

Office of the President

TO MEMBERS OF THE COMMITTEE ON GROUNDS AND BUILDINGS:

For the Meeting of March 15, 2011

ACTION ITEM

APPROVAL OF THE BUDGET FOR CAPITAL IMPROVEMENTS AND THE CAPITAL IMPROVEMENT PROGRAM, APPROVAL OF EXTERNAL FINANCING, AND AUTHORIZATION TO THE PRESIDENT TO DETERMINE COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT AND APPROVE DESIGN, ELECTRICAL SWITCHING STATION 6, BERKELEY CAMPUS

CAMPUS	Berkeley
PROJECT	Electrical Switching Station 6
PROJECT NUMBER	912399
PROPOSED ACTIONS	<ol style="list-style-type: none"> 1. Approve the project budget of \$15,200,000 2. Approve additional external financing of \$7,600,000 3. Approval of use of \$7,600,000 external financing from the <i>California Memorial Stadium (CMS) Seismic Corrections and West Program Improvements</i> 4. Delegate to the President authority to determine compliance with California Environmental Quality Act (CEQA) and approve design.
PREVIOUS ACTIONS	September 2009: Approval of budget (\$321,000,000) and external financing for <i>California Memorial Stadium (CMS) Seismic Corrections and West Program Improvements</i>
FUTURE ACTIONS	Presidential determination of CEQA compliance and consideration of design approval.
PROJECT SUMMARY	
PROJECT PROGRAM	Construct a new electrical switching station to: <ul style="list-style-type: none"> • Provide full redundancy to campus electrical infrastructure • Provide system capacity for dedicated power delivery to high-demand campus buildings (including Stanley Hall, Sutardja Dai Hall, and California Memorial Stadium).

<p>RELEVANT AUTHORITIES</p>	<ul style="list-style-type: none"> Regents Policy 8102: <i>Policy on Approval of Design, Long Range Development Plans, and the Administration of the California Environmental Quality Act</i> delegates to the Committee on Grounds and Buildings authority to approve design for projects with a total project cost in excess of \$10 million. Policy 8102 also states that a determination of compliance with CEQA is undertaken at the same level as the associated project design approval. The action authorizes the President to make a determination of CEQA compliance and design approval for the Project when such future action is proposed by the campus.
<p>TOTAL PROJECT COST</p>	<p>\$15,200,000</p> <ul style="list-style-type: none"> \$7,600,000 external financing (proposed in this item) \$7,600,000 previously approved external financing
<p>FUNDING SOURCE</p>	<p>External financing</p>
<p>SQUARE FOOTAGE</p>	<p>N/A</p>
<p>UNIT COSTS</p>	<p>N/A</p>
<p>ISSUES</p>	<ul style="list-style-type: none"> This item seeks budget approval of \$15,200,000 and external financing approval of \$7,600,000 -- half of the total project cost. The Berkeley campuswide electrical system does not have full redundancy capability. If Switch Station 1 is out of service, the campus may not have enough capacity to meet peak electrical loads. The Project would provide full system redundancy. A delay in project schedule may make the project vulnerable to weather conditions. Because the Project is particularly susceptible to weather delays, it is critical to meet the currently proposed window for construction start.

RECOMMENDATION

The President recommends that the Committee on Grounds and Buildings recommend to the Regents that:

- A. The 2010-11 Budget for Capital Improvements and the Capital Improvement Program be amended to include the following project:
- Berkeley: Electrical Switching Station 6 – preliminary plans, working drawings, and construction – \$15,200,000 to be funded with external financing.
- B. The President be authorized to obtain external financing not to exceed \$15,200,000 (\$7,600,000 additional external financing, and \$7,600,000 external financing from CMS external financing approval – September 2009) to finance the Electrical Switching Station 6. The Berkeley campus shall satisfy the following requirements:
- (1) Interest only, based on the amount drawn down, shall be paid on the outstanding balance during the construction period.
 - (2) Repayment of debt shall be from the General Revenues of the Berkeley campus and as long as the debt is outstanding, the General Revenues of the Berkeley campus shall be maintained in amounts sufficient to pay the debt service and meet the related requirements of the authorized financing.
 - (3) The general credit of the Regents shall not be pledged.
- C. The President be authorized to determine compliance with the California Environmental Quality Act for the Electrical Switching Station 6.
- D. The President be authorized to approve the design of the Electrical Switching Station 6.
- E. The President be authorized to execute all documents necessary in connection with the above.

