HOSPITAL SEISMIC SAFETY

Office of Statewide Health Planning & Development

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California state law requires hospitals to evaluate their facilities, develop plans to meet seismic standards and ensure that their buildings are seismically sound.

This bulletin shares the latest news on OSHPD's partnership with the state's 510 acute care hospitals working to meet retrofit deadlines. Also included are recent items that may be of interest to those involved in hospital construction.

To contact OSHPD about this bulletin, call (916) 324-9448.

oshpd
Office of Statewide Health Planning & Development
Gregory Bateson State Office Building
1600 Ninth Street, Room 433
Sacramento, CA 95814

New Program Shortens Plan Review Times

The Office of Statewide Health Planning and Development's (OSHPD) Facilities Development Division (FDD) is testing a new pilot program that it hopes will significantly shorten review times for hospital plan approvals.

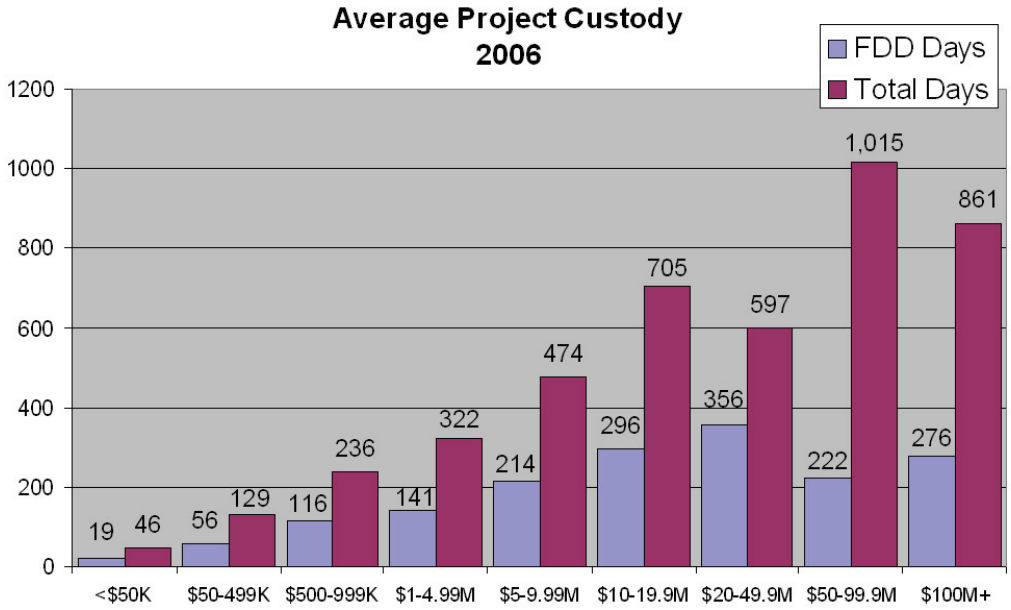
Palomar Medical Center West, located in Poway, California in north San Diego County, is the first facility designated to undergo this new process. Construction on the 52-acre 800,000 square foot facility is scheduled to begin in 2007. The $312 million facility combines elements of a resort hotel and a conservatory garden into its modern 328-bed hospital.

While plan review times vary based on size, scope and complexity of the project, most initial approvals (for foundation and structural skeleton of the building) for new hospitals are completed within 12-18 months. The process generally follows the same pattern. Hospital plans are submitted to FDD and returned for corrections to the designers within 120 days. The designer has up to 180 days to respond. FDD completes most backchecks in 40 days. Again the design team has up to 180 days to respond. And it can go back and forth until it is finalized. On many large projects, total time with FDD is less than 40% of the elapsed time, total time with the designer for correction measures 60% or more of the elapsed time.

The new review process taking place with Palomar Medical Center West aims to shave a conservative 6 months off this time frame. To meet these goals FDD's pilot project is incorporating a new approach to the design and permitting of hospital projects. Structural designs are being reviewed in phases as the design progresses, which will help catch and fix errors and omissions in the initial design process. Plan review comments are being incorporated early into the design process, rather than revising a finished design which may require extensive rework of the drawings. Anticipation is high that this new process will significantly reduce the review and approval time of the structural portion of the project. While the same depth and quality of review is performed, working side-by-side with the design team should make the process run smoother and more efficient for all parties.

