

Office of the President

TO MEMBERS OF THE COMMITTEE ON GROUNDS AND BUILDINGS:

ACTION ITEM

For Meeting of March 19, 2014

APPROVAL OF PRELIMINARY PLANS FUNDING, BIOLOGICAL AND PHYSICAL SCIENCES BUILDING, SAN DIEGO CAMPUS

EXECUTIVE SUMMARY

The proposed Biological and Physical Sciences Building project is for construction of approximately 73,000 assignable square feet (122,000 gross square feet) of teaching laboratory and service space; research and scholarly activity space; and academic and administrative office, support, and conference space. The proposed facility would provide modern instruction and research facilities for programs in the Division of Biological Sciences and the Chemistry/Biochemistry Department. This project is needed to address existing and future space needs associated with program growth in these disciplines. The total project cost is currently estimated to be approximately \$112 million to be funded from campus funds and external financing for which debt service would be funded with a combination of State appropriations under the Assembly Bill 94 (AB 94) funding mechanism and campus funds. The breakdown between all fund sources will be provided when full budget approval for the project is sought.

The Regents are being asked to approve preliminary plans funding in the amount of \$4.5 million to be funded by campus funds, specifically Short Term Investment Pool (STIP) earnings. Approval of full budget and the associated external financing will be requested in a subsequent Regents item.

RECOMMENDATION

The President of the University recommends that the Committee on Grounds and Buildings recommend to the Regents that the 2013-14 Budget for Capital Improvements be amended to include the following project:

San Diego: Biological and Physical Sciences Building – preliminary plans – \$4.5 million to be funded from campus funds.

BACKGROUND

The San Diego campus is proposing a new building that would provide teaching laboratory and service space; research and scholarly activity space; and academic and administrative office,

support, and conference space for the Division of Biological Sciences and the Chemistry/Biochemistry Department (within the Division of Physical Sciences). The Division of Biological Sciences and Chemistry/Biochemistry Department have instruction and research programs that require utility intensive facilities and have space shortages that are hindering these programs.

Project Drivers

The campus has requested State funding for the proposed Biological and Physical Sciences Building each year since 2007; however, funding has not materialized. Given the critical need to provide additional instruction and research space for the Divisions of Biological and Physical Sciences, the campus proposes proceeding with preliminary plans using campus funds available for capital projects. This project continues to be a priority of the campus for State funding and efforts to obtain State funds will continue.

Over the last decade the number of undergraduate students enrolled as majors within the Division of Biological Sciences and the Chemistry/Biochemistry Department has increased significantly. Since fall 2003, the number of students enrolled as Biology majors has increased by almost 2,000 students (a 64 percent increase); however, this does not accurately reflect full growth potential as Biology majors were impacted as a result of budget cuts between fall 2009 and 2013. The number of students majoring in Chemistry/Biochemistry has increased by more than 400 students (a 57 percent increase), over the same period of time. These popular majors are expected to increase by approximately 20 percent by fall 2020 as more students prepare to pursue expanding career opportunities in a broad array of biological and physical sciences fields.

To support enrollment in these disciplines, faculty positions (including graduate and post-doctoral fellows) are expected to increase by at least ten percent this decade for both the Division of Biological Sciences and the Chemistry/Biochemistry Department. This increase in faculty positions will fill current vacancies and meet future demands, consistent with the campus' strategic plan. The campus currently does not have the space or facilities to adequately support the prior and future growth in these programs.

Need for Instructional Laboratories to Support Undergraduate Students

A core requirement for undergraduate students enrolled within the Division of Biological Sciences majors involves hands-on laboratory courses. Currently, all of the undergraduate majors in the Division of Biological Sciences require students to complete at least one upper division laboratory course (for which two were previously required), which introduces students to the tools and methods for fields in biochemistry, cell biology, molecular biology, physiology, ecology, behavior, and bioinformatics. The Division is adding a new mandatory lower-division laboratory course that will be required of all Biology students, entailing enrollment of between 1,100 and 1,200 freshmen. In addition to the mandatory laboratory classes, the Division offers laboratory classes as electives to both Biology and non-Biology majors, creating an even greater demand for laboratory space.

Limitations had been put on the number of students who could declare a major in the Division of Biological Sciences, because of insufficient teaching laboratory space (specifically wet laboratory space) available to support the demand for required courses. A campus-funded renewal project of existing teaching laboratory space will provide additional teaching stations, allowing the limits on declaring a biological sciences major to be rescinded. However, this is a short-term fix and does not address the continuing demand for which additional teaching laboratory space is critical. As the number of students seeking to pursue a major in this Division continues to grow, the requirement for upper-division laboratory courses needs to be increased to a minimum of two courses. The course requirements are marginalized because of the inability to provide the appropriate number of course offerings within the existing amount of teaching laboratory space.

