



Watsonville Community Hospital's administrator.

Watsonville Community Hospital: Assessing The Damage

by Mary Bryant and Laurence Grotheer

Publisher's Note: The following reports are the second installments in The Post's three-part series on Watsonville Community Hospital (WCH) and its continuing efforts to recover from the earthquake of 1989.

In this edition, The Post looks at the damage sustained at WCH, the effect on operations at the hospital and plans for repair.

Surrounded by orchards in a peaceful setting North West of the City of Watsonville sits Watsonville Community Hospital (WCH), serving the general to acute health care needs of a broad population from North Monterey County through Aptos.

While some may even travel further, WCH enjoyed a reputation for excellent service even before the opening of the four-story facility on Green Valley Road in 1969.

Unfortunately, WCH's long history in the community did not protect it from the extraordinary power of the October 17, 1989 earthquake that struck Northern California, nor was there any way to predict the resulting damage to the facility.

Since 1989, the hospital administrators, along with a team of federal, state, county and independent experts, have been busy assessing the existing damage and analyzing the vast number of options for repairing and/or replacing the structure.

Much of this work, along with estimated repairs in the range of \$2 million in progress, has been suffered by the hospital, without coming to the attention of the community.

As far as The Post is aware, this is the first compilation of damage reports and analysis published in a newspaper to date.

In consideration of the absence of regular coverage and the nature of hospital operations, we have persisted through over 100 interviews, traveled throughout Northern California and researched this story as thoroughly as possible to complete the following article.

Damage

Since a complete list of the damages would more than fill these pages this story will instead focus on the major concerns facing hospital administrators, architects and engineers.

Initially, the damages appeared to be mostly "cosmetic"

and/or repairable in nature.

According to the March 28, 1990 Damage Assessment Report (DAR) prepared for Watsonville Community Hospital, these include such items as: wall cracks; floor, pavement and sidewalk settlement; mechanical and heating/air conditioning ductwork displacement; suspended acoustical ceiling failures; broken pipes; and, the collapse of storage shelving for x-ray files.

Notably, and of greater concern at the time, a modular "portable" building fell off its supports and had to be replaced, along with substantial damage to the breezeway connecting the main building and the smaller and newer

facility addition built in 1982.

This hallway was probably the most visible of all damage since it was constructed of floor-to-ceiling glass panels.

Although, beyond the broken glass, the structure itself failed due to the fact that as one building on one side moved east, the other moved west and the hallway was quite literally caught in the middle.

In total, at first glance, the repairs were significant but not insurmountable. This soon changed, as staff began reporting odors coming from floor drains on the bottom level of the main structure and gnats emerged soon thereafter.

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The Eiskamp Wing sits in front of Watsonville Community Hospital's Main Building.

AGENCIES

FEMA

The Federal Emergency Management Agency is the governmental body that prepares for, responds to, mitigates the effects of, and aids the recovery from disaster.

Its role is wide-ranging, and includes activity on the federal, state and local levels, and steps in during declared disasters to provide supplemental relief.

FEMA's Support Directorate "also assists state and local governments and the private sector in maximizing the survival of the population and other vital resources..."

Local relief efforts are addressed by FEMA's regional office in San Francisco and, since the quake, their emergency field office in Mountain View.

OES

The Office of Emergency Services is the hub of state emergency activity.

It is the body that coordinates local, state, federal and volunteer services in the event of a disaster, and also assists "local governments in their emergency preparedness, response and recovery efforts."

OES collects disaster information and acts as a liaison between local and state relief

SAFETY CODES

According to Title 22 of the California Code of Regulations, if a hospital meets local safety ordinances, and is licensed for operation, "It shall be the responsibility of the licensee to maintain the hospital in a safe structural condition."

But Albert Quintero, health facilities evaluator for the State Department of Health Services Licensing and Certification division said

though Watsonville Community Hospital doesn't currently meet code, "we allow some flexibility as long as they correct the problems."

"Obviously, they don't meet code at this time," he said, "but we're working with other agencies to get the repairs done."

"How can I tell the hospital that they must comply with code in six months," Quintero asked, "when they can't get the money to do it?"

ers; geotechnical engineer, Steven Raas & Associates; and, engineering geologists, Roger E. Johnson & Associates.

This team alone is probably larger in size and broader in expertise than the original group that planned and built the hospital in the late 60s.

Add to this assembly of consultants, representatives from the state Office of Emergency Services and Statewide Health Planning and Development, Santa Cruz County's Environmental Health Department and the Federal Emergency Management Agency (FEMA), among others.

