

**PROJECT PLANNING GUIDE AMENDMENT**

**ENGINEERING BUILDING**

**(971020)**

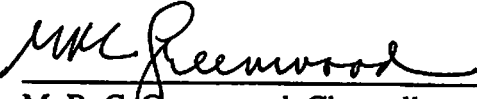
**October 2001**

**Engineering Building**  
**Project Planning Guide Amendment**  
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**APPROVAL OF PROJECT PLANNING GUIDE AMENDMENT:**

October 31, 2001  
Date

  
\_\_\_\_\_  
M. R. C. Greenwood, Chancellor  
University of California, Santa Cruz

**CAPITAL IMPROVEMENT BUDGET  
BUDGET DATA**

UNIVERSITY OF CALIFORNIA 1

Santa Cruz 2

Campus 3

Engineering Building	971020	CCCI: 4019
		EPI: 2564

Project Title	Campus Reference	Asset No.	Cost Indexes
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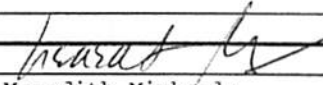
A FUNDING SCHEDULE		Per 20 - 20 C.I.P., dated		Univ. Priority No.	
Totals	Prefunded	2001-2	2002-3	2003-4	2004-5
\$ P 2,666		P 1,992			
W 2,364		P 674 (ab)			
C 51,399		W 1,803	C 39,134		E 2,000
E 5,000		W 561 (ab)	C 9,265 (ab)		E [2,000] G
			C [3,000] (c)		E [1,000] (c)
\$ 61,429 (Tot. Proj.)		5,030	51,399		5,000

B FUNDING REFERENCES				
	Column (1)	(2)	(3)	(4) Total All Sources
Account No. ....				971020
Source .....				

C COSTS					%
0. Site Clearance .....	\$	\$	\$	\$ 1,613,000	2.9
1. Construction .....				41,160,000	72.9
2. Exterior Utilities .....				2,644,000	4.7
4. Site Development .....				1,749,000	3.1
5. Fees .....				3,396,000	6.0
6. A&E/PP&C .....				2,258,000	4.0
7. Surveys, Tests, Plans, Specifications .....	\$	\$	\$	\$ 576,000	1.0
8. Special Items .....				774,000	1.4
SUBTOTAL .....	\$	\$	\$	\$ 54,170,000	96.0
9. Contingency 4.8%				2,259,000	4.0
TOTAL P•W•C .....	\$	\$	\$	\$ 56,429,000	100.0
3. Group 2&3 Equipment .....				5,000,000	
TOTAL PROJECT .....	\$	\$	\$	\$ 61,429,000	
Available Funding .....					
Anticipated Surplus (Deficit) .....	\$	\$	\$	\$	

D FINANCING			
	\$	State Funds	\$44,929,000
		State Cal ISI--QB3 (a)	3,500,000
		State Cal ISI--CITRIS (b)	7,000,000
		Gift Funds--CITRIS Matching Funds (c)	4,000,000
		Gift Funds	2,000,000
		TOTAL	\$61,429,000

E STATUS OF THE PROJECT: Project Planning Guide Amendment

UC	Name: Frank Zwart	Signature: 	Budget No.	3
SC	Title: Assoc Vice Chancellor	Title: VC Meredith Michaels	Issue Date	9/27/00
	Prepared by: Zwart/Owens/Ayraud	Approved for Campus, Date: 9/13/01	Revised	7/31/01
AVP	Program:	Signature:	Revised	10/31/01
PPC	Fiscal:	Title:	Revised	
	Cost:	Approved for AVP-PPB, Date:	Revised	

**CAPITAL IMPROVEMENT BUDGET  
ANALYTICAL DATA**

**UNIVERSITY OF CALIFORNIA** 1  
Santa Cruz 2  
Campus 3

Engineering Building	971020		CCCI: 4019
			EPI: 2564
Project Title	Campus Reference	Asset No.	Cost Indexes