Similarly, there is a high demand for organic chemistry laboratory courses taught by the Chemistry/Biochemistry Department, to support core and elective courses for a range of majors within chemistry/biochemistry, biological sciences, engineering, as well as other students who intend to apply to medical or pharmacy school. All organic chemistry laboratories require every student to have fume hood access for carrying out synthetic procedures thereby increasing the space requirements beyond the norm for other chemistry laboratories. Without additional wet laboratory space, the Chemistry/Biochemistry Department will not be able to offer a sufficient number of sections to accommodate the major requirements and there would be negative impacts to time-to-degree of Biology majors, Chemistry/Biochemistry majors and some Engineering majors.

Need for Research Laboratories and Scholarly Activity Space

As with most disciplines, the Division of Biological Sciences and the Division of Physical Sciences place emphasis on instruction in both class laboratories and research laboratories. Students are encouraged to broaden their academic experience through individual research projects or by participating in student-faculty research teams. The ability to have students connect the theory learned in the classroom with hands-on experience in the laboratory is considered pivotal to the learning process. This opportunity to learn the skills of the trade and to think like a scientist also is critical to training the next generation of science, technology, engineering, and mathematics (STEM) workers.

Separate from the research laboratory space, there is a need for research office space to support graduate student members of the research teams in completing writing and computational analysis activities for both the Division of Biological Sciences and the Chemistry/Biochemistry Department. In addition, scholarly activity space is needed to serve as common study areas for graduate students and other laboratory occupants (including undergraduates). This space also provides a venue for collaboration and discussion among faculty, research staff, and students.

Without new space, the Division of Biological Sciences and the Chemistry/Biochemistry Department will not be able to maintain the high program standards expected at a University of California campus. Existing research space is currently oversubscribed – restricting the opportunity for critical renewal activities, let alone placement of new faculty.

Need for Nuclear Magnetic Resonance Research Laboratory Space

The Department of Chemistry and Biochemistry is a national leader in Nuclear Magnetic Resonance (NMR) spectroscopy with a rich array of instrumentation available for core multi-user research support. Major users include faculty from the Department of Chemistry and Biochemistry as well as from the Scripps Institution of Oceanography and the Skaggs School of Pharmacy.

Space requirements for high-field NMR instrumentation are quite rigorous. These requirements include stability of the environment with respect to temperature, vibration, and fluctuating electromagnetic fields from moving metal objects.

Currently, five high-field NMR spectrometers are sited in a temporary inflatable facility; however a permanent location is needed. The proposed NMR facility in the Biological and Physical Sciences Building would accommodate instrumentation currently located at this temporary site as well as planned expansion of instrumentation. This planned expansion includes the “next generation” of NMR spectrometers that utilize high temperature superconducting technology to generate magnetic fields corresponding to frequencies greater than 1GHz.

Need for Academic and Administrative Office and Support Space

Similar constraints described for the research laboratory space also are true for the deficiencies in academic and administrative office space. With the number of faculty within these disciplines planned to increase by approximately ten percent this decade, academic offices for faculty in the Division of Biological Sciences and the Chemistry/Biochemistry Department are needed. In addition, shared academic offices to meet the needs of postdoctoral scholars are needed, along with a minimal need for administrative offices and support space, and conference rooms.

Project Description

The proposed Biological and Physical Sciences Building project would involve construction of an approximately 73,000 assignable square foot (asf) facility to provide modern instruction and research facilities for the programs in the Division of Biological Sciences and the Chemistry/Biochemistry Department. The building would provide teaching laboratory and service space; research and scholarly activity space; and academic and administrative office, support, and conference space. The preliminary space program is described in more detail below:

Instructional Laboratories and Laboratory Service Space (approximately 16,000 asf of space)

The proposed project would provide eight new class laboratories, designed to accommodate 24 students each for classes offered by the Division of Biological Sciences and the Chemistry/Biochemistry Department. All of the proposed class laboratories require students to use fume hoods. Space to service these class laboratories would include glass wash/autoclave equipment rooms, preparation and stocking space, fluorescent microscope room, equipment and

instrument rooms, controlled temperature rooms, and a bio-waste storage room. An open computer laboratory would be designed for flexible use.

Research and Scholarly Activity (approximately 49,000 asf of space)

Flexible laboratory modules would be constructed to support the research efforts in the building. Support space also would be included, such as special procedure rooms, equipment rooms, glass wash and/or autoclave space, controlled temperature rooms, chemical storage rooms, and controlled temperature rooms.

