Allan Price Science Commons & Research Library

Conceptual Design Study

University of Oregon

June 2013

UNIVERSITY OF OREGON Libraries

PIVOT ARCHITECTURE

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EXECUTIVE SUMMARY

The Science Library needs reimagining to remain relevant in an era of both unprecedented integration among the sciences in academic research and education and in the rapidly changing nature of the way people use information technology to accomplish traditional library tasks. To meet the long-standing need for additonal space, made acute by the dramatic evolution in the type of space contemporary libraries require, the University has begun planning for the first major renovation to the Science Library in twenty years and only the second significant update to the facility in its 45-year history.

The following report documents the process undertaken in the initial conceptual design of a remodeled Science Library and explores some of the possible design responses to the requirements discovered in that process. The focus of the effort was exploratory in nature and emphasizes broad and thorough investigation over a single, well-developed alternative. Design challenges and opportunities discovered in the six-month process were recorded. Finally, several promising alternatives were explored and evaluated to inform a future design process. This study was not intended to determine THE solution to the design challenge and consequently many of the alternatives explored have both compelling aspects and unworkable drawbacks. That inherent tension was understood and intentional.

The Science Library has many unique challenges presented by its physical location. The entire facility is below grade and consequently thirsts for daylight. Finding and entering the facility for a newcomer is relatively opaque and confusing. While the majority of its space lies below the concrete courtyard formed by Onyx Bridge and Klamath, Willamette and Cascade Halls, both active library space and required exits extend under three adjacent buildings. A major campus north-south pedestrian and bicycle connection passes over its roof.

At several public workshops held in the Library, we learned how the University community uses the current facility and heard ways in whichna rennovation might assist them with their academic pursuits. Many enjoy the diversity of environments the current facility provides, from quiet solo work to active group study sessions. Most agree more seating space and less stack space is needed. Technological advances seemed to appeal to many faculty and researchers while undergraduate students were more interested in better availability of lower-tech items like white boards. We distilled the feedback received from these sessions into several themes, such as “Make a place that feels like science,” and “Cafe: provide nourishment for body and mind”. The themes should help to guide the transformation of the Science Library into the intellectual, social and cultural heart of the Lokey Science Complex.

Some modifications to the space program generated by a previous study were explored and debated. Of primary importance is the extent of the reduction of physical collections storage necessary to provide space for desired additional seating. While the final figures remain in flux, the current collection of roughly 243,000 volumes is anticipated to be reduced by more than half though both removal and conversion to digital versions. The space needed to house the remaining collection may be reduced by employing high-density, movable stacks. Off-site storage, for various reasons, remains outside the options considered feasible. Other space issues included the desire for a café

UO Lokey Science Complex showing Science Library Location

and its associated seating, and a commons space that is transformable from casual interaction and study space to a display and presentation area. Additional seating and work space is needed both in diversity and quantity. Integration of technology and its required power and data systems is needed throughout.

Several issues face the development of the exterior of the new library. The open space between buildings, identified in the Campus Plan as part of Onyx Green and commonly referred to here as “the plaza” sees lots of people moving through it, but fewer remaining to occupy the space. The surrounding buildings offer a variety of architectural character. Except for the trees growing out of the subterranean courtyard of the Library, nothing green grows in the plaza giving it an urbanity not readily found elsewhere on campus. Development of a new entry component seems easily accommodated near the center of the space, roughly where the existing courtyard now resides. Also possible, but slightly more challenging, is the development of the eastern edge of the plaza along Klamath Hall. The western edge along Cascade and all of the corners of the plaza seem less feasible for development for a variety of reasons.

Many opportunities arise from the programmatic shift in use away from a place to secure books towards a place for people to interact with knowledge and each other. By moving the collection to a separately secured sub-section of the library, the balance of the library's reading space can be physically porous, affording better connectivity with multiple points of entry and exit without compromising the security of the collection. Since the area under Cascade Hall has no access to daylight, it seems natural to store the collection there. By doing so, additional floor space for study and collaboration is made available under the plaza deck which can be perforated to admit daylight with relative ease. Rooms requiring acoustic enclosure seem to work best at the perimeter of the libraray, while open areas seem well-suited to being centrally located or, perhaps, along a single edge. A new, recognizable entrance is needed at the plaza level and a desired café seemed most successful when directly connected to this element. Many of these ideas are described in organizational diagrams that follow.

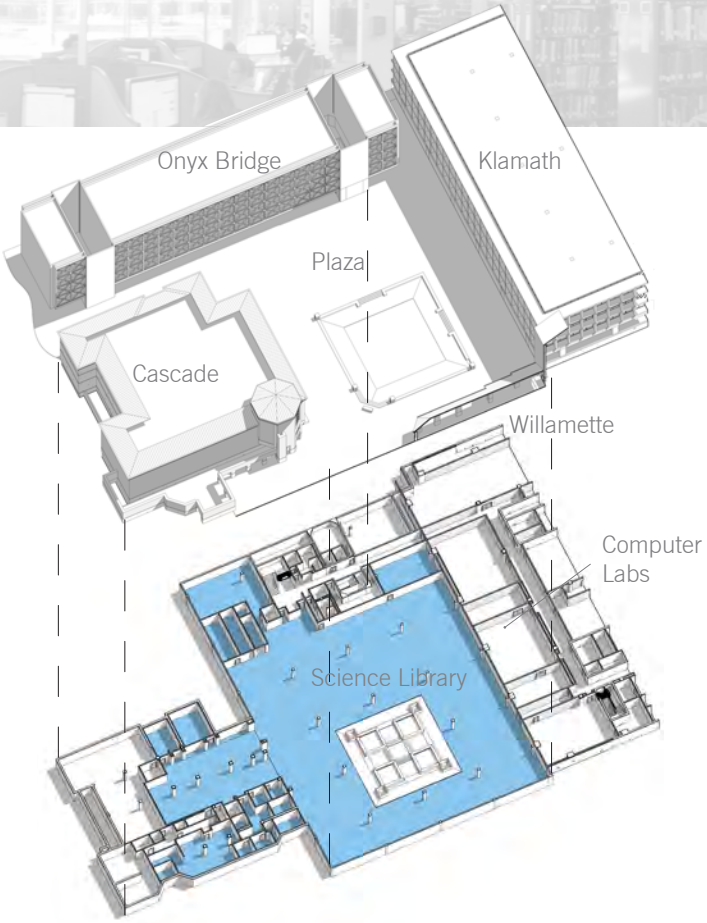
Many design challenges need resolution. The Library desperately needs a public face that marks the Hearth of the Sciences. The current facility has a distinct lack of above-ground visual presence. Many people told us they could not find Science Library until someone gavethem directions. A facility with such heavy public access surely deserves a physical presence within the science complex that welcomes users and visitors alike and identifies it as a center of study, learning and research. Additional daylight is needed below while the structures to admit it must not obstruct traffic patterns above. Onyx Bridge is thought to need replacement in the foreseeable future and consequently relying on that building’s systems seems tenuous. The dark space under Cascade Hall makes some sense for the collection, but is complicated by an irregular shape and structural columns. We hear the roof under the plaza concrete that protects the library from water-intrusion may be brittle and of limited longevity. Mechanical and electrical systems need updating and partial reconfiguration. Construction access will be challenging. All of these challenges can be addressed in subsequent design phases.

The resulting remodeled library space should be welcoming to the campus community, provide delightful space for users to spend many hours and provide a useful, supportive technological environment for academic study and research. The new space should be designed with intentional flexibility to accommodate changing space needs not yet anticipated and to maximize the investment’s longevity. The resulting place should serve as the gravitational, intellectual, social and cultural heart of the Sciences at the University of Oregon.

PROJECT BACKGROUND

Situated near the physical center of the Lokey Science Complex, the Science Library was constructed in 1967 as part of the Klamath Hall project. The library is located below the concrete plaza at the north end of Onyx Green and connects to several adjacent buildings below grade. During the construction of Cascade Hall in th eearly 1990's, the Library was expanded into the adjacent new building's basement to accommodate staff needs and an expanding print collection. Today, with approximately 28,600 gross square feet, the Science Library is home to most of the UO Libraries' materials that relate to biology, chemistry, physics, computer science, and environmental studies.

In addition to the physical collection, the library provides instructional and office space, individual and group study areas, an Anatomy and Physiology study room, and computer workstations. As enrollment at the University has grown, so has the need for additional space. From 2006 to 2012 total gate counts have increased by approximately 60,000. Simultaneously, increased use of digital resources and digital media have reduced the use of the physical collection and rendered large portions functionally obsolete. While the current facility has been actively adapted as use patterns evolved, space remains extremely limited. UO's science and research curriculum emphasizes integration of the sciences and requires small group projects and collaboration on a regular basis. Individual, quiet study space



Exploded Axonometric View of Science Library

is also necessary, and remains heavily used and in short supply.

Currently, the library accommodates 260 total seats of which 45 are in classroom instruction configuration, 25 as group study rooms, 10-15 are allocated to the Anatomy


Existing library reading room on west side of courtyard, looking north

& Physiology room, and the balance are dispersed for individual study or moveable for small groups. Several moveable screens and white boards are available to users to configure their own group study areas.

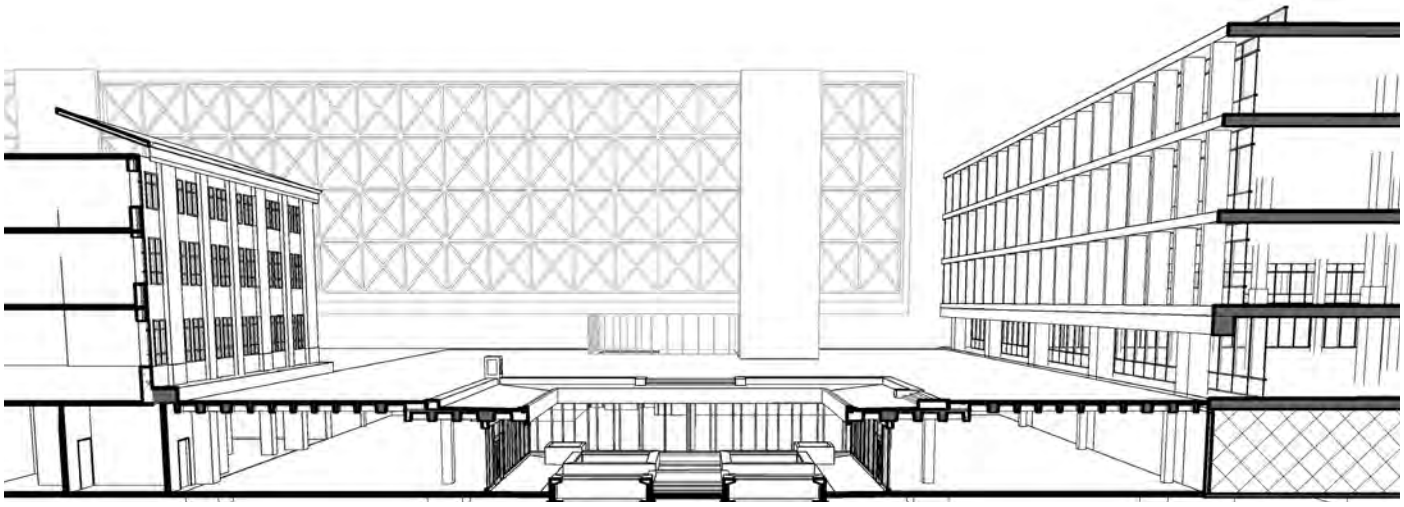
The current space is predominantly occupied by the collection and open study space. The current collection consists of approximately 243,000 books and journals. Shelving for the collection and its associated circulation space occupies about half of the total square footage of the library. Admin offices, the circulation desk and associated support spaces consume roughly another 5,300 square feet. Meeting/class rooms occupy another 1,600 square feet. UO Libraries also maintains several instructional computer labs in the basement of Klamath Hall, just east of the library proper but separated by a concrete wall. For the purposes of this study, the Klamath space has been considered as an option for library expansion and consequently absorbed into the available program area.

The Science Library offers a variety of resources and services to the University community. Large open study areas are very popular with students. Several smaller, collaborative group study rooms and classrooms with furniture that can be rearranged as needed can also be reserved. Digital tools such as Tandberg video conferencing is available on a reservation basis. There are 20 PC and 7 MAC computer workstations, 10 circulating laptop computers, 4 workstation scanners and one stand-alone Book Eye scanner. Mobile 3D displays with BluRay and video games consoles are also available. Individual study carrels occupy the quietest zones and larger, mobile furniture systems for small group study make for more lively acoustic zones. Reference Librarians assist with tours and teaching classes and on-call reference help. In addition, students can find tutoring help and Teaching Assistant hours.

In May of 2011, the design firm of Shepley Bulfinch assisted with the creation of a Vision Statement Document for the new Science Library. Initial programming was outlined in this report with the following 5 priorities highlighted:

- A central community space to facilitate interaction and connection.
- Collaborative study space to support evolving modes of teaching.
- Visible and expanded services to promote exploration and discovery.
- Flexible spaces that facilitate testing and experimentation
- Increased natural light

These concepts are further refined in this study and incorporated into the various explorations.

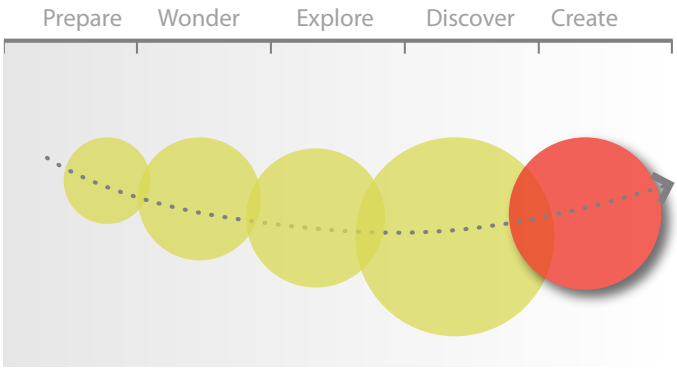


Existing section perspective through courtyard, looking north

PROCESS

The intent of this Conceptual Design is to test ideas for the expansion and renovation of the new science library. Our purpose was to investigate forces acting on the design of a new science library, document compelling alternatives, and chart the course for future design efforts. Those efforts in subsequent design phases it will need to interface with the University of Oregon's design process and adhere to the standards and requirements which govern its development on campus.

When structuring our efforts for the design process we thought of them this way:



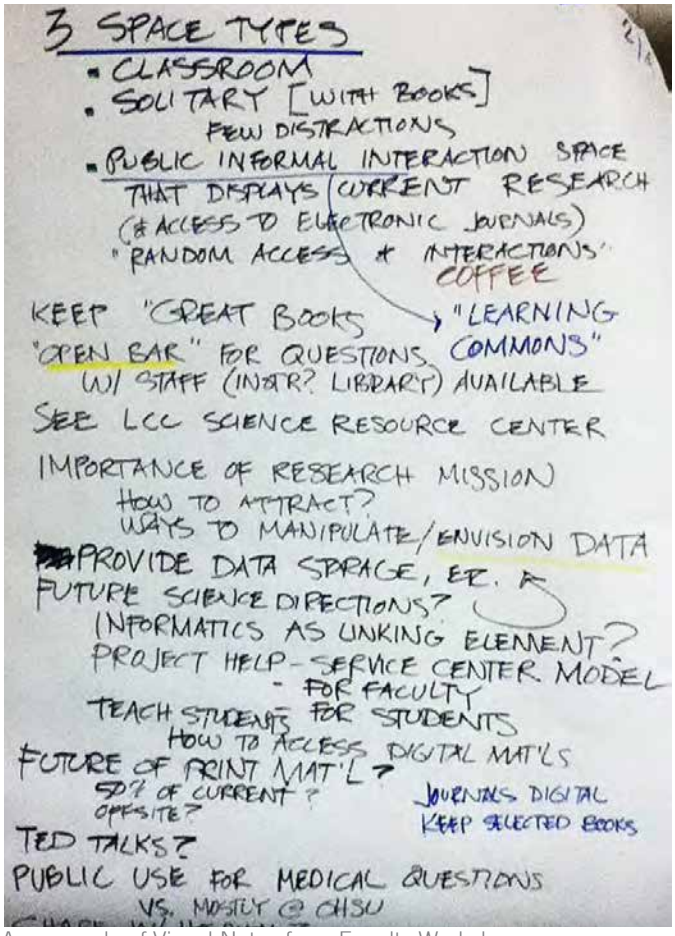
6 months

- **Prepare**- examine existing conditions and constraints.
- **Wonder**- Help the Science Library community dream; gain understanding of what could be.
- **Explore**- Understand tomorrow's research needs; Understand physical boundaries
- **Discover**- Expose opportunities; Investigate organizational options.
- **Create**- produce several compelling options; document findings for future design.

Each step in the process involved collaborative meetings with the Core Group to set goals, react to ideas and direct efforts. Several public outreach efforts in the form of workshops and forums were made to engage with the University's science community and garner their feedback on the current use and future aspirations for the facility.

Faculty Workshop

Over a dozen stakeholders (faculty, graduate researchers, administrators, etc.) from the sciences were invited to talk about the importance of the library and to envision its future. Several key ideas were generated in this workshop with perhaps the most significant being the aspiration to establish the Science Library as the intellectual, social and cultural heart of the sciences. Programmatic examples of what is needed to support this idea include instructional space, better video conferencing, public interaction displays, study space for individuals and groups, data



An example of Visual Notes from Faculty Workshop

visualization and data storage capabilities and a learning commons which would include a café, meeting space, and become the "hearth" of the new Science Library.

Library Workshop #1

The first workshop was held in the Science Library to encourage as many within the sciences to explore and document their current use patterns, identify successes and challenges of the space, and to collect their feedback using visual examples of other library and research commons recently constructed. Active note taking, sketching and synthesizing of feedback was ongoing. A 'Big Idea' wall allowed participants to document ideas that seemed to transcend any one category. Comments and feedback was later sorted into categories and synthesized into emergent design themes. These themes helped to develop the program further and identify key strategies necessary for the new facility. They seem to stem from the culture and values of the current facility and are intended to guide future development there. A list follows in the next section. Materials and notes from the Workshop can be found in the Appendix.

Workshop #1 Sketching

Library Workshop #2

During a second workshop held in the Science Library six weeks later, we began to test organizing ideas and spatial adjacencies and solicit feedback from participants. Several organizational strategies emerged which began to address the strong relationship between the needs of development above and below the plaza level. The challenge of bringing ample daylight through the plaza deck was explored, as well as the need for visual cues above the plaza deck for campus way-finding. Within the library proper further refinement of the program elements occurred as we began to test their relationships.

Core Group Meetings

A total of six meetings with the core group allowed us to investigate and test ideas discovered in the process. These meetings were invaluable in directing our effort and critiquing the results.

Office Work Sessions

Much of the detailed design refinements and graphical representations were completed by the staff of PIVOT Architecture in our offices in Eugene.

Workshop #1 - Idea board

PROGRAM DEVELOPMENT

PIVOT worked with the Core Group to verify the relevancy of the Vision Statement's original 5 priorities and to refine how they might be incorporated into the design responses. Discussion during the various workshops discovered ten important themes.

Emergent Design Themes:

1. **Make a place that feels like science**. Provide for display or presentation space that can spark interest in science and provide insight into the research and science of the University.
2. **Provide more study space that is acoustically and physically diverse**. Students have a variety of needs for study space. These include individual, quiet space, small group space, medium group space where noise will not be disruptive to others, some spaces bathed in light, some with carefully controlled light, thoughtful acoustics, moveable furniture, and variety of furniture and seating options. In summary, provide something for everyone or at least the ability to modify the environment to meet a variety of needs.
3. **Provide the physical, technological and intellectual resources needed by students and researchers to advance their fields**. Scientific teaching, research and learning are being driven by technology and the ability to access and manipulate data. Computers, high-speed access to the network, visualization and simulation capabilities, rapid prototyping, and video conferencing will continue to play a larger role in the information services provided to students and faculty. The physical space and staff expertise are needed to support these existing and emerging requirements.
4. **Strengthen the connection to the science complex and campus**. Provide a more pronounced entry and presence at the library from the plaza level. Provide for views in and out of the library. Enhance the outreach component to the K-12 community to encourage an interest in the sciences. Locate the cafe so its convenient to all to find and use.
5. **Provide knowledge from data**. There has been an increased use of large data sets in research. The library is a great location to support the research through visualization and simulations. Provide a specific space where this type of data can be shared, manipulated and visualized in group settings of varying sizes and potentially linked via video conferencing to remote sites.
6. **Bathe in light controlled for the task at hand**. Provide for task-appropriate and controlled natural light. Incorporate more natural light into the space but balance with heat gain and glare. Balance natural light with appropriate artificial light to minimize glare. Office spaces should have views to the outdoors with good proximity to natural light.
7. **Enliven and beautify the plaza**. The existing sunken courtyard provides key design elements that are very favorable such as daylight, division of space, visual relief within the space and connection with nature. Incorporate these elements into the new design in a more functional way that provides protection from the elements, more accessible and with more landscape to enjoy.
8. **Make flexible space to increase longevity**. Design spaces for multiple uses that are adaptable and reconfigurable. Provide adequte wiring paths to accommodate future technology requirements. Provide moveable furniture, white boards, and numerous locations for power and data. Provide multipurpose

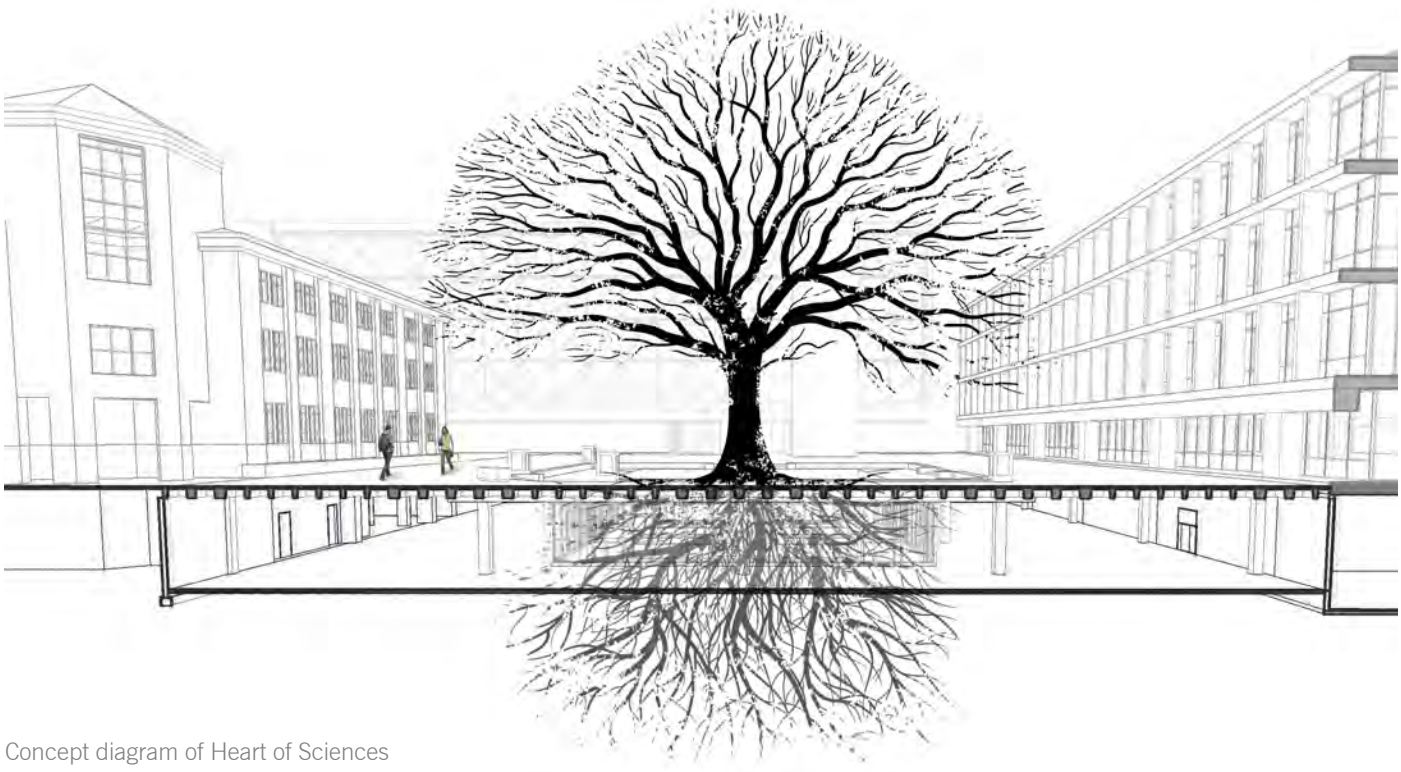
Cafe Roy at DePauw University

classrooms with diverse technological abilities that are appropriately sized and in proportion to the task.

9. **Café: provide nourishment for body and mind**. Provide a place for all disciplines to come together and share ideas along with a beverage or light snack. The central location could draw from the campus wide population. Create seating for a variety of uses.

