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April 24, 1998

## Findings and Implications

Combining known seismic needs and the recommendations in the 1997 Preliminary Seismic Evaluation, Phase 1 Report, seven campus buildings have been rated Very Poor and 50 buildings have been rated Poor (a ratings explanation is given below). No buildings were downgraded to Very Poor as a result of the new report, but many formerly rated Good or Fair were downgraded to Poor.

In all, 315,000 assignable square feet (ASF) is rated Very Poor and 1,610,000 ASF is rated Poor, totaling nearly two million ASF, or 27 percent of campus space. Nearly three-quarters of all campus space is rated Good or Fair.

These figures and the analysis do not include facilities at Clark Kerr Campus, Richmond Field Station, Albany Village, and other off-campus facilities, which remain to be rated in Phase 2 of the evaluation project. Nor do they include more than 780,000 ASF in seismic projects currently funded for construction (Doe Library, 6701 San Pablo, 2607 Hearst, 2401 Bancroft, McCone Hall, Harmon Gym, and Hearst Mining).

The 57 buildings rated Very Poor and Poor have a current replacement value exceeding \$1 billion. A preliminary estimate of the total cost for seismic retrofit of these 57 facilities is at least \$700 million, in 1997 dollars. This estimate includes seismic retrofit and associated minimum code upgrades, essential deferred maintenance work that should be performed concurrently with the seismic retrofit construction, demolition/relocation costs, and surge costs (that is, costs to relocate people and programs during construction). These estimates do not include non-seismic interior renovations. Preliminary estimates of available funds indicate that a 20- to 30-year time frame could be required to fund seismic corrections in these buildings. The total cost of the program would escalate to at least \$1 billion to \$1.2 billion over such a time frame, including assumed inflationary increases.

The campus has long recognized its seismic safety problems

and for some time has ranked correcting seismic deficiencies in campus facilities an issue of the highest priority, in order to protect the life and safety of students, faculty, and staff. The campus currently is in the midst of a major seismic upgrade program involving numerous campus buildings, and the realization of the magnitude of the problem identified in the 1997 Preliminary Seismic Evaluation comes at a time when the campus had anticipated completion of its seismic program by the middle of the next decade. The increased number of buildings means that a comprehensive program could take 20 or more years to complete.

Until this program is complete, the campus will invest in efforts to address personnel safety, meet critical service needs, and ensure institutional survival should a major earthquake occur. Such efforts will include special communications systems, emergency preparedness training, and education, in addition to targeted capital investment.

## The Rating System

Established campus standards for seismic rehabilitation projects, for new construction, and for hospital construction use performance ratings of GOOD, FAIR, POOR, and VERY POOR. These continue to serve as the backbone of the program.

- A **GOOD** seismic performance rating would apply to buildings and other structures whose performance during a major seismic disturbance is anticipated to result in structural and nonstructural damage and/or falling hazards that would not significantly jeopardize life. Buildings and other structures with a GOOD rating would represent an acceptable level of earthquake safety, such that funds need not be spent to improve their seismic resistance to gain greater life safety.
- A **FAIR** seismic performance rating would apply to buildings and other structures whose performance during a major seismic disturbance is anticipated to result in structural and nonstructural damage and/or falling hazards that would represent low life hazards. Buildings and other structures with a FAIR seismic rating would be given a low priority for expenditures to improve their seismic resistance and/or to reduce falling hazards so that the building could be reclassified GOOD.

- A **POOR** seismic performance rating would apply to buildings and other structures expected to sustain significant structural and nonstructural damage and/or result in falling hazards in a major seismic disturbance, representing appreciable life hazards. Such buildings or structures either would be given a high priority for expenditures to improve their seismic resistance and/or to reduce falling hazards so that the building could be reclassified GOOD, or would be considered for other abatement programs, such as reduction of occupancy.
- A **VERY POOR** seismic performance rating would apply to buildings and other structures whose performance during a major seismic disturbance is anticipated to result in extensive structural and nonstructural damage, potential structural collapse, and/or falling hazards that would represent high life hazards. Such buildings or structures either would be given the highest priority for expenditures to improve their seismic resistance and/or to reduce falling hazards so that the building could be reclassified GOOD, or would be considered for other abatement programs, such as reduction of occupancy.

The table below lists the buildings included in the 1997 Preliminary Seismic Evaluation, Phase 1 Report, with their new seismic rating plus other buildings whose seismic rating had previously been determined to be Poor or Very Poor. Some campus buildings are not listed, either because they are off campus and will be included in an upcoming evaluation – the Phase 2 Report – or because they are currently funded for seismic retrofit. The latter buildings were known from earlier assessments to require seismic corrections, and were targeted by the campus as priority construction projects to be funded by the state or other sources.

