abatement	$250,000
- Old Stacks Demolition	$2,082,600
- Old Stacks Structural Infill	$9,750,000
o Subtotal	$43,209,606
- Design Development Contingency	$8,641,921
- Bond	$432,096
- Construction Contingency	$4,320,961
o Interior Renovations Total	$56,604,584
Furniture Costs	$4,857,045
Technology Costs	$1,365,897
TOTAL	**$62,827,526**

Interior Renovations Options:

- *Clemmons Connector Option*	$2,208,000
- *New Stacks Perimeter Improvement Option*	$1,574,250
- *New Stacks Perimeter Improvement Option*	$1,390,500
- *Window Repair Option*	$223,997
- *Alderman Café Terrace Option*	$600,000
TOTAL *(w/ Options)*	**$68,824,273**

Alderman Library Pre-planning Estimate Basis

Strategic Planning Study by DEGW, pgs 1-25, 3/12/2007
Option 1 Baseline Scheme by DEGW, Floors 1-5, 5/9/2007
Option 2 Atrium Scheme by DEGW, Floors 1-5, 5/9/2007
Cost Estimate Matrix by DEGW, Options 1&2, Floors 1-5
Level of Finish Matrix by DEGW
MPE Analysis, Electrical Narrative, pgs 1-9
On-site meetings with DEGW, UVa and Osteen Phillips

Pricing is based on:

- Current (2nd quarter 2007) construction costs
- No phasing of the work
- The contractor will have full access to the site
- Books and furniture will be removed, stored and returned by others
- The work is to be completed during regular working hours
- The building is to be fully sprinkled
- An allowance has been included for removal of hazardous materials
- SF pricing based on recent UVa renovation projects including: the Link offices, Fayerweather Hall, Peabody Hall and the Law School classrooms
- It is assumed there will be little exterior work done to the existing building

No allowance has been made for the following:

- Furniture
- Technology (i.e. projectors and computers)
- Design, testing and inspection fees
- Cost escalation
- Builder's risk cost

Summary Comparison

While the minimal "baseline" scheme for Alderman's renovation represents a solution to modernize building systems, finishes, and furnishings, the proposed scheme introduces an atrium space and the removal/replacement of the "Old" stacks area to transform the building to achieve the vision as an intellectual crossroads. With the introduction of the atrium and the replacement of the "Old" stacks zone by modern, flexible spaces comes the ability to distribute program more freely and more closely to the ideal scenarios mapped as part of the envisioning of Alderman's future. The key principles from the visioning activities completed during the strategic planning study establish the business goals of the library and its preferred path to achieve them. They also provide the means by which the two options can be measured and compared.

Library as Intellectual Crossroads

Both schemes are organized around this central theme in order to cement the role of the Library as the place on grounds for interdisciplinary scholarship, collaboration, and interaction among users, staff, and collections. However, with the introduction of a powerful connective atrium element using views, paths, events, and exhibits; nearly 50% more collaborative space, and more special project and incubation space, the Atrium/Old Stacks Replacement scheme achieves a more complete resolution of the crossroads concept.

Cascade of Support to Vertically Organize the Building

While the baseline loosely conforms to this concept, it is truly realized within the replaced "old" stacks. There, free from some of the physical constraints of the Alderman building, the new spaces replacing the "old" stacks can be purpose-built and more readily organized according to the cascade principle.

A New Balance of User and Collections Space

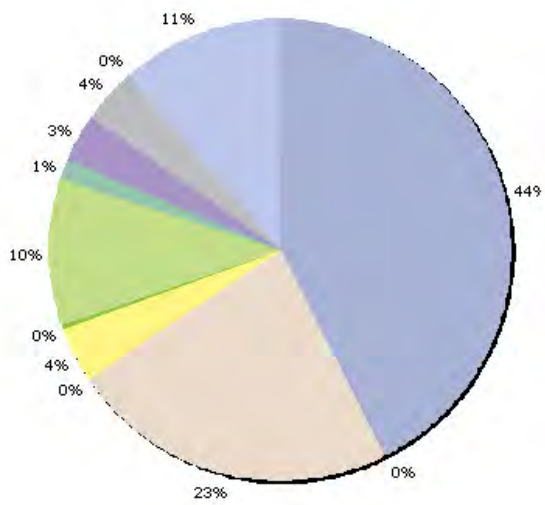
One of the principal goals for Alderman's future is to create more and better quality user space. By relocating the collection off-grounds from the "Old" stacks (and weeding the collection of unnecessary redundant volumes), more than 10% of the net area of Alderman can be reallocated from collections space to user space, providing additional and more collaborative user space in comparison to the baseline scheme.

A New Balance of Individual and Collaborative Space

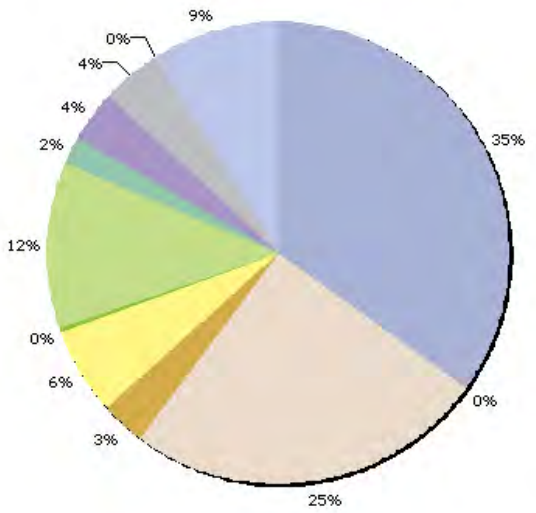
In order to support the increasingly collaborative learning and research that students are involved in, more collaborative space is needed within Alderman. In comparison to the base-

Space Breakdown Comparison

Existing Space Breakdown



Baseline Scheme Space Breakdown



Atrium Scheme Space Breakdown

line scheme, the atrium scheme offers 50% more collaborative space, due primarily to the addition of the Scholar's Court at the base of the atrium and collaborative spaces that replace the "Old" stacks space. In addition, while both schemes increase Alderman's seating, the atrium scheme provides more seating (1,401 seats as compared to 1,081) in a better mix (45% collaborative / 55% individual in comparison to 30% / 70% in the baseline scheme).

Strengthening UVA's Digital Scholarship in the Humanities and Social Sciences

UVa has been a national leader in digital scholarship in the humanities and social sciences because of its accomplished faculty, expert staff, and innovative programs to "incubate" special projects within the Library. Though this will be supported well in both schemes, the visualization/innovation/play zone in the Atrium scheme will be a strategic asset, as will the configuration of the incubation space at the base of the atrium.

More Effective Space Use

Both schemes introduce concepts for using space more effectively by sharing space across groups and managing/scheduling usage; for instance, allowing conference spaces used by staff or special project groups during the day to then be used by students at night. With slightly more of these potential spaces, such as the level 5 conference zone, the Atrium scheme is more advantageous.

Flexibility

Given the pace of change within the Library and the need to plan for an uncertain future, flexibility is paramount. Both schemes introduce a freight elevator, clarify circulation, and treat the reading rooms as open, flexible spaces. However, the "Old" stacks are highly inflexible, and so their replacement with open, technologically-enabled space with large spans and raised floors provides clear advantages.

Support for Visualization and Display of Digital Scholarship

Rendering digital activity visible is a critical task to enable Alderman to be the intellectual crossroads envisioned by the student and faculty focus groups. This kind of interactivity, digital serendipity and showcasing of work help bring people together. While every opportunity has been taken to achieve this throughout each scheme, the centralized atrium event space and the visualization/innovation/play zone within the Atrium/"Old" stacks replacement scheme provides more focused opportunities for this crucial support.

Support for use of New Media and Digital Making

Meeting the demands brought on by nascent student learning traits and wide distribution of affordable digital making tools (e.g: iMovie) will be a challenge for all libraries in the future. With additional computing and staff space, as well as more clearly organized support and alignment with Clemons, the Atrium/"Old" stacks replacement scheme offers some clear advantages for Alderman to meet these challenges.

Improved Integration between Alderman and Clemons

Because of their close physical and programmatic relationship, it is crucial that Alderman and Clemons continue to be thought of in an integrated way, and both schemes do this. The Atrium scheme is perhaps better suited to receive a physical connection to Clemons (proposed as an alternate intervention discussed in Section VIII) and more integrated with Clemons by more closely realizing the support "cascade" concept.

Staff Space Strategies for Engagement, Distribution, and Integration

Both schemes incorporate concepts for staff to be more mobile and distributed throughout the library as space, collections, and staff are increasingly going to be scheduled. However, the Atrium scheme provides more staff space than the baseline – though it has roughly the same amount as the existing condition, 4,000 sf of staff space is shifted to the Ivy Stacks. So, the baseline has a net add of 2,000 nsf while the Atrium scheme adds about 4,000 nsf. This additional staff space will allow for growth in headcount, more flexible distribution of staff, co-location with other departments such as ITC and potentially academic support activities, such as the Writing Center, Center for Undergraduate Excellence, etc.

Sustainability

The baseline scheme and the Atrium scheme each aspire to the same three principles of a broader concept of sustainability: connection to nature, occupant comfort, and energy efficiency. Approaches to implementation vary between them though; for instance, the introduction of usable courtyards and green-roofs in the baseline scheme as opposed to the creation of the day-lit atrium space. Overall, the two options are about equal on the three aspects of sustainability: regarding energy, the "Old" stacks replacement space can be built more energy-efficiently than the "Old" stacks, but the addition of an atrium creates a large volume of space to be heated or cooled.

Program Distribution Assumptions and Issues

Distribution of functions in the proposed plan was guided by the "cascade" strategy. The study compared options for distribution of functions and staff space in the two approaches and concluded that the Atrium scheme provided better adjacency relationships and potential for synergy between staff groups, especially with the Clemons connectors.

Staff Space Distribution Strategy

In the proposed plan, staff will continue to be distributed on all floors, but in a rationalized organization and layout. On the top floor, Library Administration functions will be consolidated and collocated with space for new initiatives and special/faculty projects. Based on discussions about new concepts for future public services, Research & Information Services will have a suite of work space on this floor for concentrated work, as well as work areas on level 4 and 3 for activities which involve interface with users. New meeting spaces will be created at this level to provide settings for library staff, faculty and graduate students, and new partners to interact on projects together.

Staffing on the entry level 4 will be redistributed to serve users more effectively in the repurposed big reading rooms of the East and West Wings, assuming more mobile work patterns in the future and the concept of a responsive collection strategy to support emerging information communities. Staff on level 3 will be associated with the relocated Scholars' Lab, bringing them together with IT Systems and groups working on provision of new digital services. The concept of the East Reading Room on level 3 as a growing Scholars' Support Center adjacent to the Scholar's Lab is intended to provide users with a one-stop center for the advice they need on copyright concerns and research consultations. The connection to Clemons will allow the easy migration of staff between both buildings who can assist users with their projects, whether they are incorporating data from GIS systems or material in a variety of media gathered during research projects.

Staff at level 2 will be experts involved with development of new digital and visualization tools. Their role will be to support the advanced explorations of the Incubation work areas and assist in the operation of the Innovation/Visualization Lab. Complementary expertise will also be located at this level to support scholars using the Barrett Room Asia Collections and be the home base for other subject specialists who consult with researchers on request. Connection to Clemons at this level will allow easier collaboration between staff assisting with advanced media applications in the new Digital Media Lab, relocated down to this level to provide

needed expansion space, and staff experimenting in the Innovation/Visualization Lab.

Another strategy was to exploit the features of the building even at the lowest level. On level 1 space for staff coordinating the LEO system at Alderman, facilities and receiving, plus the staff lounge will be relocated to space with natural light along the exterior wall with views into an atrium garden in the zone between Clemons and Alderman. The Rare Book School's workstations and meeting table now buried in the stacks zone will be moved out into space that is properly conditioned, located convenient to a new shared meeting space that will showcase cases displaying historical print materials from the Alderman collection as well as the Rare Book School's collection. Even though the new space on level 1 created by the installation of the base of the atrium at level 2 is interior space, it will have a high ceiling and because of the sensitive nature of the historic collections, the ability to control natural light is advantageous.

User Space Distribution Strategy

The cascade concept also provides a space strategy to distribute user spaces for more specialization and independence as users move away from the entry level. At level 4, users can flow from the very social lounge spaces near the café in Memorial Hall, to the Wings with their frequently changing collection alcoves and displays of new topics in response to user demand. The new open bridge will lead to the Gateway Hub, an active collaborative area for drop-in work.

On level 3, group study rooms and a quieter collaborative work area will be clustered along the south zone, connected by bridge to the Scholars' Lab. The East Reading Room will become the Scholars Support Center. The original Map Room will be subdivided and restored into an elegant seminar space for presentations and talks on the south side of the Clemons connector, and a quiet reading room with print journals on display on the north side. In Clemons the AV stations will be replaced with flexible furnishings and media stations for typical light media editing. The media stacks will be relocated out from the Robertson Media Center service desk to allow independent user browsing of the collection and space for group work will be expanded.

Level 2 will greatly expand the space for scholars to connect and hear talks in the Scholars' Court at the base of the Atrium, as well as provide the primary venue for showing large public visual displays or social gatherings, such as weekly teas. A complex of conferencing spaces will be on the south, allowing participants to spill out during breakout sessions into the Court. The beloved McGregor Room and a newly refurbished Barrett Room and Mount Vernon Room will com-

plement the high tech spaces at this level, as reminder of institutional history. In Clemons the relocated and expanded Digital Media Lab will offer many more seats for individual or group work on projects that may need more assistance from expert staff, with zones identified for quiet work. Level 1 of Clemons will remain defined as a quiet study floor for individual study.

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SUMMARY OF AREA BY CATEGORY

FUNCTION	Area (SF)	Option 1- Baseline - with Shifts to Ivy Stacks							Option 2 - Capture Court & Demo Old Stacks						
		First Flr	Second Flr	Third Flr	Fourth Flr	Fifth Flr	**TOTAL**	*% Diff.*	First Flr	Second Flr	Third Flr	Fourth Flr	Fifth Flr	**TOTAL**	*% Diff.*
"NEW" STACKS	83,134	13,700	13,700	13,700	13,700	6,850	**61,650**	*74.2%*	13,700	13,700	13,700	13,700	6,850	**61,650**	*74.2%*
"OLD" STACKS	39,368	4,040	5,480	5,480	5,480	5,480	**25,960**	*65.9%*	n/a	n/a	n/a	n/a	n/a	**0**	*0.0%*
OTHER MISC. SHELVING	920		920				**920**	*100.0%*	3,280	920				**4,200**	*456.5%*
PUBLIC / STUDY	27,526	2,120	11,880	12,520	17,350	1,060	**44,930**	*163.2%*	2,120	12,410	13,080	16,550	3,350	**47,510**	*172.6%*
COMPUTING+ MEDIA STATIONS	800						**0**	*0.0%*		2,830		2,780		**5,610**	*701.3%*
GROUP STUDY/MTG/ CLASSROOMS	537		2,060	4,640	730		**7,430**	*1383.6%*	1,170	2,540	6,020	730	970	**11,430**	*2128.5%*
PUBLIC SERVICES	4,521				2,210		**2,210**	*48.9%*				2,240		**2,240**	*49.5%*
STAFF OFFICES	21,773	4,270	3,380	1,050	1,080	8,260	**18,040**	*82.9%*	3,390	2,640	5,145	1,940	8,580	**21,695**	*99.6%*
SUPPORT	4,339	2,320					**2,320**	*53.5%*	3,600					**3,600**	*83.0%*
INCUBATION SPECIAL PROJECTS	6,377			3,725		2,890	**6,615**	*103.7%*		3,700			3,350	**7,050**	*110.6%*
OTHER NON-LIBRARY	9,236	6,980			800		**7,780**	*84.2%*	7,010			800		**7,810**	*84.6%*
BASEMENT 6th FLOOR AREA	13,939						**0**	*0.0%*						**0**	*0.0%*
ADJUSTMENT: CIRCULATION IN STACKS	N/A	6,487	3,250	4,308	4,280	3,727	**22,052**	*N/A*	7,247	2,680	2,666	2,638	1,320	**16,551**	
SEATS	882	48	285	372	334	42	**1,081**	*122.5%*	78	362	421	433	114	**1,408**	*159.6%*
TOTAL NET AREA	198,531	33,430	37,420	41,115	41,350	24,540	**199,907**		34,270	38,740	37,945	38,740	23,100	**189,346**	
									REFERENCE: Removed Old Stacks Mezzanine Area					19,684	

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STACKING ANALYSIS

Existing Functions:	*2007 Existing* Staff	Area (SF)	*Option 1 - Baseline - with Shifts to Ivy Stacks* Function	Staff	Area Shown	*Option 2 - Atrium Capture Court & Demo Old Stacks* Function	Staff	Area Shown
FIFTH FLOOR | ALDERMAN								
Library Administration			**Library Administration**			**Library Administration**		
Office of the University Librarian	11	1,899	Office of the University Librarian	11		Office of the University Librarian	11	
Library Development	4		Library Development	5		Library Development	5	
Communications	4		Communications	5		Communications	5	
Management Information Services	3		Financial Services	8		Financial Services	8	
Human Resources	1		Human Resources	4		Human Resources	4	
			Management Information Services	3		Management Information Services	3	
			Subtotal - Library Administration		**5,020**	*Subtotal - Library Administration*		**5,020**
Humanities & Social Sciences Services	2							
Digital Access Services	4		**Conference room**	22	580	**Conference rooms**	36	900
Library IT Systems	12	**1,300**	**Research & Information Services Suite** (also 4th flr)	21	1,370	**Research & Information Services Suite** (also 4th flr)	21	1,370
Digital Library R&D	3		**Digital Library R&D**	12	1,290	**Digital Library R&D**	12	1,290
			Total Staff Space		**8,260**	*Total Staff Space*		**8,580**
Hallway Table / Seating Zones (East and West)								
Non-Library Functions (not incl. as staff)			**Non-Library/ "Incubator" Functions:**		2,890	**Non-Library/ "Incubator" Functions:**		3,350
Washington Papers offices	8	1,456	New Initiatives/Special Projects Workspace			New Initiatives/Special Projects Workspace		
Madison Papers offices	4	777						
Small special project rooms		3,072						
Subtotal - non-library offices		**5,305**	*Subtotal - Non-Library/Incubator*		**2,890**	*Subtotal - Non-Library/Incubator*		**3,350**
"Old" Stacks Zone (5 & 5M)		**7,887**	**"Old" Stacks Zone (includes mezzanine)**		5,700	**Graduate Student Scholarship Ctr**		2,290
(including carrels)			(minus est'd loss of net area to shafts)		-220	**Meeting Rooms**		970
Public shared workareas (in circ'n zone)			Carrels (area included above)					
			Subtotal - Old Stacks Zone		**5,480**	*Subtotal - Old Stacks Zone*		**3,260**
Existing "New" Stacks Zone		**9,230**	**Existing "New" Stacks Zone (no mezzanine)**		6,850	**Existing "New" Stacks Zone (no mezzanine)**		6,850
(including carrels)			Carrels - new in renovated layout		1,060	Carrels - new in renovated layout		1,060
			Subtotal - New Stacks Zone		**7,910**	*Subtotal - New Stacks Zone*		**7,910**
Total - Fifth Floor (nasf)	**34**	**25,621**	*Total - Fifth Floor*	**36**	**24,540**	*Total - Fifth Floor*	**36**	**23,100**
gsf		**32,941**	*Circulation within Stacks (gsf)*		*3,727*	*Circulation within Stacks (gsf)*		*1,320*

