CALIFORNIA LEGISLATURE

SENATE SELECT COMMITTEE ON MOBILEHOMES

SENATOR WILLIAM A. CRAVEN, CHAIRMAN

Transcript of Hearing
on

MOBILEHOME EARTHQUAKE SAFETY

March 5, 1990

State Capitol
Sacramento, California

California Legislature

Senate Select Committee on Mobilehomes

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TRANSCRIPT OF HEARING

ON

"MOBILEHOME EARTHQUAKE SAFETY"

STATE CAPITOL

SACRAMENTO, CALIFORNIA

MARCH 5, 1990

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MARCH 5, 1990

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MARCH 5, 1990

California Legislature

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SENATE SELECT COMMITTEE ON MOBILEHOMES HEARING

"MOBILEHOME EARTHQUAKE SAFETY"

MONDAY, MARCH 5, 1990, STATE CAPITOL, ROOM 113

- BACKGROUND PAPER -

For many years, there have been concerns about the susceptibility of mobilehomes to earthquakes. The manner in which mobilehomes are installed raises discussion in particular about support systems on which the mobilehomes are perched.

MOBILEHOME INSTALLATIONS

Mobilehomes are factory built units constructed on a steel chassis with wood framing and metal siding. They are normally rolled on their own wheels and axles to the site, where they are jacked up, leveled and supported by piers or blocks spaced at a maximum of six feet on center along the frame. There is a state minimum 1 foot clearance required from the I-beam to the earth, although most homes are set about 18 inches to 2 feet off the ground.

Over the years, newer standards have been imposed and in some cases stiffened. Gas pipe connectors from the outlet to the home must be a maximum of 6 feet and made of flexible material. Gas appliances in the homes, such as water heaters, must be tied down. In 1973, new state regulations became effective to require mobilehomes to be installed to limit overturning and lateral movement in accordance with state approved manufacturer's installation procedures. Since 1980, tow-bars, wheels, and axles have been permitted to be removed.

1980 SEISMIC SAFETY COMMISSION REPORT

In 1980, the Seismic Safety Commission published a report analyzing damage to mobilehomes in four California earthquakes from 1971 to 1980. The Commission cited numerous failures of steel pier, concrete pier or concrete block supports where the mobilehome was not otherwise tied down to the ground. According to the report, the most severe damage to a mobilehome in these quakes, unless a gas or electrical fire destroyed it

completely, was where the home partially or completely fell off its supports, damaging skirting and accessories - such as porches, ramadas, awnings, and carports, and, in some instances, bending the frame and structure and damaging the floor - which was usually "punched" through by failed piers. This did not include undetermined damages to the contents of the home.

EARTHQUAKE RESISTANT BRACING SYSTEMS (ERBS)

Recognizing the problem with earthquake survivability of mobilehome support systems, in 1981 the Legislature enacted S.B. 360 (Alquist), Chapter 533, which required the Department of Housing and Community Development to adopt regulations to provide for the certification and listing of state-approved earthquake resistant bracing systems (ERBS) for mobilehomes. An HCD certified ERBS device is designed to limit the fall of a home from its support system to a maximum of 2 inches. ERBS devices are not designed to prevent damage, but rather limit that damage. Support systems may have to be reinstalled and the home re-leveled, but with an ERBS the home usually does not suffer major structural damage. By 1988, some 15 manufacturers of earthquake bracing systems for mobilehomes had been certified by HCD.

Although some have - in the past - advocated that earthquake bracing of this kind be mandated on new installations, the Alquist bill was simply designed to assure that where mobilehome owners do choose to purchase and have earthquake bracing systems installed, that such systems meet generally accepted seismic standards.

1990 HCD REPORT

The October 17, 1989 quake - which wrought wide destruction to a number of Bay Area counties - again focused renewed interest in earthquake safety for mobilehomes. After some three months of review, the Department of Housing and Community Development (HCD) released a report in January on the evaluation of support systems for mobilehomes - based on the October quake. In 12 parks where there was the most damage, HCD found that of 479 homes "downed" by the temblor, the majority were supported by steel or concrete piers.

Although the evaluation is subject to further study by HCD, the report seems to support the view of those who feel that existing state approved support structures for mobilehomes, other than ERBS devices, do not do an adequate job of protecting a mobilehome from significant damage, i.e. falling off its support system, in the event of an earthquake. The report also reinforces the view of some homeowners and others that leaving the wheels and tires on a mobilehome may serve to buffer shock waves better than commonly used support systems.

GAS RELATED FIRES

Of further concern to state and local officials, as well as earthquake safety experts, is the fact that although very few of the mobilehomes

which fall down in such quakes are irreparably damaged, those which have been destroyed are due to fires believed to be caused by broken or damaged natural gas line connections to the mobilehome, or unsecured appliances.

HEARING PURPOSE

The purpose of the committee hearing is to receive from the Department a formal presentation of HCD's findings from their January evaluation and report, and permit testimony from mobilehome owners, representatives of the mobilehome and support system industry, and others who may wish to add their comments about mobilehome earthquake safety problems. The testimony and information from this hearing will then be analyzed by the Committee and recommendations made where members of the Committee deem it appropriate.

QUESTIONS FOR THE COMMITTEE TO CONSIDER

1) How serious is the problem of earthquake damage to mobilehomes?

   (a) How expensive is it for homeowners to repair "downed" mobilehomes?

   (b) Are most mobilehome owners covered by earthquake insurance? Is the cost of that insurance commensurate with insurance on conventional structures?

   (c) Are damages to mobilehomes which are felled in a quake greater or more expensive to repair than damages to conventional residential structures?

   (d) What is the record of injuries or deaths in mobilehomes which have been damaged or destroyed in recent earthquakes?

2) How accurate is the recent HCD study on downed mobilehomes?

   (a) How many of the homes which fell down were installed prior to the stiffer 1973 state regulations on installation requirements?

   (b) Since only 12 of 27 parks initially surveyed were double-checked, does the department contemplate resurveying the other 15 parks at some future time?

   (c) Did HCD personnel physically inspect all the parks and downed homes in the survey, or is some of the information gathered on a "second hand" basis from local government?

   (d) Have the differences in the initial reports from local governments, HCD and the Office of Emergency Services on the number of downed and damaged mobilehomes been reconciled?

3) Does the information from the 1980 Seismic Commission Report and the 1990 HCD Report justify adoption of changes in standards for mobilehome support systems?

   (a) Should those types of support systems which appear to have failed in the greatest numbers be phased out for use on new installations or re-installations?

   (b) Should ERBS devices be required on new mobilehome installations or upon the resale of an existing mobilehome?

   (c) Do the damages to a mobilehome in an earthquake outweigh the cost of better support systems or mandatory ERBS installations, or are these costs more expensive than the potential damage and earthquake insurance premiums?

4) Is the most serious damage or destruction to mobilehomes in the event of an earthquake secondary - that is - fire?

   (a) Should a better gas connector system or shutoff valve be required on mobilehome installations?

   (b) Should regulations concerning inspection or re-inspection of gas appliances upon replacement in a mobilehome be stiffened to assure compliance with tie-down requirements?

   (c) What is the situation with regard to gas pipelines in parks where mobilehomes sustained the most damage? How many gas systems have had to be repaired or replaced?

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SECTION IV

T R A N S C R I P T O F T E S T I M O N Y

MARCH 5, 1990

SENATE SELECT COMMITTEE ON MOBILEHOMES HEARING TRANSCRIPT

"MOBILEHOME EARTHQUAKE SAFETY"

STATE CAPITOL, MARCH 5, 1990

SENATOR CRAVEN: We will now call our meeting to order and, rather than call the roll, I'll just tell you that I'm Bill Craven and we will be joined, I'm sure, by other members of the respective houses as things progress. With me today, on my left, is Sally Ridgeway, who is the Committee Secretary, and, to my right, is John Tennyson, who is the Consultant for the Mobilehome Committee.

This hearing is convened, primarily, as a result of the October, 1989, quake - which ravaged counties represented by Senators Mello, Kopp, and McCorquodale, in particular - from the Bay Area to Santa Cruz County.

Actually, Senator Mello had requested - back in November - that we hold a hearing to look into damages to mobilehomes, but, after checking with the Department of Housing and Community Development, we determined that accurate information about the extent of the damages was not yet available, and we chose to await the outcome of HCD's study of the matter.

Of course, their report was released in late January, and, having raised the issue of the adequacy of support systems for mobilehomes, in the event of an earthquake, they have now given us an issue to sink our teeth into, so to speak.

For those of you in the audience, a copy of the background paper and agenda for this hearing is available on the front table, as well as a limited number of copies of HCD's January report. I believe the background paper lays out the issues which we will cover today, so I will not belabor them right now.

I will say that the problems we address are not new. Senator Alquist's Seismic Safety Panel - and, later, the Seismic Safety Commission - has been warning of some of these problems for years. Whenever your home is perched a couple of feet above the ground, you are going to be susceptible to seismic forces and the potential for collapse.

The purpose of this hearing is to take testimony and gather information on the problems - primarily, support systems, and the latent fire dangers when a mobilehome falls down in an earthquake. We will listen carefully to the various points brought forth to us, analyze them and later determine whether, number one, there is a significant problem or problems, and, number two, whether legislative action is necessary and prudent to solve the problems.

Now, we have quite an agenda - so I want to move right along. We have two hours allotted for the hearing. Department of Housing Representatives have been asked to formally present their January report - and this may take, depending on the questions, at least 20 or more minutes of the hearing. After that, we would ask that each of those testifying try to limit themselves to, say, 8 minutes each and avoid repeating the same kind of testimony which we have already heard.

We would also ask that you state your name, city, and organization you represent, if any, for the record and speak directly into the microphone, as this hearing is being recorded. Again, I would admonish the audience to take their private conversations outside the room, as the noise interferes with our recording equipment and our ability to transcribe an accurate account of the hearing.

A transcript of the hearing will be automatically available in April or May to those who have testified, and, upon request, to others, if there are enough copies. Please fill out the sign-up sheet, which the sergeant has in his possession, with your name and address, if you want a copy. Ken Johnson is the sergeant with the blue blazer in the back of the room.

Now, let's get to our first witness. Here we are... Travis Pitts, who is Deputy Director, Department of Housing and Community Development, an old friend of this committee, a very, very vital cog in the operation of our legislative programs as it relates to mobilehomes. Nice to have you with us, Travis.

TRAVIS PITTS: Thank you very much Senator. Travis Pitts, Department of Housing. I hope you'll bear with me, as I have a little bit of a cough which has a tendency to manifest on difficult questions.

SENATOR CRAVEN: Don't feel badly. If you would feel more comfortable, I'll cough right back at you because I have one too.

TRAVIS PITTS: As indicated, Senator, in the Loma Prieta earthquake, we did what we in the Department of Housing had not been able to do before in smaller earthquakes and that is conduct a legitimate survey. After each of the earthquakes in Santa Barbara, Livermore, and Gilroy of relatively small magnitude, we had damage of mobilehomes, our inspectors who were assigned to the area to assist, primarily, with the health and safety aspects of having the mobilehomes reinstalled and occupied, did not have the time, nor was the damage significant enough to warrant such a survey. In the instance of the Loma Prieta earthquake, we quickly prepared a survey form and our intent was simply to determine which mobilehome support systems failed. We did not, at that particular point in time, have any intent of drawing conclusions. We thought, once we collected the data, we would then hold public hearings and have the data examined.

One of the first mistakes that we made was that we tried to incorporate data from local governments, who were also quite active in the Loma Prieta earthquake. The considerable differences between our inspectors and those of local government as to what constituted a mobilehome that was down or what damage was, caused us to throw out all the local governments' statistics and narrow the survey to that which we had some control over. For example, in Santa Clara County, the first reports were that there were 10,000 homes destroyed, and that, obviously, was not true so we relied only on the data collected by HCD inspectors. We initially looked at 27 parks. This was in conjunction with our inspectors being in those parks to assist with reinstallation and inspections for health and safety in re-occupancy. Following that, we had only learned how many homes were down and the types of support systems that the homes that went down were

installed upon. That was not adequate for the survey. We needed to know what the mobilehomes that did not go down were installed on. So, given the manpower constraints, we looked at the 12 parks where we had the most damage, and we revisited those parks and finally came up with the statistical data in the red booklet, here on the table, that indicates the number of homes in the parks that we looked at, what types of support systems were on these homes, how many of the homes on the various types of support systems stayed up during the earthquake, and how many of the mobilehomes on the various types of support systems went down. And the statistical data that we developed is relatively narrow - given the magnitude of the earthquake, we simply did not try and count all of the homes. We could not. It may differ from the data of local governments and other interested parties who did their own surveys, but it is our survey, and we can back all of these findings up with the appropriate data and survey reports of our inspectors. I am saying that reasonable people may differ on our findings because we did not survey the entire universe.

As we went from park to park with our inspections, we found that there was a considerable difference in the number of mobilehomes down, based upon the type of pier system installed on the home, so we have records portrayed in the red book that indicate the steel pier, in an earthquake, performed less adequately than the larger mass concrete block, slightly less than the concrete pier. By the way, the concrete pier is almost no longer used at all. Many of the parks in the earthquake area were older parks, so the concrete pier is rather a rarity, although we found a significant number of them in the parks where we had the damage. We give credit to the fact that the principal difference with the steel pier is

not in its strength vertically - it has superior capacity to concrete block - the difficulty is, in an earthquake, it's not the vertical force or the holding power that we're looking at - we're looking at horizontal movement. Many of these homes moved horizontally. One that we noted on an earthquake bracing system in Santa Cruz had moved 6 1/2' horizontally from the space where it was originally installed. The concrete block offers a larger surface mass for this narrow I-beam or C-channel of the mobilehome to ride upon, therefore, a shift of a few inches can be accommodated in most cases by the concrete block. We acknowledge, however, that in the event that the earthquake causes an upheave of the ground, and the mobilehome goes up and back down, in most cases, the steel pier, if it were landed squarely upon by the home, could sustain that, the concrete block normally shatters. So there are good and bad aspects of all the types of support systems we looked at. Statistically, the steel pier tumbled over and, as you can see from its configuration, which will be pointed out today, it's pyramid shaped and its relatively small bearing surface at the top lend it to being easily toppled in horizontal movement.

So, again, we propose to hold hearings later on this year. We've had two other disasters since Loma Prieta. We've had the heavy snows that we have inspectors dealing with right now in Nevada and Placer Counties - several mobilehomes damaged as well as many accessory structures - and, this afternoon, our inspectors begin their survey in the Southern California earthquake that has recently occurred, so it will likely be some time before we have sufficient staff to sit down and hold our hearings. In the interest of time, Senator, I'd be most happy to respond to any questions.

SENATOR CRAVEN: John, do you have any comments at this time?

JOHN TENNYSON: We were given some information from the California Manufactured Housing Industry that brought into question the data from your report with regard to older parks and whether these were installations - that is, the homes that fell down, were installations that were put up prior to 1973, when apparently the regulations were changed to require that installations be inspected in accordance with manufacturer's installation instructions. Do you have any comment on that, Mr. Pitts?

TRAVIS PITTS: Well, when they first contacted us to determine the ages of the mobilehomes to raise this argument, we had not initially done a survey of the age of the park to determine whether or not it had anything to do with our inspection standards. We had to go back through all of the park data and bring this information up for the California Manufactured Housing Institute. It statistically bears out that we should not have looked at it, perhaps, in the first place, because of the mobilehomes installed, 610 of those surveyed were in parks where inspections were made. In other words, they were installed after July 1st, 1974, when the regulations went into effect. Of those 610, 292 were down, or 48 percent.

JOHN TENNYSON: 48 percent of the total that were down?

TRAVIS PITTS: 48 percent of the homes in the parks, 12 that we surveyed.

JOHN TENNYSON: ...that were down, were installed after '73?

TRAVIS PITTS: That's correct. After July of '74, in the older parks, those down, out of 1,824, was 300 or 16 percent. Our argument is - is not so much with whether or not they were inspected. Earthquakes are rather odd geographically - they have a tendency to jump over large geographical areas and impact an area further from the epicenter than a park that might have been closer to the epicenter. Soil conditions play a very large part in how the earth shifts also, so I'm not sure that the inspection data is a relevant gage.

SENATOR CRAVEN: Thank you, Travis, very much. Appreciate it. Here's Senator Mello now. Senator Mello, Mr. Pitts of the Department of Housing and Community Development has just testified on some statistical figures which he and his Department have gathered, relative to the earthquake and the types of foundations, if you will, utilized and the efficacy of one versus another... I was wondering, I don't like to take you by surprise, but do you have any questions along this line that you would like to ask him, relative to those figures that he has recounted for us?

SENATOR MELLO: I apologize, I didn't hear the figures and I was looking for some notes my staff was supposed to bring down here and I want to thank you, first of all, for having this meeting. Oh, is this it?

SENATOR CRAVEN: I mentioned at the outset, Senator Mello, that you had called for a meeting right after the earthquake, but we thought, in order to do so with some degree of effectiveness, we should have some data that we could refer to and this is now what Mr. Pitts has been presenting.

SENATOR MELLO: Let me just say that, representing the Monterey Bay Area, we had some 500 homes in total that were affected by the earthquake, and I went out and looked at many of these homes in the parks. The parks that had mobilehomes that were attached to the ground through a foundation survived quite well. As far as the ones that were setting on piers, when the shaking took place, they just started shaking, and many of these homes collapsed, and the electrical wiring inside shorted out, many of the gas lines ruptured, there were fires and other damage, and so I think these are several things that we have to look at. That's why I'm pleased that so many people are here today representing so many different groups. We need to address what we in the state can do to help protect, first of all, this way of providing affordable housing that's so important for everybody, especially, and, secondly, how to make it safe, because we had a 7.1 earthquake which did a lot of damage, and they're talking about gearing up for a possible 8.3, which the geologists say is forthcoming, and we certainly don't want to see any unneeded loss of life or property.

But the questions I have are what can the committee recommend to the Legislature in a way of making sure that mobilehomes are tied down through a foundation and to the ground, anchored... and, then, secondly, if that's done, the kind of structural reinforcement change that might be needed... the most important thing that I saw is the lack of being secured to the ground. That's where the damages occurred. So, I'm interested in hearing about that. The other peripheral issues are, you know, wiring and gas supply lines... you can use sewer and water if they rupture... it's not a life threatening danger such as gas and electricity. But I really think we have to look at all ways of making sure that mobilehomes are not...

they're mobile, but once they're in a park, they usually stay there awhile. I think it's important that we come up with securing them to a foundation someway so that they can withstand these earthquakes, especially in areas... I don't even know whether we'd need to go statewide with this or whether... if you look at the fault lines, they're pretty much throughout the entire world. Sacramento is pretty well removed, by 30 or 40 miles, from a fault line, but what happens is, when a major earthquake comes, it can extend the damage two or three or four hundred miles away, so that I have a lot of concern with this , and I'm sure the Chairman has expressed that kind of concern over the years also. If there's anything further you could add that you haven't covered already, I would certainly appreciate hearing about it.

TRAVIS PITTS: Senator, Travis Pitts, Department of Housing. The only thing that I could add is that we do not disagree with you that the Loma Prieta earthquake at the 7.1 magnitude on the Richter scale clearly demonstrated that our current standards for the installation of mobilehomes are questionable as far as adequacy. We have the data now in our little red report that we have never had before, and that clearly demonstrates the inadequacy of our regulations, which support only the vertical load of the manufactured home. In no way do our current regulations for mobilehome park installations even address the horizontal forces of an earthquake, or even wind for that matter. So, given the fact that we have the data and the hearing today, the interest of the Legislature, we are committed to holding public fact finding hearings later this year to determine what direction we need to go.

As far as the electrical connections, we do not have a change proposed. Our electrical connection to these homes is currently a flexible connector; it's protected by over-current breakers. If there were any ideas as to how we could further protect the electrical installation of these homes, we would certainly be glad to look at them through the public hearing process. We are already looking at the gas situation. We lost some homes to fire in this earthquake. The fire was directly related to the earthquake because the home, as it went down off the piers, severed the gas line and there was some source of ignition, such as a water heater close by, that caused the fire. We have previously looked at the only available earthquake gas valve, which is a vibration sensitive valve with a large ball that covers the gas outlet and shuts off the gas supply in the event the gas line is vibrated. We, in the Department, have for years had some difficulty with the design of that valve because, in tests, they are subject to a lot of nuisance tripping - a large truck goes by on the road, if the homeowner bumps the pedestal with the automobile, they're constantly shutting off. Even a good bang with the lawnmower would shut the gas off. We're more interested in the type of gas valves being used in Japan which are flow-sensitive; they're called excess flow valves, so that, in the event of a rupture and any excess flow, they will shut off automatically. We've contacted the American Gas Association and Underwriters' Laboratories and found that, although there are no such valves currently manufactured and approved for sale in California, there have been several submitted for review. We're looking forward to the results of the evaluations by the Gas Association and Underwriters' Laboratories. If a valve were available which would be sensitive to the excess flow, we certainly would recommend it for inclusion in our regulations.

JOHN TENNYSON: Mr. Pitts, I understand from your report and others that some feel - they're not exactly sure what destroyed these homes from fire, but they suspect - that it was a ruptured gas line or, perhaps, an appliance, a gas appliance, such as a water heater or a stove that was not tied down. Would a pressure sensitive valve eliminate that danger even if you didn't have an appliance... if you had an appliance that was not tied down, or do you know?

TRAVIS PITTS: Mr. Tennyson, I do not know. The gas line to a hot water heater, for example, is one-half inch. I am not sure of the sensitivity level of these excess flow valves. We use excess flow valves in recreational vehicles on LP gas systems. The difficulty is the system is much smaller and I could tell you clearly, "yes", in a recreational vehicle, if you were to severe a half inch line, it would shut off, but, where you're normally dealing only with a three-eights supply, I don't know enough to respond to your question accurately at this time. We've seen no data on these types of valves.

JOHN TENNYSON: Do you have any data on the cost of installation in each unit of such a valve, for each space?

TRAVIS PITTS: In every case, Mr. Tennyson, we will be very sensitive to the increased cost of installation as we make recommendations for amendments to our regulations. In every case, there is a point of trade-off between the cost and the benefit, and we will certainly be sensitive to that in our regulations.

JOHN TENNYSON: How do utilities feel about the issue of utilizing pressure sensitive or other types of shut-off valves in a mobilehome park?

TRAVIS PITTS: I do not know. The utilities do not use them and they have not recommended them to us. In fact, in the past, when these types of vibration valves have been presented for mandatory installation on a mobilehome, the utilities have been unanimously against that type of valve, but perhaps it's, again, because of its nuisance tripping.

JOHN TENNYSON: What does it take to get one of these valves approved? Is there some kind of a certification process?

TRAVIS PITTS: There is a certification process in the area of gas valves that is typically approved and evaluated by the American Gas Association. The American Gas Association has indicated to us that there have been valves submitted to them - the evaluation process is about 4 to 6 months - and indicated that they may have such equipment approved by this summer.

JOHN TENNYSON: On a nationwide basis?

TRAVIS PITTS: Yes, they would be nationally approved. We recognize AGA so, if AGA were to approve it, it would automatically be recognized by us.

JOHN TENNYSON: And then people could install these, or would they have to be certified by your Department before they were legal to install on a mobilehome in a mobilehome park?

TRAVIS PITTS: Any alteration to a gas line requires a permit and inspection by us.

JOHN TENNYSON: So, you'd have to draft regulations for this, and how long would that take?

TRAVIS PITTS: It would not take any length of time to draft regulations. We already have regulations for alteration of a gas line, so, if we had an application from a homeowner, who wanted to install a device, no regulation would be necessary. A mandatory requirement for such valves, or any regulatory requirement for the valve, would require an amendment to regulations.

SENATOR CRAVEN: Thank you very much, Travis. Now, I'd like to welcome Senator Ralph Dills to the hearing. Senator Dills is a member of this committee and has been for some time. Senator Dills, like myself, is a Southern Californian and he represents his district out of Gardena and he has been a long-time supporter of mobilehome living as well as anything in the mobilehome legislative field in which he has a great interest. We are very happy to have him with us. Senator Dills, thank you very much. Let us go next to Mr. Gene Adams, AMA Mobilehome Service, from Riverside.

GENE ADAMS: Mr. Chairman, Senators Mello and Dills, I am in the mobilehome installation business. I've been in the mobilehome business since 1963. I'm under them, on them, in them, and everything. I relocate mobilehomes, and what I'm finding with my customers in Southern California

is that so many of the mobilehomes are setting so high and, because of that, they also are setting on steel piers - and nothing is wrong with the piers that I have found in my years of experience. However, I do find, in many, many cases, and I just, last Friday, took this screwjack out of the top of a pier underneath one of the mobilehomes on which I installed locktops. That's the condition of the screwjack - it was setting under the frame instead of the lip being up along the side of the frame - even had it been there, it was on the open side of a channel - and it wasn't holding a great deal. And, you'll notice the nut is exactly in the location where I took it out from under the mobilehome, which is approximately 3-1/2 inches from the frame. Regretfully, I find a lot of that. We find very, very few cement piers or blocks in Southern California. We can discuss the force on a cement block versus a steel block... I'm not an engineer so I can't talk intelligently about that probably, however, I have, in the past, put mobilehome parks in. In 1983, I put a park in down in Montclair. At that time, Cal Vet required that we attach the screwjack to the frame for them to finance the homes on private property or own-your-own lots. They felt that was a big security. Since then, some of the manufacturers have come out with the locktop and I think it's great. We keep it within the 2 inches that we're supposed to keep it by California Code, lock it to the frame, lock it to the pier, and attach the pier to the pad.

Now we've got, on an average, for a 24 by 60 foot mobilehome, 48 points of support. That seems to be, of course, in my opinion, that's adequate, however, I have not been through a 7.2 quake - I've been through some of the others. We have, at this time, 15 or so earthquake bracing systems

which, I understand from the report, that many of them were under homes in the Santa Cruz area and none of them failed, whether they were certified, homemade, or whatever. Therefore, we pretty much know that we've got to have a better bracing system than we currently have, whether we put locktops on the steel piers, put steel in the cement blocks, or whatever we have to do, I'm in favor of that to protect our people. I'm still finding many, many mobilehomes setting on the one inch 12 by 12 pads. Many of those have deteriorated to the point that the piers are down in the dirt, or the dirt has washed under the mobilehome because of the grading of the mobilehome parks, and are rusting. I took a pier out from under a home the other day - the one whole half of it was rusted away, so there was no support at all. We need to do something for the million mobilehomes we have out here to give them some protection. We may not be able to get an earthquake bracing system for $4-5,000 for everybody but we at least need to get some locktops on these piers and help them in some way. And I feel that the 48 points of support under the mobilehome, with the locktops locked to that pier, are going to do the job. Thank you.

