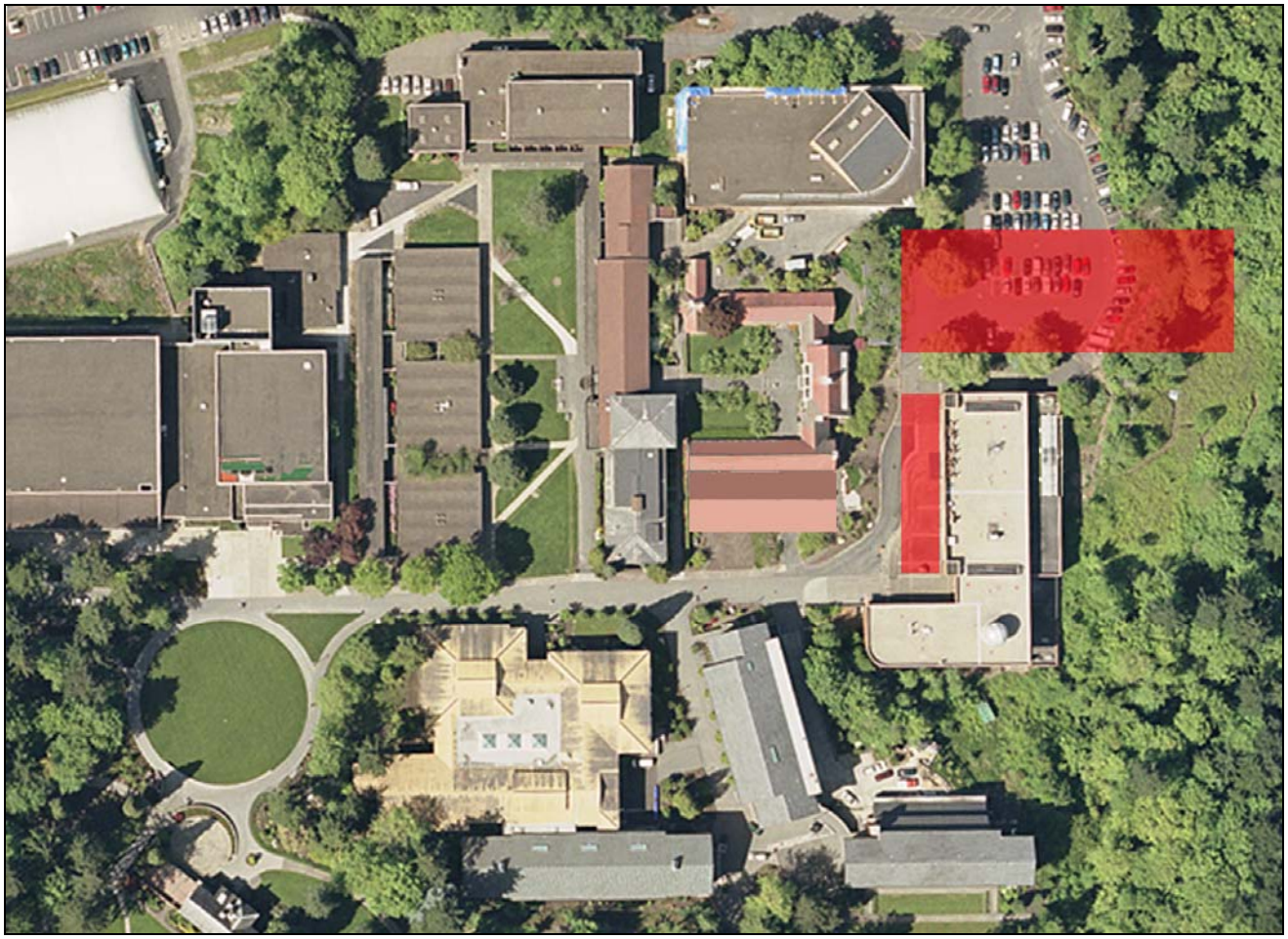


Science Facilities Expansion Feasibility Study

Prepared by

The Mathematical & Natural Sciences Division and Campus Planning

Lewis and Clark College

April 2002

Contributors

Science Facilities Expansion Steering Committee

Gary Reiness, *Convener and Chair, Division of Mathematical and Natural Sciences*
Kellar Autumn, *Representative, Biology Department*
Steve Attinasi, *Representative, Science Shops*
Barb Balko, *Representative, Chemistry Department*
Michael Broide, *Representative, Physics Department*
John Krussel, *Representative, Mathematical Sciences Department*
Barb Roberts, *Representative, Support Staff*
Harry Schleef, *Committee Advisor and Dean, Division of Social Sciences*
Tom Schoeneman, *Representative, Psychology Department*
Michael Sestric, *Representative, Campus Planning*
Evan Williams, *Representative, Environmental Studies*

Technical Advisors

Jon Wiener, Soderstrom Architects
Site development and building architectural analysis

Stephanie Coyle, Hoffman Construction Company
Constructibility analysis and cost modeling

Richard Heinz, Research Facilities Development, Inc.
Program planning and comparables analysis

Lenny Borer, Human Resources Consultant
Workshop facilitator

Executive Summary

This report provides a preliminary assessment of the requirements necessary for expanding science facilities at Lewis & Clark College. The facilities needs outlined in the report are based on academic planning assumptions provided by science faculty in the fall of 2001. These recommendations are the results of inter- and intra-departmental discussions and a two-day planning workshop conducted in January 2002.

The planning workshop was led by an experienced science facilities planning consultant, Research Facilities Design (RFD) from San Diego, California. The workshop resulted in preliminary space allocation guidelines based on an analysis of comparable institutions and the needs identified by Lewis & Clark science faculty. Analysis of data from comparable liberal arts colleges suggests that the requirements identified by Lewis and Clark are within the norms for like sized liberal arts institutions around the country.

Over crowded and outdated facilities in Olin

Using space allocation data derived from the workshop, the planning committee studied four (4) different architectural development strategies. These simple studies were designed to explore the "fit" between academic program elements and with the College's long-range master plan. The studies also illustrate how program elements can be combined in new or new and remodeled facilitates. The planning committee determined that there are multiple facilities construction scenarios that satisfy the long-range master plan and also meet the preliminary space allocation objectives identified by science faculty. One of the four studies was singled out as having the most potential for further consideration.

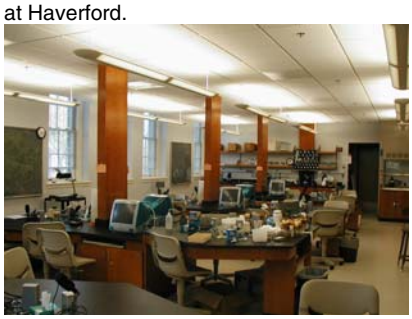
The four construction scenarios identified in the previous analysis were also evaluated for cost. There was little difference in construction costs for the four different schemes and all schemes were within the national baseline cost parameters for comparable facilities, based on data provided by RFD. The basis for selecting a scheme for further study or implementation should therefore not be based on cost, but rather on how effectively the scheme satisfies academic, master planning and site development criteria. 'Option D' is represented in this report as the scheme that may best accomplish these objectives.

The planning committee recommends the following five "next steps" for planning and developing the College's science facilities:

1. Program Planning Recommendation:

Preliminary space allocation recommendations in this report are based on assumptions about faculty growth, baseline comparables analysis and quantifiable deficiencies in existing facilities. All of these assumptions should be tested and refined in a subsequent program-planning phase using data specific to Lewis & Clark College. This can be done during the 2002/03 academic year. Students should be included in this phase of the planning process.

An example of a flexible, modern teaching lab at Haverford.



2. Space Allocation Recommendation:

Recommendations for the numbers and types of spaces (classrooms, teaching labs, research facilities, and etc.) represent the best assessment of the planning committee and its consultants. These assumptions should be tested using classroom utilization data, class size assumptions, and distribution of major by discipline, and scheduling information specific to Lewis & Clark. This can be done during the 2002/03 academic year.

3. Site & Building Development Recommendation:

There appear to be several ways to provide additional facilities for science programs. However, based on an analysis of site constraints and space allocation objectives, Option D appears to be the strategy that best solves most problems and it should be studied in more detail.

An example of a similar function teaching lab at Lewis & Clark.

4. Cost Management Recommendation:

Preliminary cost analysis based on both comparable institutions and local construction conditions suggests little difference between the different architectural schemes. For preliminary planning purposes, costs are assumed to be in the $60M to $65M range and final solutions should be selected on the basis of functional appropriateness rather than cost.

5. Schedule Recommendation:

The average time, nation wide, for planning and constructing an academic science facility is approximately 7 years. Even using the work of this past year as a springboard for future action, we are still at least 6 years away from a completed facility. To minimize the effects of construction inflation and maximize our opportunities for improving science instruction at Lewis & Clark we should expedite this planning effort to the best of our ability.

Why Does Lewis & Clark College Need New Science Facilities

Flexible lab design at Haverford

Haverford

Introduction:

Following the launch of Sputnik by the USSR in the late 1950s, U.S. colleges and universities responded to the perceived threat of Soviet scientific advances by expanded science programs and building additional buildings for teaching and research of science. This construction boom went on through the 1960s into the 1970s. Science buildings constructed during that era, including those at Lewis & Clark College, have become obsolete for several reasons. Although the style of teaching and research in science was consistent from the turn of the 20th century into the 1960s, the nature of teaching and research in the natural sciences has changed significantly since that time. The buildings constructed on the older model could not easily be adapted to new technologies, such as the explosive growth in computers and computer-based technologies in teaching and research. Modes of teaching that emphasize active learning by students, such as interactive group projects, are not well supported by classrooms with fixed, forward facing seating, nor laboratories with immobile benches and seating. And because the buildings were not designed to accommodate change, the cost or upgrading and renovation for modern needs is often prohibitive. Lewis & Clark College is not alone in facing this challenge to the quality of its science programs.

Fortunately, the widespread nature of the problem of rapid obsolescence of science buildings means that much has been learned in recent years from the mistakes of the past, and architects, planners and builders, as well as colleges and universities, have become more foresighted in their design and construction of new buildings to redress the shortcomings of the old. The need to improve older science buildings has dovetailed with a renewed interest in science education by the government and private foundations, resulting in a new boomlet of construction and thus a new knowledge base on which colleges like Lewis & Clark College can draw in order to achieve maximum effectiveness and efficiency as they design new or remodeled buildings of their own.

An organization that has fostered sharing of information about “what works” in planning new science buildings is Project Kaleidoscope (PKAL). PKAL is a national volunteer organization that was founded in the late 1980s in response to several reports during that decade that decried the quality of science education in the United States. Consisting of college and university

Flexible teaching spaces promote group learning - Dickinson

Informal learning opportunities - Reed

"Science on Display" - Dickinson

faculty, administrators, architects and building planners, and some representatives of government agencies, PKAL seeks to promote effective undergraduate science education. PKAL has sought to identify and disseminate effective methods of science education, and it has also recognized that the buildings in which scientists work and teach affect, and often limit, the quality of their science programs. Just as artists are dependent on their studios, and actors on their theatres, scientists are enabled or constrained by their working environment—their classrooms and laboratories. Since the early 1990s PKAL has organized workshops for college faculty and administrators to assist them in planning effective new science buildings, has produced a handbook to guide facilities planning by colleges and universities, and has studied the effects on new or remodeled buildings on the quality of science programs. Their report, What Difference Do Improved Science Facilities Make? is available online at: http://www.pkal.org/pubs/cov/index.html .

This report, based on studies of new science buildings at several colleges and universities around the country, identifies the value of new and renovated facilities to a college campus. These findings encapsulate well the expressed desires of the science faculty at Lewis & Clark, as well as students, the Commissions on Academic Priorities and on Teaching, and administrators. First, new facilities enhance the education of students, by permitting improvements in pedagogy, creating spaces for student/faculty research, and providing places where faculty with students and students can interact informally with each other. Second, new facilities enhance the visibility of science programs to the campus and off-campus communities, and therefore augment efforts to recruit faculty and students in the sciences. Third, new facilities foster development of programs that bridge the disciplines, bringing students and faculty from different fields into regular contact. Fourth, new facilities address functional deficiencies in the infrastructure of older buildings, including inadequacies in power, ventilation, heating and cooling, total space, and information technology, and permit the College to meet current standards for safety (such as seismic stability and hazardous materials storage) and handicapped accessibility to which older buildings seldom conform. Finally, we learned in our visits to Willamette University and the University of Portland that science enrollments had surged following the construction of new science buildings.

It is important for us to note that liberal arts colleges like Lewis & Clark have been disproportionately influential in their production of students who earn Ph.D. degrees in science, technology, engineering and mathematics.

"Undergraduate institutions have been a national resource for a significant proportion of students who undertake professional careers in the science. And the primary reason cited for their output has been the research experiences of undergraduate students with their faculty mentors."

Michael Doyle, President, the Research Corporation, a foundation in Tucson, AZ.

Donald Kennedy, President emeritus of Stanford and editor-in-chief of *Science* says he has long been amazed by the proportion of Ph.D. degrees awarded at research universities to students whose bachelor's-level education was completed at undergraduate schools. He attributes this success to that fact that undergraduate colleges, because of their size and student-faculty ratio can pay attention to the "process of learning science and the mode of inquiry…They're able to pay individual attention to their students and make sure that every one of them gets a full dose of laboratory experience. And in the absence of graduate students they make undergraduate participation in original faculty research a requirement."[1]

Bodine, Biology-Psychology at Lewis & Clark

Olin at Lewis & Clark

Overcrowded chemistry stockroom in Olin

The Situation at Lewis & Clark:

Currently the Lewis & Clark College Division of Mathematical and Natural Sciences consists of 30 faculty members who offer majors in Biochemistry, Biology, Chemistry, Environmental Studies, Mathematics, Mathematics and Computer Science, and Physics. The seven faculty in the Department of Psychology, part of the Social Sciences Division, share with the natural sciences a dependence on laboratory facilities for teaching and research, a dependence that is likely to grow as that discipline evolves. Faculty from the departments that support these offerings—Biology, Chemistry, Mathematical Sciences, Physics, and Psychology—are housed in three separate buildings: Biology/Psychology, BoDine, and Olin. In one case, Mathematical Sciences (including Computer Science), the offices are in separate buildings from their classrooms and laboratories.

These buildings are at the eastern end of the campus out of the usual traffic patterns, which renders the science programs relatively invisible to the non-scientists on campus. The main entrance to Olin, for example, is below grade, down a flight of stairs. Apart from the Olin lounge, which is an out-of-the-way corner, there is no gathering or study space for students in these buildings, nor any convenient space for faculty/student and faculty/faculty interactions, apart from faculty offices. The consequence of the current arrangement is thus to isolate science faculty and students from each other, from colleagues in other departments, and from the rest of the campus.

As shown later in this report, the total square footage available to the science programs lags substantially behind that at comparable colleges. The Psychology and Biology faculty, for example, are housed in facilities that provide about 50% as much space per faculty member as the national norm.

1 Quoted in Chemical and Engineering News, October 22, 2001, (pp59-61)

Informal meeting room - Doane

Outdoor classroom - Dickinson

These space limitations impose severe restrictions on pedagogy and research and make recruiting new faculty difficult. Both departments have been rejected by their first choice candidates in recent searches, in part because of the perceived inadequacies of the facilities for research.

The BoDine, Bio/Psych and Olin buildings were all constructed before 1979, at a time when the College put little emphasis on science or faculty scholarship, much less on research opportunities for students. In the intervening quarter century, the expectations for faculty have risen to include a substantial expectation of scholarship as a condition for promotion and tenure, but the facilities have not similarly evolved to support the research programs in the sciences. As a consequence, the College has undertaken a number of stopgap measures to create research labs, including conversion of teaching labs into research suites, reduction in classroom size to enable creation of teaching and research labs, and in one case remodeling a storage area to produce a 150 ft^2 molecular biology research laboratory. The labs thus created are small by current standards (150-300 ft^2 compared with a standard of 500-600 ft^2 at other colleges), and their creation has reduced the spaces available for teaching classes and labs. (We should note that the "research" labs are also teaching spaces, because students are active participants in the research programs of science faculty. Indeed a primary goal of recruiting a research-active faculty is to provide students the opportunity to learn science by doing original research; see above). At the same time, the number of faculty in the sciences has grown since 1977 from 4 to 7 chemists, from 4 to 5 physicists, from 5 to 8 biologists, from 7 to 8.5 FTE mathematicians and computer scientists, from 0 to 1 geologist, and from 5 to 7 psychologists. In other words the amount of space has been static as the size of the faculty has increased by nearly 50%, from 25 to 36.5, and the space needs for scholarship per faculty member have also increased.

One unfortunate byproduct of this accretion of spaces for laboratories and offices is a reduction in the availability of spaces for students and for student-faculty interaction. One by one, student lounges, or student-faculty "lunch rooms", have been eliminated as they are converted to other uses. These were places where the science faculty could meet with each other or with students in an informal atmosphere, and here has been a concomitant reduction in the sense of community that these spaces engendered. There is now only the Olin Lounge, used predominantly by students in chemistry and physics courses, but not by biology, psychology, or mathematics and

computer science students. Hence, not only are the science faculty separated from each other, the students have become balkanized as well.

Finally, the science buildings were constructed when standards for safety and accessibility were considerably more lax than is currently the case. The faculty and departmental offices in biology, psychology, and mathematics and computer sciences are all on the top floors of buildings that lack elevators. Thus they are inaccessible to faculty, students, and staff who cannot climb stairs. One small research lab on the ground floor of Olin is so cramped that one side of the lab bench cannot be used by a person able to walk, much less one in a wheelchair. The Bio/Psych and BoDine buildings were built without adequate fume hoods. Even with retrofitting, there are only 3 fume hoods in the two buildings, less than one per two laboratories. When the buildings were built, it was common to work with hazardous materials (and carcinogens) like toluene or formaldehyde on open bench tops. OSHA regulations now make those practices illegal, but there are no hood facilities to which the use of hazardous materials can be transferred. Recently (March 2002) a team of external reviewers evaluated the Chemistry Department. They found safety issues to be so pressing that their first recommendation was: "that the Chemistry Department work with the College and the Physics Department to find a solution to the overcrowded chemical stockroom. Adequate space is needed for chemical and chemical waste storage and for laboratory preparation". Fortunately, they didn't see the biology stockroom, which is even more inadequate. In addition to accessibility and safety problems, the current building hampers biologists and psychologists who wish to do research with vertebrate animals. It is illegal for the college to house any warm-blooded animals that would be used by the biology and psychology departments in teaching and research because our "animal facilities" fall far short of Federal regulations. Because those regulations will probably be extended in the future to cold-blooded animals like frogs or geckos, the lack of satisfactory animal facilities puts the research programs of several faculty members at risk.

Chemistry Research Lab at Lewis & Clark

In short, the current facilities impede research and teaching of science, hamper recruitment to Lewis & Clark of students who are interested in science and of science faculty, diminish retention of students in science programs after they come to the College because of our inability to foster a community of science learners, and pose significant problems in meeting current, not to mention future, regulations of safety and accessibility. For

these reasons, it seemed to both faculty and administration that the College should take immediate steps to remedy these problems.

The Process:

The Balance Room Lewis & Clark

Mathematical and Natural Sciences and Michael Sestric, Director of Campus Planning, convened a group of faculty and staff[1] in September 2001 to consider the needs of the College for science facilities. This group met regularly during the fall 2001 semester to identify the College's needs for science facilities and to gather information from faculty and staff throughout the Division. In November, Reiness and Sestric attended a workshop on planning new college science buildings organized by PKAL at Ursinus College in Pennsylvania. They also visited several new science buildings in eastern PA, including those at Dickinson (Math and Physics), Bryn Mawr (Chemistry) and Haverford (all sciences, including Psychology and Mathematics) Colleges. In January the whole working group visited new or renovated science buildings at Willamette University, the University of Portland, and Reed College. These site visits confirmed our suspicion that Lewis & Clark's science facilities lagged behind those of like institutions, some of whom we compete with for science students. At the same time, they provided models for how LC could effectively upgrade our facilities and pointed out mistakes we would do well to avoid.

The Balance Room at Bryn Mawr

Just before the beginning of the spring semester, Reiness and Sestric organized a two-day workshop on campus for all science faculty and staff. With the advice of external experts--Richard Heinz of Research Facilities Design, a San Diego firm with extensive experience planning science facilities for colleges, Leonard Borer as facilitator, and Dan Danielson of Soderstrom Architects, the lead architect on the Swindells science building at the University of Portland--this group spent two days both learning about new science facilities at other liberal arts colleges and formulating a plan to address the needs of the natural sciences at Lewis & Clark College for the foreseeable future. One outcome of this workshop was the realization that Lewis & Clark's science facilities are currently much inferior to the norm of other liberal arts colleges (information provided by Heinz and Danielson),

[1]Steven Attinasi, Supervisor of the Natural Science Shop and Physics Lab Coordinator; Kellar Autumn, Assistant Professor of Biology; Michael Broide, Associate Professor and Chair of Physics; Barbara Balko, Associate Professor of Chemistry; John Krussel, Professor of Mathematics; Barbara Roberts, Administrative Assistant to the Divisional Dean and Secretary, Dept. of Physics; Thomas Schoeneman, Professor and Chair of Psychology; Evan Williams, Professor of Chemistry and Head of the Environmental Studies Program; Reiness, and Sestric.

and, encouragingly, that the facilities needs identified by LC faculty and staff at the workshop are consistent with those norms.

Taking this information, the facilities group brought in Jon Wiener of Soderstrom and Stephanie Coyle from Hoffman Construction to assist us in blocking out various models for how to address the facilities needs that had been identified and to estimate the cost of doing so. Four different approaches were proposed by Wiener (see below), the first of which was judged most effective at meeting the goals articulated during this planning process. All have similar estimated costs and thus there is little to choose among them on this basis; for that reason we recommend that the College pursue the first option in its future planning for new and renovated facilities. Briefly, this option envisions expansion and renovation of Olin Hall and construction of a new science building immediately adjacent to it and linked to Olin in a way that will provide a welcoming main entrance to the "science complex".