## Campus Buildings Seismic Ratings

[Campus Map](#)

Updated April 24, 1998

### RATINGS

#### GOOD

A GOOD seismic performance rating would

Building	Rating
Building Name	Seismic Rating

apply to buildings and other structures whose performance during a major seismic disturbance is anticipated to result in structural and nonstructural damage and/or falling hazards that would not significantly jeopardize life. Buildings and other structures with a GOOD rating would represent an acceptable level of earthquake safety, such that funds need not be spent to improve their seismic resistance to gain greater life safety.

### **FAIR**

A FAIR seismic performance rating would apply to buildings and other structures whose performance during a major seismic disturbance is anticipated to result in structural and nonstructural damage and/or falling hazards that would represent low life hazards. Buildings and other structures with a FAIR seismic rating would be given a low priority for expenditures to improve their seismic resistance and/or to reduce falling hazards so that the building could be reclassified GOOD.

### **POOR**

A POOR seismic performance rating would apply to buildings and other structures expected to sustain significant structural and nonstructural damage and/or result in falling hazards in a major seismic disturbance,

Alumni House	good
Anna Head complex (6 buildings)	poor
Anthony Hall	fair
Architects & Engineers Building	poor
Art Gallery (old)	very poor
Atherton 2425	good
Atherton 2425 (outdoor walkway)	fair
Bancroft 2111	poor
Bancroft 2111 (stair tower)	very poor
Bancroft 2401	under construction (very poor)
Barker Hall	poor
Barrows Hall	poor
Bechtel Engineering Center	good
Birge Hall	good
"Botanical Garden Building 1A (#1734, store)"	fair
"Botanical Garden Building 1B (#1734, office)"	good
"Botanical Garden Building 2 (#1739, rain forest house)"	poor
"Botanical Garden Building 3 (#1749, education annex)"	poor
"Botanical Garden Building 4 (#1741, fern house)"	fair
"Botanical Garden Building 5 (#1751/51A, meeting room-greenhouse)"	fair
"Botanical Garden Building 6 (#1742, staff commons)"	poor
"Botanical Garden Building 7 (#1752, topical house)"	fair
"Botanical Garden Building 8 (#1733/43, lath house)"	poor

representing appreciable life hazards. Such buildings or structures either would be given a high priority for expenditures to improve their seismic resistance and/or to reduce falling hazards so that the building could be reclassified GOOD, or would be considered for other abatement programs, such as reduction of occupancy.

### VERY POOR

A VERY POOR seismic performance rating would apply to buildings and other structures whose performance during a major seismic disturbance is anticipated to result in extensive structural and nonstructural damage, potential structural collapse, and/or falling hazards that would represent high life hazards. Such buildings or structures either would be given the highest priority for expenditures to improve their seismic resistance and/or to reduce falling hazards so that the building could be reclassified GOOD, or would be considered for other abatement programs, such as reduction of occupancy.

"Botanical Garden Building 9 (#1732, greenhouse)"	good
"Botanical Garden Building 10 (#1731, greenhouse)"	good
"Botanical Garden Building 11 (#1746, tool shed)"	fair
"Botanical Garden Building 12 (#1745, greenhouse)"	fair
"Botanical Garden Building 13 (#1747, greenhouse)"	fair
"Botanical Garden Building 14 (#1750, domed greenhouse)"	good
"Botanical Garden Building 15 (#1744, rest room)"	good
"Botanical Garden Building 16 (#1738, storage-rest room)"	good
"Botanical Garden Building 17 (#1735/37, greenhouse)"	poor
"Botanical Garden Building 18 (#1736, greenhouse)"	poor
"Botanical Garden Building 19 (#1729, greenhouse)"	fair
"Botanical Garden Building 20 (#1753, information center)"	fair
Bowditch 2334	poor
Bowles Hall	good
California Hall	good
California Memorial Stadium	poor
Calvin Laboratory	good
Campbell Hall	poor
Campus Garage	poor
Carleton 2000	fair
Channing 2515	poor
Channing 2521	poor
Channing 2539	good

Channing 2547 (Shorb House)	poor
Channing 2612	poor
Chavez Center	good
Cheit Hall	good
College 2241	poor
College 2243	poor
College 2251	very poor
Cory Hall	fair
Davis Hall (new)	poor
Davis Hall (old)	fair
Doe Library	under construction (poor)
Doe Library Annex	poor
Doe Stack	good
Donner Laboratory (new)	poor
Donner Laboratory (old)	good
Durant Hall	fair
Dwight 2427	fair
Dwinelle Annex	poor
Dwinelle Hall	good
Edwards Track Stadium	poor
Eshleman Hall	poor
Etcheverry Hall	good
Evans Hall	poor
Faculty Club (The)	fair
Faculty Club (Women's)	good
Field Station for Behavioral Research Building 5	poor
Field Station for Behavioral Research Building 6A/6B	poor
Field Station for Behavioral Research	good

