

**Office of the President**

**TO MEMBERS OF THE COMMITTEE ON GROUNDS AND BUILDINGS:**

**ACTION ITEM**

*For Meeting of September 15, 2015*

**APPROVAL OF PRELIMINARY PLANS FUNDING, MULTIDISCIPLINARY RESEARCH BUILDING 1, RIVERSIDE CAMPUS**

**EXECUTIVE SUMMARY**

Multidisciplinary Research Building 1 will provide wet and dry research laboratories, core laboratory support facilities, a vivarium, and space for faculty and academic support at the University of California, Riverside. The project is envisioned to encompass 130,000 to 150,000 gross square feet (gsf), and will host multiple scientific disciplines engaged in collaborative research. The building site is within the academic core in an area adjacent to existing research and instruction facilities. Expanding research laboratory space will reduce existing space deficits and is integral to the campus's strategy for strengthening both research and teaching capabilities, including an ambitious plan to add 300 faculty by 2020.

The preliminary estimate for the project, which would include the cost of building construction, site improvements, infrastructure, and financing, is \$150 million to be funded from external financing. The estimate is derived from a review of comparable public and private academic projects as well as corporate research projects.

The campus requests Regents' approval of preliminary plans funding in the amount of \$6.89 million, to be funded from Facilities and Administrative Indirect Cost Recovery, and other discretionary campus sources. These funds would enable the campus to complete a Design-Build procurement package. The funding for preliminary plans would support work such as: development of detailed project program and performance criteria, site surveys, and detailed cost analysis and preparation of environmental analyses pursuant to the California Environmental Quality Act (CEQA).

In July 2015, the Regents heard the Discussion Item for this project. During that meeting, the Regents inquired about the estimated project cost and cost-per-square foot. Information pertaining to the estimated project cost is described in this item below. Approval of full budget and the external financing, as well as design and CEQA approval, will be requested at a future meeting. The full budget request will also seek reimbursement of campus funds from external financing used for preliminary plans.

## RECOMMENDATION

The President of the University recommends that the Committee on Grounds and Buildings recommend to the Regents that the 2015-16 Budget for Capital Improvements be amended to include the following project:

Riverside: Multidisciplinary Research Building 1 – preliminary plans – \$6.89 million to be funded from campus funds.

## BACKGROUND

The Riverside campus is proposing a new building that will provide research and office space, scholarly and interactive space, research cores, vivaria, and related support areas. Laboratories will be designed to Biosafety Level 2 to allow for a more diverse and sophisticated scope of research. The project is envisioned to be multidisciplinary to foster collaboration among researchers and to promote academic excellence. The building will be flexible and adaptable to accommodate emerging research demands over the next several decades. The campus is committed to designing the building to the highest feasible Leadership in Energy and Environmental Design standard, in order to advance the President's goal of achieving carbon neutrality by 2025. The need for this new building is attributed to the following:

### *High Student-to-Faculty Ratios*

University of California Riverside's (UCR) teaching and research mission to provide quality instruction is hindered by one of the highest student-to-faculty ratios in the UC system (29:1 based on ladder-rank faculty), thus diminishing the undergraduate and graduate student experience. As both undergraduate and graduate enrollments rise, the student-to-faculty ratio will increase dramatically without additional faculty. The campus' goal of adding 300 faculty by fall 2020, with an emphasis on the physical and natural sciences, requires investment in contemporary research facilities.

### *New Strategic Science Initiatives*

The campus recently completed a robust faculty-led process that identified areas for strategic investment. This process led to the adoption of research cluster hiring proposals focused on priority areas for interdisciplinary research identified in the strategic plan, *UCR 2020: The Path to Preeminence*. Areas of study span all colleges and departments, and involve investigators across campus from colleges and schools such as Bourns College of Engineering, College of Natural and Agricultural Sciences, School of Medicine, School of Public Policy, and College of Humanities, Arts and Social Sciences. Examples of research clusters include: biomedical informatics, neurosciences, systems biology, pathophysiology, and aging and life span. While the campus has developed a strategy for renovation of existing research facilities, leased space, and increased efficiency of existing space, accommodation of these research initiatives requires additional, flexible research space suited to multidisciplinary research.