Informal meeting space - Ursinus

A "typical" Department Hearth - Dickinson

The Programmatic Needs:

In their discussions, the planning committee and science faculty and staff identified several goals that new facilities should achieve. We list those briefly below.

First, the science teaching facilities should encourage active learning by students. This means both "smart" classrooms and an abundance of laboratories where students can learn science by doing it. Classrooms should enable students to interact with each other as well as with teachers and to have ready access to learning resources over computer networks. Currently many of the classrooms in the science buildings have fixed, forward-facing seating. This fosters a lecture style of teaching that promotes passivity and makes it difficult to break the class up into small discussion or working groups, for doing miniprojects or other more active forms of learning. Thus classrooms with movable seating would be preferable, as would classrooms in which each student station has internet access for laptop computers, because experience shows that future pedagogy will draw increasingly on computer-based methods for information retrieval and for communication. (For example, using such a system a professor can ask students during class to respond to questions via computer, receive the results on his/her own computer, and instantaneously assess each student's grasp of a concept.) In addition laboratories should be spacious, comfortable, and, above all, safe places for learning.

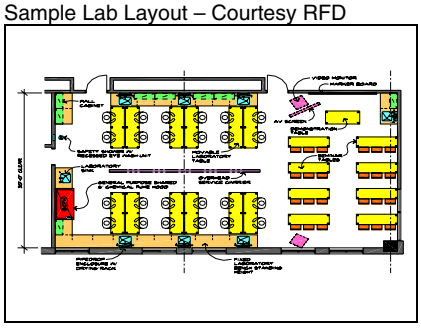
Haverford facilities encourage active learning

Second, science facilities should foster interactions among faculty and students across departmental lines. As science becomes increasingly interdisciplinary and new areas of scholarship and learning emerge at the boundaries between existing disciplines, it will become even more important for faculty and students with different disciplinary perspectives to meet and share them regularly in informal as well as formal ways. Thus the facilities should encourage and even require interaction among diverse groups of faculty and students. Currently, the different departments are separated in distinct buildings. As the humanities and social science programs have been enhanced by bringing together faculty from different disciplines under one roof, the natural sciences would benefit from a similar physical proximity to one another. As current and emerging "hot" areas such as biochemistry, biophysics, materials science (physics and chemistry), neuroscience (psychology, biology, chemistry, etc.), and bioinformatics (computer science and biology) show, there is much to be gained by crosspollination of faculty and students from different disciplines.

Adequate student study space - Dickinson

Third, the facilities should testify to the importance of science at Lewis & Clark College. The College needs modern facilities in order to continue to recruit and retain outstanding faculty in the sciences, and to compete effectively for students who are interested in science and mathematics. Strengthening science programs and attracting more students with interests in this area are goals of the College, as articulated by the Commission on Academic Priorities. As the PKAL and other reports show, improving our science facilities will be an essential part of achieving those goals. But new or renovated buildings should do more than lure students to the College. To maintain their interests in science and retain students as science majors, the buildings should foster both a learning environment in the classroom and a sense of community among science students and faculty outside the classroom. There need to be ample study areas for students to gather, and places where faculty and students can come together intentionally or serendipitously for conversation. These spaces should be physically welcoming, with ample natural light, as in Watzek library, for the gloomy Portland winters. The buildings should not be places that students flee after classes, as is generally now the case, but places where they have a "home" and a sense of belonging.

Sample Lab Layout – Courtesy RFD



Finally, the facilities must be able to meet not only the College's current needs but those of the science programs for the foreseeable future. Because science facilities are the most expensive buildings on most campuses to build

and operate, and because they have long lifetimes, it is essential that they be planned in ways that ensure their usefulness for decades to come. This means that they should be planned for maximum flexibility, enabling economical remodeling or reconfiguration as needed to meet future needs. It means that safety and regulatory issues should be foremost in the plan and the buildings should be constructed to anticipate more stringent future requirements. It means planning for growth of the faculty numbers in the sciences and for growth of student enrollments in this area; a facility just large enough to serve current needs will quickly be outgrown, as recent experience has shown elsewhere on campus. (Based on conversations with President Mooney and others, we have assumed 20% growth over an estimated 50-year useful lifetime of the buildings in our planning).

We believe that Lewis & Clark's science departments have been remarkably successful in the last decade in building educational and scholarly programs of top quality. The College has attracted a talented cadre of young (and not-so-young) faculty who have melded their excellence in teaching with strong, active research programs that attract national funding and attention and draw students in as their research partners. The students in turn have garnered numerous prestigious awards in national competitions and gained entry to top-ranked graduate and medical schools. To sustain and build on these successes will require that the facilities that house the science programs also be of the highest quality.

Science Planning Workshop

A planning workshop was held on January 14 and 15, 2002. Over 30 persons participated in the workshop, including representatives from all science departments, support staff, and several science facilities planning consultants.

Deborah Lycan, Steve Tufte, Michael Broide, Sue Benowicz, Sharon Smith, Stacey Fiddler, Greg Hermann, Janet Davidson, Barb Roberts, Jim Duncan, Michael Sestric, Gary Reiness, Wendy McLennan, Barb Balko, John Krussel, Evan Williams, Janis Lochner, Anne Boal, Erik Nilsen, Louis Kuo, Linda Noble, Steve Attinasi, Kellar Autumn, Bob Owens, Tom Schoeneman, Denise King, Rich Bettega, Richard Heinz, Lenny Borer, Dan Danielson, Yueping Zhang, Harvey Schmidt, Bill Randall, Jens Mache (part of each day), Brian Bedell-Detweiler (first day only), Jerusha Detweiler-Bedell (first day only).

The results of the workshop provided detailed information that the space program planning consultant used to prepare space allocation guidelines for each department and inter-departmental shared spaces.

The workshop participants worked together in both departmental and multi-disciplinary teams. This process resulted in a set of common visions and requirements for the entire science program as well as a set of detailed requirements for individual departments.

The workshop goals, participants list and agenda are reproduced in the appendix.

A complete transcript of the workshop was distributed to each department and is available from the Divisional Deans Office or from the Campus Planning Office.

Space Summary and Comparable Institutions Analysis

Lewis & Clark's existing science facilities occupy approximately 100,000 building gross square feet (GSF), divided between three buildings. About 53,000 square feet are in the Olin Science building with the balance divided equally between the Bodine and Bio/Pysch buildings.

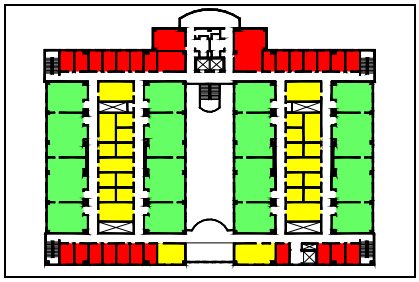
An analysis of comparable institutions suggests that Lewis & Clark should have approximately 160,000 GSF to meet space requirements based on present department faculty of 36.5 FTE (**Table 1**, Current Faculty). Assuming that faculty may grow to approximately 45 FTE, then the space requirements based on comparables analysis will be approximately 191,000 GSF as illustrated in **Table 2**, Projected Faculty.

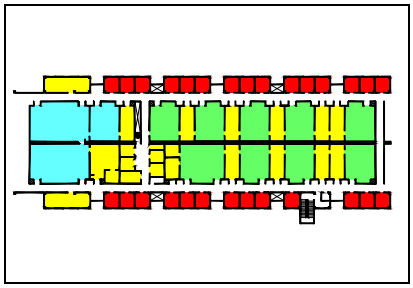
The space allocation objectives identified during the workshop, and quantified by the program-planning consultant, suggest an overall space requirement of approximately 189,000 GSF. This is consistent with the national benchmarking data summarized above. Assuming that we renovate the existing Olin building, then the net new space required will be approximately 134,652 GSF.

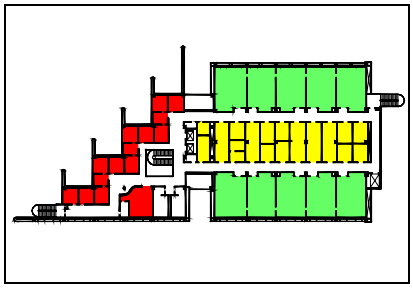
The overall space allocation recommendations, by department, are summarized in **Table 3**, Overall Space Summary.

These tables were prepared by Research Facilities Design based on information received at the Work Shop, reviews of Department requirements and consultation with the Science Facilities Expansion Steering Committee

Sample space allocation diagrams courtesy RFD







Space Allocation Recommendation:

Recommendations for the numbers and types of spaces (classrooms, teaching labs, research facilities, and etc.) represent the best assessment of the planning committee and its consultants. These assumptions should be tested using classroom utilization data, class size assumptions, and distribution of major by discipline, and scheduling information specific to Lewis & Clark. This can be done during the 2002/03 academic year.

AREA BENCHMARKING COMPARISONS AMONG PRIVATE U.S. INSTITUTIONS

January 31, 2002

Net Square Feet per Faculty Full-time Equivalent (FTE) - Current Faculty

Institution	Biology			Chemistry			Math/Comp. Sci.			Geology			Physics			Psychology			NSF Totals	
	Total NSF	FTE	SF/FTE	Total NSF	FTE	SF/FTE	Total NSF	FTE	SF/FTE	Total NSF	FTE	SF/FTE	Total NSF	FTE	NSF/FTE	Total NSF	FTE	SF/FTE	Comps	Existing
Augustana College	22,400	9	2,489	19,600	9	2,178	N/A						6,900	5	1,380	N/A				
Beloit College	19,000	8	2,375	12,610	6	2,102	4,370	6	728				11,400	3	3,800	N/A				
Bowdoin College	21,300	7	3,043	22,100	6	3,683	N/A						13,100	4	3,275	19,200	8	2,400		
Carleton College	33,000	8.3	3,976	17,500	6	2,917	10,500	12	875				16,700	6	2,783	12,500	4.8	2,604		
Colby College	24,000	10	2,400	21,200	7	3,029	3,900	10	390				6,700	6	1,117	N/A				
Dickinson College	N/A			23,517	9	2,613	9,071	10	907				15,800	11	1,436	N/A				
Grinnell College	23,470	9.2	2,551	20,660	6.8	3,038	N/A						17,906	5.6	3,198	N/A				
Hope College	32,191	16	2,012 #	28,686	16	1,793	N/A						N/A			8,403	13	646		
Lawrence University	22,825	6	3,804	15,545	5	3,109	6,075	7	868				11,700	4	2,925	N/A				
Macalester College	20,239	7.5	2,699	17,930	7	2,561	5,782	11	526				12,116	4	3,029	10,511	8	1,314		
St. Olaf College	37,563	14.5	2,591	28,883	10.33	2,796	15,983	9.17	1,743				17,583	6	2,931	16,736	5.33	3,140		
University of Portland	14,235	5	2,847	6,960	3	2,320														
University of St. Thomas	23,500	11.1	2,117	16,725	9	1,858	15,975	26.33	607				9,775	4.4	2,222	N/A				
Willamette College	17,232	6	2,872	13,031	6	2,172	6,783	12	565	4,478	3	1,493	5,153	3	1,718					
Williams College	28,400	13.1	2,168	22,600	9.7	2,330	5,900	9.4	628				14,600	5	2,920	19,500	14	1,393		
Average NSF/FTE			**2,710**			**2,567**			**784**	**DLCA Avg.**		**2,250**			**2,518**			**1,916**		
CURRENT Faculty FTE at Lewis & Clark		**8**			**7**			**8.5**			**1**			**5**			**7**			**LC Actuals**
Subtotal NSF based on comps.	**21,682**			**17,966**			**6,661**			**2,250**			**12,589**			**13,413**			**74,562**	
Existing LC Areas	**11,497**			**12,056**			**4,056**			**1,190**			**10,388**			**4,185**				**43,372**
Non-departmental Classrooms/ Dean's Suite																			**18,575**	**16,283**
Total NSF based on comps.																			**93,137**	**59,655**
Estimated Net/Gross Ratio																			**0.58**	**0.59**
Estimated Gross Area																			**160,581**	**100,820**
																			Comps	**Existing**

NOTES:

1. **Information for this analysis was gathered from a variety of sources, including building architects, master plan consultant, and RFD's own database.**
2. **NSF (net square feet) figures include all departmental space (such as teaching and research laboratories, laboratory support space, office/conference space, etc.).**
3. **NSF figures do NOT include unassigned Registrar-controlled classroom spaces or Dean's Suite.**
4. **NSF figures do NOT include corridors, toilets, custodial space, stairs, elevators, shafts, mechanical/electrical equipment spaces, etc.**

Lewis & Clark College Science Facilities

Research Facilities Design revised by Lewis & Clark College 1/31/02

Portland, Oregon

San Diego, CA

SCIENCE FACILITIES EXPANSION - Feasibility Study

Table 1

AREA BENCHMARKING COMPARISONS AMONG PRIVATE U.S. INSTITUTIONS

January 31, 2002

Net Square Feet per Faculty Full-time Equivalent (FTE) - Projected Faculty

Institution	Biology			Chemistry			Math/Comp. Sci.			Geology			Physics			Psychology			NSF Totals	
	Total NSF	FTE	SF/FTE	Total NSF	FTE	SF/FTE	Total NSF	FTE	SF/FTE	Total NSF	FTE	SF/FTE	Total NSF	FTE	NSF/FTE	Total NSF	FTE	SF/FTE	Comps	Existing
Augustana College	22,400	9	2,489	19,600	9	2,178	N/A						6,900	5	1,380	N/A				
Beloit College	19,000	8	2,375	12,610	6	2,102	4,370	6	728				11,400	3	3,800	N/A				
Bowdoin College	21,300	7	3,043	22,100	6	3,683	N/A						13,100	4	3,275	19,200	8	2,400		
Carleton College	33,000	8.3	3,976	17,500	6	2,917	10,500	12	875				16,700	6	2,783	12,500	4.8	2,604		
Colby College	24,000	10	2,400	21,200	7	3,029	3,900	10	390				6,700	6	1,117	N/A				
Dickinson College	N/A			23,517	9	2,613	9,071	10	907				15,800	11	1,436	N/A				
Grinnell College	23,470	9.2	2,551	20,660	6.8	3,038	N/A						17,906	5.6	3,198	N/A				
Hope College	32,191	16	2,012 #	28,686	16	1,793	N/A						N/A			8,403	13	646		
Lawrence University	22,825	6	3,804	15,545	5	3,109	6,075	7	868				11,700	4	2,925	N/A				
Macalester College	20,239	7.5	2,699	17,930	7	2,561	5,782	11	526				12,116	4	3,029	10,511	8	1,314		
St. Olaf College	37,563	14.5	2,591	28,883	10.33	2,796	15,983	9.17	1,743				17,583	6	2,931	16,736	5.33	3,140		
University of Portland	14,235	5	2,847	6,960	3	2,320														
University of St. Thomas	23,500	11.1	2,117	16,725	9	1,858	15,975	26.33	607				9,775	4.4	2,222	N/A				
Willamette College	17,232	6	2,872	13,031	6	2,172	6,783	12	565	4,478	3	1,493	5,153	3	1,718					
Williams College	28,400	13.1	2,168	22,600	9.7	2,330	5,900	9.4	628				14,600	5	2,920	19,500	14	1,393		
Average NSF/FTE			**2,710**			**2,567**			**784**	**DLCA Avg.**		**2,250**			**2,518**			**1,916**		
																				LC
PROJECTED Faculty FTE at L&C		**10**			**8**			**10**			**2**			**6**			**9**			**Actuals**
Subtotal NSF based on comps.	**27,102**			**20,533**			**7,837**			**4,500**			**15,107**			**17,246**			**92,325**	
Existing LC Areas	**11,497**			**12,056**			**4,056**			**1,190**			**10,388**			**4,185**				**43,372**
Non-departmental Classrooms/ Dean's Suite																			**18,575**	**16,283**
Total NSF based on comps.																			**110,900**	**59,655**
Estimated Net/Gross Ratio																			**0.58**	**0.59**
Estimated Gross Area																			**191,206**	**100,820**
																			Comps	**Existing**

NOTES:

1. **Information for this analysis was gathered from a variety of sources, including building architects, master plan consultant, and RFD's own database.**
2. **NSF (net square feet) figures include all departmental space (such as teaching and research laboratories, laboratory support space, office/conference space, etc.).**
3. **NSF figures do NOT include unassigned Registrar-controlled classroom spaces or Dean's Suite.**
4. **NSF figures do NOT include corridors, toilets, custodial space, stairs, elevators, shafts, mechanical/electrical equipment spaces, etc.**

Overall Space Summary

Department	Existing Space NSF	Draft Program-1/15/02				Final Program				Increase from Existing
		Laboratory	Lab Support	Office/Other	Totals	Lab	Lab Supt	Off/Other	Totals	
Biology	11,497	17,600	4,560	3,730	25,890	-	-	-	-	14,394
Chemistry	12,056	14,080	3,520	2,700	20,300	-	-	-	-	8,245
Geology	1,190	2,240	960	440	3,640	-	-	-	-	2,450
Math/Comp.Sci.	4,056	-	-	8,300	8,300	-	-	-	-	4,244
Physics	10,388	8,640	1,033	2,010	11,683	-	-	-	-	1,295
Psychology	4,185	8,160	320	2,370	10,850	-	-	-	-	6,665
Shared	16,283	3,840	5,180	20,315	29,335	-	-	-	-	13,052
Total Net Area	**59,654**	**54,560**	**15,573**	**39,865**	**109,998**	**-**	**-**	**-**	**-**	**50,344**
Net/Gross Ratio	**59%**				**58%**				**58%**	
Total Gross Area	**100,820**				**189,652**				**-**	88,832
Existing GSFof Olin to remodel					**55,000**					55,000
Gross Area Required for New Construction					**134,652**				**-**	134,652
Estimated Construction Cost - Renovation				**$140**	**$7,700,000**				**$0**	
Estimated Construction Cost - Addition				**$280**	**$37,702,483**				**$0**	
Total Estimated Construction Cost					**$45,402,483**				**$0**	
Project Cost Multiplier					**1.35**					
Total Estimated Project Cost					**$ 61,293,352**				**$ -**	

Site Development Options and Master Plan Fit

The College worked with a local architectural firm experienced in the design of undergraduate science facilities to evaluate the space allocation requirements developed during the program analysis phase of the study.

The architectural task was two-fold. First, to evaluate how the space requirements for each of the various departments could be aggregated into a new building(s) or into new buildings(s) plus a renovated Olin. The second major task was to determine how the combination of new and/or renovated buildings fit with the long-range master plan for this area of campus.

Academic Sector of North Campus, showing Science expansion next to Olin.
L&C Master Plan. 2000

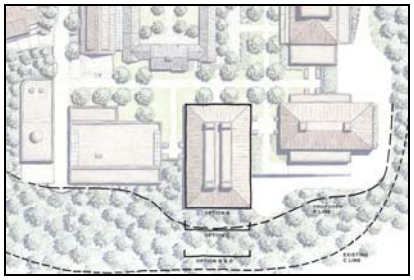
The College master plan establishes “place-holders” for new science buildings and also includes strategies for expanding the existing Olin science building. An additional objective of the master plan in this area will be to remove the Bodine-BioPysch buildings and thereby complete the central portion of the academic quadrangle.

The architectural study, prepared by Soderstrom Architects, evaluated four different expansion/renovation scenarios. The scenarios included new construction only in either one or two buildings, and a combination of new construction and expansion/renovation of the existing Olin building. All scenarios met the objectives of the master plan and also met the space allocation objectives of the planning committee. However, Option D appears to be the option that maximizes the space allocation and master plan objectives to the greatest extent possible. Option D is profiled on the following pages.

Academic Sector of North Campus,
L&C Master Plan, 2000

The complete architectural reporting, including technical reviews by consulting structural and mechanical engineers is included as an appendix. The only major technical problem appears to be a potential seismic retrofit of the existing Olin building. This retrofit will be required if vertical expansion of the existing building increases the structural loading on the existing foundation system. This requirement can be avoided by minimizing the extent of this expansion.

Site Development and Space Allocation Option "D"



This section provides a detailed description of building and site development Option D. Other options considered during this phase, as wells as the technical reports about existing building and site conditions, are discussed in the attached "Lewis & Clark College Science Expansion Feasibility Study", Soderstrom Architects, April 15, 2002.

Option "D" is based on one new building of 112,500 SF, remodeling the existing Olin building and constructing a 12,000 SF addition. There would also be 10,000 SF of new space on two below-grade levels between the new building and Olin Hall.

The new facility would be organized into two parts, the front third for offices and classrooms and the back two-thirds for labs. The three-story classroom and office portion would face the campus and the new pedestrian street behind the original Albany building. The classrooms could be on the entry level with the offices above. The lab portion would be behind this. It would be contiguous, but articulated to express the different function and break down the mass. The lab portion would match the height of the office section, but take advantage of the sloping site with two more floors below the entry level. The natural grade will allow all floors to have windows at the east end.

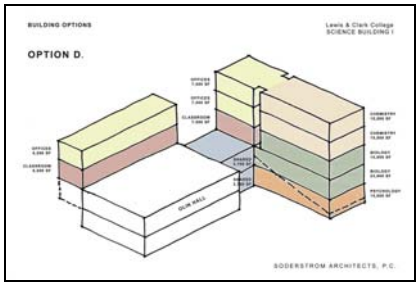
The existing and new buildings would be focused around an outdoor plaza similar to the way the Arts & Humanities buildings all radiate around Alumni Circle. This would give the Science buildings their own identity and help to foster the sense of community between the six departments. The outdoor space would also create a gathering spot for this far end of campus.

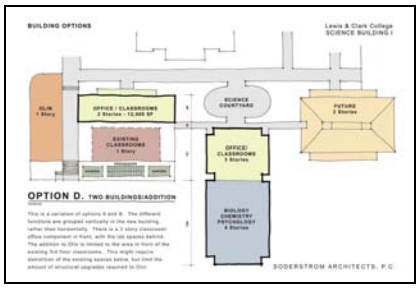
The beauty of this scheme is in its simple and appropriate organization. All of the classroom spaces would be on the entry level in both the existing and new structures. This would keep the most heavily used spaces closest to the main entries and the pedestrian traffic. All of the office space would be clustered above this on the second and third levels. The close proximity of the 49 faculty offices would encourage inter-departmental communication, while the distribution by floor and by building would allow individual department identity. Connecting the two buildings by a covered walkway/bridge would tie all of the departments together and facilitate their interaction. The outdoor plaza would create a focal element and give the sciences a shared common ground.