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STACKING ANALYSIS

Existing Functions:	*2007 Existing* Staff	Area (SF)	*Option 1 - Baseline - with Shifts to Ivy Stacks* Function	Staff	Area Shown	*Option 2 - Atrium Capture Court & Demo Old Stacks* Function	Staff	Area Shown
FOURTH FLOOR | ALDERMAN								
Circulation Services	7		**Public & Collection Services**			**Public & Collection Services**		
Public & Collection Services	11		Public Services	8	1,070	Public Services	8	1,100
			Collection Services w/in Mem. Hall	5	300	Collection Services w/in Mem. Hall	5	300
			Research & Information Services	varies	840	Research & Information Services	varies	840
(Note: Refer, staff offices incl. in Reading Rm below)			Stations w/in Reading Rooms	4	420	Stations w/in Reading Rooms	4	420
Subtotal- Staff Program		**3,721**	*Subtotal*		**2,210**	*Subtotal*		**2,240**
Memorial Hall		**3,200**	**Memorial Hall**			**Memorial Hall**		
(excludes circulation)			Exhibit		500	exhibit		500
			User seating		1,600	User seating		1,600
			Café		800	Café		800
			Subtotal- Memorial Hall		**2,900**	*Subtotal- Memorial Hall*		**2,900**
Reference Reading Room		**4,860**	**Reference Reading Room**		**6,380**	**Information Communities Reading Rooms (2)**		**12,030**
(adjusted to remove Refer. Libr. suite)			(Public Services included above)			with flexible stack areas & reader seating		
						(Public Services included above)		
Scholars' Lab	7	3,574	**Scholars' Lab**		5,650			
Scholars' Lab support offices		1,718	Scholars' Lab staff	8	1,080			
			(incl service/consultation areas)					
Subtotal- Scholars' Lab		5,292	*Subtotal- Scholars' Lab*		**6,730**			
Electronic classrooms		405	**Classrooms**		**730**	**Classrooms**		**730**
		132	(2 at 12p or 1@24p)			(2 at 12p or 1@24p)		
"Old" Stacks Zone		**8,222**	**"Old" Stacks Zone (includes mezzanine)**		5,480	**Gateway Hub**		**2,780**
						incl service/consultation areas		
			Carrels		1,100	**Counter seating along atrium edge**		**300**
			Subtotal- Old Stacks Zone		**6,580**			
"New" Stacks Zone		**18,458**	**"New" Stacks Zone (includes mezzanine)**		**13,700**	**"New" Stacks Zone (includes mezzanine)**		**13,700**
						(excludes area lost to shafts)		
(Note: existing needs to be adjusted			Carrels		2,120	Carrels		2,120
for subj. libr. changed location)			*Subtotal- New Stacks Zone*		**15,820**	*Subtotal- New Stacks Zone*		**15,820**
staff / seats / nasf	**18**	**38,461**	*Total - Fourth Floor*	**13**	**41,350**	*Total - Fourth Floor*	**13**	**36,800**
gsf		**48,752**	*Circulation within Stacks (gsf)*		*4,280*	*Circulation within Stacks (gsf)*		*2,638*

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STACKING ANALYSIS	2007 Existing		Option 1 - Baseline - with Shifts to Ivy Stacks			Option 2 - Atrium Capture Court & Demo Old Stacks		
Existing Functions:	*Staff*	*Area (SF)*	*Function*	*Staff*	*Area Shown*	*Function*	*Staff*	*Area Shown*
THIRD FLOOR | ALDERMAN								
Periodicals Reading Room		**6,344**	**Reading Room (former Periodicals Room)**		**6,380**	**East Reading Room [former Per. Rdg Rm]**		**6,380**
Map Room		**2,448**	**Periodicals Reading Rm (former Map Room)**		**2,400**	**Periodicals Reading Rm (former Map Room)**		**870**
Garnett Room		**520**	**Garnett Room**		**520**	**Garnett Room**		**520**
						Reading/Seminar Room (former Map Room)		**1,380**
Government Docs Area		4,540	**Collaboration Zone [Former Gov Docs Rm]**			**Collaboration Zone [Former Gov Docs Rm]**		
Gov. Docs Staff	6	800	Open group collaboration area near windows		2,720	Open group collaboration area near windows		2,720
ILL Staff office	9	1,617	2 rms at 960 sf subdividable into 3 rms		1,920	2 rms at 960 sf subdividable into 3 rms		1,920
			Subtotal- Collaboration Zone		**4,640**	*Subtotal- Collaboration Zone*		**4,640**
Incubator Zone (not incl. as staff):			**Incubator Zone:**					
Inst for Advanced Techy in Human. (IATH)	14	2,450	IATH		2,870			
Taylor Room (VA Ctr for Digital History)	2	855	Taylor Room (VA Ctr for Digital History)		855	**Taylor Room**		**855**
			Subtotal- Incubator Zone		**3,725**	(User/staff time-shared area)		
Conference Room		529	**Digital Services/IT Systems**	4	**1,050**	**Digital Services/IT Systems**	4	**3,020**
						(Conference room repurposed into staff space)		
"Old" Stacks Zone (3 & 3M)		**8,222**	**"Old" Stacks Zone (includes mezzanine)**		**5,480**	**Scholars' Lab**		**2,890**
			Carrels		1,100	**Scholars' Lab Staff**		**1,270**
			Subtotal- Old Stacks Zone		**6,580**	**Counter seating along atrium edge**		**300**
"New" Stacks Zone (3 & 3M)		**18,486**	**"New" Stacks Zone (includes mezzanine)**		**13,700**	**"New" Stacks Zone (includes mezzanine)**		**13,700**
			(minus loss of net area to shafts, incl. carrels)			(minus loss of net area to shafts, incl. carrels)		
			Carrels		2,120	Carrels		2,120
			Subtotal- New Stacks Zone		**15,820**	*Subtotal- New Stacks Zone*		**15,820**
staff / seats / nasf	**15**	**46,811**	*Total - Third Floor*	**4**	**41,115**	*Total - Third Floor*	**4**	**37,945**
gsf		**52,459**	*Circulation within Stacks (gsf)*		*4,308*	*Circulation within Stacks (gsf)*		*2,666*

DEGW

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STACKING ANALYSIS

Existing Functions:	*2007 Existing* Staff	Area (SF)	*Option 1 - Baseline - with Shifts to Ivy Stacks* Function	Staff	Area Shown	*Option 2 - Atrium Capture Court & Demo Old Stacks* Function	Staff	Area Shown
SECOND FLOOR | ALDERMAN								
McGregor Reading Room		**2,780**	**McGregor Reading Room**		**2,780**	**McGregor Reading Room**		**2,780**
Vault		**920**	**Vault archives**		**920**	**Vault archives**		**920**
Barrett Room/ Asia Collection		**1,320**	**Barrett Room/ Asia Collection**		**2,020**	**Barrett Room/ Asia Collection**		**2,020**
Mt. Vernon Room		**340**	**Mt. Vernon Room**		**340**	**Mt. Vernon Room**		**340**
						Scholars' Court Atrium		**5,150**
Financial Services	7	**1,214**	**Meeting/ Seminar Rooms**			**Conference/Breakout Spaces**		
Human Resources	4	**440**	Large rooms (2)		**1,620**	Large rooms (2)		**1,020**
			Small meeting rooms (2)		**440**	Meeting/seminar rooms		**1,520**
Asia Collection librarians	4	**900**	**Asia Collection librarians**	4	**780**	**Asia Collection librarians**	4	**780**
			(area reduction due to corridor)			(area reduction due to corridor)		
			Digital Research & Instructional Services	19	**2,600**	**Digital Tool Development Group/IT**	8	**1,070**
						(Scholarly Technology Development Lab)		
						(see also 3rd floor for digital services/IT systems)		
						(staffing may vary, TBD, partially ITC?)		
Content Management Services	44		**Quiet Reading Room**		**3,520**	**Incubation Space**		**3,700**
Acquisitions & Preservation		**2,318**						
Cataloging Services		**4,224**				**Collection Services**	4	**790**
Digital Library Production Services		**1,707**				(subject librarians)		
"Old" Stacks Zone (2 & 2M)		**7,150**	**"Old" Stacks Zone (includes mezzanine)**		**5,480**	**Innovation/Play Zone, Visualization Lab**	5	**2,830**
(Closed Stacks in 2 and 2M Old - No Carrels)			Carrels (assume now open stacks)		1,100	(staffing will vary)		
			Subtotal- Old Stacks Zone		**6,580**			
"New" Stacks Zone (2 & 2M)		**18,500**	**"New" Stacks Zone (includes mezzanine)**		**13,700**	**"New" Stacks Zone (includes mezzanine)**		**13,700**
(Closed Stacks in 2 New)			(minus loss of net area to shafts, incl. carrels)			(minus loss of net area to shafts, incl. carrels)		
			Carrels		2,120	Carrels		2,120
			Subtotal- New Stacks Zone		**15,820**	*Subtotal- New Stacks Zone*		**15,820**
staff / seats / nasf	**59**	**41,813**	*Total - Second Floor*	**4**	**37,420**	*Total - Second Floor*	**16**	**38,740**
gsf		**47,335**	*Circulation within Stacks (gsf)*		*3,250*	*Circulation within Stacks (gsf)*		*2,680*

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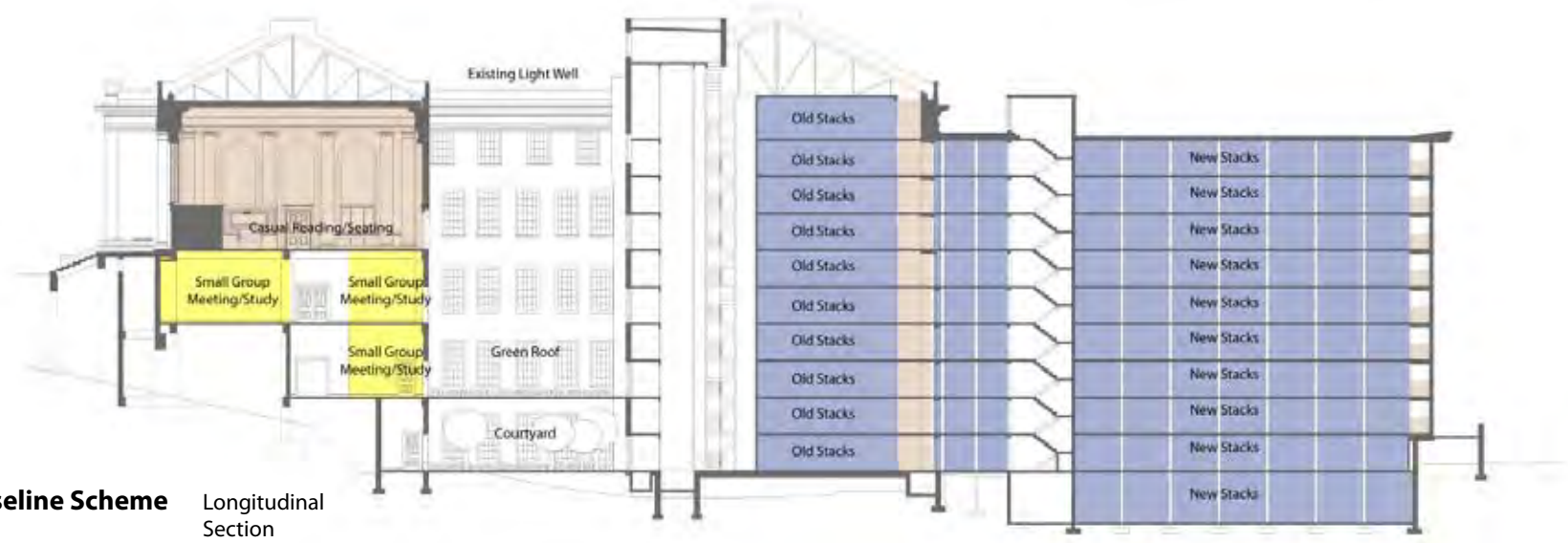
STACKING ANALYSIS	2007 Existing		Option 1 - Baseline - with Shifts to Ivy Stacks			Option 2 - Atrium Capture Court & Demo Old Stacks		
Existing Functions:	*Staff*	*Area (SF)*	*Function*	*Staff*	*Area Shown*	*Function*	*Staff*	*Area Shown*
FIRST FLOOR | ALDERMAN								
Receiving Room & Dock	1	**900**	**Receiving Room & Dock**		**970**	**Receiving Room & Dock**		**800**
Mail Sorting		**64**	Mail Sorting			Mail Sorting		
Business Services		**160**	**Business Services**	3	**1,730**	**Business Services**	3	**1,580**
Library Facilities office	2	**330**	**Library Facilities office**	2		**Library Facilities office**	2	
Staff Lounge		**1,000**	**Staff Lounge**		**630**	**Staff Lounge**		**600**
ILL LEO Staff (Borrowing & Processing)	9	**3,375**	**ILL LEO Staff (Borrowing & Processing)**	9	**1,910**	**ILL LEO Staff (Borrowing & Processing)**	9	**1,210**
Preservation	3		(reconfigured to get light access)			(reconfigured to get light access)		
			Subtotal - Staff Space		**5,240**	*Subtotal - Staff Space*		**4,190**
						Meeting Room w/ RBS Exhibit		**1,170**
Building Maintenance Spaces		**0**	**Building Maintenance**		**1,350**	**Building Maintenance**		**2,800**
Maintenance storage			Maintenance storage			Maintenance storage		
Building storage			Building storage			Building storage		
Custodial storage			Custodial storag *per inventory*			Custodial storage		
Trash Holding areas			Trash Holding areas			Trash Holding areas		
Café/Food service support & storage		**0**	Café/Food service support & storage			Café/Food service support & storage		
"Old" Stacks Zone (1 & 1M)		**7,887**	**"Old" Stacks Zone**		**4,040**	**"Old" Stacks - Replacement with new infill**		**3,280**
1st floor level (no carrels)			(remainder as replacement stacks for Rare Book School)			(minus new cores)		
"New" Stacks Zone			**"New" Stacks Zone (includes mezzanine)**		**13,700**	**"New" Stacks Zone (includes mezzanine)**		**13,700**
1st floor level (no carrels)		**9,230**	Carrels		2,120	Carrels		2,120
(some stacks of Rare Book School in B'mt)			*Subtotal- New Stacks Zone*		**15,820**	*Subtotal- New Stacks Zone*		**15,820**
1M level		**9,230**						
Non-library Space:								
Book Arts Press/Rare Book School	8	**3,950**	**Book Arts Press/Rare Book School**		**4,710**	**Book Arts Press/Rare Book School**		**4,740**
Printing Services (not incl. as staff)	8	**2,253**	**Printing Services**		**2,270**	**Printing Services**		**2,270**
staff / seats / nasf	**15**	**38,379**	*Total - First Floor*	**14**	**33,430**	*Total - First Floor*	**14**	**34,270**
			Circulation within Stacks (gsf)		*6,487*	*Circulation within Stacks (gsf)*		*7,247*
Basement *gsf*		**8,976**	Mechanical Space (no net area)		**0**	Mechanical Space (no net area)		**0**
Sixth Floor *gsf*		**4,963**	Attic space (no net area)		**0**	Attic space (no net area)		**0**
Totals - Alderman NASF	**141**	**191,085**	*total staff / seats*	**71**	**177,855**	*total staff / seats*	**83**	**170,855**
Total - Alderman GSF		**243,000**						

DEGW

Baseline Scheme

The baseline scheme is collection of spatial, staffing, and operational recommendations conceived to position the library as an intellectual crossroads while modernizing the building systems and creating some additional and better quality user space. This approach takes as a given that there will be no major changes to building envelope or primary structure, apart from those resulting from systems upgrades or performance needs. However, significant programmatic shifts and new areas of emphasis do drive interior changes that affect furnishings, finishes, lighting, partitions, slabs (in some unique cases), services, and collections. The building changes to Alderman include updating and modernizing its building systems and infrastructure to bring them up to current standards and practices. Included within this update is the installation of fire suppression sprinkler systems throughout all library spaces. As the current light wells (now divided with one half at level 2 and other half at level



Baseline Scheme Longitudinal Section

1) present exciting opportunities to connect occupants to nature, these are proposed to be improved by adding an extensive greenroof with sedums planted in three to five inches of soil at the level 2 areas. Additionally, the replacement of pavers and providing access from existing stairwells to the level 1 areas are also proposed to create usable courtyard spaces. Power and data will also be upgraded by improving/adding ubiquitous wireless coverage and by using a 12'-0" by 12'-0" power grid within large open spaces like reading rooms to ensure that no seat is more than 6'-0" from an outlet and most furniture can then be powered from below. Also, in order to provide the library with the flexibility to easily move collections, furniture, and technology around in the future, a freight elevator is proposed in the Northwest corner of the building, punched through the small portion of slab that was in-filled when the "New" stacks were added. The remaining building alterations are performance driven, rather than program- or design-driven, and are detailed later in the study as part of the building assessment.

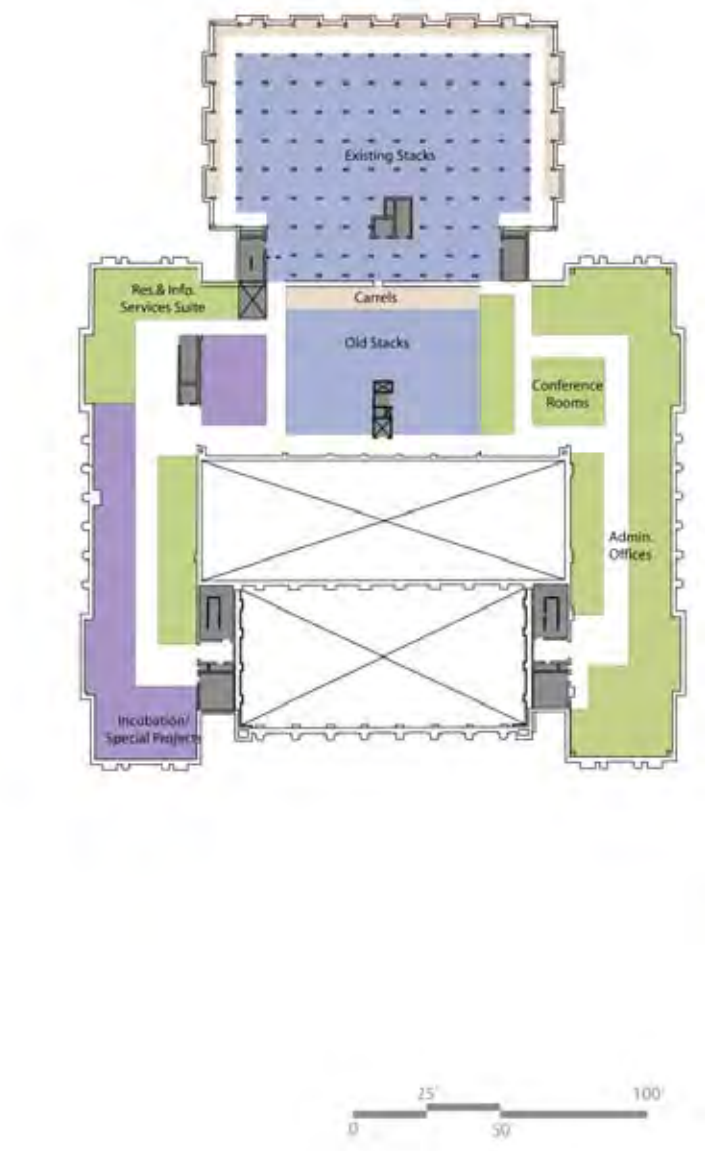
Programmatically, Alderman has been positioned to meet the challenges of a 21st century library, by, first and foremost, creating more and higher-quality user space. More specifically, the amount of user seating expands about 20% (from 882 to 1081 seats), the amount of public study area increases by 67% (from approximately 27,500 nsf to 46,000 nsf), and 7,400 nsf of collaborative space is created – all without changing the footprint or increasing total area within Alderman. This is enabled by many small changes within Alderman, but two key programmatic shifts principally make this possible: first, the staff space most closely associated with processing the collection – the processing, cataloguing, preservation, and acquisition groups - are to be relocated to purpose-built space within the expansion of the Ivy Stacks project. Though this is space is off-campus, the proximity to what will then be the majority of the physical collection, along with the prospect of high-quality office space (rather than a converted reading room-like space), are good offsets to the challenges of the satellite location. The second major programmatic shift is that of the Government Documents area: this collection (including microforms) is proposed to move to remote shelving, integrate the staff within general user services, and reduce the number microform readers. This creates the space for a collaborative zone at a high-traffic area just one floor below the main entrance. The major reading rooms remain, though their access to collections and staffing will evolve.

Achieving the vision of an intellectual crossroads will also impact the collections, as will the building systems modernization and programmatic changes. The installation of sprin-

klers within the "Old" and "New" stacks has implications for the collections as noted in the collection analysis summary. This may range from operational impacts to a required relocation of between 200,000 and 400,000 volumes to remote shelving in order to create the code-required open space for sprinkler coverage, depending on the final interpretation by the authorities having jurisdiction. Second, in order to create high-quality user space at the perimeter of the "New" stacks, this plan cllfs for removing and relocating a 4'-0" (or 1 bay) band of shelving in these areas. This will allow for more carrels and the ability to orient them perpendicular to the exterior wall, addressing student comfort and safety considerations. These three changes to the collection will relocate a range of 480,000 to 680,000 volumes, leaving more than the stated need of approximately 2/3 of the current collection, or 1.6 million volumes. Together, these spatial, staffing, and operational recommendations will reconfigure Alderman to meet its future challenges without losing its historic character.