*Lack of Flexible Research Space*

UC Riverside has 24 research buildings, of which nearly one-third range in age from 41 to 84 years. Approximately 80 percent of this space consists of enclosed laboratories, as opposed to a more contemporary open bay configuration. The enclosed laboratories limit the size of research teams; each laboratory typically accommodates a single research team, and so inherently limits opportunities for cross-disciplinary collaboration. Enclosed laboratories are typically more costly to adapt to the evolving technical demands of contemporary multidisciplinary research than are the open bays proposed in the Multidisciplinary Research Building (MRB1).

A contemporary open laboratory configuration enables the integration of multidisciplinary research teams of varying sizes to co-locate, thus fostering collaboration within commonly focused scientific “neighborhoods.” For example, UCR scientists across disciplines are funded by the National Science Foundation and National Institutes of Health in research to stop the spread of malaria, which causes one million deaths annually. To this end, chemists are looking at disruption of pheromones, geneticists are exploring the mosquito genome, biomedical researchers are looking at human health impacts, and entomologists are developing a wearable patch that would make humans in effect invisible to mosquitoes.

**PROJECT DESCRIPTION**

The proposed building is anticipated to provide 78,000 to 90,000 assignable square feet (asf), 130,000 to 150,000 gross square feet (gsf). During the development of the project performance requirements, the campus will maximize the gross and assignable space in the facility. The space program will incorporate the following types of spaces:

- Wet, dry, and computational laboratories and research offices. The wet research laboratories will be designed as Biosafety Level 2.
- Core laboratory support facilities that will accommodate shared equipment to be distributed throughout the building to address specific research support requirements.
- Support facilities include a barrier vivarium that contains animal holding areas, procedure rooms, and related vivarium support spaces.
- Collaborative space for scholarly activity and conference rooms to accommodate faculty, professional researchers, graduate students, postdoctoral scholars, and administrative support.

**Table 1: Program Ranges - Assignable Square Feet**

Description	ASF Range	
	Low	High
Laboratories, Laboratory Support, Research Offices	49,900	to 57,600
Core Laboratories,	8,600	to 9,900
Vivarium	9,400	to 10,800
Conference, Collaboration, Building Support	10,100	to 11,700
Total	78,000	90,000

During the planning process, the campus will develop facility requirements based upon best practices in order to create flexible research spaces that support biology and chemistry as noted above. Assignment of specific researchers and programs will be guided by research cluster proposals.

#### *Location*

The building will be located north of the Materials Sciences and Engineering Building on North Campus Drive. The proposed use of the site complies with the UCR 2005 Long Range Development Plan Amendment 2 (2011), which currently designates the site for academic land uses.

#### **Approval Request and Schedule**

The requested Preliminary Plans funding of \$6.89 million would enable the campus to engage a Master Architect and clearly define and document the project program and performance criteria, including cost metrics. The product of this effort will be the basis for selecting a Design-Build team through Best-Value to execute final design and construction. The delivery strategy is intended to minimize time-to-completion while maximizing value received in terms of program capacity and life-cycle performance of the facility.

The campus intends to submit the project for full budget, financing, CEQA and design approval in spring 2016. Construction would commence in fall 2016, with anticipated completion before the end of 2018.

#### **Cost Data and Funding Plan**

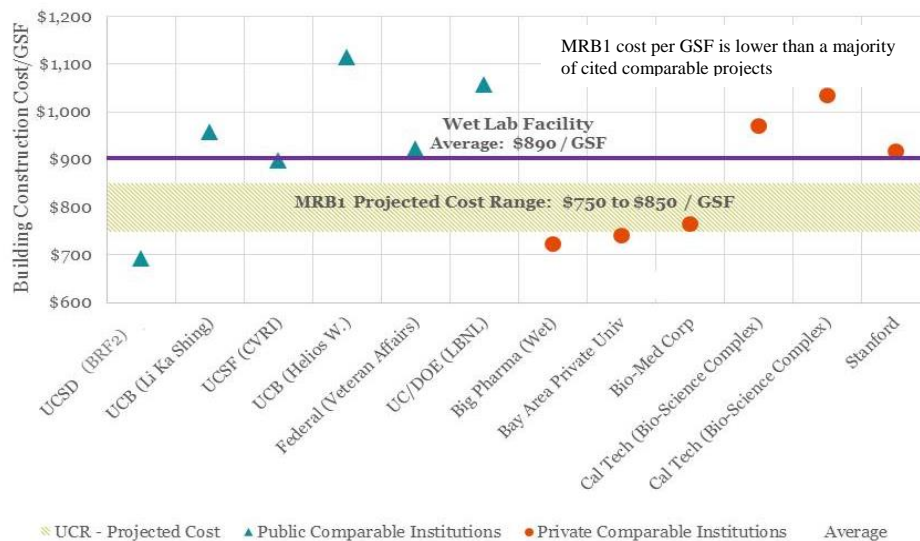
The campus has determined that a maximum project budget of \$150 million is appropriate for MRB1 in the context of the broader capital investment program. During the first ten years of payment, commencing in 2020, the campus will be paying interest only, at \$9 million annually. Interest only is utilized in order to be able to develop the repayment source from Administrative Indirect Cost Recovery Funds (ICR) in the subsequent years. Interest costs during the remainder of the term would be \$13.1 million annually. The project is intended to be funded using external financing. Debt would be serviced from Facilities and ICR, which is conservatively projected to grow at a rate of eight to 11 percent per year through 2025. The campus will be able to pay the debt service based on the incremental growth of ICR alone, which is projected to grow from