Another exciting benefit of this scheme would be a new façade and entry for Olin. The existing structure does not have the architectural character currently being developed on the campus. The massive exhaust ducts frame a cold and uninviting arcade dominating the main elevation. There is no visible front entry, since it is located down the stairs on the level below the

plaza. In general, it is an uninviting, unfriendly building that does not promote curiosity or enhance the University community.

Building a long narrow two-story structure in front would create the opportunity to remedy this. It could have the same open and interactive qualities as the ground floor of the Miller building. The two-story height would provide a stronger edge to the end of the campus and greatly improve the visual terminus of the main east-west pedestrian way. It would also provide a transition between the one-story Olin classroom structure to the south and the proposed three-story new science building. Building in front of Olin would accomplish the same objectives identified in the College's master plan without the added cost of structurally upgrading the entire Olin building. As noted in the preliminary structural review of the existing building, adding on top of Olin would trigger the requirement of a complete seismic upgrade. New footings and pilings would be needed, which would be difficult and expensive. By building on just the west side, this could be avoided. It would significantly reduce remodeling costs while providing many of the benefits.





The lab portion of the new building might be organized vertically with Chemistry taking the top two floors, putting them closest to the roof where their hoods exhaust. Since Chemistry has the greatest number of hoods, this is the most efficient arrangement. Biology could be located on the next two floors, giving them the first full floor below grade in order to meet their large area requirements. Psychology could be located on the lowest level, since they need many windowless rooms.

In general, Option "D" groups all of the "wet" sciences in the new structure and the "dry" sciences in the existing building. This will minimize remodeling costs, since the "dry" sciences require fewer utilities. It minimizes the need or extent of utility relocation.

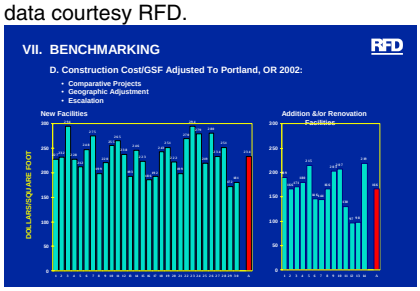
Finally, the two buildings will be connected below grade on both levels. These in-between spaces could house the shared rooms or equipment, further encouraging the interdepartmental interaction.

Site & Building Development Recommendation:

There are several ways to provide additional facilities for science programs. However, based on an analysis of site constraints and space allocation objectives, Option D appears to be the strategy that best solves most problems and it should be studied in more detail.

Preliminary Budget Analysis

National construction cost benchmarking data courtesy RFD.



Probable construction costs were reviewed from two different perspectives.

First, based on the comparables analysis of similar undergraduate science facilities, a benchmark cost per square foot was used to evaluate likely total project costs. Benchmark costs for construction only, adjusted for Portland Oregon, 2002, are $280/GSF new construction and $140/GSF remodel construction. The combined new and remodeled cost per square foot, based on comparables, is approximately $239/GSF in 2002 dollars. Applying these values to the projected space needs results in a probable construction only cost for the new and remodeled science facilities of approximately $45.4M in 2002 dollars. Applying a 35% project cost multiplier for engineering fees, communications and instructional media, furnishings, project contingency and miscellaneous owner costs results in a probable total project cost of approximately $61.3M, 2002 dollars.

Second, we evaluated probable construction costs of the four different site-specific construction options A through D, identified during the space allocation and master plan fit analysis. This work was accomplished with help from Hoffman Construction Company working in cooperation with Soderstrom Architects. We asked Hoffman to help with this effort because they are familiar with the construction quality objectives at Lewis & Clark, the construction and site development difficulties on the campus, and are also familiar with undergraduate science facilities.

Hoffman's analysis resulted in a combined new and renovated cost per square foot that ranged from $199 to $212 per GSF (construction only). The preferred option D priced out at $205. Applying these probable construction costs to the total buildings areas results in probable construction estimates that range from $37.8M to $40.3M. Option D is at $38.5M. All in 2002 dollars. Applying the construction cost multiplier at 35 % suggests a total probable construction cost range from approximately $51M to $54.4M. Option D is $52.0M. All in 2002 dollars.

Based on the forgoing cost analysis, and since we are at a very early stage in project planning, it may be best to base subsequent planning assumptions on the most conservative cost projection. Therefore assume that a new science facility, of the approximate size and scope described in this report will cost about $62M and $65M, 2002 dollars.

The following table summarizes the results of the two different cost analyzes.

Cost Management Recommendation:

Preliminary cost analysis based on both comparable institutions and local construction conditions suggests little difference between the different architectural schemes. For preliminary planning purposes costs are assumed to be in the $65M range and final solutions will be selected on the basis of functional appropriateness rather than cost.

SCIENCE EXPANSION

Work Description	Option A Cost	Option A $/gsf		Option B Cost	Option B $/gsf		Option C Cost	Option C $/gsf		Option D Cost	Option D $/gsf		Comparables Cost	Comparables $/gsf	
Finish GSF: 189,652	**37,753,835**			**40,298,985**			**39,624,673**			**38,516,885**			**45,402,483**		
DEMOLITION	$144,000	$0.76		$144,000	$0.76		$144,000	$0.76		$147,000	$0.78				
SITEWORK	$872,763	$4.60		$861,825	$4.54		$1,172,425	$6.18		$793,985	$4.22				
FOOTINGS / STRUCTURE	$3,809,456	$20.09		$4,287,278	$22.61		$3,809,456	$20.09		$3,822,000	$20.32				
EXTERIOR CLOSURE	$1,796,700	$9.47		$2,489,940	$13.13		$2,604,420	$13.73		$2,591,700	$13.78				
ROOFING	$413,200	$2.18		$408,635	$2.15		$747,200	$3.94		$392,200	$2.09				
INTERIOR CONSTRUCTION	$6,026,429	$31.78		$6,402,973	$33.76		$6,026,429	$31.78		$5,878,380	$31.25				
MECHANICAL	$6,711,824	$35.39		$6,956,448	$36.68		$6,768,744	$35.69		$6,731,600	$35.79				
ELECTRICAL	$3,467,884	$18.29		$3,751,884	$19.78		$3,500,354	$18.46		$3,477,350	$18.49				
EQUIPMENT	$6,502,820	$34.29		$6,534,800	$34.46		$6,498,500	$34.27		$6,515,000	$34.64				
FURNISHINGS	$71,190	$0.38		$98,658	$0.52		$103,194	$0.54		$102,690	$0.55				
GC's/HOISTING/INSURANCE	$2,212,439	$11.67		$2,251,457	$11.87		$2,241,120	$11.82		$2,224,137	$11.82				
CONTINGENCY	$4,804,306	$25.33		$5,128,185	$27.04		$5,042,376	$26.59		$4,901,406	$26.06				
CONSTRUCTION FEE	$920,825	$4.86		$982,902	$5.18		$966,455	$5.10		$939,436	$4.99				
CONSTRUCTION COST TOTAL	$37,753,835		73%	$40,298,985		73%	$39,624,673		73%	$38,516,885		73%	$45,402,483		74%
CONSTRUCTION COST/GSF	**$ 199**			**$ 212**			**$ 209**			**$ 205**			**$ 239**		
ENGINEERING SERVICES	$4,530,460	$23.89	9%	$4,835,878	$25.50	9%	$4,754,961	$25.07	9%	$4,622,026	$24.57	9%	$5,448,298		9%
EQUIPMENT ALLOWANCE	$3,000,000	$15.82	6%	$3,000,000	$15.82	5%	$3,000,000	$15.82	6%	$3,000,000	$15.95	6%	$3,000,000		5%
FURNISHINGS ALLOWANCE	$1,500,000	$7.91	3%	$1,500,000	$7.91	3%	$1,500,000	$7.91	3%	$1,300,000	$6.91	2%	$1,300,000		2%
MISC. OWNER COSTS	$2,076,461	$10.95	4%	$2,216,444	$11.69	4%	$2,179,357	$11.49	4%	$1,925,844	$10.24	4%	$2,497,137		4%
CONTINGENCY	$3,020,307	$15.93	6%	$3,223,919	$17.00	6%	$3,169,974	$16.71	6%	$3,081,351	$16.38	6%	$3,632,199		6%
TOTAL PROJECT, 2002 DOLLARS	**$51,881,063**		100%	**$55,075,226**		100%	**$54,228,965**		100%	**$52,446,106**		100%	**$61,280,116**		100%
PROJECT COST/GSF	**$ 274**			**$ 290**			**$ 286**			**$ 279**			**$ 323**		
ADD FOR:															
DEMOLISH BODINE/BIOPYSCH	$ 250,000			$ 250,000			$ 250,000			$ 250,000			$ 250,000		
BACKFILL THE HOLE	$ 190,000			$ 190,000			$ 190,000			$ 190,000			$ 190,000		
LANDSCAPE RESTORATION	$ 320,000			$ 320,000			$ 320,000			$ 320,000			$ 320,000		
SURFACE PARKING REPLACEMENT	$ 1,050,000			$ 1,050,000			$ 1,050,000			$ 1,050,000			$ 1,050,000		
SUB-TOTAL SITE REPAIR & PARKING	$ 1,810,000			$ 1,810,000			$ 1,810,000			$ 1,810,000			$ 1,810,000		
ADD FOR STRUCTURED PARKING	$ 1,950,000			$ 1,950,000			$ 1,950,000			$ 1,950,000			$ 1,950,000		

Notes **Options A, B and C based on 189,652 GSF. Option D is based on 188,100 GSF**
Comparable institutions cost data courtesy Research Facilities Design, San diego, CA, Febuary, 2002
Portland area cost data and construction analysis courtsey Hoffman Construction Company, April, 2002
All cost projections in 2002 dollars.

Project Implementation Schedule

Due to the complex nature of science facilities, both in their program elements and in the actual construction, it takes more time to build and occupy them than most other academic building types. For preliminary scheduling purposes, we have assumed that construction of a new building and subsequent renovation of the existing Olin, will be sequential and require a total construction duration of about 40 months. Assuming we start today and allow sufficient time for planning and permit processing (30 – 36 months), we will not likely be able to complete the entire project much before January 2008.

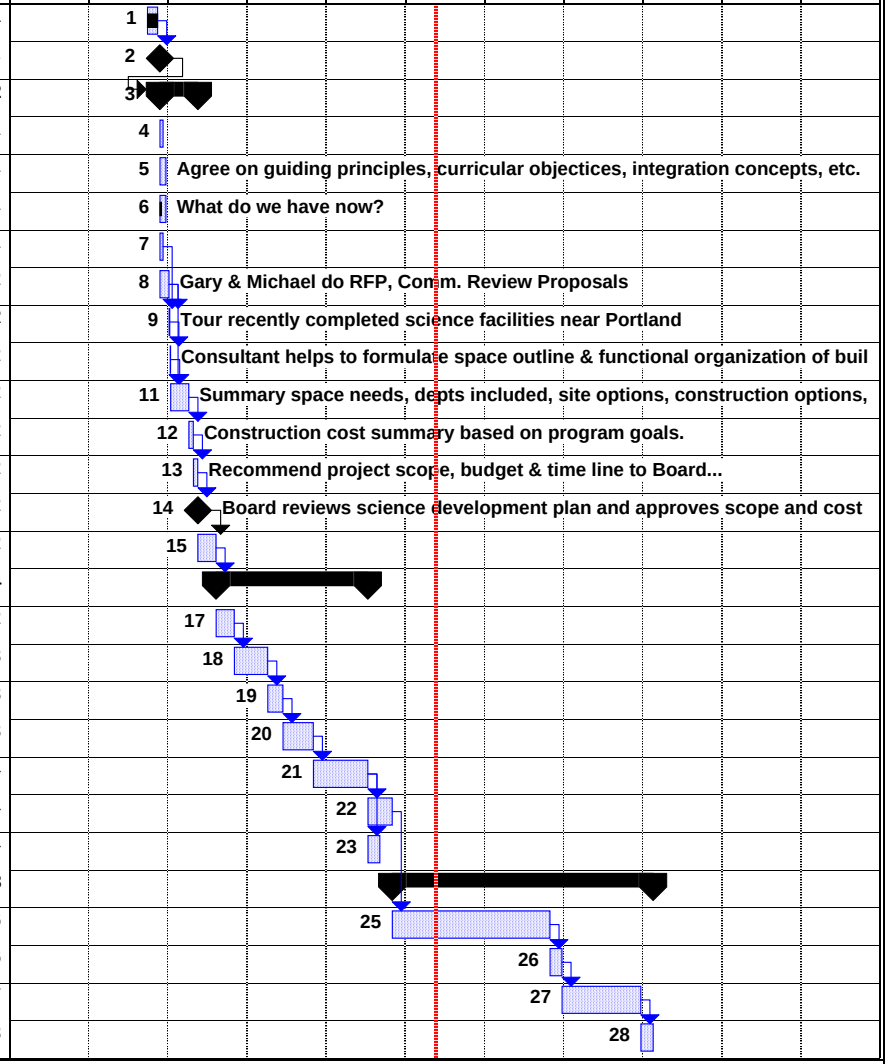
A preliminary project timeline is attached.

Schedule Recommendation:

The average time, nation wide, for planning and constructing an academic science facility is approximately 7 years. Even using the work of this past year as a springboard for future action, we are still 6 years away for a completed facility. To minimize the effects of construction inflation and maximize our opportunities for improving science instruction at Lewis & Clark we should expedite this planning effort to the best of our ability.

SCIENCE FACILITIES EXPANSION – Feasibility Study

ID	Task Name	Duration	Start	Finish
1	Planning to date	7 wks	Mon 10/1/01	Fri 11/16/01
2	Gary&Michael Great Adventure	0 wks	Wed 11/28/01	Wed 11/28/01
3	**Program Plan**	**25 wks**	**Wed 11/28/01**	**Tue 5/21/02**
4	Get Students	2 wks	Wed 11/28/01	Tue 12/11/01
5	Internal Program Analysis	4 wks	Wed 11/28/01	Tue 12/25/01
6	Set Space Baseline	4 wks	Wed 11/28/01	Tue 12/25/01
7	Establish Team Participation Agreement	2 wks	Wed 11/28/01	Tue 12/11/01
8	Select Program consultant	6 wks	Wed 11/28/01	Tue 1/8/02
9	Conduct Local Facility Tours	3 days	Wed 1/9/02	Fri 1/11/02
10	Conduct 2 day Worshop	2 days	Mon 1/14/02	Tue 1/15/02
11	Prepare Draft Summary Program	12 wks	Wed 1/16/02	Tue 4/9/02
12	Cost Analysis	3 wks	Wed 4/10/02	Tue 4/30/02
13	Prep Board Materials	3 wks	Wed 5/1/02	Tue 5/21/02
14	Board Reviews/Approves Plan	0 wks	Tue 5/21/02	Tue 5/21/02
15	Architect Selection	12 wks	Wed 5/22/02	Tue 8/13/02
16	**Building Design**	**100 wks**	**Wed 8/14/02**	**Tue 7/13/04**
17	Fianl Program Prep/Cost Validation	12 wks	Wed 8/14/02	Tue 11/5/02
18	Schematic Design & Cost Validation	22 wks	Wed 11/6/02	Tue 4/8/03
19	Value Engineering Cost Review	10 wks	Wed 4/9/03	Tue 6/17/03
20	Design Development & Cost Validation	20 wks	Wed 6/18/03	Tue 11/4/03
21	Contract Docs & Cost Validation	36 wks	Wed 11/5/03	Tue 7/13/04
22	Permit	16 wks	Wed 7/14/04	Tue 11/2/04
23	Bid	8 wks	Wed 7/14/04	Tue 9/7/04
24	**Construction & Move In**	**172 wks**	**Wed 11/3/04**	**Tue 2/19/08**
25	Construct Science Palace	104 wks	Wed 11/3/04	Tue 10/31/06
26	Commission & Move-In	8 wks	Wed 11/1/06	Tue 12/26/06
27	Remodel Olin Palace	52 wks	Wed 12/27/06	Tue 12/25/07
28	Commission & Move In	8 wks	Wed 12/26/07	Tue 2/19/08



Project: Science2
Date: Wed 5/18/05

Task
Split
Progress
Milestone
Summary
Rolled Up Task
Rolled Up Split
Rolled Up Milestone
Rolled Up Progress
External Tasks
Project Summary
External Milestone
Deadline

Appendices

Work Shop – Agenda and Goals

Space allocation work sheets

Cost analysis work sheets

“Lewis & Clark College Science Expansion Feasibility Study”, Soderstrom Architects, April 15, 2002.

Science Facilities Expansion Planning Workshop

January 14-15, 2002

N Workshop Goals

In order to prepare a report for the Board of Trustees May 2002 meeting, at which they will decide whether to commit to raising funds for new/renovated science facilities, we need to define the vision that the "building users" have for their teaching and research needs for the future, and to provide the Board a fairly detailed plan for how many, what kinds, and what sizes of spaces the buildings will incorporate to serve that vision. Planning at this level should also enable us to present the Board with reasonable space and cost estimates for the project.

Attendees:
Deborah Lycan, Steve Tufte, Michael Broide, Sue Benowicz, Sharon Smith, Stacey Fiddler, Greg Hermann, Janet Davidson, Barb Roberts, Jim Duncan, Michael Sestric, Gary Reiness, Wendy McLennan, Barb Balko, John Krussel, Evan Williams, Janis Lochner, Anne Boal, Erik Nilsen, Louis Kuo, Linda Noble, Steve Attinasi, Kellar Autumn, Bob Owens, Tom Schoeneman, Denise King, Rich Bettega, Richard Heinz, Lenny Borer, Dan Danielson, Yueping Zhang, Harvey Schmidt, Bill Randall, Jens Mache (part of each day), Brian Bedell-Detweiler (first day only), Jerusha Detweiler-Bedell (first day only).

Agenda

Day 1, January 14, 2002

- **7AM Workshop Coordinators Meeting** Breakfast meeting with Gary Reiness, Michael Sestric, Richard Heinz, and Lenny Borer.
- **8:30AM Facilities Tour**

Tour of facilities with Richard Heinz, Gary Reiness and (optional) Building Committee.

- **10 AM all science faculty workshops**.

Michael Sestric & Gary Reiness, workshop introduction, review agenda, introduce participants and workshop consultants.
Richard Heinz, Research Facilities Design, presentation: Case studies and baseline comparisons, directions in pedagogy, priority setting, department objectives, concerns, identify critical issues, answer questions.

- **12:00 – 1:00 Group lunch**
- **1:00 – 2:30 Department breakout session: Session 1**

Identify the most important requirements that an expanded science facility needs to have in order to meet your objectives for teaching, learning and research.

Report out, consolidate and categorize.

- **2:30 – 3:00 Break**
- **2:30 – 4:00 Cross-disciplinary breakout sessions: Session 2**

Working with the consolidated department lists, are there any additions to the list that your inter-disciplinary group believes will further approaches to teaching, learning and research that cross departmental borders.

Report out, consolidate and categorize.

- **4:00 Adjourn large group**
- **4:00 – 4:30 Debriefing session with Building Committee**.

Day 2, January 15, 2002

- **8:00 Continental Breakfast**
- **8:30 – 10:00 Department breakout session: Session 3**

Identify critical space requirements (matrix worksheet provided)

- Instructional Space
- Research Space
- Lab & Teaching Support Space
- Administrative Space
- Other

Report out, consolidate and categorize.

- **10:00 – 10:15 Break**
- **10:15 – 11:30 Cross-disciplinary breakout sessions: Session 4**

Using the previously prepared space list(s) identify any additional spaces that might be required to further an interdisciplinary approach to teach, learning and research.

Report out, consolidate and categorize.

- **11:30 – 12:00 Large Group discussion**

-How can we make the best use of the existing Olin science building?
-What are some options for distributing functions between a new building and the existing Olin building?