**F ANALYTICAL DATA**

	Column (1)	(2)	(3)	(4) Total All Sources
R ASF per 9/27/00 PPG .....	ASF	ASF	ASF	69,110 ASF
E ASF Current .....	ASF	ASF	ASF	90,330 ASF
A OGSF Current .....	OGSF	OGSF	OGSF	150,000 OGSF
S Ratio (Current ASF/OGSF) .....	to 1.00	to 1.00	to 1.00	0.60 to 1.00
U c Construction Cost per ASF .....	\$ /ASF	\$ /ASF	\$ /ASF	\$ 455.66 /ASF
N O Construction Cost per OGSF .....	\$ /OGSF	\$ /OGSF	\$ /OGSF	\$ 274.40 /OGSF
I S Total PWC Cost per ASF .....	\$ /ASF	\$ /ASF	\$ /ASF	\$ 624.70 /ASF
T T Total PWC Cost per OGSF .....	\$ /OGSF	\$ /OGSF	\$ /OGSF	\$ 376.19 /OGSF
s Gr. 2&3 Equip Cost per ASF .....	\$ /ASF	\$ /ASF	\$ /ASF	\$ 55.35 /ASF

**G CONSTRUCTION COST ANALYSIS**

	Costs	Unit Costs		%	Remarks
		\$/ASF	\$/OGSF		
•••Concrete & Structure .....	\$				
•••Closing-in .....					
•••Finishing .....					
•••Group 1 Equipment .....					
a. SUBTOTAL-Gen. Constr. ....	\$				
b. HVAC .....					
c. Plumbing .....					
d. Electrical .....					
e. Elevators .....					
f. Other .....					<- Identify:
TOTAL BUILDING COST ONLY .....	\$			100.0	
g. Additional Bldg. Costs .....					<- Identify:
TOTAL BUILDING ADDITIONAL COSTS .....	\$				
h. Other Construction .....					<- Identify:
i. Other Construction .....					<- Identify:
TOTAL CONSTRUCTION COST .....	\$				<- Same as Schedule C, Item 1 (line 24), Page 1

**H NOTES:**

C.8 Special Items			
Environmental Impact Report	\$	220,000	
Air quality analysis		32,000	
Agency reviews		27,000	
Communications & geology consultants		73,000	
Value Engineering (3 sessions)		300,000	
& constructibility review			
Independent seismic review		32,000	
Detailed planning		90,000	
	\$	774,000	
			Budget No. 3
			Issue Date 9/27/00
			Revised 7/31/01
			Revised 10/31/01
			Revised
			Revised

Prepared by:

## Engineering Building

### PROJECT PLANNING GUIDE AMENDMENT

The approved Project Planning Guide (PPG) for the *Engineering Building*, dated September 27, 2000, outlines the need for approximately 69,000 assignable square feet (ASF) of engineering, economics, and general assignment classroom space in a new 115,000 outside gross square feet (OGSF) building on the Santa Cruz campus. Funding was provided in the 2001 Budget Act for preparation of preliminary plans and working drawings for the project. The Santa Cruz campus is also a key member of two of the new California Institutes for Science and Innovation selected for implementation by the Governor—the Institute for Bioengineering, Biotechnology and Quantitative Biomedical Research (QB3) and the Center for Information Technology Research in the Interest of Society (CITRIS). The Santa Cruz portions of the two institutes are closely related to School of Engineering programs and their facilities would be most effective if included in the *Engineering Building* project. The University therefore proposes to amend the project as originally approved to include the additional facilities authorized for these two institutes.

This PPG Amendment identifies the changes in the *Engineering Building* project scope and budget necessary to add approximately 6,000 ASF of specialized laboratory and support space for the QB3 Institute and approximately 15,000 ASF for CITRIS. With these additions, the resulting scope of the Engineering Building will total approximately 90,000 ASF (150,000 OGSF).

#### Introduction

The central facilities and headquarters of the QB3 Institute will be at UC San Francisco, with major research components at UC Berkeley and UC Santa Cruz. CITRIS will be centered at UC Berkeley with major components at UC Davis, UC Merced, and UC Santa Cruz.