Building 7A	
Field Station for Behavioral Research Building 7B/7C/7D	poor
Field Station for Behavioral Research Building 9	poor
Field Station for Behavioral Research Building 9A	good
Foothill Student Housing (9 buildings)	good
Founders Building	good
Fulton 2223	poor
Genetics and Plant Biology Teaching Building	good
Giannini Hall	poor
Giauque Laboratory	good
Gill Tract Hybridoma Building (#9518)	good
Gill Tract Insectary Building (#9510)	good
Gilman Hall	fair
Girton Hall	good
Greek Theatre	very poor
Haas Clubhouse	poor
Haas School Complex (faculty and student buildings)	good
Harmon Gymnasium	under construction (poor)
Haste-Channing Student Housing	good
Haviland Hall	fair
Hearst 2607	under construction (poor)
Hearst Gymnasium	poor
Hearst Mining Building	under construction (very poor)

Heating Plant	good
Hertz Hall	poor
Hertz-Morrison canopy	good
Hesse Hall (new)	good
Hesse Hall (old)	poor
Hildebrand Hall	very poor
Hilgard Hall	fair
Hudson Field House	good
International House	good
Kerr Campus Building 1	good
Kerr Campus Building 2 (north and west)	good
Kerr Campus Building 2 (south)	poor
Kerr Campus Building 3	good
Kerr Campus Building 4	good
Kerr Campus Building 5	fair
Kerr Campus Building 6	fair
Kerr Campus Building 7	good
Kerr Campus Building 8	fair
Kerr Campus Building 9	fair
Kerr Campus Building 10 (dining halls)	fair
Kerr Campus Building 10 (kitchen servery)	poor
Kerr Campus Building 11	good
Kerr Campus Building 12	good
Kerr Campus Building 13	fair
Kerr Campus Building 14	fair
Kerr Campus Building 15	good
Kerr Campus Building 16	good
Kerr Campus Building 17 (Keller Hall)	good
Kerr Campus Building 18	fair
Kerr Campus Building 19	fair



Kerr Campus Building 20	fair
Kerr Campus Building 21	poor
Kerr Campus Building 22	poor
Kerr Campus Building 23	fair
Kerr Campus Building 24	fair
Kerr Campus Building 25	fair
King Student Union	fair
Koshland Hall	good
Kroeber Hall	good
Latimer Hall	poor
Law Building	good
Lawrence Hall of Science	good
LeConte Hall (new)	good
LeConte Hall (old)	poor
Lewis Hall	poor
Life Sciences Addition	good
Manville Hall	good
Mathematical Sciences Research Institute	good
McCone Hall	under construction (poor)
McEnerney Hall (1750 Arch)	good
McLaughlin Hall	poor
Minor Hall	good
Minor Hall Addition	good
Moffitt Library	good
Morgan Hall	good
Morrison Hall	good
Moses Hall	fair
Mulford Hall	poor

Naval Architecture Building	poor
North Gate Hall (east wing)	good
North Gate Hall (library and west wing)	fair
Northern Regional Library	fair
Northwest Animal Facility	good
O'Brien Hall	good
O'Brien-McLaughlin link	poor
Oxford 2120	fair
Oxford Tract Natural Resources Laboratory	good
Parking Structure A	good
Parking Structure B	poor
Parking Structure C	good
Parking Structure H	good
Parking Structure U	good
Piedmont 2222	poor
Piedmont 2224	poor
Piedmont 2232	poor
Piedmont 2234	poor
Piedmont 2240	poor
Pimentel Hall	good
Recreational Sports Facility	good
Residence Halls Unit 1 (towers)	good
Residence Halls Unit 1 Dining Commons	poor
Residence Halls Unit 2 (towers)	good
Residence Halls Unit 2 Dining Commons	poor
Residence Halls Unit 3	good
Richmond Field Station Building 100	fair
Richmond Field Station Building 102	poor
Richmond Field Station Building 110	fair
Richmond Field Station Building 112	poor

Richmond Field Station Building 150	very poor
Richmond Field Station Building 151	good
Richmond Field Station Building 152	poor
Richmond Field Station Building 154	good
Richmond Field Station Building 155	fair
Richmond Field Station Building 158	fair
Richmond Field Station Building 159	poor
Richmond Field Station Building 160	poor
Richmond Field Station Building 161	fair
Richmond Field Station Building 164	fair
Richmond Field Station Building 165	good
Richmond Field Station Building 167	good
Richmond Field Station Building 175	very poor
Richmond Field Station Building 177	poor
Richmond Field Station Building 178	poor
Richmond Field Station Building 180	very poor
Richmond Field Station Building 190	poor
Richmond Field Station Building 194	good
Richmond Field Station Building 196	poor
Richmond Field Station Building 197	poor
Richmond Field Station Building 275	fair
Richmond Field Station Building 276	good
Richmond Field Station Building 277	good
Richmond Field Station Building 280	good
Richmond Field Station Building 300	good
Richmond Field Station Building 420	fair
Richmond Field Station Building 421	good
Richmond Field Station Building 445	poor
Richmond Field Station Building 450	good
Richmond Field Station Building 451	poor