- **12:00 Adjourn**
- **12:00 – 1:00 Lunch Debriefing with Building Committee**
- **12:00 -- 1:00 Lunch for interested faculty participants**

Overall Space Summary

Department	Existing Space NSF	Draft Program-1/15/02				Final Program				Increase from Existing
		Laboratory	Lab Support	Office/Other	Totals	Lab	Lab Supt	Off/Other	Totals	
Biology	11,497	17,600	4,560	3,730	25,890	-	-	-	-	14,394
Chemistry	12,056	14,080	3,520	2,700	20,300	-	-	-	-	8,245
Geology	1,190	2,240	960	440	3,640	-	-	-	-	2,450
Math/Comp.Sci.	4,056	-	-	8,300	8,300	-	-	-	-	4,244
Physics	10,388	8,640	1,033	2,010	11,683	-	-	-	-	1,295
Psychology	4,185	8,160	320	2,370	10,850	-	-	-	-	6,665
Shared	16,283	3,840	5,180	20,315	29,335	-	-	-	-	13,052
Total Net Area	**59,654**	**54,560**	**15,573**	**39,865**	**109,998**	**-**	**-**	**-**	**-**	**50,344**
Net/Gross Ratio	**59%**				**58%**				**58%**	
Total Gross Area	**100,820**				**189,652**				**-**	88,832
Existing GSFof Olin to remodel					**55,000**					55,000
Gross Area Required for New Construction					**134,652**				**-**	134,652
Estimated Construction Cost - Renovation				**$140**	**$7,700,000**				**$0**	
Estimated Construction Cost - Addition				**$280**	**$37,702,483**				**$0**	
Total Estimated Construction Cost					**$45,402,483**				**$0**	
Project Cost Multiplier					**1.35**					
Total Estimated Project Cost					**$ 61,293,352**				**$ -**	

Lewis & Clark College Science Facilities
RFD Project No. 2001056-01

FTE	11.5	Professors	10
Count	12	Admin	1
		Lab	1

BIOLOGY DEPARTMENT
March 11, 2002

Space ID	Space Name	Existing Space Room No.	Existing Space NSF		# of Statns.	Draft Program-1/15/02 NSF	Draft Program-1/15/02 No.	Draft Program-1/15/02 Total NSF		Revised Program NSF	Revised Program No.	Revised Program Total NSF		Final Program NSF	Final Program No.	Final Program Total NSF	# of Lab Modules
LABORATORIES																	
B1.01	Introductory Biology	11-001,008	1344	*	24	1,440	2	2,880				-				-	9.00
B1.02	Non-majors 11-009,	12-101	1460	*	24	1,440	1	1,440				-				-	4.50
B1.03	Cell/Molecular/Developmental	11-008	315	*	24	1,440	1	1,440				-				-	4.50
B1.04	Molecular Biology	11-008	315	*	24	1,440	1	1,440				-				-	4.50
B1.05	Neuro/Physiology	11-013	977		24	1,440	1	1,440				-				-	4.50
B1.06	Evolution/Behavior/Vert/Invert.	12-101	470	*	24	1,440	2	2,880				-				-	9.00
B1.07	Facutty/Student Research		2404		4	480	10	4,800				-				-	15.00
B1.08	Student Research	None			6	640	2	1,280				-				-	4.00
	11-011,14,15,20,21,22,12-102,104,104a,112,							-				-				-	
								-				-				-	
Subtotal Laboratory Space			**7,285**				**20**	**17,600**			**0**	**-**			**0**	**-**	**55.00**
LABORATORY SUPPORT																	
B2.01	Stockroom	12-100	255			1,280	1	1,280				-				-	4.00
B2.02	Microscopy Suite	None				640	1	640				-				-	2.00
B2.03	Fly Room Preparation	11-003	77	*		160	1	160				-				-	0.50
B2.04	Preparation Room (Autoclave)	11-003	77	*		480	1	480				-				-	1.50
B2.05	Field Equipment Storage	None				240	1	240				-				-	0.75
B2.06	Equipment Room	12-105	145			480	1	480				-				-	1.50
B2.07	Controlled Temperature Rooms	11-010,012	202			120	3	360				-				-	1.13
B2.08	Greenhouse	13-100	1178			240	2	480				-				-	1.50
B2.09	Greenhouse Prep.	included	included			120	1	120				-				-	0.38
	Cleanup & Glass Wash	?????				320	1	320									1.00
																-	
Subtotal Laboratory Support Space			**1,934**				**13**	**4,560**			**0**	**-**			**0**	**-**	**14.25**
OFFICE/ADMINISTRATIVE																	
B3.01	Faculty Offices 2-210,11-218, 19,20,21,22,23,24,25,26,27,28,29,		1792		1	160	10	1,600				-				-	
B3.02	Laboratory Coordinator Office	11-211A	166		1	160	2	320				-				-	
B3.03	Administrative Support	11-211.1	50	*	2	250	1	250	*			-				-	
	Workroom	11-211.2	62.5	*	WS & WR Included, share w/ Pysch?				*								
B3.04	Conference (Seminar) Room	11-201	207	*	12	320	1	320				-				-	
B3.05	Student Offices	None			4	160	0	-				-				-	
B3.06	Student Study	None			4-6	120	5	600				-				-	
	Museum for specimens					640	1	640				-				-	
								-				-				-	
Subtotal Office/Administrative Space			**2,278**				**20**	**3,730**			**0**	**-**			**0**	**-**	
												-				-	
												-				-	
Totals			**11,497**				**53**	**25,890**			**0**	**-**			**0**	**-**	

* **Shared space - SF prorated**

Lewis & Clark College Science Facilities
RFD Project No. 2001056-01

FTE	**8.83**	**Professors**	**7**
Count	**9**	**Admin**	**1**
		Lab	**1**

CHEMISTRY DEPARTMENT
March 11, 2002

Space ID	Space Name	Existing Space Room No.	Existing Space NSF		# of Statns.	Draft Program-1/15/02 NSF	Draft Program-1/15/02 No.	Draft Program-1/15/02 Total NSF		Revised Program NSF	Revised Program No.	Revised Program Total NSF	Final Program NSF	Final Program No.	Final Program Total NSF	# of Lab Modules
LABORATORIES																
CH1.01	General Chemistry/Perspectives	17-116,310	2034	*	24	1,600	2	3,200				-			-	10.00
CH1.02	Organic Chemistry	17-215	889		24	1,920	1	1,920				-			-	6.00
CH1.03	Physical Chemistry/Instrumentation	17-224	349	*	12	960	1	960				-			-	3.00
CH1.04	Biochemistry (Shared?)	17-115,116	1000	*	24	1,280	1	1,280	#			-			-	4.00
CH1.05	Inorganic Chemistry	17-224	348	*	12	960	1	960				-			-	3.00
CH1.06	Molecular Modeling	12-101	378		24	640	1	640				-			-	2.00
CH1.07	Faculty/Student Research 17-114A, 115*, 118,		1973	*	4	640	8	5,120				-			-	16.00
	119,120,121,224B							-				-			-	
								-				-			-	
Subtotal Laboratory Space			**6,971**				**15**	**14,080**			**0**	**-**		**0**	**-**	**44.00**
LABORATORY SUPPORT																
CH2.01	General Chemistry Preparation	17-116D,307	275			640	1	640				-			-	2.00
CH2.02	Stockroom Suite:							-				-			-	0.00
CH2.02a	Preparation Room - In labs and stockrooms					320	1	320				-			-	1.00
CH2.02b	Stockroom (Disposables, dry goods)	17-124	210			640	1	640				-			-	2.00
CH2.02c	Stockroom (Chemicals) 17-212,213,241A		488			640	1	640				-			-	2.00
CH2.02d	Solvent Storage 17-241C,241B		136			160	1	160				-			-	0.50
CH2.02e	Corrosives Storage					160	1	160				-			-	0.50
	Ethanol Storage	17-213A	40													
	Acid Storage	17-116A	55													
	Base Storage	17-116B	95													
CH2.03	Instrument Room	17-114,220	972			640	1	640				-			-	2.00
	Balance Room	17-122	397													
CH2.04	NMR Room (in equipment room 17-114)					320	1	320				-			-	1.00
	Dark Room	17-111A	16	*												
	Filtration System for Deionized Water	17-116C	95					-				-			-	
Subtotal Laboratory Support Space			**2,779**				**8**	**3,520**			**0**	**-**		**0**	**-**	**11.00**
OFFICE/ADMINISTRATIVE																
CH3.01	Faculty Offices (7) 17-216,217,18,19,21,23,25		1428		1	160	8	1,280				-			-	
CH3.02	Laboratory Director Office	17-222	163		1	120	1	120				-			-	
CH3.03	Administrative Support	17-226A	229.5	*	1	500	1	500				-			-	
CH3.04	Work Room	17-224A	158	*	WS & WR included, share w/Physics							-			-	
CH3.05	Conference Room	17-232	80	*	12	320	1	320				-			-	
CH3.06	Student Study	17-117	247		4-6	120	4	480				-			-	
								-				-			-	
								-				-			-	
Subtotal Office/Administrative Space			**2,306**				**15**	**2,700**			**0**	**-**		**0**	**-**	
Totals			**12,056**				**38**	**20,300**			**0**	**-**		**0**	**-**	

* **Shared space - SF prorated**

Lewis & Clark College Science Facilities
RFD Project No. 2001056-01

FTE	1	Professors	1
Count	1	Admin	
		Lab	

GEOLOGY
March 11, 2002

Space ID	Space Name	Existing Space		# of	Draft Program-1/15/02				Revised Program				Final Program			# of Lab
		Room No.	NSF	Statns.	NSF	No.	Total NSF		NSF	No.	Total NSF		NSF	No.	Total NSF	Modules
LABORATORIES																
G1.01	Teaching Laboratory (Shared)	17-112	247	* 24	1,280	1	1,280				-				-	4.00
G1.02	Research Laboratory	17-105,108	755	5	480	2	960				-				-	3.00
							-				-				-	0.00
							-	#			-				-	0.00
							-				-				-	0.00
		12-101					-				-				-	
Subtotal Laboratory Space			**1,002**			**3**	**2,240**			**0**	**-**			**0**	**-**	**7.00**
LABORATORY SUPPORT																
G2.01	Field Staging (Mud Room)	None			160	1	160				-				-	0.50
G2.02	Field Equipment Storage	None			160	1	160				-				-	0.50
G2.03	Preparation Room	None			320	1	320				-				-	1.00
G2.04	Map/Sample Storage	None			160	1	160				-				-	0.50
G2.05	Seismograph Room	None			160	1	160								-	0.50
							-				-				-	0.00
							-				-				-	0.00
							-				-				-	0.00
							-				-				-	0.00
							-				-				-	
Subtotal Laboratory Support Space			**-**			**5**	**960**			**0**	**-**			**0**	**-**	**3.00**
OFFICE/ADMINISTRATIVE																
G3.01	Faculty Office	17-234	188	1	160	2	320				-				-	
G3.02	Student Study	None		4-6	120	1	120				-				-	
G3.03	Admin Support & Conference	see Chem		shared w/ Chemistry			-				-				-	
							-				-				-	
							-				-				-	
Subtotal Office/Administrative Space			**188**			**3**	**440**			**0**	**-**			**0**	**-**	
Totals			**1,190**			**11**	**3,640**			**0**	**-**			**0**	**-**	

* **Shared space - SF prorated**

Lewis & Clark College Science Facilities

Research Facilities Design

Portland, Oregon

San Diego, CA

Lewis & Cla
RFD Project No. 2001056-01

FTE	10.58	Professors	10
Count	11	Admin	1
		Lab	-

MATHEMATICS AND COMPUTER SCIENCE
January 28, 2002

Space ID	Space Name	Existing Space			# of	Draft Program-1/15/02			Revised Program			Final Program		
		Room No.	NSF		Statns.	NSF	No.	Total NSF	NSF	No.	Total NSF	NSF	No.	Total NSF
OFFICE/AMINISTRATIVE/CLASSROOM														
M/CS3.01	Math Skills Center:							-			-			-
M/CS3.01a	Work Room	11-006	410		20	960	1	960			-			-
M/CS3.01b	Testing Room	11-005	410		10	320	1	320			-			-
M/CS3.02	Math Library	12-313B	85			320	1	320			-			-
M/CS3.03	Student Study (Quiet)	12-311	118		4-6	120	5	600			-			-
M/CS3.04	Group Work Area (w/ computers)	12-301	144		10	320	1	320			-			-
M/CS3.05	Computer Science Instructional	17-305	625		24	1,280	2	2,560			-			-
M/CS3.06	Computer Science Instructional	17-309	659		18	960	1	960			-			-
M/CS3.07	Faculty Offices 12-303-310, 12-313A		1006		1	160	11	1,760			-			-
	Comons				1	250	1	250						
M/CS3.08	Administrative Support	12-313	399	*	1	250	1	250			-			-
	Kitchenette	12-313	200	*				-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
								-			-			-
Totals			**4,056**				**25**	**8,300**		**-**	**-**		**-**	**-**

* **Shared space - SF prorated**

Lewis & Clark College Science Facilities
RFD Project No. 2001056-01

FTE	**6**	**Professors**	**6**
Count	**6**	**Admin**	**Shared**
		Retired	**1**

PHYSICS DEPARTMENT
March 11, 2002

Space ID	Space Name	Existing Space Room No.	Existing Space NSF	# of Statns.	Draft Program-1/15/02 NSF	Draft Program-1/15/02 No.	Draft Program-1/15/02 Total NSF		Revised Program NSF	Revised Program No.	Revised Program Total NSF	Final Program NSF	Final Program No.	Final Program Total NSF	# of Lab Modules
LABORATORIES															
PH1.01	General Physics	17-303	1043	16	1,280	2	2,560	#			-			-	8.00
PH1.02	Advanced Physics	17-226	648	12	640	1	640				-			-	2.00
PH1.03	Advanced - Optics, etc.	17-237	562	12	640	1	640				-			-	2.00
PH1.04	Advanced - Experiments	17-111,112	304	12	640	1	640				-			-	2.00
PH1.05	Science Instrumentation	17-110	830	16	1,280	1	1,280				-			-	4.00
PH1.06	Faculty/Student Research	12-101	3122	4	480	6	2,880				-			-	9.00
	17-106,108A,109,201c,202,203a						-				-			-	
	17-228, 230,236,236B,236D,						-				-			-	0.00
														-	
Subtotal Laboratory Space			**6,509**			**12**	**8,640**			**0**	**-**		**0**	**-**	**27**
LABORATORY SUPPORT															
PH2.01	Observatory (Existing)	17-401,501	553				553				-			-	1.73
PH2.02	Storage 17-112A,201,203,303A		1011		320	1	320				-			-	1.00
PH2.03	Darkroom		175		160	1	160				-			-	0.50
							-				-			-	0.00
							-				-			-	0.00
							-				-			-	
Subtotal Laboratory Support Space			**1,739**			**2**	**1,033**			**0**	**-**		**0**	**-**	**3.23**
											-				
OFFICE/ADMINISTRATIVE/CLASSROOM											**-**				
PH3.01	Faculty Offices 17-227,229,231,233,235		1033	1	160	8	1,280				-			-	
PH3.02	Administrative Support	17-226A	114.75 *	2	250	1	250	*			-			-	
PH3.03	Conference Room	17-232	80 *	Shared w/ Math?							-			-	
PH3.04	Student Study	none	0	4-6	120	4	480				-			-	
PH3.05	Workroom	17-224A	53 *				-				-			-	
PH3.06	Lecture Prep*	17-205	859				-				-			-	
	Must be near Physics can be shared						-				-			-	
Subtotal Office/Administrative/Classroom			**2,140**			**13**	**2,010**			**0**	**-**		**0**	**-**	
											-			-	
											-			-	
Totals			**10,388**			**27**	**11,683**			**-**	**-**		**-**	**-**	

*** Shared space - SF prorated**

Lewis & Clark College Science Facilities
RFD Project No. 2001056-01

FTE	**6.7**	**Professors**	**7**		
Count	**7**	**Admin**	**Shared**		
		Lab			

PSYCHOLOGY DEPARTMENT
March 11, 2002

Space ID	Space Name	Existing Space			# of	Draft Program-1/15/02				Revised Program				Final Program			# of Lab
		Room No.	NSF		Statns.	NSF	No.	Total NSF		NSF	No.	Total NSF		NSF	No.	Total NSF	Modules
LABORATORIES																	
PS1.01	Human Neuroscience Lab				25-28	1,280	1	1,280				-				-	4.00
PS1.02	Animal Physiology Lab (Shared)				15-20	1,280	1	1,280				-				-	4.00
PS1.03	Computer Lab				25-28	1,600	1	1,600	#			-				-	5.00
PS1.04	Human Computer Interaction Lab	11-121	814		15-20	640	1	640				-				-	2.00
PS1.05	Faculty/Student Research: 11-105,7,18,19,20,22,23,24,25,26,202,203,204		1669					-				-				-	0.00
PS1.05a	Main Laboratory				6-8	240	8	1,920				-				-	6.00
PS1.05b	Waiting Room				3-4	120	8	960				-				-	3.00
PS1.05c	Observation/Control Room				2-3	60	8	480				-				-	1.50
	Rat Cages	11-131	69					-				-				-	0.00
Subtotal Laboratory Space			**2,552**				**28**	**8,160**			**0**	**-**			**0**	**-**	**25.50**
LABORATORY SUPPORT																	
PS2.01	Equipment/Storage Room					320	1	320				-				-	1.00
PS2.02								-				-				-	0.00
PS2.03								-				-				-	0.00
								-				-				-	
Subtotal Laboratory Support Space			**-**				**1**	**320**			**0**	**-**			**0**	**-**	**1.00**
OFFICE/ADMINISTRATIVE																	
PS3.01	Faculty Offices 11-232,35,36,39,40,43		1065		1	160	10	1,600				-				-	
PS3.02	Laboratory Assistant Office	None			1	120	1	120				-				-	
PS3.03	Administrative Support	11-211.1	50	*	2	250	1	250	*			-				-	
PS3.04	WorkRoom	11-211.1	63	*	WS & WR Included, share w/ Biology?				*								
PS3.05	Student Lounge				20	400	1	400									
PS3.06	Conference Room	11-201	207	*	Shared w/ Biology			-									
PS3.07	Student Study Rooms 12-212,13,14,15,16,17		248					-									
								-				-				-	
								-				-				-	
Subtotal Office/Administrative Space			**1,633**				**13**	**2,370**			**0**	**-**			**0**	**-**	
Totals			**4,185**				**42**	**10,850**			**0**	**-**			**0**	**-**	

*** Shared space - SF prorated**

Lewis & Clark College Science Facilities
RFD Project No. 2001056-01

SHARED SPACE
March 11, 2002

				Nat.Shop		ScienceDivision										
				FTE	1.53		0.92									
				Count	2		1									
Space ID	Space Name	Existing Space		# of	Draft Program-1/15/02			Revised Program			Final Program			# of Lab
		Room No.	NSF	Statns.	NSF	No.	Total NSF	NSF	No.	Total NSF	NSF	No.	Total NSF	Modules
LABORATORIES														
SH1.01	Neuroscience/Physiology			24	1,280	1	1,280			-			-	4.00
SH1.02	Biochemistry			24	1,280	1	1,280			-			-	4.00
SH1.03	Field Biology/Geoscience			24	1,280	1	1,280			-			-	4.00
Subtotal Laboratory Space			-			3	3,840		-	-		-	-	12.00
LABORATORY SUPPORT		12-101												
SH2.01	Radioisotope Storage (Low)	17-112B	28		30	1	30			-			-	0.09
SH2.02	Radioisotope Storage (High)	17-112C	49		50	1	50			-			-	0.16
SH2.03	Hazardous Waste	None			160	1	160			-			-	0.50
SH2.04	Gas Cylinder Storage	None			80	1	80			-			-	0.25
SH2.05	Loading Dock	None?			480	1	480			-			-	1.50
SH2.06	Animal Suite:						-			-			-	0.00
SH2.06a	Animal Holding Rooms	11-011			120	6	720			-			-	2.25
SH2.06b	Animal Procedure Room	None			160	2	320			-			-	1.00
SH2.06c	Cagewash Room	None			160	1	160			-			-	0.50
SH2.06d	Feed/Bedding Storage Room	None			160	1	160			-			-	0.50
SH2.06e	Animal Suite Circulation	None			240	1	240			-			-	0.75
SH2.07	Field Staging/Mudroom	None			120	1	120			-			-	0.38
SH2.08	Machine Shop	17-205,B,C,207,208, 209A	2439		1,920	1	1,920			-			-	6.00
SH2.09	Electronics Shop		208		640	1	640			-			-	2.00
SH2.10	Shop Storage (Trailer)		32				-			-			-	0.00
SH2.11	Student Poster/Easel Storage	None			100	1	100			-			-	0.31
							-			-				0.00
Subtotal Laboratory Support Space			2,756			20	5,180		-	-		-	-	16.19
														0.00
OFFICE/ADMINISTRATIVE/CLASSROOMS														0.00
SH3.01	**Dean's Suite:**													0.00
SH3.01a	Dean's Office	None		1	160	1	160			-			-	0.50
SH3.01b	Administrative Office	17-226A	115 *	1	160	1	160			-			-	0.50
SH3.01c	Conference Room	None		8	160	1	160			-			-	0.50
SH3.01d	Wating Area	None		2	75	1	75			-			-	0.23
SH3.01e	Workroom	17-224A	53 *		100	1	100			-			-	0.31
SH3.01f	File/Storage Room	None			50	1	50			-			-	0.16
	Faculty Emeriti Offices	????		2	160	2	320							1.00
SH3.02	Animal Technician Office	None			120	1	120			-			-	0.38
SH3.03	Shop Office	17-206A,206	218	2	160	1	160			-			-	0.50
SH3.04	Lecture Room (Theatre) - tiered			150	2,560	1	2,560			-			-	8.00
SH3.05	Lecture Room - tiered	12-110,300,17-204,301	6209	80	1,280	2	2,560			-			-	8.00
SH3.06	Classroom			50	1,280	7	8,960			-			-	28.00
SH3.07	Seminar Room 11-104,137,12-201,202,17-101,102,302,306, 11-		4730	20	640	4	2,560			-			-	8.00
SH3.08	Lecture Preparation Room **	17-205	859		860	1	860			-			-	2.69
SH3.09	Computer Room			Distributed & Shared w/ Departments						-			-	0.00
SH3.10	Faculty/Student Interaction			Distributed & Shared w/ Departments						-			-	0.00
SH3.11	Student Lounge	17-126	1189	Distributed & Shared w/ Departments						-			-	0.00
SH3.12	Student Study Areas			Distributed & Shared w/ Departments						-			-	0.00
SH3.13	Exploratorium				200	1	200			-			-	0.63
SH3.14	Hearth Spaces???			Distributed & Shared w/ Departments						-			-	0.00
SH3.15	IT Support Office				120	-	-			-			-	0.00
SH3.16	IT Server Room				100	1	100			-			-	0.31
SH3.17	HazMat/Radiation Safety Office				120	1	120			-			-	0.38
SH3.18	First Aid Station				100	1	100			-			-	0.31
SH3.19	Shower/Dressing Room				Pamplin					-			-	0.00
SH3.20	Theatre/Bistro???				Albany					-			-	0.00
SH3.21	Student Science Help Center			Shared w/ Math Skills, Exploratorium?						-			-	0.00
SH3.22	Covered/Secure Bike Storage			20	200	1	200			-			-	0.63
SH3.23	Main Entrance Lobby/Display				320	1	320			-			-	1.00
SH3.24	Library/Reading Room				320	1	320			-			-	1.00
SH3.25	Staff Kitchette	17-104	154		150	1	150							
Subtotal Office/Administrative/Classroom Space			13,527			33	20,315		-	-		-	-	
Totals			16,283			56	29,335		-	-		-	-	