ATTACHMENTS:

- Attachment 1: Project Description
- Attachment 2: Project Budget
- Attachment 3: Funding Plan
- Attachment 4: Summary of Financial Feasibility
- Attachment 5: Electrical System Diagram

PROJECT DESCRIPTION

<p>A. CONTEXT AND GOALS</p>

<p>The campus has a total of five switching stations, all interconnected by a double loop. The campus receives 12kV power from the Hill Area Substation, which receives 115kV power from Pacific Gas & Electric (PG&E). The power is fed to the campus through two independent and redundant sets of electrical cables. One set brings power to Switching Station 1 (SS1), while the other brings power to Switching Station 5 (SS5).</p>

<p>An electrical distribution system serving continuous critical research and teaching facilities should have adequate capacity to supply power to meet present and future peak demands and be equipped to provide a redundant power supply in case of an emergency or during times of system maintenance. The campus' existing electrical distribution system presents two challenges: lack of redundancy and limited delivery capacity.</p>

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| <ul style="list-style-type: none"> • Lack of Redundancy. As of spring 2010, the campus peak electrical load was 32 MW; this load is expected to increase to 34.5 MW by summer 2011. SS1 has an effective power capacity of 40 MW and can accommodate the entire peak campus load. SS5 has a much lower capacity, approximately 24 MW, and cannot accommodate the peak campus load if SS1 is out of service. Due to physical space limitations, it is not feasible to expand SS5 with the extra circuit capacity required to provide full redundancy. Redundancy in power supply would allow the performance of periodic system maintenance without loss of service and would maintain electrical service to the campus if service from SS1 is interrupted. The campus has experienced occasional serious power interruptions arising from electrical system component failures. These interruptions have, on some occasions, curtailed teaching and research for a day or longer. Such disruption would have been avoided had the distribution system provided redundancy, as the proposed project would provide. • Limited Delivery Capacity. The extensive and growing research enterprise at UC Berkeley includes several buildings where the nature of the research creates high electrical power demands: Stanley Hall (2006) and Sutardja Dai Hall/CITRIS (2009) are recent examples, as are the Li Ka-Shing Center for Biomedical Science and the Helios Energy Research Facility, both now under construction. California Memorial Stadium (CMS) Seismic Corrections and West Program Improvements project, now under renovation, will also have a high peak electrical demand when it is completed. |
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<p>It is the campus' practice to provide each of these high-demand facilities with its own dedicated circuits: this protects these facilities, and the research conducted in them, from shutdowns due to failures caused by other buildings sharing the same circuits. However, the existing campus electrical system does not presently have the capacity to provide dedicated circuits for these high-demand buildings. Switching Station 4 (SS4) does not have spare circuit breakers and its expansion is unfeasible due to its underground location. SS5, which feeds power to SS4, also cannot be expanded due to physical space limitations.</p>

B. PROJECT DESCRIPTION

The SS6 project would receive power from the Hill Area Substation, have adequate capacity to accommodate peak campus loads, provide a redundant power supply system, and provide dedicated power to CMS, now served by existing SS4, and to Stanley Hall and Sutardja Dai Hall/CITRIS, both now served by existing SS5.

SS6 would have an effective power capacity of 40 MW, the same as SS1, and would thus provide full redundancy to the campus system. (The actual power capacity of both SS1 and SS6 themselves is 52 MW, but the effective power capacity is limited by the duct banks serving both stations, which are rated for 40 MW.)

SS6 would consist of a building roughly 35' by 60' (2,100 sq ft.), with one level above and one level below grade. The building would be notched into the hillside near Stern Residence Hall north of the Greek Theatre. Buried conduit and cable connecting SS6 with the campus electrical infrastructure would be installed from SS6 to CMS and to Hearst Mining Circle on the central campus.

