F9

Office of the President

TO MEMBERS OF THE FINANCE AND CAPITAL STRATEGIES COMMITTEE:

DISCUSSION ITEM

For Meeting of September 13, 2017

PARNASSUS HEIGHTS HEALTH SCIENCES INSTRUCTION AND RESEARCH BUILDINGS SEISMIC IMPROVEMENTS, SAN FRANCISCO CAMPUS

EXECUTIVE SUMMARY

The San Francisco campus (UCSF) proposes to seismically improve utilities and building systems servicing the 440,000-gross-square-foot Health Sciences Instruction and Research complex (two adjacent and connected high-rise towers) at the Parnassus Heights campus site. Although the buildings have a seismic rating of Level IV, a major seismic event could cause significant damage and disruption in services if the utility systems and connections between the buildings are not seismically improved. The proposed improvements would upgrade the seismic rating to Level III, minimize risk to the utility infrastructure, ensure the preservation of invaluable research samples, and secure equipment during a seismic event.

The proposed project is part of the *2018-19 Budget for State Capital Improvements* that will be presented to the Regents for discussion at this meeting and was submitted to the Legislature and Department of Finance in early September 2017. The project would be funded by external financing supported by State general funds and campus funds. The campus funds would come specifically from a centrally managed pool of unrestricted (non-State, non-tuition) funds, including indirect cost recovery on sponsored contracts and grants and investment earnings.

UCSF expects to request approval of preliminary plans funding at the November 2017 Regents meeting. The preliminary plans funding would allow the campus to engage an architect and contractor to develop a cost-effective renovation plan, and advance the proposed project through design development.

BACKGROUND

Context

UCSF operates three major campus sites across the city of San Francisco: Parnassus Heights, Mission Bay, and Mount Zion. Research, clinical care, and education/training are conducted at all three sites, and housing and education are located at the Parnassus and Mission Bay locations. In addition to multiple smaller sites throughout the city, UCSF also occupies research space at Zuckerberg San Francisco General Hospital and Trauma Center, where UCSF faculty provide

services for the City and County of San Francisco hospital and train UCSF students, residents, and fellows.

Parnassus Heights – Health Sciences Instruction and Research Building

The Parnassus Heights campus site is home to all four UCSF professional schools – Medicine, Pharmacy, Nursing, and Dentistry – as well as UCSF Medical Center inpatient and outpatient facilities in the Moffitt/Long Hospitals and clinics. A significant number of students, faculty, physicians, and researchers in all four schools use the campus for biomedical and clinical research as well as instructional space. The Health Sciences Instruction and Research (HSIR) building complex is the largest facility devoted to instruction and laboratory research at the Parnassus campus.

The HSIR building complex consists of two 17-story laboratory buildings each with an adjacent stairway and mechanical utility tower supplying heating and ventilation, electrical, and plumbing systems. An elevator and corridor tower connects the two laboratory buildings and the nearby Medical Sciences building. A site plan is provided in Attachment 3. The complex, constructed in 1963, provides approximately 440,000 gross square feet of space, primarily for research and education activities. HSIR has a prominent role as a hub for the campus, housing faculty who are leaders in their fields, and providing participatory research settings that are essential for effective learning and for producing graduates and discoveries that drive the California economy. With over 150 principal investigators located at HSIR, the towers are used by a broad spectrum of instruction and research programs across the professional schools, such as anatomy, genetics, and bioengineering, to name a few. There are no clinical activities in these buildings.

The two laboratory towers are designated as Health Sciences East (HSE) and Health Sciences West (HSW). These towers are high-rise research and instructional buildings, comprised predominantly of biomedical research wet laboratory spaces for conducting basic and clinical translational research on floors two through 16 in HSE and floors four through 16 in HSW. A total of four lecture halls (two with 153 seats and two with 163 seats) are located on floors two through three of HSW. The distribution of assignable square feet in the two towers is shown in Table 1.

Table 1
Amount of Assignable Square Feet (ASF) of Space

Space Type	Amount of ASF	% of Total
Research and research service	224,000	79%
Academic and administrative	41,500	15%
Instruction and academic support	13,300	5%
Building service and support	3,400	1%
Total	**282,200**	**100%**

Project Drivers

Although the structure of the individual buildings does not require major retrofitting to meet minimum code requirements for existing buildings per UC Seismic Safety Policy, there are significant risks to the stability of the utility systems serving HSE and HSW in the event of a seismic event. Additionally, existing fire sprinklers and research equipment that are not braced appropriately could cause damage, injury, and block egress.