****PrepRoom Accounted for in Physics also**

HOFFMAN CONSTRUCTION COMPANY

ESTIMATE SUMMARY

BUILDING: **L&C Science**
LOCATION: **Portland, OR**
ARCHITECT: **Soderstrom**

ESTIMATOR: SJC
CHECKED BY: MBB

SUBJECT: **Science Expansion - OPTION COMPARISON**

DATE: 12-Apr-02

	189652		189652		189652		188100	
Work Description	**Option A**		**Option B**		**Option C**		**Option D**	
	Cost	$/gsf	Cost	$/gsf	Cost	$/gsf	Cost	$/gsf
Finish GSF: 189,652	**37,753,835**		**40,298,985**		**39,624,673**		**38,516,885**	
DEMOLITION	$144,000	$0.76	$144,000	$0.76	$144,000	$0.76	$147,000	$0.78
SITEWORK	$872,763	$4.60	$861,825	$4.54	$1,172,425	$6.18	$793,985	$4.22
FOOTINGS / STRUCTURE	$3,809,456	$20.09	$4,287,278	$22.61	$3,809,456	$20.09	$3,822,000	$20.32
EXTERIOR CLOSURE	$1,796,700	$9.47	$2,489,940	$13.13	$2,604,420	$13.73	$2,591,700	$13.78
ROOFING	$413,200	$2.18	$408,635	$2.15	$747,200	$3.94	$392,200	$2.09
INTERIOR CONSTRUCTION	$6,026,429	$31.78	$6,402,973	$33.76	$6,026,429	$31.78	$5,878,380	$31.25
MECHANICAL	$6,711,824	$35.39	$6,956,448	$36.68	$6,768,744	$35.69	$6,731,600	$35.79
ELECTRICAL	$3,467,884	$18.29	$3,751,884	$19.78	$3,500,354	$18.46	$3,477,350	$18.49
EQUIPMENT	$6,502,820	$34.29	$6,534,800	$34.46	$6,498,500	$34.27	$6,515,000	$34.64
FURNISHINGS	$71,190	$0.38	$98,658	$0.52	$103,194	$0.54	$102,690	$0.55
GC's/HOISTING/INSURANCE	$2,212,439	$11.67	$2,251,457	$11.87	$2,241,120	$11.82	$2,224,137	$11.82
CONTINGENCY	$4,804,306	$25.33	$5,128,185	$27.04	$5,042,376	$26.59	$4,901,406	$26.06
CONSTRUCTION FEE	$920,825	$4.86	$982,902	$5.18	$966,455	$5.10	$939,436	$4.99
CONSTRUCTION COST TOTAL	$37,753,835		$40,298,985		$39,624,673		$38,516,885	
COST/GSF	**199**		**212**		**209**		**205**	

**** Note - Options A, B and C based on 189,652 GSF. Option D is based on 188,100 GSF**

HOFFMAN CONSTRUCTION COMPANY

ESTIMATE SUMMARY

BUILDING: L&C Science
LOCATION: Portland, OR
ARCHITECT: Soderstrom
SUBJECT: Science Expansion - OPTION A
Remodel (E) Olin and add new Science I Building

ESTIMATE #:
ESTIMATOR: SJC
CHECKED BY: MBB
DATE: 3-Apr-02

HCC Acct	Description	Est Qty	Unit	Unit Price	Site Development	Remodel Area	New Construction	Project Cost	Division Subtotal	Cost/ gsf	Comments	
Finish GSF	189,652					53,600	136,052					
DEMOLITION									$144,000	$0.76		$0.76
	Misc façade demo	1	ls	$10,000.00		$10,000		$10,000		$0.05		
	Existing building selective demolition	53,600	sf	$2.50		$134,000		$134,000		$0.71		
SITEWORK									$872,763	$4.60		$4.60
	Site Earthwork											
	Clear site	52,500	sf	$0.90	$47,250			$47,250		$0.25		
	Rough grading	52,500	sf	$0.90	$47,250			$47,250		$0.25		
	Soldier Pile Wall - 2 stories	6,000	sf	$38.00			$228,000	$228,000		$1.20		
	Piling (Assume 35' Avg. * 160 EA)	5,600	lf	$27.00			$151,200	$151,200		$0.80		
	Building Earthwork											
	Base	28,750	sf	$1.00			$28,750	$28,750		$0.15		
	Structural excavation/backfill	28,750	sf	$1.75			$50,313	$50,313		$0.27		
	Utilities	1	ls	$100,000	$100,000			$100,000		$0.53		
	Site Hardscape & Landscape	1	ls	$200,000	$200,000			$200,000		$1.05		
	Site Furnishings	1	ls	$20,000	$20,000			$20,000		$0.11		
STRUCTURE									$3,809,456	$20.09		
	Structure costs sim. To Howard Hall	136,052	sf	$28.00			$3,809,456	$3,809,456		$20.09		
EXTERIOR CLOSURE									$1,796,700	$9.47		
	New costruction façade (3 floors 100X250 + dayl	33,900	sf	$50.00			$1,695,000	$1,695,000		$8.94		
	Misc iron support	33,900	sf	$3.00			$101,700	$101,700		$0.54		
ROOFING									$413,200	$2.18		
	Assume tile roof on new Sci I	33,150	sf	$10.00			$331,500	$331,500		$1.75		
	Membrane for underground connection	12,500	sf	$5.00			$62,500	$62,500		$0.33	blocking/nailers	
	Existing roof repair allowance	9,600	sf	$2.00		$19,200		$19,200		$0.10		
INTERIOR CONSTRUCTION									$6,026,429	$31.78		
	Stairs & Ornamental Iron											
	New construction	136,052	gsf	$0.25			$34,013	$34,013		$0.18		
	Remodel area	53,600	gsf	$0.25		$13,400		$13,400		$0.07		
	Casework										excludes bookracks	
	New construction (non-lab spaces)	60,600	gsf	$6.00			$363,600	$363,600		$1.92		
	Remodel area (non-lab spaces)	25,115	gsf	$3.00		$75,345		$75,345		$0.40		
	Finish carpentry											
	New construction	136,052	gsf	$2.50			$340,130	$340,130		$1.79		
	Remodel area	53,600	gsf	$2.50		$134,000		$134,000		$0.71		
	Rough carpentry											
	New construction	136,052	gsf	$0.40			$54,421	$54,421		$0.29		
	Remodel area	53,600	gsf	$0.10		$5,360		$5,360		$0.03		
	Interior doors											
	New construction	136,052	gsf	$2.50			$340,130	$340,130		$1.79		
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28		
	Inteior relites											
	New construction	136,052	gsf	$1.00			$136,052	$136,052		$0.72		
	Remodel area	53,600	gsf	$0.25		$13,400		$13,400		$0.07		
	Drywall partitions											
	New construction	136,052	gsf	$12.00			$1,632,624	$1,632,624		$8.61		
	Remodel area	53,600	gsf	$8.00		$428,800		$428,800		$2.26		
	Ceilings											
	New construction	136,052	gsf	$4.50			$612,234	$612,234		$3.23		
	Remodel area	53,600	gsf	$2.00		$107,200		$107,200		$0.57		
	Flooring											
	New construction	136,052	gsf	$4.00			$544,208	$544,208		$2.87		
	Remodel area	53,600	gsf	$2.50		$134,000		$134,000		$0.71		
	Painting/Sealants											
	New construction	136,052	gsf	$2.25			$306,117	$306,117		$1.61		
	Remodel area	53,600	gsf	$1.50		$80,400		$80,400		$0.42		
	Acoustical Treatments											
	New construction	136,052	gsf	$1.75			$238,091	$238,091		$1.26		
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28		
	Specialties											
	New construction	136,052	gsf	$2.00			$272,104	$272,104		$1.43		
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28		
MECHANICAL									$6,711,824	$35.39		
	HVAC/Plumbing	186,652										
	New Bio & Chem Labs	68,272	gsf	$55.00			$3,754,960	$3,754,960		$19.80		
	New Classrooms & Offices	75,000	gsf	$22.00			$1,650,000	$1,650,000		$8.70		
	Remodel area	43,380	gsf	$22.00		$954,360		$954,360		$5.03		
	Fire Protection											
	New construction	136,052	gsf	$2.00			$272,104	$272,104		$1.43		
	Remodel area	53,600	gsf	$1.50		$80,400		$80,400		$0.42		
ELECTRICAL									$3,467,884	$18.29		
	Building Lighting/Power											
	New Bio & Chem Labs	68,272	gsf	$23.30			$1,590,738	$1,590,738		$8.39		
	New Classrooms & Offices	75,000	gsf	$15.00			$1,125,000	$1,125,000		$5.93		
	Remodel area	43,380	gsf	$14.00		$607,320		$607,320		$3.20		
	Temporary electrical	189,652	gsf	$0.50		$26,800	$68,026	$94,826		$0.50		
	Site lighting	1	ls	$50,000	$50,000			$50,000		$0.26		
EQUIPMENT									$6,502,820	$34.29		
	Lab Casework	104,797										
	(New) Lab Areas (Phys, Geology, Bio, Chem,Psycl	74,944	gsf	$60.00			$4,496,640	$4,496,640		$23.71		
	(Exist) Lab Areas (Phys, Geology, Bio, Chem,Psycl	29,853	gsf	$60.00		$1,791,180		$1,791,180		$9.44		
	Loading dock equipment	1	ls	$15,000		$15,000		$15,000		$0.08		
	Elevator	2	ea	$100,000			$200,000	$200,000		$1.05		

HOFFMAN CONSTRUCTION COMPANY
ESTIMATE SUMMARY

BUILDING: L&C Science
LOCATION: Portland, OR
ARCHITECT: Soderstrom
SUBJECT: Science Expansion - OPTION A
Remodel (E) Olin and add new Science I Building

ESTIMATE #:
ESTIMATOR: SJC
CHECKED BY: MBB
DATE: 3-Apr-02

HCC Acct	Description	Est Qty	Unit	Unit Price	Site Development	Remodel Area	New Construction	Project Cost	Division Subtotal	Cost/ gsf	Comments
Finish GSF	189,652					53,600	136,052				
FURNISHINGS									$71,190	$0.38	
	Window coverings	20,340	sf	$3.50			$71,190	$71,190		$0.38	
SUBTOTAL - DIRECT COSTS					$464,500	$4,790,965	$24,560,800	$29,816,265	$29,816,265	$157.22	
GENERAL CONDITIONS/INSURANCE									$2,212,439	$11.67	
	General Conditions	20	Mo.	$60,000	$935	$9,641	$49,424	$1,200,000		$6.33	Supervision, offices
	Job Services	20	Mo.	$7,500	$117	$1,205	$6,178	$150,000		$0.79	Surveying, clean-up, safety, protection
	Hoisting	1	LS	$300,000	$0	$0	$200,136	$300,000		$1.58	
	Subcontractor Bonding	1	%	$29,816,265	$4,645	$47,910	$245,608	$298,163		$1.57	
	Insurance-PL&PD	1	LS	$264,277	$3,912	$40,349	$208,515	$264,277		$1.39	
CONTINGENCY		15	%	$32,028,704	$71,116	$733,510	$3,790,599	$4,804,306	$4,804,306	$25.33	
CONSTRUCTION FEE		2.50	%	$36,833,010	$13,631	$140,590	$726,531	$920,825	$920,825	$4.86	
TOTAL COSTS					$558,855	$5,764,170	$29,787,791	**$37,753,835**	$37,753,835	**$199.07**	
						$107.54	$218.94		$199.07		

BUILDING: L&C Science
LOCATION: Portland, OR
ARCHITECT: Soderstrom
SUBJECT: Science Expansion - OPTION B
Remodel (E) Olin and add new Science I Building

ESTIMATE #:
ESTIMATOR: SJC
CHECKED BY: MBB
DATE: 3-Apr-02

HCC Acct	Description	Est Qty	Unit	Unit Price	Site Development	Remodel Area	New Construction	Project Cost	Division Subtotal	Cost/ gsf	Comments
Finish GSF	189,652					53,600	136,052				
DEMOLITION									$144,000	$0.76	
	Misc façade demo	1	ls	$10,000.00		$10,000		$10,000		$0.05	
	Existing building selective demolition	53,600	sf	$2.50		$134,000		$134,000		$0.71	
SITEWORK									$861,825	$4.54	
	Site Earthwork										
	Clear site	43,750	sf	$0.90	$39,375			$39,375		$0.21	
	Rough grading	43,750	sf	$0.90	$39,375			$39,375		$0.21	
	Soldier Pile Wall - 2 stories	6,000	sf	$38.00			$228,000	$228,000		$1.20	
	Piling (Assume 35' Avg. * 140 EA)	5,600	lf	$27.00			$151,200	$151,200		$0.80	
	Building Earthwork										
	Base	30,500	sf	$1.00			$30,500	$30,500		$0.16	
	Structural excavation/backfill	30,500	sf	$1.75			$53,375	$53,375		$0.28	
	Utilities	1	ls	$100,000	$100,000			$100,000		$0.53	
	Site Hardscape & Landscape	1	ls	$200,000	$200,000			$200,000		$1.05	
	Site Furnishings	1	ls	$20,000	$20,000			$20,000		$0.11	
STRUCTURE									$4,287,278	$22.61	
	Seismic upgrade of (E) Olin (North)	21,548	sf	$14.00		$301,672		$301,672		$1.59	
	Upgrade Olin Foundation	17,615	sf	$10		$176,150		$176,150		$0.93	
	Olin Addition	32,052	sf	$28.00			$897,456	$897,456		$4.73	
	Structure costs sim. To Howard Hall	104,000	sf	$28.00			$2,912,000	$2,912,000		$15.35	
EXTERIOR CLOSURE									$2,489,940	$13.13	
	New costruction façade (3 floors 100X184 + daylig	30,060	sf	$50.00			$1,503,000	$1,503,000		$7.93	
	Olin Addition	16,920	sf	$50.00		$846,000		$846,000		$4.46	
	Misc iron support	46,980	sf	$3.00			$140,940	$140,940		$0.74	
ROOFING									$408,635	$2.15	
	Assume tile roof on new Sci I	24,700	sf	$10.00			$247,000	$247,000		$1.30	
	Membrane for underground connection	12,500	sf	$5.00			$62,500	$62,500		$0.33	blocking/nailers
	New roof over olin - Membrane??	19,827	sf	$5.00		$99,135		$99,135		$0.52	
INTERIOR CONSTRUCTION									$6,402,973	$33.76	
	Architecural reloc for seismic improvements	53,600	gsf	$10.00		$536,000		$536,000		$2.83	
	Stairs & Ornamental Iron										
	New construction	136,052	gsf	$0.25			$34,013	$34,013		$0.18	
	Remodel area	53,600	gsf	$0.25		$13,400		$13,400		$0.07	
	Casework										excludes bookracks
	New construction (non-lab spaces)	10,343	gsf	$6.00			$62,058	$62,058		$0.33	
	Remodel area (non-lab spaces)	72,477	gsf	$3.00		$217,431		$217,431		$1.15	
	Finish carpentry										
	New construction	136,052	gsf	$2.50			$340,130	$340,130		$1.79	
	Remodel area	53,600	gsf	$2.50		$134,000		$134,000		$0.71	
	Rough carpentry										
	New construction	136,052	gsf	$0.40			$54,421	$54,421		$0.29	
	Remodel area	53,600	gsf	$0.10		$5,360		$5,360		$0.03	
	Interior doors										
	New construction	136,052	gsf	$2.50			$340,130	$340,130		$1.79	
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28	
	Inteior relites										
	New construction	136,052	gsf	$1.00			$136,052	$136,052		$0.72	
	Remodel area	53,600	gsf	$0.25		$13,400		$13,400		$0.07	
	Drywall partitions										
	New construction	136,052	gsf	$12.00			$1,632,624	$1,632,624		$8.61	
	Remodel area	53,600	gsf	$8.00		$428,800		$428,800		$2.26	
	Ceilings										
	New construction	136,052	gsf	$4.50			$612,234	$612,234		$3.23	
	Remodel area	53,600	gsf	$2.00		$107,200		$107,200		$0.57	
	Flooring										
	New construction	136,052	gsf	$4.00			$544,208	$544,208		$2.87	
	Remodel area	53,600	gsf	$2.50		$134,000		$134,000		$0.71	
	Painting/Sealants										
	New construction	136,052	gsf	$2.25			$306,117	$306,117		$1.61	
	Remodel area	53,600	gsf	$1.50		$80,400		$80,400		$0.42	
	Acoustical Treatments										
	New construction	136,052	gsf	$1.75			$238,091	$238,091		$1.26	
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28	
	Specialties										
	New construction	136,052	gsf	$2.00			$272,104	$272,104		$1.43	
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28	
MECHANICAL									$6,956,448	$36.68	
	HVAC/Plumbing	189,652									
	Isolation/Reloc for seismic upgrades	53,600	gsf	$3.50		$187,600		$187,600		$0.99	
	New Bio & Chem Labs	68,000	gsf	$55.00			$3,740,000	$3,740,000		$19.72	
	New Classrooms & Offices	10,343	gsf	$22.00			$227,546	$227,546		$1.20	
	Remodel area (non wet labs - assume same	111,309	gsf	$22.00		$2,448,798		$2,448,798		$12.91	
	Fire Protection										
	New construction	136,052	gsf	$2.00			$272,104	$272,104		$1.43	
	Remodel area	53,600	gsf	$1.50		$80,400		$80,400		$0.42	
ELECTRICAL									$3,751,884	$19.78	
	Building Lighting/Power										
	Isolation/Reloc for seismic upgrades	53,600	gsf	$2.00		$107,200		$107,200		$0.57	
	New Bio & Chem Labs	89,719	gsf	$23.30			$2,090,453	$2,090,453		$11.02	
	New Classrooms & Offices	10,343	gsf	$15.00			$155,145	$155,145		$0.82	
	Remodel area	89,590	gsf	$14.00		$1,254,260		$1,254,260		$6.61	
	Temporary electrical	189,652	gsf	$0.50		$26,800	$68,026	$94,826		$0.50	
	Site lighting	1	ls	$50,000	$50,000			$50,000		$0.26	
EQUIPMENT									$6,534,800	$34.46	
	Lab Casework	105,330									

BUILDING: L&C Science
LOCATION: Portland, OR
ARCHITECT: Soderstrom
SUBJECT: Science Expansion - OPTION B
Remodel (E) Olin and add new Science I Building

ESTIMATE #:
ESTIMATOR: SJC
CHECKED BY: MBB
DATE: 3-Apr-02

HCC Acct	Description	Est Qty	Unit	Unit Price	Site Development	Remodel Area	New Construction	Project Cost	Division Subtotal	Cost/ gsf	Comments
Finish GSF	189,652					53,600	136,052				
(New)	Lab Areas (Phys, Geology, Bio, Chem,Psych	89,719	gsf	$60.00			$5,383,140	$5,383,140		$28.38	
(Exist)	Lab Areas (Phys, Geology, Bio, Chem,Psych	15,611	gsf	$60.00		$936,660		$936,660		$4.94	
	Loading dock equipment	1	ls	$15,000		$15,000		$15,000		$0.08	
	Elevator	2	ea	$100,000			$200,000	$200,000		$1.05	
FURNISHINGS									$98,658	$0.52	
	Window coverings	28,188	sf	$3.50			$98,658	$98,658		$0.52	
SUBTOTAL - DIRECT COSTS					$448,750	$8,454,466	$23,033,225	$31,936,441	$31,936,441	$168.39	
GENERAL CONDITIONS/INSURANCE									$2,251,457	$11.87	
	General Conditions	20	Mo.	$60,000	$843	$15,884	$43,273	$1,200,000		$6.33	Supervision, offices
	Job Services	20	Mo.	$7,500	$105	$1,985	$5,409	$150,000		$0.79	Surveying, clean-up, safety, protection
	Hoisting	1	LS	$300,000	$0	$0	$200,136	$300,000		$1.58	
	Subcontractor Bonding	1	%	$31,936,441	$4,488	$84,545	$230,332	$319,364		$1.68	
	Insurance-PL&PD	1	LS	$282,093	$3,779	$71,192	$195,621	$282,093		$1.49	
CONTINGENCY		15	%	$34,187,898	$68,695	$1,294,211	$3,556,199	$5,128,185	$5,128,185	$27.04	
CONSTRUCTION FEE		2.50	%	$39,316,082	$13,166	$248,057	$681,605	$982,902	$982,902	$5.18	
TOTAL COSTS					$539,826	$10,170,340	$27,945,800	**$40,298,985**	$40,298,985	**$212.49**	
						$189.75	$205.41		$212.49		

HOFFMAN CONSTRUCTION COMPANY

ESTIMATE SUMMARY

BUILDING: L&C Science
LOCATION: Portland, OR
ARCHITECT: Soderstrom
SUBJECT: Science Expansion - OPTION C
Remodel (E) Olin and add new Science I (160 X 100) plus UAB (150 X 80)