SENATOR CRAVEN: All right, thank you very much Mr. Adams. Let me just ask you a question relative to something Mr. Pitts mentioned. He talked about the difference in vertical load and horizontal roll in earthquakes. Do you have any thoughts on that? In other words, what he's saying is that it's moving this way, rather than pressure from above.

GENE ADAMS: Well, like I said, I'm not an engineer, but I know that, if you lay a 2x12x24 pad on the ground, you can push it to the side. However - and that's one I-beam under a doublewide - line 3 more of them up over

here and see what it takes to push it sideways. Therefore, here again, we're operating strictly on theory with the existing mobilehome bracing systems. That's my theory, that if we lock that pier to that frame and make it part of the frame, it's going to stay there. And the key to this whole thing is, in my opinion again, if we can keep the piers under the mobilehome, they will support it - they are designed to do that.

JOHN TENNYSON: When you say lock, are these bolted to the frame?

GENE ADAMS: Yes. I don't have one with me, but you'll see several of them today. One of my colleagues has one here that he'll show you. They clamp on one side and there's two bolts with another clamp on the other side.

JOHN TENNYSON: How do they operate in an earthquake where you have horizontal movement?

GENE ADAMS: Rich has one, he may show me in a minute...

JOHN TENNYSON: Mr. Pitts, there's nothing in your report concerning this particular type of device. Has your Department had any experience with this type of locking device in the Loma Prieta quake or any previous quake? Could you comment on that?

TRAVIS PITTS: We have had experience with this type of device, yes. Many of the installations... well, not many, but some of the installations now are being installed with the locktop pier. We did not evaluate, nor did we find a high number of these at the Loma Prieta earthquake. The

principal advantage of the locktop is that, in many cases, when a mobilehome is bounced or upset from its pier system in an earthquake, the home comes down and the pier doesn't fall over. If the pier does not fall over with the mobilehome coming to the ground, the pier itself becomes a missile that goes through the floor of the mobilehome doing substantial damage. One of the major advantages to the locktop is being clipped to the frame of the mobilehome and that does not occur. Typically, as the home moves horizontally, the pier will go over since it's clipped to the home, and I've never seen one of these devices that was guilty of penetrating the floor, but I don't have enough data to either affirm or deny what is being said here.

JOHN TENNYSON: This is not an earthquake resistant bracing system?

TRAVIS PITTS: No. It's a superior method of installing steel piers.

SENATOR MELLO: I think your description goes part way. You're connecting the pier to the frame of the mobilehome. What I've seen happen, in this last earthquake, is that it requires, in my opinion, a firm attachment into the ground. Now, homes that had a concrete footing, a foot wide or 18 inches, that went down two feet or so that were reinforced around the perimeter of the foundation - depending upon the soil, of course - but that made a fairly tight, rigid attachment to the ground. Then you have, like for conventional, you have a mud seal on there and a plate, and that connects, you know, to the home. What I don't think would have withstood even a 7.1 is attaching these piers to the frame of the mobilehome, the whole thing will shake and it will move several feet, back and forth. In

my opinion, you need something that's going to really anchor right to the ground and I've seen some drawings earlier where they put some rods into the ground somehow - 3, 4 or 5 feet - like the utilities use for these guy wires. They stick them down, then something opens up and it makes a firm attachment there and that makes a rigid tie and then you come through your pier with that and then off of the mobilehome, then you have something, I think, that will not move. But I'm just afraid that these you have will not go through this 7.1 or 8.1 or whatever, unless it is firmly attached to the ground.

GENE ADAMS: Well, Senator, my theory is based upon the fact that, to me, they can rock and roll but, if you tie them to the ground, they're going to disintegrate. That's my theory. We're building high-rises, we're building shopping centers and things now on roller systems, on water systems, and other things, for that reason, and, here again, that's strictly my theory. I am not an engineer but I have installed a lot of locktops and, like I say, in 1983, I did put a lot of mobilehomes in Montclair, and we did this for Cal Vet. Now, where that came from, I don't know, but they required it in order for people to get financing on those units. Therefore, there has been some study someplace that required locking that screwjack to the frame.

SENATOR CRAVEN: Very good, gentlemen. Thank you both very much.

I am very happy now to welcome and introduce Assemblyman Dan Hauser, who represents the Northern California area, and who has had a continuing interest in this area of legislation. Thank you for joining us, Dan.

Next, Mr. Richard Clifton, C&R Pier Manufacturing, also from Riverside. Did you feel the last quake strongly? You're not far from the epicenter.

RICHARD CLIFTON: Most definitely. In fact, I live in Ontario and we enjoyed aftershocks like everyone else; it gets your blood circulating.

SENATOR CRAVEN: I think that's a very benign way of saying it.

RICHARD CLIFTON: Well, you come to expect them, living in Southern California. It becomes a way of life. Mr. Chairman, Members of the Committee, and Mr. Tennyson, thank you for allowing me to speak to you today. My name is Richard Clifton. I'm the President of C&R Pier Manufacturing. I hope that you'll allow me to read from my notes, as I think it will be better than me trying to speak off the cuff.

SENATOR CRAVEN: No problem at all.

RICHARD CLIFTON: We're one of the leading manufacturers of steel supports used in the manufactured housing industry. My background is as a manufacturer of the steel supports, also as an installer and service technician, and, of course, in the sale of manufactured homes, I've been involved in that aspect. I've been in this industry since 1971. I'd like to start out by saying that I'm generally in agreement with most of the findings within this report. As in all such reports, there are errors and omissions which I think are to be expected with reports of this type. Our own views of the damage of the Loma Prieta earthquake, as well as the

earthquakes that we personally saw damage in Santa Barbara, in Whittier, Coalinga, this type of thing, generally show that manufactured housing does pretty well. In many cases, the damage is not too severe - skirting, porches, and, in some cases, awnings, of course, are severely damaged. The reinstallation of the home that has come down, in most cases, is relatively easy.

The big problem to us appears to be the possibility of damage to the floor, sub-floor, return air ducting, plumbing, etc. when the home comes down on the supports, whether they be cinder blocks, concrete blocks, cement piers, or steel piers. Keeping the support system under the chassis beams where they belong we think is the major problem. There are advantages and disadvantages to all three of the typically used support systems. I won't go into a great deal of detail about these, at this time, however, I will say that, to a certain extent, the opinions of the people who use the different types of supports seem, in many cases, to be prejudiced by the geographical area of their operation. In Northern California, for instance, we see a lot of block being used; in Central and Southern California, you would be hard pressed to find anything but steel piers; in Arizona, it's also split, depending on the the local preference. Most states, we find, are this way. We do sell our products, by the way, in many states in the United States.

There are other factors that also increase the failure of manufactured housing unit support systems during severe seismic activity. One that we say quite often was a severe slope of the land for drainage within the mobilehome park setting. This leads to the units being set too high. The

lower the center of gravity we can maintain and still work under these homes, the better. Another factor we witnessed was the fact that many of the units damaged were installed prior to the code requirements for supports and footings. We saw many units with support 7, 8 and, in some cases, 10 feet apart, on three-quarter inch thick, 12 inch by 12 inch pads, and, in many cases, no pads at all were used to spread out the loads. Wide spread use of ornamental block is mentioned in this report and it's typical of what we see in the field even today. The use of porch piers, which are steel piers designed for use under porches and decks, not under manufactured homes, are often used even under today's installations.

This leads me to another problem area. We don't allow homes or other buildings to be constructed with unreinforced concrete blocks - we shouldn't go backwards now and suggest that stacking blocks, without the benefit of steel and concrete enhancement, be considered as an adequate support system. The use of flexible gas connectors, 6 foot in length, specially designed for use in California, was put into place to prevent the rupture of gas piping systems during an earthquake. However, the typical installation method is to fully extend this line, which negates its intended purpose. In addition, we may want to consider, as you've already spoken about, an approved seismic gas shut-off valve. Even today, in the field, installers who will be truthful will tell you that most enforcement agency inspectors - and I might add here, this is not necessarily the case in all areas - in fact, I have found not as often with state inspectors as with local enforcement officials - they don't crawl under the units during an inspection of the installation to make visual verification that the home was installed per the manufacturer's

specification and the specifications of the support system. Without consistent verification in the field, we fall prey to the unprofessional workmanship that can lead to later problems. Now that permits and inspections are to be part of the installation of approved earthquake resistant bracing systems, are we going to actually see field inspectors crawling under these units, with the spiders and other unpleasantries found underneath an existing home, to make certain that the system has, in fact, been installed correctly? Experience would tend to lead us to the conclusion that it won't always happen.

The industry has had, for several years now, the ability to produce better supports than those that have been used in the past. Here's where I must voice my strongest complaint. In 1987, we at C&R Pier developed an improvement to the typical adjustable bearing jack most often seen in use. We spent a considerable amount of time and money on the development and testing of this adjustable jack that attaches the chassis and also the pier... it also attaches directly to, we think, should be attached, excuse me, to the footing. Most of the manufacturers today, have a design of their own that accomplishes basically the same desired results. After testing, we forwarded to the Department of Housing and Community Development the drawings and the test results for listing of this product. We were shocked to receive, by mail, a notice which read, and I quote, "There is no need for attaching mobilehome load bearing supports approved under Section 1334, Title 25, to the mobilehome chassis beam." We strongly disagree. Our experience is both designers, manufacturers of supports, and, most importantly, as installers of manufactured housing show us then, that anyone with good common sense would see the value of

maintaining the continuity of the support, the support ground contact pad, and the chassis beam. In any set of circumstances, the risk of the home being damaged or coming down during seismic activity, high winds or storms, is greatly reduced when we keep the supports in contact with the chassis. Also, stronger, perhaps broader based supports placed in strategic locations may also improve the installation. These are also readily available today.

Placement of the manufactured homes on a permanent foundation works well in private property settings. However, I can see all manner of problems in a land leased for rental park setting. The relationship between the landlord and the tenant sometimes leads to the moving of the home. Also, in areas, where we have military housing, for instance, which is very often manufactured housing, we have frequent moving of the housing units. We should consider all these factors and many more that I haven't touched upon when we consider changes to the installation methods and materials. In closing, I would just like to say that we, as responsible members of the industry, should go forward with open minds and utilize all the talents we collectively have to provide a safer environment at as reasonable a cost as we can. Let's make sure we go forward with this hearing and future hearings, and that the end result be an improved product - one that is still affordable - because this truly is the only remaining affordable housing available to many families, and we must - as an industry - maintain that stature. We at C&R Pier Manufacturing are eager and willing to serve the industry in designing an improved standard by which all manufactured homes are installed, not only in California, but throughout the United States. What we do here in California, almost

always affects the industry as a whole. Thank you again for giving me this opportunity to speak today at this very important first step in an improvement process that is certainly needed in our industry.

SENATOR CRAVEN: Thank you very much Mr. Clifton. Any questions from the Committee? There appears to be none, we thank you very much. Next is Mr. Steve Clark, Safety Beam, Sonora.

STEVE CLARK: Mr. Chairman, Members of the Committee, members of the public, thank you for giving us, for the first time in a long time, an opportunity to bring before legislators some of the critical needs that we have, in the earthquake bracing industry, been very aware of for a long time. My name is Steven J. Clark, I'm President of Unigard Technologies. We're a manufacturer of a certified earthquake bracing system and, also, heavy duty piers. Mr. Chairman, with your permission and in the interest of time, I'd like your permission to advise and extend my remarks by writing to the members and also to present the committee with some newspaper articles that may give them a little more background.

SENATOR CRAVEN: Fine, if you're submitting your statement, I think that's fine and then, perhaps, you would care to extemporize or, you know, expound upon what you may have said there in writing.

STEVE CLARK: Thank you. This problem is not a new problem... the problem of earthquake damage to mobilehomes, that we saw such a graphic example of in the Loma Prieta quake, just a few months ago. As a matter of fact, I would draw the committee's attention to a report that was published by the

Seismic Safety Commission and the title of that report was "Mobilehomes and Earthquake Damage", numbered as 79-7, that was published in 1980. This report detailed in exquisite detail the problem with mobilehomes going clear back to the 1971 Sylmar earthquake. And, Members of the Committee, every report that's ever been generated since that time by the Seismic Safety Commission in regards to mobilehomes and earthquakes has reached the same conclusion, and that is that the foundation systems that they typically use are absolutely inadequate when it comes to an earthquake. And, in fact, quoting from that report in 1970, the conclusion of that report was that both cinder blocks and steel piers represented highly unstable means of holding these mobilehomes up. And, so it's not a new problem.

The problem, as I see it, is that the people who have been responsible for keeping up with the changes in mobilehome living and lifestyles, have not built building codes and, when they do their inspections, has not created a situation where they've taken a look at the reality of how mobilehomes today are used. Mobilehomes, anymore, are very rarely ever moved. We call them mobilehomes and, in fact, the industry itself has tried to change that terminology in relation to these buildings to becoming manufactured housing. And the reason for that is that, unlike back in the 50's and 60's, these used to be trailers and the most approximate thing that I can compare them with today would be camp trailers. Today, these homes are permanent fixed homes. They've evolved into that over a period of years. The problem is that the building codes, which determine how these things are set up and how they're allowed to be installed, have not kept pace with that. And I believe, that that's the subject that the

committee has to wrestle with at this time. Now, up until this last earthquake, there has never been any verifiable means of determining what works in relationship to mobilehomes and what doesn't in terms of keeping them from falling.

This report, for the first time, tells us two things. First of all, that steel piers and cinder blocks don't work. And I've heard that HCD is giving some consideration to revising the standards for the installation of mobilehomes that would make it so they would be put on cinder blocks instead of steel piers. Well, with the information that I have provided you in the exhibits there, I think that you will have to conclude with me that that's a situation where the Department would be jumping from one frying pan into another frying pan. The fact is that neither one of them work. This report concludes that one thing does work, gentlemen. And the one thing that it says worked in every instance in this earthquake and going back in all other earthquakes, there has never been a record of a failure, is earthquake bracing.

Now, when a product has a 100 percent safety record, then I believe it's time to take a look and say okay, we do have something finally that we can put our finger on that works, and I would propose that this committee take a very strong look at making earthquake bracing, as we have it today, part of the standards for installing mobilehomes. If it's done then, at that point, every mobilehome that goes in is going to be protected without damaging the means of these homes being installed today. The simple act of adding earthquake bracing to a mobilehome doesn't change the fact as to whether it needs to be installed on cinder blocks or whether it needs to

be installed on piers, or to go to something as exotic as permanent foundations, which is very expensive. That would be the suggestion that I would bring before the committee today, that they take a very strong look, if it would be feasible to require earthquake bracing on mobilehomes and I'll be happy to answer any questions the committee may put before us.

SENATOR CRAVEN: Well, let me just ask one. The thought of putting earthquake bracing on mobilehomes... Would you do that on a regional basis or would you make that statewide?

STEVE CLARK: Senator, I think that, at a very minimum, it should be in Seismic Zone 4 areas. It could be statewide and, certainly, there's enough evidence to suggest that areas in a quake the size of an 8.2, that are some 2 and 300 miles away, may be affected sufficiently, that it would be a good idea. Generally speaking, the Seismic Safety Commission studies have indicated that mobilehomes begin falling at about the level of a 5.2 to about a 5.5 earthquake. And, virtually, the entire state is subject to earthquakes of that size.

SENATOR CRAVEN: Well, that's a very interesting point. Those of us privileged to serve in the Legislature invariably run into individuals who, exhibiting, I suppose, a personification of the American spirit, say you're forcing us to do thus and so. My colleagues and I recall very vividly when we had the seatbelt regulation law in the state of California and people would write and they would call and would storm around your office and say, "How dare you tell me what to do, it's my life and if I choose to do it, I'll do it and if I don't want to, you shouldn't force

me." Well, that sometimes creates somewhat of a dilemma, because, no matter how charitable we are, as it relates to our relationship to our constituency, we sometimes find ourselves in a situation where we're saying we know what's best for you. We have a sort of a paternalistic attitude, or maternalistic, but since we have no feminine legislators here with us today, we'll stay with the original paternalistic term. So that's why I mentioned that. In other words, I live in Oceanside, which is about 35 - 37 miles north of San Diego, and when we had the quake which has been referred to with the epicenter in Upland, which, of course, is in Southern California,.. I found, or my associates in our Carlsbad office, which is where our district office is, felt it very, very definitely. And, we are probably 80 - 90 miles from that area, and we found that, you know, repercussions. I don't think we had any damage but we certainly felt the roll of the ground. So, it's sometimes a situation where you wonder well, should we anticipate this thing and shore ourselves up against what we hope will not be, but kind of feel may well be, an eventuality, or should we just say, well, we'll stay with the red zones that we are, you know, are proven fault lines and one thing or another. That's the question that enters my mind.

STEVE CLARK: Senator, I think that there's been a great difference in the way the building codes have developed. Building codes in regard to fixed buildings evolved over a period of years. The changes in mobilehomes have come about very, very quickly and, as a consequence, they haven't had a chance. Now, for instance, if you were to take and go back 30 years on regular buildings and let us bring those same standards up today, and, suddenly, you were to say to all of the contractors, we're enacting this

standard, I'm sure they would object also. But, the problem is that we've never done anything about mobilehomes. Mobilehomes are still being installed today on exactly the same basis they were in 1955 and, as a consequence, it takes precipitant action, once we identify the program in order to do that. And, if I may make a suggestion, there's something that might make it palatable and that would be, I think that the problem is that we have more and more mobilehomes going in on permanent foundations. About 30 percent, last year, went on permanent foundations because they were on private land. The big problem we have is with homes that are existing homes today and there's over a million of them out there.

Now, if we were to have something such as a due on sale, where we wouldn't force an owner to go out and spend - these things range in price all the way from $1,400 to $4,000 - don't force anybody to go out and do it but, if we were to have it so that when that house was sold, the new owner would be required to have earthquake bracing before they could move into it. That would solve the problem, and, in a rising tide, all boats rise. It wouldn't cost sales because you're adding a small percentage to the value of the home. And the committee might also consider, and I think the atmosphere will never be more acceptable both legislatively and with the public, that for those people who can't afford it or possibly in a retrofit situation, to consider some sort of a tax credit incentive to these people, because, one way or the other, the state is going to pay for it, whether it be by increased insurance premiums, or whether it be by disaster teams going in there to clean up these homes after they've fallen down. It may well be worthwhile for this committee to consider some sort of tax incentive to encourage people to take this safety step.

SENATOR CRAVEN: It's a very, very interesting point and I think very germane. The only problem is, of course, sometimes, convincing the constituency of the efficacy of that philosophy.

STEVE CLARK: Not to mention the Governor, Senator.

SENATOR CRAVEN: Exactly. Oh, we don't have too much trouble with the Governor. We send Senator Dills down there, who has known the Governor since he was but a fair boy. But, we want to thank you Mr. Clark for your very cogent remarks and, we appreciate you bringing... yes, Senator Mello.

SENATOR MELLO: Just a brief question. When you talked about earthquake bracing, are you, more specifically, I know, in the new UBC Code for homes, they are developing a shear wall in the corners of the foundation by putting in half inch cd plywood and nailing it on 3 inch centers on all the corners and that, effectively, serves as a strengthener for the shear. Is that comparable to what you're proposing in mobilehomes?

STEVE CLARK: No, Senator, there's commercial systems available now that are designed, in fact, certified by HCD, that are designed to limit the fall and travel of mobilehomes. We have to be very careful in terms of how we go about reinforcing these homes because any seismic expert will tell you that if you rigidize a structure against earthquake movement, you're going to increase the potential for damage to contents and to the structure of that home. Now, that's one of the problems you get with a foundation. You'll never out wrestle an earthquake. The earthquake

always wins. Many of these systems are designed to move but not let the maximum amount of damage, which comes in every case by falling. A little bit of movement is okay. Falling to the ground, obviously, is extremely damaging, and, anything that you're going to take that's going to tie that thing to the earth and rigidize it, the structure of the home, very well, may not take. Now, for example, in certifying our earthquake bracing, we can't consider the frame of the home because the braces themselves are much stronger than the frame of the mobilehome. And, so, you may actually create structural damage by the rigidization that you do in that case.

SENATOR CRAVEN: Thank you, sir, very much. I, also, now want to welcome Senator Bob Presley who represents the County of Riverside and who has an ongoing, long-time interest in the mobilehome area as well. Welcome, Bob. Next... well, before I introduce the next gentleman, let me say that we've now been at it about an hour and we have an hour to go, but we have a lot of testimony yet to be received. I think we've made certain points. There seems to be certain similarity in what has been said, and I think that most of us are willing to stipulate what you have said, so if you can move away from those areas that have already been covered, we'd appreciate it. Next, from Central Piers, Inc. in Fresno, Mr. Doug Ladd.

DOUG LADD: Thank you, Mr. Chairman. I also manufacture steel piers in Fresno, and also manufacture a state approved permanent foundation, which a u-bolt fits into cement, and which they are using in Fresno, Madera, and Tulare County, and some of the counties, which is great. I also have test data on my standard piers with the locktop to the frame, and the piers - I took them to BSK Testing Lab, which is a state approved testing lab -

tested 36,900 pounds vertical load, vertical uplift was 7,800 pounds, and lateral strength was 2,100 pounds. That far surpasses anything that the state requires. My main concern is with the people that are living in these mobilehomes - the cost of this stuff. My father lives in a mobilehome, and there is no way that he can afford a $7-8,000 system to keep his home up. So, my concern is with the people that are on fixed incomes that cannot afford this kind of thing. I think, what we have today, if it's done right and done up to the code, far surpasses anything that they need. So, that's all I have to say.

SENATOR CRAVEN: Yes, sir, you're thinking of the economics of it. Am I correct in assuming that you feel that the economics, in a general sense, outweighs the safety feature?

DOUG LADD: Well, no, the safety feature comes first but the safety feature is there if it is done right and set up right.

SENATOR CRAVEN: In other words, under normal operating circumstances?

DOUG LADD: Right.

SENATOR CRAVEN: I see. Very good. Well, we appreciate your comments. Thank you very much. Senator Mello?

SENATOR MELLO: I just want to make a very obvious comment in that, after seeing 600 of these fail in my areas, if you can't afford the retrofitting, you can hardly afford losing your home. Now...

DOUG LADD: We're going to push the cost of mobilehomes up over stick homes before it's over with these systems. I mean there is things out there that can be done that isn't that expensive to do that will do the same job in my opinion.

SENATOR MELLO: A lot of people lost a $50-60-70,000 home, but maybe, when it was installed, for another $3-5,000, could have been saved.

DOUG LADD: Well, my permanent foundation pier is a 40,000 pound pier which is great. A u-bolt fits into cement and it bolts to it. This is great on private property but, in parks, they won't allow it.

SENATOR CRAVEN: Very good. Thank you Mr. Ladd. Next, a mobilehome contractor, Mark Brown from Laguna Hills. Mark, of course, is a - I presume - Southern Californian. Laguna Hills - is that the Laguna that I know and love so well?

MARK BROWN: Yes sir, the one and same. Thank you very much Senator, Senators. I'm a mobilehome contractor and I've been involved in this industry since 1971 - my family has been involved in the industry. My approach in this situation is as a result of having been involved in foundations for mobilehomes since that time. That was caused as a result of the '71 earthquake. I've been to every earthquake situation where mobilehomes have been knocked down since 1971 and including 1971.

SENATOR CRAVEN: Is that the Sylmar quake?

MARK BROWN: Yes, sir, it is. Time and time again I'm hearing that there's been no evidence, prior to now, that the earthquake safety braces have been functioning adequately or that there's any proof that they will function. In 1978, Fall Stop Corporation had a successful product and, throughout the years and up to this point and through this particular earthquake, Fall Stop as well as other products apparently have gone through this earthquake and succeeded in holding up the homes. These are earthquake resistive bracing systems. The thing that we really need to take a look at, in my opinion, is that we're looking at a situation, as one of the other gentlemen said, where you've got piers, you've got concrete blocks - which one is going to do the job? Well, effectively, neither one does the job for earthquake safety unfortunately. However, exclusive of what type of primary supports were used, earthquake safety braces were successful 100 percent of the time. If we take a look at the statistics that were used in the current report for this current earthquake, and we see how many homes went down that were on cinder blocks, and we apply that to the total number of homes in each mobilehome park, we come out with having 12 subject parks; or, about 250 mobilehomes that would have gone down, based on those statistics, had they all been set on cinder blocks. Cinder blocks are not necessarily the answer.

Earthquake resistive bracing systems would go a long way toward protecting the home, however, we've got another problem. That is, if we go in and we set these homes exclusively on cinder blocks and then hope for the earthquake bracing to do the job, our problem is that people aren't going to set those homes properly. It happens all the time. As a contractor, I

go out there and I see it. I see these homes before, during, and after the earthquakes. In fact, I happened to be inside a mobilehome when we had our 5.5, and one of my men was underneath that home. I had no idea if it was going to be a 7.5 or a 5.5. We need to take some kind of a measure. I wrote a couple of notes and I think one of the things we need to do is that we need to go through and, since there's so much here, my notes are kind of extensive - I think we need to go through and have meetings, other than these that are somewhat intimidating and limiting. I think we need to have meetings that are on a localized basis. The more localized basis meetings would be a lot better for gathering the facts that you're after. Not everybody, and certainly not very many contractors, are going to come to these meetings. If you want to get the real information, I think you need to go to the local areas, talk to the local contractors, people who have been through the earthquakes, and see what they have learned. There are a lot of considerations - if we go through and we talk to these people, we're going to get a detailed description of what happened as opposed to someone selling a product. In spite of the fact that I sell earthquake safety products, I also install water heaters, I lift and set the mobilehomes - and I lifted and set a lot of mobilehomes in the Watsonville quake. I saw a lot of the damage and I saw the causes. Some of the statistics that are in the report are not entirely accurate. There were a lot of homes that had mixed types of supports. So, there are a lot of statistics, a lot of figures, and a lot of information that needs to be gathered to get a real good, accurate picture. I'd like to address, if I may, also, Mr. Mello, the tying down of mobilehomes. One of the things that happen when you have a permanent foundation - in El Centro, in 1979, there was a 5 story government

building built, tied to 40 foot deep pilings that were driven into the ground. It was located right across the street from a 100 year old building that had been standing for many, many years.