10. **Create the intellectual, social and cultural heart of the sciences**. Create a porous edge between the library and adjacent buildings. Allow for multiple entry points to make it easy connections. Bring multiple disciplines together, scholarly communication, learning from others, create a science drop-in center or genius bar, offer scheduled discussion sessions, special presentations, offer office space to visiting professors and guests, create a hub of learning opportunities, exposure of the undergraduates to the sciences, inspire future generations.

A commons at ASU's Walter Cronkite School of Journalism (buildipedia.com)



Concept diagram of Heart of Sciences

PROGRAM ELEMENT DESCRIPTION

Using the Design Themes as a guide, the team further refined the previously established program document. In discussions with the Core Group it was determined that the program spaces should reflect the following attributes:

Café & Commons: Early in a subsequent design process, a market study will be necessary before a café component is included in the project. If incorporated, a café should offer beverages and light snacks. Seating should accommodate about 20 guests and should be open to the larger commons. Extended hours are desirable. Café should be a magnet for faculty and students to gather and share ideas.

Library Commons: The Library Commons is a visible front door, a social nucleus, a place for events with good connections to the café. This place should be prominent, well-connected and encourage casual use. It should have a strong connection to campus, the outside and daylight, as well as a centrality to the library as a whole. Flexibility for a variety of functions is needed. A variety of seating options should be available for studying, gatherings, group study, special events and presentations.

Library Services & Administration: Location should have prominence for easy patron access and would ideally be located between the collections and the open study area. Staff offices and work stations should have connections to the outside and to daylight. Consistent and strong desire was expressed for views to the outdoors and a close proximity to daylight.

Group study space at U. of Minnesota Health Sciences Library

Clapp Library Academic Commons at Oxidental College

Movable stacks allow for high density storage (image from hdfiles.com)

Collections: With a new focus, the housing of physical collections can become a subset of the overall space. Collections do not require daylight. Books and journals could be shelved in high density movable shelving to maximize the space available for student seating. Reference books or higher use books could be stored in standard shelving units. A new release book and journal area is desired and should be designed and located to encourage browsing with bookstore-like seating. Locate books where daylight is most restricted. Opportunities to separate the collection and security point from the balance of the library space should be explored to enhance flexibility and permeability of the library with adjacent buildings. Study space within the collection area would be a compatible use but is not required.

Exhibit Space: Provide space on walls or other display surfaces for student projects, current research, faculty displays, science related information. Discussions regarding curatorial responsibilities of this space were not conclusive.

Department Specific Rooms: Provide space for the successful Anatomy/Physiology room, as well as a new Physics / Chemistry version, and Computer Science room, possibly incorporating the Klamath Hall labs with power and data outlets but not necessarily computer workstations. Areas could provide space for teaching assistants and/or professors to hold office hours and help sessions.

Undergraduate Advising Suite: Will serve as the central facility for science outreach activities on campus. Different disciplines could meet and exchange ideas. Provide a reception area with comfortable seating and resources. Provide advising rooms around the perimeter.

Seating and Study Space: Both individual and small group study space is needed. Individual study space should offer a variety of options from soft lounge chairs, study carrels, alcove-type seating and open tables. Seating and study space for small groups should have chairs and tables that can be reconfigured easily and be located where conversations and collaboration will not be disturbing to those needing quiet. Ample electrical outlets and access to data should be provided to meet the flexible needs of the study areas. Spatial separation of individual and group study areas should consider both acoustic and visual distractions with a variety of experiences encouraged. Access to this area should be porous to create stronger connections to the Science Complex and campus. Ample daylight should permeate the space. Larger spaces may want to be near access points to minimize traffic through otherwise quieter areas.

Group Study Rooms: Small group study rooms should accommodate 2-4 people, have white boards, adequate electrical and data. Medium group study rooms should accommodate 10-12 people, moveable tables and chairs, white boards, and at least one should be equipped with static video conferencing. Larger group study rooms will function as collaborative learning spaces and should be flexible in their design to allow for study, presentations or instructional configurations. They should have similar amenities as the medium study rooms with the addition of projection screens.

Digital Technology Lab: Seating for 20-30 people to be used for Data Visualization, K-12 Tours/teaching and training. The Lab will be used for visualization/immersion lab and is intended to be a flexible black box that can be updated as technology evolves. Multiple technology needs include large, high resolution, interactive touch screens for group data viewing and manipulation, digital modeling and simulation, GIS, digital project management and multi-media scholarship, and science on a sphere-type installation.

Instruction / Lab: This space should accommodate 35 people and be highly adaptable as needs and technology changes. This will be a place for rapid prototyping, to explore and learn about cutting edge technologies, 3D printing, experiment kits, and hands on exploration.

Support: Adequate restrooms, storage, and building system support space should be provided. Restooms should connect to the very public Commons and perhaps other areas. It is anticipated that a new entry to the library is

University of Oregon New Science Library: Conceptual Program

4/1/2013 — **Minimum Quantities and Areas Required**

Proposed Facility	Proposed Quantity	SF/ Unit	Aprox. Size	Proposed NSF	Notes
Seating and Study Space					
Open Reading / Individual Study	160 seats	35 SF	5x7	5,600 NSF	
Open Reading / Group Study	100 seats	25 SF		2,500 NSF	
Department Specific Rooms	30 seats	30 SF	16x18	900 NSF	(3) rooms for 10 people each
Small Study Rooms, Small, 2-4	20 seats	30 SF	10x12	600 NSF	(5) rooms for 4 people each
Subtotal Seating	**310 seats**			**9,600 NSF**	
Instructional Spaces					
Digital Technology Lab	20 seats	45 SF	25x36	900 NSF	(1) room; specific technology
Instruction / Lab / Experiments / Presentation	35 seats	25 SF	25x35	875 NSF	(1) room; need tall presention lab
					(3) rooms for 12 people each; 1 w/ video
Group Study Rooms, 10-12 occupants	36 seats	25 SF	16x18	900 NSF	conferencing
Group Study Room medium	25 seats	25 SF	20x31	625 NSF	(1) room
Group Study Rooms, Large, 25	50 seats	25 SF	22x28	1,250 NSF	(2) rooms for 25 people each
Undergraduate Advising Suite	1 area	1000 SF		1,000 NSF	Open plan with clear entry
Subtotal Instructional	**166 seats**			**5,550 NSF**	
Library Service & Administration					
Librarian Offices	6 staff	130 SF	10x13	780 NSF	(6) rooms for 1 person each
Staff Workstations	3 staff	100 SF	10x10	300 NSF	(3) spaces for 1 person each
Student Workstations	2 students	50 SF	6x8	100 NSF	(2) spaces for 1 person each
Workroom	1 space	800 SF	26x30	800 NSF	
Storage	1 space	250 SF	14x18	250 NSF	
Service Points	1 space	500 SF		500 NSF	
Subtotal Administration	**9 staff**			**2,730 NSF**	
Collections					
Reference	1 area	1120 SF		1,120 NSF	6000 vols; High density storage
Collections*	1 area	7440 SF		7,440 NSF	High density storage
New Book Area	1 area	300 SF		300 NSF	Display type shelving
Cold Storage Collections	1 area	350 SF		350 NSF	Might be phased out
**Assume reduction from 242,798 vols. To 144,000 vols*					
Subtotal Collections				**9,210 NSF**	144,000 volumes;
Public, Event and Exhibit Spaces					
Library Commons	60 seats	35 SF		2,100 NSF	
Café Seating	20 seats	30 SF		600 NSF	
Servery		500 SF		500 NSF	
Subtotal Public / Social Spaces	**80 seats**			**3,200 NSF**	
Total Net Library Area	**556 seats**			**30,290 NSF**	
Non Assigned Area					
Restrooms				500 NSF	
Mechanical / Electrical / Data				300 NSF	
Circulation				1,000 NSF	
Structures and Partitions				350 NSF	
Subtotal Support				**2,150 NSF**	
TOTAL PROGRAM AREA				**32,440 NSF**	

Existing Space Basement Level: **28,963 NSF** Does not inlcude existing courtyard

Additional Space Needed: **3,477 NSF**

Additional space available:

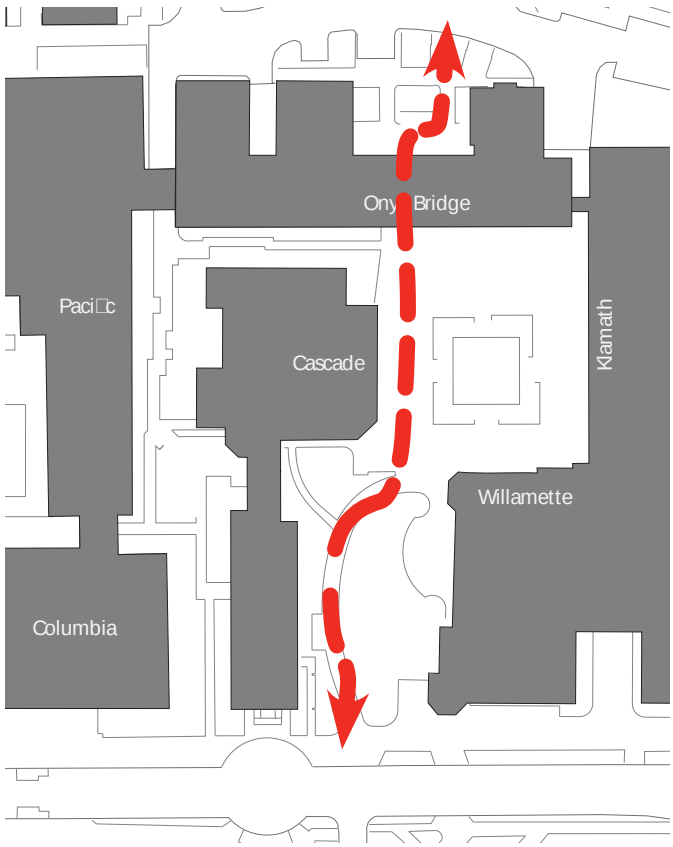
In Basement of Klamath Hall:	**3,839 NSF**	summation of rooms below
Klamath Hall Room B13	1,582 NSF	
Klamath Hall Room B13A	635 NSF	
Klamath Hall Room B13B	545 NSF	
Klamath Hall Room B26	1,077 NSF	
At existing Library courtyard, basement level:	**3,259 NSF**	measurement at glass wall face

SITE OPPORTUNITIES & CONSTRAINTS

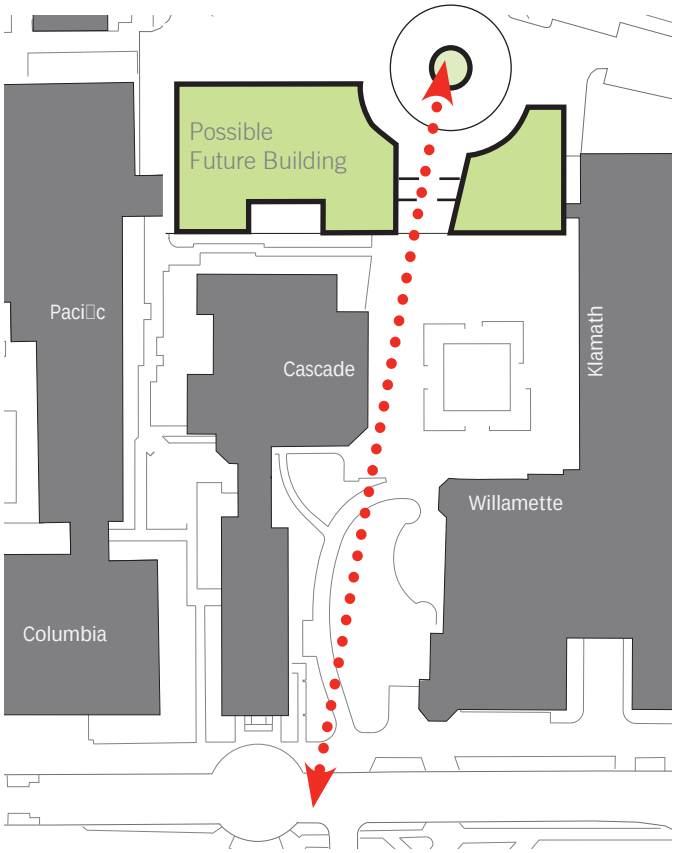
The existing library is located beneath the Onyx Green, an outdoor space surrounded by Cascade, Klamath, Willamette Halls and the Onyx Bridge building in a portion of campus designated as the "Academics, Research and Support Services Design Area". This area is regulated by the Campus Plan policies and patterns as well as the Biennial Capacity Plan for density and allowable area constraints.

The Onyx Green is a designated open space in the Campus Plan. It serves primarily as a pass through space rather than a destination. This is due in part because the plaza is paved in concrete and contains few opportunities for activity nodes. At the center of the Onyx Green is a large sunken courtyard accessible only from within the Science Library. This courtyard is defined on two sides by covered bike racks that are heavily used. The expanse of concrete and edges of the adjacent buildings lend an unwelcoming and barren feeling to the place. The most used area of the plaza is the small concrete plinth along the west edge of the plaza at Cascade hall. Sunlight bathes this area making it a desirable place to occupy.

The west edge of Onyx Green is a major pathway for bicycles, pedestrians and skateboards. This pathway connects campus to the north side of Franklin Boulevard and the north side of campus. Access needs to be maintained and connection points at the north and south edge of the Green



Major circulation path through Onyx Green

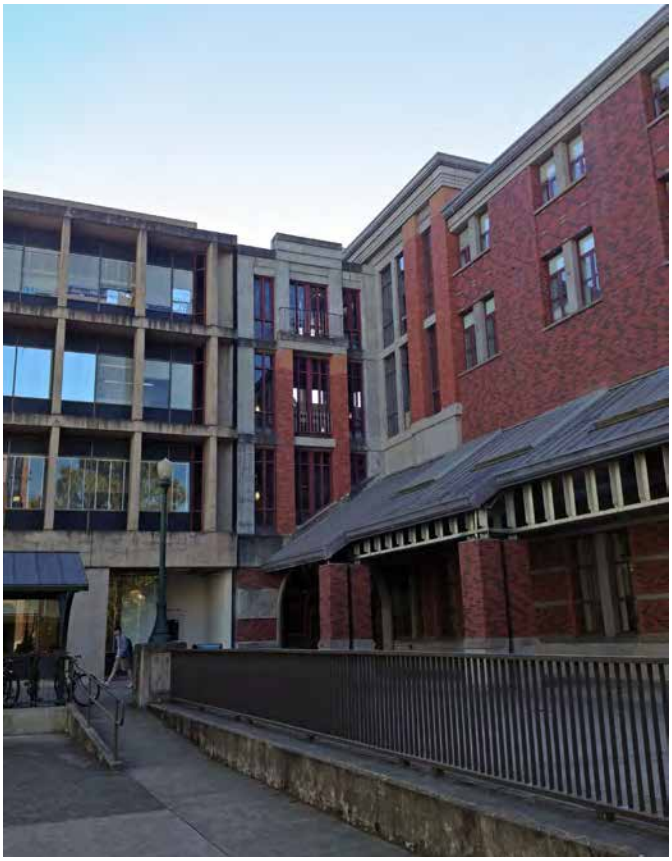


Visual access through possible future building to Franklin Blvd.

improved to reinforce view corridors. Consideration should be given to long range planning and the eventual removal and replacement of the Onyx Bridge Building.

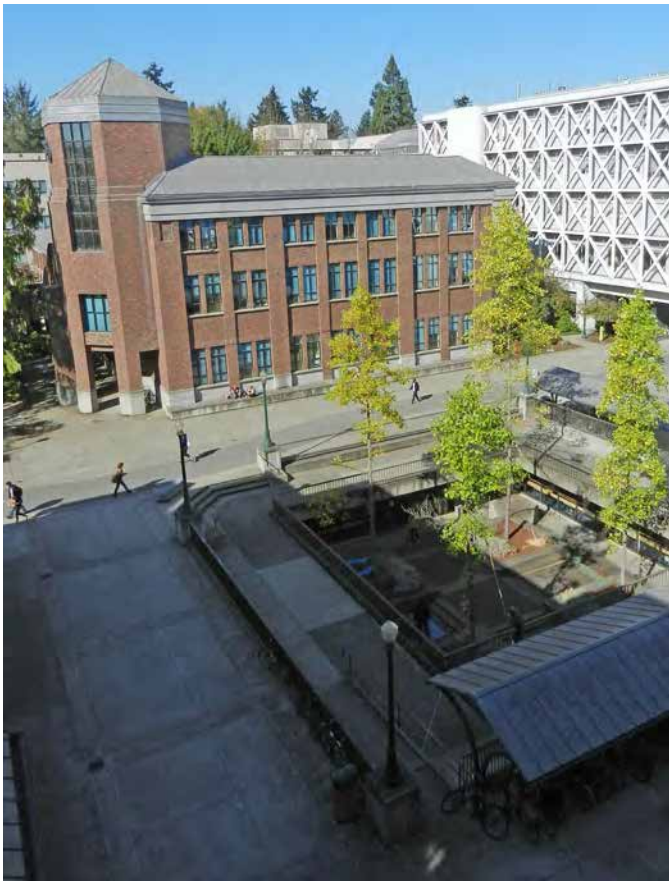
Opportunities to minimize conflict with the pedestrian and bike pathway should be explored. The Onyx Green could benefit from additional landscape and activity nodes to enliven the space and its surroundings.

The new Science Library design could consider enclosing space currently occupied by the sunken courtyard or creating an additional plaza level building to form a new entry into the library below. Opportunities to introduce daylight into the basement level should be explored. Consideration should be given to the quality of light necessary for the task at hand in the Library as well as impact to the above grade plaza level.

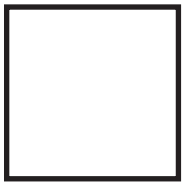


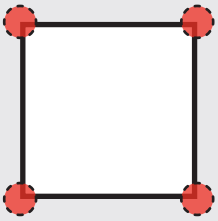
Southwest corner of Plaza as seen from courtyard

Pedestrian ramp leading to Plaza

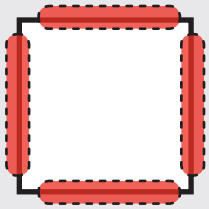


Plaza with courtyard as seen from above

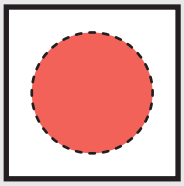




CORNERS



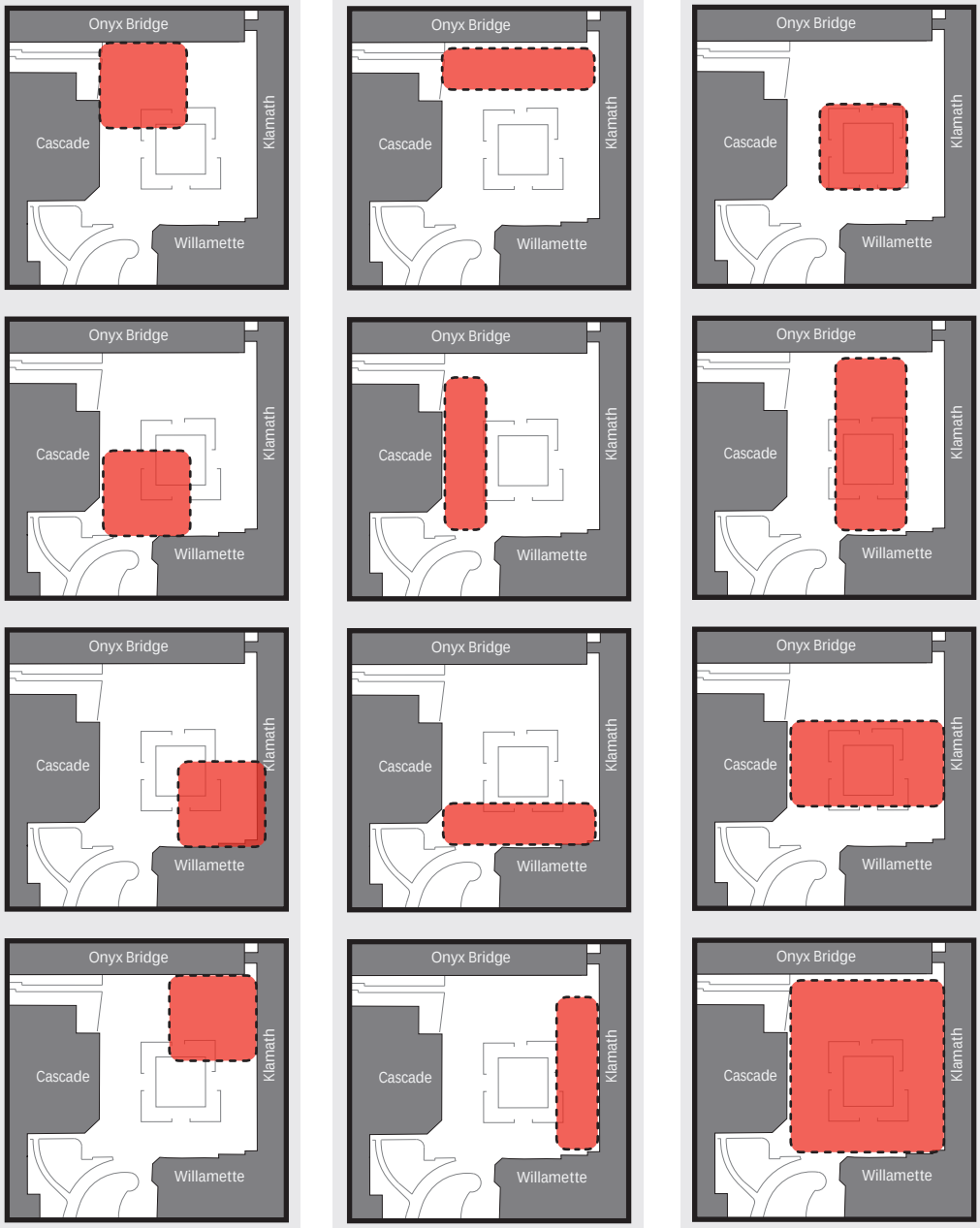
EDGES



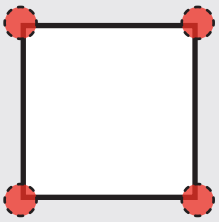
CENTERS

The following diagrams represent the possible ways in which a plaza level structure could interface with the Onyx Green. As the design advances, it is important to evaluate the impact of this new facility in the larger Campus Plan framework. While these diagrams do not attempt to represent actual floor area or final configurations, they are meant to illustrate the core concepts of development in the space.

The northern end of Onyx Green is shaped by adjacent buildings into a roughly square plaza. A square is characterized by four corners, four sides and a center. Some possible ways of building within a square are shown at right.



PLAZA DEVELOPMENT OPTIONS



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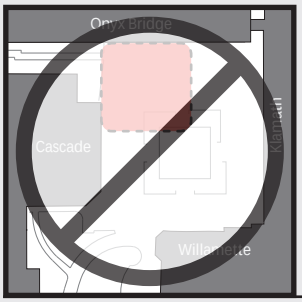
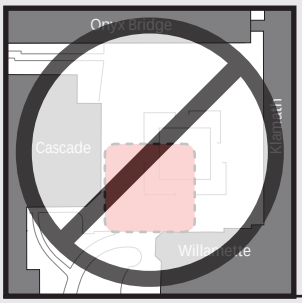
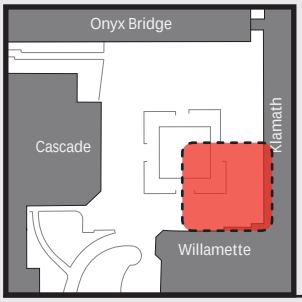


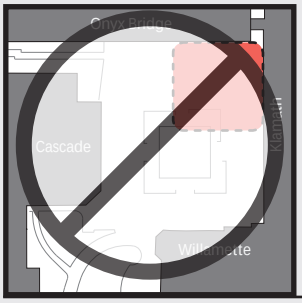
This option builds up against Onyx bridge, a building expected to be replaced in the future. Building here would also obstruct the major pedestrian/bicycle connection between campus and north Eugene. There seems little merit in pursuing this alternative.



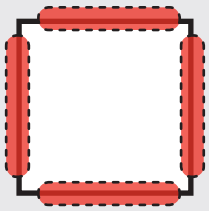
This option builds in the throat of Onyx Green, effectively dividing an important outdoor space in half. Building here would also obstruct the major pedestrian/ bicycle connection between campus and north Eugene. There seems little merit in pursuing this alternative.



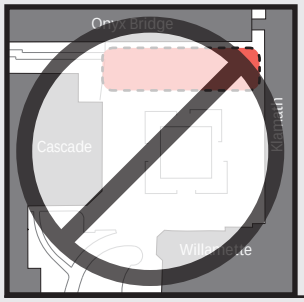
This option builds in the southeast corner of the plaza affording good connections to Klamath and Willamette Halls and the Science Walk. By developing on the north side of the four-story Willamette Hall—effectively in its shadow—there may be good opportunities for ample indirect light. Challenges include the physical tie in to the sloping roofs of Willamette Hall and the exterior glazing on the west facade of Klamath Hall. Exiting from Klamath and WIllamette Halls would need to be addressed. This position is hidden from view when arriving from the south.