ESTIMATE #:
ESTIMATOR: SJC
CHECKED BY: MBB
DATE: 3-Apr-02

HCC Acct	Description	Est Qty	Unit	Unit Price	Site Development	Remodel Area	New Construction	Project Cost	Division Subtotal	Cost/ gsf	Comments
Finish GSF	189,652					53,600	136,052				
DEMOLITION									$144,000	$0.76	
	Misc façade demo	1	ls	$10,000.00		$10,000		$10,000		$0.05	
	Existing building selective demolition	53,600	sf	$2.50		$134,000		$134,000		$0.71	
SITEWORK									$1,172,425	$6.18	
	Site Earthwork										
	Clear site	44,000	sf	$0.90	$39,600			$39,600		$0.21	
	Rough grading	44,000	sf	$0.90	$39,600			$39,600		$0.21	
	Soldier Pile Wall - 2 stories	8,100	sf	$38.00			$307,800	$307,800		$1.62	
	Sci I Piling (Assume 35' Avg. * 140 EA)	4,900	lf	$27.00			$132,300	$132,300		$0.70	
	UAB Piling (Assume 35' Avg. * 125 EA)	4,375	lf	$27.00			$118,125	$118,125		$0.62	
	Building Earthwork										
	Base	40,000	sf	$1.00			$40,000	$40,000		$0.21	
	Structural excavation/backfill	40,000	sf	$1.75			$70,000	$70,000		$0.37	
	Utilities	1	ls	$150,000	$150,000			$150,000		$0.79	
	Site Hardscape & Landscape	1	ls	$250,000	$250,000			$250,000		$1.32	
	Site Furnishings	1	ls	$25,000	$25,000			$25,000		$0.13	
STRUCTURE									$3,809,456	$20.09	
	Structure costs sim. To Howard Hall	136,052	sf	$28.00			$3,809,456	$3,809,456		$20.09	
EXTERIOR CLOSURE									$2,604,420	$13.73	
	New Science I	23,940	sf	$50.00			$1,197,000	$1,197,000		$6.31	
	New UAB	25,200	sf	$50.00			$1,260,000	$1,260,000		$6.64	
	Misc iron support	49,140	sf	$3.00			$147,420	$147,420		$0.78	
ROOFING									$747,200	$3.94	
	Assume tile roof on new Sci I	35,800	sf	$10.00			$358,000	$358,000		$1.89	
	Assume tile roof on UAB	33,000	sf	$10.00			$330,000	$330,000		$1.74	
	Membrane for underground connections (4KSF ea	8,000	sf	$5.00			$40,000	$40,000		$0.21	blocking/nailers
	Existing roof repair allowance	9,600	sf	$2.00		$19,200		$19,200		$0.10	
INTERIOR CONSTRUCTION									$6,026,429	$31.78	
	Stairs & Ornamental Iron										
	New construction	136,052	gsf	$0.25			$34,013	$34,013		$0.18	
	Remodel area	53,600	gsf	$0.25		$13,400		$13,400		$0.07	
	Casework										excludes bookracks
	New construction (non-lab spaces)	60,600	gsf	$6.00			$363,600	$363,600		$1.92	
	Remodel area (non-lab spaces)	25,115	gsf	$3.00		$75,345		$75,345		$0.40	
	Finish carpentry										
	New construction	136,052	gsf	$2.50			$340,130	$340,130		$1.79	
	Remodel area	53,600	gsf	$2.50		$134,000		$134,000		$0.71	
	Rough carpentry										
	New construction	136,052	gsf	$0.40			$54,421	$54,421		$0.29	
	Remodel area	53,600	gsf	$0.10		$5,360		$5,360		$0.03	
	Interior doors										
	New construction	136,052	gsf	$2.50			$340,130	$340,130		$1.79	
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28	
	Inteior relites										
	New construction	136,052	gsf	$1.00			$136,052	$136,052		$0.72	
	Remodel area	53,600	gsf	$0.25		$13,400		$13,400		$0.07	
	Drywall partitions										
	New construction	136,052	gsf	$12.00			$1,632,624	$1,632,624		$8.61	
	Remodel area	53,600	gsf	$8.00		$428,800		$428,800		$2.26	
	Ceilings										
	New construction	136,052	gsf	$4.50			$612,234	$612,234		$3.23	
	Remodel area	53,600	gsf	$2.00		$107,200		$107,200		$0.57	
	Flooring										
	New construction	136,052	gsf	$4.00			$544,208	$544,208		$2.87	
	Remodel area	53,600	gsf	$2.50		$134,000		$134,000		$0.71	
	Painting/Sealants										
	New construction	136,052	gsf	$2.25			$306,117	$306,117		$1.61	
	Remodel area	53,600	gsf	$1.50		$80,400		$80,400		$0.42	
	Acoustical Treatments										
	New construction	136,052	gsf	$1.75			$238,091	$238,091		$1.26	
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28	
	Specialties										
	New construction	136,052	gsf	$2.00			$272,104	$272,104		$1.43	
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28	
MECHANICAL									$6,768,744	$35.69	
	HVAC/Plumbing	189,652									
	New Bio & Chem Labs	68,000	gsf	$55.00			$3,740,000	$3,740,000		$19.72	
	New Classrooms & Offices	68,000	gsf	$22.00			$1,496,000	$1,496,000		$7.89	
	Remodel area	53,652	gsf	$22.00		$1,180,344		$1,180,344		$6.22	
	Fire Protection										
	New construction	136,000	gsf	$2.00			$272,000	$272,000		$1.43	
	Remodel area	53,600	gsf	$1.50		$80,400		$80,400		$0.42	
ELECTRICAL									$3,500,354	$18.46	
	Building Lighting/Power										
	New Bio & Chem Labs	68,000	gsf	$23.30			$1,584,400	$1,584,400		$8.35	
	New Classrooms & Offices	68,000	gsf	$15.00			$1,020,000	$1,020,000		$5.38	
	Remodel area	53,652	gsf	$14.00		$751,128		$751,128		$3.96	
	Temporary electrical	189,652	gsf	$0.50		$26,800	$68,026	$94,826		$0.50	
	Site lighting	1	ls	$50,000	$50,000			$50,000		$0.26	
EQUIPMENT									$6,498,500	$34.27	
	Lab Casework										
	UAB Lab areas	68,000	gsf	$60.00			$4,080,000	$4,080,000		$21.51	

HOFFMAN CONSTRUCTION COMPANY

ESTIMATE SUMMARY

BUILDING: L&C Science
LOCATION: Portland, OR
ARCHITECT: Soderstrom
SUBJECT: Science Expansion - OPTION C
Remodel (E) Olin and add new Science I (160 X 100) plus UAB (150 X 80)

ESTIMATE #:
ESTIMATOR: SJC
CHECKED BY: MBB
DATE: 3-Apr-02

HCC Acct	Description	Est Qty	Unit	Unit Price	Site Development	Remodel Area	New Construction	Project Cost	Division Subtotal	Cost/ gsf	Comments
Finish GSF	189,652					53,600	136,052				
	Sci I Lab areas	14,585	gsf	$60.00			$875,100	$875,100		$4.61	
	Olin Lab areas	22,140	gsf	$60.00		$1,328,400		$1,328,400		$7.00	
	Loading dock equipment	1	ls	$15,000		$15,000		$15,000		$0.08	
	Elevator (1 each bldg)	2	ea	$100,000			$200,000	$200,000		$1.05	
	FURNISHINGS								$103,194	$0.54	
	Window coverings	29,484	sf	$3.50			$103,194	$103,194		$0.54	
SUBTOTAL - DIRECT COSTS					$554,200	$4,697,977	$26,122,545	$31,374,722	$31,374,722	$165.43	
GENERAL CONDITIONS/INSURANCE									$2,241,120	$11.82	
	General Conditions	20	Mo.	$60,000	$1,060	$8,984	$49,956	$1,200,000		$6.33	Supervision, offices
	Job Services	20	Mo.	$7,500	$132	$1,123	$6,244	$150,000		$0.79	Surveying, clean-up, safety, protection
	Hoisting	1	LS	$300,000	$0	$0	$200,136	$300,000		$1.58	
	Subcontractor Bonding	1	%	$31,374,722	$5,542	$46,980	$261,225	$313,747		$1.65	
	Insurance-PL&PD	1	LS	$277,373	$4,667	$39,562	$221,643	$277,373		$1.46	
CONTINGENCY		15	%	$33,615,842	$84,840	$719,194	$4,029,262	$5,042,376	$5,042,376	$26.59	
CONSTRUCTION FEE		2.50	%	$38,658,218	$16,261	$137,845	$772,275	$966,455	$966,455	$5.10	
TOTAL COSTS					$666,702	$5,651,665	$31,663,287	**$39,624,673**	$39,624,673	**$208.93**	
						$105.44	$232.73		$208.93		

HOFFMAN CONSTRUCTION COMPANY

ESTIMATE SUMMARY

BUILDING: L&C Science
LOCATION: Portland, OR
ARCHITECT: Soderstrom
SUBJECT: Science Expansion - OPTION D
Add on to (E) Olin and add new 225' X 100

ESTIMATE
ESTIMATC
CHECKED
DA

HCC Acct	Description	Est Qty	Unit	Unit Price	Site Development	Remodel Area	New Construction	Project Cost	Division Subtotal	Cost/ gsf
Finish GSF	188,100					53,600	134,500			
	DEMOLITION								$147,000	$0.78
	Misc façade demo	1	ls	$10,000.00		$10,000		$10,000		$0.05
	Demo (E) 2nd level Olin	2,000	sf	$4.00		$8,000		$8,000		$0.04
	Selective demo of remaining Olin	51,600	sf	$2.50		$129,000		$129,000		$0.69
	SITEWORK								$793,985	$4.22
	Site Earthwork									
	Clear site	37,950	sf	$0.90	$34,155			$34,155		$0.18
	Rough grading	37,950	sf	$0.90	$34,155			$34,155		$0.18
	Soldier Pile Wall - 2 stories	4,200	sf	$38.00			$159,600	$159,600		$0.85
	Sci I Piling (Assume 35' Avg. * 160 EA)	5,600	lf	$27.00			$151,200	$151,200		$0.80
	Building Earthwork									
	Base	34,500	sf	$1.00			$34,500	$34,500		$0.18
	Structural excavation/backfill	34,500	sf	$1.75			$60,375	$60,375		$0.32
	Utilities	1	ls	$100,000	$100,000			$100,000		$0.53
	Site Hardscape & Landscape	1	ls	$200,000	$200,000			$200,000		$1.06
	Site Furnishings	1	ls	$20,000	$20,000			$20,000		$0.11
	STRUCTURE								$3,822,000	$20.32
	Structure for new Sci I building	122,500	sf	$28.00			$3,430,000	$3,430,000		$18.23
	Structure for Olin Addition	14,000	sf	$28.00			$392,000	$392,000		$2.08
	EXTERIOR CLOSURE								$2,591,700	$13.78
	New Science I	36,000	sf	$50.00			$1,800,000	$1,800,000		$9.57
	Olin 14,000 SF addition	12,900	sf	$50.00			$645,000	$645,000		$3.43
	Misc iron support	48,900	sf	$3.00			$146,700	$146,700		$0.78
	ROOFING								$392,200	$2.09
	Assume tile roof on new Sci I	32,200	sf	$10.00			$322,000	$322,000		$1.71
	Membrane for underground connections (5KSF ea	5,000	sf	$5.85			$29,250	$29,250		$0.16
	New Olin Roof	7,000	sf	$5.85		$40,950		$40,950		$0.22
	INTERIOR CONSTRUCTION								$5,878,380	$31.25
	Stairs & Ornamental Iron									
	New construction	134,500	gsf	$0.25			$33,625	$33,625		$0.18
	Remodel area	53,600	gsf	$0.25		$13,400		$13,400		$0.07
	Casework									
	New construction (non-lab spaces)	44,500	gsf	$6.00			$267,000	$267,000		$1.42
	Remodel area (non-lab spaces)	25,115	gsf	$3.00		$75,345		$75,345		$0.40
	Finish carpentry									
	New construction	134,500	gsf	$2.50			$336,250	$336,250		$1.79
	Remodel area	53,600	gsf	$2.50		$134,000		$134,000		$0.71
	Rough carpentry									
	New construction	134,500	gsf	$0.40			$53,800	$53,800		$0.29
	Remodel area	53,600	gsf	$0.10		$5,360		$5,360		$0.03
	Interior doors									
	New construction	134,500	gsf	$2.50			$336,250	$336,250		$1.79
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28
	Inteior relites									
	New construction	134,500	gsf	$1.00			$134,500	$134,500		$0.72
	Remodel area	53,600	gsf	$0.25		$13,400		$13,400		$0.07
	Drywall partitions									
	New construction	134,500	gsf	$12.00			$1,614,000	$1,614,000		$8.58
	Remodel area	53,600	gsf	$8.00		$428,800		$428,800		$2.28
	Ceilings									
	New construction	134,500	gsf	$4.50			$605,250	$605,250		$3.22
	Remodel area	53,600	gsf	$2.00		$107,200		$107,200		$0.57
	Flooring									
	New construction	134,500	gsf	$4.00			$538,000	$538,000		$2.86
	Remodel area	53,600	gsf	$2.50		$134,000		$134,000		$0.71
	Painting/Sealants									
	New construction	134,500	gsf	$2.25			$302,625	$302,625		$1.61
	Remodel area	53,600	gsf	$1.50		$80,400		$80,400		$0.43
	Acoustical Treatments									
	New construction	134,500	gsf	$1.75			$235,375	$235,375		$1.25
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28
	Specialties									
	New construction	134,500	gsf	$2.00			$269,000	$269,000		$1.43
	Remodel area	53,600	gsf	$1.00		$53,600		$53,600		$0.28

HOFFMAN CONSTRUCTION COMPANY
ESTIMATE SUMMARY

BUILDING: L&C Science
LOCATION: Portland, OR
ARCHITECT: Soderstrom
SUBJECT: Science Expansion - OPTION D
Add on to (E) Olin and add new 225' X 100

ESTIMATE
ESTIMATC
CHECKED
DA

HCC Acct	Description	Est Qty	Unit	Unit Price	Site Development	Remodel Area	New Construction	Project Cost	Division Subtotal	Cost/ gsf
Finish GSF	188,100					53,600	134,500			
MECHANICAL									$6,731,600	$35.79
	HVAC/Plumbing	188,100								
	New Bio & Chem Labs	68,000	gsf	$55.00			$3,740,000	$3,740,000		$19.88
	Olin expansion (CR's and Office)	14,000	gsf	$22.00			$308,000	$308,000		$1.64
	New non-lab spaces	53,500	gsf	$22.00			$1,177,000	$1,177,000		$6.26
	Remodel area	52,600	gsf	$22.00		$1,157,200		$1,157,200		$6.15
	Fire Protection									
	New construction	134,500	gsf	$2.00			$269,000	$269,000		$1.43
	Remodel area	53,600	gsf	$1.50		$80,400		$80,400		$0.43
ELECTRICAL									$3,477,350	$18.49
	Building Lighting/Power	188,100								
	New Bio & Chem Labs	68,000	gsf	$23.30			$1,584,400	$1,584,400		$8.42
	Olin expansion (CR's and Office)	14,000	gsf	$15.00				$210,000		$1.12
	New non-lab spaces	53,500	gsf	$15.00			$802,500	$802,500		$4.27
	Remodel area	52,600	gsf	$14.00		$736,400		$736,400		$3.91
	Temporary electrical	188,100	gsf	$0.50		$26,800	$67,250	$94,050		$0.50
	Site lighting	1	ls	$50,000	$50,000			$50,000		$0.27
EQUIPMENT									$6,515,000	$34.64
	Lab Casework	105,000								
	Sci I Lab areas	83,000	gsf	$60.00			$4,980,000	$4,980,000		$26.48
	Olin Lab areas	22,000	gsf	$60.00		$1,320,000		$1,320,000		$7.02
	Loading dock equipment	1	ls	$15,000		$15,000		$15,000		$0.08
	Elevator (1 each bldg)	2	ea	$100,000			$200,000	$200,000		$1.06
FURNISHINGS									$102,690	$0.55
	Window coverings	29,340	sf	$3.50			$102,690	$102,690		$0.55
SUBTOTAL - DIRECT COSTS					$438,310	$4,676,455	$25,127,140	$30,451,905	$30,451,905	$161.89
GENERAL CONDITIONS/INSURANCE									$2,224,137	$11.82
	General Conditions	20	Mo.	$60,000	$864	$9,214	$49,509	$1,200,000		$6.38
	Job Services	20	Mo.	$7,500	$108	$1,152	$6,189	$150,000		$0.80
	Hoisting	1	LS	$300,000	$0	$0	$200,136	$300,000		$1.59
	Subcontractor Bonding	1	%	$30,451,905	$4,383	$46,765	$251,271	$304,519		$1.62
	Insurance-PL&PD	1	LS	$269,618	$3,691	$39,383	$213,274	$269,618		$1.43
CONTINGENCY		15	%	$32,676,042	$67,103	$715,945	$3,877,128	$4,901,406	$4,901,406	$26.06
CONSTRUCTION FEE		2.50	%	$37,577,449	$12,861	$137,223	$743,116	$939,436	$939,436	$4.99
TOTAL COSTS					$527,321	$5,626,136	$30,467,763	**$38,516,885**	$38,516,885	**$204.77**
						$104.97	$226.53		$204.77	

Lewis & Clark College
SCIENCE EXPANSION

April 15, 2002

Feasibility Study

Image from Master Plan, NE corner of campus.

SODERSTROM ARCHITECTS, P.C.
1200 NW Naito Parkway, Suite 410 | Portland, Oregon 97209 | 503.228.5617 | FAX 503.273.8584 | www.sdra.com

SODERSTROM ARCHITECTS, P.C.
architecture | planning | exterior restoration | interior design

April 18, 2002

Michael Sestric
Facilities Planner
LEWIS & CLARK COLLEGE
0615 SW Palatine Hill Road
Portland, OR 97219

RE: New Science Building

Dear Michael:

The goal of this study was to develop a **workable concept model** for a new science building or buildings. We began the process by reviewing the space program developed by Research Facilities Design (RFD). We challenged some of the basic assumptions and looked for overlaps or redundancies in order to confirm the total square footage amount. We also discussed overall goals, adjacencies and organizational concepts. This led to three basic schemes:

- Option A: Remodel Olin as needed and build one new building that would provide all of the new space.
- Option B: Remodel Olin, adding another story onto it, then build one new building to accommodate all of the remaining needs.
- Option C: Remodel Olin and build two new buildings, one primarily for offices and classrooms and another for Biology and Chemistry.

Each option had some advantages and disadvantages, but none of them seemed just right. Nor did any of them successfully address the master plan goals. This led to the development of an **Option D**, which combined the best aspects from each. It proposed an addition to the front of Olin, addressing one of the concerns of the master plan, while avoiding the added cost of a complete seismic upgrade to the existing structure. It combined all of the new space into one structure, maximizing efficiency, yet nicely organizing the large footprint into a classroom/office portion in front and a contiguous, yet separate lab portion in back. A more detailed description of Option D follows this introduction.

Part of our study also involved brief assessments of the existing infrastructure and the implications of new construction. These assessments were done by engineers who are familiar with the campus, the master plan and the construction standards the College usually follows. The structural engineer was KPFF, the mechanical/electrical engineer, CBG, and the civil engineer, Harper Houf Righellis. They were all asked to look for fatal flaws to any of the proposed concepts. In general, they did not see any insurmountable hurdles in any of them. However, the structural engineer pointed out that adding another story on top of Olin would add considerable cost, since it would trigger a complete seismic upgrade to the existing structure. New footings and pilings would be required, as well as strengthening all of the structural joints. The mechanical engineer noted that it would be easiest to accommodate Biology and Chemistry (wet labs) in the new structure, and Math, Physics and Geology (dry labs) in the existing building.

We also looked at the soils conditions and the location of the environmental zones. The geotechnical report does not indicate any problems. Even though the proposals include two stories below grade, the borings did not find rock at these levels. Pilings would most likely be required and have been included in the cost estimates. The site slopes away enough so that even the lowest level would have some windows.

Options B and D show the buildings extending about 120 feet beyond the east face of Olin. That would be 20-25 feet before the current Conservation (C) zone boundary. This would not trigger any zoning requirements. The City's proposed change for the C zone line, however, would move it approximately 50 feet closer to the campus. All of the options except Option A would intrude into this zone. According to Lee Leighton, Westlake Consultants, building within the new C zone would not be allowed unless it were previously approved as part of the college's master plan.

In summary, Option D looks to be a promising and exciting arrangement that could meet the department's goals and the objectives of the master plan in a cost efficient and effective manner.

Sincerely,

SODERSTROM ARCHITECTS, P.C.

Jon H. Wiener, AIA
Partner

JHW/sm

Attachment

OPTION "D"

Option "D" is based on one new building of 112,500 SF, remodeling the existing Olin building and constructing a 12,000 SF addition. There would also be 10,000 SF of new space on two below-grade levels between the new building and Olin Hall.

The new facility would be organized into two parts, the front third for offices and classrooms and the back two-thirds for labs. The three-story classroom and office portion would face the campus and the new pedestrian street behind the original Albany building. The lab portion would be contiguous with this, but articulated to allow the expression of its different function. Since the overall building might be 225 feet long, this break would help to reduce the mass and blend in with the scale of other buildings on campus. The lab portion could match the height of the office section, but take advantage of the sloping site with two more floors below the entry level. The natural grade will allow all floors to have windows at the east end. The new addition would house classrooms at the street level with offices above.

The buildings would be focused around an outdoor plaza similar to the way the Arts & Humanities buildings all radiate around Alumni Circle. This approach would give the Science buildings their own identity and help to foster the sense of community between the six departments. The outdoor space would also create a gathering spot for this far end of campus.

The beauty of this scheme is in its simple and appropriate organization. All of the classroom spaces would be on the entry level in both the existing and new structures. This would keep the most heavily used spaces closest to the main entries and the pedestrian traffic. All of the office space would be clustered together above this on the second and third levels. The close proximity of the 49 faculty offices would encourage inter-departmental communication, while the distribution by floor and by building would allow individual department identity. Connecting the two buildings by a covered walkway/bridge, would facilitate this interaction. The outdoor plaza would create a focal element and give all of the departments a shared common ground.

Another exciting benefit of this scheme would be a new façade and entry for Olin. The existing structure does not have the architectural character currently being developed on the campus. The main elevation is dominated by the massive exhaust ducts, creating a cold and uninviting arcade. There is no visible front entry, since it is located down the stairs on the level below the plaza. In general, it is an uninviting, unfriendly building that does not promote curiosity or enhance the University community. Building a long narrow two-story structure in

front would create the opportunity to remedy this. It could have the same open and interactive qualities of the ground floor of the Miller building. The two-story height would provide a stronger edge to the end of the campus and greatly improve the visual terminus of the main east-west pedestrian way. It would also provide a transition between the one-story Olin classroom structure to the south and the proposed three-story Science I.

Building in front of Olin would accomplish the same objectives identified in the College's master plan without the added cost of structurally upgrading the entire Olin building. As noted in the preliminary structural review of the existing building, adding on top of Olin would trigger the requirement of a complete seismic upgrade. New footings and pilings would be needed, which would be difficult and expensive. By building on just the west side, this could be avoided. It would significantly reduce remodeling costs while providing many of the benefits.