The primary driver for the project is to reduce the risk of interruptions or damage to critical research and assets during a seismic event. These risks include:

1. Risk to Infrastructure. The vertical distribution of electrical, HVAC, and plumbing systems is located in the two mechanical towers that are adjacent to the HSW and HSE research towers. The piping rises between the stair towers of HSE and HSW inside the building separation joint and then branches out at each floor. Analysis of the HSIR structures indicates that the laboratory buildings and mechanical towers deflect in opposite directions. During the course of an earthquake, the structures (laboratory and mechanical towers for both HSW and HSE) are expected to move out-of-phase, which would cause differential motion and pounding at the separation joints.

   The largest concern for the mechanical, plumbing, and fire protection is related to the locations where piping crosses the separation joints without any expansion compensation, and piping that is installed in the seismic gap. Relative movement at the building separation joints could damage utilities contained in or crossing the joint; joints could entirely close in the largest ground motions, which could crush or break the utility lines. The column splices in the four corner columns (of each laboratory tower), between floors five and six and between floors seven and eight, will yield in tension and may not close again in compression, which also could cause a break in utility lines. Additionally, the utility lines do not have separation joint expansion compensation. Without the ability to flex and move with the buildings during a seismic event, the lines will break. The potential damage to the utility systems and connections may obstruct the stairways located in the mechanical towers, causing risk for people exiting the buildings.

2. Risk to Research. The risk to ongoing research is significant, with possible circumstances ranging from disruption of research to complete dissolution of research projects. Much of the research spans decades of work and is irreplaceable. Most samples are required to be stored at specific temperatures. A loss of power or damage to equipment would result in damaged, contaminated, or altogether destroyed samples; future tests on them would not be possible. The impact of damaged or lost research and inability to re-start quickly would negatively affect potential scientific discoveries and cause loss in revenue from grants and gifts. Faculty retention would also be affected, with many potentially looking for opportunities elsewhere to re-start their programs, which would disrupt the education enterprise.

3. Risk to the Life Safety Systems (Fire Controls and Alarm). The building fire control system and fire alarm distribution panels were installed as part of a campus-wide fire and life safety system upgrade in the early 1990s; however, the anchorage was designed per the code requirements at the time and would be evaluated and upgraded as required. Most of the existing fire sprinklers are not braced appropriately, which could cause breaking of the pipes and further damage the buildings, their contents, or cause injury. Bracing of laboratory equipment (such as freezers, cabinets, and other large research equipment) would be evaluated and installed as needed to avoid costly damage and personal injury.

PROPOSED PROJECT

The proposed retrofit of the utilities and systems would protect systems and equipment to reduce laboratory down time, preserve valuable research, and improve functionality following an earthquake. The proposed project would address the relative movement at building separation joints and address column splices. Retrofitting against the shear-governed behavior of the concrete walls in the mechanical tower also is considered. Following these improvements, the seismic rating would be upgraded to Level III.

Project elements in the HSIR complex include:

- Improve seismic performance of building separation joints between the mechanical and laboratory towers and construct dampers across joints.
- Install column splices between levels 5 and 6 and between levels 7 and 8.
- Install mechanical tower dampers.
- Install damping frames around the perimeter of each level of the laboratory buildings, which would substantially reduce seismic drifts and accelerations.
- Improve bracing of existing fire sprinklers and other utilities.
- Replace or add bracing to existing laboratory equipment (such as freezers, cabinets, and other large research equipment).
- Improve fire control systems.

All of the proposed work can be accomplished while the building is occupied, with minor disruption to ongoing activities.

The seismic improvements included in the proposed project would allow for the circumstances described below, following a seismic event:

- Essential research activities could resume in days, with full research productivity resuming within weeks.
- Potential interruptions in power could be limited to hours.
- Potential interruptions to other building systems could be repaired in weeks.
- Significant need for cleanup of fallen items would be reduced.
- Some experiments could need to be re-set or re-run.
- No irreplaceable samples would be lost.
- Building would be acceptably safe to allow immediate emergency access to laboratories for clean-up and restoration of essential research or sample protection.

Schedule

An action item for preliminary plans budget approval would be brought to the Regents in November 2017. An item for budget and design approval pursuant to the California Environmental Quality Act would be brought to the Regents at a future meeting.

Funding Plan

The total project budget would be funded from external financing supported by State General funds as well as campus funds. Campus funds are specifically from a centrally managed pool of unrestricted (non-State, non-tuition) funds, including indirect cost recovery on sponsored contracts and grants and investment earnings.