\$18 million to \$28 million by 2020. With no other claims on ICR, the campus would be able to afford the debt service on the building even in the unlikely event that the ICR failed to grow. A detailed schedule of fund sources will be provided when the project is brought to the Regents for full budget approval.

A preliminary cost model based on recently completed comparable laboratory buildings in the UC system indicates that an appropriate cost per gsf is \$964 - \$1,113 for project cost<sup>1</sup> and \$750-\$850 for building cost.<sup>2</sup> The cost model will be tested and refined as detailed building performance criteria are developed in collaboration with research stakeholders and with the support of the Master Architect.

A probable cost of construction analysis was completed by an outside cost estimating firm to identify a reasonable construction cost per gsf for planning purposes. UCR staff examined reported construction costs for comparable research building projects in the public and private academic sectors and the corporate “big pharma” and biotech sectors. The results of these analyses are presented in Table 2, Comparable Construction Costs, Public and Private Sector Projects, with this project shown at \$750 - \$850 per gsf. Please note that these are for building costs.

**Table 2: Comparable Construction Cost, Public and Private Sector Projects**



\*UCSD – Recession 2008

<sup>1</sup> “Project Cost” includes the Building Cost, Site Clearance/Development, Exterior Utilities, and Soft Costs. This cost excludes the cost of Moveable Equipment.

<sup>2</sup> “Building Cost” includes the cost of normal building construction work and site costs within five feet of the building. This cost does not include the cost of Site Clearance/Development, site utility work starting five feet from the outside perimeter of the building (“Exterior Utilities”), Moveable Equipment, or “Soft Costs”.

In parallel with the analysis of comparable projects, the campus developed a construction cost model based on program assumptions and the selected MRB1 site. The model assumes a 150,000 gsf, five-story structure and architectural expression consistent with the UCR Physical Design Framework. The proposed program used in the model includes wet and dry research laboratories, vivarium, academic support spaces, meeting rooms, computing, entry lobby and building operations space. Anticipated site development would integrate the building into the campus environs, while responding to sustainability and climate-appropriate criteria. The model indicates that for planning purposes, a building cost range of \$750 - \$850 per gsf is appropriate.

**Key to Acronyms**

ASF	Assignable Square Feet
CEQA	California Environmental Quality Act
CM@R	Construction Manager at Risk
GSF	Gross Square Feet
ICR	Indirect Cost Recovery Funds
MRB1	Multidisciplinary Research Building 1
P3	Public-Private Partnership
UCR	University of California Riverside

**ATTACHMENTS:**

- Attachment 1: Preliminary Plans Budget
- Attachment 2: Alternatives Analysis
- Attachment 3: Delivery Model
- Attachment 4: Project Location

## PRELIMINARY PLANS BUDGET

Cost Category	Amount
Master Architect Fees <sup>1</sup>	\$1,784,000
Design Build Fees <sup>2</sup>	\$2,000,000
Campus Administration <sup>3</sup>	\$429,000
Surveys, Tests, Plans, and Specifications <sup>4</sup>	\$92,000
Special Items <sup>5</sup>	\$2,585,000
Total Preliminary Plans Budget	\$6,890,000

The preliminary plans budget activities involve the following.

- Retain architectural services to establish overall baseline project performance requirements in terms of qualitative and quantitative measures. These criteria will be provided to the subsequently procured Design-Build team.
- Complete a multi-step process to select the design-build team to attract and select the most competent teams. Pre-qualified teams will be invited to submit a preliminary design scheme responding to project performance criteria and concurrently submit a cost proposal. Selection will be completed through a competitive Best-Value process where the value is a function of proposed total cost against design quality, scope optimization, and added value by the Design-Build team.
- Accomplish planning and design activities to generate information required to obtain necessary approvals and adoption of environmental documentation.