Legend

- Stacks
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Public Services
- Staff Offices
- Support
- Media Services
- Incubation/Special Projects
- Maintenance/Mechanical



Key Space Attributes

-New and old stacks remain

-Staff Areas consolidated to East Wing

-Staff Conference Areas on East Wing

-Incubation/Non-library areas expanded, located on West Wing, with space for co-located staff

-Potential for skylights in key areas (e.g.: conference rooms)

Baseline Scheme Fifth Floor

DEGW

Legend

- Stacks
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Public Services
- Staff Offices
- Support
- Media Services
- Incubation/Special Projects
- Maintenance/Mechanical

Key Space Attributes

-Reference Reading Room renovated

-Staff consistently located at Reading Rooms and niches

-Scholar's Lab Expanded (some staff relocated to Level 5)

-Class/Training rooms located adj. to Scholar's Lab

-Café relocated to south wall

-Lounge and Exhibit area along front façade, with add'l doors for egress

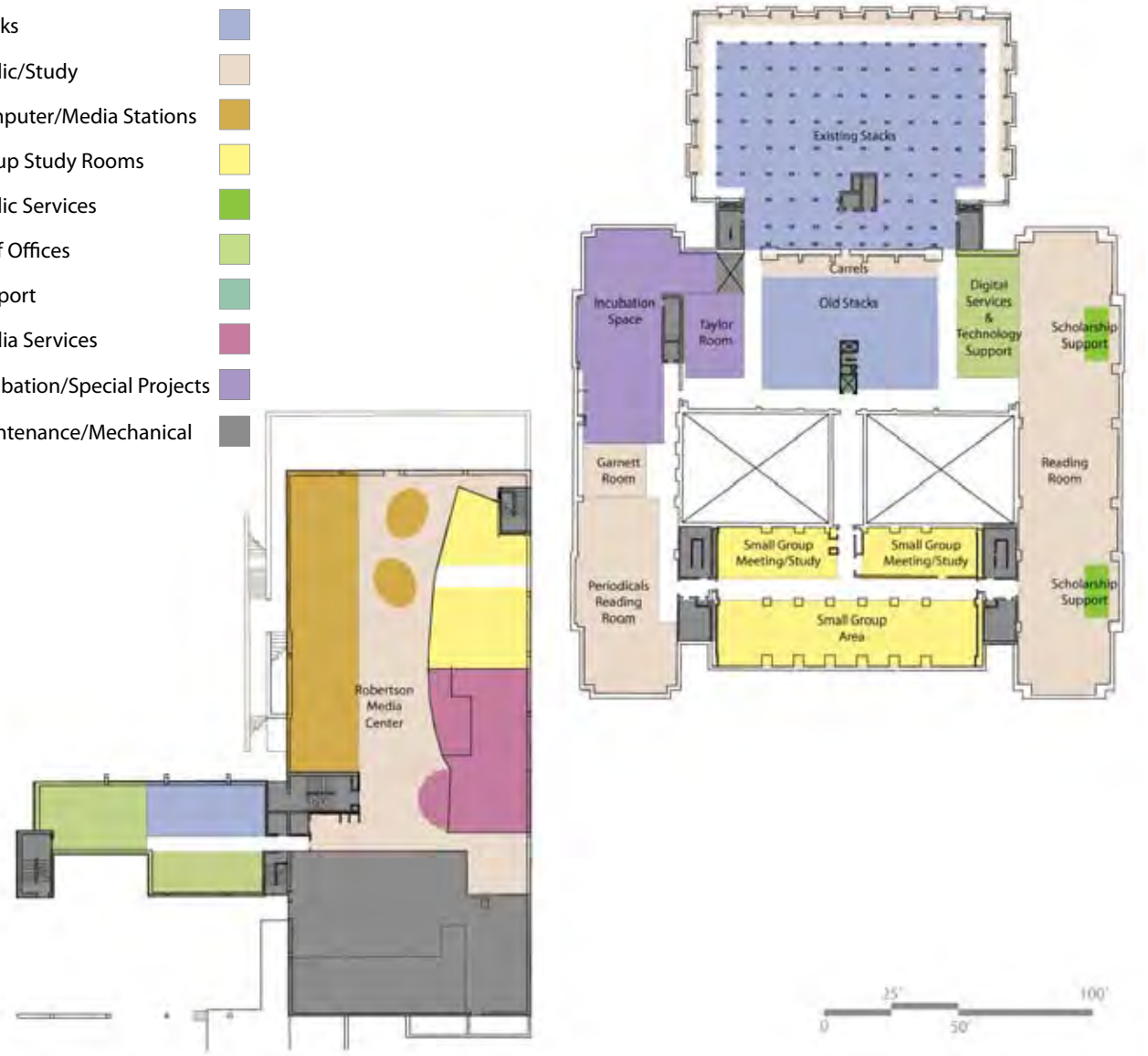
-Reduced Front service desk (some area distributed to Reading Rooms)

-Circ. Staff between East Room and Old Stacks

Baseline Scheme Fourth Floor

Legend

- Stacks
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Public Services
- Staff Offices
- Support
- Media Services
- Incubation/Special Projects
- Maintenance/Mechanical



Baseline Scheme Third Floor

Key Space Attributes

-Periodical Reading Room renovated with focus more on collaborativge study (mix of group and individual) and seminar presentations

-Flexible small group zone created at south side with open area at areaway windows and enclosed rooms on light-wells

-Map Room renovated as periodicals reading room

-Garnett and Taylor Rooms remain but incubation space (e.g.: IATH) expanded

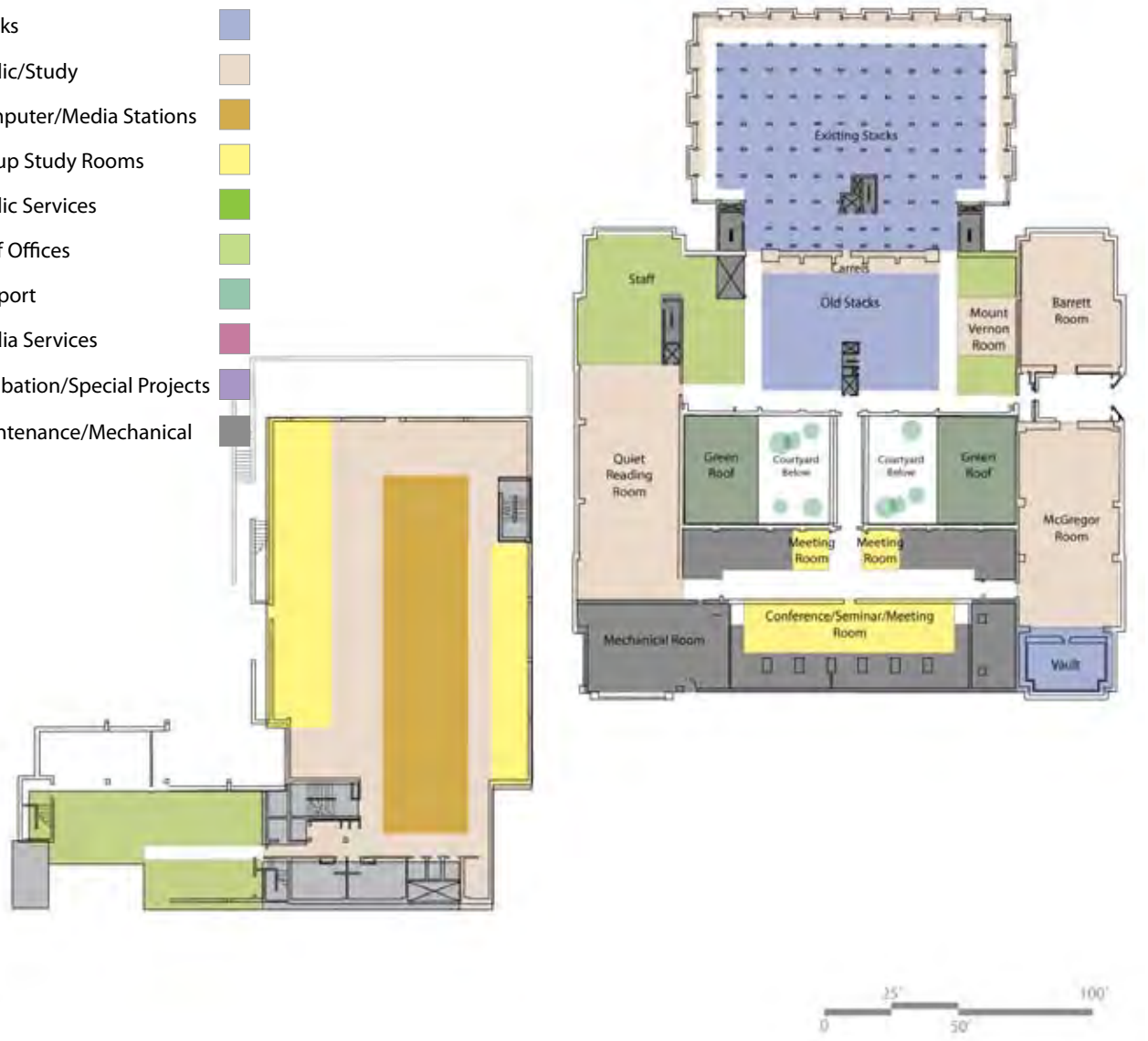
-ILL retains location, but with reduced area

-Scholarship Support Center integrated into East Reading Room

DEGW

Legend

- Stacks
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Public Services
- Staff Offices
- Support
- Media Services
- Incubation/Special Projects
- Maintenance/Mechanical



Key Space Attributes

-Barrett and McGregor Rooms remain, with film vault used for film archives

-"Extensive" greenroof (2-4" soil depth) at Level Roof within light-well

-Processing area relocated off-grounds to create space for quiet reading room as in West Wing

-Subject librarians located between Old Stacks and Reading Rooms to serve as in collection

-Conference/Seminar Rooms at south side

-Rear of Southern Wing to be converted for use as Mech/Storage. (Staff relocated to Level 5 / Ivy Stacks)

Baseline Scheme Second Floor

Legend

- Stacks
- Public/Study
- Computer/Media Stations
- Group Study Rooms
- Public Services
- Staff Offices
- Support
- Media Services
- Incubation/Special Projects
- Maintenance/Mechanical

Key Space Attributes

-Expanded / relocated Rare Book School Stacks and meeting/ office space

-New Stacks collections pulled back 4'-0" from perimeter to create user space (carrels perpendicular to window)

- Base of light-well base accessible as courtyard, with minor excavation as req'd for plantings

-Staff Lounge adjacent to courtyard

-Facilities, Business Services reduced and some LEO to remain

-Corner ILL/IT offices at SW

-Printing Services remains

-New Freight Elevator at 1963 infill zone

Baseline Scheme First Floor

DEGW

Notes on Buildings Systems/Infrastructure Changes

Recommended Architectural Interventions:

-Provide new interior finish systems as required at new partitions and renew existing interior finishes to match as appropriate and/or required.

-Remove all asbestos containing materials from habitable spaces.

-Refinish existing wood furniture to remain and provide new as required.

-Install a new accessible passenger elevator and a new freight elevator, each of which is to serve every floor of the facility.

-Provide two new egress doorways from Memorial Hall to the exterior terrace.

-Provide the existing architectural changes as required to allow new mechanical, electrical and sprinkler improvements to designated period rooms, including; the McGregor, Barrett, Mount Vernon, Taylor, Garnett rooms and Memorial Hall.

-Memorial Hall would be additionally renovated to provide a new café, additional lounge space, new exhibit space and an improved service desk area.

-Evaluate the existing single glazed window systems and provide a renovated system, thermally improved as appropriate and compatible with the historic windows.

Recommended Mechanical, Plumbing, Fire Protection and Electrical Interventions:

-Provide complete replacement of the existing heating, ventilating and air conditioning systems. The scheme proposed for renewal is a 4-pipe system with air handlers and fan coils, capable of providing the comfort and humidity control necessary for individual spaces in this building.

General considerations, arrangement and components of this system will consist of the following:

-It is in University Utilities Department's six year capital plan to replace the chillers at Alderman and Clemons. The Department would prefer to replace that capacity in a stand alone plant, possibly at/near the cooling towers for Newcomb. However, that may not be feasible for many reasons in which case the chillers would need to be shoe-horned back into the same place. In this case, the existing mechanical room in the basement of the new stacks will be utilized to rebuild the chiller plant, accommodating sufficient working clearances for this equipment. The plant will contain chillers,

chilled water pumps, condenser water pumps, and electric steam boiler for humidification. A new cooling tower will replace the existing one.

-A new heating plant will be established in one of the existing dirt rooms. The existing heating water converter and pumps will be replaced with new in the same location. This unfinished area of the building will be captured as finished mechanical space.

-New Stacks: Rebuild the air handler located in the new stacks basement mechanical room that serves this space. The new air handler will be variable air volume and will incorporate energy recovery for outside air, economizer cycle and humidification. Replace the associated ductwork with new ducts that distribute air horizontally throughout the basement with vertical risers up through the stacks. Horizontal runs through low-ceiling areas in the new stacks will be minimized.

-Old Stacks: Rebuild the air handler located in the attic that serves this space. The new air handler will be variable air volume and will incorporate energy recovery for outside air, economizer cycle and humidification. Replace existing ducts with new vertical duct risers established to deliver air to each level, and new horizontal ducts to distribute air throughout each level. Horizontal runs through low-ceiling areas in the new stacks will be reworked to minimize head-height clearance obstructions.

-Fourth floor spaces on the east and west sides of the original building will be conditioned by roof mounted variable air volume air handlers that incorporate energy recovery and economizer cycle. Variable air volume boxes with hot water reheat will provide individual room control.

-The roof mounted air handler serving Memorial Hall will be replaced with a similar constant volume unit that incorporates humidity control, energy recovery and economizer cycle. Existing air distribution located in the attic space can be reused.

-The remainder of spaces will be served by modular constant volume air handlers and fan coils sized appropriately for the specific zone. Air handlers will incorporate humidity control where required for preservation of printed materials. Air handlers will be located in existing attic spaces of the original building, on the roof and in dedicated mechanical closets. Fan coils will be located above ceilings. Pre-conditioned outside air will be ducted to these fan coils and air handlers by dedicated outside air units with energy recovery. These units will minimize energy use and enhance the dehumidification control for the spaces served.

-The existing dirt room space at the second level will be captured as finished mechanical space for air handling equipment and pipe routing.

-All air handlers and fan coils will have ducted supply and return.

-As much as possible, the sizes of filters will be standardized to minimize the amount of filter stock and storage required.

-Dedicated split systems will be utilized for year-round air conditioning of telecommunications closets.
-A direct digital control (DDC) building automation system (BAS) will control all systems and optimize energy use. Individual units serving rooms will be controlled by a wall temperature and humidity sensors.

-New heating water, chilled water and low-pressure steam distribution piping will be routed to air handlers / humidifiers and fan coils throughout the building by way of corridor ceiling spaces and vertical chases.

-All mechanical spaces will be tempered by way of HW unit heaters and exhaust fans.
The existing plumbing systems will be replaced in their entirety. The existing underground domestic water supply line into the building will be maintained. A new pressure reducing valve, electronic meter and reduced pressure zone (RPZ)backflow preventer will be installed. All domestic water supply and sanitary waste / vent piping will be replaced with new. Isolation valves will be installed in water supply piping at each floor level, branch lines and individual restrooms to facilitate maintenance. Water closets will be low-consumption type with automatic flush valves. Urinals will be waterless type. Lavatories will have automatic faucets and 0.5 gpm aerators. Water coolers will utilize R410a refrigerant and be dual-height for accessibility. Accessible fixtures will meet ADAAG requirements. Floor drains will be provided in all public restrooms. Small storage type or point-of-use electric water heaters will be used for lavatories and sinks. No domestic hot water recirculating systems will be used.

-An automatic sprinkler system throughout with standpipes at stairwells is required to provide full protection for this building. A new 6" or 8" water line will be brought to the building from the University water supply system. The available water pressure should be sufficient to operate a wet-pipe sprinkler and standpipe system satisfactorily without the need for a fire pump.

The main service equipment and switchboards have recently been replaced and can continue to provide acceptable service for the foresee-

able renovation. Electrical systems downstream of the main switchboard have outlived their service life and will be replaced to provide reliable and acceptable service henceforth for any proposed major renovation.

Considerations include:

-Gaining code-required service clearance to the main switchgear located in the new stacks, facilitated by rebuilding the mechanical systems in this location.

-New panelboards, feeders and branch circuits.

-New raceways and conductors are needed for branch circuits. Where possible, branch circuits will be run concealed above ceilings and within walls. Where this is not possible, extruded aluminum dual-channel surface raceways with removable covers will be used and integrated with telecommunication cabling needs.
-New wiring devices – wall switches, receptacles.

-All light fixtures will be replaced with appropriate types (e.g., direct-indirect for offices) and energy-efficient technologies. Enhanced lighting controls will incorporate multiple switching, occupancy sensors and daylight harvesting where appropriate. Emergency egress lighting will be provided using battery packs integral to the light fixtures.

-All exit signs will be LED type.

-The existing telecommunication closets require expansion by extending the doorway wall of each closet 4 ft. This will provide adequate space for equipment and working clearances in accordance with the University standards.

-The existing fire alarm systems will be replaced with a new addressable system, with the main control panel located in a dedicated electrical space (accessible to authorized personnel only, location to be determined) and remote annunciator panels. All devices and cabling will be new. The system will incorporate all features required for a fully protected building.

Recommended Structural Interventions:

-Structural work for new elevators would include installation of new foundations and load-bearing masonry walls. Existing floor slabs and framing would require demolition and new support at the elevator walls. Foundations may require underpinning at adjacent existing foundations.

Summary of Cost Estimate Assumptions

OPTION 1 BASELINE

Interior Renovations Costs:		
-	Interior Finish Matrix	$29,466,412
-	5 Stop Elevator	$340,000
-	Flat Roof Replacement	$300,000
-	HAZMAT Abatement	$250,000
o	Interior Renovations Subtotal	$30,356,412
-	Design Development Contingency	$6,071,282
-	Bond	$303,564
-	Construction Contingency	$3,035,641
o	Interior Renovations Total	$39,766,900
Furniture Costs:		$4,170,585
Technology Costs:		$997,590
TOTAL		**$44,935,075**

Interior Renovations Options:		
-	*Clemmons Connector Option*	$2,208,000
-	*New Stacks Perimeter Improvement Option*	$1,574,250
-	*New Stacks Perimeter Improvement Option*	$1,390,500
-	*Window Repair Option*	$223,997
-	*Alderman Café Terrace Option*	$600,000
TOTAL *(w/ Options)*		**$50,931,822**

Alderman Library Pre-planning Estimate Basis

Strategic Planning Study by DEGW, pgs 1-25, 3/12/2007
Option 1 Baseline Scheme by DEGW, Floors 1-5, 5/9/2007
Option 2 Atrium Scheme by DEGW, Floors 1-5, 5/9/2007
Cost Estimate Matrix by DEGW, Options 1&2, Floors 1-5
Level of Finish Matrix by DEGW
MPE Analysis, Electrical Narrative, pgs 1-9
On-site meetings with DEGW, UVa and Osteen Phillips

Pricing is based on:

- Current (2nd quarter 2007) construction costs
- No phasing of the work
- The contractor will have full access to the site
- Books and furniture will be removed, stored and returned by others
- The work is to be completed during regular working hours
- The building is to be fully sprinkled
- An allowance has been included for removal of hazardous materials
- SF pricing based on recent UVa renovation projects including: the Link offices, Fayerweather Hall, Peabody Hall and the Law School classrooms
- It is assumed there will be little exterior work done to the existing building

No allowance has been made for the following:

- Furniture
- Technology (i.e. projectors and computers)
- Design, testing and inspection fees
- Cost escalation
- Builder's risk cost

Separate pricing has been prepared for:

- Option 1
- Option 2
- New Stacks Perimeter Improvements
- Clemmons Connector
- Window Treatment
- Alderman Cafe Terrace

Alternate Interventions

Two approaches were developed for the renewal of Alderman Library: a "baseline" scheme in which its systems are modernized and spaces reprogrammed and renovated, and second in which, in addition to modernization, reprogramming, and renovation, also replaces the "old" self-supporting stacks and encloses existing light courts to create a unifying atrium space. In addition to these options, several alternative interventions have been identified as part of a "menu" of potential design ideas to help best position Alderman and the entire central library precinct to best meet the challenges of the 21st century library. These options may be selected from the "menu" based on the universities priorities, using criteria such costs, feasibility, and how well each complements or improves upon the two basic options. These alternates are described below:

Atrium as connector

Navigating the grade change

Clemons Connector

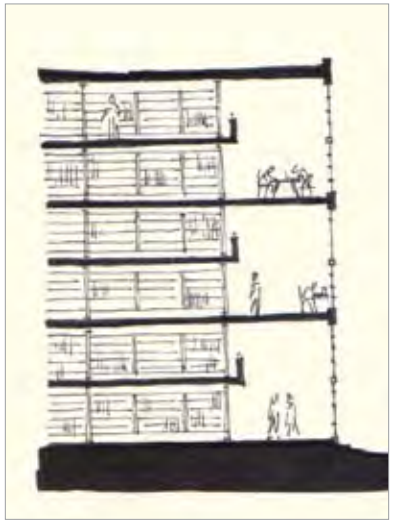
A glazed connection could be constructed between Alderman and Clemons at floors 2, 3, and 4 to create a seamless user experience, gain operational efficiencies, and allow for the sharing of peak loads across libraries. This connection would enclose the approximately 20'-0" space that currently separates the buildings, thought they are now joined at level 1 as a back-of-house connection. By introducing a glazed roof above level 3 and glass wall at the North face, and open atrium condition could be created for connecting bridges. These bridges would be ramped to negotiate the floor height differences between the buildings: 1'-0" , 2'-0" and 5'-0" at Levels 1, 2, and 3, respectively. The program elements at these connection points have been configured in the atrium and baseline schemes to capitalize on the possibility of these connections, but the synergy between Alderman and Clemons is significantly stronger with the introduction of the atrium and the replacement of the old stacks because programs can be better aligned floor-by-floor and users are drawn further down into the building to the base of the atrium at level 2.