Hospital plan review is a collaborative process between FDD Project Managers and the architects and engineers designing the facility. The continuous interaction and communication, which is central to the success of the pilot project, will help address and resolve questions and concerns as they arise and move the project toward the shared goal of timely and efficient completion of the project.

While structural review will remain a time consuming part of the review process, this pilot project will help OSHPD and designers work together to eliminate errors and omission in the final plans and drastically reduce the time it takes to move a project through the process.



HAZUS Update

On March 21, 2007, Facilities Development Division (FDD) Deputy Director John Gillengerten updated the Hospital Building Safety Board (HBSB) on the progress of the Hazards U.S. (HAZUS) technology.

HAZUS is a state-of-the art technology that can estimate the potential losses from damage caused by natural hazards including earthquakes, landslides, and fires following earthquakes. In addition HAZUS estimates damages to buildings, loss of life and indirect and direct economic losses from catastrophes.

Many California hospitals constructed prior to the enactment of the Hospital Facilities Seismic Safety Act (HFSSA) of 1973 are vulnerable to severe damage and risk of collapse from a strong earthquake. The poor performance of these buildings in the Northridge Earthquake prompted the enactment of SB 1953 (Chapter 740, 1994), which expanded the HFSSA to require that all general acute care hospitals evaluate each hospital building and rate the building based on its seismic performance.

All hospital buildings must comply with specific seismic safety requirements and those buildings rated as highest seismic risk are required to be retrofitted or replaced by specific deadlines. Advancements in HAZUS technology have afforded OSHPD the opportunity to reexamine the seismic risk of buildings in greatest danger of collapse.

FDD is currently in the process of testing and fine-tuning HAZUS. Criteria are being developed for buildings in order to determine significant weaknesses. HAZUS methods will be adjusted to accurately capture structural irregularities, which may make some buildings more vulnerable to earthquake damage. Many of these buildings are classified as posing a significant risk of collapse and danger to the public in the event of a natural disaster. Based on preliminary analysis of the HAZUS data on hospital buildings in California, it appears that a significant number may be eligible for assignment to a lower risk category.

Hospital buildings designated as Structural Performance Category-1 (SPC-1) rating are considered to be of the highest potential risk of collapse or significant loss of life in the event of a strong earthquake. These hospital buildings must be retrofitted, replaced or removed from providing acute care services by January 1, 2008, unless granted an extension to January 1, 2013. Of the 2,709 acute care hospital buildings in California, 1,110 (40%) were rated SPC-1.

The projected outcome of the structural reevaluation is that some hospital buildings will no longer be rated as SPC-1 but will be reclassified to a lower risk performance category that would allow more time for compliance with SB 1953 seismic retrofit requirements.

The implementation approach to HAZUS is that it will be a voluntary program in which hospitals may opt not to participate. There may be a multi-tiered approach to HAZUS. Tier 1 could be comprised of buildings for which seismic evaluations were submitted to FDD in 2001, while Tier 2 are buildings that were self-declared by the owner. Completion timeframes for Tier 1 and Tier 2 are dependent upon hospital facility response. The evaluation of buildings using HAZUS requires validating the seismic risk of each building.

Upcoming Hospital Building Safety Board Meetings

June 18-19, 2007: Quarterly Meeting, Sacramento

August 8, 2007: Instrumental Committee, Los Angeles

August 16, 2007: Ad Hoc Commitee on Standard Details, Location TBD

Information will be posted on our Web site at www.oshpd.ca.gov/fdd/events.

Ombudsman Line

If you have questions, unresolved issues or complaints about OSHPD's Facilities Development Division (FDD), call the ***Director's Ombudsman Hotline at (916) 653-0288.***

The line is available 24/7. If you have any questions, leave a voice message. Your call will be returned within two to three working days or as soon as possible. You may also e-mail your questions to: ***Ombudsman@oshpd.ca.gov.***

This line is not intended to handle specific questions regarding code interpretation or routine construction. These questions should be directed to OSHPD's plan review or field personnel.