SENATOR CRAVEN: This is rather embarrassing but go ahead. It's the county building. I used to represent that area during that time.

MARK BROWN: My humble apologies... After the 6.4 earthquake that devastated the building that was supposed to be 8.0 earthquake proof, they all moved, apparently, back into the older building. The building cost approximately $5 million to build, that's a million dollars a story that you and I got to pay. It then cost almost a million dollars to demolish it and turn it back into the parking lot that it once was.

SENATOR CRAVEN: It's one of the nicest Taco Bell's in El Centro now.

MARK BROWN: Frank Lloyd Wright was a very insightful man - he developed originally the seismic isolation principle for buildings and, in fact, built a building in Japan at extensive cost with a seismically isolated foundation. The forerunner for the kinds of foundations that we have now in the larger buildings. After the earthquake there, his was virtually unscathed and, in fact, it was the only building that was virtually unscathed. So, at first glance, it looks like a good idea to tie something down to the ground - looks terrific. Tie downs failed in the Loma Prieta earthquake - they simply failed. They failed in the Whittier earthquake and they also failed in the Santa Barbara earthquake, and these are all documented. So, what we need to take a look at very closely are

the things that may look good on the surface and the information that you may gather here today from people with specialized interest, may not be the whole story, and I'd like to push very strongly for a little more research on a localized level.

SENATOR CRAVEN: You know, Mark, along those lines, you're from the County of Orange, which is southerly adjacent to the County of Los Angeles. Have either of those counties - that's the number 1 county and the number 3 county in the state from the standpoint of population - have they done any surveying through their building inspector departments or whatever of this area of damage and potential damage?

MARK BROWN: I'm sorry, sir, I'm not sure I understand your question.

SENATOR CRAVEN: Well, you mentioned earlier that you thought it should be considered on a local level. Now, you may say, "Well, Bill, how are you going to do that?" Now, right off the top of my head, I say, "Well, you've got 15 regions of GSMOL, so every region should have a meeting and figure it out." But, maybe we should professionalize it a little more than that, and we should go to the county which exists in every nook and cranny. They should be in a position to offer professional advice as well. So, I just wondered how you thought it should be handled.

MARK BROWN: Well, I think it would be really very effective to go ahead and, through HCD, set up meetings in every county. I would like to suggest that, since you have available to you a list of all C-47 mobilehome specialist contractors, that you would invite each and everyone

of them to a meeting. Perhaps, hold 2 meetings in each county that they could come to and have a round table discussion to gather information, have some objectives, some questions that you want to deal with. Get a better prospective of the mobilehomes and how they fit. There are a lot of things being said here today that simply don't stand true in function in the earthquakes.

SENATOR CRAVEN: Well, I think that your idea is very, very good, and I'm not clairvoyant, but I have a feeling that Mr. Pitts, in the back of his mind, is saying, "By the time we get all this data gathered together, and have these meetings with the staff that I have, mobilehomes will be air-suspended!" Is that right, Travis? He's shaking his head. Actually, if they have to send out a mailing of 25, it puts them behind because they just don't have the people to do it. It's unfortunate but true.

MARK BROWN: I can appreciate that. I also wanted to start out this, and I neglected to do so, and I want to thank the HCD and want to commend them on a job well done. They did a beautiful job in the Watsonville area where I centered my work. They came out there - they gave us instant on-site free permits and no hassle with the reinspections. It was a big plus, it was excellent. It was the only way that it could be effectively handled. They did a wonderful job, they were available, and you're not going to hear it from a lot of people, so I wanted to be the one, maybe the only, to say that you did a really great job.

SENATOR CRAVEN: We may have that chiseled into granite. It's nice of you to say that, but they have done a good job. In fact, Travis did something

somewhat unusual for a member of the bureaucracy - he admitted, during the course of his opening remarks, that they had made a mistake, I think was the words he used. You don't find people around in our milieu saying things like that too frequently but they are very frank, they approach the problems I think with a great deal of dedication and energy as well as enthusiasm, and I think that they do a tremendous job. If they had a bigger department, they would do an even better job.

MARK BROWN: I want to address one last item, if I may, and that is that, if we would have had a 7.5 earthquake, I think it would have been a lot more devastating in the mobilehome industry. I think you would have seen a lot more mobilehomes going down. If we had... in your study, in one of the notations, you demonstrate in there that you had counted some 25,000 mobilehomes in the general immediate vicinity. If the biggest percentage of those homes had gone down - we had trouble just getting all those homes up that were down and, according to your numbers, it was a very limited number - there were not enough qualified people to do the job, and there were a lot of unqualified people doing the job, and I'm surprised no one got killed.

If we have another earthquake that's of devastating size and a lot of homes go down, you've got a lot of people that are going to be out of homes. There's going to be an awful lot of cost to the government, and I think that now is the time to make an effort to put the burden on the people to purchase the product for the safety of the home, as opposed to the government paying the price later, and then the people will put it in. Consistently, I found that, after the earthquake, people found the money

to put in the earthquake safety devices. This is a little late. If we make some kind of an effort for doing it beforehand, it's going to save FEMA from these loans, it's going to save administrative costs, and it's going to save having a lot of people out of their houses, not to mention the problems with unscrupulous contractors, as we had a lot of that, too.

SENATOR CRAVEN: Thank you very much, we appreciate it. Next is Thomas Tobin, Executive Director of the Seismic Safety Commission.

THOMAS TOBIN: Thank you very much. I'm really pleased with hearing and listening to what's been said so far, and I think I'll just reserve my remarks to a few points and let you get back to your agenda. First of all, mobilehomes are great structures. It's the kind of structure we like in earthquake country - they're light weight, they're regular in design, they're capable of withstanding earthquake forces, and a much better building than what we normally would deal with - but the high failure rate of mobilehomes after earthquakes truly does create a public problem, as well as perhaps disaster for the individuals who own them. It complicates our response, it adds to the response in an already overburdened local government response system and state, it causes recovery problems. These are all people who need to deal with the recovery process through applications, perhaps grants, and other sources of funding - and the crime of it is that so much of it, if not all of it, is avoidable, and it's avoidable relatively easily.

It is a statewide problem in answer to one of your questions earlier - California is zoned 3 and 4 under the Uniform Building Code. These zones

3 and 4 are the second worse seismic region in the world. All of California is subject to earthquake activity, even Sacramento. The real difference is that Sacramento is on deep, soft soils and, in an earthquake, at some distance, we would expect the shaking here to be a rather long period, and of the nature that mobilehomes, perhaps, wouldn't feel very strongly. But the forces are the kinds of forces that we saw in Mexico City or the forces that the Frank Lloyd Wright Imperial Hotel saw in 1923, because it also is on a very soft, deep, deep soil, and stiff structures, short structures do quite well. But, Sacramento was damaged in 1906, Sacramento was damaged in an earthquake that the location of which is disputable, but, perhaps, it was Winters or the Berryessa area, or other areas - it's unclear where it was created in 1898.

The problem is one, primarily, of the existing structures because there are so many of them involved and the cost to retrofit a structure like that is a surprise and a significant cost to the individuals that own these buildings. But the devices that have been certified, obviously, seem to work very well, but that's not necessarily the only approach of trying to withstand earthquake forces in these buildings and is not a great engineering feat. In fact, it can be done quite readily - we've seen that at the Lawrence Livermore Laboratories where just plywood shear walls in the corners were enough to withstand earthquake forces quite well. It's basically a problem with just needing to add that requirement to the practice of installing these devices, clearly the piers do not work well. We've known that and we can resist the forces, perhaps, with new style piers or by connecting the piers, in some way, so they can act as a unit and the device can hold to it. And, you could use the certified

bracing devices but not necessarily. I guess what I'm trying to get through is that the devices have worked well but that doesn't mean that that's the only approach, and there can be other ways of doing that. The force levels just are not that great, and they're not that great because the structures involved are lightweight structures. Earthquake forces come about from inertial forces that depend on the mass of your structure and, since you're dealing with structures that are not massive, the forces are really quite low and, therefore, easily resisted. We certainly support HCD's intentions to develop a lateral support requirement as part of their installation regulations. It is badly needed, it makes sense, and the sooner the better, and we would do whatever we can do to support that effort on their part.

Earlier, a question was asked about gas valves and what the utilities' opinions are. The gas utilities in California are unanimous in that they are not in favor of the wholesale installation of automatic earthquake trigger gas shut-off valves, and the reason is that there are relatively few gas leaks. A lot of the gas leaks are due to types of failures that can be resisted such as strapping water heaters in mobilehomes. And, secondly, when these valves are triggered in an earthquake, it creates a massive problem of relighting that can go on for months. I believe I saw some numbers put together by the Southern California Gas Company on the effect of having to re-light pilot lights and re-establish gas service because of valves that might be tripped in a great earthquake in Southern California. We've looking at periods of time like 3 to 6 months to restore all those gas services. The concern might be, in part, expense on how long it takes, but it's also a matter that, during that period of

time, you have people without natural gas service for heating and the other health and safety issues associated with them. To start each one of these, is not necessarily as simple as what some of us might think. I wouldn't hesitate to start my own, although it does frighten me, but realize that after every earthquake, we always have people who relight their gas valves and blow up their house, and that it is something that has to be done carefully. When the gas company does it, they first have to check the gas system to make sure that there are no apparent leaks, they then re-establish the gas flow back in, and then they search for gas leaks and smell for it, and it's only once they're sure that the gas system is secure that they can then go ahead with lighting the pilot light. We're looking at an hour or so per installation. It takes a long time to do that. And their feeling, and I strongly concur with them, on the way to approach the gas problem, is to tie down our appliances which could slide and break, require the flexible connections that are required by the current codes, and do a lot of very strong public education, so that people learn to recognize the smell of mercaptan and can turn off the source when it's necessary to do so.

The last thing I wanted to mention is that the Commission is sponsoring two bills, one by Assemblyman Cortese, that's now in the Senate, and the second identical measure by Senator Torres, which is now in the Assembly. Both measures would create a state income tax credit for installing a device to resist earthquakes in mobilehomes and would provide a $200 credit - not a lot but, hopefully, a meaningful incentive - that would encourage people to install these devices to resist earthquakes. Thank you, Mr. Chairman.

SENATOR CRAVEN: Very good. John?

JOHN TENNYSON: I've got a question on those bills. It says that, if they're more than $2,000,.. the limit is $2,000 in order to get the credit, yet most of these devices are much more expensive than that. Why is there a $2,000 limit?

THOMAS TOBIN: The reason's obvious, as we've having a very difficult time getting more in terms of those that are concerned about the state's income, but I think that the real operable language is that, for mobilehomes, it's limited to $200 in terms of that credit which, if you had seen earlier, was when the bill was a tax deduction. The deduction was limited to $2,000 and we've changed that from a deduction now to a tax credit because it's easier to administer, and it doesn't require new forms and, as such, it was limited to $200. So, you know, compare the credit of $200 against a cost of $2-3-4 or $5,000.

JOHN TENNYSON: So, there's no limit on the cost of the device now?

THOMAS TOBIN: That's correct.

SENATOR CRAVEN: Very good. Senator Mello, did you have anything? Senator Dills, no? Dan? Very good, thank you very much, Mr. Tobin. Next is the Legislative Chairman of the Golden State Mobilehome Owners League in Sacramento, Mr. Paul Henning.

PAUL HENNING: My name is Paul Henning and I reside at 865 Florin Road, Space #65, Sacramento, 95828. It's not my duty here to testify but, today, I brought you people that were in the trenches during that earthquake and their names are Ellen Newman, Hannah Langlotz, and Mary Stark, and these people are to be commended as they came about 200 miles. They came from Hollister, and they live in Mission Oaks Mobile Home Park, and, at this time, to save time, I would like to bring them, all three, to the table. I think they will bring you more information than...

SENATOR CRAVEN: I know they will and I know that they're not going to repeat anything that they've heard before. Right? Thank you ladies, it's very nice to have you here, particularly, in good health. So who's going to be the lead off lady? Please state your name.

MARY STARK: Thank you, Mr. Chairman and distinguished members of the committee. My name is Mary Stark, 217 Acorn Lane, Hollister, California, 95023. The damage in the Mission Oaks Park in Hollister was extensive. The park consists of 235 spaces, there were 68 mobilehomes that went down to the ground, and 105 were made unlivable; however, I was spared any serious damage. My home did not move an inch. Six piers needed replacement because of cracks, and I also have 2 braces - one in the front and one in the back of the coach, and they were made from the tongue of the mobilehome, and welded with bars across and bolted to the frame of the mobilehome. I'm thankful I have them because I think they helped me quite a bit. The wheels and axles were removed at the time the mobilehome was set up, but I was lucky. That's it. Thank you.

HANNAH LANGLOTZ: My name is Hannah Langlotz, and I live on 164 Redwood Drive, in the Mission Oaks Mobilehome Park in Hollister. I went through the earthquake like everybody else but, 2 years before, the Sure Safe Company came into the park and they offered these braces. So, I had to make up my mind because it was not cheap. It was quite expensive for retired persons like we are, you know. But, anyhow, they... Pardon?

SENATOR CRAVEN: How much was it?

HANNAH LANGLOTZ: Two-thousand-four-hundred-fifty.

SENATOR CRAVEN: $2,450. And, that was several years ago.

HANNAH LANGLOTZ: That was two years ago and mine is a small one. It's 14'x 56', and I paid it and they put a safety on the water heater. I had an automatic shut-off on the gas but I didn't like it, because, for each and every little tremor we had in Hollister (and we have 2. earthquakes all the time), it would shut-off, and then I had to have somebody come in and turn the heat on, turn the hot water on, and everything - the gas was just gone.

SENATOR CRAVEN: Is this the type of device we were talking about earlier?

HANNAH LANGLOTZ: I don't know but the same company put it in that was in that deal but I didn't like it, and we have a different shut-off safety and it works now, you know, and we didn't have to do that, but we had the means...

SENATOR CRAVEN: Are you finished? I was just going to ask you a question. The installation that was made 2 years ago, did that ride out the tremor?

HANNAH LANGLOTZ: Yeah. My mobilehome did not move an inch. I have no damage, no cracks, no nothing. The pipes underneath were in order, everything was fine, so it paid off.

SENATOR CRAVEN: Well, that's very good. That's kind of happy news.

HANNAH LANGLOTZ: Yeah. That's why I'm here, I thought I'd bring a little bit of happy news to all of you.

SENATOR CRAVEN: Well, that's very nice. They ought to put you in their next brochure, I think. All right, Ellen?

ELLEN NEWMAN: Yes, I'm Ellen Newman, and I'm also from Mission Oaks Park, and my address is 227 Acorn Lane, Hollister. My house has no piers, nothing under it, but it has its axles, its wheels, and its tires, and it's gone through two earthquakes - the one in '84 and then the one in October. And, in the first earthquake, I lost one wine glass; the second earthquake in October, I had a heck of a time even finding enough to cover my deductible. I lost my water heater - it was pulled out of the wall - that's all I lost, and that didn't cover my deductible. But you know...

SENATOR CRAVEN: Maybe you should've broken some windows!.. (laughter)

ELLEN NEWMAN: But, you know, looking around there - around the park - I began to do my own individual survey of different kinds of props and underpinnings they had, and, you know, I came to my own conclusion - and, I like this young man's idea of local counties because of your geological differences in the ground, and they would need different types of... (omission here due to changing of tapes)...

SENATOR CRAVEN: ...five foot centers? Well, of course, that's a little more rigid, I suppose... more protection there.

ELLEN NEWMAN: Well, right. It gives more reinforcement... I had no jacks or anything. Frankly, I prefer it the way mine is, and I still like the idea of the springs with the floating pads.

SENATOR CRAVEN: Yes, I understand. Well, that's very interesting, the comments that you make. Do you want to comment on the wheels and tires, Travis? He doesn't seem, what I would call, blatantly enthusiastic, but... Mr. Tennyson had some thoughts on this, Travis, and he will ask you a question.

JOHN TENNYSON: The comments, Travis, that the lady brought up, we've had a number of calls and inquiries to the committee concerning the utilization of wheels, tires, and axles, in other words, leaving them on. Apparently, prior to 1980, the law required that they be left on a manufactured or mobilehome and, at that time - I don't know if it was by law or regulation, that it was amended out - and, in many parks today, you

have the wheels and axles removed and used, then, on another chassis to move another mobilehome someplace. Is this one of the alternatives, perhaps, that has been discussed, to an earthquake bracing system, that would have some merit?

TRAVIS PITTS: Travis Pitts, Department of Housing. Mr. Tennyson, it certainly has been discussed. It's long been advocated by the Golden State Mobilehome Owners League, or at least some of the members, that we be required to leave the axles and the wheel hubs on the home. It does not have the same performance capacity as an earthquake resistant bracing system. Virtually, anything that is under the home that has the strength of an axle and wheel hub and spring assembly is going to prevent the home from falling further to the ground, and it will do that. The axles and wheel hubs are typically located just aft or just to the rear of the balance point of a manufactured home or mobilehome. If the home went to the ground and was supported by axles and wheel hubs, either the front or the rear is still likely to go down. It is not a perfect solution. We acknowledged in our report that those homes that fell to the ground that still had their axle and wheel hub assemblies, fared better in the earthquake than those that did not. Absolutely acknowledged. Whether or not it's the answer to earthquakes, I personally disagree.

SENATOR MELLO: The two ladies here, Mary and Hanah, I guess, stated that after the installation of this bracing, you had little or no damage. Now I'm looking at the report here, in your mobilehome park, out of 225 units, 120 of them went down. I'm trying to find out, was there a correlation? These that fell... did they not have the kind of bracing that you put in?

HANNAH LANGLOTZ: I don't think so. There were so few people who could afford it, like the big ones were close to $5,000, and I had a smaller one and so I squeezed, you know... I just wanted to have that because the film we saw said that to build up the mobilehome again, after it's on the ground, it starts at $7,500 and that is deductible, and I figured that it was probably higher than the $2,450 that I used for the braces. I believed the gentleman in what he said to me. He said if you had a 6. earthquake, it's going to hold your mobile.

SENATOR MELLO: Tell me this now. Of the ones that did put in the bracing, did any of them fail and go down?

HANNAH LANGLOTZ: I don't think they went down. Some of them moved, you know, one-half foot or a foot back, or something like that...

SENATOR MELLO: What I'm trying to figure out here is, does it pay to put the bracing in?

HANNAH LANGLOTZ: I don't know if it was the Sure Safe... it was another company that put braces in... I had Sure Safe and they may be different.

TRAVIS PITTS: Senator, Travis Pitts, again, Department of Housing. In the park, there were five homes with earthquake resistant bracing systems installed. Each one performed without failure. I think the confusion is that she's talking about a brand name and we're not. We're just talking about the systems in general. All five in that park performed.

SENATOR MELLO: Performed well and none of them failed, in other words.

HANNAH LANGLOTZ: It's just expensive for most of the people. They would like to have it, but I just was pleading and, you know, I just scraped everything together. I don't know why I wanted it so much but I just wanted that under my mobile.

SENATOR MELLO: If five performed well, you still had another hundred that did not go down, so I guess they're without bracing also then?

HANNAH LANGLOTZ: Yeah, they were moving into the driveway, or they were moving back or forward, or they were crooked and all kinds of ways.

MARY STARK: There were several homes in there that had the cradles on there where their home is supposed to swing back and forth and every one of them, that I know of, dropped. And the people were out of their homes for up to a month and even longer than that because the homes dropped from 2 to 5 inches and, in one of them, the piers came up through the floor.

SENATOR MELLO: Thank you very much.

SENATOR CRAVEN: Thank you all, ladies, we're much appreciative. Paul, are you going to conclude for your troopers here?

PAUL HENNING: I wish to thank the Committee for the mobilehome people and their interest in us. I have 7 letters here to inject into the hearing.

SENATOR CRAVEN: Fine, if you'll give them to the Sergeant behind you, he will see to it that they are delivered to the proper person. Paul, just let me ask you a quick question. GSMOL has no position on this bracing situation at this time, do they?

PAUL HENNING: No, sir. Thank you.

SENATOR CRAVEN: Next is Fall-Stop Corporation from Huntington Beach, Mr. Marvin Brown. We've got about 18 minutes left here to go.

MARVIN BROWN: Thank you. My name is Marvin Brown with Fall-Stop Corporation from Huntington Beach.

SENATOR CRAVEN: You've been with us before, have you not, Mr. Brown?

MARVIN BROWN: I don't know, have I?

SENATOR CRAVEN: Well, you look familiar to me. Perhaps, it's the distinguished manner in which you conduct yourself.

MARVIN BROWN: Oh, boy, what'll I do now? It's interesting, the points that we've discussed in past years are all coming to the floor now, wheels and tires. I'm sorry Senator Mello just left. One of the major points is, take El Centro, for instance, the municipal building that was destroyed because of the rigid unyielding construction of the building. Also, the water tower there, built to the latest federal and state

standards, looked really nice until, after the quake, and, if they would have destroyed the wooden tower there, they would have been without water. It stayed and yielded to the force of the quake - the lateral movement - so, therefore, it remained and served the public as it was built to do.

The causes... I would like to divorce the pier from the earthquake safety support. There seems to be a merging which I think that the piers, as they've been utilized, maintains the steel beams of the coach so that you have no yielding in a long set. The deflection is avoided. The device that we have allowed a slip surface between the ground and the mobilehome and was firmly attached to the home. In Whittier, where we saw the benches that allow you to float through, we saw the coach fall because of the ground movement on the benches and simply bounce. If you've ever watched somebody with a jack hammer, an air hammer, you can put the tool to the ground, but until you begin striking the blows which occur in an earthquake, you have no damage, but let it start striking those staccato blows, and you can tear anything apart. And, that's the reason that we feel that anything that should be called an earthquake safety support system should be very strongly attached to the home, and that's different than a pier. A pier doesn't have to be but it is good.

I think that that is a good feature to attach it to the home. There were safety systems that did fail. I have photographs of that and the price of these devices has been heard about. I think everyone here realizes... everyone has been so straight and positive in trying to present an upper picture. There are the gougers, those that may - behind closed doors - misrepresent and make statements that would be, perhaps, not in the best

interest of the general public. I should have brought a few thousand people that have Fall-Stop in this last quake that were quite pleased that they had no failure whatsoever. I polled a small sampling of 1,500 mobilehomes with the old system, not the certified system, and about 200 of the certified system in this area. There was not a failure among them, and we were quite pleased with that, of course.

Most of the points have been covered. I know you have an awful lot to bring up but I think pricing should be looked at and the policing of the sales of the devices and sales tactics should definitely be looked at most strongly. There is a contractors license document which is a booklet, sort of a gray booklet, and if you've ever seen the movie "Tin Man", well, you would introduced to them with the tactics that have been utilized in the sale of these devices. I don't know of... Are there any questions you may have of me? We have 19 years in the industry with a perfect safety record. Before bringing Fall-Stop into the market place with our original units, we took the Fall-Stop, attached it to a home, raised the home up so that the device would fall more than a foot, threw about 5,000 pounds into the front of a 24x64' unit and dropped it four times with no damage at all to the coach. Upon pulling it, we had a mark of about 12' through macadam, decomposed granite, and other tests, with absolutely no damage whatsoever. We knew it would work and, yet, it would allow the coach to have the safety feature that is built into the mobilehome when it comes out of the factory, it's not attached to the ground. And that slip surface should be retained, not on the device at the top and I... well, wherever. Everyone has their own idea, but let's allow the coach to move. Just like the water tower. We don't want them to collapse.

SENATOR DILLS: Thank you, Mr. Brown. Are there any questions of Mr. Brown from members of the staff or the committee. Thank you very much. We have Art Angelo and Patrick Shay, Sure Safe Industries, San Diego.

PATRICK SHAY: My name is Patrick Shay, I'm with Sure Safe Industries, and I live in San Diego. My mother covered most of our products... one of the ladies that just talked (laughter). She's not really my mother. I just have a couple of things to say. We manufacture safety products, obviously, as well as safety jacks and earthquake bracing systems. In reading Travis Pitts' report, on page 4, it almost tells us that we do not have a good foundation system in the State of California. We just have some that are not as bad as others, but there is one line that does read kind of in defense of the steel piers, "If the horizontal forces of wind and earthquake could be overcome by tie-downs or some other means, the steel pier would be an excellent method of supporting a manufactured home." In other words, to come up with some system, the steel pier could be used with a vertical or in a lateral support system. I think the lock-top system which is not only manufactured by us but by other companies which, as you can see, clamps to the I-beams and to the pier system, and this is replaced if there are 40 of these in a mobilehome, of piers and, what we call, the screwjack - the screwjack just sets there - we take the screwjack out and replace the pier and put in a safety jack which ties it to the home. And, if it's a system that requires 40 or 44, or 20 or 24, we replace this with our safety jack. There are other products on the market such as these and they are a very good tie-down system. At the beginning, about 3 years ago, when we talked about the safety jack system,

it was mainly replaced so the piers would not come through the floors. Now, I also spent some time in the Santa Cruz area after the earthquake, in Mission Oaks, Rancho Cerritos, etc., and in every park I went into, there were piers that had come up through the floors, and, to me, that seems to be the danger and, probably, the most damaging of what can happen when a home falls to the ground. We did see some systems, safety jacks that bent at the base and were caught by the earthquake system, earthquake braces which we hope to install between 2 to 2-1/2 inches below the I-beams and, to our knowledge, we had no failures whatsoever in our system. That's basically all I have to say.

SENATOR CRAVEN: Thank you, Mr. Shay. Where are you located in San Diego?

PATRICK SHAY: I live in Rancho Bernardo.

SENATOR CRAVEN: Oh, very good. You're in a great district. Yes, sir?