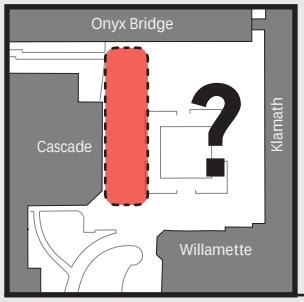
This option builds up against Onyx bridge, a building expected to be replaced in the future. Challenges include the exterior glazing on the west facade of Klamath Hall. This position would be prominently in view when arriving from the south. However, the proximity to Onyx Bridge probabaly makes this option untenable.



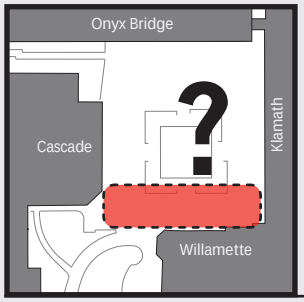
EDGES



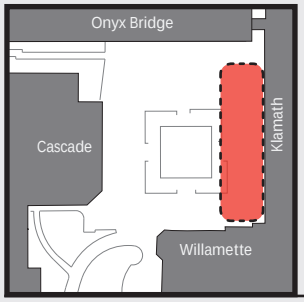
This option builds up against Onyx bridge, a building expected to be replaced in the future. Building here would also obstruct the major pedestrian/bicycle connection between campus and north Eugene. There seems little merit in pursuing this alternative.



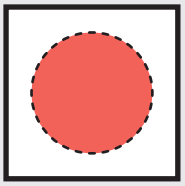
This position could be compellingly prominent If care were taken to accommodate pedestrian/bicycle access, spatial connectivity of Onyx Green as a whole. Building here would displace the major pedestrian/bicycle route, but not necessarily obstruct it. Tying in to the facade of Cascade Hall would require addressing access to light and views for the residents of Cascade Hall. The expansive east-facing wall would not be ideal for controlled daylighting. The northern end, adjacent to Onyx Bridge, would need to accommodate future construction



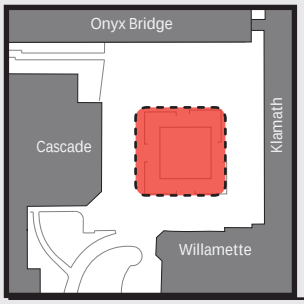
This option affords good connections to Willamette Halls and the Science Walk and possible connections to Klamath Hall. By developing on the north side of Willamette Hall there may be good opportunities for ample indirect light from the north. Challenges include the physical tie in to the sloping roofs of Willamette Hall. If extended into the throat of Onyx Green, care would need to be taken to accommodate pedestrian/bicycle access and spatial connectivity of Onyx Green as a whole.



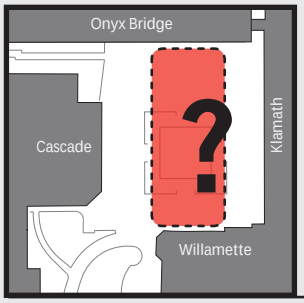
This option builds up against the west facade of Klamath Hall. That facade has known issues with intense solar exposure from afternoon sun. This position is could be viewed when arriving from either the north or south but would be hidden from more distant views. Preservation of daylight and views for the residents of the first and probably the second floors of Klamath Hall would require resolution.



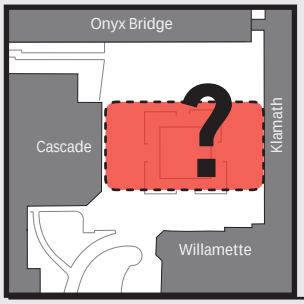
CENTERS



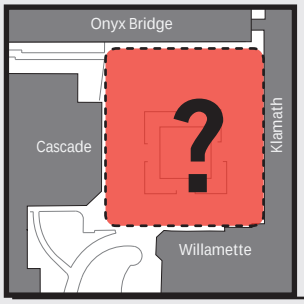
While occupying the center of the plaza has spatial challenges for Onyx Green, this option has few other drawbacks. The 1988 design for Cascade Hall included a bid alternative for this option that was not pursued for financial reasons. Good visual presence, flexible connectivity, multiple internal circulation options all make this an attractive option.



This option would preserve the pedestrian/bicycle connection in tact and would be prominently visible, but also makes a significant change to the shape and character of Onyx Green and leaves a sliver of outdoor space to the east, adjacent to Klamath Hall. Good connections to Willamette Hall are possible. The northern end, adjacent to Onyx Bridge, would need to accommodate future construction. Properly controlled skylighting could provide for good daylight potential below. code implications arise from limiting existing buildings' frontage and fire access.



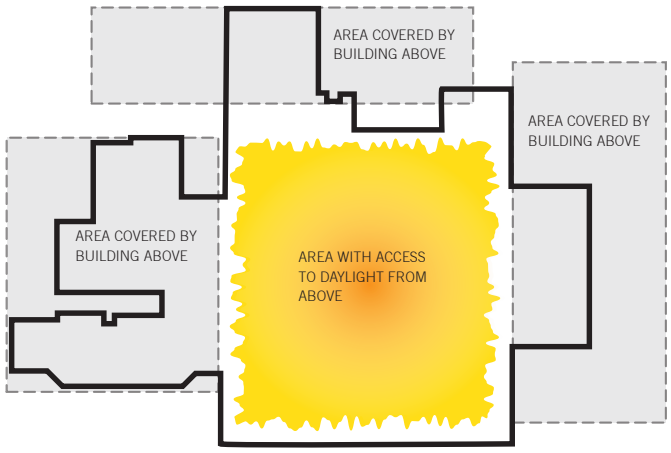
This option affords good connections to Cascade and Klamath Hall. While it seems counter-intutive to build over/across the pedestrian/bicycle access route, if accommodated carefully, this option would be very prominent. Spatial connectivity of Onyx Green as a whole would be significantly affected. Properly controlled skylighting could provide for good daylight potential below. Preservation of daylight and views for Klamath and Cascade Halls, as well as internal reorganization of perimeter areas within these buildings, would require resolution. Code implications arise from limiting existing buildings' frontage and fire access.



This option might replace the concrete plaza in its entirety with a combination of glazed roofing systems and more solid walkways/green spaces. However, filling the Green with an above grade building, effectively obstructing access to and covering windows of adjacent buildings does not seem appealing, Accommodating the north-south bicycle/pedestrian route would be a challenge, if not extremely difficult. Significant code implications arise from limiting existing buildings' frontage and fire access.

DESIGN CONSIDERATIONS

Design investigations during this process have highlighted several important responses to the design challenges unique to the Science Library. Several issues include Access to Daylight, Collection Size and Configuration, Furniture Considerations, Activity zones, Strengthening Connections.



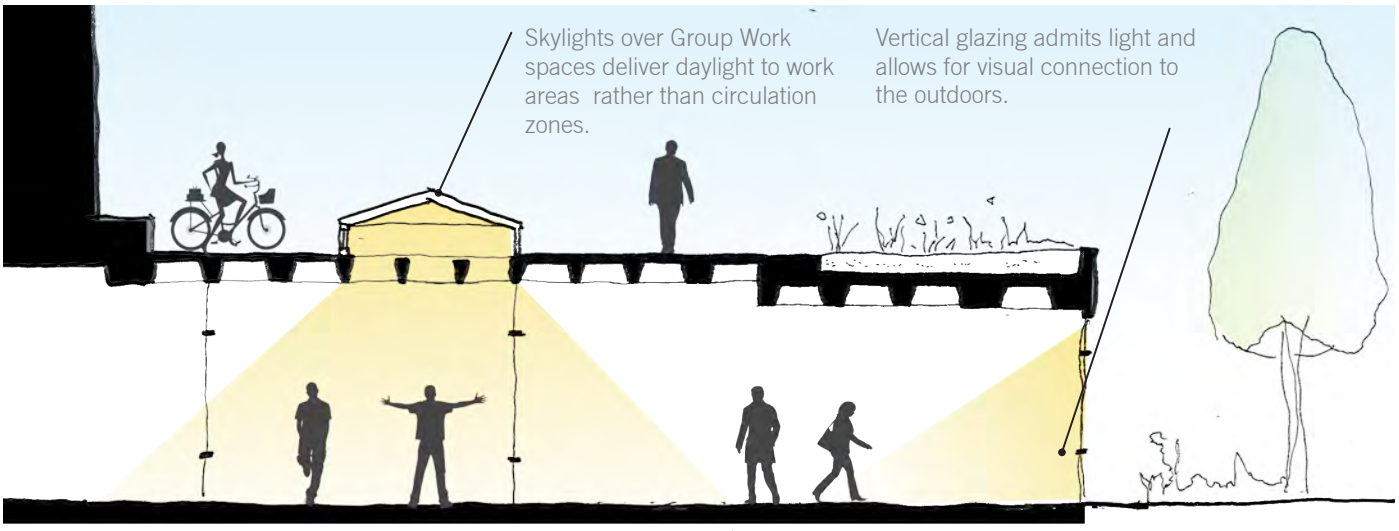
Plan Diagram illustrating daylight opportunities

Access to Daylight

Tasks that require long periods of concentration on visual materials, like reading or group communications are strengthened by ample lighting. Daylight is desirable since it has excellent color rendition, is free, and connects people to the natural cycles of the environment. In every workshop and meeting we heard that users of the library crave daylight. Staff who spend long hours working in the library were vocally in support of increasing the access to daylight and views to the outside throughout the facility, but especially at administrative office areas.

Illuminating an interior space with daylight requires, among other things, a careful balancing of intensity to ease glare problems which could lead to user eye strain. Ideally the newly remodeled spaces would have lighting from multiple sources. Each source should employ controls to admit light but minimize direct sun shining on work surfaces.

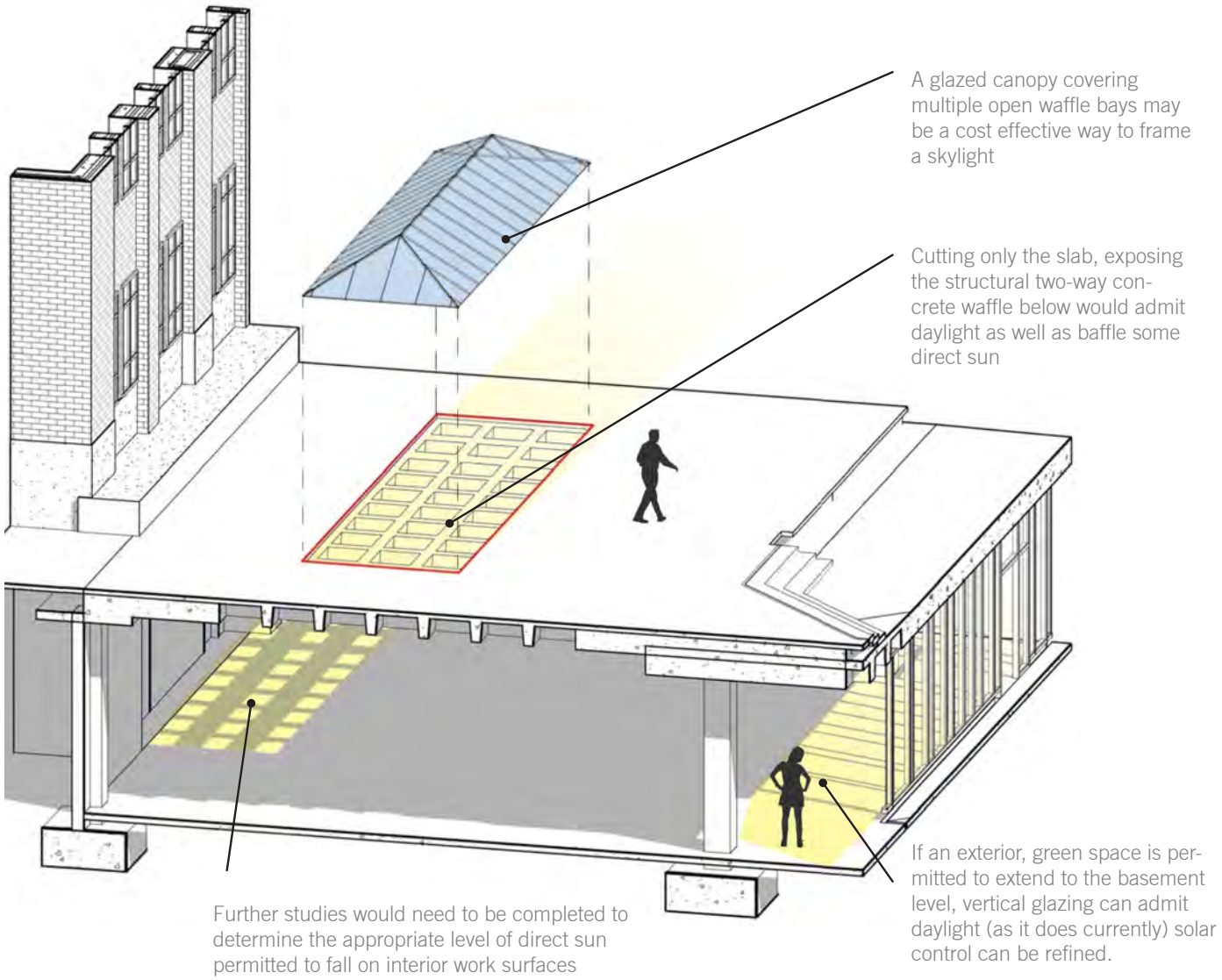
Several strategies seem possible for the New Science Library. As proposed in previous studies, a glazed covering could turn the existing courtyard into a large skylight. Alternatively, multiple smaller openings could be cut in the plaza deck at strategic locations. Since the structural support of the plaza deck is a two-way "waffle" slab, one option might be to remove the concrete slab but leave the deep



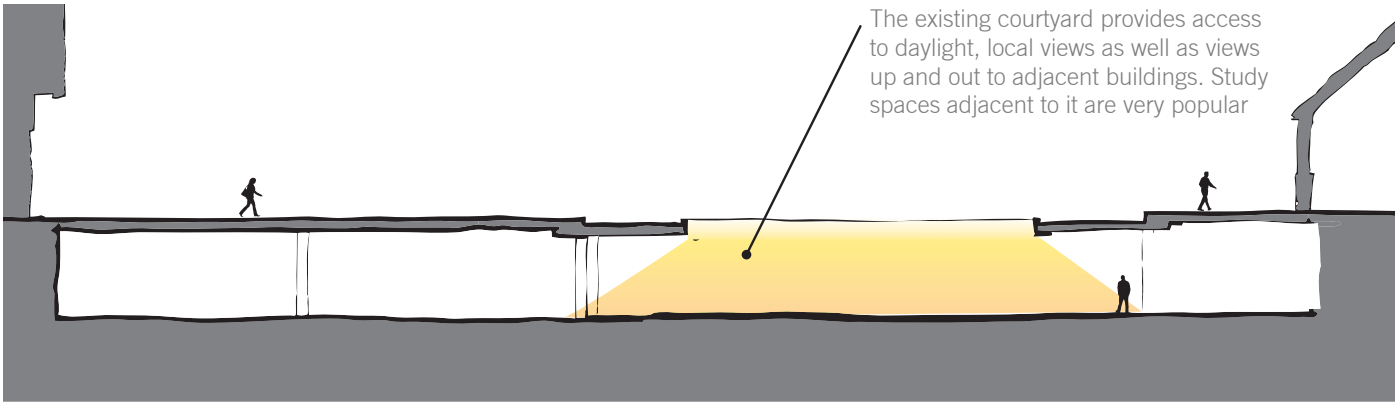
Section diagram through Science Library and courtyard

concrete beams below to act as baffles for sunshine.

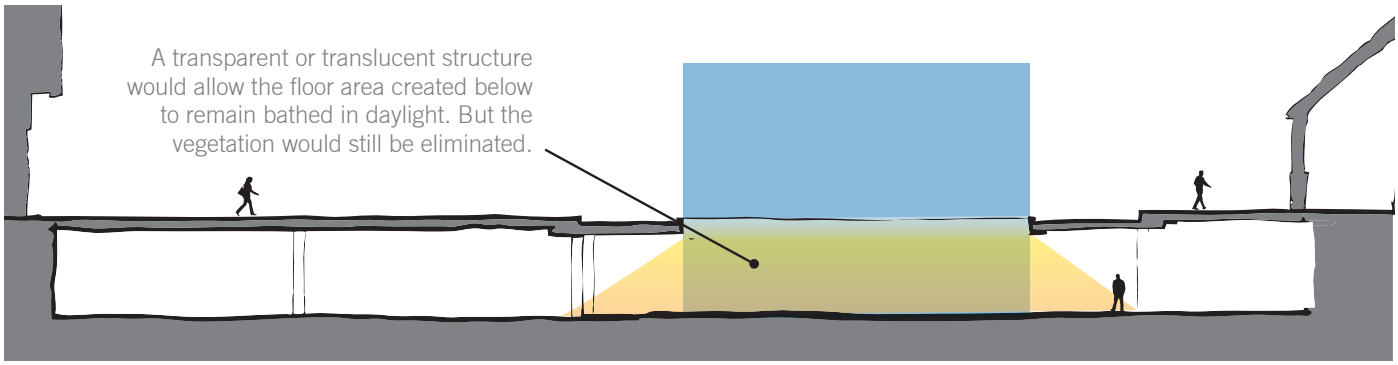
Alternatively, the courtyard could be maintained and augmented by additional skylights elsewhere. Several workshop participants indicated they prefer the visual relief the existing courtyard affords. The courtyard has the added benefit of creating an acoustic separation between study areas of differing acoustic vibrancy.



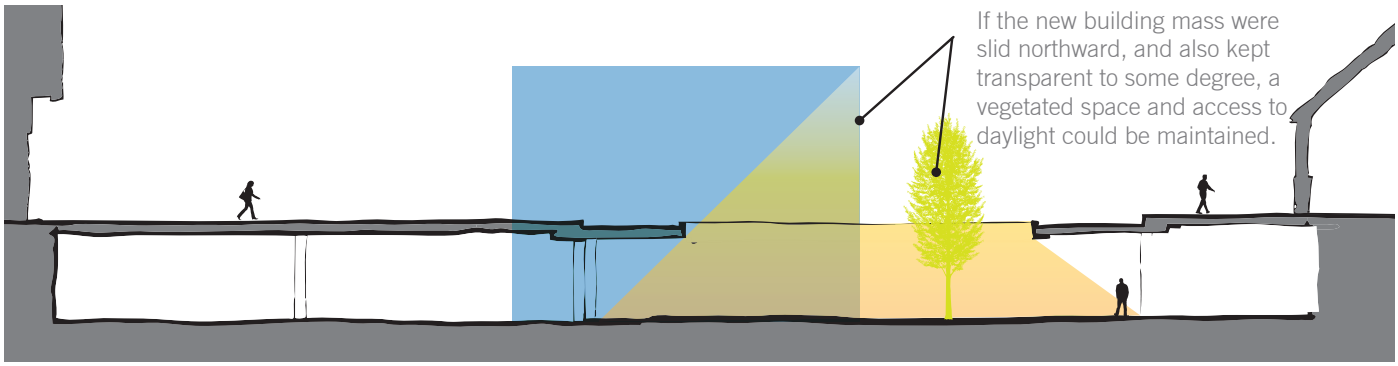
Sectional diagram showing skylighting strategy



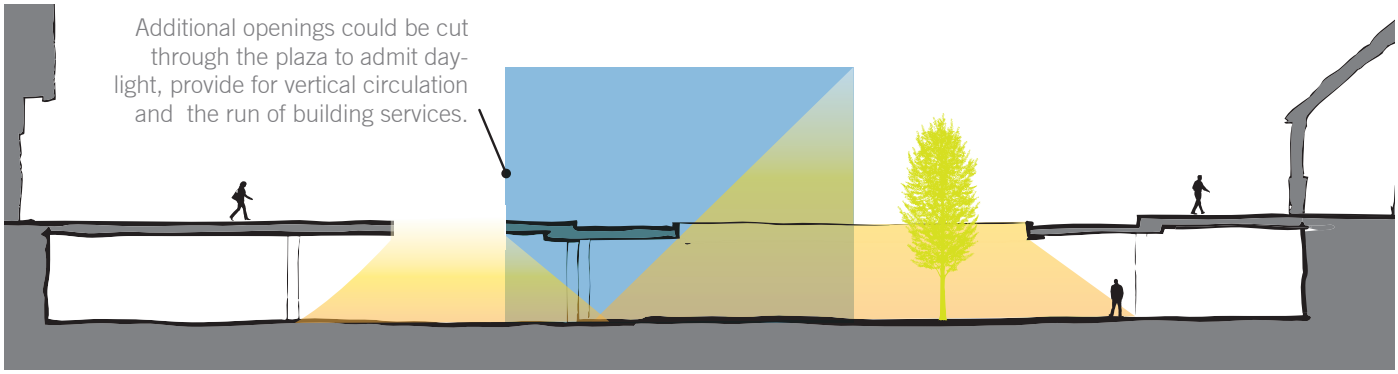
Existing Science Library Courtyard Daylight Diagram - Section



Daylighting Strategy with new addition at plaza level- Section



Dayiighting Strategy with partial courtyard - Section



Daylighting Strategy with additional openings - Section

Collection Size and Configuration

In order to achieve the desired program goals for study area, seating and instructional space, a significant reduction in the collection size needs to be achieved. Several factors outside the scope of this document need to be considered such as off site storage, digital archiving, cost of digital only journals and resources, etc. The following information is provided as information to help inform the reduction of the collection.

Change in Customer Service needs:

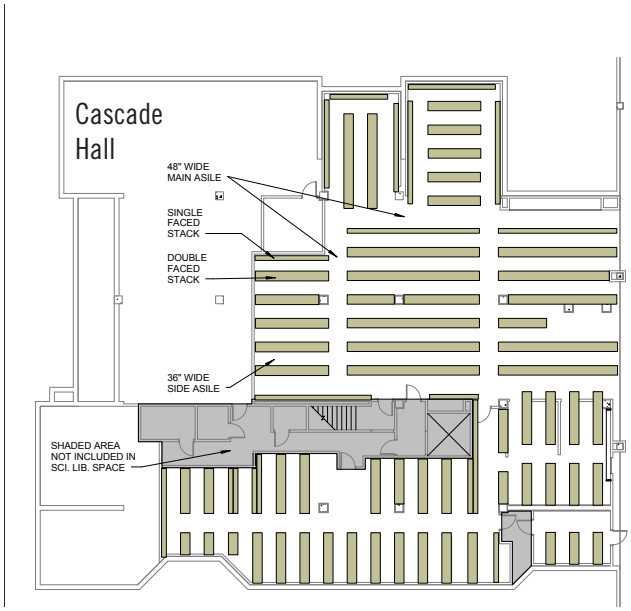
- Collection shifts to digital resources and data services.
- New staffing model that supports digital resources, instruction and outreach.
- Create a space that encourages interaction, collaboration, discovery.
- Improved access to digital sources will be needed.
- Provide training and support of digital tools.
- Data Set Management, assistance, training.

Collection Size and Reduction criteria:

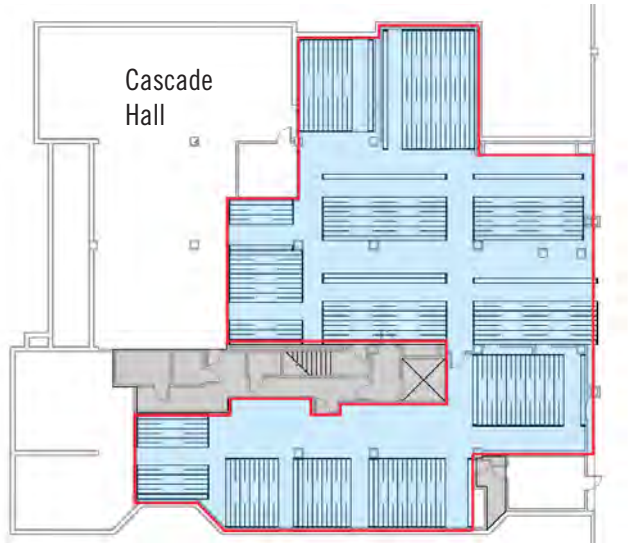
- Priority for reference materials (6,000 volume size)
- Materials that are not available electronically or have special agreements
- Heavily circulated items
- Textbook loan program
- New releases- hard copy vs. electronic
- Faculty input- identification of important or heavily referenced books.
- Journals- those not available in electronic format.

Other issues:

- Are the items removed from the collection stored off site for retrieval?
- Establish how to manage future growth of hard copy sources.
- Confirm that 10% growth for the collection is consistent with what you can achieve.
- Determine Reference collection access- are the books in traditional stacks or high density storage stacks?
- Additional new release space is assumed to be outside of the total volume collection size. These will be accommodated in a low density display format. Average of 1 volume per LF to 4 volumes per LF. Need to confirm total volumes.