QB3 promises to lead the next revolution in biomedical research. The Institute will integrate physical, mathematical, and engineering sciences to create new techniques for attacking biological problems that, in the past, were unapproachable. The integration of sciences could open the way for the discovery of treatments and cures for some of society's most intractable diseases, such as brain disorders, cancer, and diabetes. The Institute will also foster the development of artificial tissues that mimic those found in the human body. These developments will be used to make replacement blood vessels, bone implants, and synthetic replacement organs. Better imaging techniques and computer-assisted analysis developed at the Institute will improve the detection and treatment of diseases.

The Santa Cruz campus contribution to the work of QB3 will focus on bioinformatics—

computing methods used to sift through volumes of data generated by the human genome project and other new developments in biomedical research. Bioinformatics includes techniques that may allow scientists to do experiments on computers rather than in the lab.

CITRIS will design Information Technology (IT) solutions to large-scale social and commercial problems affecting the quality of life of individuals and organizations. CITRIS researchers will provide a common design for Societal-scale Information Systems (SIS) for Smart Classrooms, Smart Buildings, Urban SIS, and Medical Networks. Research at the Santa Cruz campus will focus on the design and engineering of SIS.

To accommodate QB3 and CITRIS, approximately 21,000 ASF will need to be added to the new Engineering Building. QB3 will require approximately 6,000 ASF and CITRIS will require approximately 15,000 ASF.

### Program Description

#### **ENGINEERING BUILDING**

The *Engineering Building* project, as previously approved, will construct a new 69,110 ASF building to provide data-intensive engineering laboratory and office space to support existing and developing teaching and research programs in the School of Engineering; general assignment classrooms to help meet general campus growth needs; and office and research space for the Economics Department. The new building will be adjacent to the existing Baskin Engineering building, which has a large complement of utility-intensive, wet-bench laboratories and will continue to accommodate such uses for at least the near future.

#### **QB3 INSTITUTE**

The QB3 Institute is comprised of three programs: Structural and Chemical Biology, Bioengineering and Biotechnology, and Bioinformatics. The Santa Cruz campus will focus on the Bioinformatics Program. The mission of the Bioinformatics Program is two-fold: 1) to provide the theoretical and computational arm needed by the other two programs of the institute to translate experimental results into predictive models and comprehensive profiles of biological regulation at multiple levels; and 2) to drive critical research projects in the areas of genomics, proteomics, complex systems, and medical discovery informatics. The Bioinformatics Program will thus provide the mathematical and computational matrix that will unify the three programs of the Institute.

Large-scale genome sequencing, more facile protein structure determination, and the development of high-throughput methods of biological screening have revolutionized biomedical research. The ability to use the vast amount of data that is generated depends completely on the application of bioinformatics, which applies information technology to

large bodies of biological data, devises algorithms for extracting information about the expression, structure and function of biomolecules, and provides computational methods for generating predictive models. The Bioinformatics Program will provide the expertise needed to interpret experimental results and translate them into formats that can be understood and utilized by other researchers and physicians, thus inventing a common language to facilitate the transition between the acquisition of data and its application to further research and medicine.

In the area of genomics, a primary goal of the Bioinformatics Program will be to develop and apply new methods of extracting information from DNA sequence and expression data to enable discoveries in gene function in individual cells, in groups of cells communicating with each other, and in the whole organism.

In the area of proteomics, the Bioinformatics Program will take a variety of approaches to decipher the roles that proteins play in orchestrating the functions of the cell and whole organism in health and disease. Complex systems research of the Bioinformatics Program will include strategies to model the behaviors of large supramolecular complexes, and metabolic and genetic pathways, including those involved in disease generation and evolution. The Bioinformatics Program will also contribute to medical discovery by correlating genetic data with clinical data and generating computational models of underlying systems that will facilitate diagnoses and treatments.

## **CITRIS INSTITUTE**

From business systems and social and political infrastructure, to the many aspects of personal life, Information Technology (IT) is transforming all aspects of society at an accelerating pace. However, the current path for developing IT will, at best, severely underutilize its potential and, at worst, yield a fragile and disaster-prone IT infrastructure that not only would be unable to meet market demands but would at the same time leave much of the general population behind. Many of society's most vital needs, such as transportation, health care, education, and emergency preparedness, do not receive adequate attention in the IT community.