ART ANGELO: Senator, ladies and gentlemen, I'm Art Angelo and I'm the President of Sure Safe Industries. I think the situation that we have here, we need to focus on the entire foundation as a whole. I think piers do just what they are designed to do - they support vertical weight. They were never designed to support lateral loads. This is a device locking to the frames, as Pat has stated. There are 3 basic types of frames for a mobilehome. Each one is a little bit different, and each one does require a different type of apparatus to lock it onto the frame. The important thing is that we are taught, with earthquake drills, to duck and cover, which is very dangerous to a home that does not have this attached to the

pier. The pier can come through the floor. I think we had one instance where 40 piers had actually pierced the floor of a mobilehome while a gentleman was still sleeping in bed. Had he not been in bed, there could have been serious injury. This was in the Loma Prieta earthquake.

We also need to address the problem of lateral support - I think this is where earthquake braces have come in and played an important role. The initial design of the earthquake brace, with the certification, was to prevent the mobilehome from dropping more than 2 inches. I think the only difference between one design and another design is that they all accomplish keeping the home from dropping more than 2 inches. The question is the protection of the mobilehome. I think where we try to out-wrestle an earthquake, or we're preventing the home from dropping 2 inches, or we are protecting the frame of the coach, it's really a hard thing to accomplish if we have a rigid type of a system because of the strength of the frames of the mobilehomes. These are actual frames. If we can come up with a design that takes into consideration lateral, sectional, and vertical support of the mobilehome, I think we'd have the safest place to be in an earthquake next to being in a plane overhead.

SENATOR CRAVEN: Have you favored HCD with data that you have generated in connection with the manufacture or protection of these devices?

ART ANGELO: We have plenty of data. We have not supplied HCD with it as of yet, Senator, but in 100 percent of the instances, our systems have been successful. I think one of the problems that needs to be addressed is to forget about cost and try to develop something that's going to work.

SENATOR CRAVEN: Yes, we talked a little bit about the economics of it and I'm sure you understand that as well as we do. But, really, something that works is, I guess, worth anything you have to pay for it, if the emergency presents itself, and you are saved because of it.

ART ANGELO: There's one other thing, too, along that line, Senator, and that is, if a foundation is proper and holds the mobilehome in the proper position, it's going to also eliminate a lot problems with re-roofing of the mobilehomes, and many other problems that come into play when one side settles more than the other. So, in the long run, it really is something that would pay for itself. It would certainly be worth more money to a person purchasing a home in California, being earthquake country.

SENATOR CRAVEN: Yes, I agree. Thank you. Yes sir?

PATRICK SHAY: Yes, I'd like to ask just one question. It seems like every time there's a disaster anywhere in the United States, the mobilehome community gets hit the worst, whether it be floods, or tornadoes, or whatever. I've heard no statistics, or any laws that's coming from other states, or what we know about what other states do, like the State of Florida, Texas. I went to Arkansas over Christmas, and I saw the most unusual tie-down systems I'll ever see in my life. They actually tie themselves to trees and strap them over rocks and do anything to keep their home from being blown away in the tornado belts - but have we ever got any statistics on what they do for foundation systems in the State of Florida or in other parts of the country?

SENATOR CRAVEN: John? Mr. Tennyson may have some information.

JOHN TENNYSON: No, the Committee doesn't have any information on that aspect. I'm sure we could attempt to gather that information by contacting other states.

PATRICK SHAY: There may be products out there we don't know about.

JOHN TENNYSON: As far as earthquakes are concerned, of course, that's a phenomenon that's pretty much been a California problem.

SENATOR CRAVEN: Thank you both very much. We appreciate you bringing the material up to show us.

ART ANGELO: I'd like to submit this to the Committee also.

SENATOR CRAVEN: Fine, the Sergeant will take it. Senator Presley?

SENATOR PRESLEY: Unfortunately, I was a little late and didn't hear Mr. Pitts' testimony, but, in reading his report, it looks like HCD has a certified earthquake resistant bracing system, which I guess you've researched and feel it is safe, and we are seeing a number of different systems, I guess you would call them, exhibited here today. There's no law, of course, that says they have to follow your certification, I guess. You've done some research and you've certified a system, but manufacturers can try to meet those regulations or standards or ignore them, I guess?

TRAVIS PITTS: Travis Pitts, Department of Housing, they cannot be ignored today. Legislation has been enacted and we implemented that legislation in 1985 that requires all earthquake resistant bracing systems manufactured for sale in the State of California to be approved by HCD through a certification process. We have established the criteria that these systems must meet, and you're hearing from several manufacturers who manufacture devices that meet that criteria. There are approximately 15 manufacturers of certified devices approved today.

SENATOR PRESLEY: Approved? That's by your Department. And all that we have seen today have been approved, so you have a number of different systems out there that are competing against each other. Hopefully - let's pick somebody here that I know , Mr. Clifton - let's say he builds a better mousetrap, so then his only way of being rewarded for being better is that he can market that with mobilehome people, as long as he's within your guidelines?

TRAVIS PITTS: Basically, you're correct. It's an area of competition.

SENATOR PRESLEY: So, all of these that we have seen here, though, have been certified?

TRAVIS PITTS: Yes, sir.

SENATOR PRESLEY: Thank you, Mr. Chairman.

SENATOR CRAVEN: Travis, we offer a certification to those people who are deserving, in other words, whose products have been tested and certified.

TRAVIS PITTS: That's correct.

SENATOR CRAVEN: Is there any requirement in advertising in this area of sales marketing that requires the imprimatur of HCD in that advertising? In other words, if I'm a fellow who has never been certified but I hold myself out as, you know, being legitimate, is there any way we can move against me for trying to purport or hold oneself out as being certified when, in fact, I am not?

TRAVIS PITTS: Yes, sir, that would be a criminal violation of the Health and Safety Code.

SENATOR CRAVEN: Okay. Thank you, Travis. Well, let's see if we can wind it up here. Jim Kilfoil, Universal Bracing, Campbell.

JAMES KILLFOIL: I'm James Killfoil from Campbell. Most everything that I had to say, quite honestly, has been said in the last hour, hour and a half. There was some good points. We were involved directly in what happened in Watsonville and Santa Cruz just from practical experience. The point that I think was made that I would like to make is about the distance that the earthquakes can affect, not only the mobilehome community but all places. The number of coaches that were down in the San Jose area, I realize they were under city ordinances so that HCD didn't get involved in it directly, but there were a number of them down in

Sunnyvale, Mountain View, and also in San Jose. And, if you looked at those you would find, probably, an even split between the ones that were on concrete or, what I consider the cinder block that were set up since about 1980, and also on the steel pier foundations. The one difference is that the ones that were set up on cinder block crumbled and did not cause extreme floor damage, as the ones that were on the steel piers that were not attached to the frames did sustain considerable floor damage when they did fall to the ground, which is very similar to what happened in Watsonville and the Santa Cruz area. Another thing that I mention, too, is that - and it's too bad that Greg Landry wasn't here - he may be down south, I don't know for sure where he is - but he has worked exclusively down there in the Watsonville area, and, if there is anybody that could give actual on-site testi- mony, I think it would be Greg Landry with the State of California.

SENATOR CRAVEN: Thank you very much, we appreciate your comments. Frank Goodie, Seismic Support Systems of Carpinteria.

GERRY GOODIE: I'm replacing Frank Goodie, I'm Gerry Goodie, Frank's son. Senator Craven, thank you for the opportunity and allowing me to address the Committee. I'd like to, first of all, offer a manufactured housing committee disaster preparedness manual our firm has put together. It's got a lot of the research documentation we have taken the time to put together regarding manufactured housing and earthquakes. Manufactured homes have the highest homeless case load, as far as people being homeless and out of their structures after an earthquake. I read a recent document by FEMA that bothers me. Some of the things we have talked about today,

of course, are agreed upon. The idea of having some localized steering committees where sometimes representation is very, very important and I would volunteer my services towards that. My background is 18 years in the industry and I'm currently in Corona, California, the owner of Seismic Support Systems, Incorporated. We install roughly 10 of these state certified systems on a daily basis.

SENATOR CRAVEN: Well, you were fairly close to the last one, then, weren't you, if you're in Corona?

GERRY GOODIE: Yes, very, very scared also. This was the first time I've been affected by an earthquake, but the more I learn about them, the more I worry about them. What I'd like to offer is that I do believe that we should cut off the problem immediately. I think we're adding anywhere from 10 to 15,000 of these problems a year out into the market place. So, I think there needs to be an end to that, and the mandates on the new installations, I think, would be the first step in, at least, addressing the problem, as they are being added to right now. We cannot keep up with what's being added. The current industry in supporting these...

SENATOR CRAVEN: Now, Gerry, let me just interject. Are you referring to statewide or zoning?

GERRY GOODIE: Statewide. I think it's roughly 10 to 12,000 manufactured homes being placed annually, 30 percent of those are on private property on permanent foundation systems, these others are being placed on temporary that are not adequate. So, I would...

SENATOR CRAVEN: So, what you're kind of recommending is that, as of a particular date, it would be a requirement rather than a permissive thing?

GERRY GOODIE: On the new installations. On the existing, make it on a "for sale" situation and the problem will really correct itself over a period of 5 to 7 years. One of the problems I see is that my children are also being housed in one of these buildings during the daytime at school in a relocatable or a mobile classroom, the same type of structure - extremely unsafe and has been identified on "In The California At Risk". Finally, Update Article 1.3 has identified a relocatable classrooms, it's the first time they've identified those as being a potential problem also, so I think we need to put some effort into that. The Unreinforced Masonry Building Law is a situation I think that's been very well done to address the situation they have. I don't see the same types of standard inspection procedures as I see in the Unreinforced Masonry Building Law requirements. They have some standardized inspections that I think help to get the local jurisdictions with the State of California HCD.

SENATOR CRAVEN: Very good. Well, thank you very much. We're most appreciative. You're going to leave that book with us, aren't you? Very good. Just leave it there and the Sergeant will pick it up. Next, Leonard Wehrman, National Foundation of Manufactured Home Owners.

LEONARD WEHRMAN: Good afternoon, Senator and Members. My name is Leonard Wehrman. I live in Daly City, and I'm here today representing the National Foundation of Manufactured Home Owners, which is the national

organization of the state associations around the United States, including the Golden State Mobilehome Owners League. In that behalf, I represent the homeowners on all the national issues and, Senator, that which was just passed to you and John Tennyson, may I first ask that that report be included in the transcript - I'd greatly appreciate it - and I can reduce my remarks greatly, because my remarks are going to center around, particularly, what's happening on the national issue and a little bit of what's happening with HCD. May I first start off with the fact that, as a result of the October 17th earthquake, President Bush has signed an Executive Order, #12699 specifically, on January 5th, 1990, that regulates and determines what future federal buildings will be looking like in so far as seismic safety is concerned? And, because manufactured housing is a regulated building under the federal code, manufactured housing will be included in that category. The 20 person committee that has been formed as a result of this executive order has been at work for several years and they will continue to do so and implement the next phases of this. They will be looking at all of the things that have been presented here. Particularly, first of all, about the structure of the home itself and the various aspects of how one would install that home. Let me assure you, however, that this is not isolated to the State of California, because, if you look at the maps, they cover at least 13 major states. In fact, a major study that's being done today is being done by the State University of New York in Buffalo because they think the next bigger earthquakes will be happening in the Midwest or the Northeast versus in California or the West Coast or, even conceivably, Alaska. That executive order, as I said, will take an implementation of about 4 years to look at, and I'm not too sure that the people in California, however, can stand by waiting for that

event to happen, so I'm very glad to see people moving forward. But, as a result of this executive order, some other things are happening. As a result of the federal construction codes and standards, which these homes are built to today, the manufacturer's instructions are going to be looked at, because one of the things that I will insist that they look at is to make available instructions that are designed for specific homes.

Many of the bracing systems that are out there, or even the pier systems, are not designed for the particular type of home that's being done. They are designed very generically and what it takes is, what is called, a design agency to approve a particular foundation system including earthquake braces, tie-downs, and all other features for that particular home. In short, what you need is an integrated, designed system. Most important today, lenders' insurance companies are getting very leery about loaning on manufactured housing because of the type of installation we have and, perhaps, our vulnerability. I have to agree that the foundation systems we have, not only in California - and, quite frankly, they're better than most around the country - are still inadequate. So, we need to address that issue, and one of the ways we are going to be doing that is that each brand new homeowner gets a consumer type manual giving all the information about repairs, maintenance upkeep of that home, and including facts on how to install it. And, we're going to try to work on some of those areas to advise homeowners, at least in the new category, what the home should consist of.

Somebody was mentioning the economics and it doesn't necessary sound like a foolproof easy method to do from a practical standpoint, but one of the

easiest ways to make economics work is, most homes today that are roughly 60 foot in length, have 3 axles on them. What we really need today, rather than remove those axles, is simply leave those axles there and replace them into another location. As Mr. Travis Pitts indicated, they are basically in a 2/3rds, so if you left the tail end one, move the center one forward to, approximately, half part of the unit, and move the other set of wheels to the first part of the unit, for absolutely no cost at all because those units are only costing maybe between $75 and $100 per axel to leave underneath the home because the homeowner, basically, is already buying them anyway. So, for a relatively small amount of money - at least, he would have some degree of protection from the wheels and axles. Certainly not as good as an earthquake bracing device or some of the other units but, for an economic value, it would be certainly easy to do that. A manufacturer can install those at the factory site, when he manufacturers the new home, and the installer just simply moves those axles forward or leaves them set where they are. I have to agree, even though I work on the Title 25 Task Force with HCD, we are very inadequate in, what is called, Article 7 of the Installation. They do not address, particularly, lateral forces, including seismic and wind and, even though we have already passed that area, I hope we can reopen this and I highly encourage HCD to have a series of public hearings in the very near future on how to specifically address this thing, because it is an issue in which California, perhaps, can be the forerunner of all the other states.

Lastly, I will leave with the Committee a book that I found to be most interesting and this is "Lessons Learned From The Loma Prieta, California Earthquake", put out by the Geological Survey. It does not address the

area particularly of buildings or manufactured housing but it is all the lessons that the earthquake people have learned from this business. And, so I'd like to leave this with the Committee and make available, also, to Travis Pitts at HCD, because this is an outstanding book. And I might just offer that I have access to a library of such books through the Geological Survey and these various agencies that have developed these federal programs. Thank you very much Mr.Chairman.

SENATOR CRAVEN: Thank you very much, Len. It's nice to see you again. Next, our last witness, is David Kaltenberg, Kaltenberg's Mobilehome Service, Santa Cruz.

DAVID KALTENBERG: Good afternoon. My name is Dave Kaltenberg. I have Kaltenberg's Mobilehome Service, and I've been doing mobilehome service for 23 years. We moved about 300 coaches between moving and stabilizing after the earthquake. We found no steel piers that were... legal for a mobilehome support system. We found no stamped piers. Every pier we found was a porch pier. We didn't find any steel legal pier that failed. So, when you qualify steel piers as a failure against concrete, you have to take legal, you know, balance the two sides off. We collected all kinds of them and stored them off in the corner for anybody that wanted to look at them. We found none that were legal. We found concrete piers throughout the years that we'd just go out to level a house and there's all kinds of cracks through them. Sometimes you can hit them with your hand and they'll just shatter in place. Personally, I don't like concrete for that reason, but we didn't seem to find a big difference - coaches, side by side, whether they were steel or concrete, and they still fell.

We found coaches with tie-downs, they still fell. They would only move 3 feet to the length of the tie-down, but, if they came down, it didn't seem to matter whether it moved 3 feet or 6 feet, they were still down. The biggest damage we found was from concrete piers through the floor, but that's the easiest damage to replace as far as that type of thing. The hardest damage to fix was the bent frames from dropping on the ground and falling on the concrete piers. We found no steel piers through floors.

SENATOR CRAVEN: Well, is this basically in the Santa Cruz area?

DAVID KALTENBERG: This is just in Santa Cruz-Watsonville, right.

SENATOR CRAVEN: Then you probably are very closely associated with Senator Mello, because I know he spent a tremendous amount of time in most of his mobilehome parks looking at the damage, talking to people, and recommending that we have a hearing on this item. So, you have somebody who is very conversive with the problems which you face in your business and I think that the hearing today has produced a lot of good information. We're most appreciative, Dave. Thank you very much.

Well, ladies and gentlemen, we're very appreciative of the fact that you took your time to be with us today. This is an area that we've talked about on and off over a period of years. We talked about it, even when we weren't having earthquakes. We talked about it, basically, in a sort of protective sense, that we felt that unfortunately - this happens in many businesses - there are a certain element of charlatans out there among us who are trying to sell people things that they really don't need,

purporting that they do something that they don't do and never could do, and some of them, unfortunately, are eminently successful. We were talking about that then, and we've just eluded to it a little bit today, but we heard from you a great deal of technical information which is very valuable, and trying to assimilate all of this information, which is basically John's job, and he will do that I am sure along with conversations with Mr. Pitts and HCD and others, to try to come up with and see exactly what we're faced with, what we might do in a remedial sense, and how we can provide the very best safety situations for the people we are pleased to represent.

I want to thank my colleagues, Senator Dills, Senator Mello, and Senator Presley, as well as Assemblyman Dan Hauser, who was with us a little bit earlier, for their presence here today, and, certainly to each and every one of you, our most grateful thank you. We are adjourned.

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SECTION V

SUMMARY AND CONCLUSION

MARCH 5, 1990

SUMMARY AND CONCLUSION

Other than representatives of the Department of Housing and the Seismic Safety Commission, most of the witnesses who presented testimony at the hearing were mobilehome owners, or were representing manufacturers or installers of piers and other support structures for mobilehomes, or earthquake resistant bracing systems for mobilehomes.

Comments ran the gamut from contentions that earthquake bracing devices should be required on all new mobilehome installations and on resales of existing units, to those who believe such devices are too expensive and that alternatives, such as better pier structures, use of wheels and axles on the chassis, or better enforcement of installation requirements for existing support structures, are needed instead.

Thus, although there was general agreement that there is an earthquake safety problem for most mobilehomes, some of the testimony from this hearing was self-serving, and much of it conflicting and inconclusive. The Committee does not have the staff or expertise to verify or contest these various conflicting claims in a timely fashion.

The Committee does recommend, however, that a comprehensive study of the earthquake safety of mobilehomes is needed. Assessment of the problem should take on both short-range and long-range goals. Short-range objectives could include a review of existing standards for mobilehome support structures (piers, blocks, etc.), consideration of re-inspection requirements for such structures, evaluation of the efficacy of so-called cost-effective means of minimizing earthquake damage short of more expensive earthquake bracing systems, such as leaving wheels and axles on mobilehome chassis, improving consumer awareness of the earthquake safety problem which homeowners face, and ways homeowners can make meaningful choices in dealing with the problem. Long-range, such issues as re-evaluating manufactured housing construction standards, weighing various means of implementing new, if any, support system standards for new installations, as well as the retrofit of existing installations to meet any such new standards, should be considered.

Additional issues should include re-evaluation of standards for utility connections, consideration of standards for the use of utility shut-off valves, and the financing of any new installation and retrofit requirements for mobilehome support systems.

The study of these issues should be undertaken by the Department of Housing and Community Development (HCD), the department of state government which has the responsibility for administering mobilehome health and safety standards, with the input of the Seismic Safety Commission, local governmental entities, and other public agencies involved with earthquake safety issues, and the manufactured housing industry, support system industry, and earthquake bracing industry. Timely recommendations from such a study, where necessary, could be enacted by subsequent legislation.

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SECTION VI

A P P E N D I X

(SELECTED MATERIALS)

MARCH 5, 1990

AMENDED IN SENATE APRIL 25, 1990

SENATE BILL No. 2518

Introduced by Senator Craven

March 1, 1990

An act to add Section 18613.6 to the Health and Safety Code, relating to mobilehomes, making an appropriation therefor, and declaring the urgency thereof, to take effect immediately.

LEGISLATIVE COUNSEL'S DIGEST

SB 2518, as amended, Craven. Mobilehomes: seismic safety study.

(1) This bill would express certain findings and declarations of the Legislature with regard to the seismic safety of mobilehomes.

(2) The bill would require the Department of Housing and Community Development to report to the Legislature, on or before January 1, 1991, on specified issues relating to the seismic safety of mobilehomes.

(3) The bill would appropriate $25,000 from the Mobilehome-Manufactured Home Revolving Fund to the Department of Housing and Community Development for the purposes of the report.

(4) The bill would declare that it is to take effect immediately as an urgency statute.

Vote: 2/3. Appropriation: yes. Fiscal committee: yes. State-mandated local program: no.

The people of the State of California do enact as follows:

SECTION 1. The Legislature finds and declares that, in view of the damage and destruction suffered by manufactured homes and mobilehomes in the Loma Prieta earthquake of October 17, 1989, the need to ensure, in the event of a future earthquake, the safety of the supporting structures and utility connections of these homes is of the utmost concern.

SEC. 2. Section 18613.6 is added to the Health and Safety Code, to read:

18613.6. (a) The department shall conduct a study on the safety of foundations systems and supporting structures for, and utility connection devices to, manufactured homes and mobilehomes under major earthquake conditions within the past 10 years, including the Loma Prieta earthquake. In conducting the study, the department shall consult with representatives of local government, other state agencies, the mobilehome industry, and public utilities.

(b) The study shall address, but shall not be limited to, all of the following:

(1) An analysis of the type and extent of damage to homes, including damage by fire, and the types of damage, which rendered manufactured homes and mobilehomes irreparable.

(2) The extent to which damage to utility connections to the home, such as natural gas lines, caused fire or damage to manufactured homes and mobilehomes.

(3) The ability of various types of foundation and support systems to withstand major earthquake forces, *including the effectiveness of axles and wheels, which are left on a manufactured home or mobilehome upon installation, in limiting damage to the home.*

(4) The extent and cost of repairs to, or replacement of, manufactured homes and mobilehomes damaged because support systems failed or were damaged in an earthquake.

(c) On or before January 1, 1991, the department shall report, in writing, to the Legislature, the findings of the

study required by this section and, based on the findings, make any recommendations for legislation needed to improve the safety of manufactured home and mobilehome foundations and support systems and utility connection devices in the event of an earthquake.

SEC. 3. The sum of twenty-five thousand dollars ($25,000) is hereby appropriated from the Mobilehome-Manufactured Home Revolving Fund to the Department of Housing and Community Development for the purposes of Section 18613.6 of the Health and Safety Code.

SEC. 4. This is an urgency statute necessary for the immediate preservation of the public peace, health, or safety within the meaning of Article IV of the Constitution and shall go into immediate effect. The facts constituting the necessity are:

In order to review the earthquake safety of foundation and support systems and utility connection devices for manufactured homes and mobilehomes, and to enable the Legislature to enact safety measures deemed necessary, as soon as possible to prevent further damage and injury in future earthquakes, it is necessary that this act take immediate effect.

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AMENDED IN SENATE FEBRUARY 1, 1990

AMENDED IN SENATE JANUARY 12, 1990

CALIFORNIA LEGISLATURE—1989-90 FIRST EXTRAORDINARY SESSION

SENATE BILL No. 25

Introduced by Senator Torres
(Principal coauthor: Assembly Member Cortese)
(Coauthor: Senator Alquist)

November 2, 1989

An act to add and repeal Sections 17052.2 and 23602 of the Revenue and Taxation Code, relating to taxation, to take effect immediately, tax levy.

LEGISLATIVE COUNSEL'S DIGEST

SB 25, as amended, Torres. Seismic safety: tax credits.

The existing Personal Income Tax Law and Bank and Corporation Tax Law allow various credits against the taxes imposed by those laws.

This bill would provide, until December 1, 1994, a credit under both laws in an amount equal to 10% of the costs paid or incurred by the taxpayer after October 17, 1989, for the construction and installation of seismic rehabilitation improvements on buildings, as specified, subject to a cumulative total maximum credit for each building of $1,000. It would permit the purchaser of a building from an owner, as defined, or an owner-developer, to take this credit in the year in which the escrow closed or in which the purchaser acquired legal title, notwithstanding the above time limitation, if specified conditions occur. It would reduce the amount of the costs eligible for the credit by the amount of any grant provided by a public entity, and by the amount of payments or reimbursements made by an insurer, for those costs.

This bill would require the Seismic Safety Commission, with the assistance of the State Architect, the State Building Standards Commission, and the Franchise Tax Board, to propose regulations for the guidance of local building departments and structural design professionals in determining costs eligible for the credits.

This bill would provide that its tax provisions shall apply to taxable and income years beginning on or after January 1, 1990, and before January 1, 1994, but would provide that those provisions apply, as specified, to seismic rehabilitation performed subsequent to October 17, 1989, and prior to taxable and income years beginning in 1990.

This bill would require the Franchise Tax Board to report to the Legislature no later than January 15, ~~1991~~ *1992*, on the impact, as specified, of the credits.

This bill would take effect immediately as a tax levy.

Vote: majority. Appropriation: no. Fiscal committee: yes. State-mandated local program: no.

The people of the State of California do enact as follows:

SECTION 1. Section 17052.2 is added to the Revenue and Taxation Code, to read:

17052.2. (a) For taxable years beginning on or after January 1, 1990, and before January 1, 1994, there shall be allowed as a credit against the "net tax" (as defined by Section 17039) an amount equal to the amount determined in subdivision (b).

(b) (1) The amount of the credit allowed by this section shall be an amount equal to 10 percent of the cost paid or incurred by the taxpayer after October 17, 1989, for the construction on and installation in any building, as defined in Section 18001.6 of the Health and Safety Code, of seismic rehabilitation improvements which are designed to increase seismic structural safety in accordance with a plan developed by a structural engineer, civil engineer, or an architect for that building, where that building is identified as hazardous by local governments in accordance with criteria established by the Seismic Safety Commission pursuant to Section 8875.1

of the Government Code or in accordance with a previously adopted city or county earthquake safety ordinance adopted pursuant to Section 19163 of the Health and Safety Code. The maximum amount of the credit allowed with regard to each building shall not exceed a cumulative total of one thousand dollars ($1,000) for all years in which a credit is claimed pursuant to this section with regard to that building.