Collection in traditional storage shelves



Collection in high density storage shelves

- 6. Speciality Storage- video games, CD's, oversize, etc. Need to quantify collection size.

Reference Collection planning:

- Plan for collection Size of 6,000 volumes
- 6 volumes per LF for planning shelf space
- 6,000 vol / 6 per LF=1000 LF needed
- Determine how much of Reference collection needs / wants to be in standard stacks, lower height stacks or high density storage.

Existing Collection Size:

Journals:	114,798 (2,128 must remain on shelf)
Books/Reference:	128,000 volumes[1]
Total Collection Size:	242,798 volumes

Footnotes:

1 Includes 6,000 volumes of Reference

2 Includes maintaining 2,128 volumes

Shelf capacity depends on several factors including overall height (number of shelves), open space required to manage the collection and high density or traditional shelving. The following are general planning assumptions used to test fit the reduced collection size in the basement of Cascade Hall in the west part of the existing Science Library.

General Assumptions:

- Maintain 15% free space for shelf management
- Maintain 10% for growth of the collection
- Assume space for display, new release, etc. is not included in total volume calculation
- Assume stacks are 7 shelves high.

Shelf Capacity:

Type	LF Available	Volumes (100% capacity)		
		@ 6 v/LF	@ 7 v/LF	@ 8 v/LF
Traditional	9,700 LF	55,200	67,900	77,600
High-Density	21,455 LF	128,700	150,000	171,600

Reduction Strategies:

Reduction Strategy Option A:

Journals:70% Reduction to 42,190 volumes[2]

Books/Reference: 27% Reduction to 79,759 volumes

Total Collection Size:	121,949 volumes
Growth & Management	30,487 volumes
Maximum Capacity:	152,436 volumes

Reduction Strategy Option B:

Journals: 50% Reduction to 68,897 volumes[2]

Books/Reference: 52% Reduction to 52,444 volumes

Total Collection Size:	121,342
Growth & Management	30,335 volumes
Maximum Capacity:	151,677 volumes

Reduction Strategy Option C:

Journals: 85% Reduction to 22,159 volumes[2]

Books/Reference: 8% Reduction to 100,518 volumes

Total Collection Size:	122,677 volumes
Growth & Management	30,669 volumes
Maximum Capacity:	153,347 volumes

Furniture Considerations

One of the goals for the new Science Library is to provide a

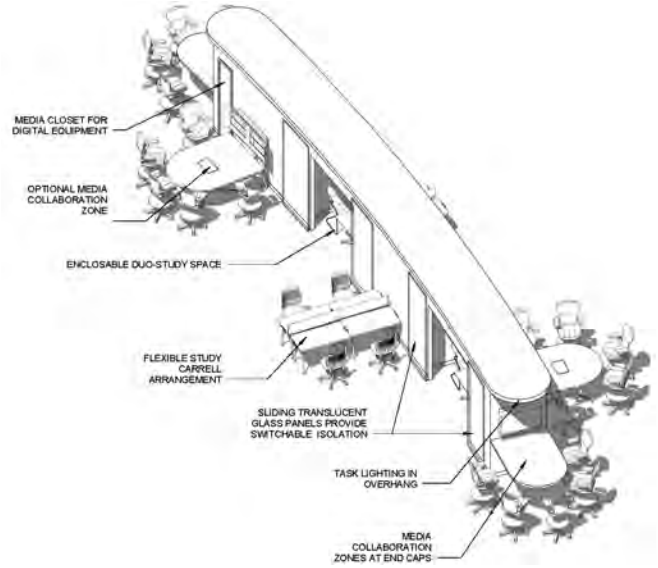
Typical shelf module

flexible environment that accommodates a range of "study scenarios" including group study space, computer terminals, and individual study carrels. Moveable white boards allow students to quickly create a group study space with some partition from the large space. Adequately sized study carrels with ample room to spread out a laptop, books, paper and other items are critical.

Workshop feedback from students indicates that moveable furniture for small group study is essential. They frequently use the marker boards. Access to electrical and data should be provided at all seating locations. They also indicated that they use a variety of furniture or seating arrangements depending on their task at hand. They enjoy having the option to use a study carrel or sit in a soft chair or sofa on occasion. They welcome having a more relaxed lounge atmosphere associated with the cafe and commons. Key characteristics that we heard include flexibility, functional, moveable, comfortable, adaptable and properly equipped with technology.

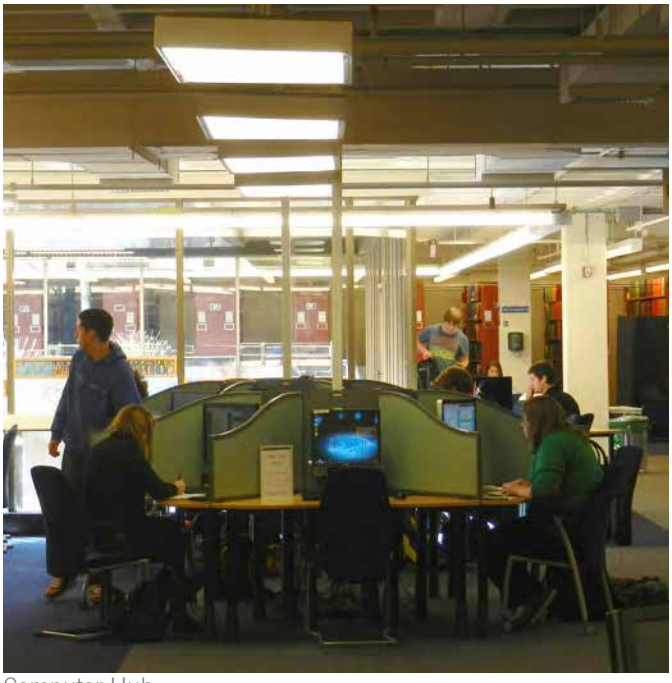
In order to maximize flexibility and adaptability of the new Science Library the use of permanent partitions should be kept to a minimum. Designs should incorporate innovative means to provide power and data without limiting the adaptability of the furniture. The diagrams below illustrate two options for organizing seating with power and data.

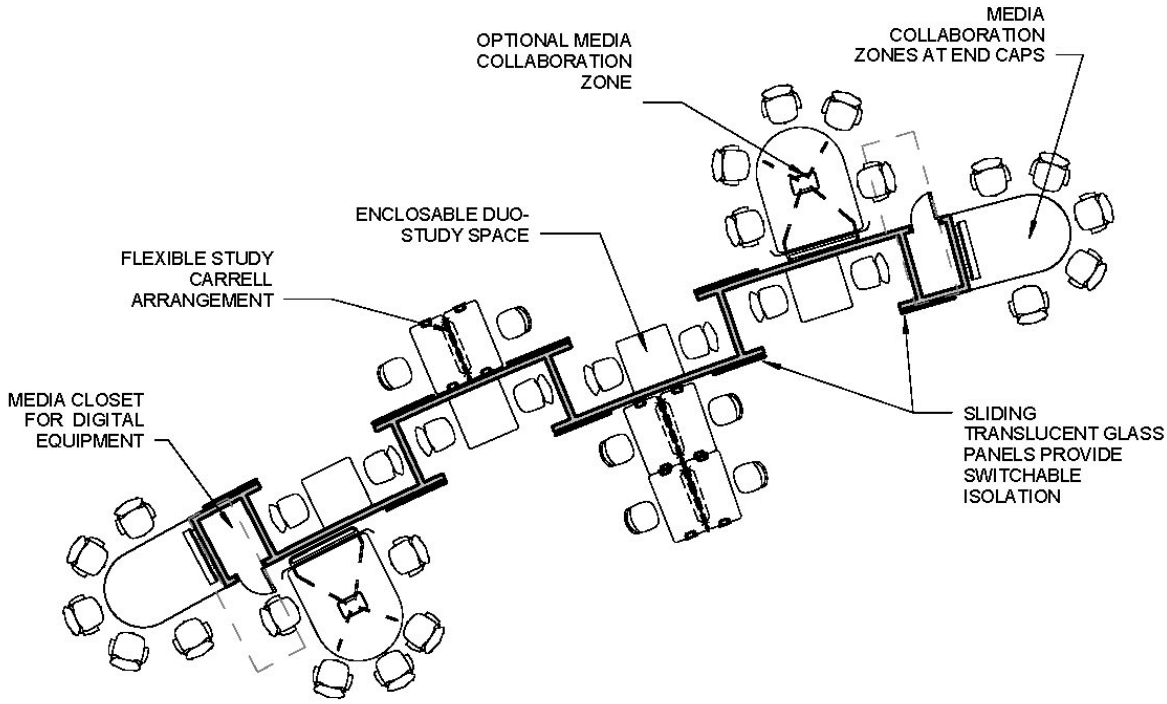
The first option is the Seating Spine which accommodates small group collaboration tables, individual study carrels and semi-enclosed alcoves for a few students. Power and data can be easily distributed to the walls from below or above. Partitions can be modular allowing the spine to expand, contract or be pulled apart. It can also provide some spatial separation in the larger space if quiet and conversation areas are needed.



Axonometric Diagram: Seating Spine


Individual study carrels along courtyard edge


Computer Hub



Plan Diagram: Seating Spine

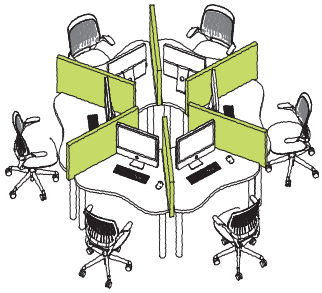
Small tables for two people can be partially or fully enclosed with sliding doors. Overhead planes can provide lighting and additional acoustics if desired.
The second option for flexible furniture investigated the commons and its adaptability. The plans below illustrate a basement level commons with a variety of seating options for individual and group study. Ideally this space would be located near the entry of the library from the plaza level. The furniture could be re-configured for larger presentations or events as needed. Low walls at the perimeter help define the edges of the space, provide power / data connections and allow for bar height seating. A presentation alcove at one end provides for a screen and associated A/V equipment for lectures or guest speakers. When not in use, wall mounted marker boards can be utilized by small study groups. A variety of seating options should be provided for diversity and flexibility.

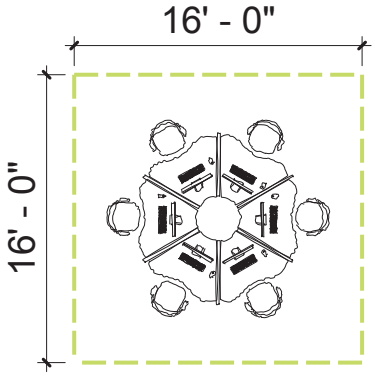
Movable power pedestals can be designed to provide both data and power from the floor. They are intended to be about the scale of an end table and could be relocated for special events if needed or remain in place and occupy about the same amount of space as a chair. Seating can be arranged to face the pedestals for group study or chairs can turn their backs to them for individual study.

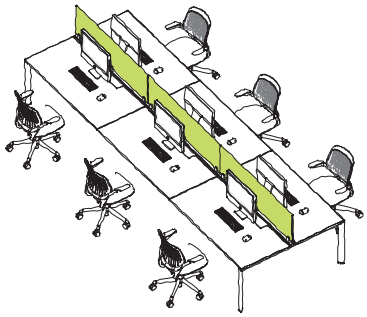
Furniture will ultimately play an integral role in the design of this space. Multiple furniture layouts were studied for each study scenario. The amount of space the furniture took up along with an allowance for circulation around the furniture was quantified. Square footage per person in each scenario was included to help analyze the differences between the various layouts. The following diagrams illustrate possible furniture layouts and their associated space needs per person.

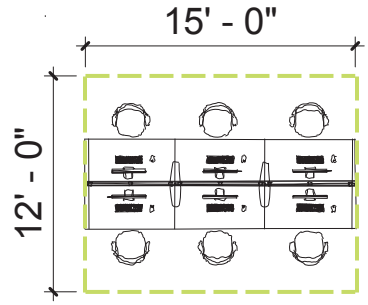
Group Study Area

Computer Workstations: Individual



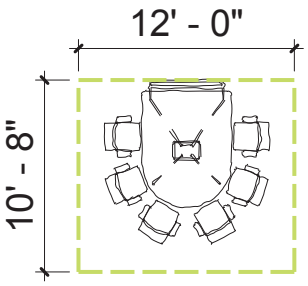




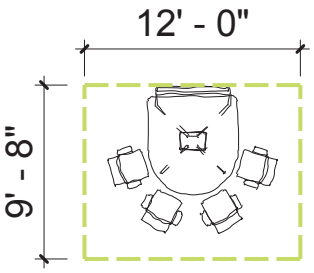


	SEATS	TOTAL SQ. FT.	SQ. FT. PER SEAT
WHEEL FORMAT	6	256	43
BENCHING FORMAT	6	180	30

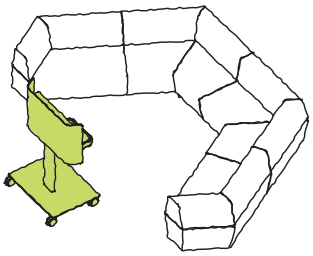
Computer Workstations: Group

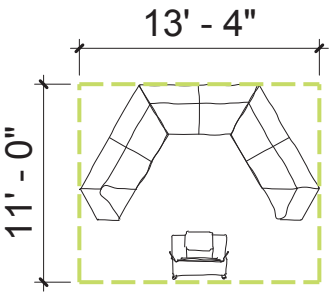


LARGE AV STATION

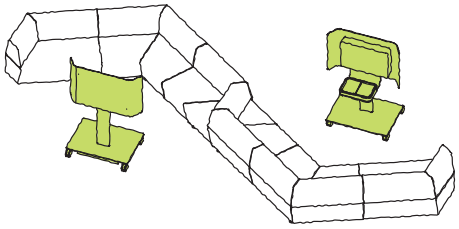


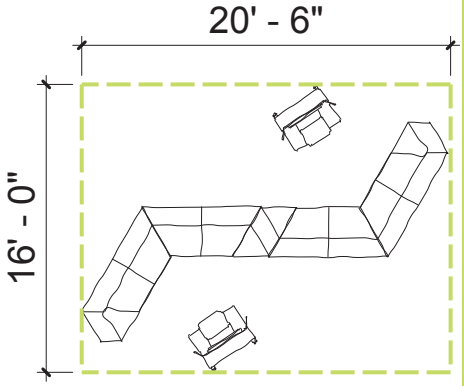
SMALL AV STATION





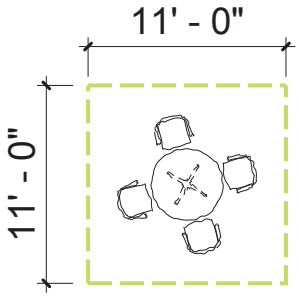
SINGLE LOUNGE AV STATION





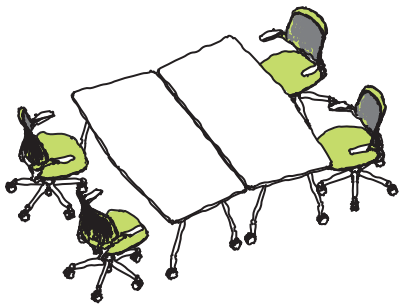
DOUBLE LOUNGE AV STATION

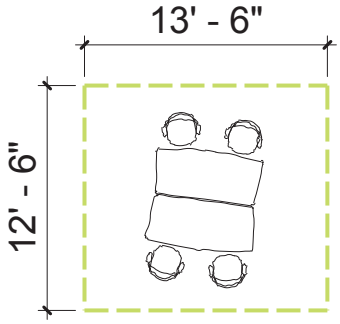
SEATS	TOTAL SQ. FT.	SQ. FT. PER SEAT
6	128	21
4	116	29
6	147	25
8	328	41



ROUND TABLE & CHAIRS

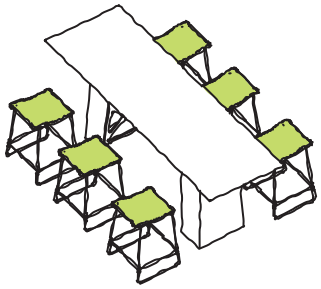
SEATS	TOTAL SQ. FT.	SQ. FT. PER SEAT
4	121	30

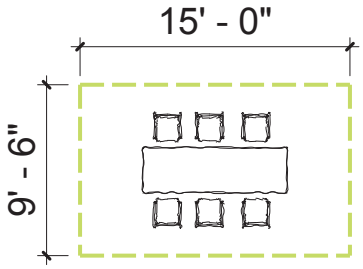




MODULAR TABLES & CHAIRS

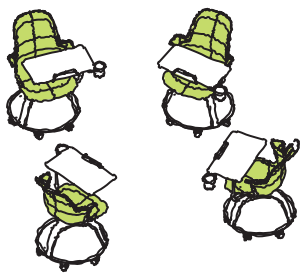
SEATS	TOTAL SQ. FT.	SQ. FT. PER SEAT
4	169	42

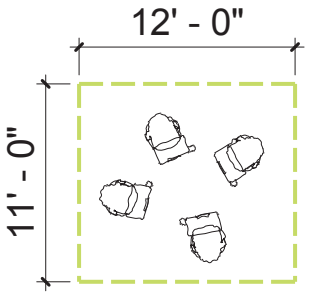




TALL TABLE & STOOLS

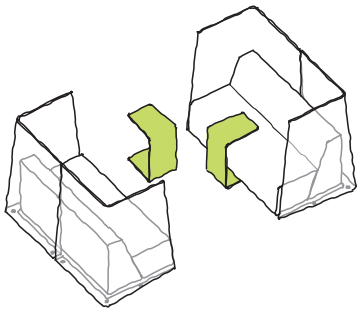
SEATS	TOTAL SQ. FT.	SQ. FT. PER SEAT
6	145	24

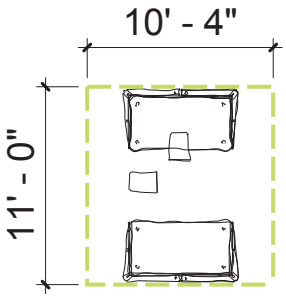


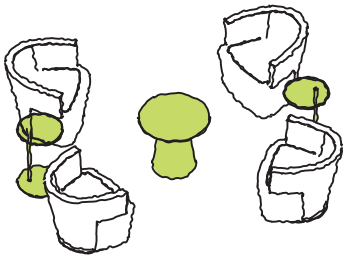


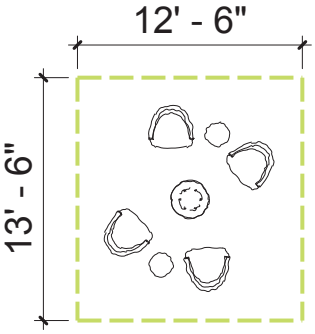
MOBILE CHAIRS WITH TABLETS

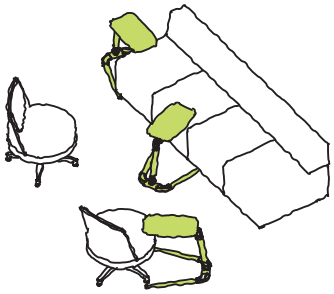
SEATS	TOTAL SQ. FT.	SQ. FT. PER SEAT
4	132	33

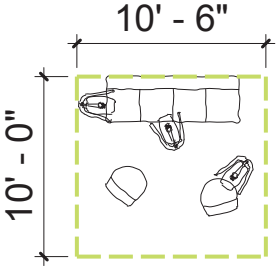


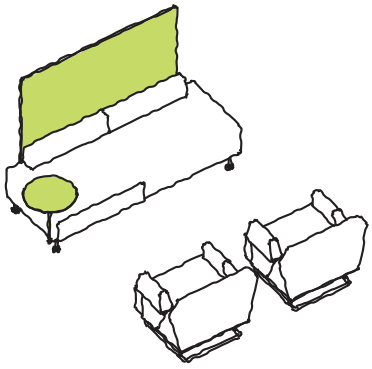


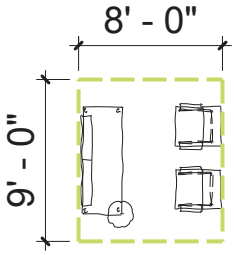




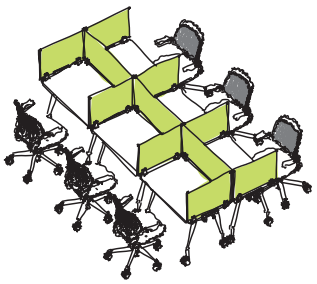


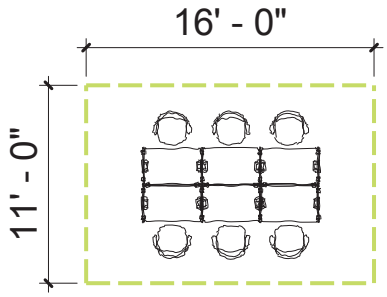


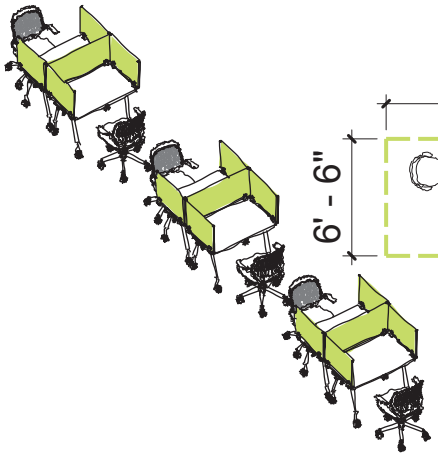


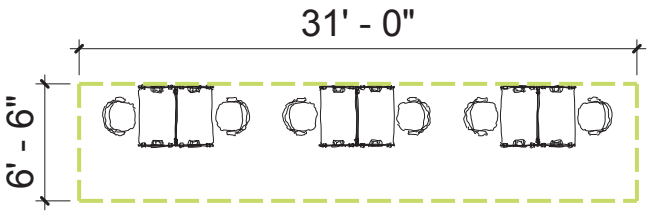


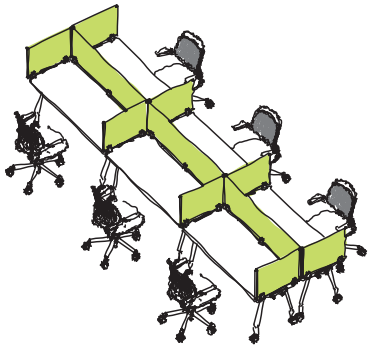
	SEATS	TOTAL SQ. FT.	SQ. FT. PER SEAT
SCREENED BANQUETTES	4	114	28
CLUSTERED CLUB CHAIRS	4	169	42
SOFA, CHAIRS, & LAPTOP TABLES	5	105	21
BANQUETTE & CHAIRS WITH SCREEN	4	72	18