New Stacks Perimeter Options

Though the "New" stacks provide valuable shelving capacity and individual work space in their perimeter carrel zone, these study spaces are of low quality due to low ceiling heights, desk configurations, and a lack of access to light and view. In addition, the exterior appearance of the "New" stacks building is poor in comparison to the surrounding buildings and original library structure, which is particularly unfortunate given that the stacks are often the first thing one sees upon arriving at central grounds from University Avenue.

Two alternates have been identified to address these shortcomings: first, removing the mezzanine slabs of the perimeter column-bay of

Addition of windows to New" Stacks facade



Removal of slab perimeters to create double-height spaces

the North and/or East and West faces (or some combination thereof), and second, replacing the recessed vertical bands of marble on the "New" stacks with glass curtain wall (equipped with the necessary performance to protect the collection). Removing the perimeter slabs would be done in conjunction with relocating the perimeter 4'-0" of the shelving zone to create generously-proportioned, double-height user space. This would also permit carrels to be placed perpendicular to the exterior wall (alleviating safety concerns) and interspersed with small group meeting spaces. Currently these spaces are day-lit only by small windows located between the projecting brick façade and the recessed stone façade and offer limited views out. With the addition of daylight and view created by replacing the opaque marble bands with glass, this perimeter zone would be transformed into high-quality user space while also improving Alderman's exterior appearance.

Though these two interventions could be implemented separately, they are mutually-reinforcing and so are best introduced together. Both would also make the stacks themselves more pleasant to be in, particularly valuable given that the browsability of the "new" stacks is one of the primary reasons for the collections to remain on central grounds. Further, given that one of Alderman's great assets is its collection of quirky individual spaces that students like to "encamp" in, these mutually-reinforcing alternates would be a worthwhile strategic investment.

Window Treatment

In addition to an option for altering the facade of the "New" stacks as previously noted, an alternate has been developed for the typical historic windows within the brick facades of the original Alderman building. Though the existing windows are in relatively good condition and in keeping with the architectural context on central grounds, their energy performance is deficient according to current (and future) standards. The windows are un-insulated (single-pane) and are typically coupled with a plexiglass sealing panel attached with velcro to the historic frame and interior blinds for shading. Buro Happold and DEGW have developed an alternate treatment for these windows which would enable better energy and daylighting performance without compromising their historic character. We propose to insert a high-performance, fixed glass panel approximately 4" to 6" inboard of the original window and put reflective, aluminum blinds in the cavity created. These blinds could be automatically controlled (e.g. linked to the building management system) and would bounce light into the space and offer better energy performance because the heat generated by sunlight hitting them stays in the cavity rather than in the interior space.

Clemons Library Internal Improvements

This study considered the library precinct of

Double-height, sunlit study space

Strategy for improving daylight penetration

Alderman, Clemons, and the Small Special Collections library holistically, and so, over the course of the study, certain aspects of Clemons library have been identified as potential areas for improvement – many of which would complement the proposed changes to Alderman. The Clemons building generally meets the needs of its users and its large, open floorplates offer flexibility in meeting future challenges. These floorplate configurations do have two drawbacks though: limited access to daylight at the inner sections and difficulty in getting power to the all areas of the floor. Though not much can be done about the former since it is really a trade-off between flexibility and daylight, future renovations should be mindful of creating enclosures which will further darken the interior or limit views to the exterior. However, the latter deficiency can be addressed by replacing the furniture systems, especially the carrels, which are aging and now significantly under-utilized due to size, configuration, and lack of power. Utilizing contemporary furniture systems will provide improved access to power and data, flexibility, and a range of difference study settings.

Beyond these physical enhancements of Clemons, some programmatic changes are also recommended. First, the Digital Media Lab should move out of the back of Clemons onto the main floor so that it can increase in size considerably, given the expansion of digital making, curricular developments, and changing student demographics as the 'net generation' heads into full swing. This increase would also help further the synergy with the Robertson Media Center. In addition, the programming of Alderman is proposed to align with Clemons by locating the Scholar's lab and the group study spaces on Alderman's 3rd floor, which would be further improved with the proposed physical connector between the two libraries.

Clemons Terraces

With their views and location, the terraces on the North side of Clemons library are virtually unused assets to the library and the university. The terraces are currently unused because of two security concerns: first, because doors on levels 1, 2, and 3 (currently configured as alarmed, emergency egress doors) outlet to terraces served by exterior stairs, materials and equipment could be stolen, and second, because of Clemons's 24/5 schedule, these doors are difficult to visually monitor. There are two solutions to these security concerns that would enable the library to capitalize on its terraces: either solve the security concerns by introducing appropriate technologies and protocols or, alternatively, glaze-in the terraces to create additional interior space within a new glass enclosure. In order to keep the terraces as exterior spaces, a combination of exterior card swipe, video monitoring, locking equip-

Lively outdoor cafe space

ment, and RFID tagging of collections would permit regular flow to and from the terraces. The enclosed option could be achieved by creating a "greenhouse" condition over these terraces using glass curtain wall and skylights in order to gain the space (whose exterior doors could function to those presently in place without limiting the daylight penetration to already deep floorplates.

Alderman Café Terrace

The overall sustainability strategy for Alderman Library proposes strengthening the relationship between it and the surrounding environment - visually through daylight and view, and physically by creating a series of adjacent exterior study/social spaces. Given the success of the Alderman Café and that it is proposed to be relocated to Southeast portion of Memorial Hall, creating an exterior café space would be a terrific addition to the front of Alderman library, allow café activity to spill outdoors and welcome more people to the library while capitalizing on Charlottesville' climate. In order to create this terrace, which would be roughly the same plan area as the ramps on the West side of the entry, the bike storage would have to be relocated (perhaps the fourth floor terrace on Clemons) but little else would have to be done to make this strategic addition to Alderman which would also help reinforce the idea of adjacent exterior study spaces overall.

MEP Sustainability Strategies

Mechanical Systems:

-Energy recovery units for outside air

-Natural ventilation through atrium

Plumbing:

-Use small water heaters at point of use in lieu of central system. This avoids a recirculating system.

-Automatic flush valves on water closets

-Waterless urinals

-Reduced flow lavatory faucets

Electrical Systems:

-Occupancy sensor controls for lighting.

-High efficiency lighting which results in less wattage than code maximum.

-Daylight harvesting controls for lighting, where appropriate

Budget and Financing Plan

The University Library is requesting roughly $75M in state general funds for a capital project to restack/renovate roughly 30,000 SF to create additional space for library users, renew the building systems in Alderman, and add life safety and accessibility improvements. Recognizing that the work will need to be phased to keep the facility in continuous operation during construction, and that the amount is too great for a single request, the University plans to make 3 requests of roughly $25M in the 3 biennia beginning in 2012-2014.

[Information forthcoming from Provost]

S chedule

In order to manage the growth of collections and make room for more user space in the Alderman Library, the Ivy Stacks II facility must first be built. This stacks expansion will allow roughly 600,000 volumes to be moved out of Alderman immediately. The project also includes roughly 6,000 assignable SF for four technical groups presently located in Alderman: Preservation, Acquisitions, Cataloguing and Digital Library Production Services. Moving these groups to the Ivy Stacks facility will free roughly 4,500 ASF in Alderman.

The proposed renovation of the Alderman library building will take place in two phases:

Phase 1. Replace the Old Stacks core.

Phase 2. Renovate the surrounding spaces.

[Information forthcoming from Provost]

Architectural Building Assessment Report

Alderman Library Assessment
Building Code Analysis

Existing Conditions
It was determined in consultation with the University's ASBO officials that this analysis of Alderman Library should be based on the **2006 International Building Code**. That code will not be adopted by the Commonwealth of Virginia until the summer of 2008. The code addresses issues of fire and life safety, including structural fire resistance, automatic fire detection, fire alarm and fire suppression features and means of egress, including; configuration, characteristics and support features for egress from the facility.

Use and Occupancy
Alderman Library is classified as an A-3 Assembly Occupancy. It is not anticipated that the future renovation project would change this Use Group.
Some uses incidental to the primary function of a building constitute a mixed use, and as such are required to be separated or protected, or both, in accordance with the code.

General Building Heights and Areas
The typical floor plan for the existing original library (not including the new stacks) is between 24,350 and 30,540 square feet per floor, which is in excess of any allowable area on Table 503, except Type I construction. It is assumed that the existing structure is Type I construction, which is allowed to be of unlimited area. Type IB construction allows up to eleven stories, existing stacks are ten stories, so it is assumed that the existing structure is Type IB construction.

Construction Type
Type IB is construction in which the major building elements are substantially noncombustible materials. The structural frame and bearing walls, both interior and exterior are of a minimum two hour fire-resistive rating. Floor construction, including supporting beams and joists, is required to be of a minimum two hour fire-resistive rating. Certain combustible materials are allowed in Type IB construction in certain applications. (22 items including fire-retardant-treated wood under certain conditions, interior finishes, light-transmitting plastics, etc.)

Fire-Resistive-Rated Construction
The building is essentially a steel frame structure. The steel frame, both columns and beams are encased in concrete and support reinforced concrete floor slabs. This construction exceeds the 2-hour fire-resistive rating required for the building.
The Old Stacks represent a significant dilemma. The ten story old stack structural system is thin two-way concrete floor slabs supported by a closely spaced grid of 2 ¼″ x 2 ¼″ steel columns. These columns are additionally compromised by the fact they are hollow, and the electrical distribution system for the lighting system is circulated through the columns. The fire-resistive rating of this structural system is unknown; it would appear to be a system that would not be capable of receiving any fire-resistive rating.

Fire Walls
Existing fire walls in the buildings are appropriately located and configured. Staircases were originally open to adjacent uses and have been retrofitted with rated wall construction separations. Some doors into these stairs were identified that were not labeled and would not appear to be rated. Mechanical and electrical rooms in the new stacks appear to be appropriately separated. In the original building that separation has not been appropriately maintained. Most substantially in the electrical room at the first floor, southeast corner; significant openings to adjacent spaces were observed. Maintaining the integrity of fire-rated walls is complicated because there is not adequate documentation of the locations of presumed fire walls.

The construction between the original building and the new stacks addition is separated by a fire wall documented to be a 2-hour wall. This wall is appropriately located and configured, openings in the wall are protected by 1 ½ fire-rated assemblies as required. Some incidental storage spaces required to be separated are not, storage rooms over 100 square feet require one hour separation or an automatic fire-extinguishing system.

Means of Egress
IBC 2006, Chapter 10 Means of Egress provides for the design, construction and arrangement of means of egress from new or altered structures. Chapter 34, Existing Structures provides guidance and compliance alternatives and evaluation procedures that may prove valuable and/or necessary when realizing additions, alterations and repairs to existing structures.

Modest areas of concern were noted throughout areas of access, primarily in the stacks. All areas are required to have a ceiling height of not less than 7' 6", that dimension is frequently lower, with several areas as low as 6' 0" under mechanical ducts in the new stacks.

Occupant Load
IBC 2006, Section 1025 Assembly states that Group A occupancies with an occupant load of greater than 300 shall be provided with a main exit, which is of sufficient width to accommodate not less than one-half the occupant load, and not less than required width of all means of egress leading to the exit.

The occupant loads for existing functional library areas of reading rooms (50 net) and

stack areas (100 gross) were calculated from Table 1004.1.1 for each area of use in Alderman. Other areas were calculated based on the use that most clearly resembles the use in Alderman, including; areas of assembly (15 net), business (100 gross), classroom (20 net) and conference (15 net). These "other areas" were also inventoried in the field to observe the actual occupancy. Calculations in this assessment were based on the greater of the two numbers. Of course the critical numbers will ultimately need to be calculated based on the proposed uses of each area.

Egress Width
Egress width per occupant served is a significant concern in the existing Alderman Library facility. Every component of a path of egress from each floor of the facility should comply with the requirements of the IBC. Stairs, doorways and corridors will each have dimension assigned to that component per floor. That number may be increased if the facility were to add an approved automatic sprinkler system in accordance with 903.3.1.1 or 903.3.1.2. Each 36" single door into a stair yields a 33" clear opening; at .2 inches per occupant, that door would allow 165 occupants, or 220 occupants if sprinklered. Similarly, each pair of egress doors has a clear dimension of approximately 66" yielding a capacity of 330, or 440 if sprinklered.

Stairs have similar known capacities. Stairs 70 and 71, the main stairs in the original building are restricted to as little as 44"; which yields a capacity of 220 occupants, or 293 if sprinklered. The main stairs in the 60's addition are 48" wide with associated capacities of 240 unsprinklered and 320 if sprinklered.

Assembly Use Groups have additional applicable code sections. Alderman is impacted most significantly by 1025.2, Assembly Main Exit; which states that an Assembly occupancy with an occupant load of greater than 300 shall have a main exit. That main exit must be of sufficient width to accommodate not less than one-half the total occupant load. At Alderman the pair of doors at the existing main fourth floor egress is sized to accommodate 330 occupants. Existing paths of egress for the second, third, fourth and fifth floors are directed to the fourth floor entry/exit. The combined occupant load of those levels, minus the stacks, is 1063; one-half of which is 532, indicating the main egress is currently undersized.

Additionally, 1025.3 requires each level with an occupant load greater than 300 to have a means of egress that provides egress capacity for at least one-half of the total occupant load served by that level. This requirement is met on the second floor, which is also served by a direct egress to the outside. However, the third level is totally dependent on the horizontal exit between the old stacks and the new stacks and the four main stairs. If a single egress is required from one of these exits that provides for ½ the total occupants then existing doors to stairways are undersized.

Another area of concern is the doors from Stairs 70 and 71 on the fourth floor. Assuming occupants from the third floor and the fifth floor were to evacuate simultaneously and based on calculated occupancy of 470, occupants could converge on two doors with a combined capacity to handle only 330.

Accessible Means of Egress
Section 1007 of the IBC addresses required egress for persons with a disability. Where two means of egress are required from an area, two accessible means of egress are required as well. This reflects a change in the code in recent years, previously one accessible means of egress was required in areas that would otherwise require two means of egress. There is a notable exception; accessible means of egress are not required in alterations of existing buildings. The University should evaluate the merits and risk of this allowance; it is assumed that the intent of this study is to provide the required egress for all occupants of the building.
Stairs with areas of refuge, complying with Section 1007.6; and horizontal exits (such as from old stacks to new stacks, through a fire-resistive rated wall) can constitute an accessible egress.
In buildings where a required accessible floor is four or more stories above or below the level of exit discharge at least one required accessible means of egress should be an accessible elevator. Alderman would probably not be legally required to provide an accessible elevator given its floor configuration and multiple direct egresses to grade. However, safe egress for a person with a disability should be a primary concern in any renovation of the building. An accessible elevator should comply with the requirements for emergency operation, signaling device requirements and should be accessed from either an area of refuge or a horizontal exit.

Stairways
Alderman Library is served by seven internal stairs. Their characteristics of each are slightly different, as follows:

Stair 70 is the eastern most of the two main stairs in the original building. The stair was originally open to the adjacent floor space on the third, fourth and fifth levels and was enclosed at some date after the original construction. The stair is more than 44" wide, except between the second and first floors, where it reduces to 36". The door swings are arranged such that the exit from the stair is assumed to be at the fourth floor. (Fourth floor swings out, other floors swing in.) This concept is reinforced by location and designation of exit signs. There is no "gating" that would prevent an occupant from bypassing the floor of egress in an emergency.
There are typically guardrails at the inside of each run and handrails at the outside of each run. Guardrail design does not comply with current code, 30" height. Handrails typically do not comply with current codes.

The doors into the stairs typically comply with current code; regarding fire rating, positive latching, self-closing and width.
The fire resistive rating of the stair shaft is compromised by the placement of windows in the shaft and at inside corner walls of adjacent non-rated construction.
Large areas of potential rescue assistance are provided at the second floor, and only at the second floor. No areas of rescue assistance are designated.

Stair 71 is the western most of the two main stairs in the original building. The stair is substantially similar in characteristics to Stair 70.

Stair 74 is a supplemental access stair which serves each and every floor and mezzanine level of the old stacks. The stair is typically 28" wide and restricted to as little as 25 ½" by the single handrail. The handrail has no extensions and is not continuous as required by code. The construction dates to the original building and is all painted steel. The top and bottom of each run of stairs opens directly into the stacks with no compliant separation. Some manner of separation is attempted by a door at each intermediate landing. The bi-swinging doors are non-compliant; 26 ½" wide, with automatic closing provided by spring-loaded hinges and no positive latching.
There is no indication at the fourth floor that this is the primary egress floor.

Stair 75 is located in the northwest corner of the original building. It was designed as an exit stair, and is modest in scale and detail. The stair was originally open to the adjacent floor space on the third, fourth and fifth levels and was enclosed at some date after the original construction. The width of the stair runs are typically 32" and are at places restricted to as little as 28" by handrail placement. The handrail is located only at the inside of each run, and do not comply with current code regarding their extensions.
The doors into the stairs typically comply with current code; regarding fire rating (1 ½ Hr), 100 square inch vision panel, positive latching, self-closing and width. The door at the fourth floor swings out and would appear to not be rated (Wood panel door with one panel removed and replaced with non-compliant 240 square inch glass vision panel.)
Other than the door openings cited, the required integrity of the rated shaft appears intact.
No areas of rescue assistance are designated.

Stair 78 connects all floors and all mezzanines of the new stacks. It is centrally located in the new stacks between Stairs 79 and 80 and serves as a supplemental stair providing access to the stacks. The width of the stair runs is typically 28" and are restricted to as little as 24 1/2" by placement of the single handrail, which is adjacent to the inside run.
Handrails typically do not comply with current codes regarding extensions.
The doors into the stairs typically comply with current code; regarding fire rating, positive latching, self-closing and width. A single fire resistive rated door, on the fourth floor, was observed to stick open as a result of improper adjustment.
The stair is enclosed by a rated shaft, which appears substantially compliant.
The required headroom for any stair is 6' 8"; this stair has as little as 6' 4" at each run.
No areas of rescue assistance are provided or designated.

Stair 79 connects all floors and all mezzanines of the new stacks. The stair is located at the western side of the new stacks immediately adjacent to the original construction. The width of the stair runs are typically 48" and are restricted to as little as 40" by placement of the handrails at each side of the stairs.
Handrails typically do not comply with current codes regarding continuousness or extensions.
The doors into the stairs typically comply with current code; regarding fire rating, positive latching, self-closing and width. Several doors were observed to not meet the tolerances required by code as a result of warping.
The stair is enclosed by a rated shaft, which appears substantially compliant.
No areas of rescue assistance are provided or designated.
The required headroom for any stair is 6' 8"; this stair has as little as 6' 4" at each run.
The stair connects to the basement without effective means of designating the level of exit discharge, other that the door to the exterior at level one. The basement was locked, allowing no access.