(2) Earthquake resistant bracing systems for mobilehomes and manufactured homes which are certified by the Department of Housing and Community Development pursuant to Section 18613.5 of the Health and Safety Code shall be eligible for the credit allowed by this section. However, with regard to each mobilehome or manufactured home the maximum amount of the credit allowed for the earthquake resistant bracing systems, including installation, pursuant to this paragraph shall not exceed a cumulative total of two hundred dollars ($200) for all years in which ~~claims~~ this credit is claimed with regard to that mobilehome or manufactured home.

(c) The credit allowed by this section shall be claimed in the state income tax return for the taxable year in which the installation of the seismic rehabilitation improvements occurred, except that a credit for seismic rehabilitation improvements installed after October 17, 1989, and prior to the beginning of the subsequent taxable year beginning in 1990, shall be claimed in the state income tax return for that taxable year beginning in 1990. However, if an owner or owner-developer of the building irrevocably elects not to claim the credit otherwise allowable, the next purchaser of the building may claim the credit in the year during which the purchaser's escrow closed or the year during which the purchaser acquired legal title to the building.

(d) No credit may be claimed under this section for any costs described in subdivision (b) for which a deduction was otherwise allowed for any taxable year ending prior to the taxable year beginning in 1990.

(e) No credit may be claimed under this section for any costs described in subdivision (b) which were paid or

incurred in connection with the seismic rehabilitation of a structure having five living units or less, except for those costs described in subdivision (b) which were paid or incurred in connection with an earthquake resistant bracing system for a manufactured home or mobilehome, or for those costs incurred to comply with Section 19211 of the Health and Safety Code.

(f) For purposes of computing the amount of the credit allowed by this section, the costs described in subdivision (b) eligible for the credit shall be reduced by the amount of any grant provided by a public entity, and by the amount of any payments or reimbursements made by an insurer, for those costs.

(g) For purposes of this section, "installation" or "construction" means placed in position in a functional state.

(h) "Owner" includes duly recorded holders of legal title, a person purchasing premises under a contract of sale, or a person who is a member of a nonprofit corporation or association which is a duly recorded holder of legal title.

(i) The Seismic Safety Commission, with the assistance of the State Architect, the State Building Standards Commission, and the Franchise Tax Board, shall, within six months of the effective date of this section, propose regulations for the guidance of local building departments and structural design professionals in determining those costs eligible for the tax credit described in this section.

(j) With the exception of a husband and wife, if there is more than one owner of a building on which eligible seismic rehabilitation improvements are made, each owner shall be eligible to receive the seismic rehabilitation tax credit in proportion to his or her ownership interest in the building. In the case of a partnership, the tax credit may be divided between the partners pursuant to a written agreement in accordance with Chapter 10 (commencing with Section 17851), which includes Section 704 of the Internal Revenue Code concerning substantial economic effect, relating to a

partner's distributive share. In the case of a husband and wife who file separate returns, the credit may be taken by either or equally divided between them.

(k) The basis of any building for which a credit is allowed under this section shall be reduced by the amount of the credit. The basis adjustment shall be made for the taxable year for which the credit is allowed.

(*l*) In the case where the credit allowed by this section exceeds the "net tax," the excess may be carried over to reduce the "net tax" in the following year, and succeeding years if necessary, until the credit has been exhausted.

(m) Notwithstanding subdivision (a), the purchaser of a building may claim the credit in the year during which the purchaser's escrow closed or the year during which the purchaser acquired legal title to the building if both of the following occur:

(1) The purchaser has signed a binding purchase agreement on or before December 31, 1993, with the intent to purchase from the owner or owner-developer a building in which the installation of the seismic rehabilitation improvements *has* occurred.

(2) The owner or owner-developer has irrevocably elected not to take the credit allowed by this section.

(n) This section shall remain in effect only until December 1, 1994, and as of that date is repealed. However, any unused credit may continue to be carried forward, as provided in subdivision (*l*), until the credit has been exhausted.

SEC. 2. Section 23602 is added to the Revenue and Taxation Code, to read:

23602. (a) For income years beginning on or after January 1, 1990, and before January 1, 1994, in the case of an owner of a building, there shall be allowed as a credit an amount equal to the amount determined in subdivision (b).

(b) The amount of the credit allowed by this section shall be an amount equal to 10 percent of the cost paid or incurred by the taxpayer after October 17, 1989, for the construction on and installation in any building, as

defined in Section 18001.6 of the Health and Safety Code, of seismic rehabilitation improvements which are designed to increase seismic structural safety in accordance with a plan developed by a structural engineer, civil engineer, or an architect for that building, where that building is identified as hazardous by local governments in accordance with criteria established by the Seismic Safety Commission pursuant to Section 8875.1 of the Government Code or in accordance with a previously adopted city or county earthquake safety ordinance adopted pursuant to Section 19163 of the Health and Safety Code. The maximum amount of the credit allowed with regard to each building shall not exceed a cumulative total of one thousand dollars ($1,000) for all years in which a credit is claimed pursuant to this section with regard to that building.

(c) The credit allowed by this section shall be claimed in the state franchise or income tax return for the income year in which the installation of the seismic rehabilitation improvements occurred, except a credit for seismic rehabilitation improvements installed after October 17, 1989, and prior to the beginning of the income year beginning in 1990, shall be claimed in the state franchise or income tax return for that income year beginning in 1990. However, if an owner or owner-developer of the building irrevocably elects not to claim the credit otherwise allowable, the next purchaser of the building may claim the credit in the year during which the purchaser's escrow closed or the year during which the purchaser acquired legal title to the building.

(d) No credit may be claimed under this section for any costs described in subdivision (b) for which a deduction was otherwise allowed for any income year ending prior to the income year beginning in 1990.

(e) For purposes of computing the amount of the credit allowed by this section, the costs described in subdivision (b) eligible for the credit shall be reduced by the amount of any grant provided by a public entity, and by the amount of any payments or reimbursements made by an insurer, for those costs.

(f) For purposes of this section, "installation" or "construction" means placed in position in a functional state.

(g) "Owner" includes duly recorded holders of legal title, a person purchasing premises under a contract of sale, or a person who is a member of a nonprofit corporation or association which is a duly recorded holder of legal title.

(h) The Seismic Safety Commission, with the assistance of the State Architect, the State Building Standards Commission, and the Franchise Tax Board, shall, within six months of the effective date of this section, propose regulations for the guidance of local building departments and structural design professionals in determining those costs eligible for the tax credit described in this section.

(i) If two or more taxpayers share the ownership of a building on which eligible seismic rehabilitation improvements are made, each owner shall be eligible to receive the seismic rehabilitation tax credit in proportion to its ownership interest in the building. In the case of a partnership, the tax credit may be divided between the partners pursuant to a written agreement in accordance with Chapter 10 (commencing with Section 17851), which includes Section 704 of the Internal Revenue Code concerning substantial economic effect, relating to a partner's distributive share.

(j) The basis of any building for which a credit is allowed under this section shall be reduced by the amount of the credit. The basis adjustment shall be made for the income year for which the credit is allowed.

(k) In the case where the credit allowed by this section exceeds the "tax," the excess may be carried over to reduce the "tax" in the following year, and succeeding years if necessary, until the credit has been exhausted.

(*l*) Notwithstanding subdivision (a), the purchaser of a building may claim the credit in the year during which the purchaser's escrow closed or the year during which the purchaser acquired legal title to the building if both of the following occur:

(1) The purchaser has signed a binding purchase agreement on or before December 31, 1993, with the intent to purchase from the owner or owner-developer a building in which the installation of the seismic rehabilitation improvements occurred.

(2) The owner or owner-developer has irrevocably elected not to take the credit allowed by this section.

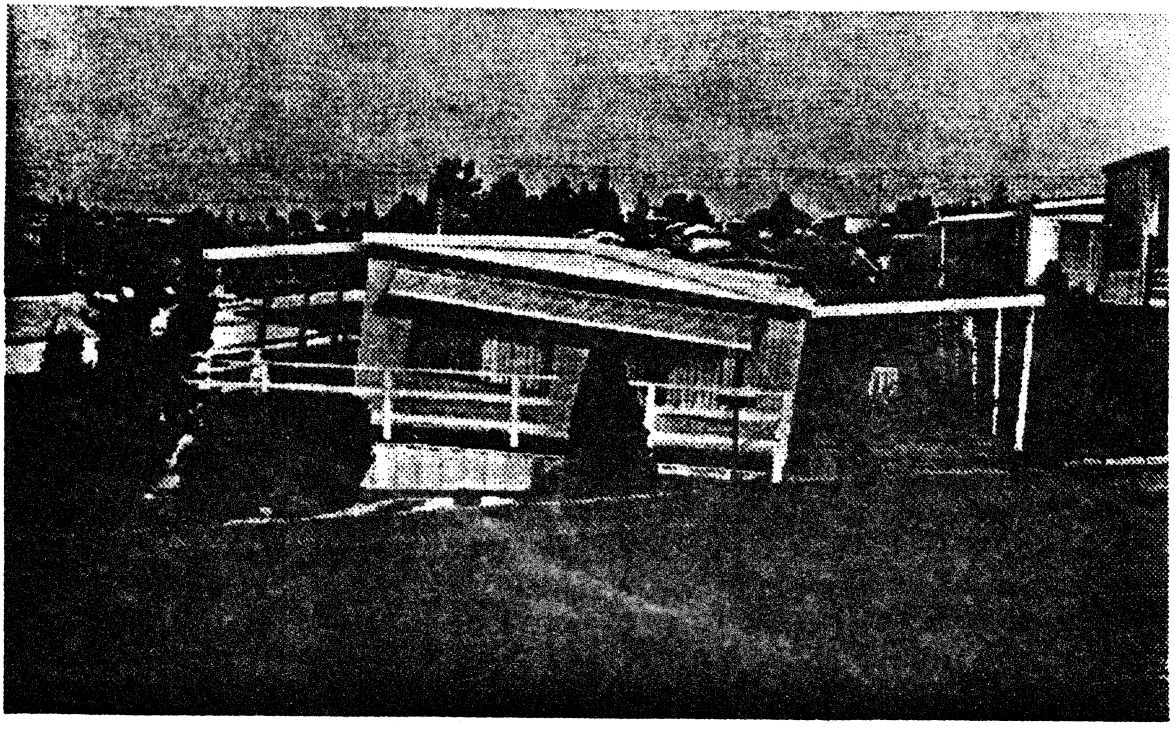
(m) This section shall remain in effect only until December 1, 1994, and as of that date is repealed. However, any unused credit may continue to be carried forward, as provided in subdivision (k), until the credit has been exhausted.

SEC. 3. The Franchise Tax Board shall report to the Legislature no later than January 15, ~~1991~~ *1992*, as to the impact of Sections 17052.2 and 23602 of the Revenue and Taxation Code, including the number and the total amount of the credits claimed under those sections, the distribution of the credits by city and county, and the state revenue loss attributable to the credits.

SEC. 4. This act provides for a tax levy within the meaning of Article IV of the Constitution and shall go into immediate effect.

O

State of California
Department of Housing &
Community Development



Evaluation of Manufactured Housing Support System Performance in the

LOMA PRIETA EARTHQUAKE

STATE OF CALIFORNIA

George Deukmejian
Governor

John Geoghegan
Secretary
Business, Transportation and Housing Agency

Maureen Higgins
Director
Department of Housing and Community Development

John Ellis
Chief
Division of Codes and Standards

INTRODUCTION

On October 17, 1989 the Loma Prieta Earthquake damaged, severely damaged and, in some cases, destroyed structures in several California Counties. A significant number of these structures were housing units, including manufactured homes (mobilehomes).

The Department of Housing and Community Development (HCD) has primary responsibility for manufactured housing in California and, unless assumed by local government, primary responsibility for enforcement of the California Mobilehome Parks Act. HCD's Division of Codes and Standards responded immediately following the earthquake to assist local governments with damaged manufactured homes and to assist the general public where HCD had primary enforcement responsibility within mobilehome parks.

Nine (9) California counties were designated as disaster areas following the earthquake. However, only three (3) counties had significant damage to manufactured homes. These counties were San Benito, Santa Clara and Santa Cruz. This report deals primarily with these three (3) counties since these are the counties where HCD efforts were focused and statistics gathered.

In several previous earthquakes HCD inspection personnel had reported differences in the performance of different types of manufactured home support systems. Though no statistical data was gathered and the damage to manufactured homes was not sufficient for a meaningful survey and analysis, there were growing concerns from inspection staff that manufactured home installation requirements needed to be reevaluated.

In addition to HCD inspection staff observations in previous earthquake responses, HCD had implemented California Health and Safety Code (HSC) Section 18613.5 providing for HCD certification of Earthquake Resistant Bracing Systems. While HCD had implemented this provision of law and notified manufactured home owners of the availability of HCD certified systems, their design and expected performance were largely based on engineering theory since none had been full-scale tested. For years prior to HCD implementation of the certification process in 1985 there had been numerous sales of non-HCD certified devices and installation of home-made devices as well.

The Loma Prieta earthquake and the resulting wide-spread damage to manufactured housing provided an opportunity to gather statistical data that HCD blended into our emergency response. Each HCD inspector, while carrying out their basic mission of emergency response, completed a short questionnaire on the manufactured homes observed. The questionnaire was simple so as not to impede the inspector's basic mission and was designed solely as a basis for evaluating manufactured home support systems.

METHODOLOGY

I

Given the quick response, the methodology employed to evaluate the performance of manufactured housing support systems needed to be straight-forward and simple. A checklist form was quickly prepared to determine the number of homes within a mobilehome park, the number down, and, the types of support systems used on the homes that were down. Twenty-seven mobilehome parks under both HCD and local jurisdictions were evaluated under this method. Five-hundred ninety-two (592) of the two-thousand thirty-four (2,434) homes in these parks were down (24%), and the types of support systems of those homes down were carefully recorded.

Evaluation of the data collected indicated the need for additional information. It was of little value to our subsequent analysis to know what types of support systems were used on homes downed by the earthquake, but not to know what types of systems supported the homes that did not go down.

II

Inspection staff returned to 12 of the 27 mobilehome parks initially surveyed to determine the type of support systems employed on homes that did not go down. Time did not permit a re-survey of all 27 parks so those parks with the greatest number of homes down were selected. In these 12 parks containing 1,239 homes, 479 homes were down (39%). Enforcement jurisdiction in these 12 parks was also a combination of HCD and local jurisdictions.

During this re-survey data was accumulated with respect to one type of support system, in one park, that was inconsistent with the findings in other parks. This support system, concrete block, demonstrated a much higher failure rate in this particular park than in any other park surveyed.

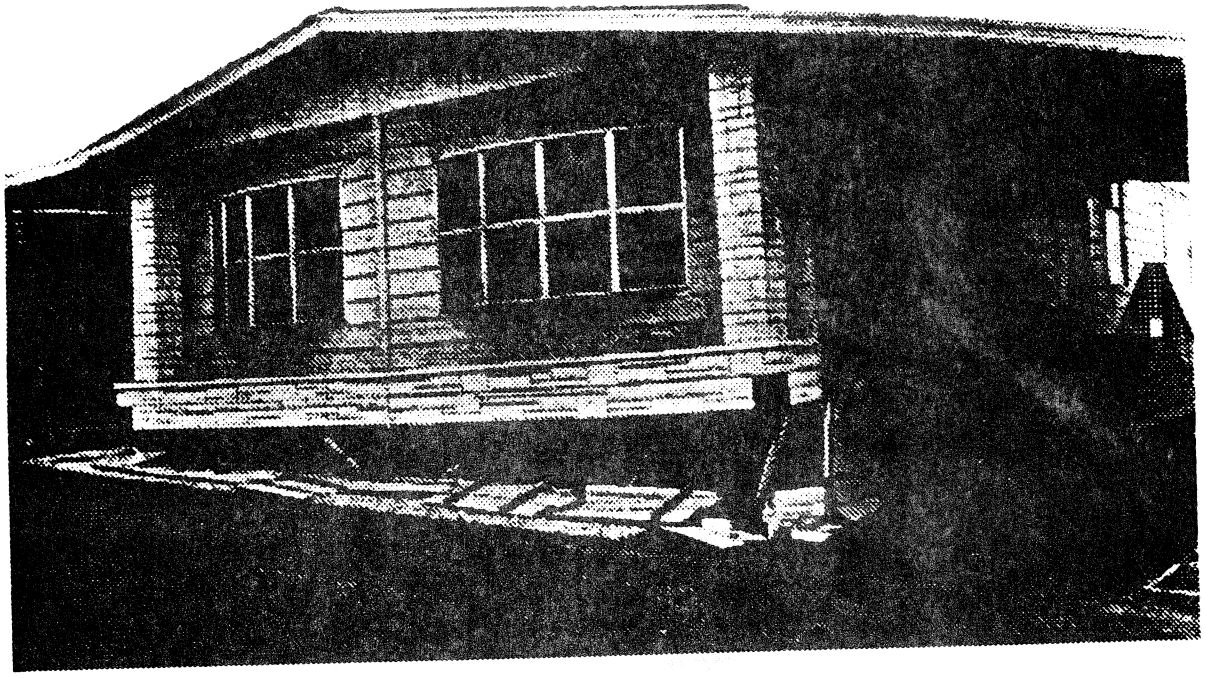
III

Inspection staff returned to that one park, where a higher than average failure of concrete block support systems was encountered, to determine the possible reasons for the lower performance.

In the days immediately following the Loma Prieta earthquake HCD supervisory and inspection staff from the Division of Codes and Standards (Division) were dispatched to the area from several assigned areas within Northern California. The Division's Southern California staff were placed on standby to be moved into the disaster area in the event they were needed. Unlike previous disasters where Division staff were employed in the "damage assessment" activity necessary to obtain declarations of a disaster from the Governor and the President, extensive media coverage led to early declarations at both the State and Federal level.

Since Division staff were not required to participate in extensive damage assessment activities, they were able to concentrate on the damage to manufactured housing within mobilehome parks where HCD has a combination of primary and secondary enforcement responsibility. HCD has secondary enforcement responsibility for the Mobilehome Parks Act where local governments have opted to assume primary responsibility. In the event that local governments choose not to provide enforcement within their jurisdictions, the Mobilehome Parks Act provides that HCD shall have the primary enforcement responsibility within that jurisdiction. Of the State's nearly 6,000 mobilehome parks, HCD has primary enforcement responsibility in more than half of the parks.

The figure below is representative of a manufactured home considered to be "down", i.e., the home's support system had failed to a sufficient degree that the home would be required to be reinstalled:



Within the disaster area Division staff found manufactured homes "down" in twenty-seven (27) mobilehome parks within the hardest hit counties of San Benito, Santa Clara and Santa Cruz. These parks reflected a mixture of both HCD and local enforcement jurisdictions.

Within San Benito, Santa Clara and Santa Cruz Counties there are 193 mobilehome parks containing 24,438 manufactured homes. Seventy-five (75) of the parks (39%) and 9,243 of the spaces (38%) are subject to HCD enforcement jurisdiction with the balance subject to local government jurisdiction. There were reportable damages to manufactured homes in approximately twenty-seven (14%) of the parks within these counties. The Division's initial assessment of the performance of manufactured home support systems was conducted within these twenty-seven (27) parks. The initial count of the homes down within these parks was:

Park County/Name	# Spaces	# Down	% Down
SAN BENITO			
Mission Oaks Mobilehome Park	225	120	53%
River Oaks Park	12	8	67%
Hollister Park	10	7	70%
O'Bannon's Mobilehome Park	11	4	36%
Banning Trailer Park	16	2	13%
Country Trailer Estates	4	1	25%
Mission Vineyard Mobile Estates	7	1	14%
SANTA CLARA			
Pacific Mobile Estates	178	36	20%
Hacienda Valley	165	14	8%
Morgan Hill Apartments and Trailer Park	25	12	48%
Wagon Wheel	121	9	7%
Madrone Estates	173	8	5%
Hill Haven Trailer Park	44	2	5%
Dalys Mobilehome Park	24	1	4%
SANTA CRUZ			
Rancho Cerritos	144	92	64%
Pinto Lakes Estates	174	82	47%
Monterey Vista Mobile Estates	122	70	57%
Green Valley Estates	105	57	54%
Colonial Manor	71	8	11%
Old Mill Mobilehome Park	39	14	36%
Meadow Manor	276	14	5%
Freedom Mobilehome Park	45	13	29%
Portola Heights	119	10	8%
Mountain Brook Mobilehome Park	44	4	9%
Vista Del Lago	202	1	<1%
Riverside Mobilehome Park	28	1	4%
Clearview Court	50	1	2%
TOTALS	2,434	592	24%

In addition to the homes that went down during the Loma Prieta earthquake, four (4) homes were destroyed. Two (2) of these homes were structurally damaged beyond repair and two (2) others were burned.

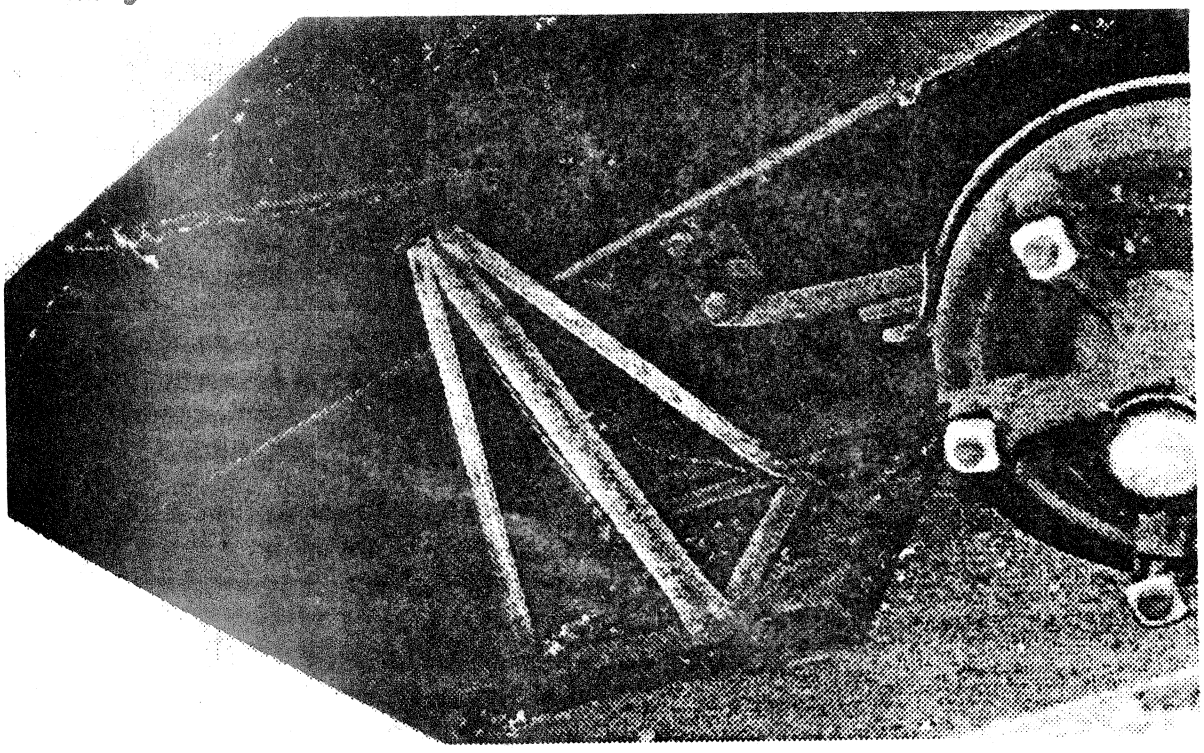
The figure below is of one (1) of the manufactured homes destroyed by fire during the Loma Prieta earthquake:

While the cause of the fires that destroyed two (2) mobilehomes during the Loma Prieta earthquake is not known, it is suspected that the gas piping to either the home itself or to one of the home's gas appliances were ruptured and the escaping gas ignited. Gas appliances within the home are required to be secured in place; however, previous experience indicates that homeowner replacements of appliances often overlook this requirement of HCD and Federal regulations. Another requirement of HCD regulations is that the gas piping connector to the home itself be flexible and of a six-foot (6') length. The purpose of this unusual connector, listed and tested specifically for this application, is to accommodate movement of the home without fracture of the connector.

Of the 592 homes that went down in the 27 parks surveyed, 301 were homes installed on steel piers (51%), 223 were installed on concrete piers (38%) and 68 were installed on concrete blocks (11%). All of these support systems for manufactured homes are approved under HCD regulations.

The steel pier is a favorite of many manufactured housing installers. They are relatively light in weight and their triangular construction allows them to be stacked one upon another thereby taking up little space in the installer's truck.

The figure below is of a manufactured home that had been installed with steel piers:



While the steel pier is favored by many for its light weight and easy adjustability, it provides little bearing surface for the manufactured home to rest upon. On the other hand, the steel pier has considerable ability to hold vertical weight. If the horizontal forces of wind and earthquake could be overcome by tie-downs or some other means, the steel pier would be an excellent method of supporting a manufactured home.

Unfortunately, there are few areas of California that are not subject to the horizontal forces of wind and earthquake. Horizontal movement of the home during high winds or in an earthquake sometimes causes the steel pier to topple over, or for the home's frame to slip away from and off of the steel pier's relatively small bearing surface.

The figure on the previous page shows a steel pier still sitting vertical and nearly square upon its pressurized wood footing. In this particular circumstance it appears that the home has moved several inches horizontally without toppling the pier. Had the homeowner not left the wheelhubs and axles on the home after installation, preventing the home from falling completely to the ground, the steel pier would have punctured the floor of the home. This is a relatively common problem in an earthquake and many believe that the combination of vertical and horizontal forces in earthquakes first lift the home from the pier, shift the home horizontally a few inches, then gravity slams the home to the ground. The figure on the previous page would seem to support that theory in this case.