Assessing "New" Damage

Bracing for the worst, the team began extensive field tests, ranging from the soils underneath the structure, to a survey to determine if the building had shifted.

And, if only to add insult to injury, aftershocks occurring in the area caused further damage.

Some relief was in store. Donald Urfer, structural engineer, brought the good news with his report, "It is our opinion, based on observable damage and our review of the original drawings, that the lateral force resisting structural system of the hospital sus-

tained little if any damage."

In simple terms, this meant the building was safe for occupancy according to the experts and state agencies.

According to WCH's administrator, Paul Estess, "The building would still perform as it was supposed to do according to the guidelines that structural engineers use. Basically what that means is that... a building with this type of use, (i.e. a critical facility), in... an earthquake should protect the occupants from harm and allow them to exit the building."

Another piece of good news was to follow, after a survey by the civil engineering firm, Mid-Coast Engineers, the building was reported to show only a very slight variance.

Elmore stated in the DAR, "The facility's structural system worked for vertical and horizontal shift and... the building is not displaced or leaning."

After these favorable findings, one would think the project team would celebrate. Although most likely relieved, the damage that was discovered was serious and immediate remedies needed to be found.

As architect Robert Elmore said in a recent interview, "Because of the way the tower

moved, it put a lot of stress on the lower ground floor areas." The building did perform the way it was supposed to perform, [and] it did some things that were kind of surprising. The slab seems to be... absorbing a lot more of the impact than it maybe should have, but overall the building did very well..."

The slab in question is six inches of concrete that served as the bottom floor of the hospital. It is not part of the structural support, and as constructed is not designed to hold its own weight. Instead it moves with the soil underneath, and here lies the major extent of the problem.

Heart of the Problem

Again, let's emphasize that the slab is separate from the foundation and not a part of the structural support system. However it is still critical to operations in the hospital.

The damage to the slab is significant and to the point, Albert Quintero, Health Facilities Evaluator/Supervisor for the State Department of Health Services said, "The ground floor must be replaced, or [they should] build a new hospital."

To understand the concern, one must know a little bit about about construction,

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The DAR reported that in November, "The facility was concerned with getting back in visual shape," but "by mid-December it becomes obvious that the problems are not superficial and (the architect) is given the go-ahead to mobilize all necessary design consultants to verify all building component systems, specifically structural and mechanical. The sag in the ground floor concrete slab on grade [i.e. resting on the soil] has become more of a concern and reasons for the failure need to be determined."

The Project Team

Before the earthquake the hospital corridors and grounds were the province of health workers and patients. Now, these people share their hospital with experts from across the country, as well as contractors, electricians and plumbers.

The team of independent consultants includes: architect and project director, Elmore Design Group; structural engineer, Donald Urfer & Associates; mechanical engineer, McQuillan/Davidson Associates; electrical engineer; Alfa Tech Consulting Engin-

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and, it's really pretty simple.

The ground underneath the hospital is made of loose soil, which is great for growing fruits and vegetables, but not the best suited for constructing big buildings.

In the October earthquake, the soil at the site, along with most areas in downtown Watsonville and Santa Cruz, experienced a phenomenon known as liquefaction, the process by which unconsolidated water saturated sediment [loose soil and a high ground water table] take on the properties of a liquid.

The geotechnical engineers, Steven Raas & Associates, report, "This earthquake resulted in soil settlement under the hospital from both liquefaction and differential compaction. The magnitude of settlement is between 2 and 5 inches and appears to extend under the entire hospital main building."

The original architects who designed the facility knew about the potential for liquefaction. This is why they engineered the building to rest on pilings driven into the solid soils found some 50 feet under the building.

So, as the soil settled, the slab did too. And, with the extensive movement of the ground, the sewer lines buried approximately three feet below the soil experienced widespread damage.

According to Raas, "The cast iron sewer lines which run under the hospital have broken in 20 locations, and there are several breaks in the lines outside of the footprint of the hospital as well."

At this point in early 1990, the engineers knew there were four or so months worth of sewage from the hospital contained between the slab and the soil, which explains the odors emanating from cracks in the slab and floor drain, the fly infestation and the backup of floor sinks.

After more study, it became evident where the "low point," under the hospital was, and where the sewage had collected.

Elmore stated, "From our core samples that were taken... we discovered that the low point is really underneath the food service area."

Roger Houston of the County's Environmental Health Department recalled, "There was no sewage coming up in the kitchen anywhere... the flies were coming up through cracks in the plumbing system and through cracks in the wall."