CITRIS will sponsor and house collaborative, IT-focused research to find solutions to large-scale social and commercial problems affecting the quality of life of individuals and organizations. The CITRIS research plan is designed to evolve over time, engaging and rewarding collaboration among researchers and industrial partners from many disciplines in engineering and the natural and social sciences.

Driving the core technological research and development in CITRIS are problems that have a major impact on the economy, quality of life, and future success of California: education; saving lives, property, and productivity in the wake of disasters; boosting transportation efficiency; advancing diagnosis and treatment of disease; and expanding business growth through powerful personalized information services. Solutions to these

problems have a common IT feature: at their core, they depend on highly distributed, reliable, and secure information systems that can evolve and adapt to radical changes in their environment, delivering information services that adapt to the people and organizations that need them. These systems are referred to as Societal-scale Information Systems.

No current system satisfies these needs. However, CITRIS is developing systems that will. CITRIS researchers at UCB have already demonstrated how the use of "Smart Dust" sensors in buildings may be able to help resolve one of California's current societal problems, the state's energy crisis. In a test in May 2001, these \$100, matchbook-sized sensors monitored electricity usage in Berkeley's Cory Hall and helped to reduce energy consumption by 10% for the period of the test.

While sensor networks are not new, the technology that is used today is very large, expensive, and unwieldy and difficult to deploy. Under CITRIS, sensors may soon be the size of a penny and cost less than a dollar each. These wireless sensors will communicate with each other automatically, and form a network that would control conditions in a room or building. Under CITRIS, the same "Smart Sensor" technology will be designed to monitor all sorts of environmental conditions including traffic congestion, air pollution, and magnetic fields, and even monitor the pulse, blood pressure, or movements of elderly people.

### Project Description

The best opportunities for the accommodation of the QB3 and CITRIS institutes on the Santa Cruz campus will be to take advantage of capital projects that are already underway and appropriate in terms of location, intended use, and timetables for completion. Approximately 21,000 ASF of research/scholarly activity and support and academic and administrative offices and support will be added to the planned Engineering Building to meet the needs of the institutes.

#### **QB3 INSTITUTE**

The primary work of the principal investigators, postdoctoral scholars, researchers and graduate students involved in the Bioinformatics Program will be to perform computations on large data sets and to communicate the results. Appropriate facilities are required to attain, analyze, and share information relating to the data sets.

Planned space in the Engineering Building will now includes approximately 6,000 ASF of new space to accommodate the growth of the QB3 Institute's operations at Santa Cruz. Slated for completion in 2005, this additional space will house three computational biology research laboratories for graduate students, postdoctoral scholars, and research faculty, a video conference room, and scholarly activity space. It will also house offices



for researchers (5), postdoctoral scholars (5), and technical and administrative staff (5). The space for the QB3 Institute is broken down as follows:

QB3 Space Classification	ASF
<b>Research/scholarly activity and support</b>	
3 computational biology research laboratories	2,600
Scholarly activity space	350
5 research offices @135 asf	675
Videoconference room	900
<b>Research/scholarly activity and support total</b>	<b>4,525</b>
<b>Academic and administrative offices and support</b>	
5 postdoctoral scholar offices @135 asf	675
Institute Director and 4 administrative and technical staff offices with reception area	785
Mail/workroom	100
<b>Academic and administrative offices and support total</b>	<b>1,560</b>
<b>Total QB3 space</b>	<b>6,085</b>

**CITRIS INSTITUTE**

Research under CITRIS at UC Santa Cruz will address areas of: design and engineering of Societal-scale Information Systems (SIS), including issues of databases and network attached storage, communications and networks; integrated microsystems, with emphasis at UC Santa Cruz on optical electronics, packaging and sensor electronics; and human-centered computing, with emphasis on user-interfaces to complex systems and large databases; smart learning environments, including support for distributed learners and workers via telecollaboration; environmental monitoring, including real-time sensor networks and databases; algorithms and techniques for SIS; and use of SIS in education.