Stair 80 connects all floors and all mezzanines of the new stacks. The stair is located at the eastern side of the new stacks immediately adjacent to the original construction. The stair is substantially similar in characteristics to Stair 79. The stair connects to the basement without effective means of designating the level of exit discharge. This situation is more problematic here than in Stair 79, by virtue of the fact that the entrance into the stair shaft at Level One is into a blank wall. The door to an exterior egress is at Level One mezzanine, a flight above. Without any other signage it is likely that in an emergency an occupant may go down the stair to the basement which was locked, allowing no access.

Ramps
There are no interior ramps in this facility. The one exterior ramp is dealt with in the Accessibility section of this report.

Handrails and Guards
Handrails and guardrails in Alderman were observed to be substantially sound and safe. However, because of changes to previous codes they do not in all cases comply with current code. Handrails were observed to lack extensions and continuity as required. Guardrails are required to limit passage through the rail to less than a 4″ sphere. The original guardrails in Alderman are in excess of that dimension, the new guardrails in the New Stacks are substantial less restrictive than required.

Exit Access
Egress through intervening spaces is somewhat problematic at Alderman. Each area of use should ideally exit to a corridor, numerous paths through intervening spaces were observed, however, they would currently appear to meet the requirements for allowable exceptions. Similarly, multiple tenant spaces have the possibility of compromising egress in an emergency and should be reviewed.

Common path of travel concerns were not observed in the facility. That could be a problem in a space like the Barrett Room, that space is limited to a maximum of 49 occupants to prevent having a common path greater than 75'.

Exit and Access Doorways
All 36" single doors at stair entries typically measured 33" clear. Pairs of doors were measured at a clear opening of 66". Individual pairs of door openings at each floor which lead from the original building into the old stacks are 32" clear opening and should be widened.

Exit Access Travel Distance
Exits should be located on each level such that the maximum length of exit access travel, measured from the most remote point within that level to the entrance to an exit along the natural and unobstructed path of travel is less than 200', or 250 with a sprinkler system. There were issues noted on the first floor, however, they would be corrected by virtue of the proposed sprinkler system.

Corridors
Corridors in an Assembly occupancy are required to be 1-hour fire-resistive rated when serving an occupant load of greater than 30. The wall construction in Alderman would justify such a rating, however, all corridor doors would be required to be a minimum of a 20 minute assembly, and outfitted with positive latching and a closer to maintain the door in a closed position. This requirement would be relieved if the building were to be provided with an automatic sprinkler system.
The corridors were observed to of sufficient width throughout the facility.
Dead end corridors were noted at several locations in the building, including; on the 5th floor, each of the corridors serving the staff offices adjacent to the Old Stacks and on the main Administrative office wing on the east side of the building and on the first floor in each end of the printing suite and in the Rare Book office.

Exits
Alderman Library, by virtue of its occupant load is required to have four exits. It has the main exit on the fourth floor, a minor exit on the second floor and a well known service exit on the first floor frequently used by staff but rarely by the public. The horizontal exit from the Old Stacks to the New Stacks, while a valuable component of the egress capacity of the building, lacks the required continuity of a protected path of egress. The two stairs in the New Stacks exit directly to the outside of the facility and constitute compliant fourth and fifth exits from the building. Stairs 70 and 71 do not constitute exits by virtue of their lack of required continuity.

Alderman Library Assessment
Building Code Analysis

Proposed Improvements

Alderman Library is classified as an A-3 Assembly Occupancy. The following recommendations do not anticipated that any future renovation project would change that Use Group. The scope of any eventual renovation and/or renewal project will determine to a large extent, the scope of improvements required to the existing facility. If additional square footage were to be added or the use were to change, significant efforts would need to be made to comply to the maximum extent technically feasible with the code in place at the time of the change. However, if the baseline project envisioned as part of this study is initiated, the required improvements would be minimal. It is assumed that existing conditions in Alderman were compliant when they were initially constructed and were accepted as such by the building official at that time. In the Baseline Scenario there may be life safety improvements that are prudent to be made, that are not in fact required to be made.

Baseline Scenario
The scope of improvements in the baseline scenario, include the following;

- Targeted renovations to create/improve user space,
- Improvements to accessibility,
- Renewal of the mechanical, electrical and plumbing systems
- Removal of asbestos from the building.

Targeted renovations to ″create″ user space may trip additional life safety code improvements. However if the proposed scope is primarily one of renewal of existing systems, major new work to address life safety issues may not be required.

Automatic Fire Suppression System
If as planned, an automatic sprinkler system is to be installed in the Baseline Scenario, then numerous lesser fire and life safety issues will be mitigated, including;

- Incidental storage spaces over 100 square feet require one hour separation or an automatic fire-extinguishing system.
- Egress width of stairs, doorways and corridors are allowed a certain fixed occupancy, a sprinkler system allows for increased occupant load capacity. This is critical at several locations, most significantly the main stairs and their doors, that currently do not match required capacity.
- Travel distance issues on the first floor would be corrected.
- The requirement for rated corridors and corridor door assemblies, including closers would be relieved.

Fire-Resistive-Rated Construction
As observed under Existing Conditions, the Old Stacks present a significant dilemma. The structural system is not capable of receiving any fire-resistive rating. In the event of a fire emergency, the entire 10 story system could collapse in a very brief time. If access to the New Stacks was eliminated, paths of egress on every floor would be compromised. Portions of the building would have only one exit if their ability to pass through the Old Stacks were to be eliminated. However, in the Baseline Scenario this existing condition may not be required to be improved.

Fire Walls
Multiple conditions were observed that may be and probably should be corrected in the baseline scenario, including;

- The integrity of the existing fire walls are compromised by penetrations for pipes and conduits.
- Openings in fire walls, which are required to be protected, were not labeled, nor did they appear to be rated assemblies.
- Numerous doors, primarily through the fire wall between the Old Stacks and the New Stacks are blocked off, labeled incorrectly or in some other way compromised.

Means of Egress
Section 1025.2, Assembly Main Exit; requires that an Assembly occupancy with an occupant load of greater than 300 has a main exit. That main exit must be of sufficient width to accommodate not less than one-half the total occupant load. At Alderman the pair of doors at the existing main fourth floor egress is sized to accommodate 330 occupants. Existing paths of egress for the second, third, fourth and fifth floors are directed to the fourth floor entry/exit. The combined occupant load of those levels, minus the stacks, is 1063; one-half of which is 532, indicating the main egress is currently undersized.
Provide two additional pair of doors exiting from Memorial Hall to the front terrace at the fourth floor, south elevation. These new doors could be located in existing window openings on each flanking side of the existing main door. This proposal has been reviewed by the University's Architectural Historian, who approved the concept and recommended the doors be deferential to the main doors. The doors should be designated as exit doors from the interior, however, they could be primarily unused (alarmed) so as not to require a vestibule similar to the existing doors.

Egress Width of several doors is of concern. The following issues are not required under the Baseline Scenario but may be prudent to consider.
Doors into Stairs 70 and 71 on the fourth floor are not of sufficient width to accommodate anticipated occupants. Door width should be increased at both locations.
Door frames into the old stacks from the original building are of insufficient width, the doors are no longer in place. Remove 10 existing 32″ wide frames and widen openings in the wall to a minimum of 36″ clear opening. (Existing width does not meet ADA requirements either)

Accessible Means of Egress
Section 1007 of the IBC requires two accessible means of egress from all areas of Alderman Library. Compliant elevators, stairs with areas of refuge, complying with Section 1007.6; or horizontal exits (such as from old stacks to new stacks, through a fire-resistive rated wall) can constitute an accessible egress. An accessible elevator should

comply with the requirements for emergency operation, signaling device requirements and should be accessed from either an area of refuge or a horizontal exit.

There is a notable exception; accessible means of egress are not required in alterations of existing buildings. Additionally, Code states ″in buildings where a required accessible floor is four or more stories above or below the level of exit discharge at least one required accessible means of egress should be an accessible elevator″. Alderman would probably not be legally required to provide an accessible elevator given its floor configuration and multiple direct egresses to grade. The University should evaluate the merits and risk of these allowances; it is assumed that safe egress for a person with a disability should be a primary concern in any renovation of the building.

Stairways
The main exit from the building is on the fourth floor, at an intermediate landing. There is no ″gating″ to acknowledge this fact. The University should evaluate this condition and recommend an appropriate response. Numerous issues of non-compliance would not have to be addressed in the Baseline Scenario.
Handrails and Guardrails do not comply with Code. They would not be required to be modified in the Baseline Scenario.

Exit Access
Exit Access Travel Distance issues are corrected by installation of an approved sprinkler system.
Exit Access Doorways at each floor which lead from the original building into the old stacks are 32" clear opening and should be widened to 36″; not required, but should be considered in the Baseline Scenario.
Corridor issues are substantially corrected by installation of an approved sprinkler system.

Exits
No substantial change to the exits, other than the previously discussed main entry, is required in the Baseline Scenario.

Scenario #2
The scope of improvements in Scenario #2, includes all the improvements from the Baseline Scenario and the following;

- Replace Old Stacks.
- Enclose Light wells.

This scenario envisions significant additional square footage being added or modified in such a way that requirements for compliance ″ to the maximum extent technically feasible″ with the building code would be tripped.

Automatic Fire Suppression System
An automatic sprinkler system will be installed in each scenario, there by mitigating all the lesser fire and life safety issues cited under the Baseline Scenario.

Fire-Resistive-Rated Construction
As observed under Existing Conditions, the Old Stacks present a significant dilemma. Scenario #2 would require that this issue be directly addressed and an appropriate solution found and implemented. The structural system is not capable of receiving any fire-resistive rating. In the event of a fire emergency this entire 10 story system could collapse in a very brief time.
Removal and replacement of the existing Old Stacks is recommended, other solutions may be viable.

Fire Walls
Multiple conditions with the required fire walls were observed that should be corrected in Scenario #2, including;

- The integrity of the existing fire walls are compromised by penetrations for pipes and conduits.
- Openings in fire walls, which are required to be protected, were not labeled, nor did they appear to be rated assemblies.
- Numerous doors, primarily through the fire wall between the Old Stacks and the New Stacks are blocked off, labeled incorrectly or in some other way compromised.

Each of these items was previously cited as ″may″ be corrected in the Baseline Scenario.

Means of Egress
Section 1025.2, Assembly Main Exit; requiring additional egress capacity at the main exit was addressed as prudent in the Baseline Scenario, it would be required under Scenario #2.

All **Egress Width** issues would need to be resolved in Scenarios 2, including:

- Doors from Stairs 70 and 71 on the fourth floor are not of sufficient width to accommodate anticipated occupants. Door width should be increased at both locations.
- Door frames into the old stacks from the original building are of insufficient width, the doors are no longer in place. Remove 10 existing 32″ wide frames and widen openings in the wall to a minimum of 36″ clear opening. Of course if the Old Stacks were to be removed this item would not be an issue.

Accessible Means of Egress
Requirements for accessible means of egress would be more clearly mandated under Scenario #2 than had been the case under the Baseline Scenario. The construction envisioned as part of the ″Replace Old Stacks″ component of the work would allow for new construction which directly responds to these challenges.

Provide two means of accessible egress, to include either compliant elevators, stairs with areas of refuge or horizontal exits from all areas of Alderman Library.

Stairways
Alderman Library is served by seven internal stairs. Only four stairs meet the basic width requirements of the Code, Stairs 70, 71, 79 and 80. The issues associated with each are slightly different, as follows:

Stair 70 and 71 are the two main stairs in the original building. The stairs should be improved as possible, issues include:

- There is no "gating" that would prevent an occupant from bypassing the fourth floor of egress in an emergency.
- Guardrail design does not comply with current code, 30" height. Handrails typically do not comply with current codes.
- The fire resistive rating of the stair shaft is compromised by the placement of windows in the shaft and at inside corner walls of adjacent non-rated construction. This condition should be evaluated, sprinklering may alleviate this need.
- . No areas of rescue assistance are designated.

Stair 74 is a supplemental access stair which serves each and every floor and mezzanine level of the old stacks. This stair would likely be eliminated in any scenario that involved replacement of the Old Stacks. The stair should be improved as possible, issues include:

- The stair is typically 28" wide and restricted to as little as 25 ½" by the single handrail. The handrail has no extensions and is not continuous as required by code.
- The top and bottom of each run of stairs opens directly into the stacks with no compliant separation. Some manner of separation is attempted by a door at each intermediate landing.
- The bi-swinging doors are non-compliant; 26 ½" wide, with automatic closing provided by spring-loaded hinges and no positive latching.
- There is no indication at the fourth floor that this is the primary egress floor.

Stair 75 is located in the northwest corner of the original building. The stair should be improved as possible, issues include:

- The width of the stair runs are typically 32" and are at places restricted to as little as 28" by handrail placement. The handrail is located only at the inside of each run, and do not comply with current code regarding their extensions.
- The door at the fourth floor swings out and would appear to not be rated

Stair 78 connects all floors and all mezzanines of the new stacks. The stair should be improved as possible, issues include:

- The width of the stair runs is typically 28" and are restricted to as little as 24 1/2" by placement of the single handrail, which is adjacent to the inside run.
- Handrails typically do not comply with current codes regarding extensions.
- A single fire resistive rated door, on the fourth floor, was observed to stick open as a result of improper adjustment.
- The required headroom for any stair is 6' 8"; this stair has as little as 6' 4" at each run.

Stairs 79 and 80 connect all floors and all mezzanines of the new stacks. The stairs have multiple compliance issues as outlined under Existing Conditions. A scenario that replaced these stairs with ones that are totally compliant would have some merit, but significant cost. More realistically the existing stairs could be improved, issues include the following:

- The width of the stair runs are typically 48" and are restricted to as little as 40" by placement of the handrails at each side of the stairs.
- Handrails typically do not comply with current codes regarding continuousness or extensions.
- Fire-rated doors were observed to not meet the tolerances required by code as a result of warping.
- No areas of rescue assistance are provided or designated.
- The required headroom for any stair is 6' 8"; this stair has as little as 6' 4" at each run.
- The stair connects to the basement without effective means of designating the first floor as level of exit discharge.

Handrails and Guardrails in Alderman were observed to be substantially sound and safe. However, because of changes to previous codes they do not in all cases comply with current code. Handrails were observed to lack extensions and continuity as required. Guardrails are required to limit passage through the rail to less than a 4″ sphere. The original guardrails in Alderman are in excess of that dimension, the new guardrails in the New Stacks are substantial less restrictive than required. Proposed improvements to the existing stairs should be evaluated.

Exit Access
Several additional options beyond the 2 basic scenarios have been discussed in the formulation of a proposed renovation project. One option involves the construction of an enclosed connection between Alderman and Clemons libraries. This option could reasonably be added to the base scope of either Scenario #1 or Scenario #2.
This option would contribute to an enhanced plan of egress from the building. New horizontal exits, separated by fire-rated walls would benefit egress from the first, second and third floors of Alderman.
Exit Access Travel Distance issues are corrected by installation of an approved sprinkler system.
Exit Access Doorways at each floor, which lead from the original building into the old stacks are 32" clear opening and should be widened to 36″.
Corridor issues are substantially corrected by installation of an approved sprinkler system. Issues not alleviated by the installation of sprinkler system should be resolved under Scenarios 2, including dead end corridors on the fifth floor that may be impacted in conjunction with any replacement of the Old Stacks.

Alderman Library
Accessibility Assessment

Issues of accessibility in Alderman were reviewed in relation to two applicable codes; the Americans with Disabilities Act (ADA) – Architectural Barriers Act (ABA) Guidelines for Buildings and Facilities, published in the Federal Register on July 23, 2004 (amended August 5, 2005) and the 2006 International Building Code, which references the standards in the ICC/ANSI A117.1 Accessible and Usable Buildings and Facilities, 2003. Both documents are meant to control the design, construction, additions to, and alteration of sites, facilities, and elements for accessibility to persons with disabilities. When existing spaces are to be altered each space or element is required to comply with the codes to the maximum extent technically feasible. If providing accessibility for people with one type disability is not feasible, accessibility must still be provided in compliance with the requirements for people with other types of disabilities to the extent that such accessibility is feasible. Where an alteration affects the accessibility, or contains an area of primary function, the route to the primary function area shall be accessible; and shall include toilet facilities, telephones and drinking fountains that comply with the code.

The costs of providing the accessible route are not required to exceed 20 percent of the costs of alteration affecting the area of primary function. It is assumed the scope of the capital project envisioned at Alderman will initiate a total compliance with the accessibility codes.

The 2006 International Building Code addresses important issues of accessible means of egress and areas of refuge beyond the scope of the ADA. At least one accessible means of egress is required for every accessible space and at least two accessible means of egress are required where more than one means of egress is required. The technical criteria for accessible means of egress allow the use of exit stairways and evacuation elevators when provided in conjunction with horizontal exits or areas of refuge. While typical elevators are not designed to be used during an emergency evacuation, evacuation elevators are designed with standby power and other features according to the elevator safety standard and can be used for the evacuation of individuals with disabilities. The IBC also provides requirements for areas of refuge, which are fire-rated spaces on levels above or below the levels of exit discharge where people unable to use the stairs can go to register a call for assistance and wait for evacuation.

Historic buildings are required to meet the accessibility requirements of the ADA and the IBC, however, if it is determined that the alterations would threaten or destroy the historic significance of the building there are exceptions that may apply to achieve program accessibility.

Existing Conditions

There are certain minimum requirements that are applied in any condition. There are also special requirements and exceptions which may be allowed in certain situations in alterations and historic preservation projects which were reviewed. An ADAAG checklist was utilized as an assessment tool, that document includes criteria to address multiple elements of an accessible facility. Elements and spaces that were identified in Alderman Library and were reviewed on site include:

Exterior Accessible Routes
The primary entrance for the general public is at the fourth floor, south façade; that entrance is served by a ramp which provides an accessible route linking the entrance to public streets and sidewalks, a passenger loading zone and a public transportation stop. The entrance coincides with the route for the general public to the extent feasible while avoiding the entry stairs. Additional concerns relative to width, turning and passing, provisions for the blind, changes in level appear to be met. Secondary access is provided at the first floor service entry which is proximate to both the interior elevators.

Interior Accessible Routes
The majority of the ″people″ spaces in Alderman are appropriately designed for the use of people with disabilities. Check-out and information areas are designed so that a portion of the required function is allowed to happen at a counter of compliant height.
Access aisles in the stacks are problematic. Aisles are required to be a minimum of 36″ clear width, and 42″ is preferred where possible. The Old Stacks are typically 36″ clear width, the New Stacks are typically 34″. This dimension is dictated by the grid of the structural bays; there is a column line in the middle of every other row of shelves.

Protruding Objects
No significant non-compliant protruding objects were identified in Alderman.

Ground and Floor Surfaces
Floors in all accessible rooms were observed to be stable, firm and slip-resistant. Carpets were securely attached with a firm pad.

Ramps
A ramp has been added to provide an accessible exterior route to the main front entrance to the facility. The ramp is a 1:12 slope, with appropriate cross slope, width, landings. The handrails are located on each side and are at an appropriate height, however, they are not round and do not meet the requirements of an equivalent gripping surface. There is not a uniform clearance of 1 ½” between rail and adjacent walls as required and there does not appear to be adequate structural strength. Two adjacent concrete slabs are displaced creating a non-compliant ¾” lip at one point in the running slope.

Stairs
Stairs connecting levels that are not connected by an elevator, ramp or other accessible means of vertical access must comply with the ADAAG for stairs. All levels of Alderman are connected by the central elevator in the old stack, negating the need for compliant stairs. Accessible egress is required by code and is addressed in the Code Analysis section; however, an important consideration relative to the stairs is as follows: An area of refuge could be provided in the two main staircases at the second floor level. If it were

determined that this was to be a required component of any future renovation, it would be prudent to provide those improvements in the near future.
Issues associated with the existing stairs relative to ADAAG are primarily related to the handrails, including the following:

- The handrails are not continuous along both sides.
- Required extensions are not always in place.
- The clearance between walls and handrails is not exactly 1 ½″ as required.

Elevators
Two elevators are provided in the facility, neither meets the minimum required dimensions for the elevator cars, nor would the existing shafts allow an adequate car. (51”x 68” required, 49”x 56” provided) The existing elevators have been retro-fitted so as to meet the majority of the requirements with regards to operation, controls, signals, signage, etc. The notable variance from the ADAAG is the horizontal gap between the car floor platform and the landing edge, 1-1/4” is maximum allowed the existing gap was measured at 1-3/4” on the staff elevator. An elevator is required to provide an accessible egress when an accessible floor is four or more stories above or below a level of exit discharge. In buildings equipped throughout with an automatic sprinkler system the elevator is not required on floors with a horizontal exit and located at or above the level of exit discharge. **Though not required by the building code; a major renovation should include a new compliant elevator which services every level of the facility.**

Doors and Gates
Existing doors were found to be in substantial compliance with the ADAAG.