A large open research space would be constructed to provide permanent accommodations for the Chemistry/Biochemistry Department's research in NMR spectroscopy. The existing high-field NMR spectrometers would be relocated from the temporary facility and installed in the new building as part of this project, with additional spectrometers and equipment purchased and installed separately. The existing temporary inflatable facility currently dedicated to NMR research would be replaced by permanent research space in the proposed building and the temporary facility would be removed.

Scholarly activity and research office spaces also would be provided to support the interdisciplinary programs in the building and designed in a combination of shared office and open landscape office space.

Academic and Administrative Offices and Office Support (approximately 8,000 asf of space)

Academic office space would be constructed to support the faculty and postdoctoral scholars providing instruction and research in the building. Administrative office space would be provided to support personnel, and support space would include mail and copy rooms.

To allow for flexibility of meeting spaces provided in the program, several conference rooms of various sizes would be included in the proposed building. In addition, a large assembly space with fixed seating, sloped floor, and control room would be constructed to accommodate approximately 170 persons.

Site and Utilities

The proposed site is approximately 2.5 acres, located in Revelle College, and is in close proximity to Biological and Physical Sciences departments in existing facilities to meet project adjacency requirements. Existing fire and service access from Scholars Drive would be extended to support the project site and will require the realignment of a recreational field. The project is expected to receive all of its utilities from existing campus infrastructure.

Approval Request and Schedule

The requested Preliminary Plans funding of \$4.5 million would enable the campus to complete schematic design and design development prior to submitting the Project for full budget and

financing approval from the Regents. The funding would support site surveys, specialty consultants, preparation of an Environmental Impact Report pursuant to the California Environmental Quality Act, and cost analysis.

The campus intends to submit the Project for full budget and financing approval in fall 2014, with approval of design and certification of the Environmental Impact Report to be sought in early 2015. Following these approvals, it is estimated that construction would commence in summer 2016, with the goal of completion by the end of 2018.

Funding Plan

The total Project budget for preliminary plans, working drawings, construction, and moveable equipment is currently estimated to be approximately \$112 million. The project is intended to be funded with campus funds and external financing for which debt service would be funded with a combination of State appropriations under the AB 94 mechanism and campus funds. The breakdown between all fund sources will be provided when full budget approval for the project is sought.

The estimated cost for the Preliminary Plans phase is \$4.5 million to be funded with campus funds (specifically STIP earnings).

ATTACHMENTS:

- Attachment 1: Preliminary Plans Budget
- Attachment 2: Alternatives Considered and Delivery Model
- Attachment 3: Project Site Map

PRELIMINARY PLANS BUDGET

Cost Category	Amount
A/E ⁽¹⁾	\$2,900,000
Campus administration ⁽²⁾	450,000
Surveys, tests, plans ⁽³⁾	250,000
Special items ⁽⁴⁾	900,000
Total Preliminary Plans Budget	\$4,500,000

Notes

- (1) Executive architect fees for schematic design and design development, along with cost estimator, code consultants, scheduling consultant fees.
- (2) Campus project manager, planning, engineering and design review, and contracts administration.
- (3) Includes soil reports, site surveys, advertising, and reproduction costs.
- (4) Special items include environmental review and documentation, coastal commission process fees, plan check fees, peer reviews, and specialty consultants reviews (seismic, ADA, enhanced commissioning).

SUMMARY OF ALTERNATIVES CONSIDERED

The campus investigated the following alternatives to meet the program needs of the Division of Biological Sciences and the Chemistry and Biochemistry Department.

Reassign Existing Space on Campus

The campus as a whole is experiencing severe space inadequacies in all functional areas: general academic campus, School of Medicine, Scripps Institution of Oceanography, and administrative and support units. Even if space were available for reassignment, the Division of Biological Sciences and the Chemistry/Biochemistry Department require wet laboratory teaching and research laboratory space that cannot be easily or cost-effectively converted from other types of space.