Construction in the planned Engineering Building will create approximately 15,000 ASF of new space for ten specialized research laboratories, an eleventh, large research laboratory (“Simularium”) for experimenting with technology and teaching techniques, a machine/instrument room, a video conference/telecollaboration room, a conference room, two scholarly activity rooms, and a central interactive space. In addition, office space will be required to house 18 researchers, six technical staff, and five administrative staff

who will be associated with the CITRIS project. The space for CITRIS is broken down as shown below:

CITRIS Space Classification	ASF
<b>Research/scholarly activity and support</b>	
10 specialized research laboratories	6,000
18 research offices @135 asf	2,430
Simularium research laboratory	2,000
Videoconference/telecollaboration room	600
2 scholarly activity rooms @250 asf	500
Central interactive space	600
Machine/instrument room	550
Mail/copy room	120
<b>Research/scholarly activity and support total</b>	<b>12,800</b>
<b>Administrative offices and support</b>	
Institute Director and 9 administrative and technical staff offices with reception area and supply/workroom	1,535
Conference room	800
<b>Administrative offices and support total</b>	<b>2,335</b>
<b>Total CITRIS space</b>	<b>15,135</b>

### Summary

The original *Engineering Building* project included approximately 69,000 asf of space for engineering (48,000 asf), economics (15,000 asf), and general assignment classrooms (6,000 asf). Engineering space included 69 faculty offices and 69 data-intensive research laboratories, as well as associated support spaces: conference rooms, faculty services spaces, an interactive space, and a central computer room. Economics space included 45 academic offices, eleven research offices, two research laboratories, a department office, a conference room, and faculty services space. Three general assignment classrooms were also included in the original project (one at 200 stations and two at 50 stations each).

With the addition of space for the QB3 Institute (approximately 6,000 asf) and the CITRIS Institute (approximately 15,000 asf), the total amended project scope for the *Engineering Building* is now approximately 90,000 asf. The cost per square foot of the institute space is slightly higher than the cost per square foot of the original building space due to videoconferencing and distance education requirements; a greater density of electrical power to support intensive computing; additional air conditioning to offset the

heat generated by the denser computing equipment; and emergency power generation.

The following summarizes ASF by space category for the expanded Engineering Building (including the space to be added for QB3 and CITRIS).

<b>Engineering Building Summary of ASF by Space Category</b>				
<b>Space Category</b>	<b>Engineering Original</b>	<b>QB3</b>	<b>CITRIS</b>	<b>Total</b>
	<b>ASF</b>	<b>ASF</b>	<b>ASF</b>	<b>ASF</b>
Research/scholarly activity	43,590	4,525	12,800	60,915
Academic and administrative offices and support	19,520	1,560	2,335	23,415
General assignment classrooms	6,000			6,000
<b>Total ASF</b>	<b>69,110</b>	<b>6,085</b>	<b>15,135</b>	<b>90,330</b>

**Cost Basis**

The campus has conducted cost analyses and has prepared a detailed cost estimate. As the design now underway progresses, cost information will be refined.

# PROJECT SCHEDULE

University of California, Santa Cruz

Project: Engineering Building

Account No: 971020

Date: 9/14/01

Activity	No. of Months	Fiscal Year																																																											
		July 2001-2												July 2002-3												July 2003-4												July 2004-5												July 2005-6											
		J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J												
Preliminary Plans	12	[Shaded]																																																											
SPWB review	2																																																												
Working drawings	5																																																												
Agency review	2																																																												
DOF review	1																																																												
Bid/award contract	3																																																												
Construction	26																																																												
Equipment	15																																																												
Cumulative calendar months	(51)	Approved: <u>Frank Zwart</u> Title: Frank Zwart, Associate Vice Chancellor <span style="margin-left: 200px;"> <u>Fran Owens</u>              Fran Owens, Director           </span>																																																											

Campus or Field Station Santa Cruz

Project Account 971020

Project Title Engineering Building

For purposes of compliance with the California Environmental Quality Act of 1970 (CEQA), and Amended University of California Procedures for Implementation of CEQA, this project has been reviewed and initially classified as indicated below. Please check (X) as appropriate. Include project description and appropriate local map.