Entrances and Exits
Accessible entrance and exits are limited to the main fourth floor entrance and the service entrance at the first floor. Access to these existing entrances is appropriate, and substantially compliant with the ADAAG.
However, ADAAG requires the number of accessible entrances be at least equivalent to the number of exits required by the applicable building code. Alderman is required by the 2006 IBC to have four exits. The second floor exit would allow someone to leave the building, however, you are immediately required to go up or down a stair. The fourth required exit is a horizontal exit into the New Stacks which is in turn egressed through one of two staircases.
Issues regarding accessible means of egress are addressed in the Life Safety assessment. It is assumed that the intent of this study is to provide safe and appropriate egress for all occupants of the building. There is currently no accessible means of egress from the second, third and fifth floors of this building. Compliant accessible means of egress, including; compliant elevators, stairs with areas of refuge, complying with Section 1007.6; and horizontal exits (such as from old stacks to new stacks, through a fire-resistive rated wall) can constitute an accessible egress.
There currently exist no areas of refuge in the building.

Drinking Fountains and Water Coolers
An assortment of drinking fountains have been retrofitted in the facility in an attempt to meet the requirements of the ADAAG.

Toilet Rooms and Bathrooms
Both employees who utilize wheelchairs commented that the ADA toilet room improvements do not meet their needs; the alternative toilet stall that was provided does not allow the stall door to be closed if they are in the stall.

Telephones
No public telephones are available on site.

Alterations

Additions and alterations to existing buildings are allowed certain exceptions to the full requirements of the code. No alteration may decrease existing accessibility below the requirements for new construction. In existing buildings or facilities, alterations must comply with the following:

- Each element, space, feature, or area that is altered must comply with the applicable minimum requirements for new construction and the applicable technical provisions associated with that element.
- When alterations of single elements amount to an alteration of a room or space, the entire space must be made accessible.
- If full compliance with the technical provisions of an altered element, space, feature, or area is technically infeasible, then certain special technical provisions may be utilized. If there is no special technical provision for an altered element, space, feature, or area, or if full compliance with the special technical provision is technically infeasible, the alteration must provide accessibility to the maximum extent feasible. Any elements or features of the building or facility that are being altered and can be made accessible, must be made accessible within the scope of the alteration.

Historic Preservation

Alterations to a qualified historic building or facility must comply with the minimum requirements for alterations. If it is determined that the proposed alterations would threaten or destroy the historic significance of the building or facility alternative requirements may be utilized. It was not felt that any alternative accessibility solutions would be required to provide full access to this facility.

Alderman Library Assessment
Environmental Health and Safety

The University of Virginia's Office of Environmental Health and Safety maintains records of all asbestos and lead analysis that has been completed in any University building. Mr. Marlin Phillips provided access to a University wide Asbestos Assessment Study completed by Hall-Kimbrell Environmental Services Inc. in 1988. That document identifies Asbestos Containing Material (ACM) samplings taken throughout Alderman Library and is summarized as follows:

Existing Conditions

Asbestos Containing Material (ACM)
ACMs have been identified in the following areas:
Original Building

- First floor mechanical room, ACM was identified in the pipe covering, corrugated pipe covering and mudded joint packing on both ACM and non-ACM pipe coverings of drain lines, hot water steam, low pressure steam and domestic water.
- First floor Room112A, ACM was identified in the wrapped cardboard/paper pipe covering of domestic water system.
- Rooms 113, 105A, 107, 109A, 111, 113, 117, 175 ACM was identified in the pipe covering and mudded joint packing of the pipe coverings of the low pressure steam system.
- Second floor mechanical room, ACM was identified in the pipe covering, the mudded joint packing of corrugated pipe covering and the boiler tank insulation.
- Second floor Rooms 216D and 218, ACM was identified in the sprayed acoustical ceiling plaster.
- Fifth floor mezzanine stacks, ACM was identified in the pipe covering and mudded joint packing.

New Stacks

- Basement, Room B001, ACM was identified in the mudded joint packing of non-ACM pipe covering.
- Fifth floor, Stairwell 578, ACM was identified in the mudded joint packing of non-ACM pipe covering.

Additional partial surveys are conducted on an as needed basis in association with any work order executed at the University. This work has identified additional ACM at Alderman Library, including the following;

- Room 115 and Main floor lobby (presumably Memorial Hall) Tan 12" x 12" floor tile and associated mastic.
- Main entry vestibule Tan 9" x 9" floor tile and associated mastic.
- Room 114 Gray 9"x 9" floor tile and associated mastic.
- Rooms 224A, 225, 319, 423 Gray 12"x 12" floor tile and associated mastic.
- Rooms 219, 401 Brown 9"x 9" floor tile and associated mastic.
- Room 219 Black 4"x 12" floor tile border.
- Room 201 Pink 9"x 9" floor tile and associated mastic.
- Waterproofing materials on the exterior walls.

This work has typically been abated in association with renovation and renewal projects of a limited scope in the immediate area of the sampling. They may represent ACMs that might be anticipated in areas which have not been previously renovated in Alderman.

Lead Paint
Lead content is frequently determined prior to initiation of renovation or repainting projects at the University. Federal standards require specific remedial action when a paint exceeds 0.5% lead by weight. Previously applied paints were determined by testing to contain lead at the following levels at Alderman Library:
Exterior trim paint on the columns adjacent to the front entry has been identified as containing 30% lead.
Exterior trim paint at windows contained 3.6% lead by weight.
Exterior trim paint at doors contained 2.9% lead by weight.
Interior trim paint in Room 319A contained .02%-.05% lead by weight.
Interior trim paint in Room 423 contained .02% lead by weight.

Other hazardous materials that have been identified in Alderman Library include fluorescent light tubes and ballast.

Proposed Improvements

Baseline Scenario
The scope of improvements in the baseline scenario, include the following;

- Targeted renovations to create/improve user space,
- Improvements to accessibility,
- Renewal of the mechanical, electrical and plumbing systems
- Removal of asbestos from the building.

It is the intent of the Baseline Scenario that most asbestos containing materials in both the original building and the New Stacks would be removed as part of this work. Mechanical system replacement would include removal of pipe covering, joint packing and boiler tank insulation known to contain ACM's.
ACM's associated with the sprayed acoustical ceiling plaster in Rooms 216D and 218, may not be required to be removed. The condition of the material and the installation of the new sprinkler system will need to be considered.

Most asbestos floor tile and associated mastic in the building would be removed. Some promenade original flooring, particularly that in Memorial Hall, may not be replaced as a result of its contribution to the historic character of the building.
Waterproofing materials on the exterior walls, identified as ACM, would not require replacement

Scenario #2
The majority of ACM removal or abatement is to be addressed in the Baseline Scenario. The scope of improvements in Scenario #2, include all the improvements from the Baseline Scenario and the following;

- Replace Old Stacks.
- Enclose Light wells.

This scenario envisions new construction that may include dealing with ACMs and/or lead paint not removed or abated in the Baseline Scenario, notably resolution of the old Stacks and waterproofing on exterior walls.

Alderman Assessment
Fit and Finish Assessment

Existing Conditions
Existing finishes in Alderman Library are considerably varied; both in type, quality and condition.

Several individual spaces were originally constructed of substantial, noble materials of the highest quality and detail. Those spaces are substantially intact and their preservation should be a high priority. These spaces include; Memorial Hall, the McGregor Room, and the Barrett Room. Several smaller spaces including the Mount Vernon Room, the Taylor Room and the Garnett Room are similar in materials and are detailed so as to appear of a particular period.

Toilet rooms and stairs in the original building were built of appropriate, high-end materials in frequent use at the time. The stairs are terrazzo treads and some landings, with steel risers and nosing and railing systems. The original toilet rooms had terrazzo floors, ceramic tile walls, and marble toilet partitions with wood panel doors. Both stairs and toilets show their age and have suffered previous renovations of less noble materials.

A significant percentage of the space in Alderman was designed to be pleasant, straight forward, functional work and study space. The predominate materials include; carpet, sheet linoleum or vinyl composition tile flooring, painted gypsum board or plaster walls, and suspended or direct glued acoustic ceiling systems. These finishes range from original to the 1938 construction to recently installed. Most existing finishes would appear to be currently serviceable; the major objection would be the inconsistent and piecemeal nature of previous renovations and repairs. These spaces may have modest gestures of architectural detail or embellishment,

Other spaces were designed to be more utilitarian, including storage rooms, mechanical spaces and printing services. Predominate finishes in these spaces include concrete floors and unfinished ceilings with painted exposed structure.

Alderman Library
Exterior Closure Assessment

Exterior Walls

The original 1938 facility is primarily brick, installed in a flemish bond. There are cast stone sills at each window, cornice and roof balusters. The exterior columns are brick with a stucco parge coat and finish paint. The brick, associated pointing and cast stone work are all in remarkably good condition.

The 60's stacks addition exterior walls consist of a granite base, and large vertical panels of brick and recessed white marble. The granite base is in good condition. One modestly displaced piece was noted at the northeast corner. The vertical joints are caulked and the horizontal joints are leaded, all joints are in adequate condition. The marble is in good condition and all joints have recently been recaulked.

Windows and Doors

The windows in the original 1938 facility are large wood frame operable double hung sash with single-pane divided lite glass. Most windows have been outfitted with interior storm panels to provide some insulating value; these panels have been removed in several locations. The interior paint finish is frequently deteriorated and requires significant preparation and refinishing, this has typically been delayed as a result of the interior storm panels.

The windows in the 60's addition are minor slits, 8" wide by the full height of the addition. They are fixed aluminum frames with single pane glass. The lower floors (1M and 2) have an aluminum frame installed on the exterior, presumably to provide privacy for the study carrels immediately inside the windows. No correctable deficiencies were noted.

Doors are typically in somewhat poor condition. Three pairs of presumed original doors exist, at the main fourth floor entrance (glazed panels and a second similar pair at the interior vestibule), at the second floor grade level entrance (wood panel in good condition) and at the rear loading dock area on the first floor.

Single metal service doors exist around the perimeter at various locations; egress stairs have a vision panel and mechanical space doors frequently have a louvered panel. Seven total doors, they are typically in poor condition.

Alderman Library
Exterior Closure Assessment

Proposed Improvements

The major components of exterior closure at Alderman Library are in good condition. The required improvements would be minimal in any of the envisioned scenarios. The scope of any eventual renovation and/or renewal project is to a large extent independent of improvements that may be made to the exterior of the existing facility.

Baseline Scenario

The scope of improvements in the baseline scenario, include the following;

- Targeted renovations to create/improve user space,
- Improvements to accessibility,
- Renewal of the mechanical, electrical and plumbing systems
- Removal of asbestos from the building.

No significant improvements are envisioned to the components of exterior enclosure in this scenario.

Exterior Walls
No significant improvements and/or repairs are envisioned to the exterior walls of the original facility or the New Stacks.

Windows and Doors
The double hung wood windows in the original 1938 facility are substantially intact. They should be refurbished and renewed for proper function and improved appearance. The windows have been previously outfitted with interior storm panels; consideration should be given to removing these panels and investigating alternative means of achieving thermal efficiency while allowing the windows some operable function.

No correctable deficiencies were noted in the New Stacks

Three pairs of original wood doors at the main entrances should be maintained and renewed as appropriate.

Seven metal service doors at the perimeter should be replaced with new assemblies and associated hardware.

Scenario #2
The scope of improvements in Scenario #2 includes all the improvements from the Baseline Scenario and the following;

- Replace Old Stacks.
- Enclose Light wells.

This scenario envisions additional construction but would not significantly impact the exterior closure of the facility.

Exterior Walls

No significant improvements and/or repairs are envisioned to the existing exterior walls of the original facility or the New Stacks in either of the basic scenarios. However, enclosing the light wells will convert a significant amount of exterior wall to interior wall and include a new transparent roof element. Modifications to the existing structure suggested by the alternative options, including replacement of the marble panels with new window wall systems and the enclosed connection to Clemons Library would create substantial new exterior elements. Each of these proposed constructions would involve modification of existing wall elements with associated protection, repair and/or replacement required.

Windows and Doors

Modest improvements and/or repairs are envisioned to the existing door and windows of the original facility as outlined in the Baseline Scenario. The enclosure of the Light wells may alter the approach to repair and/or renewal of windows opening into that new space. Modifications to the existing structure suggested by the alternative options, includes an option for a significantly enhanced window treatment. A system utilizing the existing window unit as an exterior panel and a new fixed glass interior panel with a reflective aluminum blind in the cavity holds the promise of improved energy and daylighting performance.

Alderman Library
Roof Assessment

Existing Conditions
The roof of Alderman Library consist of multiple components, including: two main elevated gable forms and surrounding low slope areas of the original building and a single low slope surface at the 1960's addition. Included in the roof assessment was a review of three recessed areaways at the perimeter of the facility, the waterproof systems at each of two interior light wells and a small low slope roof at the first floor loading dock.

The primary visible roof component of Alderman Library is a gable form which sits directly over the front entrance and is oriented perpendicular to the central axis of the building. That roof is 6:12 pitch and covered with slate shingles which appear to be in good condition. The gable is received in brick parapet walls at each end. The low edge terminates at a build in gutter that is behind a parapet wall of alternating brick panels and precast stone balusters. Behind the interior light wells is a second gable roof form, similar to the previous, however, this roof is now substantially surrounded by low-slope roofs as a result of the addition. The two slate roofs comprise approximately 8,400 square feet. The roof was substantially repaired in 1999 and appears to be in excellent condition**.** Barring significant changes the existing slate roofs could reasonably be expected to provide significant additional service.

The remainder of the original roofing consist of two similar areas, each symmetrical about the central axis of the building. Both roofs are low-slope gravel ballasted EPDM behind continuous parapet walls at the entire perimeter. The roofs are reported to date from the mid-1980's. The gravel ballast prevents significant observation of the membrane and its associated seams. Modest bridging was observed at the perimeter flashing. There has been some patching and relining of the metal gutters with EPDM membrane. The roof is in adequate condition at the present time; however, given the age of the existing system it should be assumed that the ballasted EPDM roof will require total replacement at the time of the scheduled building renovation.

The roof on the addition is low-slope .60 mil thickness, it was observed to be dated as 9/87. The membrane is entirely ballasted with river rock. It is reported that the roof may be installed directly over the original built-up roof. The surface is drained by way of six internal drains. The roof is in adequate condition at the present time; however, given the age of the existing system it should be assumed that the ballasted EPDM roof will require total replacement at the time of the scheduled building renovation.

The small 480 square foot low slope roof over the loading area at the northwest corner of the facility is a build-up field with a formed metal perimeter termination. The termination flashing is brittle and frequently deteriorated to failure, bridging was observed in multiple locations. Standing water was observed on the roof in a location so as not to drain. This roof is in poor condition.

The perimeter areaways along the south façade have recently been reroofed and are in good condition. The areaway along the south façade is scheduled for replacement in the near future.

The interior light wells each have a first floor concrete slab and a second floor EPDM membrane with gravel ballast. The EPDM systems would appear to date from the mid-80's**.** The roofs are in adequate condition at the present time; however, given the age of the existing system it should be assumed that the ballasted EPDM roof will require total replacement at the time of the scheduled building renovation. The concrete slabs are in poor condition, with some displacement and cracking at the perimeter. Each is served by one drain. Water damage was evident along the brick base of adjacent walls at the entire perimeter of each slab. No reports of impounded water were noted.

All previously reported leaks have been repaired and it is assumed the existing roof system will be adequate to the task, with routine required maintenance until the scheduled building renovation.

Proposed Improvements

Baseline Scenario
The scope of improvements in the baseline scenario, include the following;

- Targeted renovations to create/improve interior user space,
- Improvements to accessibility,
- Renewal of the mechanical, electrical and plumbing systems
- Removal of asbestos from the building.

There should be little impact on the roof systems from the work associated with the Baseline Scenario. The two slate roofs should reasonably be expected to provide significant additional service.
The low-slope gravel ballasted EPDM roofs, including the roof of the addition are reported to date from the mid-1980's. Given the age of these roofs it should be assumed that the ballasted EPDM roofs would require total replacement as part of the Baseline Scenario. Any proposed changes to the existing roof for the mechanical or plumbing system improvements should be coordinated with this work.

Scenario #2
The scope of improvements in Scenario #2, include all the improvements from the Baseline Scenario and the following;

- Replace Old Stacks.
- Enclose Light wells.

This scenario envisions additional square footage being added or modified in a way that may affect the existing sloped roof above the Old Stacks and may include features that include new roofing components.

EXISTING CONDITIONS

Mechanical Systems

The original building and new stacks addition are primarily conditioned by a heating, ventilating and air conditioning system retrofitted to the buildings c. 1985. This system is generally described as a 4-pipe heating water (HW) and chilled water (CHW) system with more than thirty air handling units. Additional heating is provided by the original HW radiator system in the main building.

The 1985 HVAC systems retrofit might best be described as “shoe-horned” into the building, as the only major space programming change made at the time was to accommodate the central mechanical equipment in the basement of the new stacks. A few air handling units are installed in mechanical closets, and a few more in excavated but unfinished “dirt rooms.” Beyond this, most of the air handlers are located above dropped ceilings.

The HVAC systems are well maintained and operating in a manner consistent with their age and within the capabilities of their type. In general, the chillers, cooling tower, pumps, piping, air handlers and ductwork are in fair-good condition for 20-year old equipment; the original converter, pumps, cast iron radiators and piping are in fair condition. While the system is not capable of maintaining consistent indoor temperatures suitable for all occupants, there are no reports of excessive moisture that could lead to mold / mildew. The systems do have other shortcomings as described later in this text.

The source of heating for the entire building is medium temperature heating water (MTHW) generated at the campus central plant. MTHW is piped from the central plant to the library via underground utility tunnels and enters the southeast side of the building in an excavated “dirt room” on the second floor. The MTHW lines continue through the dirt room and also serve Clemons Library. The lines serve a shell-and-tube heat exchanger in the dirt room for converting the MTHW to low temperature heating water (LTHW) for use within Alderman Library. LTHW from this converter is distributed by three base-mounted zone pumps – also located in the dirt room. Two of these pumps serve cast iron radiators throughout the main building. A third pump distributes LTHW to the new stacks radiators and main mechanical room. A fourth pump exists at this location, but it is no longer in service. The converter and pumps are 1968 vintage.

In the 1985 preservation project, dual vertical in-line reheat (RH) pumps (lead and standby) were installed for distributing LTHW to air handlers throughout the building. The reheat water system includes auxiliary heat recovery from the chillers, which is no longer operational.

Chilled water (CHW) is provided by two 250-ton York centrifugal chillers (1985 vintage) located in the main mechanical room in the basement of the new stacks and a cooling tower located at the west side of the building. Base-mounted pumps (one per chiller) are used for the primary CHW loop. Dual vertical in-line secondary CHW pumps (lead and standby) distribute CHW to the air handlers throughout the building. Base-mounted pumps (one per chiller) circulate condenser water from the chillers to the cooling tower.

Low pressure steam (LPS) for humidification is generated by an electric boiler located in the new stacks basement. This boiler is relatively new – reportedly less than 10 years – and in good condition. Make-up water for this boiler is from a shell-and-tube heat exchanger that pre-heats the make-up water using LTHW.

LTHW, CHW and LPS is distributed from the new stacks main mechanical room via piping mains that traverse throughout the building horizontally and vertically. One main piping riser exists in the northeast corner of the old stacks – other risers are scattered throughout the building as convenient to the locations of air handlers. There are no reported problems with leaks or corrosion of the piping. Problems are reported with the original Italian-made control valves at each air handler.

Space conditioning for the new stacks is provided by two built-up constant volume air handlers located in the basement mechanical room – AHU-29A and AHU-29B (multi-zone). Ducts from these air handlers traverses vertically through two shafts at the stairwells, and horizontally across the basement area and each stack floor level. Horizontal ducts in the stacks present head-height issues – in some cases, no more than 6-ft clearance. Space conditioning for the old stacks is provided by two modular constant volume air handlers – AHU-28A (multi-zone) and AHU-28B. All of the air handlers serving the stacks have carbon filtering and steam humidifiers.

Modular rooftop constant volume air handlers provide space conditioning for administrative spaces on the fifth floor (AHU-25 and 26) and Memorial Hall (AHU-27). Space conditioning for the remainder of the main building is provided by various sizes of modular constant volume air handlers – some in mechanical closets, some in dirt rooms and many above dropped acoustical tile ceilings. Air handlers that serve the Barrett Room, McGregor Room and vault include carbon filters and steam humidifiers. Some other selected air handlers also include steam humidifiers.