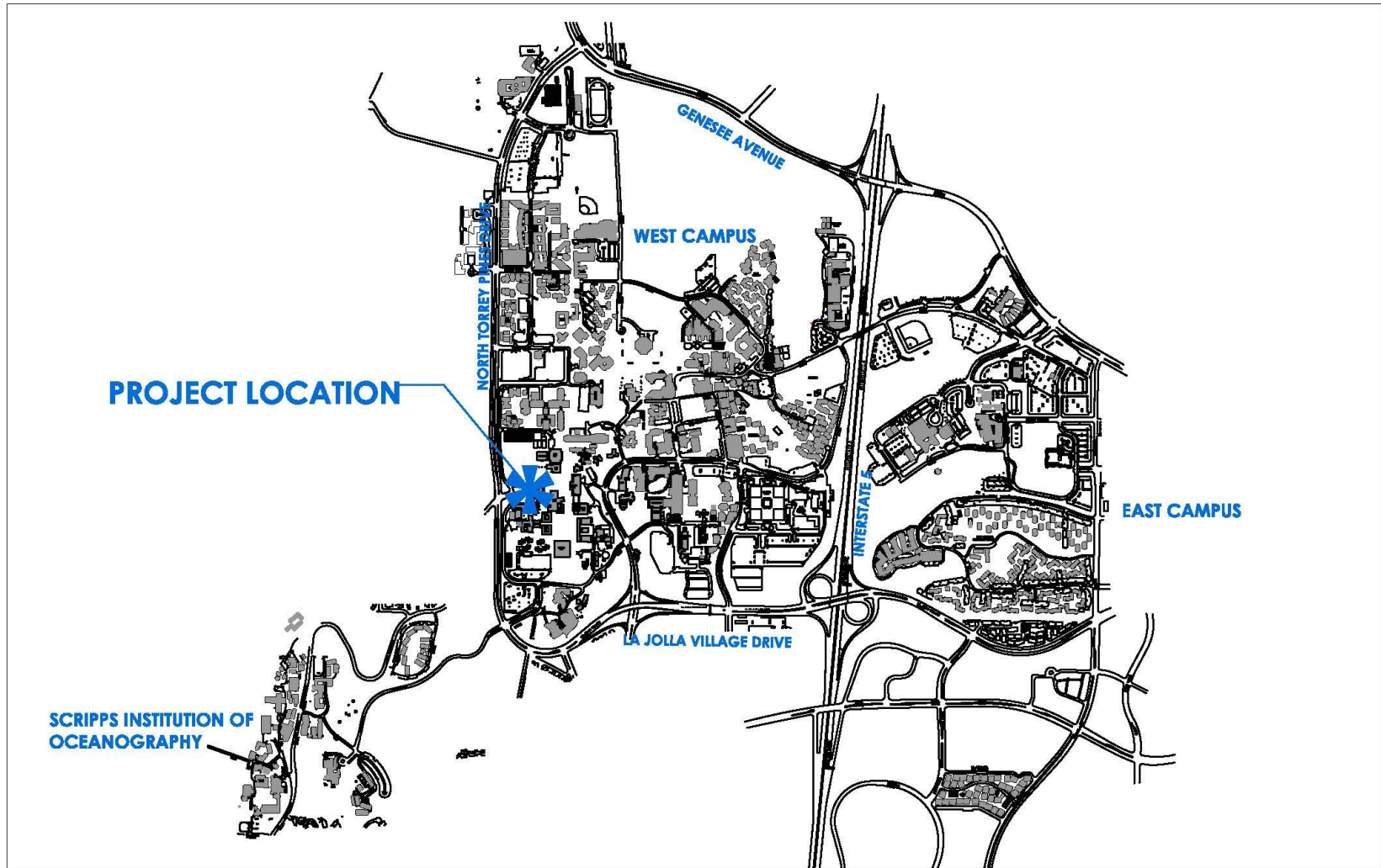
The campus continues to take steps to improve and maximize the utilization of existing facilities. These steps include renewal of existing instructional and research spaces to modernize building systems and improve efficiencies. For example, a renewal project in York Hall will result in additional seats in teaching laboratories for courses in Division of Biological Sciences and Chemistry/Biochemistry Department; also, an entire floor of the Muir Biology Building is being renovated to improve building systems, modernize research laboratory space, and increase the number of faculty that can be supported in the space. Even with continued improvements similar to these examples, net new space still remains critical for instruction and research on the campus.

Build a Building of Smaller Size

The space program proposed for the new project reflects the most critical needs of the Division of Biological Sciences and Chemistry/Biochemistry Department to support instruction and research growth through this decade. Constructing a smaller facility would continue to disadvantage the expanding instruction and research programs, leading to restrictions on available course offerings and associated hands-on learning opportunities for students. In addition, construction of small additions to multiple existing buildings could be done to accommodate the required square footage; however, this would increase the total project cost significantly and cause increased disruption to classroom and research activity in those buildings.

DELIVERY MODEL

The campus intends to hire a Construction Manager/General Contractor (CM/GC) for the project during the design phase to perform basic pre-construction services and is considering further CM/GC services for managing cost risks, such as design-assist and/or design-build with key major trades and use of a Guaranteed Maximum Price contract amendment.



NORTH



CREATED ON 6-17-09
UCSD PHYSICAL PLANNING DEPARTMENT

Biological and Physical Sciences Building
EXHIBIT 1 -Project Location Plan
UNIVERSITY OF CALIFORNIA, SAN DIEGO