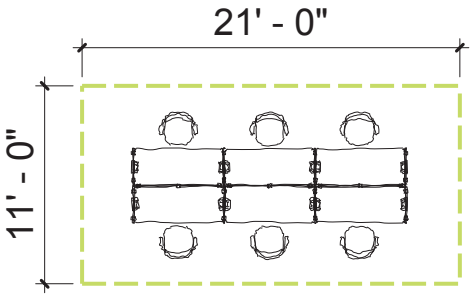


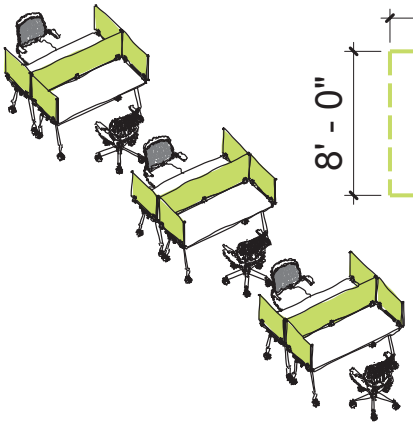


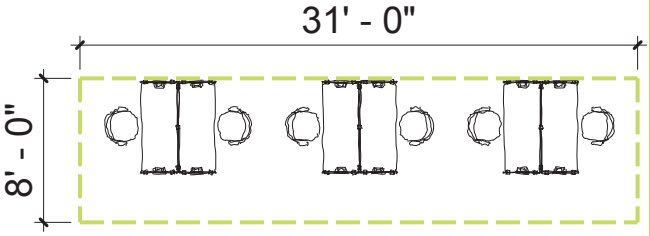








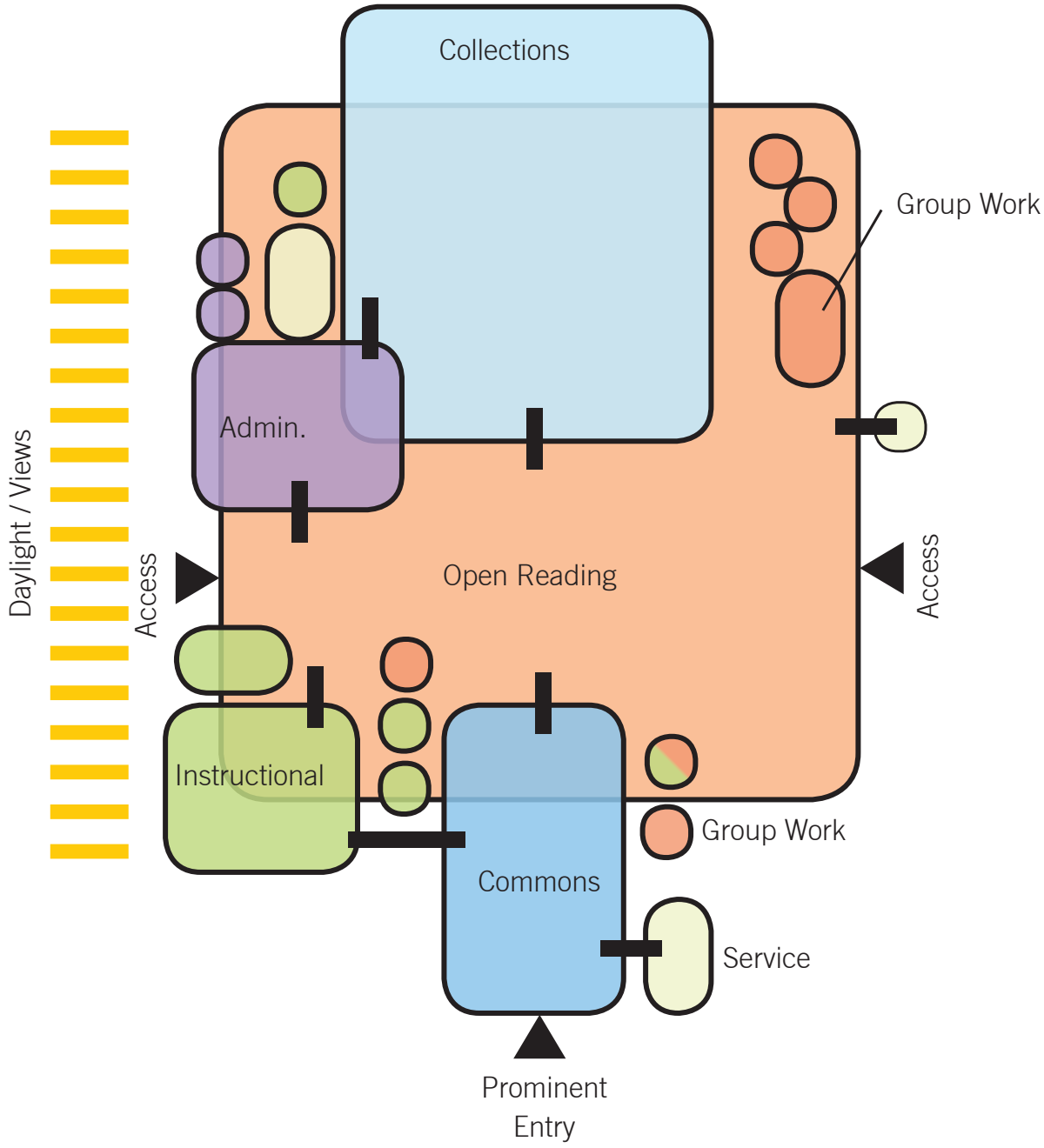


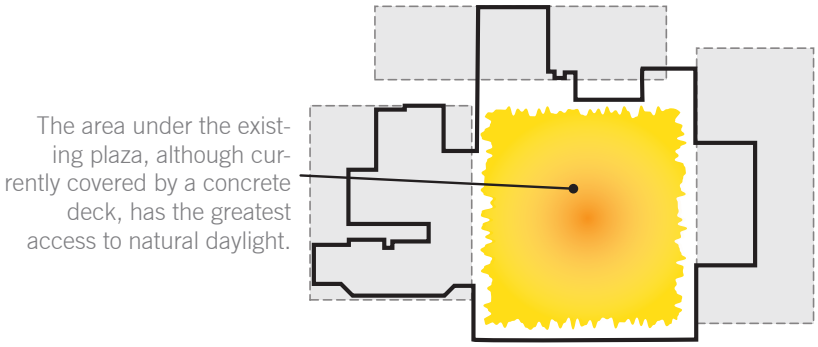


	SEATS	TOTAL SQ. FT.	SQ. FT. PER SEAT
CURRENT CARREL: POD FORMAT	6	176	29
CURRENT CARREL: ROW FORMAT	6	202	34
60" WIDE CARREL: POD FORMAT	6	231	39
60" WIDE CARREL: ROW FORMAT	6	248	41

Organizational Diagrams

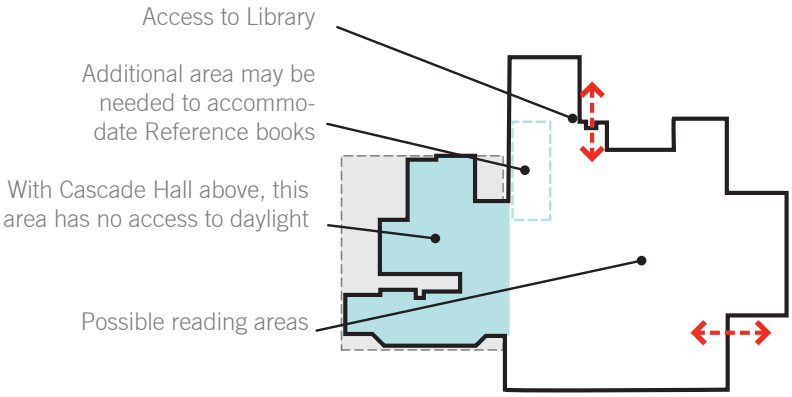
Several key organizational attributes were developed for the major program elements. The following diagrams represent the summary of those elements and key adjacency relationships that should be considered in the design to the new Science Library.





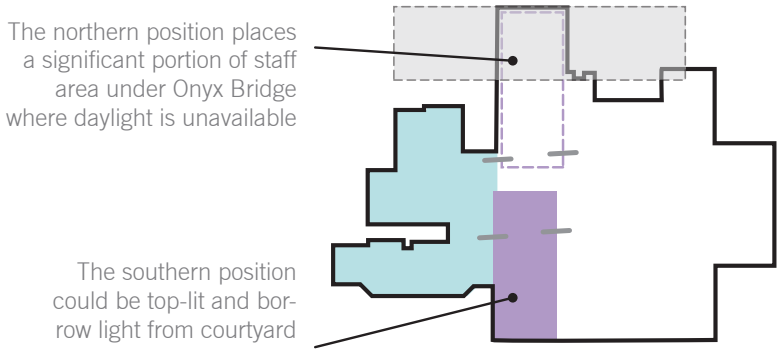
Daylight:

The original library was conceived as a place for books that people visited. The NEW Science Library should be a place for people first. The one factor most needed in a satisfactory place for people--and in such short supply underground--is DAYLIGHT. This shift in thinking drives the organization of building elements.



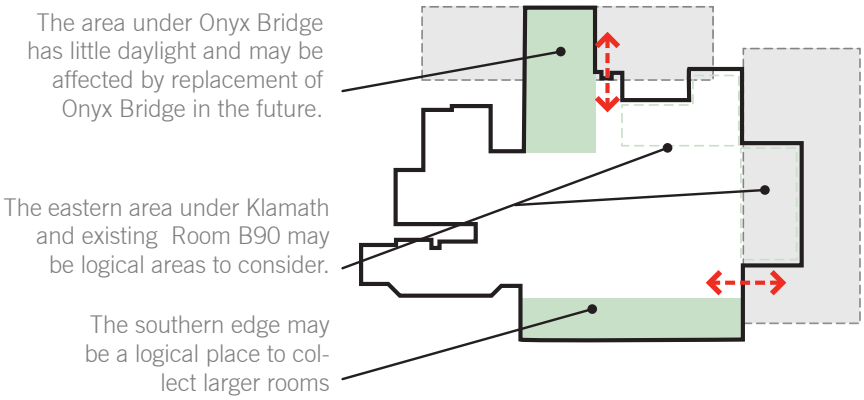
Collections:

Books logically go where access to daylight is most restricted. The area under Cascade Hall has no access to daylight. However, the complexity of the existing plan footprint will most likelt negatively impact the efficient layout of storage systems. The collections need to be secured to control access and removal of books. By separating the collections from the reading areas the reading areas gain the ability for more flexible access points. Depending on the desired collection size, additional square footage may be required elsewhere.



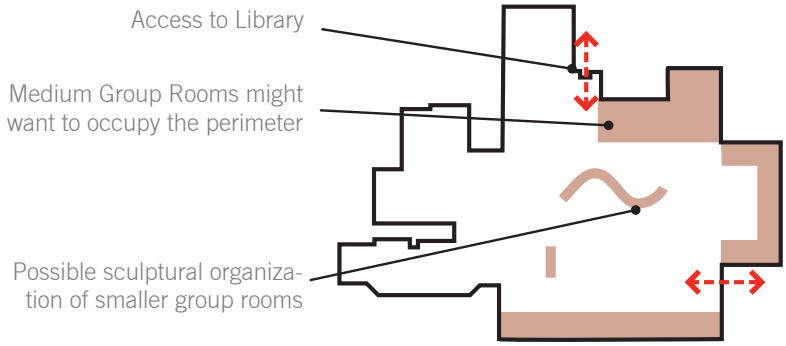
Library Service and Administration:

This area is for staff who work here full time. Providing these people the best access to daylight as possible is a priority. They also need general prominence for easy patron support, and good access to both Reading areas and Collections. Generally it is thought that contiguous space will aid efficient operations over time.



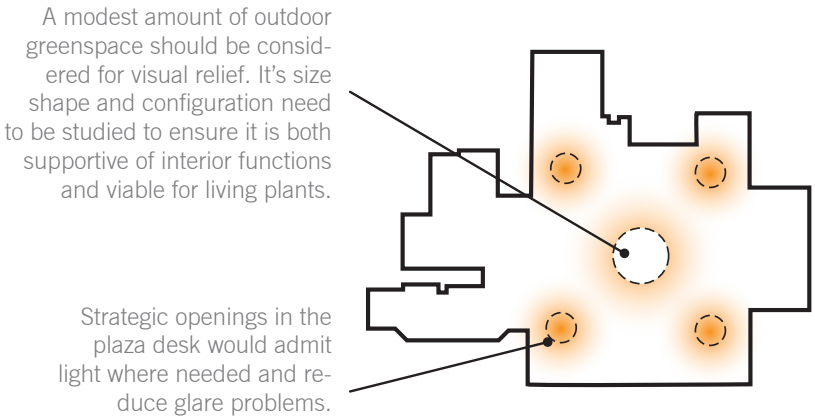
Instructional Spaces:

Although possible to make somewhat transparent, several of the required instructional spaces are larger rooms (800 to 1,250 sf) that will need vertical writing and projection surfaces. Locating them near edges allows the remaining open space to serve as flexible, reconfigurable reading / study areas. They do not necessarily need to be contiguously organized.



Group Study Spaces:

Similar to the larger Instructional Spaces, the medium group study rooms may fit well against the perimeter of the space to allow the open reading room to remain flexible. Small group room might be allowed to float in the larger space and used to define and sculpt the open reading areas.



Visual Relief:

Although not explicitly required by building program, many people interviewed at Workshops commented on the benefits the existing courtyard offers for visual relief after long hours of studying. To accommodate all the program elements required there may be little area left for a courtyard, but strong consideration should be given to including such an element. The size, configuration and location should be configured to support the Commons and Open reading areas. Additional daylight should be admitted through the plaza deck above to balance the light from the courtyard and reduce potential glare problems.

BUILDING CODE

Assumptions:

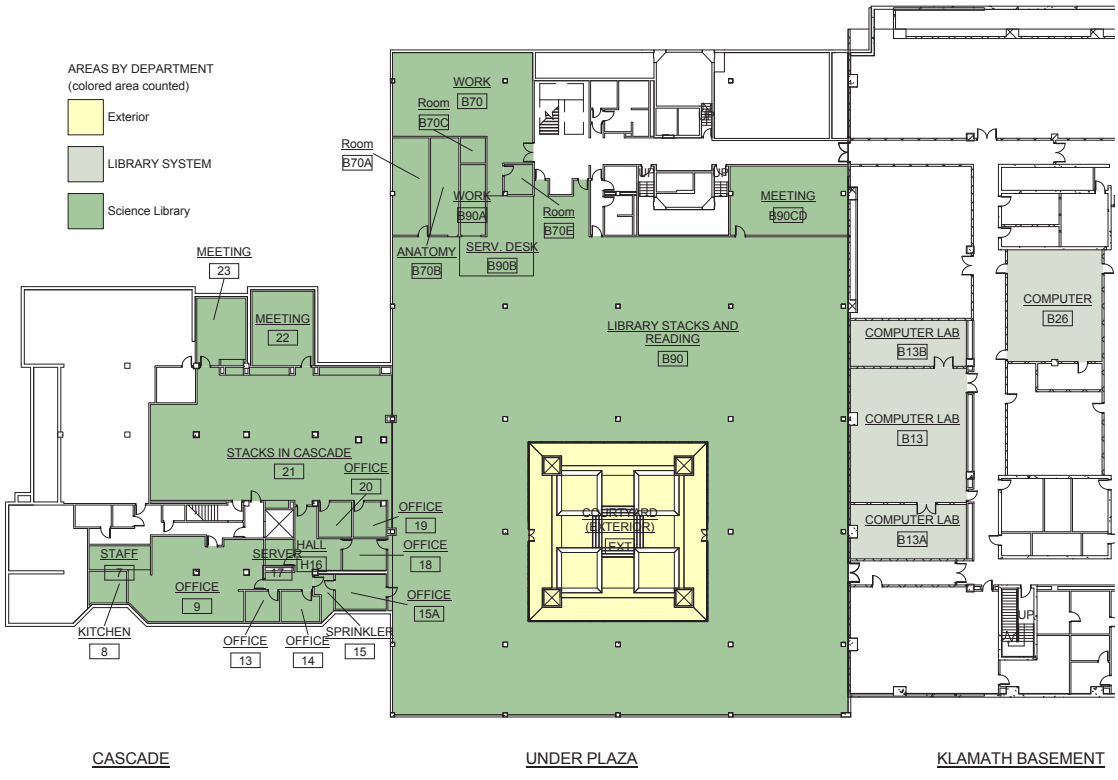
Code:	2010 OSSC
Use:	Library
Occupancy:	A-3
Construction:	Assume 1-B (verify)
Sprinklers:	Fully Sprinklered

History:

The original library was built in 1969 in conjunction with Klamath Hall, the building to its east. Cascade Hall to the west was constructed in the early 1990's. Two-thirds of the basement of Cascade Hall became an expansion for the library at that time. In the early 2000's the concrete plaza deck that serves as the roof of the library was removed and the waterproof membrane replaced. At that time the area around the courtyard at the plaza level was modified and covered bicycle parking was added.

Building Area:

The Science Library currently occupies a total of 28,963 sq. ft. below grade space. Portions of its occupied space are under two separate buildings. Approximately 5400 sq. ft. of space is under Onyx Bridge. It is not clear where a distinction between the basement level library and the rest of Onyx Bridge would be assumed, or if the spaces would be considered separate buildings at all. Similarly, approximately 6,600 sq. ft. of space is under Cascade Hall. It is our understanding that a fire separation between Cascade Hall and the Science Library is created by a "deluge curtain", a high-volume fire sprinkler system installed along the joint between the two buildings. The University has expressed a desire to eliminate the need for the "deluge curtain" given the maintenance and testing requirements that are associated with such a system. Currently no part of the Library resides under Klamath Hall to the east or



ROOM AREAS

Number	Name	Area
7	STAFF	150 SF
8	KITCHEN	121 SF
9	OFFICE	970 SF
13	OFFICE	106 SF
14	OFFICE	117 SF
15	SPRINKLER	68 SF
15A	OFFICE	180 SF
17	SERVER	77 SF
18	OFFICE	140 SF
19	OFFICE	116 SF
20	OFFICE	119 SF
21	STACKS IN CASCADE	3083 SF
22	MEETING	463 SF
23	MEETING	335 SF
B70	WORK	1373 SF
B70A	Room	362 SF
B70B	ANATOMY	281 SF
B70C	Room	64 SF
B70E	Room	86 SF
B90	LIBRARY STACKS AND READING	18942 SF
B90A	WORK	182 SF
B90B	SERV. DESK	491 SF
B90CD	MEETING	829 SF
H16	HALL	307 SF
Science Library: 24		28963 SF
B13	COMPUTER LAB	1582 SF
B13A	COMPUTER LAB	635 SF
B13B	COMPUTER LAB	545 SF
B26	COMPUTER	1077 SF
LIBRARY SYSTEM: 4		3840 SF
EXT	COURTYARD (EXTERIOR)	3259 SF
Exterior: 1		3259 SF
Grand total: 29		36062 SF

Area Analysis for Existing Science Library

Willamette Hall to the south. However, several schemes explored in this study included appropriating some spaces there that are contiguous with the current library. Such a connection would likely require upgrades to the fire separations between buildings.

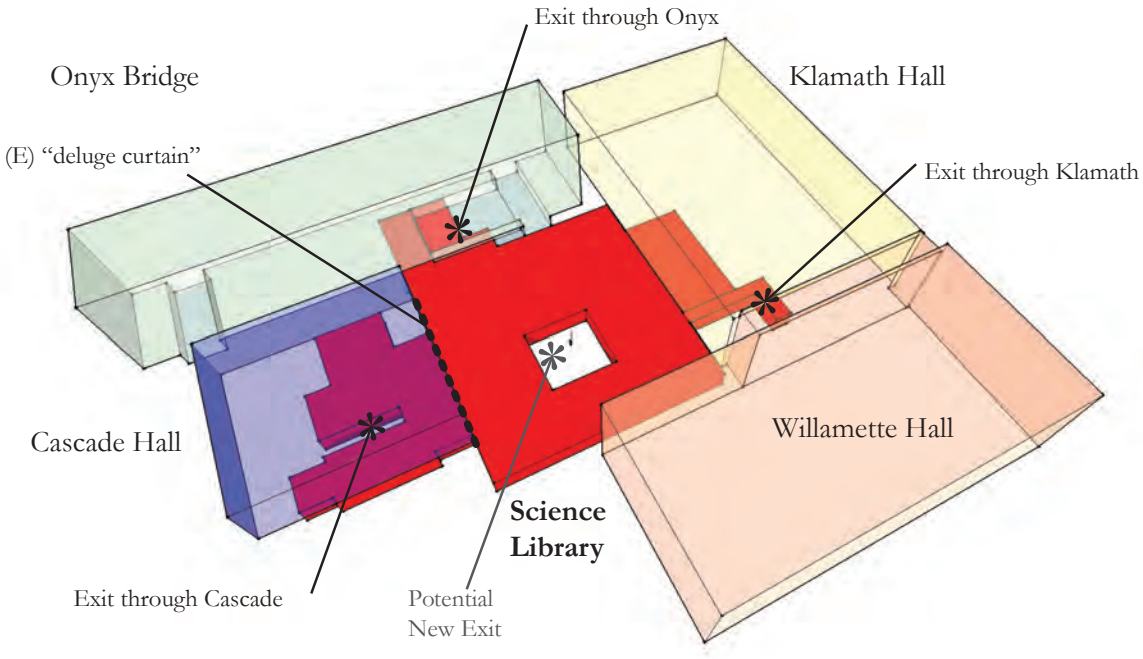
Exiting:

All three of the existing library exits travel through other buildings: Onyx Bridge, Klamath and Cascade. The main entrance stair under Onyx Bridge is made of concrete and has partially open risers. The guard and handrail system on this stair likely does not meet current code standards. This stair discharges to the south, onto the plaza. The eastern exit from the Library travels through alarmed fire doors into Klamath Hall. Exiting occupants would travel into a common hallway to an enclosed stair. At the plaza level the stair connects to another hallway that discharges back west on to the plaza. Both of these exits appear to discharge onto the "roof" of the Science Library. The code does not directly address this circumstance, but it seems clear that the fire rating of the plaza deck assembly will remain important to occupant safety and code compliance. This anomalous situation was permitted under a previous code and therefore may be "grandfathered in". The third exit is

Existing Separation at Klamath Hall Basement from Library

under Cascade Hall. An alarmed exit door connects to an enclosed stair that leads to ground level.

A future remodel of the Science Library will likely introduce a new main entrance directly to the plaza level. This exit may also discharge onto the "roof" of the sci-



ence library and as such should be evaluated carefully if it serves as a required exit.

Accessibility:

The library is served by a single public elevator located in Onyx Bridge. A second service elevator is available in Cascade Hall but is not accessible to the public. The future remodel should include a new elevator dedicated to the Science Library.

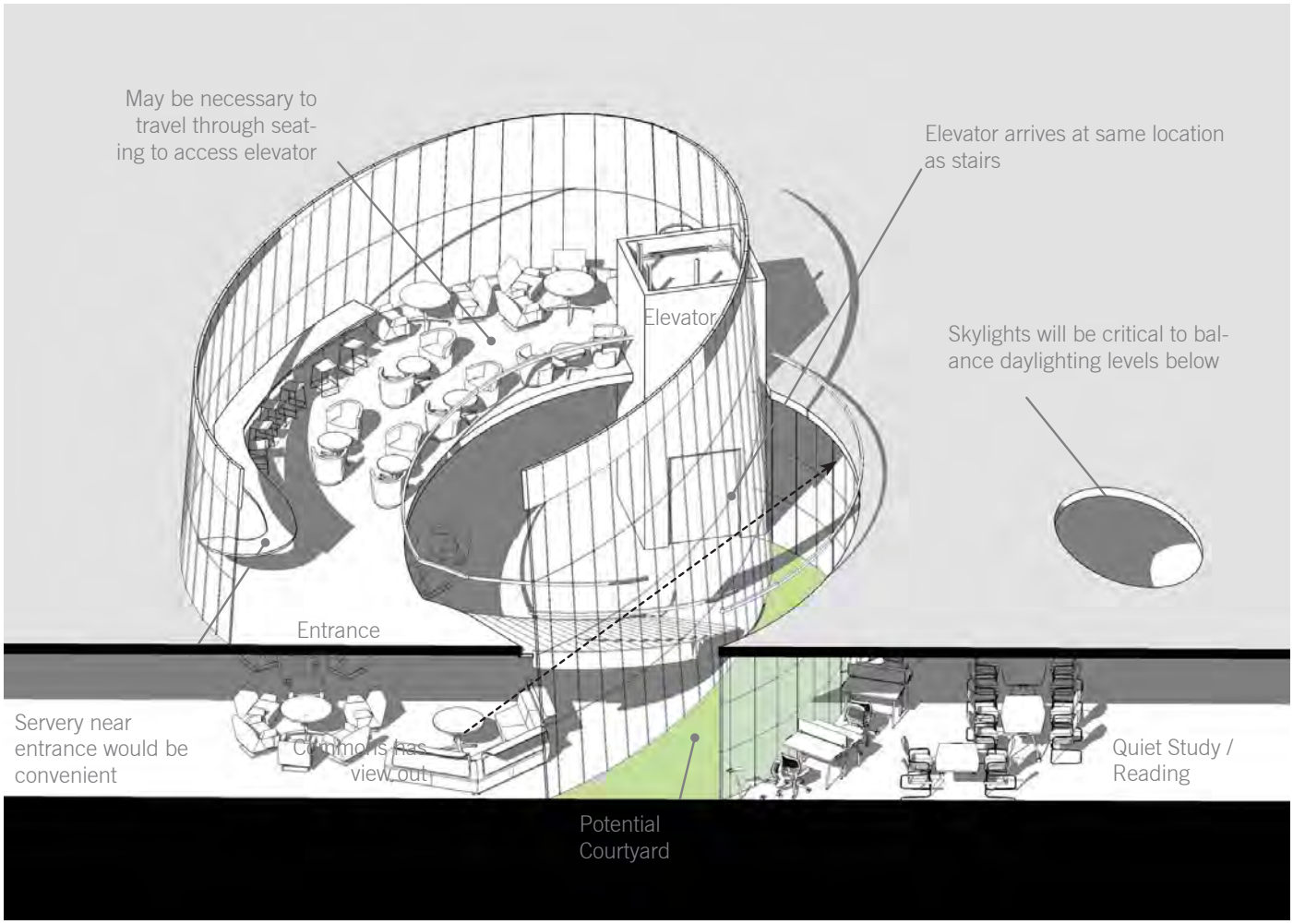
Restrooms:

The Science Library is currently served by restrooms in the basement of Onyx Bridge near the main entrance. Additional restrooms are located in the basement of Klamath Hall but are shared with the users of that building. Some ADA improvements have been made but the existing facilities do not fully comply with current accessibility standards. The current program document may not provide adequate space needs should a full upgrade of restroom facilities be deemed important.