Richmond Field Station Building 452	poor
Richmond Field Station Building 453	poor
Richmond Field Station Building 454	poor
Richmond Field Station Building 472	fair
Richmond Field Station Building 473	fair
Richmond Field Station Building 478 (machine shop)	poor
"Richmond Field Station Building 478 (wood collection, corridor)"	good
Richmond Field Station Building 480	poor
Richmond Field Station Building 484	poor
Richmond Field Station Building 486	fair
San Francisco Extension Center Middle Hall (old gym)	fair
San Francisco Extension Center Richardson Hall	poor
San Francisco Extension Center Woods Hall and Annex	good
San Pablo 6701	under construction (poor)
Sather Tower (observation level)	poor
Senior Hall	poor
Silver Laboratory	poor
Silver Laboratory Annex	good
Simon Hall	good
Smyth House	poor
Smyth-Fernwald 2925-2939 Dwight (4 buildings)	poor
"Smyth-Fernwald 2939 Dwight (entry, office-workshop)"	fair
South Hall	good
Sproul Hall	good
Stanley Hall	poor

Stanley Hall Annex	good
Stephens Hall	fair
Stern Hall	good
Strawberry Canyon Center	under construction (poor)
Strawberry Canyon Chemical Facility	fair
Switchgear Station No. 1	good
Switchgear Station No. 1 (retaining wall)	fair
Tan Hall	good
Tang Center	good
Tolman Hall	poor
UC Berkeley Art Museum	very poor
University Hall	good
University House	fair
Valley Life Sciences Building	good
Warren Hall	poor
Wellman Hall	poor
Wheeler Hall	good
Wurster Hall	very poor

## Estimated Building Repair or Replacement Costs

These figures are very preliminary and require further detailed analysis and verification.

Anna Head complex	\$11,000,000
Architects & Engineers Building	1,000,000
Art Gallery (old)	4,000,000
Barker Hall	14,000,000

Barrows Hall	13,000,000
2334 Bowditch	1,000,000
California Memorial Stadium	14,000,000
Campbell Hall	18,000,000
Campus Garage	4,000,000
2515 Channing	2,000,000
2521 Channing	7,000,000
2547 Channing	2,000,000
2241 College	1,000,000
2243 College	-----
2251 College	2,000,000
Davis Hall (new)	16,000,000
Doe Library Annex	10,000,000
Donner Laboratory (new)	9,000,000
Dwinelle Annex	2,000,000
Edwards Track Stadium	10,000,000
Eshleman Hall	13,000,000
Evans Hall	24,000,000
2223 Fulton	14,000,000
Giannini Hall	21,000,000
Greek Theatre	5,000,000
Haas Clubhouse	3,000,000
Hearst Gymnasium	16,000,000
Hertz Hall	8,000,000
Hesse Hall	14,000,000
Hildebrand Hall	19,000,000
Latimer Hall	25,000,000
LeConte Hall (old)	14,000,000
Lewis Hall	22,000,000
McLaughlin Hall	13,000,000

Mulford Hall	23,000,000
Naval Architecture Building	4,000,000
O'Brien Hall (link portion)	1,000,000
Parking Structure B	2,000,000
2222 Piedmont	1,000,000
2224 Piedmont	2,000,000
2232 Piedmont	2,000,000
2234 Piedmont	1,000,000
2240 Piedmont	2,000,000
Residence Halls, Unit I Dining Commons	6,000,000
Residence Halls, Unit II Dining Commons	6,000,000
Sather Tower (observation level)	4,000,000
Senior Hall	1,000,000
Silver Laboratory	15,000,000
Smyth House	1,000,000
Smyth-Fernwald buildings	7,000,000
Stanley Hall	24,000,000
Strawberry Canyon Center	1,000,000
Tolman Hall	20,000,000
UC Berkeley Art Museum	28,000,000
Warren Hall	10,000,000
Wellman Hall	14,000,000
Wurster Hall	17,000,000

### Totals

Total Seismic Retrofit or Replacement	544,000,000
Surge	95,000,000
Essential Deferred Maintenance	21,000,000
Demolition or Relocation	17,000,000
Subtotal	677,000,000
Plus Financing During Construction @ 3%	20,000,000

Total Seismic Program Costs, 1997	\$697,000,000
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