The project scope also incorporates the inclusion of capacitors in both SS6 and SS1, to increase the efficiency of the distribution system and reduce the demand for PG&E power.

A diagram showing conditions before and after construction of SS6 is presented in Attachment 5.

C. SCHEDULE

Construction Start	April 2011
Completion	August 2012

D. SUSTAINABILITY

Target LEED™ Rating	N/A
UC Policy Compliance	The project will comply with the <i>University of California Policy on Sustainable Practices</i> . As this policy requires, the project will adopt the principles of energy efficiency and sustainability to the fullest extent possible, consistent with budgetary constraints, regulatory requirements, and programmatic demands.

F. CEQA CLASSIFICATION

The University will determine the appropriate CEQA compliance approach for this project and make a CEQA determination prior to design approval/authorization to proceed with the project.

**PROJECT BUDGET
CCCI 5624**

Category	Total	% of Total
Site Clearance	\$ 200,000	1.3%
Building	8,675,000	57.1%
Exterior Utilities	940,000	6.2%
Site Development	1,130,000	7.4%
A/E Fees ^(a)	1,300,000	8.6%
Campus Administration ^(b)	870,000	5.7%
Surveys, Tests	145,000	1.0%
Special Items ^(c)	585,000	3.8%
Contingency	1,355,000	8.9%
	\$15,200,000	100%
Groups 2 & 3 Equipment		
Project Total:*	\$15,200,000	

*The total project cost includes the \$7,600,000 representing the additional financing proposed in this item, and \$7,600,000 from the previously approved CMS project.

- (a) Fees include executive architect and other professional design contract costs.
- (b) Campus administration includes project management and inspection.
- (c) Special items include advance planning and studies, environmental mitigation and monitoring, code compliance fees, and interest during construction of \$300,000.

FUNDING PLAN												
A. PROJECT COST: (\$15,200,000)												
Funding Source	External Financing											
B. FUNDING SCHEDULE												
Phase	Proposed (2010-11)	Funding Source	Total									
Preliminary Plans & Working Drawings	\$ 1,191,000	External Financing	\$ 1,191,000									
Construction	14,009,000	External Financing	14,009,000									
Total:	\$15,200.000		\$15,200,000									
C. EXTERNAL FINANCING FOR ADDITIONAL FUNDING SOURCE												
Tax-Exempt Amount:	\$7,600,000											
Tax-Exempt Rate:	6.00%	Term:	30 years									
Estimated Debt Service/Year:	\$556,000											
Pledged Source of Repayment	Facilities and Administrative cost recovery (formerly known as Opportunity and Educational Funds)											
D. ALLOCATION OF PROJECT COST												
<p>The total project cost for construction of a new SS6 is \$15,200,000, including an estimated total of \$300,000 in interest during construction.</p> <p>The financial strategy for Electrical Switching Station 6 is therefore as follows:</p> <table style="width: 100%; border: none;"> <tr> <td style="width: 30%;">Proposed Action:</td> <td style="width: 20%; text-align: right;">\$ 7.6 million</td> <td style="width: 50%;">(proposed action-new external financing)</td> </tr> <tr> <td>Previously approved (CMS):</td> <td style="text-align: right;"><u>\$ 7.6 million</u></td> <td>(external financing contained within approved project budget)</td> </tr> <tr> <td>Total</td> <td style="text-align: right;">\$15.2 million</td> <td></td> </tr> </table> <p>The CMS share of external financing was anticipated and incorporated into the CMS approved project budget as part of the utilities improvements.</p> <p>As long as the debt is outstanding, the General Revenues of the Berkeley campus shall be maintained in amounts sufficient to pay the debt service, and meet the related requirements of the authorized financing.</p> <p>The external financing will be paid from specific revenue sources specified in the external financing documents; therefore, the general credit of the Regents will not be pledged.</p> <p>The summary financial feasibility analysis may be found in Attachment 4.</p>				Proposed Action:	\$ 7.6 million	(proposed action-new external financing)	Previously approved (CMS):	<u>\$ 7.6 million</u>	(external financing contained within approved project budget)	Total	\$15.2 million	
Proposed Action:	\$ 7.6 million	(proposed action-new external financing)										
Previously approved (CMS):	<u>\$ 7.6 million</u>	(external financing contained within approved project budget)										
Total	\$15.2 million											

SUMMARY OF FINANCIAL FEASIBILITY

Berkeley Campus	
Project Name	Electrical Switching Station 6
Project ID	912399
Estimated Project Cost ^a	\$15,200,000

Proposed Sources of Funding	
External Financing (additional)	\$7,600,000

Below are results of the financial feasibility analysis for the proposed project using the campus' debt affordability model. The financial projections take into consideration all previously approved projects.