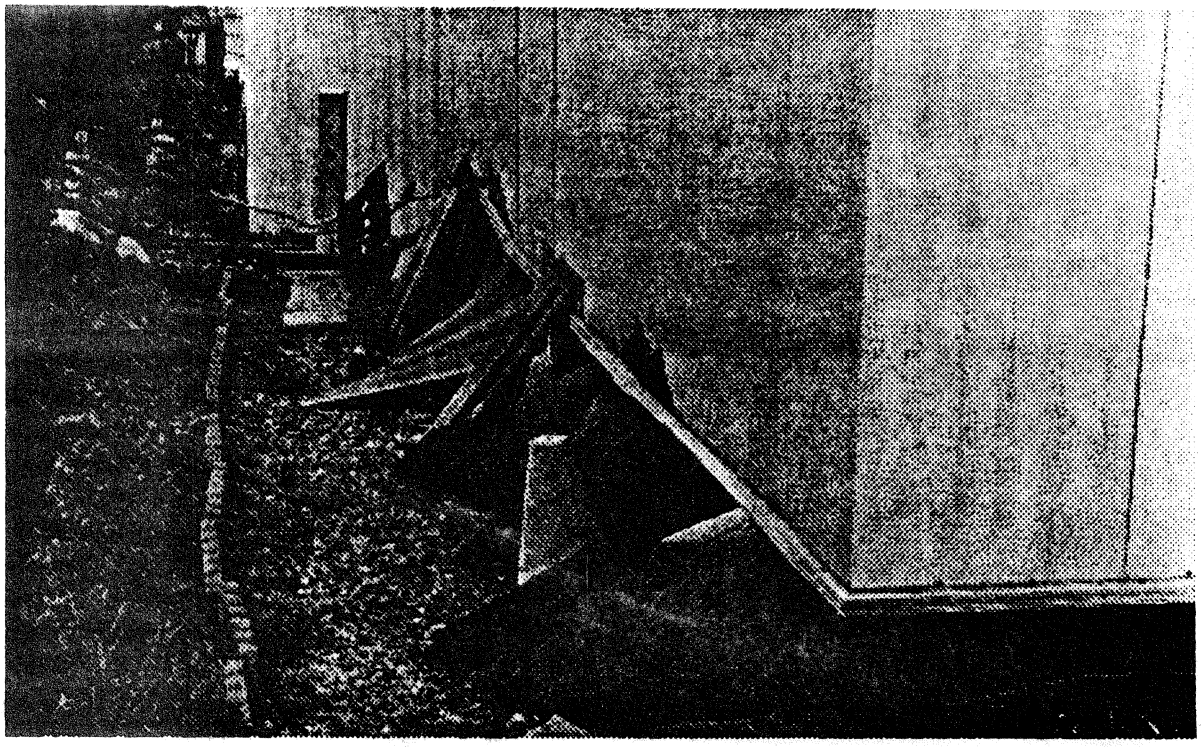
Until 1980, manufactured homes, then known by their still common name "mobilehomes", were vehicles under California law. Since these homes were treated as vehicles the wheelhubs and axles were prohibited by law from being removed from the home. Since 1980, manufactured homes have become transportable structures under California law and their towbars, axles and wheelhubs may be removed. Many businesses have developed over the years since 1980 that deal with the purchase, removal and recycling of the axles and wheelhubs from manufactured homes. It has even become popular in recent years to exclude these amenities from the price of new manufactured homes and they are removed from the homes by the dealer or installer at the time of delivery and installation of the home.

There are still a number of homeowners who advocate leaving the axles and wheelhubs on the manufactured home and a few others who believe that the wheels and tires, properly inflated of course, should also remain on the home for stability during earthquakes. Although the maintenance of these seemingly obsolete appendages may seem ridiculous to most homeowners, particularly with recent concerns for energy conservation and recycling, the figure on the previous page makes the issue worthy of consideration.

The axle and wheelhub of the home shown on the previous page actually prevented the home from falling completely to the ground. Had the home gone to the ground, there is no question that the pier shown in the figure, as well as several others, would have punctured the floor of the home and caused considerable damage. The home, at the point of axle connections, was held approximately twelve inches (12") from the ground by this assembly of parts actually designed to move the home down the road.

The concrete pier is similar in design to the steel pier, only much heavier. The pier has a concrete base of triangular design with an adjustable steel bolt in the center of the pier to facilitate adjustment. While this type of pier has most of the characteristics of the steel pier and performs about the same as a steel pier, it is quite heavy and cannot be stacked. In most areas of the State the concrete pier does not have the same degree of popularity as it appears to have within the disaster area where its use was second only to concrete block.

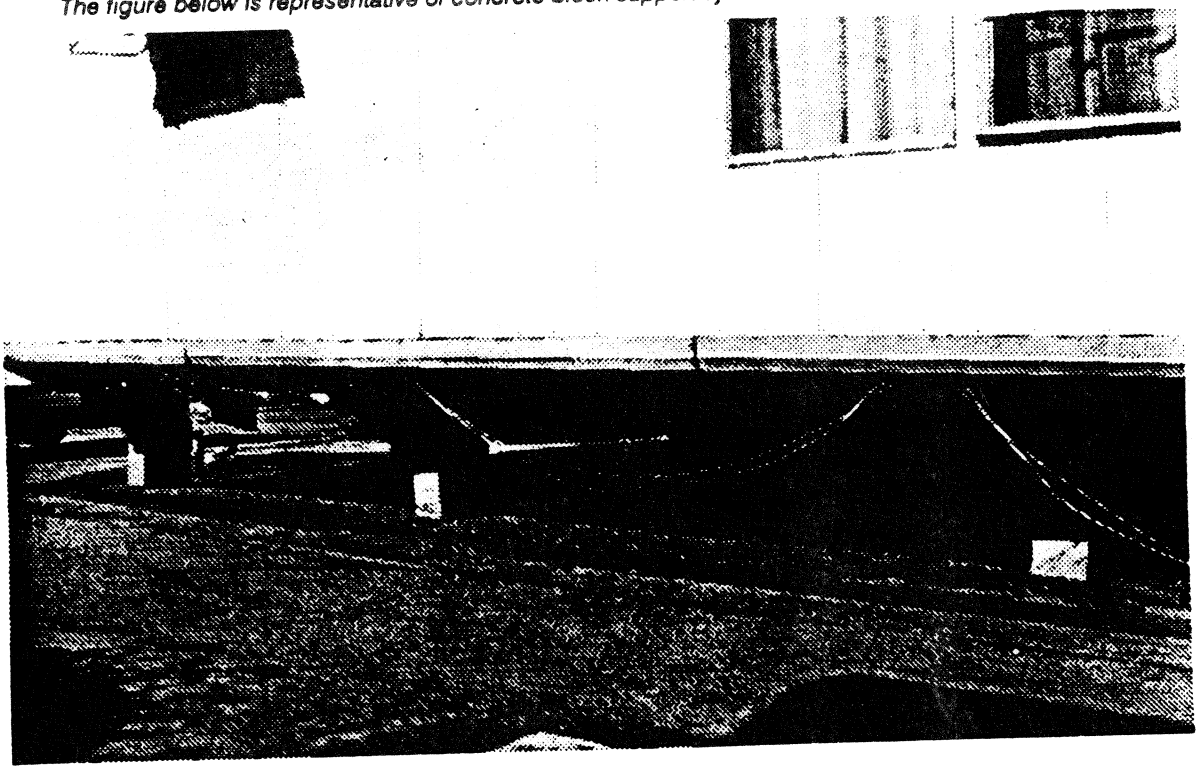
The figure below is of a manufactured home that had been installed with concrete piers:



223, or 38%, of the homes down were installed on concrete piers and, like steel piers, concrete piers are an approved method of supporting manufactured homes under current HCD regulations.

Sixty-eight (68), or 12%, of the manufactured homes found by Division inspectors to be downed by the Loma Prieta earthquake were installed on concrete block. There were two (2) different methods of stacking the block; 1) block against block from the footing material to wood shims at the point of contact with the home's chassis, and 2) using intermediate wood spacers between the blocks. There was no identifiable difference in the performance of these two (2) methods. Unlike steel and concrete piers, concrete blocks provide a greater bearing surface at both the footing and at the manufactured home's chassis. This greater bearing surface is believed to be responsible for the improved performance of this type of support system in an earthquake.

The figure below is representative of concrete block support systems:



One of the problems noted with concrete block, where the support system failed, was the breaking of the blocks where earthquake forces raised the home and the home came crashing down on the block. In similar instances with steel piers, in the unlikely event that the chassis came down squarely on the pier, the steel piers buckled. There were no noted instances of the failure of concrete piers under vertical pressure.

Following the initial assessment, as time permitted, Division staff conducted a more detailed evaluation of 12 of the parks where damage was heaviest. Within these 12 parks were 479, or 81%, of the 592 homes down. These 12 parks were:

SAN BENITO

1. The Mission Oaks Mobilehome Park with 225 spaces and 120 homes down had homes installed with the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	75	14	61	81%
Concrete Piers	39	21	18	46%
Concrete Block	111	70	41	37%
	225	105	120	53%

Five (5) homes within this park were equipped with Earthquake Resistant Bracing Systems (ERBS) and each performed without failure.

2. The Hollister Park with 10 spaces and 7 homes down had homes installed with the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	6	0	6	100%
Concrete Piers	0	0	0	0%
Concrete Block	4	3	1	25%
	10	3	7	70%

3. The Country Trailer Estates with 4 spaces and 1 home down had homes installed with the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	4	3	1	25%
Concrete Piers	0	0	0	0%
Concrete Block	0	0	0	0%
	4	3	1	25%

SANTA CLARA

4. Dalys Mobilehome Park with 24 spaces and 1 home down had homes installed with the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	24	23	1	4%
Concrete Piers	0	0	0	0%
Concrete Block	0	0	0	0%
	24	23	1	4%

SANTA CRUZ

5. Rancho Cerritos with 144 spaces and 92 homes down had homes installed on the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	33	11	22	67%
Concrete Piers	106	38	68	64%
Concrete Block	5	3	2	40%
	144	52	92	64%

Thirteen (13) homes in the park had ERBS and each one performed without failure.

6. The Pinto Lake Estates with 174 spaces and 82 homes down had homes installed on the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	85	35	50	59%
Concrete Piers	73	42	31	42%
Concrete Block	16	15	1	6%
	174	92	82	47%

Four (4) homes in the park had ERBS and each one performed without failure.

7. The Monterey Vista Estates with 122 spaces and 70 homes down had homes installed on the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	87	27	60	69%
Concrete Piers	27	18	9	33 %
Concrete Block	8	7	1	13%
	122	52	70	57%

Fifteen (15) homes in the park were equipped with ERBS and each one performed without failure.

8. The Green Valley Estates with 105 spaces had 57 homes down and had homes installed on the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	36	15	21	58%
Concrete Piers	66	31	35	53%
Concrete Block	3	2	1	33%
	105	48	57	54%

Two (2) homes in this park were installed on ERBS and each one performed without failure.

9. The Colonial Manor with 71 spaces had 8 homes down and had homes installed on the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	5	3	2	40%
Concrete Piers	49	45	4	8%
Concrete Block	17	15	2	12%
	71	63	8	11%

Three homes in this park were installed on ERBS and each one performed without failure.

10. The Meadow Manor with 276 spaces had 14 homes down and had homes installed on the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	10	0	10	100%
Concrete Piers	0	0	0	N/A
Concrete Block	266	262	4	2%
	276	262	14	5%

11. The Old Mill Mobilehome Park with 39 spaces had 14 homes down and had homes installed on the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	0	0	0	N/A
Concrete Piers	32	20	12	38%
Concrete Block	7	5	2	29%
	39	25	14	36%

Four (4) homes in the park were equipped with ERBS and each one performed without failure.

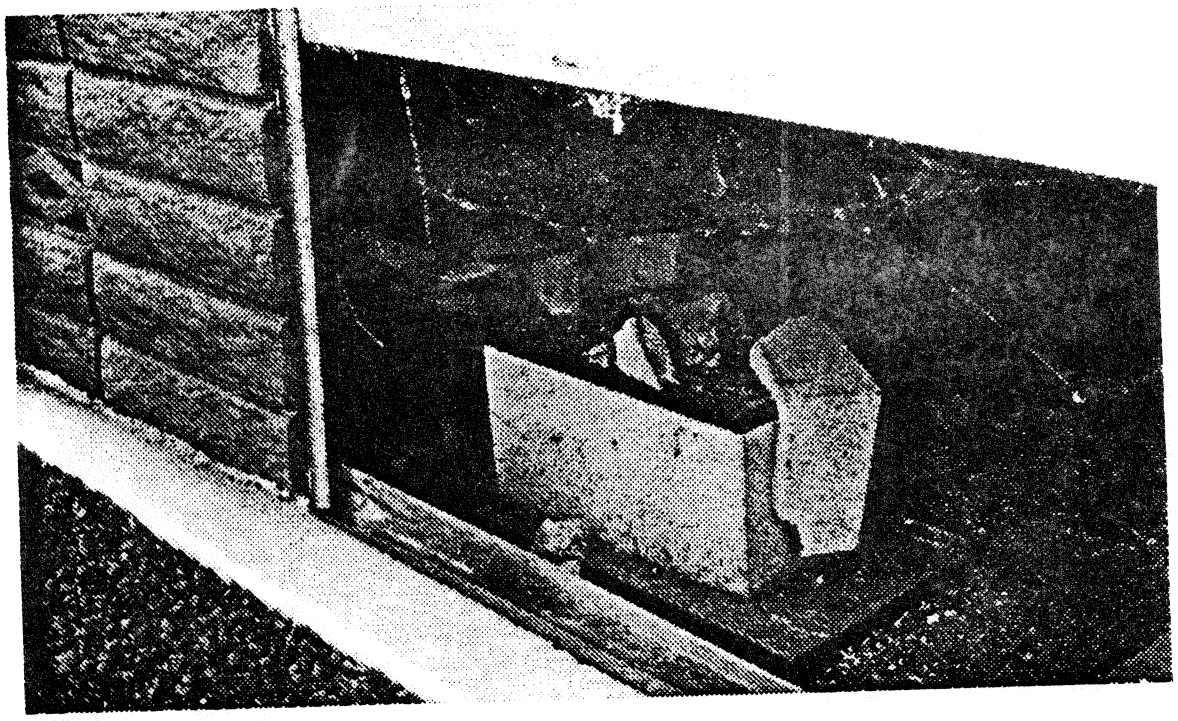
12. The Freedom Mobilehome Park with 45 spaces had 13 homes down and had homes installed on the following types of support systems:

	Total	Not Down	Down	% Failure
Steel Piers	9	2	7	78%
Concrete Piers	31	25	6	19%
Concrete Block	5	5	0	0%
	45	32	13	29%

The above represents a 0% failure rate of Earthquake Resistant Bracing Systems; a 64% failure rate for steel piers; a 43% failure rate for concrete piers; and, a 12% failure rate for concrete block. There was an unusual occurrence of the failure of concrete block in the Mission Oaks Mobilehome Park in San Benito County. Division inspectors returned to the park to look for a possible cause and found that the majority of concrete block support

systems in the park were of lightweight (ornamental) concrete block rather than the conventional 8" X 8" X 16" building (structural) concrete block.

The figure below is representative of a failed block support system.



Although fewer than 4% of the homes in these 12 parks were equipped with Earthquake Resistant Bracing Systems (ERBS), their performance without failure is worthy of additional note. An ERBS is not designed to prevent damage or to prevent the home from being displaced from its pier or block support system, the ERBS is designed to reduce damage to the home. In each instance where homes were found to be equipped with ERBS the system performed as designed.

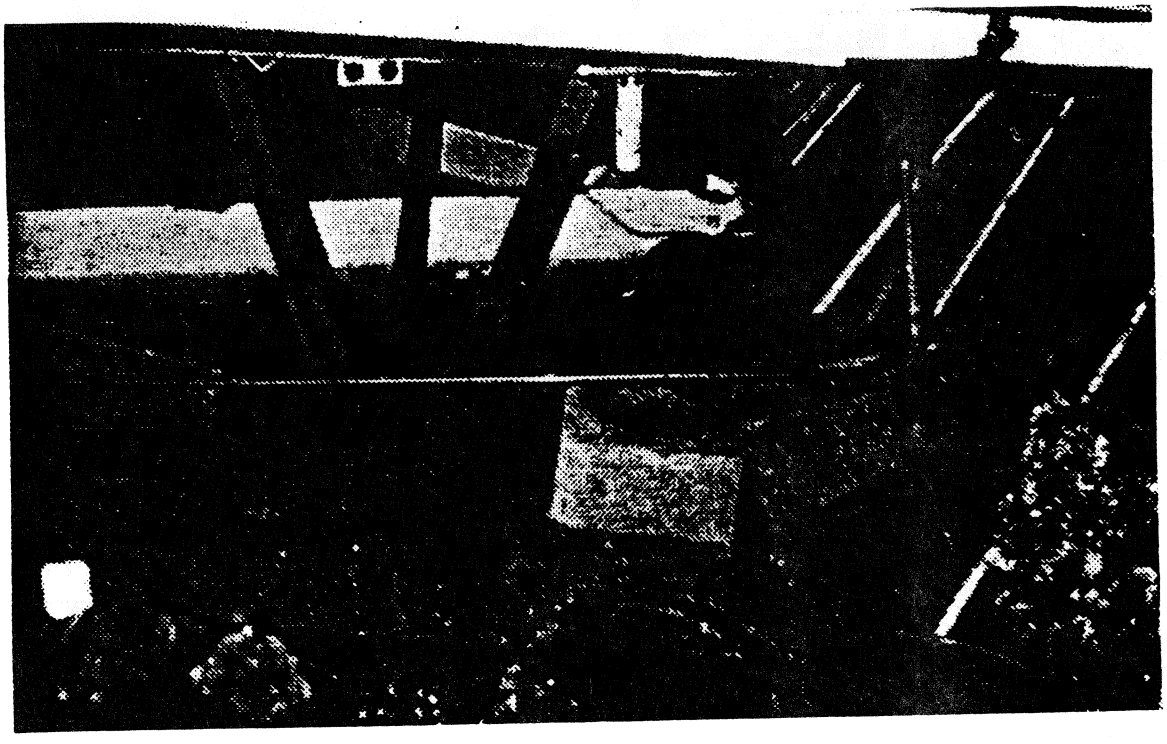
The HCD certified ERBS is designed to limit the fall of a home from its support system to a maximum of two inches (2"). Following an earthquake, homes equipped with ERBS may still have to be reinstalled upon their support systems. However, the reinstallation is greatly simplified since the home has not fallen completely to the ground and has not suffered significant structural damage. Homes with ERBS in the Loma Prieta earthquake, although their primary support systems had failed, were stable and were continued to be occupied.

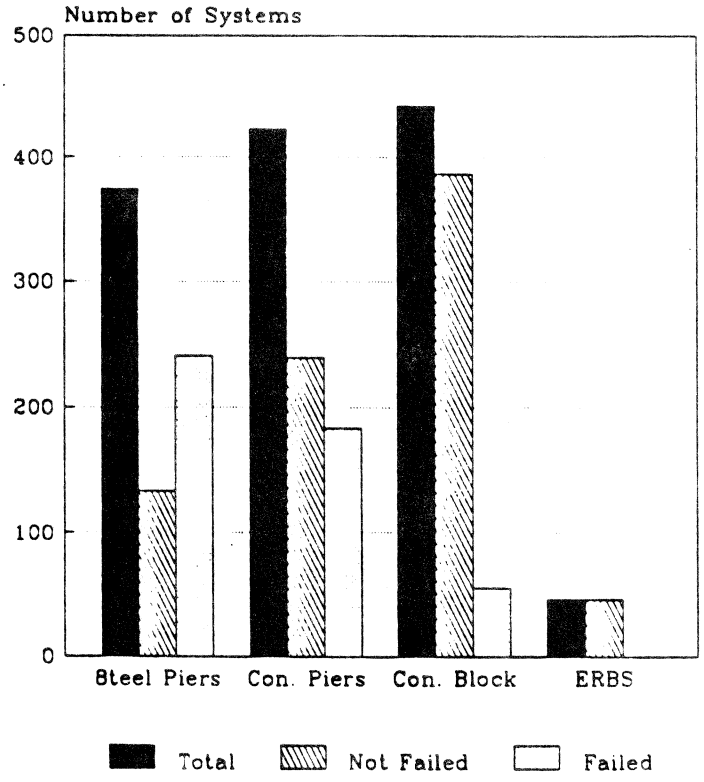
While older, non-certified, and home-made ERBS reduced damage to homes on which they were installed, these devices did not perform as well as the newer certified devices. HCD

is pleased with the industry support for the rigid certification standards and with the performance of the devices now that performance has been confirmed by more than the engineering theory initially applied in the certification program. HCD is also pleased that no performance conditions were observed of certified ERBS in the Loma Prieta earthquake that would necessitate a change in our regulations for certification.

In early 1990 HCD will be implementing legislation signed by the Governor in 1989 requiring a permit and inspection of each installation of an ERBS. This permit and inspection process will provide additional assurance to homeowners that the ERBS has been properly installed on their home.

The figure below is of a home with a failed primary support system and a functioning ERBS.





The above chart indicates the different types of support systems found, the number that performed without failure, and, the number that failed as a result of Loma Prieta earthquake forces.

A clear result of the evaluation of performance from the different types of manufactured home support systems is that there are substantial differences. It is also clear that the prior observance by Division inspectors in smaller earthquakes that concrete block support systems performed better than others can be statistically proven.

Additionally, we have observed the performance of HCD Certified Earthquake Resistant Bracing Systems (ERBS) for the first time under more than theoretical conditions. These systems do the job that they were designed to do. It was observed by inspectors that the homes equipped with HCD Certified ERBS sustained considerably less damage than the non-certified systems although both types of systems performed adequately. This observance could not be documented by repair bills, etc., it was simply an observance.

While this report does not reflect or represent a position of the Department of Housing and Community Development on the adequacy of support systems currently approved for manufactured homes, it certainly serves as the basis for consideration of changes to our regulations.

The Department will, in the Summer of 1990, hold "Fact Finding" Hearings to gather input from the public and industry concerning the adequacy of our current regulations for the support of manufactured homes. The dates, times and places of these hearings will be announced.

STATE OF CALIFORNIA GEORGE DEUKMEJIAN, Governor

DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF CODES AND STANDARDS - Administrative Office
1800 Third Street, Suite 280, Sacramento, CA 95814
Mailing Address: P.O. Box 1407, Sacramento, CA 95812-1407
(916) 445-9471

March 12, 1990

INFORMATION BULLETIN MP-90-02

To: MOBILEHOME EARTHQUAKE RESISTANT BRACING SYSTEM MANUFACTURERS AND INSTALLERS
MOBILEHOME PARKS
MOBILEHOME PARKS INTERESTED PARTIES
LOCAL ENFORCEMENT AGENCIES
DIVISION STAFF

SUBJECT: ANNOUNCEMENT OF EMERGENCY REGULATIONS - EARTHQUAKE RESISTANT BRACING SYSTEM INSTALLATION PERMITS

This bulletin announces the adoption of emergency regulations requiring permits and inspections when earthquake resistant bracing systems are installed on or under manufactured homes/mobilehomes. Assembly Bill 631 (Chapter 304, Statutes of 1989) enacting Health and Safety Code, Section 18613.7, required the Department to promulgate regulations to implement permit, installation and inspection procedures and establish a schedule of fees for these activities.

Accordingly, the department's regulations were filed with the Office Of Administrative Law as an emergency filing, and became effective March 12, 1990. A public hearing for the regulations will be held within 120 days from the date they became effective. A copy of the regulations in strike out and underline format will be available from the department at the hearing or by writing to:

The Department of Housing and Community Development
Division of Codes and Standards
Mobilehome Parks Program
P.O. Box 1407
Sacramento, Ca 95812-1407
(916) 445-9471

The specific location, date and time for the hearing will be announced in the near future by a "Notice of Adoption of Regulations by the Department of Housing and Community Development" issued by the department to the addressees of this bulletin.

The subject regulations for earthquake resistant bracing systems are contained in Title 25 of the California Code of Regulations, Chapter 2, Article 7.5. The emergency regulations added to Article 7.5 establish a process for obtaining a permit to install an earthquake resistant bracing system and make it mandatory for the enforcement agency to conduct an inspection of the installation. For the readers convenience, a copy of those sections from Article 7.5 affected by this emergency regulatory action have been included with this bulletin.

In summary, the enclosed regulations are in effect now. Any person proposing to install an earthquake resistant bracing system which is certified or subject to the certification requirements under Article 7.5, must comply with these regulations by making application to the appropriate enforcement agency for an installation permit. All such installations must be inspected by the enforcement agency. It is important to note however, that installation of an earthquake resistant bracing systems is **not** required.

If additional information is needed contact Chris Anderson, Mobilehome Parks Program Manager, at (916) 445-9471.

John Ellis
Chief

CALIFORNIA CODE OF REGULATIONS
Title 25, Chapter 2
Subchapter 1, Article 7.5

1. Amend Section 1370 to read:
1370. Application and Scope.

(a) The provisions of this article relating to the certification of mobilehome or manufactured home earthquake resistant bracing systems are applicable to all mobilehome or manufactured home earthquake resistant bracing systems sold or offered for sale within the State of California.

(b) The provisions of this article relating to the installation or reinstallation of an earthquake resistant bracing system required to be certified pursuant to this article, shall apply to a system installed or reinstalled on or under a manufactured home or mobilehome.

(c) The requirements of this article shall not apply to a mobilehome or manufactured home installed on a foundation system pursuant to Section 18551 of the Health and Safety Code.

(d) Nothing in this article shall be construed as requiring the installation of earthquake resistant bracing systems on or under a mobilehome or manufactured home sited either before or after the effective date of this article.

(e) Nothing in this article shall be construed as requiring certification or a permit for the creation and installation of an earthquake resistant bracing system by a registered owner who resides in the mobilehome or manufactured home for the sole use of the registered owner.

NOTE: Authority cited: Sections 18613.5 and 18613.7, Health and Safety Code. Reference: Sections 17003.5, 18300 and 18613.5, Health and Safety Code.

2. Amend Section 1370.2 to read:
1370.2 Certification Required.

(a) It shall be unlawful for any person, firm, or business to sell or offer for sale within this state, any earthquake resistant bracing system unless the system is certified by the department as meeting the requirements of this article.

(b) It shall be unlawful for any listing or testing agency to list as "approved" or authorize the use of its labels for any mobilehome or manufactured home earthquake resistant bracing system until such system is certified by the department.

NOTE: Authority cited: Sections 18613.5 and 18613.7, Health and Safety Code. Reference: Sections 17003.5, 18300 and 18613.5, Health and Safety Code.