     I. EXEMPT FROM THE CALIFORNIA ENVIRONMENTAL QUALITY ACT

When it can be seen with certainty that there is no possibility the action will result in physical changes to the environment or the action is specifically exempted by statute, the project is classified as exempt from CEQA.

     II. CATEGORICALLY EXEMPT

This project falls under the indicated Class of Exemption and there is no significant effect on the environment.

- |   |   |
|---|---|
| <u>    </u> Class 1: Existing Facilities                            | <u>    </u> Class 17: Open Space Contracts                                  |
| <u>    </u> Class 2: Replacement or Reconstruction                  | <u>    </u> Class 18: Designation of Wilderness Areas                       |
| <u>    </u> Class 3: New Construction of Small Structures           | <u>    </u> Class 19: Annexation of Existing Facilities and Lots            |
| <u>    </u> Class 4: Minor Alterations to Land                      | <u>    </u> Class 20: Changes in Organization of Local Agencies             |
| <u>    </u> Class 5: Alterations in Land Use Limitations            | <u>    </u> Class 21: Regulatory Enforcement Actions                        |
| <u>    </u> Class 6: Information Collection                         | <u>    </u> Class 22: Educational Programs                                  |
| <u>    </u> Class 7: Regulatory Protection of Natural Resources     | <u>    </u> Class 23: Normal Operations                                     |
| <u>    </u> Class 8: Regulatory Protection of the Environment       | <u>    </u> Class 24: Regulations of Working Conditions                     |
| <u>    </u> Class 9: Inspection                                     | <u>    </u> Class 25: Transfer of Ownership of Land to Preserve Open Space  |
| <u>    </u> Class 10: Loans   | <u>    </u> Class 26: Acquisition of Housing for Housing Assistance         |
| <u>    </u> Class 11: Accessory Structures                          | <u>    </u> Class 27: Leasing New Facilities                                |
| <u>    </u> Class 12: Surplus Government Property Sales             | <u>    </u> Class 28: Small Hydroelectric Projects                          |
| <u>    </u> Class 13: Acquisition for Conservation                  | <u>    </u> Class 29: Cogeneration Projects                                 |
| <u>    </u> Class 14: Minor Additions to Schools                    | <u>    </u> Class 30: Minor Actions to Prevent Hazardous Substances Release |
| <u>    </u> Class 15: Minor Land Divisions                          | <u>    </u> Class 31: Historic Resource Restoration/Rehabilitation          |
| <u>    </u> Class 16: Transfer of Ownership of Land to Create Parks | <u>    </u> Class 32: In-fill Development Projects                          |

     III. INITIAL STUDY

This project is not Exempt from CEQA or Categorically Exempt; an Initial Study is to be prepared to determine if the project may have a significant effect on the environment that has not been substantially and adequately analyzed in a certified program EIR.

Checklist      Narrative     

  X   IV. ENVIRONMENTAL IMPACT REPORT (EIR)

It is known that the project will have a significant effect on the environment and has not been adequately and substantially analyzed in a certified program EIR.

PROJECT DESCRIPTION

The proposed project is the construction of an Engineering Building on the north UCSC campus. The project would provide approximately 90,000 assignable square feet (asf) of space (approximately 150,000 outside gross square feet) to house School of Engineering programs (approximately 48,000 asf); Economics programs (approximately 15,000 asf); Institute for Bioengineering, Biotechnology, and Quantitative Biomedical Research programs (approximately 6,000 asf); Center for Information Technology Research in the Interest of Society programs (approximately 15,000 asf); and general assignment classrooms (approximately 6,000 asf). Facilities to support teaching and research in the programs identified above would include data-intensive research laboratories, academic offices, administrative offices, and other support space. The building would be constructed adjacent to the existing Applied Sciences Building (now called the Baskin Engineering Building).

V. Does this project conform to the approved LRDP?   X   YES      NO      NOT APPLICABLE

VI.   A. Bertken     10/9/01     Thomas Vani     10.12.01    
Prepared by Date Local Approved by Date

VII. OFFICE OF THE PRESIDENT COMMENTS  
     Concur with Classification  
     Do not Concur

Signed \_\_\_\_\_ Date \_\_\_\_\_