Financing Assumptions	
Anticipated Repayment Source	General Revenues of the Berkeley Campus
Anticipated Fund Source	Facilities and Administrative cost recovery (formerly known as Opportunity and Educational Funds)
Amount Financed (this action)	\$7,600,000
Financial Feasibility Rate	6.00%
First Year of Principal (e.g., year 10)	FY 2013
Final Maturity (e.g., 30 years)	FY 2042
Estimated Average Annual Debt Service	\$556,000

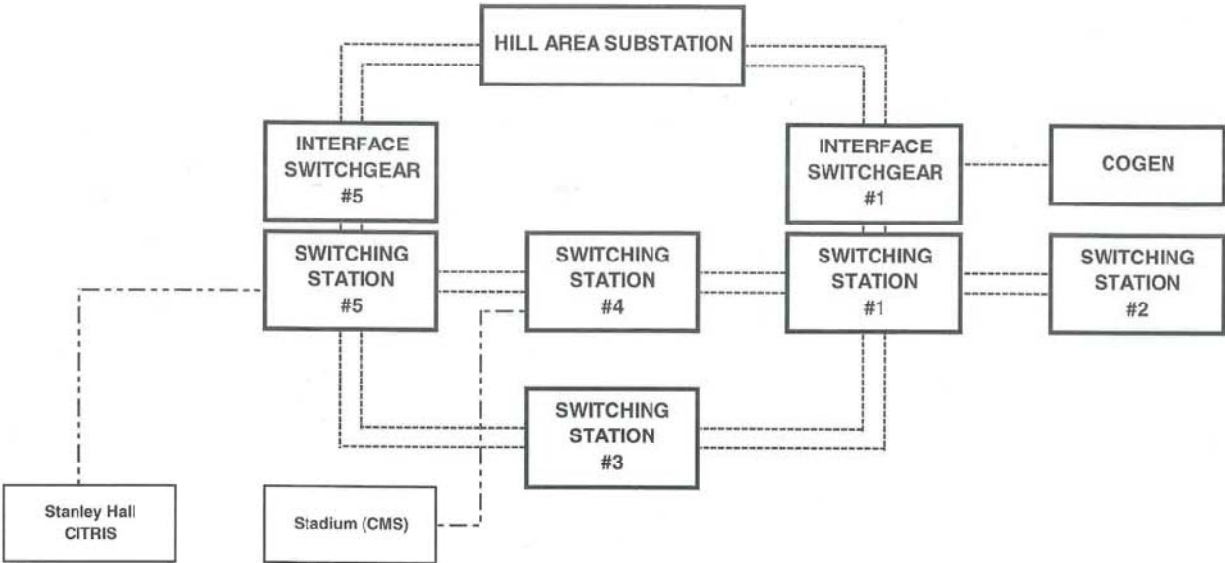
Campus Financing Benchmarks		
	10 Year Projections (as of 15 Jan 2010)	Approval Threshold
Debt Service to Operations	5.7% (max @ FY 2018)	6.0%
Debt Service Coverage	3.56 (min @ FY 2013)	2.0 x
Expendable Resources to Debt	n/a	1.0 x

Financing approval requires the campus to meet the debt service to operations benchmark and one of the two other benchmarks for approval.

^a The 'estimated project cost' shown here is the total cost. This item seeks the presently unfunded 50% balance of the project Electrical Switching Station 6 project cost.

ELECTRICAL SYSTEM DIAGRAM

EXISTING SYSTEM (2010)



PROPOSED SYSTEM