"The state was very concerned about them... and they were plating [catching

and testing] some of the dead flies they found in the hospital to see if they were carrying any bacteria or virus. They came up negative..."

Still, the infestation was of concern, especially since the three cases of hepatitis reported in December of 1989 were from WCH, affecting employees at the hospital.

While, the infectious diseases created concern, it was found in these cases that the hepatitis occurred as a result of the employees consuming food that was prepared out-

side the facility, and brought in over the holidays.

And, in response to the concern, Dr. Pat Coleman of the Hepatitis Department at the Centers for Disease Control in Atlanta said, "If there was an outbreak in a specific place, you'd find a high concentration of hepatitis 'A' cases already... cooking destroys the disease." In addition, Margaret Whaley, WCH's infection control nurse, said "[If it had been caused by gnats], it would have affected a lot more people."

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Southern Californians Know the Feeling

by Mike Kostyal

After the shaking stopped from the 1971 San Fernando earthquake, Los Angeles County Health administrators were surprised by the serious structural damage to Olive View Medical center in Sylmar, northwest of Los Angeles.

Much of the earthquake's destructive fury was directed at the newest buildings in this health complex owned by the County of Los Angeles. When built, these buildings were believed to be earthquake resistant.

Three people died at the Olive View complex, two from a power failure that shut off their life support systems. A third person, attempting to leave the building, was crushed by a collapsing portion of the building.

Because the earthquake struck at 6:01 am, very few people were in the first floor and basement of the building. If the earthquake had occurred later in the day, loss of life would have been significantly higher.

Similar to the Watsonville Community Hospital, the five story Olive View Medical Treatment and Care Building, completed in 1970, suffered excessive damage to its first floor and basement.

It took 16 years, 130 million dollars, and a ton of management skill for the Olive View center to be rebuilt, according to Olive View administrator Doug Bagley.

"Tell the Watsonville hospital administration to call me before they decide on rebuilding or replacing," Bagley said.

After a year and a half of studies, the Federal Emergency Management Agency (FEMA) decided that the damaged Olive View buildings should be torn down. Architect work and the plan-

ning process took another four years, Bagley recalled.

"The process is exceedingly complex and cumbersome—very difficult for a local entity to wind itself through all the complexities. It takes a lot of managerial resources and a lot of time. Being a long way from Washington DC doesn't help either, Bagley said."

According to Bagley, the basic federal law governing FEMA provides for exact replacement of what you had before. But changes in building codes, changes in technology, and changes in need make exact replacement impossible or impractical, Bagley explained. Recent changes in FEMA standards allow for greater flexibility.

"We ended up with fewer in-patient beds and less square footage than before, but FEMA said we had a greater capacity and they weren't going to pay for it. We only got partial reimbursement. Other hospitals that were damaged had the same problems with FEMA," said Bagley.

Construction on Olive View began in 1977, but was interrupted from 1979 to 1983 because of Proposition 13. It was finally completed in 1987.

In 1973, Los Angeles County was able to purchase a private hospital that had financial problems, and all of Olive View's medical services were moved there. The damaged buildings at the complex were demolished in 1975.

Patient care services returned to Olive View in 1987 when the new Medical Treatment facility, a six-story 480,000 square foot building was completed in 1987, 16 years after the quake.

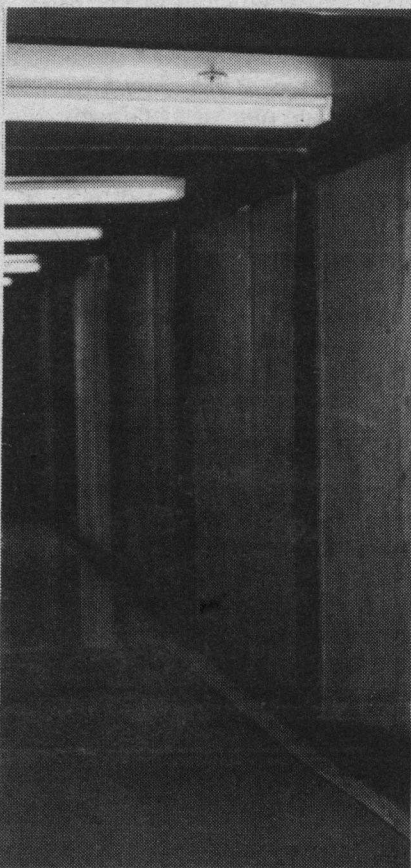
Is the new building earthquake-proof? Bagley laughs. "It's defined as having a capability of withstanding a magnitude 7.5 earthquake on the local fault, and 8.5 on the San Andreas." □

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According to Estess, "We know of no case of infectious disease that can be tied back to the gnats... and that's... [with] a very aggressive, stepped-up monitoring program..."