### Notes:

- 1) Architectural design services to establish Performance Criteria for Design/Build Competition.
- 2) Design services provided by Design-Build entity through Design Development
- 3) Campus Project Management and Contract Administration
- 4) Site surveys
- 5) Special Items includes environmental review and documentation, specialty consultants and Design-Build competition stipends

## ALTERNATIVES ANALYSIS

The building program is driven by the need to accommodate new and emerging research programs for new faculty which will improve the ratio of students-to-faculty, and enhance student engagement and experience. Three options were analyzed in detail in the Business Case Analysis and are summarized below.

### Option A – Provide 130,000 - 150,000 gsf of Off-Campus Leased Space

UC Riverside investigated the potential of leasing wet laboratory space within 40 miles of campus and found none. Facilities outside the Riverside area do not provide the environment to support academic and research programs, and leasing space is not considered a feasible alternative.

### Option B – Renovate 130,000 - 150,000 gsf On-Campus

Ongoing renovation projects are in design or construction on campus to address a portion of the need for quality wet and dry laboratory space. The option to renovate space, however, does not provide any new research space and could not provide enough space to accommodate 300 new faculty.

### Option C – Construct 130,000 - 150,000 gsf of New Space On-Campus

New construction provides new research space within the campus academic core to support faculty hires and promote collaborative and multidisciplinary work as part of an active academic community. A higher federal indirect cost recovery rate will be available to campus with this alternative. The campus would retain the asset. Construction of modern research space in a new facility provides long-term flexibility for program use and adaptive reuse.

### Conclusion

UC Riverside cannot lease modern wet laboratory space within 40 miles of the campus. Current renovation projects provide some relief but do not provide net new research space. New construction (Option C) is viewed as the preferred alternative to meet research laboratory space requirements and to invest in UCR's future.



## DELIVERY MODEL

The selected construction delivery model for MRB1 project is Design-Build.

The campus evaluated three delivery models for the Multidisciplinary Research Building 1 (MRB1): Construction Manager at Risk (CM@R); Design-Build (DB); and a public-private partnership (P3). The salient drivers in the evaluation were (1) most expeditious time-to-occupancy, reflecting the importance of meeting the rapid expansion of research programs associated with faculty expansion in the relevant disciplines, and (2) optimal design and construction risk allocation. The following summarizes the evaluation findings.

### Public-Private Partnership

UC Riverside is considering the application of a P3 approach to deliver a range of potential projects. However, the goals of the MRB1 project do not lend themselves to the P3 model. Primary factors weighted against the selection of P3.

- The pursuit of a public-private partnership and the likely duration of the selection, negotiation, and agreement phases of development would almost certainly not deliver the mission-critical facility within an acceptable and predictable time frame.
- There is no identified market in the region for the at-risk participation of a private entity in the development of core academic research facilities.
- MRB1's technical performance requirements and its central campus location present potential complications that are appropriately addressed by direct University management of design and construction.

### Construction Manager at Risk

CM@R is certainly a viable delivery approach for facilities such as MRB1; there are abundant successful examples in the UC system and beyond. However, CM@R is typically less advantageous in terms of overall time-to-occupancy than Design-Build and does not offer the value-optimization potential that is characteristic of the Design-Build model. Furthermore, CM@R does not mitigate the risk inherent in the Owner's exposure to contractor claims based on alleged design deficiencies.

### Design-Build

The Design-Build approach is increasingly the model of choice for development of a range of project types. Public owners have embraced the following inherent potential advantages of well-conceived and effectively managed Design-Build processes. These advantages include:

- The value-optimization and innovation that can be realized by competition among qualified teams in response to the Owner's defined performance criteria; added building square footage, and enhanced operational performance;

- The expeditious time-to-occupancy performance associated with the contractual integration of design and construction;
- The management of risk inherent in the Owner's having a single prime contractual relationship, under which cost and quality risks are largely borne by the design-build entity, and with minimal risk to the Owner arising from design deficiencies.

UC Riverside has pursued and retained professional resources with vast experience in the application of Design-Build to the development and delivery of the most complex facility types, with notable success within the UC system and beyond. The campus project management group will work collaboratively with these professional experts as an integrated team, to ensure that the MRB1 project has the benefit of the best practices of the design and construction industry.

PROJECT LOCATION