Supply, return and outside air intake ducts associated with the modular air handler units runs predominantly above ceilings in the area served by the respective air handling unit. Ducts for Memorial Hall run through the attic.

The mechanical systems are controlled by a hybrid pneumatic and electronic Johnson Metasys system. Electronic controls are monitored by the University Systems Control. The controls air compressor is located in the penthouse mechanical room. A brief summary of controls sequences follows.

- Humidity and temperature control and setpoints vary depending on zone criteria type (A, B, or C).
- LTHW pumps are started / stopped and the LTHW loop temperature is reset based on outside air temperature.
- LTHW and chilled water are controlled to a constant supply water temperature. Hydronic system temperatures do not operate on an outdoor reset schedule.
- Some air handlers control to constant discharge air temperature, others control to space temperature, and others switch between space and discharge air temperature based on humidity levels.
- Dehumidification is available on all air handlers.

Some spaces have been renovated since the 1985 mechanical system retrofit. No major changes were made to the mechanical systems serving the renovated areas in response to the change in space use. In some cases, this has resulted in already-present inadequate temperature control and zoning being made worse.

Shortcomings and complaints:

- Some equipment and piping is covered with asbestos-containing materials. An asbestos survey and management plan exists.
- Cast iron radiators –
    - The original manual control valves for the cast iron HW radiators suffer occasional leaks due to the age of the valve packing. There are no means for isolating individual radiators, thus requiring the shut-down of entire heating water loops for repairs.

- Control of radiators is manual only and not interfaced with automatic temperature controls for the air handling units. This can lead to energy waste and occupant discomfort.
- Control of the radiator heating output is difficult due to old/worn/leaky radiator valves and connection to reheat loop (one of two top complaints from building occupants).
- Bleed lines broken off by visitors causes leak problems

o Air handlers –

- Air handling units and steam humidifiers located above dropped ceilings are difficult to maintain and service.
- Air handling units in "dirt rooms" are subject to dust/dirt and occasional moisture intrusion.
- The many differing sizes of air handlers require stores of many different sizes of filters.
- Storage space for filters is inadequate. Many filters are stored in "dirt rooms" where they are subject to dirt/dust and moisture.
- Inadequate zoning to provide occupant comfort. The use of portable electric heaters is common, and taxes the electrical system.
- Humidifier high limit controls are unreliable and prone to failure.
- The 1985 control valves used in LTHW and CHW piping at air handling units are Italian-made. Parts are not available and leaks are frequent.
- Condensate drains leak and frequently clog.

o Controls –

- The hybrid pneumatic / electronic system does not allow implementation of adequate strategies for energy conservation.

Plumbing Systems

Domestic water enters the building at the "dirt room" in the southwest corner of the second floor. Domestic hot water is produced by multiple electric water heaters in the vicinities of restrooms and fixtures. Domestic cold and hot water are distributed throughout the building in galvanized steel piping to restrooms on each level and other miscellaneous plumbing fixtures. Where repairs to the domestic water supply piping have been required, copper piping has been used.

Sanitary waste and vent piping, and storm piping is cast iron. The flat roofs of the building lack secondary (emergency) drains.

Originally, refrigerated water was generated by a unit located in the second floor "dirt room." This unit is no longer in service. Drinking water is filtered at each drinking fountain.

Plumbing fixture locations and associated piping are original to the building. Fixtures have been replaced with modern, low-water consumption type. While wheelchair-accessible lavatories exist, the water closet stalls and urinals may not comply with current ADAAG requirements. Based on the International Plumbing Code for an A-3 occupancy and an occupancy load of 1,852, the required plumbing facilities are as follows.

Fixture type	Minimum No.	**Req'd No.**	Actual No. on each Floor 1st	2nd	3rd	4th	5th	**Actual Total**
Males								
Water Closets / Urinals	1 per 125	**8**	4	5	4	4	6	**23**
Lavatories	1 per 200	**5**	2	3	3	3	4	**15**
Females								
Water Closets	1 per 65	**14**	3	3	2	2	3	**12**
Lavatories	1 per 200	**5**	3	3	3	3	2	**14**
Drinking Fountains	1 per 500	**4**	2	3	2	2	2	**9**
Service Sinks	1	**1**			1	2		**3**

Based on the calculated building occupant load, the number of plumbing fixtures meets or exceeds the plumbing facilities required by current code, with the exclusion of the number of water closets for females.

Shortcomings and complaints:

o Domestic water supply –

- Occupants complain that potable water from drinking fountains is distasteful. This is likely due to the aged galvanized steel piping, which is prone to internal corrosion buildup. For this reason, individual filters are installed at some of the drinking fountains – an infringement of University policy. The filters have not alleviated the distastefulness.
- The galvanized steel piping is corroded and prone to leaks at joints.

o Flat roofs lack overflow drains.

Fire Protection Systems

No fire protection sprinkler or standpipe systems exist in this building. The elevator machine rooms and hoistways are not protected by preaction systems.

Shortcomings and complaints:

o Protection of this building is not consistent with the University's policy of providing automatic fire protection of all buildings on campus.

Electrical Systems

Primary power is fed to the building from the University primary electrical system in two locations – a pad-mounted transformer at the southeast corner of the main building, and an indoor 15kV high voltage switch in the basement at northeast corner of the new stacks. The service into the southeast first floor switchgear is rated 208/120V, 3 phase.

The service and switchgear at the northeast corner was originally added in the 1985 preservation project. The main switchgear at both services and the high voltage switch has just recently been replaced. The 208V switchgear is manufactured by Square D Company and rated 4000A. The high voltage switch at the northeast corner feeds a combination 1000 kVA transformer /

switchboard with secondary voltage of 480/277V, 3 phase. The 480V switchgear is rated 1600A.

The 480V switchboard has a main circuit breaker and six branch circuit breakers. It appears there is space available for two more circuit breakers.

Much of the original building's electrical distribution feeders, panelboards and branch circuits remain. Additional distribution was installed in the 1985 preservation project. Breakers are old and worn, and difficult to find repair parts for.

Switches and receptacles are old and worn. Locations of power outlets no longer meet the needs of the building use. Branch circuits in surface raceways have been added to alleviate some of these problems.

Lighting is predominantly fluorescent, of dated vintage (magnetic ballasts and T12 lamps). Emergency lighting units with batteries are used for egress lighting.

The fire alarm system has two main panels – one located in an office space at the second floor level. Initiating devices (manual pull stations, smoke detectors, heat detectors, duct detectors) and alarm devices (horns, horn/strobes) are located throughout the building.

There are two communications closets that serve the entire library, located in the old stacks 3M level in the southwest and southeast corners. From each closet there is a vertical chase to each floor of the old stacks by which cabling is fed to each floor of the library.

A closed circuit camera system exists at the first and second floors, originally intended to provide security for the special collections area (which has since been relocated).

Shortcomings and complaints:

- Switchgear –
  - The breaker in the 480V switchgear that feeds Panel PP2 trips frequently. The breaker handle is broken due to frequent resetting.
- Distribution –
  - Panelboards are old and worn and have surpassed their expected service life. Replacement breakers are no longer available.
  - Branch circuits are not segregated, well organized or documented. Some circuits are fed from panels located on different floors. Loads connected to some breakers are unknown.
  - Branch breakers are used to control lighting in the old stacks area, leading to excessive wear and tear on the breakers.
  - Branch circuits and devices for plug loads are inadequate throughout the building. Some circuits are overloaded, some have simply shorted out and are no longer usable.
  - Occupants complain of the lack of adequate receptacles, especially in offices. In some cases, this results in the need to unplug one device in order to use another.
- Lighting –
  - The majority of fixtures are old, worn and of outdated technology (magnetic ballasts and T12 fluorescent lamps). Many of the fixtures in stack areas have broken acrylic lenses.
  - Control of the stacks lighting is inadequate and inconvenient for the staff.
  - Switches are old and worn, and do not incorporate modern techniques and technologies, such as dual-switching, occupancy sensors, etc.

CONCEPT PLANS

Mechanical Systems

The existing heating, ventilating and air conditioning systems will be removed and replaced with new. All existing equipment, piping, ducts, controls and appurtenances will be removed.

The scheme proposed for renewal is a 4-pipe system with air handlers and fan coils. This type of system is consistent with applications in other buildings at the University and is capable of providing the necessary comfort and humidity control necessary for individual spaces in this building.

General considerations, arrangement and components of this system will consist of the following.

- It is in University Utilities Department's six year capital plan to replace the chillers at Alderman and Clemons. The Department would prefer to replace that capacity in a stand alone plant, possibly at/near the cooling towers for Newcomb. However, that may not be feasible for many reasons in which case the chillers would need to be shoe-horned back into the same place. In this case, the existing mechanical room in the basement of the new stacks will be utilized to rebuild the chiller plant, accommodating sufficient working clearances for this equipment. The plant will contain chillers, chilled water pumps, condenser water pumps, and electric steam boiler for humidification. A new cooling tower will replace the existing one.

- A new heating plant will be established in one of the existing dirt rooms. The existing heating water converter and pumps will be replaced with new in the same location. This unfinished area of the building will be captured as finished mechanical space.

- New Stacks: Rebuild the air handler located in the new stacks basement mechanical room that serves this space. The new air handler will be variable air volume and will incorporate energy recovery for outside air, economizer cycle and humidification. Replace the associated ductwork with new ducts that distribute air horizontally throughout the basement with vertical risers up through the stacks. Horizontal runs through low-ceiling areas in the new stacks will be minimized.

- Old Stacks:

  - Scenario 1 only: Rebuild the air handler located in the attic that serves this space. The new air handler will be variable air volume and will incorporate energy recovery for outside air, economizer cycle and humidification. Replace existing ducts with new vertical duct risers established to deliver air to each level, and new horizontal ducts to distribute air throughout each level. Horizontal runs through low-ceiling areas in the new stacks will be reworked to minimize head-height clearance obstructions.

  - Scenarios 2 and 3: Rebuild the air handler located in the attic that serves this space. The new air handler will be variable air volume and will incorporate energy recovery for outside air, economizer cycle and humidification. Replace existing ducts with new vertical duct risers established in the renovated core to deliver air to each level, and new horizontal ducts to distribute air throughout each level of the renovated core and surrounding spaces.

- Lightwell:

  - Scenarios 2 and 3: This space will be served by a separate air handler located in the new stacks basement. The new air handler will be variable air volume and will incorporate energy recovery for outside air, economizer cycle and humidification. New ducts will distribute air horizontally through the new stacks basement to new vertical risers up through the the enclosed light well. In economizer mode, air will be relieved through the new lightwell roof.

  - The lightwell also will serve as a means for relieving natural ventilation from the spaces surrounding it.

- Fourth floor spaces on the east and west sides of the original building will be conditioned by roof mounted variable air volume air handlers that incorporate energy recovery and economizer cycle. Variable air volume boxes with hot water reheat will provide individual room control.

- The roof mounted air handler serving Memorial Hall will be replaced with a similar constant volume unit that incorporates humidity control, energy recovery and economizer cycle. Existing air distribution located in the attic space can be reused.

- The remainder of spaces will be served by modular constant volume air handlers and fan coils sized appropriately for the specific zone. Air handlers will incorporate humidity control where required for preservation of printed materials. Air handlers will be located in existing attic spaces of the original building, on the roof and in dedicated mechanical closets. Fan coils will be located above ceilings. Pre-conditioned outside air will be ducted to these fan coils and air handlers by dedicated outside air units with energy recovery. These units will minimize energy use and enhance the dehumidification control for the spaces served.

  - The existing dirt room space at the second level will be captured as finished mechanical space for air handling equipment and pipe routing.

  - All air handlers and fan coils will have ducted supply and return.

  - As much as possible, the sizes of filters will be standardized to minimize the amount of filter stock and storage required.

- Dedicated split systems will be utilized for year-round air conditioning of telecommunications closets.

- A direct digital control (DDC) building automation system (BAS) will control all systems and optimize energy use. Individual units serving rooms will be controlled by a wall temperature and humidity sensors.

- New heating water, chilled water and low-pressure steam distribution piping will be routed to air handlers / humidifiers and fan coils throughout the building by way of corridor ceiling spaces and vertical chases.

- All mechanical spaces will be tempered by way of HW unit heaters and exhaust fans.

Plumbing Systems

The existing plumbing systems will be replaced in their entirety.

Considerations include:

- Maintaining the underground domestic water supply line into the building. A new pressure reducing valve, electronic meter and RPZ backflow preventer will be installed in serviceable locations.
- All new domestic water supply and sanitary waste / vent. Isolation valves will be installed in water supply piping at each floor level, branch lines and individual restrooms to facilitate maintenance.
- Low-consumption water closets with automatic flush valves. Waterless urinals. Lavatories with automatic faucets and 0.5 gpm aerators. Accessible fixtures to meet ADAAG requirements.
- Water coolers will utilize R410a refrigerant and be dual-height for accessibility.
- Floor drains in all public restrooms.
- Small storage type or point-of-use electric water heaters for lavatories and sinks. No domestic hot water recirculating systems will be used.

Fire Protection Systems

An automatic sprinkler system throughout with standpipes at stairwells is required to provide full protection for this building. A new 6" or 8" water line will brought to the building from the University water supply system. The available water pressure should be sufficient to operate a wet-pipe sprinkler and standpipe system satisfactorily without the need for a fire pump.

Electrical Systems

The main service equipment and switchboards have recently been replaced and can continue to provide acceptable service for the foreseeable renovation. Electrical systems downstream of the main switchboard have outlived their service life and will be replaced to provide reliable and acceptable service henceforth for any proposed major renovation.

Considerations include:

- Gaining code-required service clearance to the main switchgear located in the new stacks, facilitated by rebuilding the mechanical systems in this location.
- New panelboards, feeders and branch circuits.
- New raceways and conductors are needed for branch circuits. Where possible, branch circuits will be run concealed above ceilings and within walls. Where this is not possible, extruded aluminum dual-channel surface raceways with removable covers will be used and integrated with telecommunication cabling needs.
- New wiring devices – wall switches, receptacles – will be installed.
- All light fixtures will be replaced with appropriate types (e.g., direct-indirect for offices) and energy-efficient technologies. Enhanced lighting controls will incorporate multiple switching, occupancy sensors and daylight harvesting where appropriate. Emergency egress lighting will be provided using battery packs integral to the light fixtures.
- All exit signs will be LED type.

In either scenario, the existing telecommunication system will require at least some rework.

- Scenario 1: The existing telecommunication closets require expansion by extending the doorway wall of each closet 4 ft. This will provide adequate space for equipment and working clearances in accordance with the University standards.
- Scenario 2: Since the old stacks area will be removed, the telecommunication systems will be removed in their entirety. The new system will incorporate all features required for a fully integrated building, including but not limited to:
  - Establish at least two telecommunications closets, optimally located in the southwest and southeast sides of the rebuilt old stacks area. Each IT closet should be sized 8' x 10' and have access from the public corridor. Year-round air conditioning will be required.
  - New CAT 6 (or 6e) cabling for network drops and RG6 cabling for CATV drops.
  - Ladder-type cable trays for cable management above corridor ceilings that run the length of the corridors.

The existing fire alarm systems will be replaced with a new addressable system, with the main control panel located in a dedicated electrical space (accessible to authorized personnel only, location to be determined) and remote annunciator panels. All devices and cabling will be new. The system will incorporate all features required for a fully protected building, including but not limited to:

- Annunciator panels at main entry points on the south (Memorial Hall) and north (service entrance) sides of the building.
- All new cabling in metal conduit and routed concealed above ceilings and within walls.
- Manual pull stations at entries to stairwells on each floor level, and at exit discharge doors.
- Smoke detectors in storage rooms. Heat detectors with remote alarm indicating lights (RAILs) in mechanical rooms.
- Duct smoke detectors with RAILs in air handling systems of greater than 2,000 cfm capacity.
- Smoke and heat detectors in elevator machinery rooms and hoistways, and smoke detectors at elevator lobbies to provide elevator recall service and integration with preaction fire protection systems.
- Strobes and horn/strobes in all corridors, restrooms, classrooms, seminar rooms, meeting / conference rooms, and mechanical rooms. Spacing of devices and candela levels of strobes will be in accordance with the requirements of building codes and ADAAG.
- Supervision / alarm interface with new wet-pipe fire sprinkler systems.

Structural Building Assessment Report

Alderman Library
University of Virginia
DMWPV Job No. C0611-05

June 23, 2007

PURPOSE AND SCOPE

As requested, DMWPV has performed a visual walkthrough structural condition assessment of the existing Alderman Library. The objective of the assessment was to perform a general structural condition survey of the building, identify potential structural deficiencies and provide a general estimate of the floor live load capacity. Floor capacity reviews are limited to typical conditions. Our observations were limited to visual inspections of the accessible portions of the spaces.

We also reviewed the available record structural drawings for the building to become familiar with the building's structural systems. We understand that the building's proposed usage will continue as library and study spaces.

Existing Building Description

The existing building generally consists of an original multi-story structure constructed in 1936 that is connected to a multi-story addition built in 1966.

Original 1936 Building:

The original building is essentially a 5-story structural steel framed building. The floor framing is concrete encased steel beams and columns supporting solid concrete slabs. The typical floor slab is a 4" or 4½" solid slab spanning between 16" deep steel beams and 30" deep steel girders. Steel roof trusses support gable shaped roofs at the north and south sections of the building. Sloped 2½" precast slabs bear on purlins spanning between the trusses. The flat roof is generally 4" solid slabs spanning between beams. Exterior walls appear to be non-bearing masonry infills with punched window openings. Foundations are cast-in-place concrete spread footings.

Within the north section of the building below the gable shaped roof, there is a 10-story stack floor system with interstitial floors. The stack floors are thin two-way concrete floor slabs supported by a closely spaced grid of 2¼" x 2¼" steel columns. This system may have been a lift-slab. Within the stack floor system, there are transfer beams at the 3rd tier below which the column spacing reduces. The existing drawings note that the main building columns are braced by the stack floors.

1966 Addition

The addition is a 10-story cast-in-place concrete framed building that connects to the north face of the original building. This addition expanded the original book stack storage space with floors aligned with the original building stack floors. The column grid is approximately 9' x 9'-10". The floor slabs are 5" thick solid flat slabs. At the perimeter walls, steel shelf angles at each floor support a brick and marble veneer. The stair and elevator walls are cast-in-place concrete. Foundations are cast-in-place concrete spread footings.

Floor Capacity

We calculated the live load capacity of several areas of the existing framing based on the available record construction documents. This review was limited to spot checking a few repetitive conditions and does not constitute a complete review.

The original building floor slabs appear to have a live load capacity exceeding 100 psf. The typical stack floor construction is not shown in the documents. However, the shelves are supported directly by the columns and do not load the floor. We would expect that the floor slab capacity is appropriate for corridor use, but not book stack loads.

The drawings for the 1966 addition indicate that the stack floors are designed for a live load of 120 psf.

Condition

The structural condition of the existing building is generally good. Our inspections of the existing building revealed no major deficiencies, and in our opinion, none of the deficiencies require immediate corrective action or represent a structural concern. We did not observe significant displacements, cracks, or evidence of corrosion in the framing. Following is our commentary regarding various structural areas:

1. Exterior Brick Masonry: We noted several small isolated areas of cracked brick masonry on the exterior of the building. These are generally minor in nature. The jack arches lintels and other brick work appear to be functioning well and in good condition. The brick and mortar appears generally sound and solid.
2. Building Joint: There appears to be no expansion joint between the original building and the 1966 addition to allow for differential movement. There is minor cracking along the interface between to the two buildings. In our opinion, these small differential movements and resultant cracking are expected.
3. 1936 Building Steel Roof Framing: There is evidence of past roof leaks and minor corrosion in isolated areas of the steel roof framing. These appear to be very minor in nature and limited in extent.
4. 1936 Building Framing: The existing concrete encased steel framing appears to be functioning well. To the extent that it is visible and accessible, we did not observe displacements, cracks, evidence of corrosion or other items of concern in this framing.
5. 1936 Building Stack Floor System: The stack floor slabs and columns appear to be in good condition. We did not observe excessive cracking or deflections that would raise concern in this area.

6. 1966 Addition: The cast-in-place concrete framing in this area appears sound. We did not observe cracks, displacements or other items of concern.