3. Amend Section 1370.6 to read:
1370.6. Definitions.

For purposes of administration and enforcement, the definitions contained in this section shall apply to this article.

"Certification" means the department's stamp of approval applied to the plans and ERBS - manufacturer's installation instructions for an earthquake resistant bracing.

"Contractor" means any person as defined in Business and Professions Code Section 7026.

"Department" means Department of Housing and Community Development.

"ERBS" means an earthquake resistant bracing system.

"Earthquake Resistant Bracing System" means an anchoring system, bracing system, or other device designed and constructed, or represented as having been designed and constructed, for the purpose of protecting the health and safety of the occupants of and reducing damage to a mobilehome or manufactured home in the event of an earthquake.

"ERBS - Manufacturer's Installation Instructions" means the specific written directions for an earthquake resistant bracing system to be installed on or under a mobilehome or manufactured home.

"ERBS - Manufacturer" means a person, firm or business engaged in assembly or construction of earthquake resistant bracing systems for mobilehomes or manufactured homes.

"Installation" means the installation of an earthquake resistant bracing system which has not been previously installed on or under any mobilehome or manufactured home.

"Installer" means a person, firm or business engaged in the installation of an earthquake resistant bracing system on or under a mobilehome or manufactured home.

"Label" means a tag, symbol or other identifying mark.

"List" means all equipment and installations that appear in a list published by an approved listing or testing agency.

"Listing Agency" means an agency approved by the department which is in the business of listing or labeling and which maintains a periodic inspection program on current production of listed models, and which makes available at least an annual published report of such listing in which specific information is included that the product has been tested by an approved testing agency to approved standards and found safe for use in a specific manner.

"Registered owner" means a person registered by the department as the owner of the manufactured home or mobilehome.

"Reinstallation" means the installation of an earthquake resistant bracing system which had been previously installed under the same or a different mobilehome or manufactured home.

"Resident" means any person living in the mobilehome or manufactured home who may or may not be the owner.

"Testing Agency" means an organization which:

(a) Is in the business of testing equipment and installations;

(b) Is qualified and equipped for such experimental testing;

(c) Is not under the jurisdiction or control of any manufacturer or supplier for any affected industry;

(d) Maintains at least an annual inspection program of all equipment and installations currently listed or labeled;

(e) Makes available a published directory showing current listings of manufacturer's equipment and installations which have been investigated, certified and found safe for use in a specified manner and which are listed or labeled by the testing agency; and

(f) Is approved by the department.

NOTE: Authority cited: Section 18613.5, Health and Safety Code. Reference: Section 18613.5, Health and Safety Code.

4. Amend Section 1371 to read:

1371. Construction and Design Requirements.

(a) Earthquake resistant bracing systems shall be designed and constructed to resist seismic forces determined in accordance with the provisions of Section 2312, Chapter 23, Uniform Building Code, 1982 Edition.

(b) Earthquake resistant bracing systems shall be designed to limit any downward vertical movement of a mobilehome or manufactured home to a maximum of two (2) inches.

(c) The ERBS - manufacturer shall assure that each system sold or offered for sale bears two rigid, permanently affixed labels which shall have a useful life equal to that of the system. One label shall provide in a legible manner, evidence of approval from a listing or testing agency. The second label shall provide in a legible manner, the ERBS - manufacturer's name and the manufacturer's model name or number.

(d) If the earthquake resistant bracing system consists of more than one bracing device, each individual device shall be labeled as required in subsection (c).

NOTE: Authority cited: Section 18613.5, Health and Safety Code. Reference: Sections 17003.5, 18300 and 18613.5, Health and Safety Code.

5. Amend Section 1372.2 to read:
1372.2. Plan Requirements.

(a) Plans submitted to the department for certification shall be on substantial paper or cloth, not less than 8 1/2 x 11 inches or multiples thereof but not exceeding 25 1/2 x 36 inches.

(b) A plan shall include all pertinent items necessary for the design, construction, and installation of the system, such as details of connections, dimensions, footings, general notes and the method of installation.

(c) A plan shall depict only one design or model of earthquake resistant bracing system.

(d) A plan shall include the ERBS - manufacturer's installation instructions which, when approved, may be copied for the purposes specified in Section 1374.6 and 1374.7.

(e) Each page of the plan and each page of the ERBS - manufacturer's installation instructions shall provide a blank space not less than 3 x 3 inches for the department's stamp of approval.

(f) Each page of the plan and each page of the ERBS - manufacturer's installation instructions shall be identified by the ERBS - manufacturer's name and the manufacturer's model name or number of the system to be certified.

(g) The cover sheet of the ERBS - manufacturer's installation instructions shall show the total number of pages which constitute the instructions.

NOTE: Authority cited: Sections 18613.5, 18613.7, Health and Safety Code. Reference: Sections 18300 and 18613.5, Health and Safety Code.

6. Adopt Section 1374.5 to read:
1374.5. Permit Required.

(a) A permit shall be obtained from the enforcement agency prior to installation or reinstallation of an earthquake resistant bracing system, required to be certified, on or under a manufactured home or mobilehome.

(b) When an earthquake resistant bracing system is to be installed at the time of the manufactured home or mobilehome installation, separate permits shall be required for the installation of the manufactured home or mobilehome and the earthquake resistant bracing system.

NOTE: Authority cited: Sections 18613.7 and 18300, Health and Safety Code. Reference: Sections 18502.5 and 18613.7, Health and Safety Code.

7. Adopt Section 1374.6 to read:
1374.6 Permit Application.

(a) The person, firm or business required to obtain a permit to install or reinstall an earthquake resistant bracing system on or under a manufactured home or mobilehome shall apply to the enforcement agency. Where the department is the enforcement agency, the application shall be made on form HCD 50 ERBS, Application for Permit to Install Manufactured Home or Mobilehome Earthquake Resistant Bracing System, dated 1/90, as set forth in subsection (b). This form is provided by the department.

(b) Form HCD 50 ERBS, Application for Permit to Install Manufactured Home or Mobilehome Earthquake Resistant Bracing System, dated 1/90:

STATE OF CALIFORNIA
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF CODES AND STANDARDS

APPLICATION FOR PERMIT TO INSTALL MANUFACTURED HOME OR MOBILEHOME EARTHQUAKE RESISTANT BRACING SYSTEM

THIS FORM WILL SERVE AS THE PERMIT WHEN APPROVED AND A PERMIT NUMBER IS ASSIGNED AS INDICATED IN SECTION 6 BELOW

DEPT USE ONLY

ID No_____
Col. No_____
Fee Rec'd_____
Assigned to_____
_____
Date Assigned_____
Routed by _____
Date Closed _____
Closed by _____

SECTION 1 - APPLICANT INFORMATION

Name _____

Address _____

_____ Telephone (___) _____

Check One, As Appropriate ☐ Contractor ☐ Registered Owner

SECTION 2 - INSTALLATION SITE INFORMATION

Resident's Name _____

Resident's Space Or Lot No. _____ Telephone (___) _____

Mobilehome Park Name _____

Mobilehome Park Address_____

_____ County _____

SECTION 3 - EARTHQUAKE RESISTANT BRACING SYSTEM INFORMATION

Manufacturer's Name_____ Certification No. _____

Brand Or Model Name _____ Model No._____

Check One, As Appropriate ☐ New Installation ☐ Reinstallation

SECTION 4 - CONTRACTOR INFORMATION (Note: Not applicable to homeowner installation.)

License No. _____ Classification _____ Expiration Date _____

Workers' Compensation Insurance Policy No. _____ Expiration Date _____

☐ Exemption to Workers' Compensation Insurance. I certify that in the performance of the earthquake resistant bracing system installation, I shall not employ any person in any manner so as to become subject to the Workers' Compensation laws of California.

SECTION 5 - APPLICANT CERTIFICATION AND INFORMATION

I hereby certify under penalty of perjury that the information provided herein is true and correct.

Typed or Printed Name_____

Signature_____ Date_____ at_____
(County)

NOTE: This application must be accompanied by a copy of the plans and ERBS - manufacturer's installation instructions made from the original, bearing the Department's stamp of approval. This application shall also be accompanied by the fee in accordance with the California Code of Regulations, Title 25, Chapter 2, Section 1376(h).

PLEASE SEE BACK OF FORM FOR IMPORTANT INFORMATION REGARDING YOUR APPEAL RIGHTS

SECTION 6 - APPLICATION PROCESSING -- PERMIT ISSUANCE RECORD (Department Use Only)

☐ Application Rejected On _____ ☐ Application Accepted On _____

☐ Permit Issued On _____ No. _____ Expiration Date _____

Rejected Or Issued By _____

HCD 50 ERBS (NEW 1/90) DISTRIBUTION: ORIGINAL TO APPLICANT; 2, AREA OFFICE; 3, DR; 4, ASSESSOR

You, the applicant, may appeal directly to the Director of the Department and/or the Secretary of the Business, Transportation and Housing Agency for a timely resolution of any dispute arising from a violation of the time periods within which the department must process this application. The appeal shall be decided in your favor, if the department exceeds the maximum time period of issuance or denial of the permit and has failed to establish good cause for exceeding these time periods. In such an instance, you shall receive full reimbursement of any and all filing fees paid to the department.

Department of Housing and Community Development
P.O. Box 1407
Sacramento, CA 95812-1407

(916) 445-9471

Business, Transportation and Housing Agency
1120 N Street
Sacramento, CA 95814

(916) 445-1331

NOTE: Authority cited: Sections 18300 and 18613.7, Health and Safety Code. Reference: Sections 18613, 18613.5 and 18613.7, Health and Safety Code.

8. Adopt Section 1374.7 to read:

1374.7. Installation Requirements

(a) A manufactured home or mobilehome earthquake resistant bracing system may only be installed by:

(1) The manufactured home or mobilehome registered owner; or

(2) A contractor as defined in Business and Professions Code Section 7026. The contractor shall be licensed by the Contractors State License Board, and provide proof of a current license, and current Workers' Compensation Insurance coverage or certify to exemption from Workers' Compensation Insurance.

(b) The permit shall be in the possession of the installer and available to the enforcement agency during the installation of an earthquake resistant bracing system.

(c) Installations of earthquake resistant bracing systems shall comply with the ERBS - manufacturer's installation instructions certified by the department. Certified systems shall not be modified without recertification by the department.

(d) The installer shall leave a copy of the ERBS - manufacturer's installation instructions with the owner of the manufactured home or mobilehome when the installation is completed. The copy of the ERBS - manufacturer's installation instructions must have been made from the original bearing the department's stamp of approval.

(e) The installer shall obtain the mobilehome park operator's written approval prior to excavating for support or hold down footings and endangering underground utilities.

(f) Where the space beneath a mobilehome or manufactured home is enclosed there shall be provided removable or openable access panels measuring not less than 18 inches in any dimension, and not less than 4 square feet in area. The access panels shall be located on one side of the mobilehome or manufactured home and be within 20 feet of each earthquake resistant bracing system device. The access panels shall not be fastened by any means requiring the use of a special tool or device to remove or open the panels.

Authority cited: Sections 18300 and 18613.7, Health and Safety Code. Reference: Sections 18300 and 18613.7, Health and Safety Code, and Section 3800, Labor Code.

9. Amend Section 1375 to read:

1375. Inspections.

(a) The department may conduct inspections to determine compliance with the approved certification.

(b) The enforcement agency shall conduct an inspection of each earthquake resistant bracing system, required to be certified that is installed or reinstalled on or under a manufactured home or mobilehome.

(c) Should inspection by an enforcement agency other than the department reveal that a manufacturer is manufacturing systems which do not conform to the department's certification, the enforcement agency shall, within 10 days of the inspection, notify the department in writing. The written notification shall include:

(1) The ERBS - manufacturer's name.

(2) The model name and/or identifying number.

(3) The manufactured home or mobilehome resident's name and address where the system was installed.

(4) A brief description of the earthquake resistent bracing system's noncompliance with the department's certification.

(d) Upon receiving a correction notice of noncompliance with department certification from a local enforcement agency, or obtaining such information by inspection, the department shall provide written notification of noncompliance requiring correction within 30 days, or at a later date as determined

by the department, to the manufacturer . The department shall also send an informational copy of the ERBS - manufacturer's notification of noncompliance to the listing or testing agency that investigated and listed the system. The ERBS - manufacturer shall apply for reinspection in accordance with Section 1375.2.

(e) Where the ERBS - manufacturer, after having been notified of the violation, fails to comply with the order to correct, or continues to manufacture systems in violation of the certification, the department's certification shall be revoked.

(f) If, as a finding of inspection, the installation of an earthquake resistant bracing system is found to be in violation of the ERBS - manufacturer's installation instructions and/or plan, the enforcement agency shall provide the installer with a written correction notice of the violation requiring correction within 30 days or at a later date as determined by the enforcement agency. The written notice shall also require the installer to make application to the enforcement agency for reinspection upon correction of the violations. The installer shall apply for reinspection in accordance with Section 1375.2.

NOTE: Authority cited: Sections 18613.5 and 18613.7, Health and Safety Code. Reference: Sections 18300, 18613.5 and 18613.7, Health and Safety Code.

10. Adopt Section 1375.2 to read:

1375.2. Required Correction and Reinspection

(a) Any ERBS - manufacturer issued a correction notice pursuant to Section 1375, shall take appropriate action to eliminate the violations and conform to the department's certification within 30 days or at a later date as set forth in the correction notice. Upon correction of the violations, the ERBS - manufacturer shall apply to the department for reinspection. The application shall be made on the department-provided form HCD 50 REINSP Application for Reinspection, dated 1/90 (See Appendix A). The application shall be accompanied by the reinspection fee specified in Section 1376 and provide the following information:

(1) The applicant's name, address and telephone number.

(2) The name, address, space or lot number and telephone number of the manufactured home or mobilehome resident.

(3) The name, address and county of the mobilehome park.

(4) The date of the correction notice.

(5) Identification that the type of construction or installation to be reinspected is an earthquake resistant bracing system.

(6) A description of the work to be reinspected on the earthquake resistant bracing system.

(7) The signature and typed or printed name of the applicant certifying to the accuracy of the information provided.

(8) The date the certification was signed.

(9) The county where certification was signed.

(b) Any person, firm or business having installed an earthquake resistant bracing system, who is issued a correction notice pursuant to Section 1375, shall take appropriate action to eliminate the violations and conform to the ERBS - manufacturer's installation instructions certified by the department, within 30 days or at a later date as set forth in the correction notice. Upon correction of the violations, the installer shall apply to the enforcement agency for reinspection. Where the department is the enforcement agency, the application shall be made on the department-provided form HCD 50 REINSP Application for Reinspection, dated 1/90 (See Appendix A). The application shall be accompanied by the reinspection fee specified in Section 1376 and provide the following information:

(1) The applicant's name, address and telephone number.

(2) The name, address, space or lot number, and telephone number of the manufactured home or mobilehome resident.

(3) The name, address and county of the mobilehome park.

(4) The permit number for the earthquake resistant bracing system installation.

(5) The date of the correction notice.

(6) Identification that the type of construction or installation to be reinspected is an earthquake resistant bracing system.

(7) A description of the work to be reinspected on the earthquake resistant bracing system.

(8) The signature and typed or printed name of the applicant certifying to the accuracy of the information provided.

(9) The date the certification was signed.

(10) The county where certification was signed.

NOTE: Authority cited: Sections 18300 and 18613.7, Health and Safety Code. Reference: Sections 18300 and 18613.7, Health and Safety Code.

11. Amend Section 1376 to read:

1376. Fees.

(a) Certification application fee, one hundred dollars ($100).

(b) Renewal fee, fifty dollars ($50).

(c) Resubmission fee, ten dollars ($10).

(d) Revision fee, ten dollars ($10).

(e) Certification review fees of thirty-nine dollars ($39), for the first hour and nineteen dollars and fifty cents ($19.50) for each 30 minutes or fractional part thereof in excess of one hour. The balance of certification review fees due shall be paid to the department prior to the issuance of certification.

(f) Where the department is the enforcement agency, Inspection or reinspection fee, sixty-three dollars ($63) for the first hour plus thirty-one dollars and fifty cents ($31.50) for each 30 minutes or fractional part thereof in excess of one hour.

A minimum fee of sixty-three dollars ($63) shall be submitted with each application for a permit or reinspection. Any additional fees required shall be paid upon completion of the inspection or reinspection.

(g) Change of ERBS- manufacturer's name, ownership or address fee. Fifteen dollars ($15.00).

(h) Where the department is the enforcement agency, Permit Application fee, twenty dollars ($20).

NOTE: Authority cited: Sections 18502.5, 18613.5 and 18613.7, Health and Safety Code. Reference: Sections 18300, 18502.5, 18613.5 and 18613.7, Health and Safety Code.

12. Adopt Section 1377 to read:

1377. Permit Application Review and Notice of Department Decision.

(a) Within 5 working days of the receipt of an application to install an earthquake resistant bracing system, the department shall provide the applicant with written notice whether the application is complete pursuant to Section 1374.6 and acceptable for filing. If the application is not complete, the notice shall specify the information and/or documentation necessary to complete the application. If the application is not complete, the notice, the application and the accompanying documentation shall be returned to the applicant.

(b) Within 15 working days of the receipt of a complete and acceptable application, the department shall issue a permit or shall provide the applicant with written notice of the department's refusal to issue a permit. The written notice of refusal shall specify the reasons why the permit may not be issued.

(c) An application for a permit to install an earthquake resistant bracing system shall be considered complete and acceptable if it is in compliance with the provisions of Section 1374.6 of this article.

(d) Should the applicant fail to submit a complete and acceptable application within 90 days of the notice of rejection, the application shall be deemed abandoned and all fees submitted pursuant to Section 1376 shall be forfeited to the department. Should an applicant cancel the application for the permit to install a manufactured home or mobilehome earthquake resistant bracing system, all fees submitted shall be forfeited to the department.

(e) The estimated minimum, median and maximum elapsed time between receipt of a completed application for a permit to install an earthquake resistant bracing system and reaching a final decision are as follows:

(1)	Minimum	5 working days
(2)	Median	10 working days
(3)	Maximum	15 working days

(f) The applicant may appeal directly to the Director of the Department and/or the Secretary of the Business, Transportation and Housing Agency for a timely resolution of any dispute arising from a violation of the time periods within which the department must process this application. The appeal shall be decided in the applicant's favor if the department has exceeded the established maximum time period of issuance or denial of the permit and the department has failed to establish good cause for exceeding the time period. If the appeal is decided in the applicant's favor, the applicant may receive full reimbursement of any and all filing fees paid to the department.

NOTE: Authority cited: Section 18502.5 and 18613.7, Health and Safety Code, and Section 15376, Government Code. Reference: Sections 18300, 18502.5 and 18613.7, Health and Safety Code, and Section 15376, Government Code.

APPENDIX A

STATE OF CALIFORNIA
DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF CODES AND STANDARDS

APPLICATION FOR REINSPECTION

DEPT USE ONLY
ID No_____
Col. No_____
Fee Rec'd_____
Assigned to_____
_____
Date Assigned_____
Routed by _____
Date Closed _____
Closed by _____

SECTION 1 - APPLICANT INFORMATION

Name_____

Address_____

_____Telephone (___)_____

SECTION 2 - SITE INFORMATION (Complete As Applicable)

Resident's Name _____

Resident's Address _____

Resident's Space Or Lot No. _____Telephone (___)_____

Mobilehome Park Name _____

Mobilehome Park Address _____

_____County_____

SECTION 3 - DESCRIPTION OF WORK TO BE REINSPECTED

Permit No. (if applicable)_____ Date of Correction Notice_____

Type of Construction or Installation (select one):

☐ Manufactured Home/Mobilehome Installation ☐ Mobilehome Park Construction

☐ Accessory Structure ☐ Earthquake Resistant Bracing System ☐ Other

Description Of Construction Or Installation To Be Reinspected:_____

SECTION 4 - APPLICANT CERTIFICATION AND INFORMATION

I hereby certify under penalty of perjury that the information provided herein is true and correct.

Printed or Typed Name _____

Signature _____Date_____at_____
(County)

NOTE: This application must be accompanied by the reinspection fee specified in the California Code of Regulations, Part I, Title 25, Chapter 2, Section 1020 or 1376 whichever is appropriate.

HCD 50 REINSP (NEW 1/90) DISTRIBUTION: ORIGINAL TO APPLICANT; 2, AREA; 3, DR

TITLE 25. DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT

NOTICE IS HEREBY GIVEN.

Notice is hereby given that the Department of Housing and Community Development proposes to formally adopt emergency regulations for the permitting and inspection of mobilehome and manufactured home earthquake resistant bracing systems. These regulations were approved by the Office of Administrative Law on March 12, 1990 on an emergency basis and will remain in effect for 120 days. The Department must adopt these regulations within the 120 day time period. Consequently, a public hearing has been scheduled at which any interested person may present statements orally or in writing about this proposed regulatory action. The hearing will be held at 1800 - 3rd Street (3rd and "R"), Second Floor Conference Room, Sacramento, California at 10:00 a.m. on June 11, 1990. Written comments about these proposals will be accepted by the department from April 27, 1990 until 5:00 p.m. on June 11, 1990. Please address your comments to Chris Anderson, Mobilehome Parks Program Manager, Division of Codes and Standards, P.O. Box 1407, Sacramento, CA 95812-1407.

INFORMATIVE DIGEST.

Health and Safety Code Section 18613.7 requires that a permit be obtained from an enforcement agency each time an earthquake resistant bracing system is installed on any manufactured home or mobilehome. An enforcement agency is defined in Health and Safety Code Section 18207 as being the Department of Housing and Community Development or a city, county, or city and county which has exercised the option provided in Health and Safety Code Section 18300 to assume from the department, the jurisdiction for the enforcement of the Mobilehome Parks Act and the regulations promulgated thereunder. Health and Safety Code Section 18613.7 also requires the enforcement agency to inspect the installation of the earthquake resistant bracing system to ensure compliance with regulations adopted by the department. The enforcement agency is authorized to adopt a fee schedule not to exceed the costs of issuance of the permit and inspection. Consequently, the department proposes to amend and adopt the following regulations which implement this program.

Existing Section 1370 provides for the application and scope of the provisions contained in Article 7.5 entitled, "Mobilehome and Manufactured Home Earthquake Resistant Bracing Systems." The department proposes to further clarify the application and scope by specifying that the provisions of the article apply to the certification of mobilehome or manufactured home earthquake resistant bracing systems sold or offered for sale and the installation or reinstallation of an earthquake resistant bracing system required to be certified that are installed or reinstalled on or under a manufactured home or mobilehome. Additionally, the department proposes to provide exemption from the application and scope of the article to those earthquake resistant bracing systems which are created and installed by the registered owner of the

mobilehome or manufactured home and for use solely by the owner. The section also provides for other clarifying changes.

Existing Section 1370.2 establishes the requirements for certification of an earthquake resistant bracing system. The department proposes to delete existing provisions requiring the manufacturer provide the consumer with a copy of the earthquake resistant bracing system's installation instructions, and the manufacturer assure that each system sold, offered for sale or installation bears evidence of approval from a listing or testing agency. These provisions have been updated and moved to a more appropriate section in the article. In addition, the department proposes some clarifying changes in the section.

Existing Section 1370.6 contains the definitions of the terminology used in the article. The department proposes to amend and add definitions to this section.

Existing Section 1371 provides for the construction and design requirements for earthquake resistant bracing systems. The department proposes to amend the section by requiring the manufacturer to assure each system sold or offered for sale bears two labels as specified. In addition, the department proposes to amend the section by requiring each individual device of the earthquake resistant bracing system be labeled.

Existing Section 1372.2 specifies the plan requirements for an earthquake resistant bracing system. The department proposes to add requirements that each page of the plan and each page of the installation instructions include the manufacturer's name and model number of the system to be certified, and that the cover sheet accompanying the installation instructions clearly indicate the total number of pages contained in the instructions. The department is also proposing to amend the section to provide that each page of the plan and each page of the installation instructions include the department's stamp of approval, and the plan and installation instructions may be copied for purposes of applying for the permit and meeting installation requirements.

Proposed Section 1374.5 specifies the requirements for a permit. The department proposes to specify when a permit is required and that separate permits be required for the installation of a manufactured home or mobilehome and the earthquake resistant bracing system.

Proposed Section 1374.6 provides the requirements for application for the permit. In this proposal, the department specifies the form and information required to apply for a permit.

Proposed Section 1374.7 provides the installation requirements for an earthquake resistant bracing system. In this proposal, the department specifies who may install a system and their qualifications. Additionally, the proposal specifies the permit be in the possession of the installer and made available to the enforcement agency during the installation of an earthquake resistant bracing system. A further requirement specifies that certified systems must not be modified without recertification by the department. The proposed section also requires the installer leave a copy of the manufacturer's installation instructions with the owner of the manufactured home or mobilehome and clarifies the procedures for making copies of the installation instructions.

Further requirements include provisions for the installer to obtain the mobilehome park operator's written approval prior to excavating for support or hold down footings and endangering underground utilities, and the area beneath the manufactured home or mobilehome contain removable or openable access panels.

Existing Section 1375 specifies inspection requirements for earthquake resistant bracing system certification. The department proposes to add a requirement providing for the inspection of systems installed or reinstalled on or under a manufactured home or mobilehome. Additionally, the department proposes to add a requirement for a notification and correction process for those manufacturers found to be in noncompliance with department certification and installers found to be in noncompliance with the manufacturer's installation instructions or provisions of the article.

Proposed Section 1375.2 provides the correction and reinspection requirements for manufacturers and installers of earthquake resistant bracing systems, who are issued a notice of correction. The department proposes to specify the form and information required to apply for reinspection upon correction of a violation.

Existing Section 1376 specifies the fees charged by the department for certification of an earthquake resistant bracing system. The department proposes to charge a new permit application fee for installation of an earthquake resistant bracing system of $20.00, and increase the existing fee for inspections from $39.00 to $63.00 for the first hour, and $19.00 to $31.50 for each 30 minutes or fractional part thereof in excess of one hour. A reinspection fee has been added at the same fee level as inspections.

Proposed Section 1377 addresses application processing for the issuance of a permit to install an earthquake resistant bracing system.