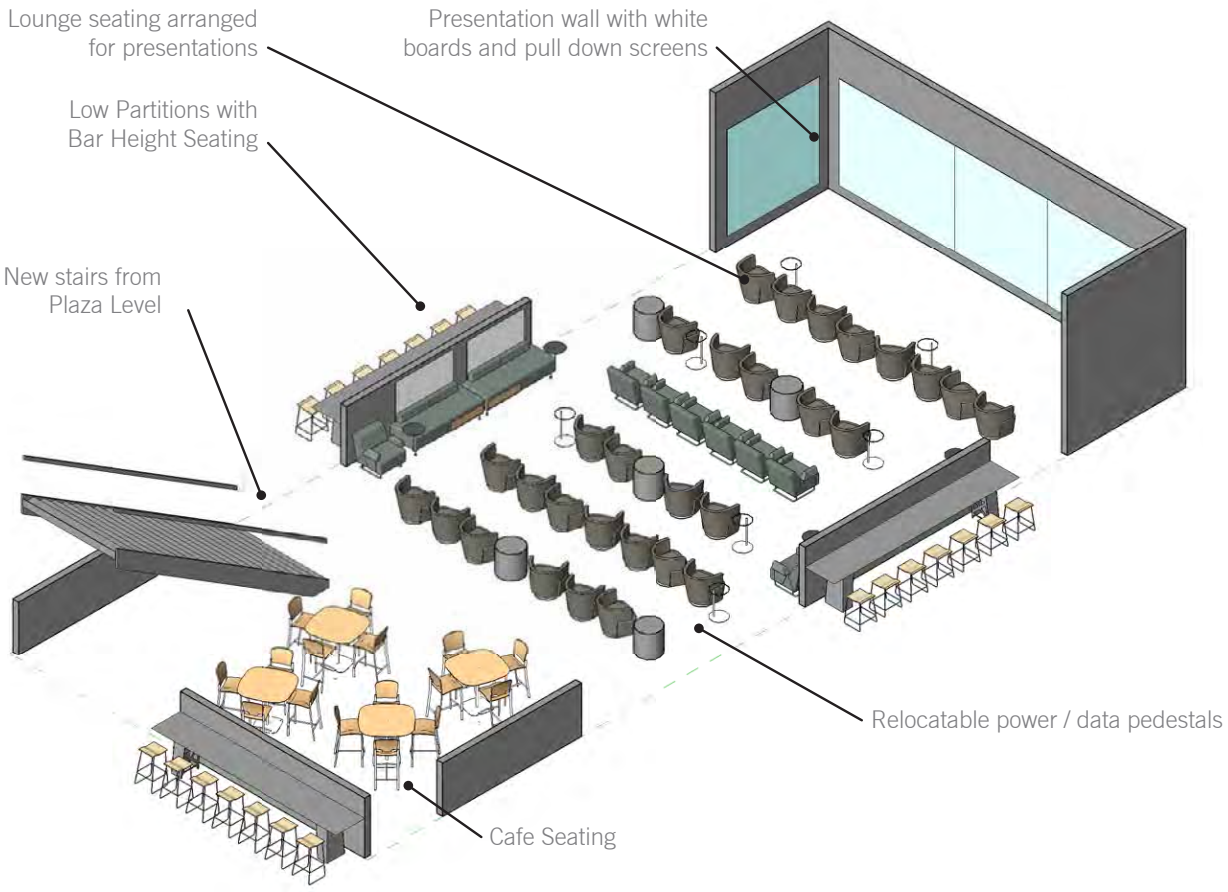
Deluge Curtain at Cascade Hall and Science Library Basement

CONCEPTUAL ALTERNATIVES

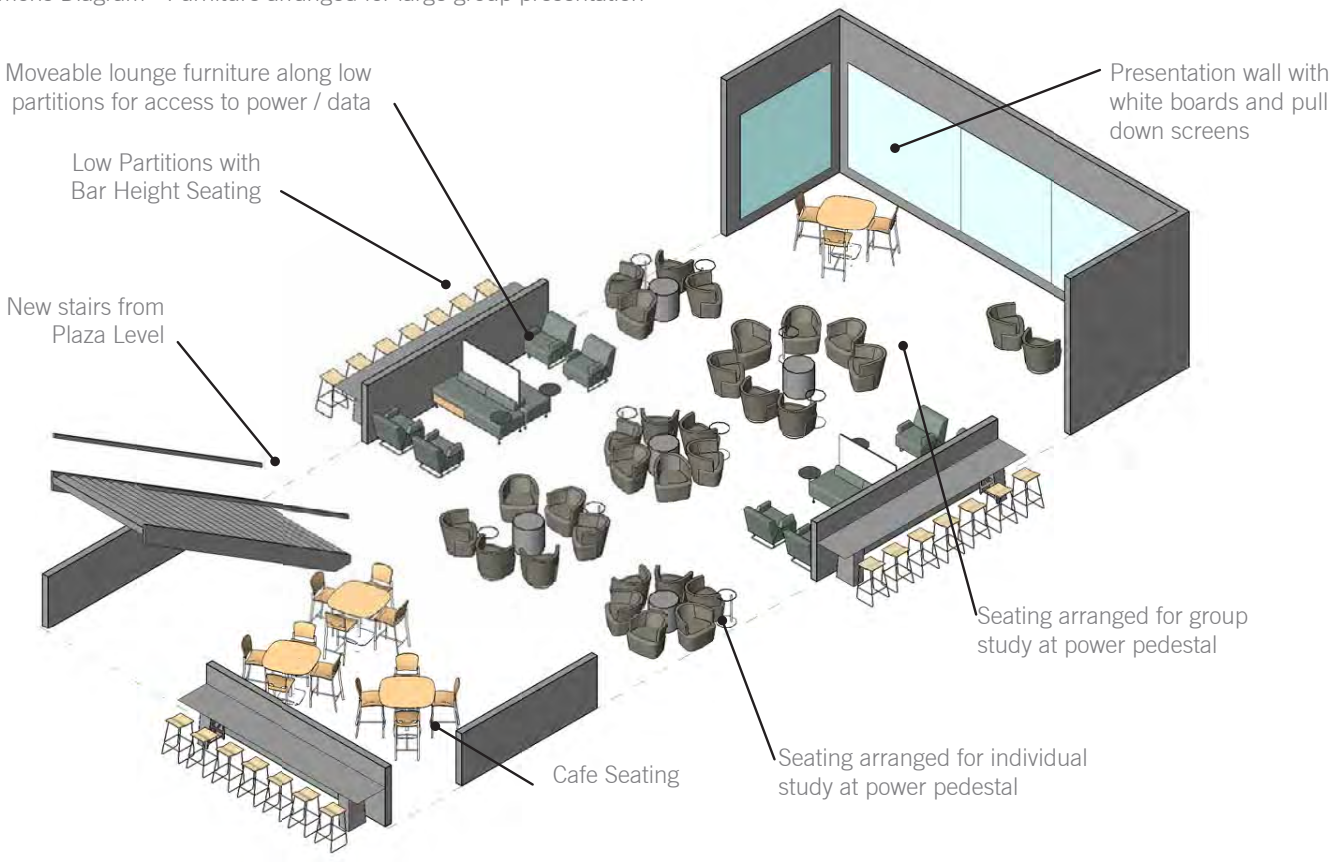
The following images represent concepts that support the vision of the new Science Library as the intellectual, social and cultural heart of the sciences. They provide a glimpse into the various components and relationships necessary to support the academic endeavors of the sciences. They are not meant to be specific solutions, but rather illustrate a design gesture that reinforces the 10 Emergent Design Themes developed in the workshops with faculty, staff and students.



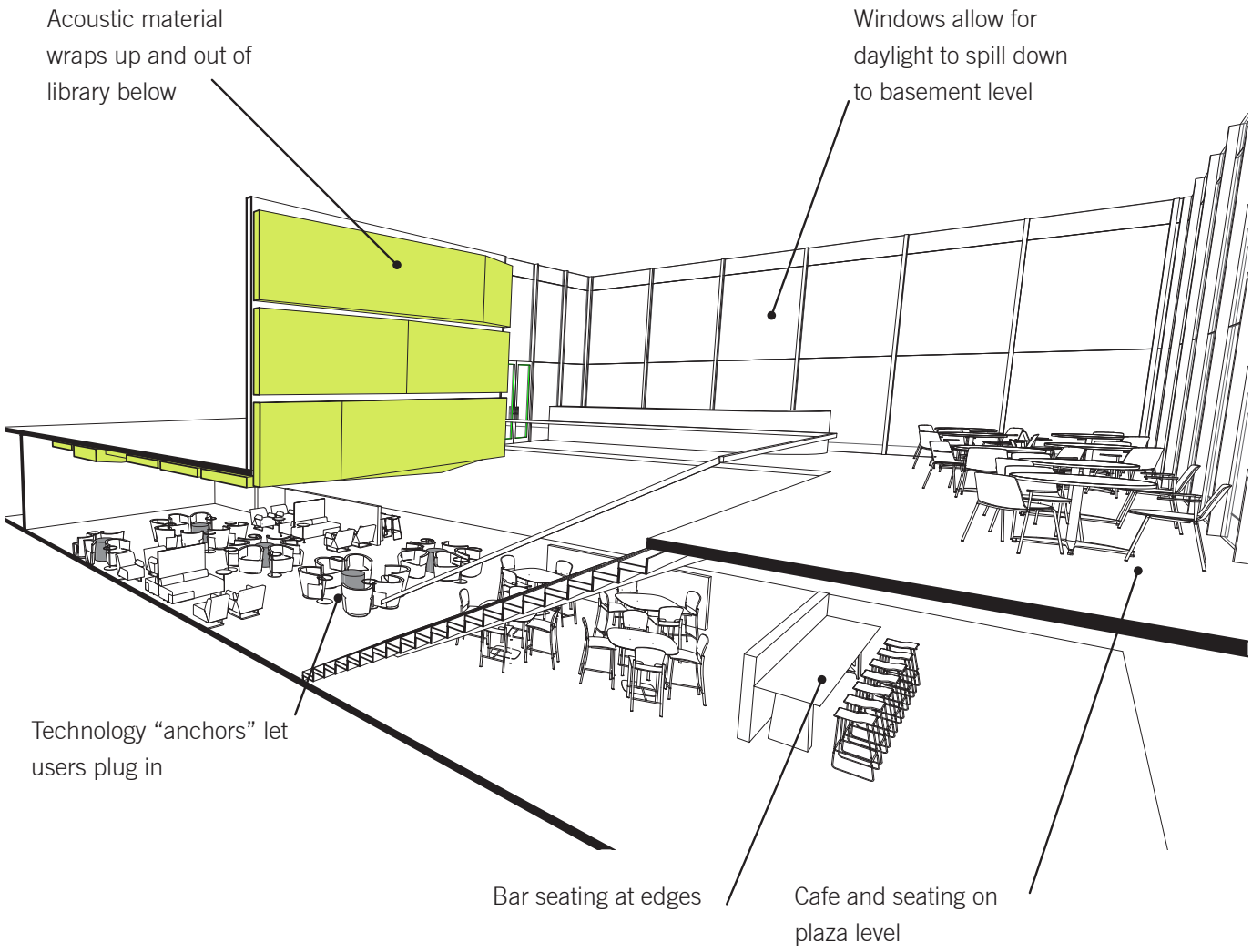
Axonometric Diagram investigates linkage between Commons and Café

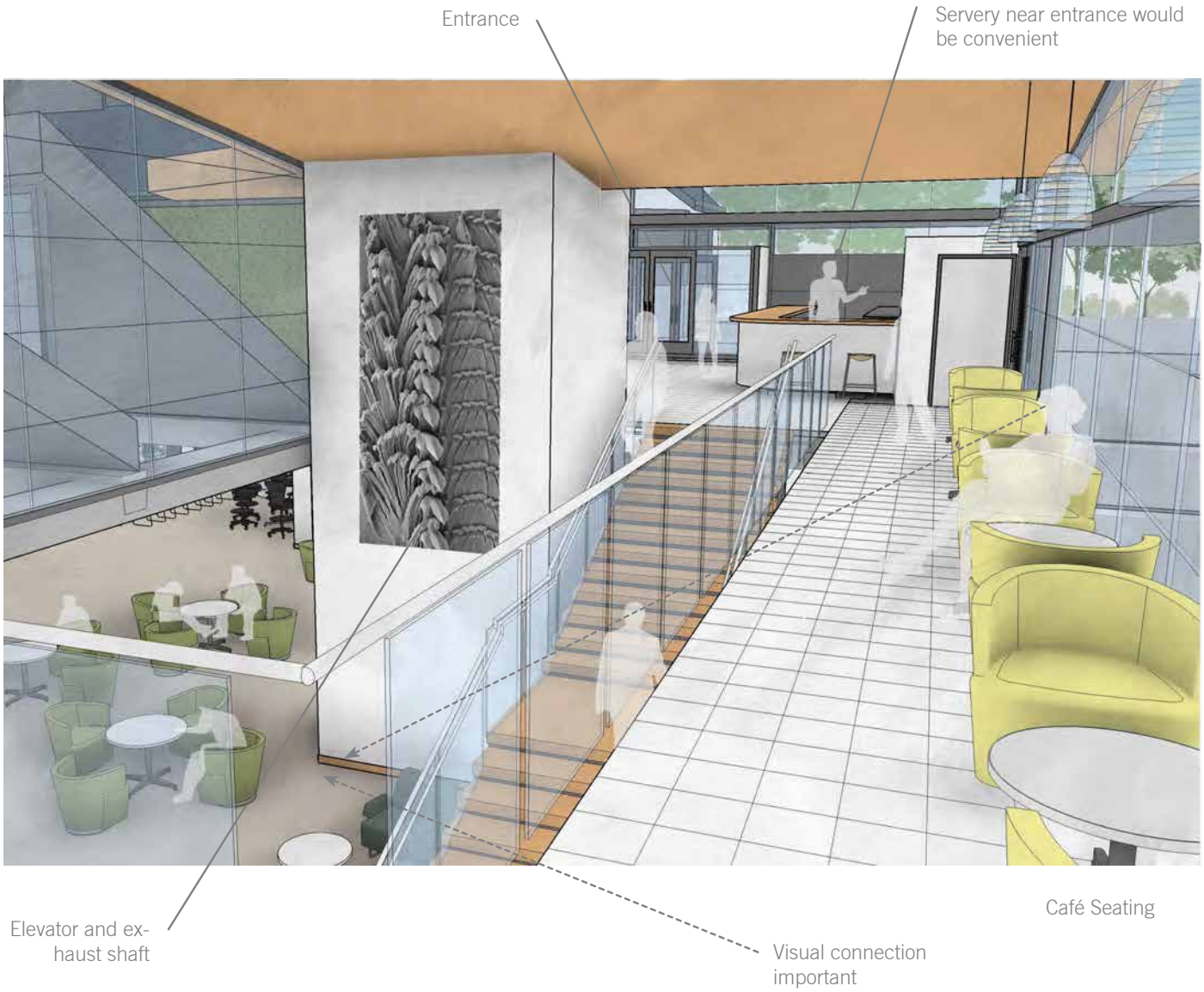


Commons Diagram - Furniture arranged for large group presentation



Commons Diagram- Furniture arranged for small group and individual study.

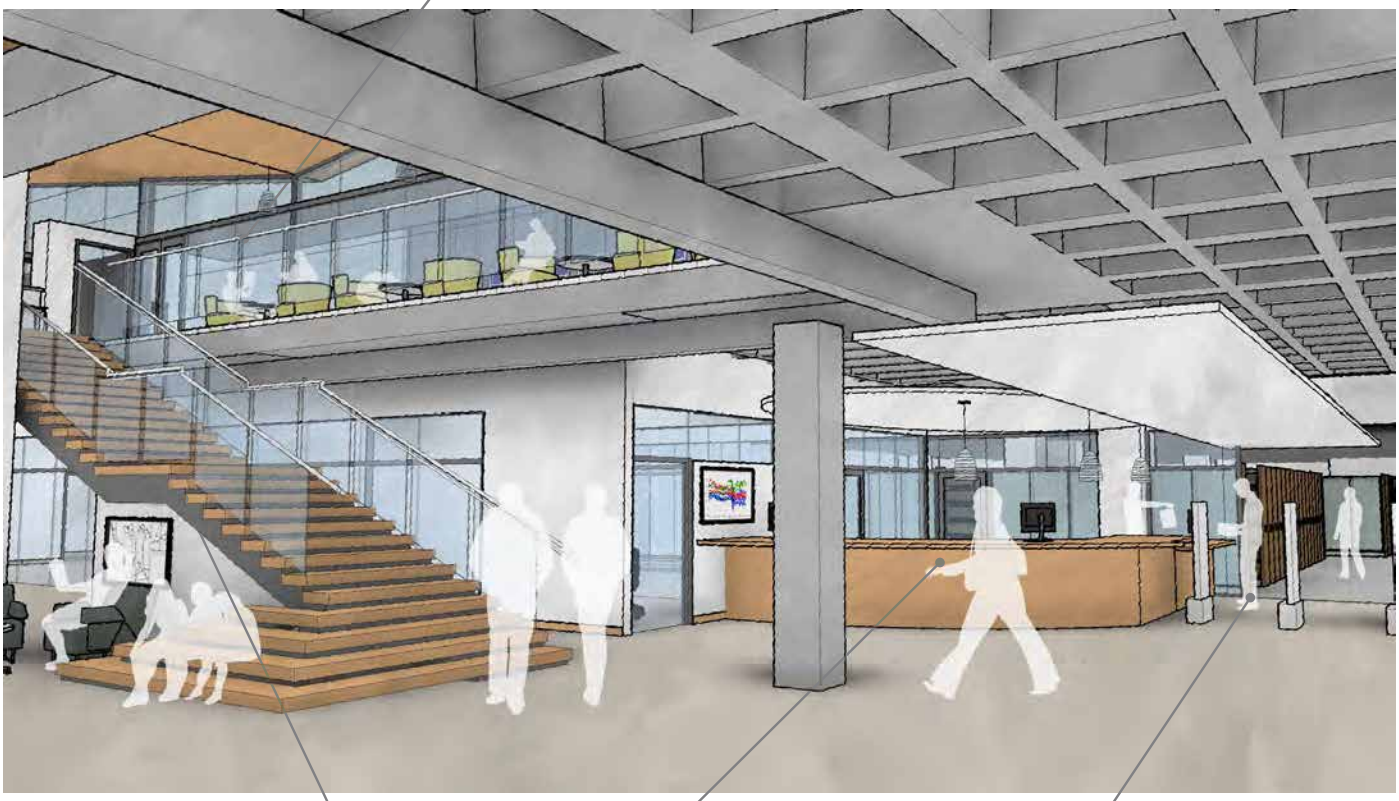

Acoustic material wraps up and out of library below
Windows allow for daylight to spill down to basement level
Technology “anchors” let users plug in
Bar seating at edges
Cafe and seating on plaza level



View to Commons from Cafe

View to Cafe from Commons

Café Seating visible at Plaza level above



Stair from above arrives near Service Desk and Commons - Good for orientation

Stacks visible beyond

View to Service Desk from Commons

Passersby in Onyx Green can see down into Library, removing the “stealth” feel of current space

A tall ceiling is conducive to reading and provides views to the exterior

Group Collaboration Spaces beyond

Provide low, fixed edges to supply power and fast data

Study Space

View to Outside from Commons

APPENDIX

Systems Investigation Reports:

- Mechanical
- Electrical
- Structural

Workshop Notes:

- Faculty Workshop
- Library Workshop #1
- Library Workshop #2

UNIVERSITY OF OREGON

UO SCIENCE LIBRARY RESEARCH COMMONS

CONCEPTUAL DESIGN STUDY - MECHANICAL

GENERAL REVIEW OF LIBRARY SPACE MECHANICAL SYSTEMS

The 1960's library open ceiling space is served by multiple exposed supply duct branches from a multi-zone air handling unit with return ducts running along the perimeter of the space. Storm drain piping from multiple courtyard drains share the ceiling space with sprinkler piping, ducts and suspended lights.

Ceiling space available for new or revised utilities appears to be limited by the following utility elevations. Spot measurements taken at one location near the entry to the library:

Floor to underside of slab: 11'-0"

Lights: Bottom elevation at 8'-1", top elevation at 8'-6".

Bottom elevation of 4" sprinkler main: 9'-3". Top elevation: 9' 7"

Bottom elevation of 6" storm drain main at hub: 8'-8"

Space available for ducts or terminal devices is limited to approximately 18" from elevation 9'-7" up to the slab with duct routing closely coordinated with storm drainage piping.

A newer addition to the library in 1988 is served by an air handling system located in Cascade Hall. The newer addition has ceilings, ceiling diffusers and grilles.

EXISTING HVAC EVALUATION:

The science library is currently served by two existing HVAC systems.

System #1: Klamath Air handling Unit SF-1

This air handling unit is located in the Klamath Hall basement mechanical room and serves the older 1960's area of the library area. The unit is classified as a "multi-zone" system typically designed in the 1960-1970's era.

Chilled water cooling coils inside the unit simultaneously cool part of the supply air with hot water heating coils heating the remainder of the supply air. The hot and cold airstreams are continuously mixed by zone dampers at the unit discharge to satisfy the space temperatures in the zones.

The constant volume supply fan is scheduled to deliver 27,535 CFM. Conditioned air delivered to the space is returned to the unit via return air chase located inside the perimeter walls of the library with a continuous 6" return air opening at the floor level. Outside air for ventilation is ducted to the unit and mixed with the return air via a duct that draws the air from an areaway within close proximity to the Onyx Bridge loading dock. The outside air is shared with an adjacent SF-2 fan system that serves the Klamath basement labs.

Reuse of this unit is not recommended for the upgraded library for the following reasons:

- The age of the unit is approaching 45 years. This lifespan has reached a point where replacement of major components is typically needed.
- The supply fan system delivers a constant volume of supply air to the space. Energy code requires variable air volume systems that are controlled to match actual space cooling and/or ventilation requirements at any given time.

- The supply fan motor is an inefficient outdated model.
- The multi-zone design makes use of a highly inefficient concept that simultaneously cools and heats the air and then mixes it for temperature control. The energy code restricts the use of these simultaneously cooled and heated systems.
- The amount of outside air delivered to the unit is not identified on the original design drawings. A field check shows a small 24" x 12" duct delivering outside air to the unit. This size duct indicates that a small amount of outside air was designed for the unit in comparison to the larger supply air volume. Energy code requires new air systems to include air side economizers that can deliver outside air equal to the full amount of the supply air when the outside air temperatures are suitable to provide cooling of the spaces.

Heating is provided by hot water baseboard heaters located along the glass perimeter surrounding the sunken courtyard. Facilities has rerouted the heating water piping from below grade to above grade.

Possible New System Options and Challenges:

Fumes from vehicles in the adjacent loading dock are currently being drawn into the outside air intake and contaminate the occupied spaces. This condition poses the greatest challenge to reinstalling a new air handling unit in this mechanical room.

Ductwork from the mechanical room to the science library space consists of a wide spread of supply and return air ductwork extending along the entire length of the wall separating the two rooms. Consequently there appears to be limited opportunity to add a new outside air duct if the existing ductwork is to be reused.

To address two key requirements for the project: High energy efficiency required by the Oregon Sustainable Development Plan and limited ceiling space for new HVAC ductwork, the following system options are proposed. Further analysis of the space air conditioning loads and a detailed field survey is needed during the design phase to refine the concepts.

Option #1: New Mechanical Room

Provide a new air handling unit inside a mechanical room located within the new science library. A new source of outside air will be taken from a higher level above grade and located directly over or in close proximity to the mechanical room. The new HVAC system will be based on a Demand Controlled Ventilation System with the air handling unit delivering code ventilation air to the space.

An overhead active or passive chilled beam system is proposed to address the cooling requirements. Meeting spaces with a high occupancy load may require supplemental fan coil units. Heating will be provided by hot water radiant panels and/or fin tube baseboard heaters located along perimeter walls and adjacent to glass areas exposed to the outdoors.

A new steam-to-heating water heat exchanger for air handling unit and baseboard heaters will be located in the Cascade Hall mechanical room with steam connected to the campus tunnel system. Chilled water for chilled beams will be sourced from Klamath or Cascade Hall mechanical rooms pending further analysis of HVAC loads.

Option #2: Reuse of Existing Mechanical Room

If a suitable high level clean source and pathway can be found to deliver outside air to the mechanical room, a new air handling unit can be located in the same footprint of the existing unit. The new unit will need to be constructed of sections to allow transportation through the doorways and assembled inside the mechanical room. The new system would be similar to that described above for option #1.

The existing supply and return ductwork serving the Science Lab area should be replaced with new ductwork or can be reused if the budget is limited. Ductwork in the Klamath Building is contaminated with a black soot material. If the existing ductwork is reused, it is recommended that a professional service be hired to clean the inside surfaces.

A new steam-to-heating water heat exchanger for the baseboard heaters will be located in the Cascade Hall mechanical room with steam connected to the campus tunnel system. Chilled water for chilled beams will be sourced from Klamath or Cascade Hall mechanical rooms pending further analysis of HVAC loads.