LA Office

The Southern California office of FDD is located in the Metropolitan Water District Building in downtown Los Angeles, adjacent to the historic Union Station and within minutes of the region's transportation hubs such as Amtrak, Metro Red Line (subway) and MTA bus networks. Driving directions and parking in the vicinity may be found at ***www.mwdh2o.com/mwdh2o/pages/about/union_station_parking_map.pdf.***

Office of Statewide Health Planning & Development

Facilities Development Division

700 Alameda Street, Suite 2-500
Los Angeles, CA 90012

Tel: (213) 897-0166
Fax: (213) 897-0168

A New Kind of Hospital, Peninsula Medical Center

A new kind of hospital is taking shape in Burlingame, California as Mills Peninsula Health Services recently celebrated the groundbreaking of its Peninsula Medical Center, a new 243-bed, $528 million facility set to replace its half century old hospital.

Slated for a 2010 opening, Peninsula Medical Center is a hospital designed for 21st century requirements and attitudes. From its advanced medicine to designs offering patient and family-friendly amenities the hospital strives to encourage a better healing environment and serve its community.

Today's healthcare architects and designers recognize that patients heal faster, require less pain medication, and spend less time in a hospital when their physical environment is pleasant, quiet, naturally lit and aesthetically pleasing.

Following the destruction caused by 1994's Northridge Earthquake, California's legislature passed stringent seismic safety measures for hospital buildings that required most to renovate, rebuild or close by 2013. These requirements have led to an unprecedented building boom of new hospitals throughout California. In the midst of this boom is Mills Peninsula Health Services with plans to build the region's safest, most technologically advanced hospital.

While, the existing hospital faces demolition, it makes way for a seismically sound facility offering state of the art technologies. The new facility is a six-story, 440,000 square foot hospital, with a five-story 150,000 square foot medical office building adjacent to it. The medical office building attaches to the new hospital and improves outpatient access. The attached office building will be dedicated to physician specialists who need to be close to patients in the hospital, such as obstetricians and surgeons. The hospital will provide Emergency, Medical/Surgical Acute Care, Critical Care, Family Birthing Center, Skilled Nursing, and Diagnostic Imaging services.

Given its proximity to several faults it is crucial that Peninsula Medical Center conforms to the strictest seismic standards in order to remain operational after a major earthquake. The facility will be the first *base isolated* hospital in Northern California. Base isolation is a design that separates the building from the ground so that the building moves independently in the event of a tremor. Imagine a building on ball bearings where the ground moves and the bearings role, lessening the amount of force that the building experiences. Structural design plans call for the hospital to have a braced-frame structure, with double-concave base isolators and seismic dampers. Braced-frame structures utilize a system where the beams and columns are made rigid by bracing the connections of the members, rather than using diagonal braces or shear walls. This system has the advantage of leaving interior spaces free of shear walls and braces, allowing a more open and flexible plan. Seismic dampers are similar to shock absorbers in that they reduce the seismic forces transferred to a building or other structure. With these design plans and improvements Peninsula Medical Center will have the highest level of earthquake safety.

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Peninsula Medical Center Opening in 2010

New Supply Air Requirements for Toilet Rooms

On January 18, 2007, new amendments to the 2001 California Mechanical Code (CMC) became effective. The amendments change supply air requirements for toilet rooms in hospitals, skilled nursing facilities, licensed clinics, and correctional treatment centers. CMC Section 407.4.1.3 now allows the conveyance of air from corridors to serve toilet rooms of up to 50 square feet. Previously, this was allowed for toilet rooms of up to 30 square feet; however, this was of no benefit to accessible toilet rooms that are required to be at least 50 square feet in area. In addition, to avoid duplication of code requirements, Section 602.1 has been amended to refer to Section 407.1.3.

Typically, toilet rooms entered from corridors must be accessible to persons with disabilities; and therefore, this new requirement will result in new construction, alteration, and operational savings for healthcare facilities. The Office of Statewide Health Planning and Development (OSHPD) estimates that new construction and alteration savings could be up to $2,900 per toilet room based on the elimination of ductwork, supply air outlet, fire/smoke damper, installation, and air balancing. In addition, OSHPD estimates a reduction in energy costs of

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Toliet Rooms, continued.

approximately $75.00 per year per toilet room.