1936 Building South Elevation

Minor brick cracks

1966 Addition Building Joint

1936 Building Stacks 3rd Tier Transfer Beam

1936 Building Sloped Roof Framing

North Gable End Wall

DEGW

Matrix of Assumptions for Cost Estimating

Definitions	A	B	C
Level of Finishes	A "Standard"setting, including elements such as GWB walls, vinyl tile floors, ACT drop ceiling, etc.	An "Upgraded" setting, consisting of flexible wall systems, carpet tiles, etc.	A "Historic" setting, often including wood paneling, wood floors, a hard ceiling, etc.
Furniture	Laminate, nut & bolt shelving, manufacturer-standard systems furniture, generic, modular	addition of higher quality materials such as wood, some customization	custom millwork, higher-end materials such as stone, glass, wood used throughout, "customer-specified" materials,
Technology Provision	An environment providing basic amenities for computing, including wireless internet access, power outlets, flat screens, etc.	An enhanced environment with access to hardware and software for collaboration and advanced editing	A specialized computing environment that includes advanced software and hardware, immersive displays, etc.
Lighting	A utility-level of lighting for safety and basic usability. Meets current energy-efficient standards.	A higher level of lighting for tasks involving longer periods of occupation, including work and study. Meets current energy-efficient standards.	The highest level of lighting to provide quality illumination in landmark rooms and gathering spaces. Meets current energy-efficient standards.

Color Key

- Public / Study
- Computer / Media Stations
- Group Study Rooms
- Public Services
- Processing
- Staff Offices
- Support
- Non-Library Areas
- Stacks

UVA | Alderman Library | Cost Estimate Matrix | Option 2 Atrium

FLR	FUNCTION	Area (net sq ft)	Space Description	Level of Finishes	Furniture	Technology Provision	Lighting	Notes
5	**Skylight**	**4780**	Glass enclosure	N/A	N/A	N/A	C	-Skylight installed over atrium -Assume architectural lighting for atrium space
	Graduate Scholarship Center (Special Room at top of new infill)	**2290**	An open study space with carrels, loose tables and chairs	B	B	B	B	-Assume skylights and sloped ceilings -Part of new construction in Technology Core, including raised floors and clear spans
	Freight Elevator Lobby	**125**		A	N/A	N/A	N/A	-Install freight elevator cab and shaft within existing infill slab area between original building and addition
	Group Study Rooms	**970**	3 conference rooms, each seating 12 persons	B	B	C	B	For conference spaces, amenities include: -Video conferencing -Smart boards -Acoustic treatment -Blackout shades -Part of new construction in Technology Core, including raised floors and 45-foot clear spans
	Staff Offices	**7410**	A mix of 1/2 open offices and 1/2 enclosed office space	A	A	B	B	-Relocation/demolition of 40% of partitions -Electrical upgrade -More receptacles -Concealed wiring where connections mounted on surfaces -Replace furnishings -Includes 1100 sq ft of conferencing space with typical amenities and refurbished skylights
	Non-Library/"Incubator" Functions:	**4780**	A mix of 1/2 open offices and 1/2 enclosed office space	A	A	B	B	-Relocation/demolition of 40% of partitions -Electrical upgrade -More receptacles -Concealed wiring where connections mounted on surfaces -Replace furnishings
	"New" Stacks Zone	**7220**		N/A	B	A	A	-Remove a range from east side and west side, 4 feet of shelving along north side -Cut existing mezzanine slab back one column bay on east, west, and north side, adding bracing beam to perimeter at each column

UVA | Alderman Library | Cost Estimate Matrix | Option 2 Atrium

FLR	FUNCTION	Area (net sq ft)	Space Description	Level of Finishes	Furniture	Technology Provision	Lighting	Notes
	Atrium bridge	**390**	Bridge	B	N/A	N/A	N/A	-A 40-foot long, open-air bridge connecting new hub structure with southern wing
	Information Community Reading Rooms	**11260**	Renovated reading room with open seating and lounge seating, includes two small office suites with consultation area	C	C	A	C	-Includes East Reading Room and West Reading Room -Movable furnishings and stacks to allow rearrangement of information community alcoves
	Freight Elevator Lobby	**125**		A	N/A	N/A	N/A	-Install freight elevator cab and shaft within existing infill slab area between original building and addition
	Information Center/ Computing Hub	**2780**	A drop-in open computing facility	B	B	B	B	-Computing workstations supplemented by a staffed service area and group work tables -Part of new construction in Technology Core, including raised floors and 45-foot clear spans
4	**Classrooms**	**1050**	Reconfigurable classroom with movable tables	B	B	B	B	-Retractable partitions to connect two rooms
	Public Services	**890**	Open service desks with storage and work	B	B	A	B	-Placed within large reading room space -Finish is coordinated with reading room space
	Staff Offices	**2990**	An open office arrangement with small rooms for consultation	A	A	B	B	-Placed adjacent and within large reading room space -Office is enclosed by systems furniture wall and ceiling panel for acoustic isolation -Staff are public-facing and basic support
	Memorial Hall	**3200**	Lobby space with lounge, café, exhibit space, and service desk	C	C	A	C	-Café is free-standing element occupying a corner of the space with own lighting, plumbing, counter, and small storage
	"New" Stacks Zone	**18460**		N/A	B	A	A	-Remove a range from east side and west side, 4 feet of shelving along north side -Cut existing mezzanine slab back one column bay on east, west, and north side, adding bracing beam to perimeter at each column

UVA | Alderman Library | Cost Estimate Matrix | Option 2 Atrium

FLR	FUNCTION	Area (net sq ft)	Space Description	Level of Finishes	Furniture	Technology Provision	Lighting	Notes
3	**Atrium bridge**	**390**	Bridge	B	N/A	N/A	N/A	-A 40-foot, open-air span connecting new hub structure with southern wing
	East Reading Room (Former Per. Red. Rm)	**4110**	Renovated reading room with open seating and lounge seating, includes two small office suites with consultation area	C	C	A	C	-Includes East Reading Room and West Reading Room
	Periodicals Reading Room (Part of Former Map Room)	**870**	Renovated reading room with open seating and lounge seating	C	C	A	C	-Contains refurbished, functional fireplace
	Garnett Room	**350**	Small historic reading room	C	C	A	C	-No change apart from MEP/FP upgrades
	Taylor Room (As Quiet Reading Room)	**900**	Small historic reading room	C	C	A	C	-No change apart from MEP/FP upgrades
	Scholars' Lab	**2890**	A mix of settings for supported computing activities, including workstations, lounge seating, and loose tables and chairs	B	B	B	B	-Part of new construction in Technology Core, including raised floors and 45-foot clear spans
	Freight Elevator Lobby	**125**		A	N/A	N/A	N/A	-Install freight elevator cab and shaft within existing infill slab area between original building and addition
	Large Group Meeting Room	**1380**	A reconfigurable meeting room with movable tables	B	B	C	B	
	Collaboration Zone (Former Gov Docs Rm)	**4660**	An open meeting area and enclosed meeting rooms	B	B	B	B	-40% enclosed rooms -60% open area -Open meeting areas include loose tables and chairs, closed meeting rooms enclosed by demountable walls
	Other Staff:IT/Consulation Services (Former IATH)	**3020**	A mix of enclosed and open offices	A	A	B	B	
	ILL- head plus Instructional Scanning Services	**1270**	A mix of enclosed and open offices	A	A	B	B	
	Scholarship Support Services	**1470**	An open office arrangement with small	A	A	A	B	-Placed within a larger office area adjacent to reading room -Consultation room enclosed
	"New" Stacks Zone	**18490**		N/A	B	A	A	-Remove a range from east side and west side, 4 feet of shelving along north side -Cut existing mezzanine slab back one column bay on east, west, and north side, adding bracing beam to perimeter at each column
	Clemons Connector	**450**	Glass-enclosed connector between Alderman and Clemons	B	B	A	B	Extensive switchback ramping (60' length required) to negotiate height differential -Self supporting structure and foundation

UVA | Alderman Library | Cost Estimate Matrix | Option 2 Atrium

FLR	FUNCTION	Area (net sq ft)	Space Description	Level of Finishes	Furniture	Technology Provision	Lighting	Notes
2	**McGregor Reading Room**	**3180**	A historic reading room, including loose tables and chairs, as well as lounge seating	N/C	N/C	N/C	N/C	-No change to historic room apart from MEP and FP upgrades
	Barrett Room / Asia Collection	**2020**	Will be a recently renovated historic room	N/C	N/C	N/C	N/C	-No change to room apart from MEP and FP upgrades
	Mt. Vernon Room	**480**	A small public study area in an historic setting with a functional fireplace	N/C	N/C	N/C	N/C	-No change to historic room apart from MEP and FP upgrades
	Scholar's Court	**5150**	An open court at the base of atrium with	C	C	B	C	-Loose tables -Café seating -Lounge areas -Collaboration areas in the corner -Display screens
	Freight Elevator Lobby	**125**		A	N/A	N/A	N/A	-Install freight elevator cab and shaft within existing infill slab area between original building and addition
	Innovation / Play Zone	**2830**	A blackbox visualization area for cutting-edge technology experimentation	B	B	C	B	-Part of new construction in Technology Core, including raised floors and 45-foot clear spans
	Conference / Breakout Spaces	**2560**	Two large and three medium-sized conference rooms	B	B	C	B	-For conference spaces, amenities include: -Glass front walls -Video conferencing -Smart boards -Acoustic treatment -Blackout shades
	Staff Offices	**1850**	Enclosed office spaces	A	A	B	B	
	Incubation Space	**4480**	A mix of open and enclosed office spaces	A	A	B	B	
	"New" Stacks Zone	**18500**		N/A	B	A	A	-Remove a range from east side and west side, 4 feet of shelving along north side -Cut existing mezzanine slab back one column bay on east, west, and north side, adding bracing beam to perimeter at each column
	Clemons Connector	**80**	Glass-enclosed connector between Alderman and Clemons	B	B	A	B	-Bridge through multi-storey atrium connector -Self-supporting structure and foundation

UVA | Alderman Library | Cost Estimate Matrix | Option 2 Atrium

FLR	FUNCTION	Area (net sq ft)	Space Description	Level of Finishes	Furniture	Technology Provision	Lighting	Notes
1	**Relocated IT Servers& Equipment Storage (West Block)**	**2150**	Storage room	N/A	N/A	H	A	-New floor and ceiling construction to create Scholars' Court above
	Meeting Rm w/ RBS Exhibit (East Block)	**1480**	Meeting room for use with light-sensitive materials	A	N/A	A	A	-New floor and ceiling construction to create Scholars' Court above
	Freight Elevator Lobby	**125**		A	N/A	N/A	N/A	-Install freight elevator cab and shaft within existing infill slab area between original building and addition
	Receiving Room & Dock	**800**		N/A	N/A	N/A	A	-No change to room apart from MEP and FP upgrades
	Mail Sorting	**60**		N/A	N/A	N/A	A	-No change to room apart from MEP and FP upgrades
	Building Maintenance (Rm 113)	**750**	Storage space	N/A	N/A	N/A	A	-No change to room apart from MEP and FP upgrades
	Staff Offices	**3360**	A mix of enclosed and open offices	A	A	B	B	
	"Old" Stacks- Replacement with New Infill	**3000**		N/A	B	A	A	
	"New" Stacks Zone	**18460**		N/A	B	A	A	-Remove a range from east side and west side, 4 feet of shelving along north side -Cut existing mezzanine slab back one column bay on east, west, and north side, adding bracing beam to perimeter at each column
	Books Arts Press / Rare Book School	**4110**	Renovated office and work space	A	N/A	A	A	-Assume base building provision, tenant to provide own furnishings and equipment
	Printing Services	**2730**	Renovated office & production space	A	N/A	A	A	-Assume base building provision, tenant to provide own furnishings and equipment
	Clemons Connector	**600**	Glass-enclosed connector between Alderman and Clemons	B	B	A	B	-Ramping to negotiate height differential -Demolish existing concrete connector

UVA | Alderman Library | Cost Estimate Matrix | Option 1 Baseline

FLR	FUNCTION	Area (sq ft)	Space Description	Level of Finishes	Furniture	Technology Provision	Lighting	Notes
5	**Staff Offices**	**6550**	A mix of 1/2 open offices and 1/2 enclosed office space	A	B	B	B	-Relocation/demolition of 40% of partitions -Electrical upgrade -More receptacles -Concealed wiring where connections mounted on surfaces -Replace furnishings
	Freight Elevator Lobby	**125**		A	N/A	N/A	N/A	-Install freight elevator cab and shaft within existing infill slab area between original building and addition
	Non-Library / "Incubator" Functions	**4380**		A	B	B	B	-Relocation/demolition of 40% of partitions -Electrical upgrade -More receptacles -Concealed wiring where connections mounted on surfaces -Replace furnishings
	Corridors			A	N/A	N/A	B	-Update flooring -Replace ceilings -New lighting fixtures -Ductwork as required
	"Old" Stacks Zone	**7890**		N/A	B	A	A	-Install continuous counter along light well -Replace 20 carrels (main floor & mezzanine)
	"New" Stacks Zone	**7450**		N/A	B	A	A	-Remove a range (shelving) from east side and west side -Remove 4 feet of range (shelving) along north side

UVA | Alderman Library | Cost Estimate Matrix | Option 1 Baseline

FLR	FUNCTION	Area (sq ft)	Space Description	Level of Finishes	Furniture	Technology Provision	Lighting	Notes
4	**East Reading Room**	**5980**	Renovated reading room with open seating and lounge seating. May include two small office areas with consultation space	C	C	B	C	-Renovate with new ceiling and lighting -Renovate existing wood tables and chairs -Wire for power and task lighting -Refinish wood shelving -10' grid of flush power receptacles distributed through open floor areas, some of which will serve tables, no surface mounted conduits in main reading room
	Scholar's Lab (West room)	**4380**	A mix of settings for supported computing activities, including workstations, lounge seating, and loose tables and chairs	B	B	B	B	-Ceiling is replaced -Grid of flush power receptacles distributed through open floor areas, some of which will serve tables
	Freight Elevator Lobby	**125**		A	N/A	N/A	N/A	-Install freight elevator cab and shaft within existing infill slab area between original building and addition
	Classrooms	**840**	A reconfigurable classroom with movable tables	B	B	B	B	-10' grid of flush power receptacles distributed through open floor areas to allow rearrangement of tables
	Public Services	**420**	Open service desks with storage and work	B	B	A	C	-Placed within large reading room space -Finish coordinated with reading room space
	Staff Offices	**2980**	An open office arrangement with small rooms for consultation	A	A	A	B	-Placed adjacent and within large reading room space -Office enclosed by systems furniture wall and ceiling panel for acoustic isolation -Staff are public-facing for basic support
	Memorial Hall	**3200**	Lobby space with lounge, café, exhibit space, and service desk	C	C	A	C	-Café is free-standing element occupying a corner of the space with own lighting, plumbing, counter, and small storage
	"Old" Stacks Zone	**8220**		N/A	B	A	A	-Place continuous counter along light well -Replace 20 carrels (main floor & mezzanine)
	"New" Stacks Zone	**18460**		N/A	B	A	A	-Remove a range (shelving) from east side and west side -Remove 4 feet of range (shelving) along north side

UVA | Alderman Library | Cost Estimate Matrix | Option 1 Baseline

FLR	FUNCTION	Area (sq ft)	Space Description	Level of Finishes	Furniture	Technology Provision	Lighting	Notes
3	**Periodicals Reading Rm** (Former Map Rm)	**2400**	Renovated reading room with open seating and lounge seating	C	C	A	C	-Restoration of existing wood tables and chairs -Wired for power and task lighting -Restore wood paneling and cases -Refurbish existing fireplace with ventless gas model
	Garnett Room	**490**	Endowed reading room with limited access	N/C	N/C	N/C	N/C	No change to room apart from MEP and FP upgrades
	Freight Elevator Lobby	**125**		A	N/A	N/A	N/A	-Install freight elevator cab and shaft within existing infill slab area between original building and addition
	Collaboration Zone (Former Gov Docs Rm)	**3860**	An open meeting area with loose tables and chairs and enclosed meeting rooms with demountable walls	B	B	B	B	-10' grid of flush power receptacles distributed through open floor areas to allow rearrangement of collaborative furnishings by users
	Scholarship Support Center (Former Per. Red. Rm)	**6570**	An open office arrangement with small rooms for consultation	B	C	B	B	-Contiguous with staff offices adjacent to reading room -Includes consultation room -10' grid of flush power receptacles distributed through open floor areas
	Staff Offices	**940**	A mix of enclosed and open offices	A	A	B	B	-Placed adjacent and within large reading room space -Office is enclosed by systems furniture wall and low ceiling panel for acoustic isolation -Staff are public-facing and more expert support
	"Old" Stacks Zone	**8220**		N/A	B	A	A	-Place continuous counter along light well -Replace 20 carrels (main floor & mezzanine)
	"New" Stacks Zone	**18470**		N/A	B	A	A	-Remove a range (shelving) from east side and west side -Remove 4 feet of range (shelving) along north side
	Non-Library / "Incubator" Functions	**3680**	A mix of enclosed and open offices	A	A	C	B	-Taylor Room, 850 sq ft historic reading room within this zone, unchanged apart from MEP/FP

UVA | Alderman Library | Cost Estimate Matrix | Option 1 Baseline

FLR	FUNCTION	Area (sq ft)	Space Description	Level of Finishes	Furniture	Technology Provision	Lighting	Notes
2	Green Roof	2300	A planted non-occupiable roof area	N/A	N/A	N/A	N/A	-An extensive green roof with 3" base of soil
	McGregor Reading Room	3040	A historic reading room, including loose tables and chairs, as well as lounge seating	N/C	N/C	N/C	N/C	-No change to historic room apart from MEP and FP upgrades
	Barrett Room / Asia Collection	2020	Will be a recently renovated historic room	N/C	N/C	N/C	N/C	-No change to room apart from MEP and FP upgrades
	Mt. Vernon Room	480	A small public study area in an historic setting with a functional fireplace	N/C	N/C	N/C	N/C	-No change to historic room apart from MEP and FP upgrades
	Second Floor Reading Room	4750	Renovated reading room with open seating and lounge seating	C	C	A	C	-Contains refurbished, functional fireplace -Grid of flush power receptacles distributed through open floor areas
	Freight Elevator Lobby	125		A	N/A	N/A	N/A	-Install freight elevator cab and shaft within existing infill slab area between original building and addition
	Meeting / Seminar Rooms	2050	Two large conference rooms with a total capacity of 52, along with a medium-sized room that seats 12	B	B	C	B	-For conference spaces, amenities include: -Glass front walls -Video conferencing -Smart boards -Whiteboard wall surface -Acoustic treatment -Blackout shades -Sealing off space abuttiing exposed earth with perimeter waterproofing
	Staff Offices	1590	A mix of enclosed and open offices	A	A	B	B	-1/3 of offices occupy open space within reading rooms and supplemented by enclosed consultation rooms -2/3 occupy enclosed office spaces adjacent to reading rooms
	"Old" Stacks Zone	7150		N/A	B	A	A	-Place continuous counter along light well -Replace 20 carrels (main floor & mezzanine)
	"New" Stacks Zone	18500		N/A	B	A	A	Remove a range (shelving) from east side and west side, remove 4 feet of -Remove 4 feet of range (shelving) along north side

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FLR	FUNCTION	Area (sq ft)	Space Description	Level of Finishes	Furniture	Technology Provision	Lighting	Notes
1	**Open-Air Courtyards**	**2250**	2 Courtyard within light wells	N/A	B	A	B	-Created paved occupiable area over existing roof -Add doorways from each adjacent stairwell through existing wall for user access
	Meeting / Study Area between green courts	**300**	Open meeting area	B	B	A	B	
	Freight Elevator Lobby	**125**		A	N/A	N/A	N/A	-Install freight elevator cab and shaft within existing infill slab area between original building and addition
	Receiving Room & Dock	**800**		N/C	N/C	N/C	A	-No change to room apart from MEP and FP upgrades
	Mail Sorting	**60**		N/C	N/C	N/C	A	-No change to room apart from MEP and FP upgrades
	Building Maintenance (Rm 113)	**750**	Storage space	N/C	N/C	N/C	A	-No change to room apart from MEP and FP upgrades
	Staff Offices	**4270**	A mix of enclosed and open offices	A	A	A	B	
	"Old" Stacks- Replacement with New Infill	**7890**		N/A	B	A	A	-Place continuous counter along light well -Replace 20 carrels (main floor & mezzanine)
	"New" Stacks Zone	**18460**		N/A	B	A	A	-Remove a range (shelving) from east side and west side -Remove 4 feet of range (shelving) along north side
	Books Arts Press / Rare Book School	**5270**	Renovated office and work space	A	N/A	A	A	-Assume base building provision, tenant to provide own furnishings and equipment
	Printing Services	**2700**	Renovated office & production space	A	N/A	A	A	-Assume base building provision, tenant to provide own furnishings and equipment