System #2: Cascade Air handling Unit AHU-2, EF-2, EF-7 and AC-1

This equipment is located in the Cascade Hall basement mechanical room. They serve multi-use spaces in a 1988 addition to the older library including offices, seminar space, photocopy room and kitchen. The HVAC system delivers a constant volume of air to duct mounted hot water reheat coils serving each space. Room thermostats modulate heating water through the reheat coils to maintain room setpoint.

Air handling Unit AHU-2 is scheduled at 7,600 cfm. The unit has a hot water heating coil, chilled water cooling coil and economizer dampers to facilitate use of outdoor air for cooling when conditions are appropriate. This unit should meet current energy code requirements with some modifications to the Siemens controls. Air conditioning unit AC-1 with a humidifier delivers conditioned air to the Secure Storage Room presumably to provide a protective environment for stored materials.

Exhaust/return fan EF-2 (7,500 cfm) returns room air to AHU-2 and/or discharges a percentage of the air to the areaway depending how much outside air is being used in the economizer mode. Exhaust fan E-7 (905 cfm) exhausts the kitchen and photocopy room.

Depending on the new programming assigned for this area, re-use of this HVAC system should be possible with the following modifications:

- Convert the energy inefficient constant volume system to variable air volume (VAV) as follows:
    - Add VAV terminal units to each duct branch serving a room or zone.
    - Add variable speed drives to the supply and exhaust fans. Vary fan speed to match cooling requirements at any given time.
    - Add DDC controls to vary the supply and exhaust fan airflows to match room cooling and heating conditions at any given time.

- Add carbon dioxide sensors to high occupancy spaces to provide the minimum ventilation quantity required by code in proportion to the occupant load at any given time. Vary the outdoor air to match the occupancy load in the spaces.
- Close the terminal unit airflow to a space when the rooms are not occupied, using light fixture occupancy sensors to detect occupancy.

FIRE PROTECTION

The 1960 and newer area of the science library is served by two separate fire sprinkler systems. One system originates in Klamath Hall and the other in Cascade Hall. Sprinkler heads on each system are different styles. A deluge sprinkler curtain system is installed near the interface of the older library area to Cascade Hall to provide a rated separation between the two buildings.

Drew Standridge requested that a single uniform sprinkler system be provided to serve the entire new library area with sprinkler heads meeting the current university standard. In addition, he would like to see the deluge system removed if a code investigation shows this will be allowed.

C:\Users\dwk\Desktop\UO Science Library Upgrade - Conceptual Design Study.doc

UNIVERSITY OF OREGON

UO SCIENCE LIBRARY RESEARCH COMMONS

CONCEPTUAL DESIGN STUDY - ELECTRICAL

GENERAL REVIEW OF LIBRARY SPACE ELECTRICAL SYSTEMS

Normal Power

The Science Library is currently served by panelboards in two locations.

The panelboards located in the northeast portion of the space originate in Klamath Hall. The service voltage for these panelboards is 120/208 Volts, 3 phase. The panelboards were installed in 1960s when the original Science Library was constructed. These panelboards are not listed for the available fault current and have reached the end of their useful life. The capacity of the feeders serving these panelboards should be adequate to serve the remodeled space.

The second set of panelboards serving the space are located in a mechanical space in the southwest corner of the Library. These panelboards were installed under the 1988 addition to the Science Library. These panelboards are served from the electrical service in Cascade Hall. The service voltage for these panelboards is 277/480 Volts, 3 phase. There is capacity in the Cascade Hall electrical service to serve all the panels in the Science Library space.

It is recommended that the panelboards in the northeast portion of the space be replaced with new panelboards and be refed from the Cascade Hall electrical service.

The existing panelboards located in southwest corner of the space may be reused.

Additional panelboards may be required to be installed to serve additional power needs in the space.

Emergency Power

There is minimal emergency/standby power provided in the basement of Cascade Hall.

A study has been completed that would route the standby feeder into Willamette Hall to provide emergency power to Willamette and Klamath Halls. If this project is implemented prior to the Science Library renovation, standby power could be extended from Klamath Hall to the Science Library.

Lighting

Current lighting in the space consists predominantly of fluorescent luminaires. The luminaires in the original Science Library area are provided with 120 Volt ballasts while the luminaires in the newer section are provided with 277 Volt ballasts.

All lighting in the Science Library will need to be replaced. Serving the entire Science Library from the Cascade Hall service will allow the entire space to utilize 277 Volt ballasts.

Occupancy sensors and a centralized lighting control panel will need to be explored as this project moves forward into design.

Telecommunications

Telecommunications needs for the Science Library are currently served from Room 5A, located in the newer area of the space. The existing racks are nearing capacity. The pathways from the room into the Library are inadequate at this time.

The computer needs for the Library are anticipated to increase with the renovation of the space. It is recommended that the existing telecommunications room be increased in size and additional pathways be provided out into the library space.

In addition, a new telecommunications room should be provided on the east side of the Library. The room should be no less than 10 feet by 7 feet but may need to be up to 10 feet by 11 feet.

Fire Alarm

The current "fire alarm" system in the space is a sprinkler monitoring system. Detection devices are not present. Annunciation consists of bells connected to flow switches in the fire sprinklers.

Horns and horn/strobes will need to be provided for annunciation in the space. Ceiling mounted devices are the preferred option in the stack areas to allow for flexibility in relocating the stacks.

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STRUCTURAL SOURCE, LLC
CONSULTING STRUCTURAL ENGINEERS
86705 Pine Grove Road, Eugene, OR 97402 (541) 912-3958 www.structural-source.com

Science Library and Research Commons Conceptual Design Study
Structural Technical Investigation
University of Oregon, Eugene, Oregon

December 6, 2012

Summary:

A schematic investigation of the existing Science Library structural systems has been performed by Structural Source, LLC to assist in understanding the opportunities and constraints that these systems might impose on potential renovations of the building.

Description:

The existing Science Library building is a one-story cast-in-place concrete structure that is beneath the courtyard located between the Onyx Bridge, Klamath Hall, and Cascade Hall buildings on the University of Oregon campus (see attached partial site plan). The Onyx Bridge building was built in 1962, with a stair and elevator tower that extends one level below grade in anticipation of the library construction. In 1966, the Science Library and Klamath Hall were constructed. The Science Library structure was designed and built to be immediately adjacent to the Onyx Bridge stair and elevator tower, but not to connect to it structurally. Cascade Hall was constructed on the west side of the Science Library in 1988 and a portion of the concrete basement walls originally constructed with the Science Library was removed to provide connectivity between the two structures.

Documentation:

Copies of the following original construction documents for the Onyx Bridge, Science Library, Klamath Hall, and Cascade Hall buildings were used to develop this investigation report:

Onyx Bridge:
Drawing Title: Science Building - First Addition, University of Oregon, Eugene, Oregon
Author: Lawrence, Tucker & Wallmann Architects
Dated: 1962

Science Library:
Drawing Title: University of Oregon Science Building, Eugene, Oregon
Author: Skidmore, Owings & Merrill Architects
Dated: 1966

Klamath Hall:
Drawing Title: University of Oregon Science Building, Eugene, Oregon
Author: Skidmore, Owings & Merrill Architects
Dated: 1966

Cascade Hall:
Drawing Title: University of Oregon Science Facilities: Science VI – Geology / Library
Author: The Ratcliff Architects
Dated: 1988

Scope of Work:

Structural Source, LLC has been asked to review the existing structural systems of the Science Library relative to their existing load-carrying capacities, possible strengthening strategies, and issues relating to potential construction loading that might affect a renovation. Additionally, an assessment of building code issues that may affect project development shall be included in the review.

Findings:

Vertical Load Carrying System: The vertical load carrying system is comprised of a courtyard level concrete waffle slab supported by concrete columns and conventional concrete spread footings.

Loading: The live load listed in the General Notes on sheet S-1 of the construction documents for the Science Library is 100 psf for the Plaza Level (see attached). This agrees with the current building code design load of 100 psf required for Assembly Areas which is appropriate for a courtyard. The original construction drawings also show a 4" thick layer of sand, grout and brick pavers on top of the waffle slab. This would equate to an added dead load of approximately 45 psf. In the current condition, the brick pavers have been replaced with a concrete topping slab over rigid insulation, presumably of a similar weight. Inclusion of an additional 10 psf for mechanical, electrical, plumbing and miscellaneous loads would result in a total added dead load of 55 psf. Since the average weight of the waffle slab is120 psf at the typical condition, the total uniform load for the system equals 275 psf, which corroborates the column loads listed on sheet S-8 of the construction documents.

Waffle Slab: The primary vertical load carrying component of the Science Library structure is a conventionally reinforced cast-in-place concrete waffle slab located at the courtyard level. In general, the slab is comprised of a 3" thick top slab with joists formed using 14" deep by 30" square pans, resulting in a 17" total structural depth. Joist web spacing and width varies, but they are commonly 6" wide at 3'-0" on center. The waffle pattern is filled in solid at the columns to create a column capitol for enhanced punching shear and flexural capacity. The construction documents suggest that the waffle slab was constructed with a slope to drain, but the notations are sparse and should be confirmed.

Concrete Columns: The columns that support the waffle slab are cast of concrete with a 5000 psi compressive strength and reinforced with conventional deformed steel reinforcing bars. Calculations show that the typical interior columns have some surplus vertical load carrying capacity, but their allowable vertical load will be governed by the capacity of the footings that they are resting on.

Spread Footings: Calculations show that the conventional concrete spread footings that support the interior columns are designed right to the limit of the allowable soil bearing capacity of 16,000 psf listed in the General Notes on sheet S-1 of the construction documents (see attached). This condition will act as the limiting factor for the vertical load carrying system, effectively restricting the addition of any appreciable load to the assembly.

Conclusion: The vertical load carrying system appears to have been very economically designed with little or no reserve. Any new vertical loads associated with a renovation either need to be transferred to the subgrade independent of the existing structure, or load needs to be removed from the existing system to offset the new loads. This could potentially be accomplished by removing the existing concrete topping slab and installing a light-weight elastomeric membrane in its place.

Previous Reviews and Project History: It was mentioned in one project meeting that a previous review of the existing waffle slab had been done and that the engineer found the system to be considerably deficient. This previous review is apparently not available any more. It was also mentioned that the structure was thought to have been built without a building permit, suggesting that quality control may have been lax and that the construction documents may not reflect what was actually built. Since the

level of detail of this evaluation cannot confirm or deny these facts, it is assumed for this investigation that the construction drawings provided by the University are accurate and reflect what was actually constructed.

Lateral Load Resisting System: Existing detailing indicates that the Science Library structure was kept seismically isolated from the adjacent structures through the use of expansion joints. That being said, there is not an obvious lateral load resisting system associated with the Library structure. There are two types of retaining walls utilized around the perimeter of the generally rectangular footprint that could act as shear walls.

Loading: The General Notes on sheet S-1 of the construction documents for the Science Library do list Seismic Zone 2 under the Design Loads (see attached), but the lack of qualifying shear walls on the east, south and west sides would suggest that the Library structure may not have been designed for seismic loads at all. The Seismic Zone 2 note was intended to apply to Klamath Hall, which was part of the same set of drawings. Buildings with soil backfill on all sides are sometimes considered effectively constrained from lateral displacement such that no lateral force resisting system is required. This approach could possibly be considered for loading in the north/south direction of the Science Library structure, but not in the east/west direction. As a matter of fact, loading in the east direction should be based on the sum of the seismic load in that direction and the lateral soil pressure from the soil being retained on the west side of the structure since there is no retained soil on the east side of the structure.

Shear Walls: The rectangular footprint of the Library structure has a large amount of concrete retaining wall on the south, west, and north sides. The east side is predominantly open to the basement level of the adjacent Klamath Hall. The retaining walls are of two distinctly different constructions based on their connection to the waffle slab:

The retaining walls on the north side are tied rigidly into the edge of the waffle slab with two layers of hooked rebar dowels, developing a shear friction mechanism that could transfer a significant amount of lateral load parallel to the wall. See attached section A/S1 from the original construction documents depicting this condition.

The walls on the south and west side were detailed to be "removable". This was done by providing a limited number of rebar dowels from the slab to the top of the walls, and by wrapping the dowels to prevent bond with the concrete. Additionally, a bond breaker was specified to be applied to the cold joint in the concrete between the top of wall and the edge of the waffle slab at this condition. See attached detail A/S2 showing this condition. The result is that the only shear transfer capacity of the connection is the shear strength of the rebar itself with no contribution from the concrete. This could be overcome by installing new shear transfer mechanisms between the bottom of the slab and the inside face of the retaining walls. These could be steel angles with seismically approved expansion anchors as one option.

Seismic Detailing: Aside from a lack of an apparent lateral load resisting system, many of the ductile detailing requirements of the current building code have not been integrated in the construction of the retaining walls. The code requires that walls with a certain level of flexural compressive stress have boundary elements (similar to column cages) built into the ends of the walls. To bypass this requirement, enough shear walls have to be activated such that the compressive stresses in every wall never reach the specified threshold compressive stress. This will likely require all of the remaining walls to become functioning shear walls.

Torsional Irregularity: The lack of shear walls along the east side of the structure creates a large offset between the center of rigidity of the structure and the center of mass. This offset will define the system as having a torsional irregularity. This will trigger an amplification of the seismic design forces required to be applied to the structure, but should not result in a significant problem.

Renovation Options: A request was made to discuss some practical and impractical options for daylighting into the lower level of the structure or adding structural framing above the courtyard level.

Daylighting: A waffle slab is effectively a complex two-way slab system. Two-way slab systems have a zone in the middle of each slab "bay" that can easily be removed without adversely affecting the remainder of the system. A "bay" is defined as the rectangular shape defined by the supporting columns establishing the four corners. The middle section is simply the middle third of the span in both directions. So, in a 36' x 36' bay, the 12' x 12' section of the slab at the center of the bay could easily be removed without requiring posts to be added. Larger openings can be cut into the slab, but supporting posts and footings will likely be required. Openings that extend a long distance across the slab will need to be reviewed for their effect on the slab acting as a seismic diaphragm.

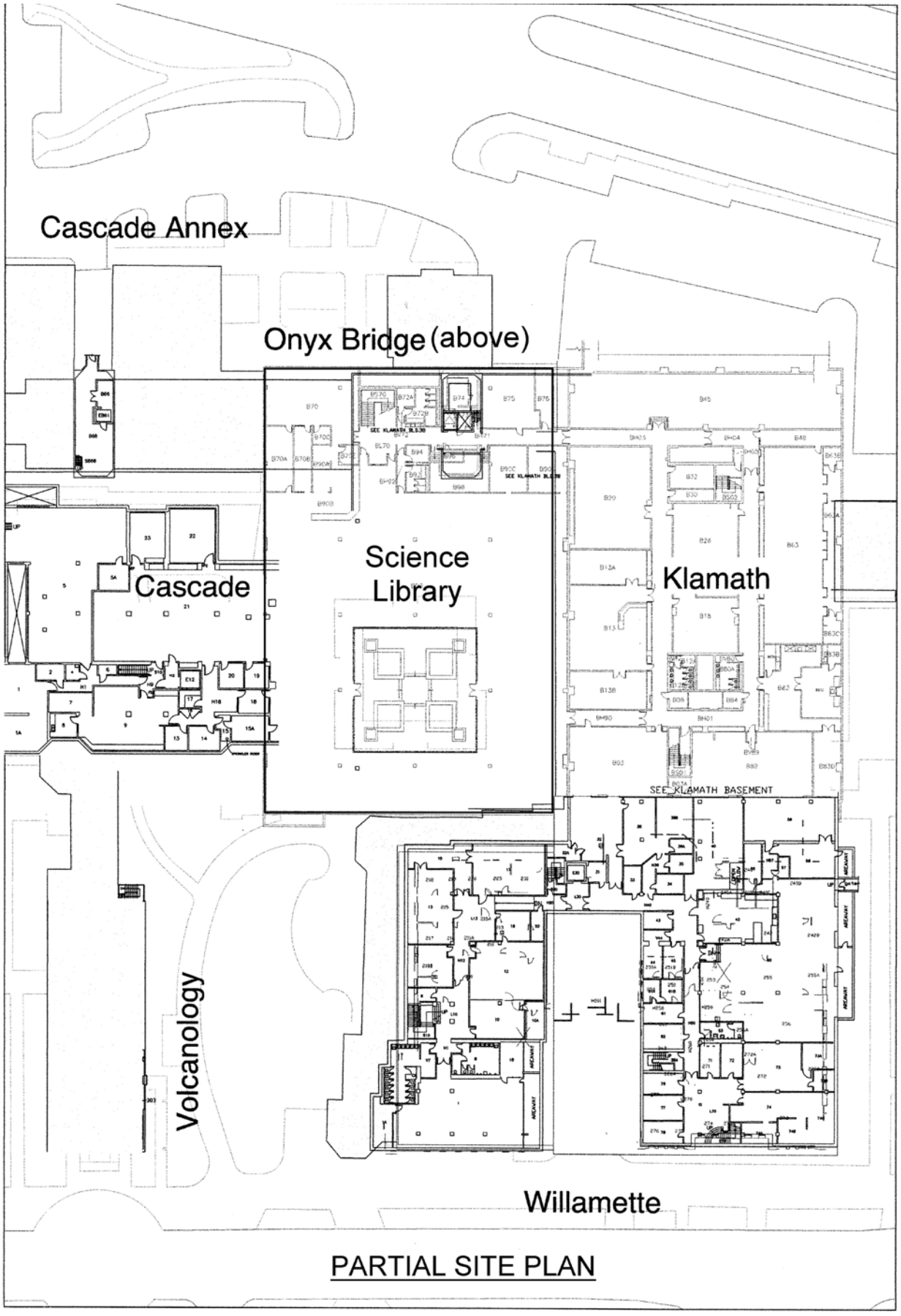
Courtyard Framing: As discussed previously, the existing structure will not accommodate additional vertical loads well. Vertical loads from any new framing at or above the courtyard level should be supported by new posts or bearing walls that extend down to new foundations. Strengthening of the existing columns and foundations is possible, but will likely be found as cost-prohibitive.

Construction Loading: The 100 psf live load used to design the waffle slab should allow reasonable amount of construction uniform loading on the deck without requiring shoring to the slab on grade below. This could be in the form of materials temporarily stacked on top of the slab. Concentrated loads are more of a concern due to the thin 3" slab spanning between the webs of the waffle joists. The concrete topping slab and rigid insulation on top of the slab will help to distribute concentrated loads to reduce this concern, but concentrated loads should be evaluated by an engineer prior to application. A typical example of a concentrated load to be concerned about would be tire loads, specifically from fork lifts. The use of shoring posts below the slab and cribbing on top of the slab can resolve a number of special conditions. The general contractor should be made responsible for the design of such systems as construction means and methods, including review and approval by a registered professional engineer.

Conclusions: It has been found that the existing Science Library structure has limitations relative to supporting new vertical loads due to the efficiency of the original structural design of the vertical load carrying system. It was also determined that the lateral load resisting system is deficient and will require strengthening if it is intended to be brought up to current building code standards. Additionally, the existing waffle slab system has the potential for new penetrations for daylighting either with or without posts depending on the locations and configurations of the openings. Nothing was discovered that would suggest that a renovation of the Science Library would not be recommended.

Kevin Wilger

Kevin Wilger, S.E.
Principal



PARTIAL SITE PLAN

GENERAL NOTES

GENERAL:

1. Soil Pressure assumed 16,000 psf L.L. and D.L.
2. Elevations shown on foundation plan are maximum elevations to bottom of footings. Footings to rest on firm natural undisturbed rock, notify Architect if other conditions are found.
3. Verify all openings in floors on architectural, mechanical, and electrical plans.
4. See architectural plans for general details and dimensions not shown.
5. Contractor to verify and check all dimensions not shown.
6. Design loads: Science Building = 150 psf L.L., Library Wing Plaza Level = 100 psf L.L., Wind 15 psf 0-60 ft., 20 psf - Up Seismic Zone 2.
7. No excavation shall be made below any footing closer than a one to one slope to the bottom of same.
8. Backfill all pipe trench excavations below footings with lean concrete to bottom of footing.

CONCRETE:

1. For construction joints (C.J.) not otherwise shown see Specification.
2. Stone concrete to be $f_c' = 3000$ psi at 28 days plus 15% for test cylinder - except for columns (see Column Schedule).
3. Pour concrete beams, joists, and slabs in one continuous operation.
4. Contractor to furnish details for pickup system to be used for tilt-up wall panels for approval.

REINFORCING:

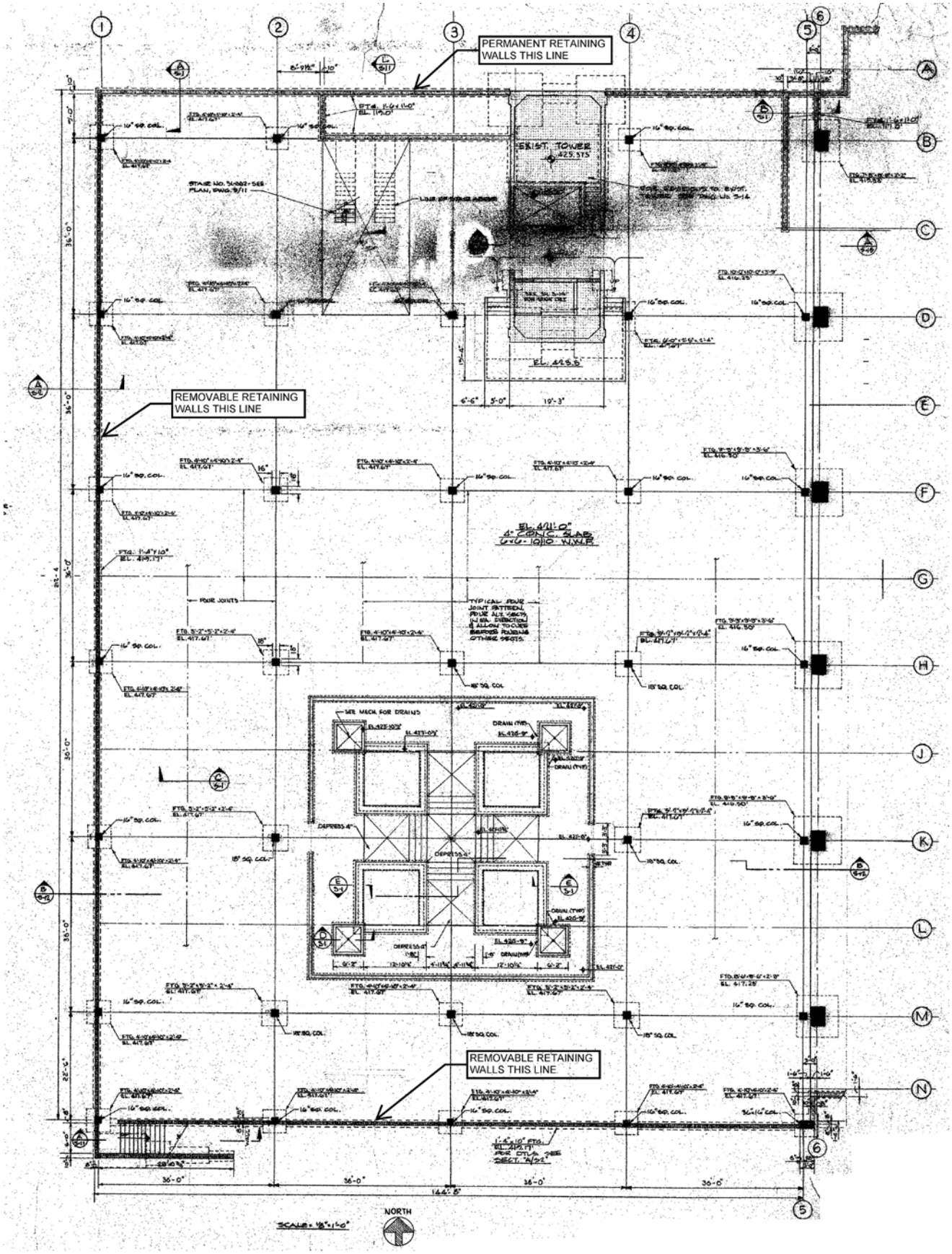
1. All reinforcing steel (except as noted) to be hard grade ($f_y = 60,000$ psi) deformed bars ASTM Specification A-15 conforming to ASTM A-305 detail, fabricate, and place per ACI Manual 315 and Code 318. Welded wire mesh (WWM) to be ASTM A-185. (All Specifications latest Edition).
2. Set main reinforcing steel 2" from forms for columns or surfaces exposed to weather, 1-1/2" for beams and girders, 3" for footings and other concrete poured against earth, 1" for waffle slabs.
3. Reinforce all concrete walls with 1/4 of 1% reinforcing steel each way unless otherwise noted.
4. Provide 2'-0" x 2'-0" corner bars for all horizontal wall steel at all corners and intersections. Bar lap 27 x diameter or 2'-0" minimum.
5. Unless noted otherwise, place 2 - #6 over, 2 - #5 under and 2 - #5 each side all wall openings; vertical bars story height plus 2'-0", horizontal bars opening plus 2'-0" each end (minimum). Place 2 - #6 in bottom all walls. Place 2 - #5 vertical at all discontinuous wall ends.
6. Terminate non-continuous bent reinforcing bars in standard hook to within 3" of opposite face of concrete. Straight bars to extend to within 3" of opposite face of concrete at end spans.