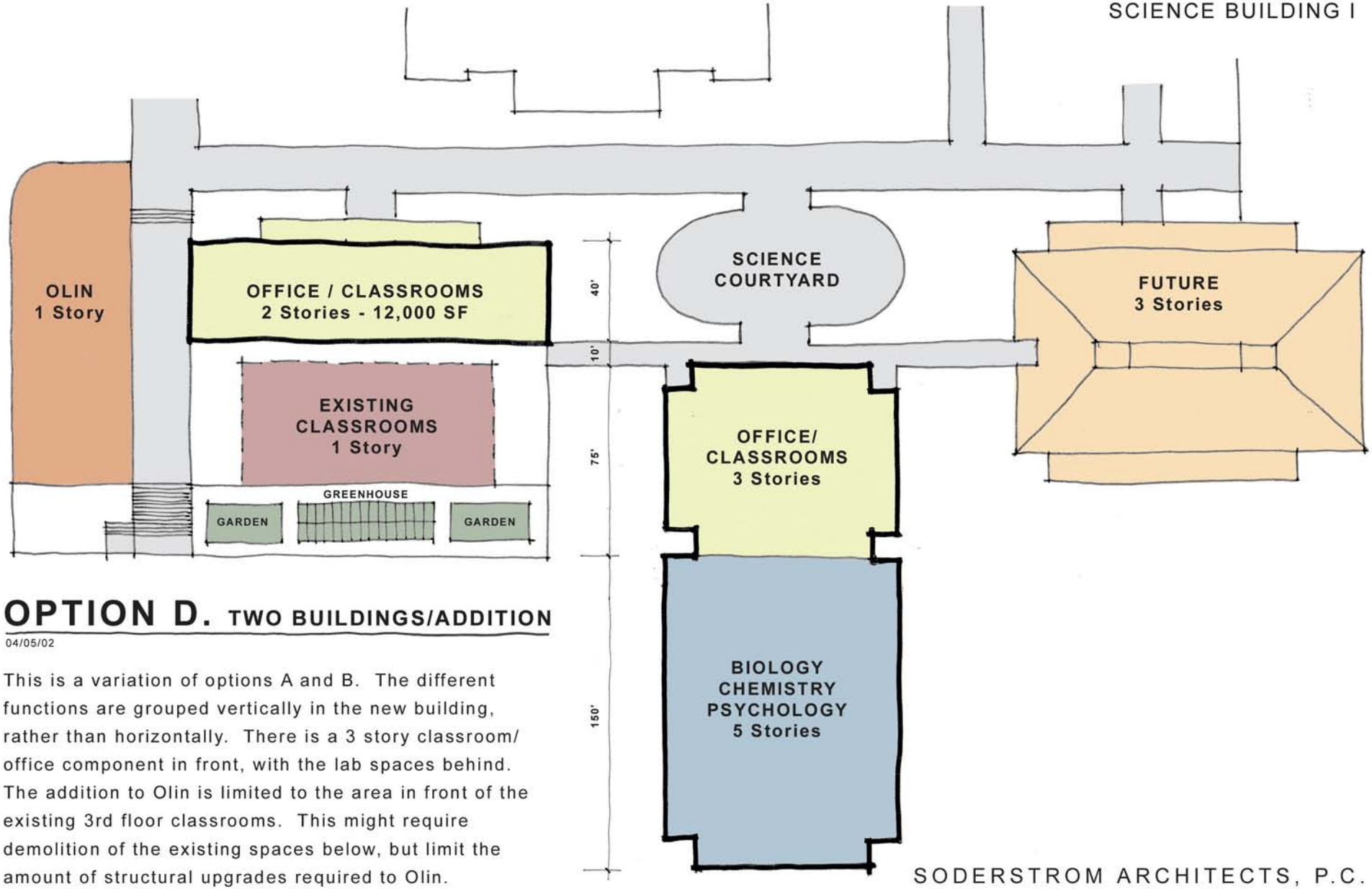
The lab portion of the new building might be organized vertically with Chemistry taking the top two floors, putting them closest to the roof where their hoods exhaust. Since Chemistry has the greatest number of hoods, this is the best arrangement. Biology could be located on the next two floors, giving them the first full floor below grade in order to meet their large area requirements. Psychology could be located on the lowest level, since they need many windowless rooms.

In general, Option "D" groups all of the "wet" sciences in the new structure and the "dry" sciences in the existing building. This will minimize remodeling costs, since the "dry" sciences require less utilities. It minimizes the need or extent of utility relocation.

Finally, the two buildings will be connected below grade on both levels. These in-between spaces could house the shared rooms or equipment, further encouraging the interdepartmental interaction.

BUILDING OPTIONS

Lewis & Clark College
SCIENCE BUILDING I



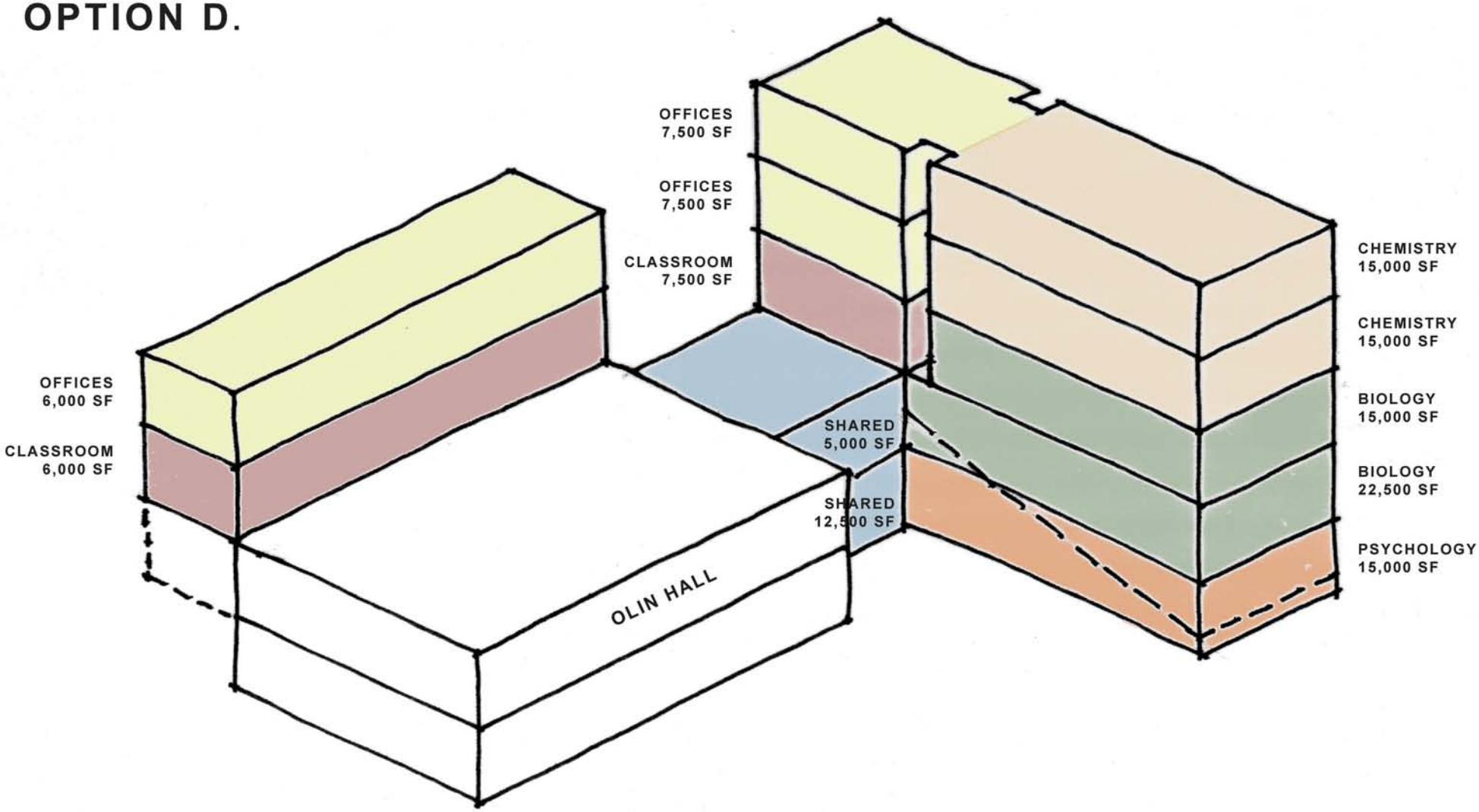
OPTION D. TWO BUILDINGS/ADDITION

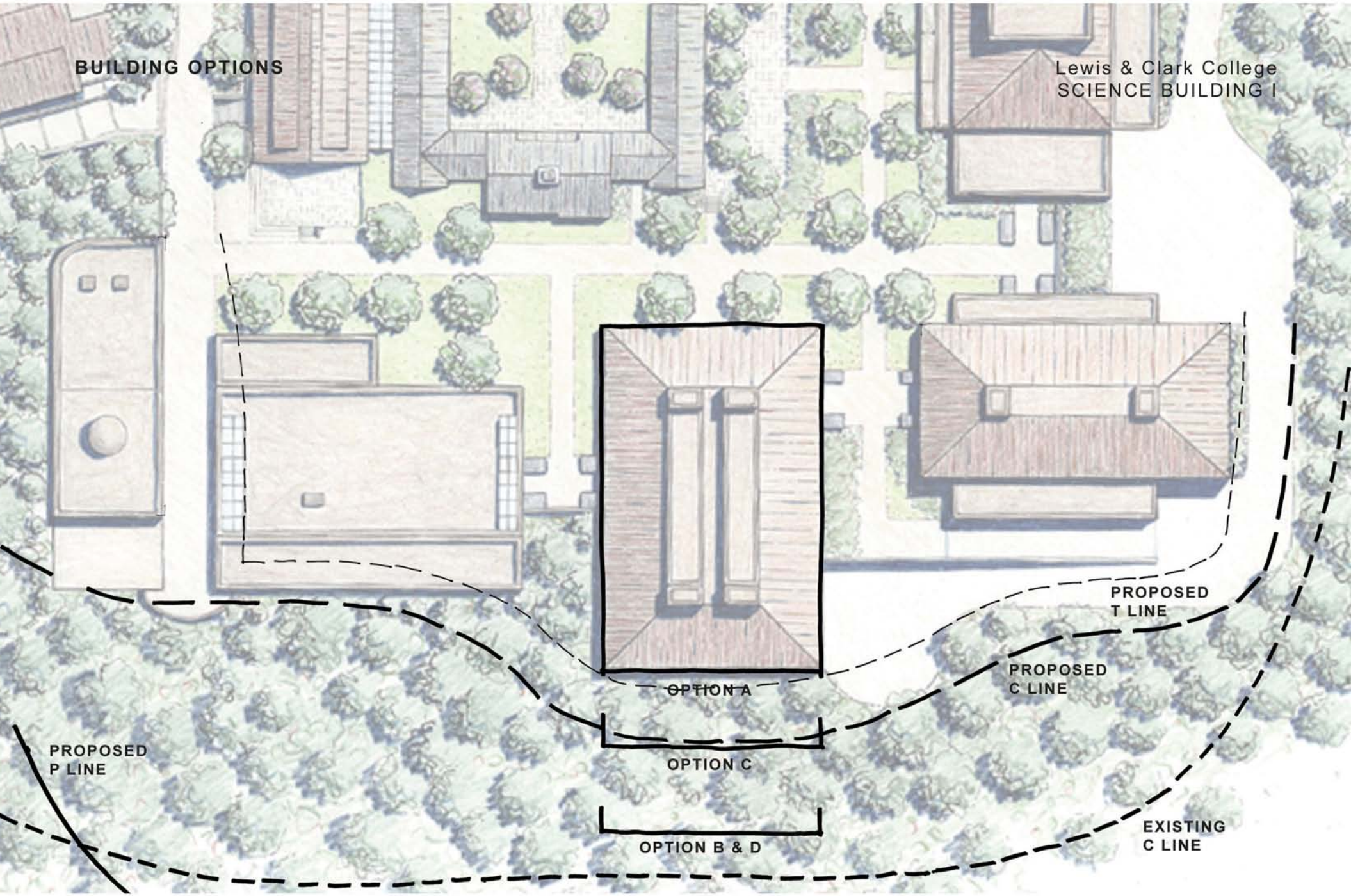
04/05/02

This is a variation of options A and B. The different functions are grouped vertically in the new building, rather than horizontally. There is a 3 story classroom/ office component in front, with the lab spaces behind. The addition to Olin is limited to the area in front of the existing 3rd floor classrooms. This might require demolition of the existing spaces below, but limit the amount of structural upgrades required to Olin.

SODERSTROM ARCHITECTS, P.C.

OPTION D.


OFFICES
7,500 SF
OFFICES
7,500 SF
CLASSROOM
7,500 SF
OFFICES
6,000 SF
CLASSROOM
6,000 SF
SHARED
5,000 SF
SHARED
12,500 SF
OLIN HALL
CHEMISTRY
15,000 SF
CHEMISTRY
15,000 SF
BIOLOGY
15,000 SF
BIOLOGY
22,500 SF
PSYCHOLOGY
15,000 SF


BUILDING OPTIONS
Lewis & Clark College
SCIENCE BUILDING I
PROPOSED
T LINE
PROPOSED
C LINE
OPTION A
OPTION C
OPTION B & D
PROPOSED
P LINE
EXISTING
C LINE

PROGRAM

3-27-02

	Lab & Support		*Office & Admin*		*# Offices*	*Classrm.*		*Other*		*Total*	
Biology	38,115	GSF	6,416	GSF	(14)					44,530	GSF
Chemistry	30,272		4,644		(12)					34,916	
Geology	5,504		757		(2)					6,261	
Math/CS	10,819		3,457		(11)					14,276	
Physics	16,636		3,357		(8)					20,095	
Psych	14,585		4,076		(12)					18,662	
Shared	15,515		1,763		(4)	30,100		3,079		50,456	
Total	**131,446**	**GSF**	**24,570**	**GSF**	**(63)**	**30,100**	**GSF**	**3,079**	**GSF**	**189,166**	**GSF**

BUILDING OPTIONS

3-27-02

Total Program	189,652	gsf
Olin	- 53,600	
New Construction	136,052	gsf

Option A - 2 Buildings / Remodel

	GSF	
Olin	53,600	
SPACE BETWEEN	11,052	→ 2 stories / 5,526 SF each
Science I	+ 125,000	→ 5 stories / 3 above grade 25,000 SF each floor 100' x 250' (50' beyond parking)
	189,652	

Option B - 2 Buildings / Addition

	GSF	
Olin	53,600	
Addition	32,052	→ 2 stories
SPACE BETWEEN	12,000	→ 2 stories / below grade
Science I	+ 92,000	→ 5 stories 18,400 gsf each 100' x 184'
	189,652	

Option C - 3 Buildings

	GSF	
Olin	53,600	
SPACE BETWEEN	4,000	→ 1 stories / below grade
Science I	64,052	→ 4 stories / 3 above grade
SPACE BETWEEN	8,000	→ 2 stories / below grade
U. A. B.	+ 60,000	→ 5 stories / 3 above grade
	189,652	

SCOPE OF WORK SUMMARY

3-27-02

Option A – 2 Buildings/Remodel

Olin –

- No seismic upgrade
- Selective remodel, program driven, assure 50% gross floor area or 26,800 sf
- Minimal scope

Science I –

- 136,052 sf new construction
- 3 floors above grade, 25,000 sf/floor, 14 feet floor to floor
- 2 floors below grade 30,526 sf each 15 feet floor to floor
- Daylight at east end as grade allows

Option B – 2 Buildings/Addition

Olin –

- Seismic upgrade to northern half
- Remove roof and 3rd floor on northern half and replace with 2 story 32,000 sf addition. Provide additional piles and footings as needed.
- Comprehensive remodel for this half, minimal scope for remaining space

Science I –

- 104,000 sf new construction
- 3 floors above grade, 18,400 sf/floor, 15 feet floor to floor
- 2 floors below grade, 24,400 sf/floor, 15 feet floor to floor

Option C – 3 Buildings

Olin –

- Same scope as Option A

Science I –

- 68,000 sf new construction
- 3 floors above grade, 16,000 sf/floor, 14 feet floor to floor
- 1 floor below grade, 20,000 sf, 15 feet floor to floor

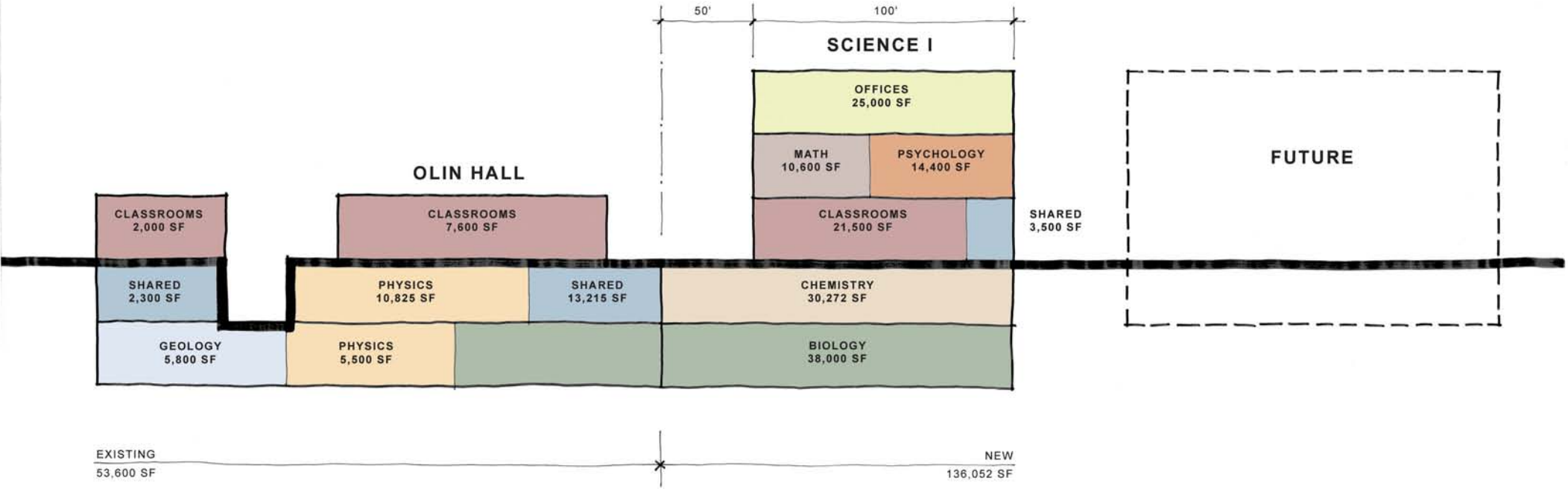
U.A.B. –

- 68,000 sf new construction
- 3 floors above grade, 12,000 sf/floor, 15 feet floor to floor
- 2 floors below grade, 16,000 sf/floor, 15 feet floor to floor

OPTION A. TWO BUILDINGS / REMODEL

04/05/02

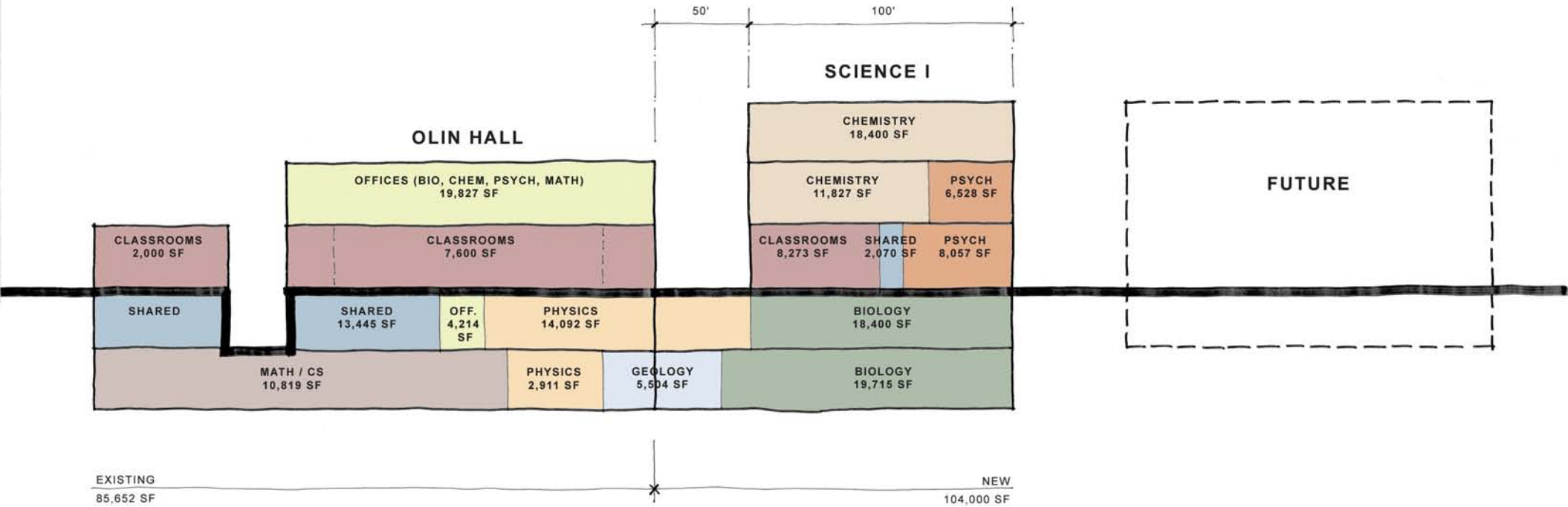
This option is based on one new building that provides all of the needed added space. The new building is organized floor by floor for the various functions. An alternative would be to group functions vertically.