OSHPD had originally proposed these amendments during the California Building Standards Commission 2004 Code Adoption Cycle. For reasons unrelated to OSHPD's proposal, the Commission did not approve the adoption of the 2004 CMC. The Commission encouraged OSHPD to pursue another vehicle to adopt these amendments. In 2006, the California Hospital Association sponsored legislation, SB 1659, Cox (Chapter 678, Statutes of 2006), which authorized OSHPD to propose emergency regulations to amend the CMC to facilitate construction of accessible toilet rooms in hospitals and skilled nursing facilities. On March 23, 2007, the Commission approved the amendments to CMC Sections 407.4.1.3 and 602.1 for "permanent" adoption.

Seismic Safety Extensions:
If you have questions on the seismic safety extensions call or write to:
Attention: Seismic Safety Extension Program
Office of Statewide Health Planning & Development
Facilities Development Division
1600 Ninth Street, Room 420
Sacramento, CA 95814
(916) 654-3362

HOSPITAL SEISMIC SAFETY

Peninsula Medical Center, continued

Patient-centered care directed the design of Peninsula Medical Center. Patients will reside in single occupancy private rooms that include family sleeping accommodations. Long distance views overlook the natural surroundings of the San Francisco Bay. Floor to ceiling windows will provide increased daylight not only in patient rooms but in building interior core spaces. Family zones are integrated within each patient room and ground-level and rooftop gardens are included for contemplation and distraction. From its private rooms to its healing gardens all of these features are designed to speed healing and promote comfort.

In addition to private patient rooms and "social spaces" for family members, new designs include decentralized nursing stations to reduce staff chatter, acoustical tiles and carpet to reduce equipment noise, special filtration systems to improve air quality and neutralize odors, and access to gardens and natural light to reduce stress and combat depression that can be exacerbated by noisy, chaotic and harshly lit hospitals.

Each year, 2,200 babies are born at the Mills-Peninsula Family Birth Center, more than any other hospital in San Mateo County. Sometimes the new designs have to balance the needs of convenience for staff with the comfort and safety of patients. In neonatal units, for example, while open plans make it easier for staff to move from baby to baby, studies have shown that noise and lights and the hustle and bustle of staff are detrimental experiences for fragile populations like premature infants

As the building department for hospitals FDD reviews the drawings and plans for these innovations assuring that they conform to building codes. FDD plan reviewers are looking to to see if the room sizes are adequate, fire ratings for doors meet code requirements and that operating room lights hang over the patients securely. In addition FDD reviews whether proper fire-rated walls and ceilings are used, and that fire alarms and fire sprinklers are installed correctly.

The designers also took an integrated approach to the design of the building systems for sustainability. The entire building has been designed to work efficiently as a holistic system. Energy use is as efficient as any California hospital. Other sustainable design concepts employed in the project include cool roofs, low VOC (Volatile Organic Compound) materials and finishes, high recycled content materials, high performance glazing, select solar shading devices, and extensive building commissioning.

Green principles and practices Mills-Peninsula will use in constructing its new facility include:

- Water-based paints and other low-VOC products that emit far fewer fumes and chemicals than found in many commercial products
- Flooring free of PVC, or vinyl, considered the most environmentally damaging type of plastic
- Furniture upholstery containing recycled materials
- Architecture that takes fullest advantage of daylight to cut energy use for lighting and heating
- Energy-efficient ventilation (using only fresh, outdoor air), heating and water systems expected to reduce annual energy use by 33 percent compared with typical new hospital designs
- Electronic patient charting, Internet-based communications systems and telemetry monitoring capability reflect Mills Peinsula's Health Services' 21st-century commitment to providing cutting edge medical technology and expertise to the community

A design-assist process was utilized to reduce "deferred approvals" with OSHPD. A general contractor was hired early in the Schematic Design phase to provide pre-construction services and to act as a design-assist partner. During Design Development, contractors for the major trades assisted with constructability reviews, cost estimates, and shop drawing development for agency review. A three dimensional virtual model is currently being created by the design team and the design assist sub-contractors at the jobsite to identify any potential conflicts between the structural systems, partitions and the mechanical, electrical and plumbing systems.

The current facility will remain in operation until the new hospital is complete, so the community will experience no disruption in medical service.

The Peninsula Medical Design Team consists of:

Anshen+Allen – Architect
Turner Construction Company – Pre-Construction Contractor Services
Rutherford & Chekene – Structural Engineer
Ted Jacobs Engineering Group, Inc. – Mechanical/Electrical/Plumbing