STEEL:

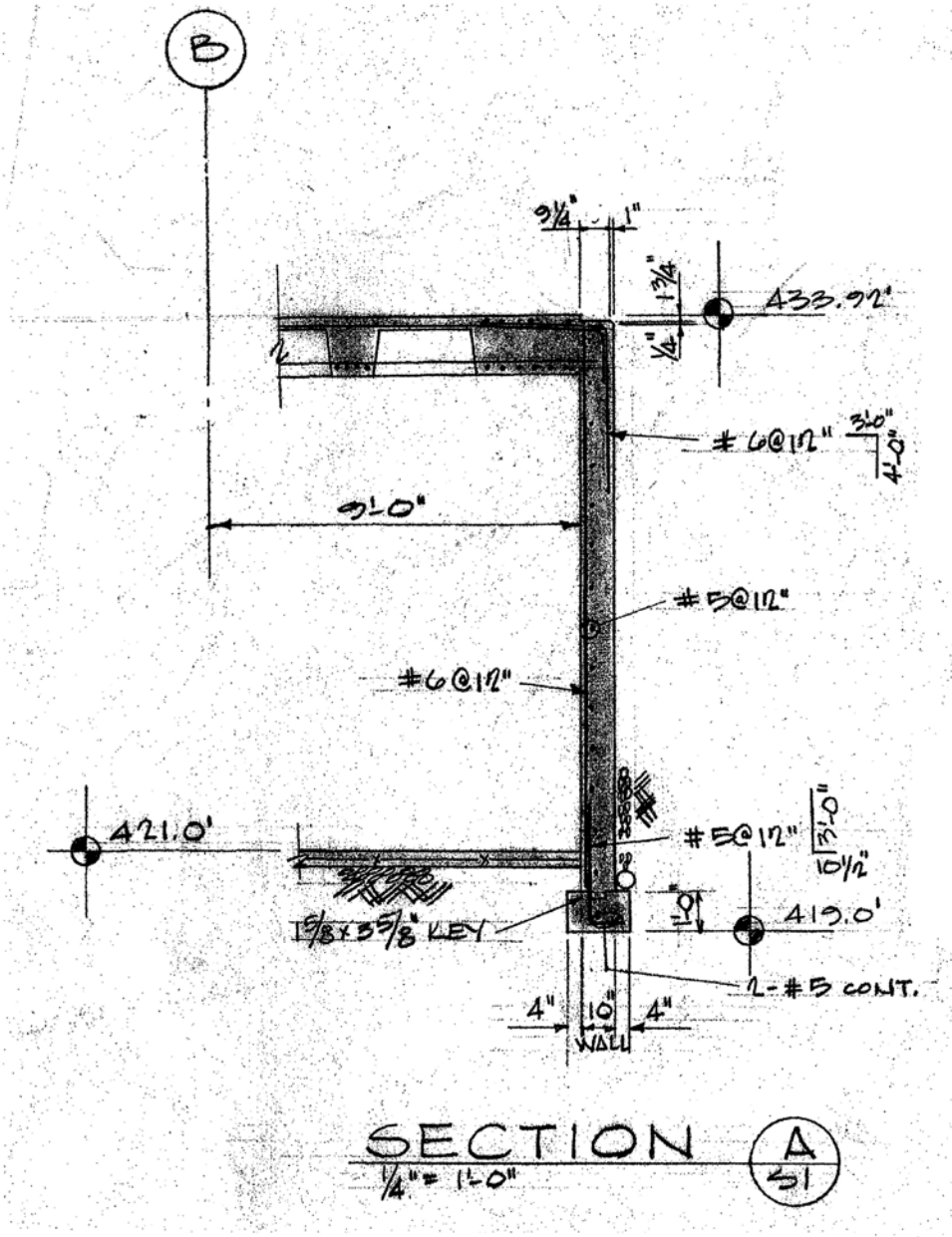
1. All structural steel ASTM A-36 (latest edition), $f_s = 22,000$ psi, detail, fabricate and weld to AISC Specifications.
2. Install secondary structural members around openings in floor after primary structure is erected.

BLOCK:

1. Concrete block shall be lightweight units conforming to ASTM Specification C-90 (latest edition) Grade A units with mortar conforming to UBC Type A.
2. Reinforce all block walls as shown with a minimum of 3/16 diameter trussed wire reinforcing every 3rd course or #9 trussed wire reinforcing every 2nd course, and 2 - #4 in continuous bond beam at the top.
3. Unless noted otherwise, reinforce all openings in block walls with a minimum of 2 - #5 in grouted lintel bond beam over openings, bars opening plus 3'-0"; 2 - #4 in fully grouted cell at jambs, bars opening height plus 2'-0" above and below; 2 - #4 in grouted lintel bond beam below opening, bars opening width plus 3'-0".
4. All grout for reinforced block walls to be 2000 psi concrete made with 3/8" minus aggregate.
5. Trussed rod reinforcing for block walls to conform to ASTM A-82 (latest edition).
6. Fill all cells having anchors with grout.



SCIENCE LIBRARY FOUNDATION PLAN



PERMANENT RETAINING WALL SECTION

HOW TO DRAW IN RESEARCH COMMUNITY?

COFFEE & MEETING SPACE & VIDEOCONF.

WILLAMETTE ATRIUM COFFEE

SCI LIB WELL-LOCATED, CENTRAL

VISIBILITY TO PASSING BIKES/PEDS

BOOK NEW BOOKS -

OUTREACH FOR K-12, ETC

BOOGY GOES TO AAA HEARTH

WILLAMETTE ATRIUM

"IT & COFFEE"

OFFICES FOR VISITOR DROP-IN

OR OTHER SMALL FLEXIBLY-ASSIGNED SPACES

WITH EASY ACCESS/SCHEDULING

NEED HIGH QUALITY WHITE BOARDS

GLASS OR ENAMEL

MOVE DEPARTMENTAL HELP/STUDY SPACES

TO LIBRARY (CHEMISTRY) & PEER

LIBRARY TO INTERFACE ADVISORS

BOOKS IN MATH/PHYSICS, ETC.

LOCATION

- ATTACH TO SCI LIB, NOT SOME SEPARATE
- BUT NEAR QUADRANGLE

3 SPACE TYPES

- CLASSROOM
- SOLITARY [WITH BOOKS]
  FEW DISTRACTIONS
- PUBLIC INFORMAL INTERACTION SPACE
  THAT DISPLAYS (CURRENT RESEARCH
  (& ACCESS TO ELECTRONIC JOURNALS)
  "RANDOM ACCESS & INTERACTIONS"

KEEP "GREAT BOOKS "OPEN BAR" FOR QUESTIONS W/ STAFF (INSTR? LIBRARY?) AVAILABLE

→ "LEARNING COMMONS"

SEE LCC SCIENCE RESOURCE CENTER

COFFEE

IMPORTANCE OF RESEARCH MISSION
HOW TO ATTRACT?
WAYS TO MANIPULATE/ENVISION DATA
PROVIDE DATA STORAGE, ET. C
FUTURE SCIENCE DIRECTIONS?
INFORMATICS AS UNKING ELEMENT?
PROJECT HELP - SERVICE CENTER MODEL
- FOR FACULTY
TEACH STUDENTS FOR STUDENTS
HOW TO ACCESS DIGITAL MAT'LS
FUTURE OF PRINT MAT'L?
50% OF CURRENT?
OFFSITE?
JOURNALS DIGITAL
KEEP SELECTED BOOKS
TED TALKS?
PUBLIC USE FOR MEDICAL QUESTIONS
VS. MOSTLY @ CHSU
SHARE W/ HOSPITAL?

NEW SCIENCE LIBRARY

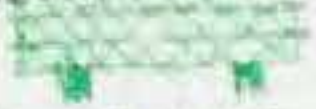
NAME? INT SCI 3?

PROJECT SCOPE?

UNDERSTAND NEIGHBORING NEEDS (LOKEY LAB / ~~ZEBRAFISH~~ EXAMPLE)

KEEP ONTX BRIDGE REPLACEMINT IN MIND

HOW DO YOU FIND SCI LIBR?
"AT BASE OF THE UGLIEST BUILDING"



RESPECT NORTH/SOUTH PED & BIKE MOVEMENT

BETTER VIDEO CONFERENCING 5-6 UP TO 20-30 PEOP.
LARGE DISPLAY
& FULL PARTICIPANT VISIBILITY.
& SHARED DISPLAY

FEWER BOOKS - MORE DIGITAL MEDIA

POTENTIAL L. LOKEY GIFT
INCLUDE INSTRUCTIONAL SPACE { INTERACTIVE MULTIMEDIA LARGE FLEXIBLE

HOW CAN LIBRARY BE THE INTELLECTUAL CENTER OF THE SCIENCES WHEN THAT IS NOW ON THE WEB?

COFFEE FOOD

OFFICE HOUR SPACE: WHITE BOARDS & COMPUTERS

SEE HUMAN PHYS, CHEM

"MENTAL REC CENTER" - VISIBILITY

DAYLIGHT - TOO MUCH?

NEED AT PERIMETER.

MEET W/ GRAD STUDENTS & UNDERGRADS

DIRECTLY INTERVIEW CURRENT USERS

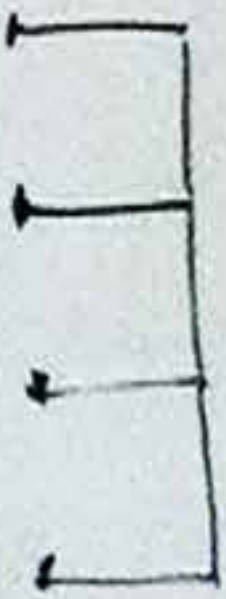
GRAD STUDENTS
SAME NEEDS AS RESEARCHERS

COMMUNICATIONS { ELECTRONIC, VERBAL, VISUAL } NEED ALL THREE
IS IT.

WHITE BOARDS · FLAT SCREENS
FLEXIBLE COLLABORATION/
DISPLAY ENVIRONMENTS

OVER COURSE OF DAY:
GETS BUSY AROUND 10

"ROOMLET" ALCOVES



1. Make a place that feels like Science
    - Seeing science going on and seeing the library at the same time
    - areas to display physically or electronically the products of people's research.
    - SPARK INTEREST IN SCIENCE
    - Sinage!
    - Rotating display screens, vote on what goes up.
    - Display or presentation space
    - rotating display of products of scientists research
    - make space visual

2. Provide more study space that is acoustically and physically diverse
    - Not enough quiet space.
    - cool new furniture
    - Like the idea of glassing over the courtyard and making that a quiet room.
    - Limited collaborative spaces - need more for 3-10 people
    - socializing/collab spaces for group study
    - somewhere to nap! comfy couches!
    - cubby quiet spaces/small group spaces
    - Separate - Idea from another university: quiet floor/space, collaborative/space
    - Study rooms very important (accommodate 5-6 people)
    - booths and soft, comfy seats
    - very important to have a mix of spaces
    - library is primarily a study location - love it. lively but still quiet.
    - One big study space where you can talk and independent spaces.
    - I come to the library to actually study (fall asleep at home!). Sometimes it's too loud, recognize people talking
    - Like the quiet area.
    - Current study rooms are gloomy and hidden.
    - Somewhere to sit and relax in a quiet area - for reading papers
    - quiet study @ top level (individual tables and comfy chairs overlooking other library areas).
    - Include clocks and more outlooks at each tables - "Real" clocks, so you don't have to use a cell phone.
    - more private/quiet spaces needed
    - don't like cubes
    - multiple power outputs from one location
    - environment with peers - ask a lot of people what they want
    - GHS - have cube rooms still quiet, like chairs. Can move into group style for 2-3 people.
    - research commons, maker spaces
    - visualization and making spaces
    - tables for 9 (3 groups)
    - More personal space with tables
    - Quiet and open areas
    - More individual activity in the library
    - comfortable chair and tables
    - learning commons
    - more acoustically separated spaces for group work

- niches - private spots like in the example, individual spots
- create vertical control of noise
- some table spaces
- modular spaces
- seating/tables/whiteboards in same area
- padded chairs
- napping couches, comfortable chairs, movable tables
- the ability to create your own space
- more study rooms for 1-2 people (like Knight library) with write-on walls
- Use this library because of location, it's smaller and can usually find a place
- study alone - power cord access
- bigger desks to spread out materials
- quiet spaces along the windows - see outside and have personal space
- need a confined quiet zone
- levels (literally) of noise
- Separation between noisy and quiet is important
- priorities should be individual study spaces
- come here for quiet space
- great acoustics as is
- the giant study area can be loud
- plus quiet spaces
- quiet spaces - less successful
- 4 most together important, similar to a shared office

3. Provide the physical, technological and intellectual resources needed by students and researchers to advance their fields

- Requests for light table for tracing
- More computers
- high demand for more computers
- laptops are great and flexible!
- Technology! Consider it!
- utilize hand and technology methods
- Genius lab, great (physics drop-in on campus works!)
- Expand the anatomy lab
- Use whiteboards a lot, usually in groups.
- Use chalkboards and whiteboards.
- Better cell phone service.
- more power outlets/computer plug-ins around the library
- expand libraries!
- Places you could look up books, schedule meeting rooms, check availability
- interactive displays, touch screens
- Library - keep recent publications up front and keep journals together
- more power outlets- 3 prong
- 3-D printing
- can plug in at least 3 laptops per table/space
- interactive with electronics/ electronic work tablets they can draw on

- Journals that are not online - primary. Could use more resources.
- Update technology. Make rooms Skype ready.
- Projectors
- lab in the library - computer room
- texts on file - able to come to the library when needed
- more computers - like set up at Knight Library computer stations
- journals are online now
- technical not available online or mitra library loan.
- important to have books that are not online
- buy every new text book! Like Cambridge University in England
- photocopy terminals - all work now
- screen readers
- richer internet meeting - weekly WebX meetings, faculty receive collaboration with other universities, really collaborative tool
- improve communications
- taught online classes - a way to have personal connections with students (i.e. video office hours, "face time")
- smart board
- more whiteboards
- need outlets
- Journals - missing newer editions
- need updated info under geology and grad chemistry
- help desk - speak with someone more knowledgeable to make it easy to find resources on the internet
- no one really uses books, but don't get rid of them.
- technology important, would like more sketching
- ability to save drawings - smartboard for group or by oneself
- conceptual articles - write
- journals online are good resources
- Ergonomics are important!

4. Bathe in light controlled for the task at hand
    - more natural light!
    - window in office
    - currently gloomy
    - more work spaces near a window!
    - gets hot by glass, but likes idea of daylight.
    - Lack of daylight - not bothersome.
    - light from the courtyard = good. Would spend more time if had better seating.
    - Currently "The Dungeon"
    - Love idea of garden inside for natural light.
    - Non harsh fluorescent lights, mix with natural lighting.
    - due to weather, would like something to emulate sitting on a bench outside
    - love natural light from the courtyard
    - different lighting throughout - brighter spaces, more natural light
    - control of sun for projection, but bring it into the space.

- more natural light
- natural light, see outside
- Natural Light! Especially in faculty and library employee areas - but need control in areas where projection happens and for heat.
- tons of daylight currently
- would like natural light

5. Strengthen the connection to Science Complex and campus
    - Like the secret aspect of the Science Library
    - Idea for entrance: an elevator sticking out of the ground
    - Needs to be bigger
    - feel comfortable even for non-science majors
    - Currently a great location!
    - Multiple entrances is a great idea
    - Make entry more pronounced.
    - Help boards!
    - Library help should be prominent, known.
    - Geology - split resources between libraries.
    - Community interaction
    - Add a 3rd story; Onyx Bridge could easily use whole full 2nd floor
    - Where is it? The front of the library?
    - Library map!
    - Second entrance location
    - "Hidden Gem" - unique
    - informal learning - outreach
    - outreach mission
    - NSF requires grantees to do some sort of outreach with K-12
    - keep it public
    - make comfortable for visiting teachers and students
    - "informal learning" here means public outreach, public education, no credit hours, spark interest
    - interaction between sciences, need that bump of encouragement

6. Provide knowledge from data
    - visualization, simulations
    - data visualization
    - supporting research endeavor with data visualization technology and 3D printing
    - Ecology and evolution research
    - data visualization - problem with seeing it over heads of people in front

7. Enliven and beautify the plaza
    - keep central atrium light space
    - access, but covered to stay dry in winter
    - enclosed atrium with heating, but then add technology and desks/chairs
    - courtyard: a place to get away from everything

- more green space - trees on top of library.
- Enjoys using the courtyard - used noisy and quiet sides.
- Fountain outside
- Love the courtyard! More modern - waste of time and energy.
- Plaza too dry and blah - green would be better
- Courtyard used mostly for cell phone use and Week o' Welcome activities
- Skateboard noise from overhead is heard in library
- really like the courtyard for phone calls

8. Make flexible space to increase longevity
    - meeting rooms: up to 30 people
    - B90C = great room but long and skinny
    - problem with current B90 and other rooms
    - Room 22 is a great size, maybe same shape but bigger/smaller
    - Flexible desks and chairs in classrooms
    - classes in computer labs
    - multi-purpose classrooms with diverse technological abilities
    - adaptable classrooms
    - separate people and books?
    - more meeting/talking areas
    - flexible work stations, small group meeting rooms
    - presentation space
    - movable whiteboards
    - big tables that you can spread out
    - Separate books
    - Science classes (CIS) - in a computer lab with space for laptops, too.
    - Willamette Hall, Physics Study room is good example: 5-7 marker boards, screens, Skype capable.
    - spaces, ideal size would be 30-50 (50 better, with 9 students per station)
    - creating stations, groups of 3 seems to be a magic number
    - Space specific for Physics tutorials - lecture, demo room, physics teaching
    - peer learning - students in groups of 3
    - Conference rooms - make for 10-15 people, if available add Skype meeting technologies
    - rooms for students to present and practice with projectors
    - Flexible work areas - like Fenton Math
    - create a visible intent to use the rooms, so others can join
    - Bigger Anatomy rooms
    - bigger classrooms, not long and narrow
    - more tables to combine for groups
    - Used to have a room to do demos for groups of school kids - room for 50-60 people (public lectures, etc.). Call it "special seminar room" - not for set times every week or regular classes, but especially for special visits.
    - a room for demos - maybe include a counter and a sink, but not essential

9. Cafe: provide nourishment for body and mind
    - sofas and drinks

- cafe and food and drinks
- coffee/snack area would be a relief
- need to be able to use "points"
- keep connected to the science libraries, don't have to go out when it's raining.
- CAFE!!
- Cafe being really integral with library - up on step/platform in the middle, like Barnes & Noble

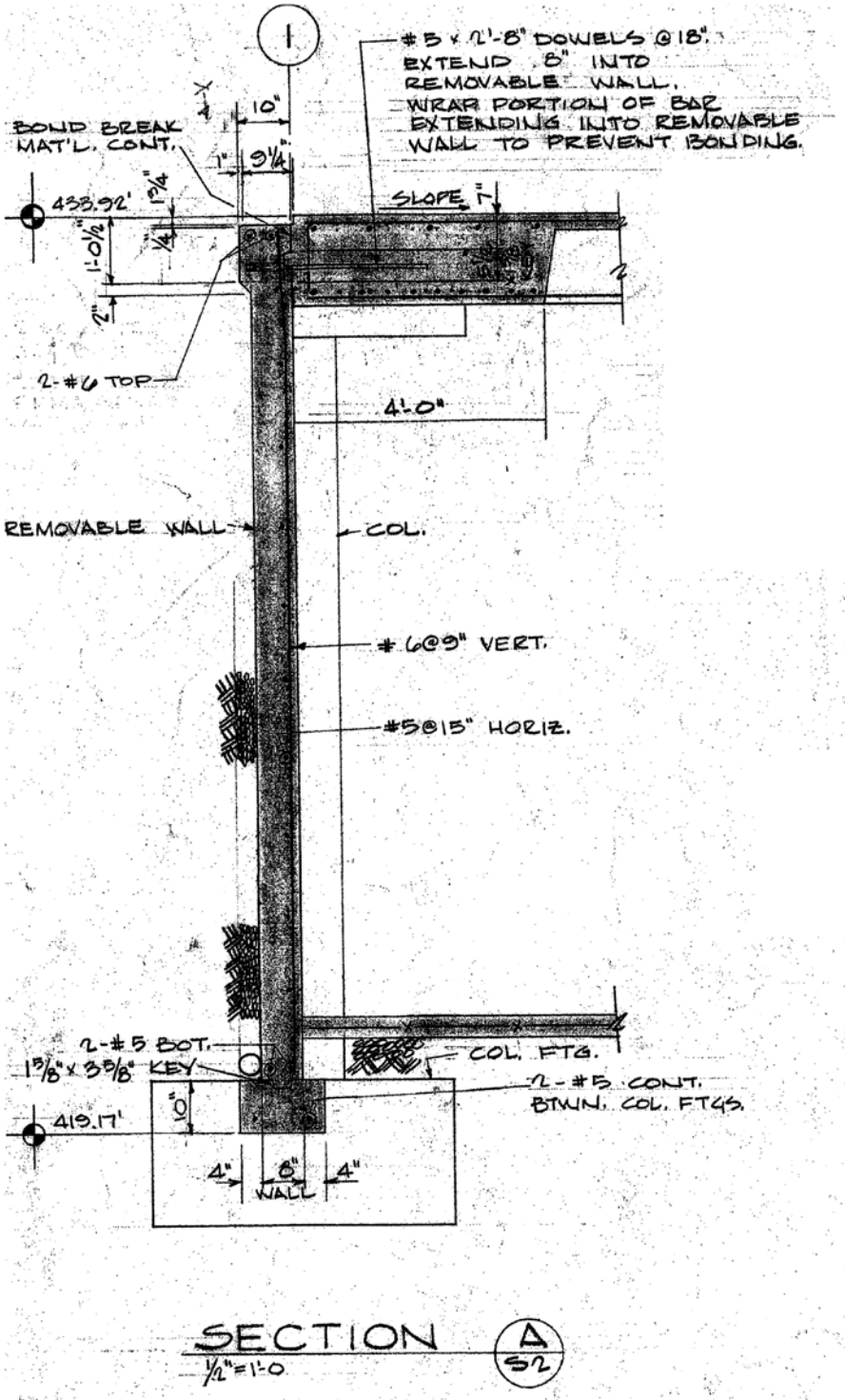
10. Create the intellectual, social and cultural heart of the sciences
    - Provide multiple ways for the staff to come and go.
    - informal learning (outreach) - support K-12 teachers
    - Drop-in tutoring - for Intro and GenEd
    - bring multiple disciplines together
    - drop-in sessions
    - scholarly communication, facilitate and help it be a physical space
    - collaborate with comm. groups to bring in expertise
    - scheduled discussion sessions
    - Shouldn't be physics only - share with other departments
    - Interdisciplinary - not likely as a drop-in
    - Higher probability of more usage if created something really "new"
    - bringing in things (events, symposia, etc.) that push boundaries. Example, theme of water = water education, water rights.
    - meet with other biology people to have discussion - mostly in small groups
    - think of it as more of a student space
    - office hours space/help sessions
    - TAs available would be helpful
    - useful - new students interact with post doc. students, generate new ideas
    - Science drop-in center
    - create dedicated spaces for different disciplines - have experiment rooms set up so students can practice
    - administrator coordinating departments
    - Centrally located in the sciences
    - COURSE (acronym) - w/ Outreach

11. Color Preferences/Materials Comments
    - color schemes are important
    - Each color, study - more calm. Not too bright (intense). Not too dark.
    - Like wood and plants
    - make very modern but not cold
    - more wood, less concrete
    - muted cool colors - not a lot of different colors

12. Precedents
    - Utah State: books stored in automatic "Red Box" for books.
    - Pacific Source Company Garden - sciences come together for group garden, staff only. Donate food.
    - OSU interactive tutorial spaces

- King County example: locker/shower facilities for bike commuters
- Cronkite School of Journalism @ASU: food, classrooms, media centers, presentation spaces and Green energy efficient.
- Montana State: internal fountain!
- Idea, HEDCO Building

13. Miscellaneous
    - "Parents are science and love library too"
    - Biology department was trying to be "Green" office.
    - Big Creek works well.
    - "Santa's Workshop" (on note about Physics Tutorials)
    - I used to enjoy looking at new books.
    - Wheelchair access!
    - NCSU student study group - 20% good
    - Temperature control - never right
    - Need bigger restrooms
    - clear organization
    - low ceilings - hanging on thoughts (w/drawing of stick figure)



REMOVABLE RETAINING WALL SECTION