OPTION B. TWO BUILDINGS / ADDITION

04/05/02

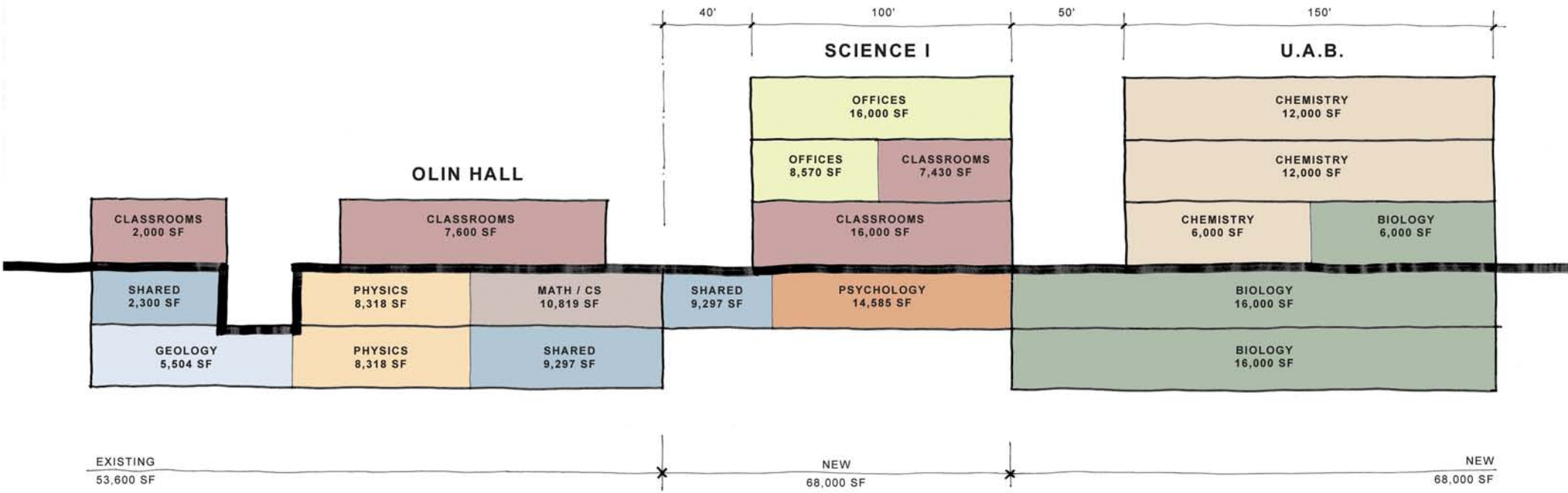
This scheme is based on a two story addition to Olin that houses offices and classrooms.



OPTION C. THREE BUILDINGS

04/05/02

This option provides a classroom / office building
and a separate wet lab facility for biology and chemistry.



kpff Consulting Engineers

March 21, 2002

Mr. Jon Wiener
Soderstrom Architects
1200 NW Naito Parkway Suite 410
Portland, OR 97209

RE: Lewis & Clark College
Olin Hall

Dear Jon:

The purpose of this letter is to summarize our preliminary review of the Olin Hall drawings and the potential modifications to the structure that are being considered. Olin Hall is a three story building with reinforced concrete waffle slab floors and roof. The concrete columns bear on spread footings and pile caps. It was built in 1977, and each level contains approximately 22,000 square feet. The following is a summary of the questions raised so far:

Item 1
Are there any serious structural deficiencies we should be concerned about for continued use of the building?

There were no apparent structural deficiencies noted during our walk-through, March 18, 2002, or uncovered during our review of the structural drawings. However, we have only performed a limited review of the building and there may be concealed problems we're not aware of.

Item 2
Is the building as safe as you would expect for a building of its vintage?

The building is as safe as would be expected for a structure designed in 1977 based on the requirements of the 1976 Uniform Building Code. It appears there is the potential for significant soil loads on the building in the event of an earthquake. These loads, resulting from only one side of the building being below-grade, would need to be considered in any seismic upgrade.

Item 3
What would trigger a seismic upgrade?

Triggers to seismic upgrades are:

- A change of use to a higher level occupancy.
- Adding 5% or more to the mass of the structure, or modifying any lateral force resisting element so that its capacity is reduced by more than 5%.

111 S.W. Fifth Avenue Suite 2500 Portland, OR 97204-3628 (503) 227-3251 Fax (503) 227-7980

Seattle Portland San Francisco Los Angeles Irvine San Diego Phoenix McLean

Item 4
Are there interior shear walls or other structural features that would seriously restrict interior remodeling?

There do not appear to be any interior shear walls indicated on the drawings. The concrete shear walls appear to be on the perimeter of both the north and south portions of the building.

Item 5
One other question is whether Olin is a good candidate for a seismic upgrade or a bad one?

Olin Hall is probably not a good candidate for a seismic upgrade. It is a relatively heavy building, which means the seismic forces will be high. The seismic forces for the building could be as much as 100% higher than used in the original design. Modifying the foundations, especially if additional piles were required to strengthen footings, would be difficult and expensive.

Item 6
Would it be relatively easy to do the work or very difficult?

Adding additional walls to resist the load would be relatively easy. The foundation work, as noted previously, would be somewhat more difficult.

Item 7
Relative to this, are there unique qualities to the structural system of this building?

The building is not particularly unique. The design does present some challenges for upgrade to current code. As noted previously, the waffle slab structure is heavy. There do not appear to be any walls on the east side of the north portion of the building. Therefore, the walls on the north, west, and south must resist loads from torsion of the building because the center of mass is not near the center of rigidity of the existing walls. With the high mass and higher lateral loads from current code, there could be uplift on some of the footings. Resisting this uplift will require additional concrete or piling, which will be difficult to install.

Item 8
Does the building act as one structure in terms of lateral? (There's a big open passageway through the middle.)

There is no indication on the drawings that the two portions of the building have any special ties. Based on the shear wall layout and the large diaphragm opening, we would expect that the two portions would act independently during an earthquake. This may cause damage to the structures where they connect.

Item 9
If so, could it be divided in two so we could add on to one side and not have to do a lateral upgrade to the other?

It would appear the removal of the roof between the two portions of the building would not be a problem structurally, as long as all the walls remain. We would not expect an upgrade would be required because the seismic load would be reduced.

Item 10
Could an additional floor be added?

An addition over the roofs on the east and west sides of the north portion of the building might be possible if the pile foundations have some reserve capacity. However, we would not expect there to be a significant amount of extra capacity in the foundations. This option would trigger an upgrade. Transferring lateral forces through the roof section between north and south will be difficult. We believe the south portion would not need to be upgraded since it appears to have adequate walls.

Item 11
Could the existing concrete roof be removed and two additional "light weight" floors added?

Removing the existing third floor and adding two additional floors is possible. The new floor framing would have to be connected to the existing columns. This may be difficult because when locating anchors, there may not be space between the existing reinforcing. It's likely a seismic upgrade would be required for this scenario.

Our evaluation includes limited field reconnaissance to observe the general physical status of the building and the site, a review of available design drawings of the original structure, and assessment of significant structural deficiencies observed. Observations, analyses, and conclusions contained in this report reflect our best engineering judgment. Concealed problems with the construction of the buildings may exist that cannot be revealed through our review. KPFF, therefore, can in no way warrant or guarantee the condition of the existing construction of the building and the building site.

Please call if you have any questions.

Sincerely

Ronald G. Kernan PE
Associate

202103/letter-soderstrom-032102.doc

Lewis and Clark College
Olin Science Addition and Renovation
Preliminary Mechanical and Electrical System assessment
4/2/02

We have reviewed the three preliminary organizational options proposed for the expansion and renovation of the science facilities at the college. This assessment summarizes preliminary considerations for mechanical and electrical systems in response to the options. At this stage the assessment is cursory, based on our current knowledge of the campus and Olin, and our experience with similar facilities. We have the following comments:

MECHANICAL

Fire Sprinklers – The buildings will require fire sprinklers. The campus water system is now sufficient to support fire sprinklers.

Plumbing Systems – Infrastructure is available for water and sanitary sewer. Storm sewer detention will likely be required. The location of the buildings will need to be coordinated with existing storm and sanitary sewers. Laboratory waste will require a sampling manhole. Waste neutralization is unlikely. Most laboratory plumbing in Olin will not be necessary and can be abandoned or removed.

HVAC Systems – The new facilities will require additional steam and chilled water from the central energy plant. Boilers and chillers will have sufficient capacity, but piping from the plant to the project site will need to be upsized. Alternatives for steam and chilled water piping, consistent with the north campus utility master plan should be considered. The fan systems in Olin have more than adequate capacity to serve classrooms and dry labs. For efficient operation, it will be desirable to convert the systems to recirculating variable air volume with DDC controls. New fan systems should be efficient and safe for laboratory functions.

ELECTRICAL

Normal Power – The power in the existing Science Building is 120/208v. This will be adequate for classrooms. The new addition will require a 277/480v and 120/208v transformer. Primary power will be extended from the new vault being installed as part of the Albany Hall Remodel. The existing 120/208 volt transfer will require new feeders.

Emergency Power – Emergency power will come from the planned emergency generator upgrade at central plant.

Telephone/Data – Telecom/Data service will enter the existing and new facility via the tunnel from Watzek Library.

Lighting – Lighting in the existing facility should be upgraded to T8 lamps and electronic ballasts if it has not been done so already.

Harper Houf Righellis, Inc.

5200 SW Macadam Avenue, Suite 580, Portland, OR 97201
tel 503.221.1131 www.hrcivil.com fax 503.221.1171

LAC-02

MEMORANDUM

To: Jon Wiener, Soderstrom Architects

From: Ron Peterson, P.E., RDP
Harper Houf Righellis, Inc.

Date: April 09, 2002

Subject: Olin/Science I/U.A.B. Civil Engineering Narrative

STORMWATER

In general, all storm runoff flows either north or east to natural ravines that convey flow to the Willamette River. The existing system is described in the North Campus Utility Master Plan dated January 1994. The City of Portland requires Stormwater Management from all new and redeveloped projects within the City. The Bureau of Environmental Services has implemented the Stormwater Management Manual Revision Number 1, dated September 2000.

Stormwater Management Levels

All new development and redevelopment projects will fall under one of three management levels described as follows:

Level 1

New development falls under Management level 1 if it creates new impervious area of less than 500 square feet after mitigation measures have been applied.

Level 2

New development falls under Management level 2 if it creates new impervious area equal to or greater than 500 square feet after any mitigation measures have been applied.

Level 3

Redevelopment falls under Management level 3 if the footprint of the replacement development is greater than 500 square feet after mitigation measures have been applied. Redevelopment is defined as any development that requires demolition or removal of existing structures or impervious surfaces at a site and replacement with new development. Maintenance activities such as repavement are not considered to be redevelopment. Interior remodeling projects are also not considered to be redevelopment.

STORMWATER (cont.)

The addition to Olin (added roof area), Science Building I and the U.A.B. would each trigger the requirements of the Stormwater Manual and would fall under Management Level 3. The stormwater management measures for pollution reduction and flow control outlined in the manual are required to treat and control runoff from all (non-mitigated) impervious area in the development footprint. Note: For projects under 15,000 square feet that are required to control flows, surface infiltration facilities are encouraged. Because of minimum orifice size specifications, structural flow control facilities for projects under 15,000 square feet are not effective and will not be required.

A summary of the major design criteria, as related to Lewis & Clark College is as follows:

1. Complete a Form MIT for any proposed project that will create over 500 square feet of impervious area. This will identify the type and amount of mitigation measures that will be implemented to treat and detain stormwater runoff. A minimum of 20 percent of impervious surfaces must be mitigated, unless site/project conditions preclude approved mitigation measures. Approved mitigation measures include; eco-roofs, roof garden, landscape planters, porous pavement, new trees, and saving existing trees. This form will also identify the amount of unmitigated impervious surface area to be managed.

2. Apply simplified measures for unmitigated impervious area less than 15,000 square feet. If approved simplified measures are implemented for all unmitigated impervious area, then no further stormwater management measures are required. Stormwater detention is not required for projects with less than 15,000 s.f. of unmitigated impervious area.

3. For any re-development in which the total unmitigated impervious surface area exceeds 15,000 square feet, water quality facilities shall be designed to remove 70 % of total suspended solids (TSS).

4. For any re-development in which the total unmitigated impervious surface area exceeds 15,000 square feet, water quantity facilities shall be designed to limit developed peak runoff rates to the undeveloped (forested) condition for the storm events equal to ½ of the 2 year, 5-year, 10-year and 25 year events.

5. Porous pavement shall only accept precipitation, not stormwater runoff. It may be used for walkways, patios, plazas, driveways, parking lots, and some portions of streets. Porous pavement must be installed and maintained to manufacturer's specifications to receive mitigation credit.

6. Parking lot redevelopment may use simplified measures for stormwater management by breaking the contributing areas into 15,000 s.f. or less sub-basins. Any code required landscaping must be used for stormwater management unless the Bureau of Environmental Service's plan review staff approve otherwise.

STORMWATER (cont.)

The project should be developed in accordance with the Stormwater Management Manual, Revision 1, dated September 2000. Mitigation measures will be implemented to the fullest extent possible in an effort to reduce the unmitigated impervious surface area of the project area. The redevelopment should strive to manage stormwater runoff as close as possible to the project area with "green" type facilities such as; landscape swales, vegetative filters, stormwater planters, landscape infiltration and sand filter systems.

Due to the size and difficulties associated with the topographical and geological conditions of the campus, it may become necessary to manage the project by mechanical methods. Mechanical means of stormwater management include buried oversized pipes or vaults for flow control (water Quantity), and approved mechanical water quality devices. Due to the proximity of the projects to the Environmental Zones, Environmental Review may be required for new storm outfalls to the natural ravines.

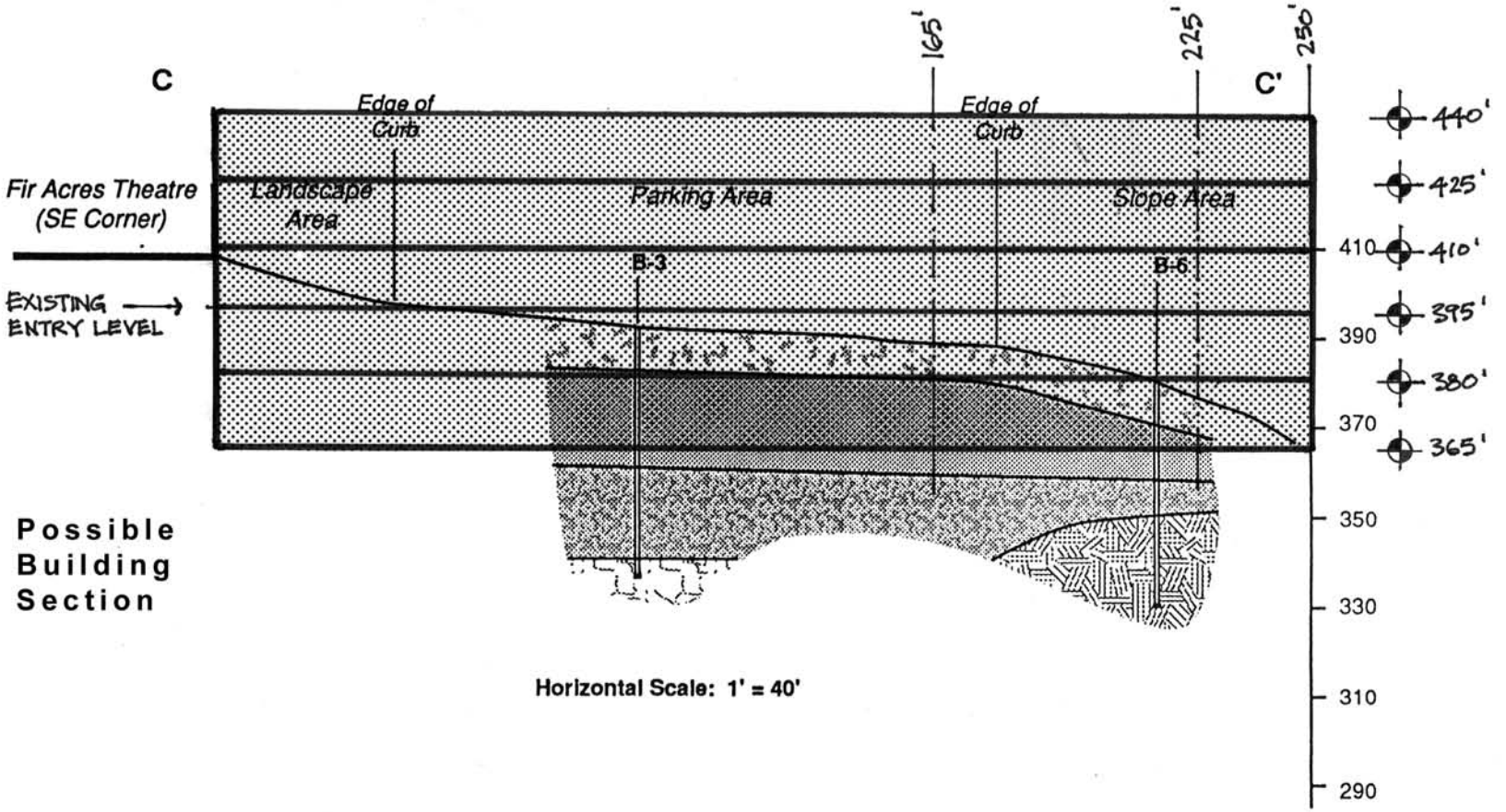
SANITARY SEWER

In general, the sanitary sewer system flows to the southeast and is conveyed to the public system located in the ravine adjacent to the Humanities and Art buildings south of Olin. The existing system is described in the North Campus Utility Master Plan dated January 1994.

The 1994 Master Plan indicates a new gravity piped system along the north and east sides of the campus. This system is planned to run south to the connection with the public sewer system south of Olin. This system will run directly east of the Olin/Science I proposed location and should be analyzed for feasibility with new topographic information. Construction of this new main may require Environmental Review due to its proximity to the existing Environmental Zones. An existing sanitary sewer main is available west of the project. This existing main serves the Albany Quad project and the northern portion was to be abandoned in the Master Plan. It should be analyzed for feasibility in serving the North Campus Master Plan, in lieu of the east side proposal.

WATER

The backbone of the water system for the entire College is an 8-inch main that connects to the City's public system in two locations. The 8-inch main loops through the north and south campus. This private system provides both domestic and fire service and is metered at both connections to the public system. Both connections to the public system have backflow devices. A portion of new 8 inch main is to be constructed with the Albany Quad project per the 1994 Utility Master Plan, and will be available to serve these projects. This new main will be located between Albany and Olin.



KEY

- Fill
- Sandy to Clayey Silt (Portland Hills Silt)
- Silty Clay (Residual Soil)
- Silty to Clayey Sand (Decomposed Basalt)
- Basalttic Bedrock

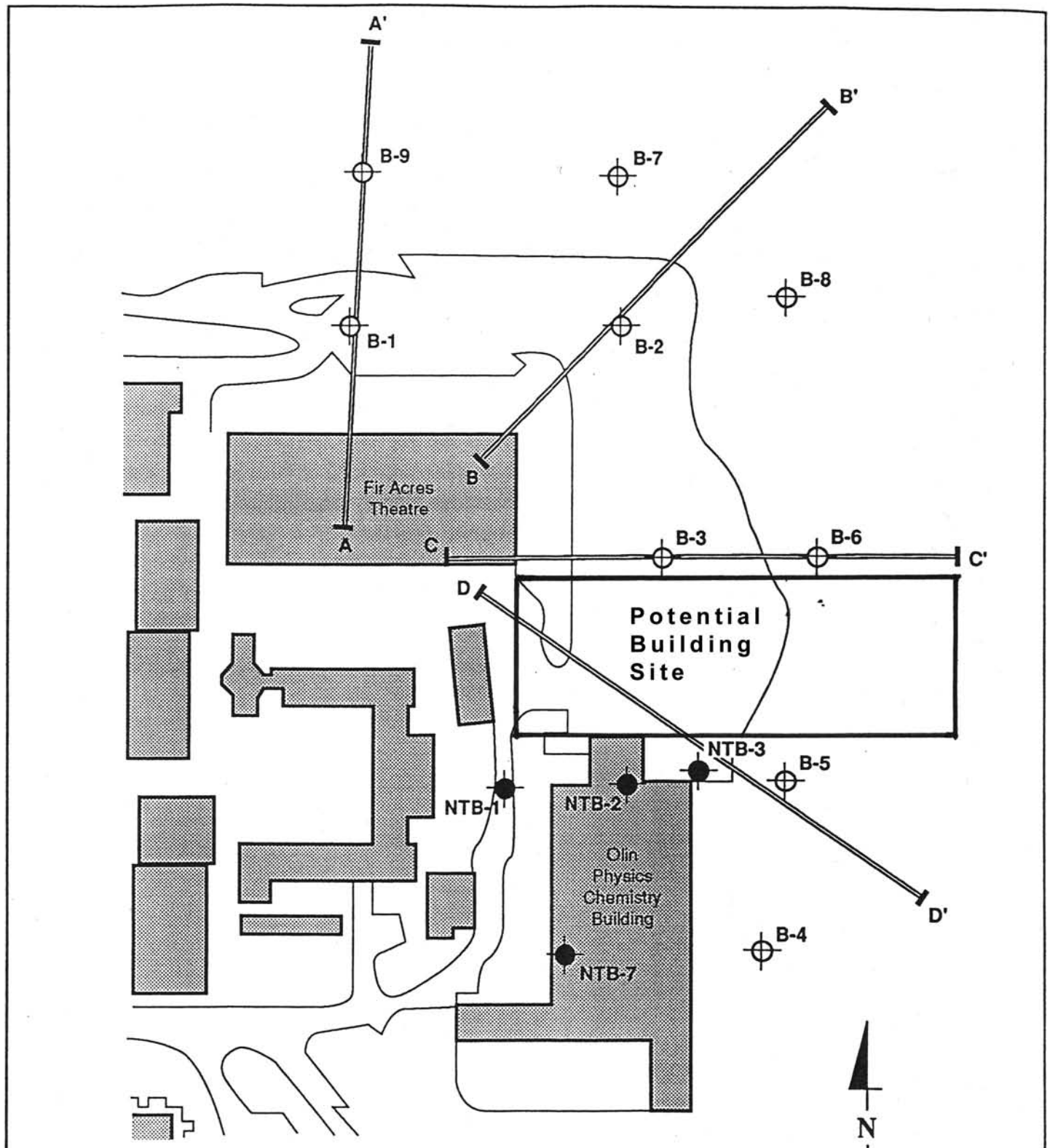
NOTES:

1. Subsurface conditions shown are accurate only at the boring locations shown. Stratigraphy is interpolated between borings and may not reflect the actual subsurface conditions.
2. The locations of borings shown on this cross-section are presented in Figure 1. Logs of the borings are presented in Appendix A.

GENERALIZED SUBSURFACE PROFILE C-C'

Janaury 1995
288-019-016

Lewis & Clark College
New Northeast Development Area
Portland, Oregon



SITE PLAN

Lewis & Clark College
New Northeast Development Area
Portland, Oregon

January 1995
288-019-016

DAMES & MOORE

FIGURE 1