Repairing the Damage

While hundreds of alternatives have been considered, ranging from bringing in mobile kitchens to elaborate plans to repair damage without disrupting hospital operations, the process has been difficult.



Once which was glass in walkway is now boarded up.

One of the first orders of business was to get rid of the gnats. Estess recalls, "We had all kinds of experts helping us to decide what to do. It was one of the entomologists that we consulted that [decided] that it was a matter of pouring lots of salad oil down the drain [in the floor of the kitchen]." Evidently, the gnats were unable to fly with oil on their wings.

Estess continued, "Once we... identified the species and got more literature, it turned out that they apparently bred in the slime that forms around the pipe and inside the pipe. So we built our own pressure washer, a machine that pulls itself through the pipe... and just cleaned the pipe... the problem is gone."

The first step to relieve the pressure on the sewage lines was to reroute the pipes from the upper floors so they would bypass the ground floor. Next, they began to repair ground floor lines as they were able.

At this writing, more than ten months after the earth-

quake, the pipes under the kitchen are almost repaired.

According to Estess in an August interview, "They've finished one side and they'll start on the other side tonight... they're finding the pipes in general are in pretty bad condition... They are probably going to have to continue on... across the floor and replace the whole set of pipes... [they will be complete] probably within the week."

With the sewer lines at least temporarily, if not in some cases permanently repaired, there is still much to do.

While the ceiling tiles that fell during the quake have been for the most part replaced and better stabilized, there are walls to repair, sidewalks to dig up and concrete to repour. The equipment has been reanchored and reconnected, but the breezeway must still be rebuilt.

Estess said about the plans for the breezeway: "It won't be repaired to the design standards... what we would do if it were going to be permanent... It was solid glass... it's going to be built up with walls and small standard windows."

What to do with the slab

In the March damage report, the project team consultants agreed that the suitable repair solution would be to replace the existing slab with a new structural slab. The structural slab would be more current as far as modern codes are concerned, and would answer one last question.

That issue concerns; according to Urfer's letter in the DAR, "A gridwork of tie-beams below the slab-on-grade connecting all of the pile caps together. These tie-beams are intended to offer a lateral stability to the pile caps and allow the whole foundation system [to] act as a single unit."

The tie-beams appear to have settled in a manner similar to the slab. If this is the case, the new slab would address the concerns of lateral support.

So, if the answer is this simple, why wait?

Elmore said, "FEMA wanted us to repair the existing structure—that was the mandate... but it is a long process, whereas the only way they (WCH) can make it any shorter is to move out... entirely out of the ground floor..."

How long will this take? Perhaps up to seven years, according to Elmore, with an initial cost estimate of \$40 million.

It is this estimated cost

estimate that caused delays in making the final decision.

Under FEMA guidelines, if repair costs exceed one half of the replacement cost, the applicant is entitled to request reimbursement for an entirely new building.

If there is any good fortune in all of the hospital's troubles, this may be it. Estess said, "Notwithstanding the earthquake, the hospital was marginal financially. In a way the earthquake presents a serendipitous opportunity to configure [a new] facility to be financially viable."

Before discussions could continue about construction of a new structure, however, FEMA had to reevaluate the repair procedures and address issues of soil contamination under the site. They also wanted to ascertain damage to the tie-beams, if any.

New estimates based on a streamlined repair plan that would allow for the construction of additional ground-floor space for the various departments to move to during work on the slab, has brought the cost down. Estess said, "The new number I saw... was \$26 million, but the electrical bid wasn't in yet. I think it's going to come close to \$29 million."

Still over one half the replacement cost, Elmore adds a few more reasons to replace the building rather than repair it.

He said, "If you're going [to spend] let's say \$30 to \$40 million... to repair this building, what you've got is a nearly 30 year-old building. [A structure] that was designed pre-earthquake codes... that is still somewhat antiquated because of that... So why spend that kind of money when you can spend the same amount of money and have state-of-the-art [hospital design]... It makes no sense—it doesn't add up."

WCH administrators and engineers are now completing yet another report for FEMA and hope to have an answer on the agencies' decision to repair or replace the facility soon.

If they receive permission to replace the structure, Estess said, "I think we're looking at three to four years and perhaps one of the critical variables in there is the local question of land use..."

That question, along with an update on repairs and FEMA's concerns and an overall look at health care in this area will be included in the final installment of this series in the next edition of *The Post*.

Anne Chavre and Mike Kostyal contributed to this report. □