KEY TO ACRONYMS

ASF	Assignable-Square-Foot
HSE	Health Sciences East Tower
HSIR	Health Sciences Instruction & Research
HSW	Health Sciences West Tower
HVAC	Heating Ventilation and Air Conditioning

ATTACHMENTS
Attachment 1: Alternatives Considered
Attachment 2: Parnassus Heights Campus Site
Attachment 3: Health Sciences Instruction and Research Buildings

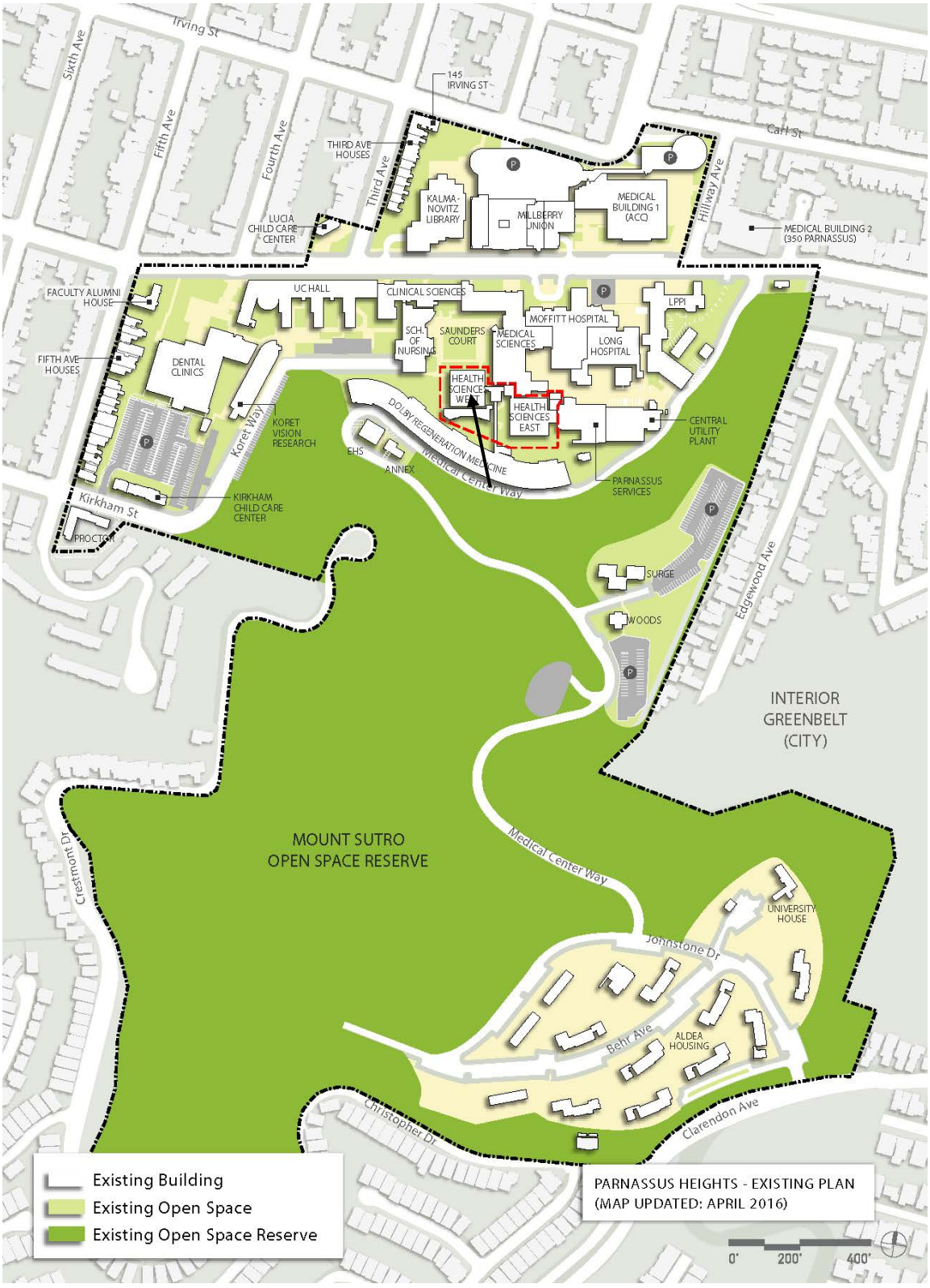
ATTACHMENT 1

ALTERNATIVES CONSIDERED

The project addresses deficiencies related to building systems at specific facilities, thus the only alternative to the proposed project is not to execute the project. Deferring this work would compromise the integrity of the utility services to critical research experiments. Similarly, the options for implementing the scope are limited as the work described for this project cannot be done in phases, since a piecemeal approach would actually weaken the stability of the buildings.

ATTACHMENT 2

PARNASSUS HEIGHTS CAMPUS SITE



ATTACHMENT 3

HEALTH SCIENCES INSTRUCTION AND RESEARCH (HSIR) BUILDINGS