NOTICE IS HEREBY GIVEN.

Notice is hereby given that the Department of Housing and Community Development proposes to adopt additional regulations relative to the certification of mobilehome and manufactured home earthquake resistant bracing systems in addition to the emergency regulations described above. These regulations will be addressed at the public hearing, as scheduled above at 1800 - 3rd Street (3rd and "R"), Second Floor Conference Room, Sacramento, California at 10:00 a.m. on June 11, 1990. Any interested person may present statements orally or in writing about this proposed regulation action at the scheduled hearing. In addition, written comments about these proposals will be accepted by the department from April 27, 1990 until 5:00 p.m. on June 11, 1990. Please address your comments to Chris Anderson, Mobilehome Parks Program Manager, Division of Codes and Standards, P.O. Box 1407, Sacramento, CA 95812-1407.

INFORMATIVE DIGEST.

Existing Section 1370.4 addresses the enforcement and penalty provisions under the article. The department proposes to amend the section by clarifying the provisions regarding the causes for

cancellation of certification.

Existing Section 1372 provides the procedures for obtaining department certification of a mobilehome and manufactured home earthquake resistant bracing system. The department proposes to amend the section by specifying the use of a form to apply for department certification.

Existing Section 1372.4 addresses the processing of the application and plans for certification of a mobilehome and manufactured home earthquake resistant bracing system. The department proposes to amend the section by further clarifying the procedures for processing the application and plans.

Existing Section 1376 specifies the fees charged by the department for certification of an earthquake resistant bracing system. The department proposes to increase the certification review fee from $39.00 to $67.00 for the first hour and from $19.50 to $33.50 for each 30 minutes or fractional part thereof in excess of one hour. The department also proposes to make some additional clarifying changes to the section.

AUTHORITY.

The department is proposing this regulatory activity under the authority provided by Sections 18300, 18502.5, 18613.5 and 18613.7 of the Health and Safety Code and Section 15376 of the Government Code.

REFERENCE.

The regulatory proposals implement, interpret, and/or make specific Sections 17003.5, 18300, 18502.5, 18613, 18613.5, 18613.7 and 18700 of the Health and Safety Code, Section 3800 of the Labor Code, and Section 15376 of the Government Code.

AVAILABILITY OF STATEMENT OF REASONS AND TEXT OF PROPOSED REGULATIONS.

The text of the proposed regulations is available upon request along with an initial statement of reasons, prepared by the department, which explains the reasons for the proposals. All information which the department is considering as the basis for this proposal will be maintained in a rulemaking file, which is available for inspection at 1800 - 3rd Street (3rd and "R"), Sacramento, California during normal business hours (8:00 a.m. to 5:00 p.m.).

CONTACT PERSON.

Any questions about this regulatory activity, as well as requests for the above noted documents may be directed to Chris Anderson, Mobilehome Parks Program Manager, P.O. Box 1407, Sacramento, California 95812-1407 (916) 445-9471.

POST HEARING MODIFICATIONS TO THE TEXT OF THE REGULATIONS.

Please note that, following the public comment period, the department may adopt the proposed regulations substantially as proposed in this notice or with modifications which are sufficiently related to the original proposed text and notice of proposed regulatory activity. If modifications are made, the

modified text with the changes clearly indicated will be made available to the public for at least 15 days prior to the date on which the department adopts the regulations. Requests for copies of any modified regulations should be addressed to the agency contact person identified above. The department will accept written comments about the modified regulations during the 15-day period.

LOCAL MANDATE.

The proposed regulatory activity will impose additional expenditures of approximately $83,820 annually to local agencies. However, the proposed fee schedule will generate sufficient revenue to cover anticipated costs of program administration and enforcement. The proposed regulatory activity does not impose a mandate on school districts.

FISCAL ESTIMATE.

The proposed regulatory activity will impose additional expenditures of approximately $127,000 annually on the department. However, the proposed fee schedule will generate sufficient revenue to cover anticipated costs of program administration and enforcement. The proposed regulatory activity does not impose a cost on local agencies or school districts which requires reimbursement pursuant to Part 7 (commencing with section 17500) of Division 4 of the Government Code. The proposed regulatory activity does not impose other nondiscretionary costs or savings on local agencies; and does not impose a cost or saving on federal funding to the state.

COST IMPACT ON PRIVATE PERSONS AND BUSINESSES.

The proposed regulatory activity will have no significant cost impact on private persons or businesses.

ECONOMIC IMPACT ON SMALL BUSINESS.

Understanding of the requirements and procedures will be enhanced for manufacturers and enforcement agencies, and the unnecessary level of involvement by listing or testing agencies will be eliminated. The proposed regulatory activity will provide small business a minor beneficial economic impact.

HOUSING COSTS.

The proposed regulatory activity will have no significant effect on housing costs.

ALTERNATIVES.

The Department of Housing and Community Development must determine that no alternative considered will be more effective in carrying out the purpose for which the action is proposed or no alternative will be as effective and less burdensome to affected private persons than the proposed action.

Maureen Higgins for:

MAUREEN HIGGINS, DIRECTOR

4/17/90

DATE

At the GSMOL 1990 Convention

Says lunch speaker Travis Pitts:

Wheels & axles fare better in earthquakes

By Mary Jane Morgan
EDITOR

FRESNO — Mobilehomes on wheels and axles with a certified earthquake bracing system fared best in the 7.1 Loma Prieta Oct. 17 earthquake, according to Travis Pitts, deputy director for the California Department of Housing and Community Development (HCD) and who was the luncheon speaker at the 1990 Convention here.

None went down.

In citing HCD's recent report, he said there was a clear result of the evaluation of performance from the different types of manufactured home support system and that there are substantial differences.

In the summer, HCD will hold fact-finding hearings to gather input from the public and industry concerning the adequacy of current regulations for manufactured homes. Dates, times and places will be announced.

Pictures in the HCD report were taken by Maxine Pfeiffer of Region 10 and at that time GSMOL state vice-president of zone B, central section, who toured the parks assessing damages and reporting what the League could do about it.

Of the nine California counties declared disaster areas as a result of the giant trembler, only three had significant damage to mobilehomes — San Benito, Santa Clara and Santa Cruz, an area with 193 parks containing 24,438 spaces.

Only those parks subject to HCD jurisdiction (39 percent or approximately 75 parks) were HCD inspected with the others under review by local governments. Twenty-seven (14 percent) of the HCD surveyed parks reported damages, with 592 homes "down." In this instance "down" means the home's support system had failed to a sufficient degree that the home would be required to be reinstalled on the site.

Of the homes that went down, 301 (51 percent) were on steel piers, 223 (38 percent) were on concrete piers and 65 (11 percent) on concrete blocks.

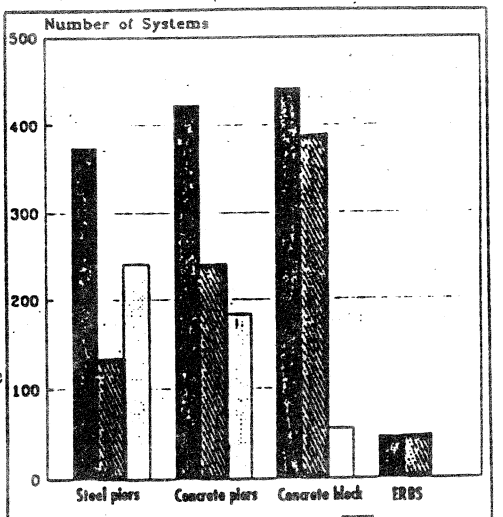
In addition, four homes in the tri-county area were destroyed. Two of these were structurally damaged beyond repair and two others were burned. Gas leaks are suspected.

The following is how HCD describes briefly the systems.

Steel pier is a favorite of many installers. They are relatively light in weight and their triangular construction allows them to be stacked one upon another, taking up little space in the installers truck.

— A concrete pier is similar in design to the steel pier, only much heavier. The pier has a concrete base of triangular design with an adjustable steel bolt in the center of the pier and performs about the same as a steel pier. It is quite heavy and cannot be stacked, but does not seem to be as popular as concrete block.

— Concrete blocks have two different methods of stacking the blocks. One is block against block from the footing material to wood shims at the point of contract with home's chassis and the other is using intermediate wood spaces between the blocks. No identifiable difference was found by HCD in the performance.



The above chart indicates the different types of support systems found, the number that performed without failure, and the number that failed as a result of Loma Prieta earthquakes forces. ERBS stands for those on wheels and axels with a certified bracing system.

One of the problems noted with concrete blocks when the support system failed noted inspectors, was the breaking of the blocks and the home crashing down. In similar instances with steel piers, the steel piers buckled. There were no noted instances of the failure of concrete piers under vertical pressure.

Also observed by inspectors was that HCD certified systems sustained considerably less damage than the non-certified systems, although both systems performed adequately.

Until 1980, mobilehomes were vehicles under California law and were treated as such. The wheelhubs and axles were prohibited by law from being removed. Since then, though their category has been redefined and axles and wheelhubs may be removed.

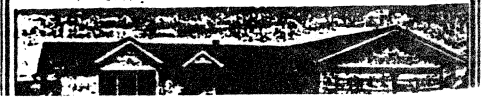
Many businesses have developed over the years that deal with the purchase, removal and recycling of the axles and wheels. And in recent years it has been popular to exclude them from the price of a new manufactured home as they are removed by the dealer or installer at the time of delivery and installation.

There are still a number of homeowners who advocate leaving the wheels and axles on the home and a few others who believe that the wheels and tires, properly inflated should also remain on the home for stability during quakes.

One picture in the HCD report showed that the wheels and axel on a home prevented it from falling completely to the ground. If that had happened the piers would have punctured the floor and caused considerable damage. The home, HCD said, at the point of axle connections, was held approximately 12 inches from the ground by the assembly of parts actually designed to move the home down the road.

The report notes that before the state certification of bracing systems was begun in 1985, there had been numerous sales of nonexempt certified devices and installation of home-made devices as well. Until 1989's earthquake, their design and expected performance were largely based on engineering theory since none had been full-scale tested. The Loma Prieta shaker and the resulting wide-spread damage to mobilehomes was a departmental opportunity to gather statistical data.

The stated result: "These systems do the job they were designed to do."



National Foundation
Manufactured Home Owners

161 FRANCISCAN DRIVE * DALY CITY, CALIFORNIA 94014 * (415) 992-7470

March 5, 1990

The Honorable William A. Craven
Chairman, Senate Select Committee on Mobilehomes
1100 "J" Street, Suite 511
Sacramento, CA 95814 (916) 324-4282

Re: Legislative Hearing on October 17 Earthquake

Dear Senator Craven:

We have attached 4 documents for inclusion in the record for the Senate Select Committee Public Hearing on the October 17 earthquake:

1. Presidential Executive Order No. 12699 signed January 5, 1990, entitled "Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction" that also applies to the manufactured housing and community facilities with a cover letter from the National Foundation of Manufactured Home Owners.

2. National Association of Home Builders (NAHB) Report "Damage to Homes in the San Francisco Area Earthquake - A Quick Response" dated December 20, 1989. Prepared for the Department of Housing and Urban Development, Washington, D. C.

3. Cover page of NCSBCS A-225.1 document "Manufactured Home Installation" 1987 Edition. New 1992 proposal being organized at this time.

4. Summary excerpts from the report prepared by the National Conference of States on Building Codes and Standards (NCSBCS), Herndon, VA.

Senator Craven, during the oral testimony portion of the legislative hearing we will present, summarize, and explain the above documents.

In addition, we will present comments on the "Federal Manufactured Home Consumer Manual" requirements, 24 CFR Part 3283.

Also, we will present comments on improving the Manufactured Housing Installation Regulations administered by the California Department of Housing and Community Development.

Thank You, Senator Craven.

Leonard G. Wehrman
Vice President for Gov't
and Industry Relations

Federal Register
Vol. 55, No. 6
Tuesday, January 9, 1990

Presidential Documents

Title 3—

The President

Executive Order 12699 of January 5, 1990

Seismic Safety of Federal and Federally Assisted or Regulated New Building Construction

By the authority vested in me as President by the Constitution and laws of the United States of America, and in furtherance of the Earthquake Hazards Reduction Act of 1977, as amended (42 U.S.C. 7701 *et seq.*), which requires that Federal preparedness and mitigation activities are to include "development and promulgation of specifications, building standards, design criteria, and construction practices to achieve appropriate earthquake resistance for new . . . structures," and "an examination of alternative provisions and requirements for reducing earthquake hazards through Federal and federally financed construction, loans, loan guarantees, and licenses. . . . " (42 U.S.C. 7704(f)(3, 4)), it is hereby ordered as follows:

Section 1. Requirements for Earthquake Safety of New Federal Buildings.

The purposes of these requirements are to reduce risks to the lives of occupants of buildings owned by the Federal Government and to persons who would be affected by the failures of Federal buildings in earthquakes, to improve the capability of essential Federal buildings to function during or after an earthquake, and to reduce earthquake losses of public buildings, all in a cost-effective manner. A building means any structure, fully or partially enclosed, used or intended for sheltering persons or property.

Each Federal agency responsible for the design and construction of each new Federal building shall ensure that the building is designed and constructed in accord with appropriate seismic design and construction standards. This requirement pertains to all building projects for which development of detailed plans and specifications is initiated subsequent to the issuance of this order. Seismic design and construction standards shall be adopted for agency use in accord with sections 3(a) and 4(a) of this order.

Sec. 2. Federally Leased, Assisted, or Regulated Buildings.

The purposes of these requirements are to reduce risks to the lives of occupants of buildings leased for Federal uses or purchased or constructed with Federal assistance, to reduce risks to the lives of persons who would be affected by earthquake failures of federally assisted or regulated buildings, and to protect public investments, all in a cost-effective manner. The provisions of this order shall apply to all the new construction activities specified in the subsections below.

(a) Space Leased for Federal Occupancy. Each Federal agency responsible for the construction and lease of a new building for Federal use shall ensure that the building is designed and constructed in accord with appropriate seismic design and construction standards. This requirement pertains to all leased building projects for which the agreement covering development of detailed plans and specifications is effected subsequent to the issuance of this order. Local building codes shall be used in design and construction by those concerned with such activities in accord with section 3(a) and 3(c) of this order and augmented when necessary to achieve appropriate seismic design and construction standards.

(b) Federal Domestic Assistance Programs. Each Federal agency assisting in the financing, through Federal grants or loans, or guaranteeing the financing, through loan or mortgage insurance programs, of newly constructed buildings

shall plan, and shall initiate no later than 3 years subsequent to the issuance of this order, measures consistent with section 3(a) of this order, to assure appropriate consideration of seismic safety.

(c) Federally Regulated Buildings. Each Federal agency with generic responsibility for regulating the structural safety of buildings shall plan to require use of appropriate seismic design and construction standards for new buildings within the agency's purview. Implementation of the plan shall be initiated no later than 3 years subsequent to the issuance of this order.

Sec. 3. Concurrent Requirements. (a) In accord with Office of Management and Budget Circular A-119 of January 17, 1980, entitled "Federal Participation in the Development and Use of Voluntary Standards," nationally recognized private sector standards and practices shall be used for the purposes identified in sections 1 and 2 above unless the responsible agency finds that none is available that meets its requirements. The actions ordered herein shall consider the seismic hazards in various areas of the country to be as shown in the most recent edition of the American National Standards Institute Standards A58, *Minimum Design Loans for Buildings and Other Structures*, or subsequent maps adopted for Federal use in accord with this order. Local building codes determined by the responsible agency or by the Interagency Committee for Seismic Safety in Construction to provide adequately for seismic safety, or special seismic standards and practices required by unique agency mission needs, may be used.

(b) All orders, regulations, circulars, or other directives issued, and all other actions taken prior to the date of this order that meet the requirements of this order, are hereby confirmed and ratified and shall be deemed to have been issued under this order.

(c) Federal agencies that are as of this date requiring seismic safety levels that are higher than those imposed by this order in their assigned new building construction programs shall continue to maintain in force such levels.

(d) Nothing in this order shall apply to assistance provided for emergency work essential to save lives and protect property and public health and safety, performed pursuant to Sections 402, 403, 502, and 503 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act (Stafford Act) (42 U.S.C. 5170a, 5170b, 5192, and 5193), or for temporary housing assistance programs and individual and family grants performed pursuant to Sections 408 and 411 of the Stafford Act (42 U.S.C. 5174 and 5178). However, this order shall apply to other provisions of the Stafford Act after a presidentially declared major disaster or emergency when assistance actions involve new construction or total replacement of a building. Grantees and subgrantees shall be encouraged to adopt the standards established in section 3(a) of this order for use when the construction does not involve Federal funding as well as when Federal Emergency Management Agency (FEMA) funding applies.

Sec. 4. Agency Responsibilities. (a) The Director of the Federal Emergency Management Agency shall be responsible for reporting to the President on the execution of this order and providing support for the secretariat of the Interagency Committee on Seismic Safety in Construction (ICSSC). The ICSSC, using consensus procedures, shall be responsible to FEMA for the recommendation for adoption of cost-effective seismic design and construction standards and practices required by sections 1 and 2 of this order. Participation in ICSSC shall be open to all agencies with programs affected by this order.

(b) To the extent permitted by law, each agency shall issue or amend existing regulations or procedures to comply with this order within 3 years of its issuance and plan for their implementation through the usual budget process. Thereafter, each agency shall review, within a period not to exceed 3 years, its regulations or procedures to assess the need to incorporate new or revised standards and practices.

Sec. 5. Reporting. The Federal Emergency Management Agency shall request, from each agency affected by this order, information on the status of its procedures, progress in its implementation plan, and the impact of this order on its operations. The FEMA shall include an assessment of the execution of this order in its annual report to the Congress on the National Earthquake Hazards Reduction Program.

Sec. 6. Judicial Review. Nothing in this order is intended to create any right or benefit, substantive or procedural, enforceable at law by a party against the United States, its agencies, its officers, or any person.

THE WHITE HOUSE,
January 5, 1990.

[FR Doc. 90-720
Filed 1-8-90; 12:08 pm]
Billing code 3195-01-M

DAMAGE TO HOMES IN THE SAN FRANCISCO AREA EARTHQUAKE

A QUICK RESPONSE EVALUATION

October 17, 1989

By

David J. MacFadyen
President
NAHB National Research Center

Prepared for:

Office of Policy Development and Research and
Office of Manufactured Housing and Regulatory Functions
U. S. Department of Housing and Urban Development
Washington, D.C.

By:

NAHB National Research Center
400 Prince George's Boulevard
Upper Marlboro, MD 20772-8731

December 20, 1989

CR-7419A

DAMAGE TO HOMES IN THE SAN FRANCISCO AREA EARTHQUAKE

A QUICK RESPONSE EVALUATION

OCTOBER 17, 1989

BACKGROUND

David J. MacFadyen, President of the NAHB National Research Center, was in San Francisco at the time of the October 17, 1989 earthquake. After the quake, he spent three days driving around the area conducting an on-the-spot assessment of damage to dwelling units according to design characteristics, structural features and fasteners, location, housing type, approximate age, and other qualities and attributes affecting structural performance. He took many photographs illustrating particular types of structural reactions to the earthquake. In addition, he talked to officials of code groups and representatives of the Northern California Building Industry Association to compare opinions and reactions.

The NAHB National Research Center submitted unsolicited proposals to the U.S. Department of Housing and Urban Development, Office of Policy Development and Research, and the Office of Manufactured Housing and Regulatory Functions offering to provide a *Quick Response Evaluation* of the damage, with photographs, which would be based on Mr. MacFadyen's findings. This Evaluation would take the form of a brief written report that would include:

- a description of houses observed;
- general observations regarding damage and its contributing causes; and
- suggestions on appropriate HUD actions and responses.

In the proposal, Mr. MacFadyen also offered to give an oral and photographic report to appropriate HUD officials.

The proposal was accepted by HUD. This document comprises the brief written report. The text is supplemented by photographs taken by Mr. MacFadyen.

BASIC FINDINGS

The basic findings of Mr. MacFadyen's survey are as follows:

(1) Houses built since the adoption of the 1976 revision of the Uniform Building Code (UBC) by the International Conference of Building Officials sustained little damage in the earthquake.

(2) Where older homes were damaged, a primary cause of the problems was separation of houses from their foundations. An instance can be seen in Photograph No. 1.

(3) No major code changes, or recommendations regarding such changes, appeared to be called for in the damage witnessed and studied by Mr. MacFadyen. This was confirmed in a discussion with John Traw, technical representative for the International Conference of Building Officials (ICBO).

(4) One area in which full investigation of quake damage may suggest changes in ICBOs Uniform Building Code is specific soil response conditions. Certain soil conditions may not have performed as expected. However, current criteria for houses built on fill appear to be adequate.

NATURE OF THE EARTHQUAKE

Experts state that the October 17 quake was characterized by a "rolling" motion -- an "earth wave" -- as contrasted with the jolting of quakes such as the San Fernando area earthquake that occurred in 1971. Various features of the resulting damage are probably related to this characteristic of the quake.

The duration of the quake is also an important factor. It lasted for 15 seconds. Experts believe that much greater damage could have been anticipated if the quake had lasted longer. The 1971 San Fernando quake lasted for 30 seconds, with accompanying harmonic motion and repeated cycling movement that made major contributions to building damage and collapse.

CODE REVISIONS

Many structures suffered serious damage or collapse in the 1971 San Fernando area quake, and the causes of the structural failures were extensively studied.

The findings precipitated changes relating to housing and light-frame construction in the 1973 International Conference of Building Officials (ICBO) Uniform Building Code (UBC). Substantial additional changes were made in the Code in 1976.

HOUSING PERFORMANCES COMPARED

All instances of significant damage to homes that were seen by Mr. MacFadyen involved older dwellings. Homes and other light-frame structures built since 1976, whose construction reflects the requirements of the 1976 UBC, appear to have provided adequate protection against seismic loads. This finding was confirmed by Lon Carlson, Director of Public Affairs for the Northern California Building Industry Association.

In addition to the better performance of post-1976 homes, it was evident that homes that were well "tied together" performed well.

Characteristics of these homes included:

- adequate lateral bracing;
- positive sill plate-foundation connections;
- proper wall and roof connections;
- sheathing that functioned as shear bracing for corners; and
- adequate foundation anchorage to the soil.

Types of homes classified as "conventional" performed well, while some nonconventional or outdated elements performed less well. The latter types included homes with large areas of glass and insufficient shear wall area.

Homes built upon piers or stilts did not perform well. An example can be seen in Photograph No. 2.

Un-reinforced masonry failures were common. Chimney problems are described and illustrated below.

FOUNDATION PROBLEMS

Separation of the home from its foundation, which apparently caused the major types of damage to older homes, occurred where tie-downs were missing or undersized and were not placed continuously. Foundation types represented in the failures included concrete or concrete masonry stem walls (also known as cripple walls or knee walls), brick or rubble

strip foundations, and pier or stilt foundations on hillsides. See Photographs No. 2 and No. 3. The latter type of construction gave way on a number of mountain homes where the front was at grade and the back was supported on stilts. Homes that failed lacked sufficient lateral ties between the piers and between the building frames and the piers, and had inadequate lateral bracing between piers.

SOIL CONDITION

Two key issues in soil condition appear to be the level of compaction, and shock-wave attenuation characteristics.

Much was learned from the 1971 San Fernando quake about the interaction between soil and structures. However, it was often difficult to isolate specific causes for individual failures on certain types of soil. John Traw of ICBO believes that there may still be things to learn about earthquake reactions as they relate to some soil types.

For several years prior to the October 17 quake, the seismic community has been working toward new soil classification maps of the U.S. Full investigation of the damage in the October 17 quake will provide additional information on how different types of soils behaved. This information will be studied in relation to present code requirements.

RESIDENTIAL CHIMNEYS

A number of residential chimneys collapsed during the quake. Many of these chimneys were built to fall away from the residence.

In a few instances, however, chimneys on older residences fell into the house, causing extensive damage.

MANUFACTURED HOUSING

The principal type of damage to manufactured housing was dislodging of the units from their foundations.

Most manufactured housing that was seen by Mr. MacFadyen experienced little or no damage from the quake. Mr. MacFadyen saw about 250 manufactured housing units in three mobile home parks, two in Los Gatos and one in Santa Cruz. He saw no damage in the park in Santa Cruz, and no damage in one of the two parks in Los Gatos. Five units were damaged in the second park in Los Gatos, with the principal damage consisting of units being shaken off their foundations. See Photographs No. 4 and No. 5.

According to Travis Pitts of the Manufactured Housing Section of the California Department of Housing and Community Development, few manufactured housing units were destroyed by the quake. In areas thus far surveyed by the Department, a number of units were shaken off their foundations. California does not require tie-down of the units to their foundations for purposes of wind-resistance, although some homes have tie-downs.

A summary of the findings is as follows:

Hollister Area, San Benito County

Units Shaken Off Foundations:	123
Destroyed:	4

Santa Clara County, Outlying San Jose

Units Shaken off Foundations:	99
Destroyed:	0

Santa Cruz Area

Units Shaken Off Foundations:	212
Destroyed:	4

Half of the eight units that were destroyed -- two each in the Hollister area and the Santa Cruz area -- were destroyed by fire caused by broken gas lines. The remaining four were destroyed due to the impact of falling from their foundations and striking the ground on a corner or one edge. These destroyed units were estimated to be 1960s vintage, and thus were built prior to the issuance of the HUD Code governing manufactured units.

Most of the units that fell from their foundations have been replaced on their foundations and are occupied. It appears that such damage as they incurred was relatively minor, and in most instances can be economically repaired. The greatest damage in these cases occurred to attached structures such as porches, carports, and skirting, which were often damaged beyond repair.

A majority of units that fell off their foundations, were resting either on commercial metal jack stands or concrete piers of the truncated pyramid type. Only eight of 314 homes that were placed on stacked concrete blocks with wooden shims fell from this type of foundation. None fell from an "earthquake resistant" foundation system, similar to a metal saw-horse, that was developed by the state.

RECOMMENDATIONS FOR HUD ACTION

In his quick-response survey, Mr. MacFadyen did not see problems that would require urgent follow-up initiatives by HUD.

There are questions about the reactions of certain soils under earthquake conditions. The continuing study of this question by the U.S. Geological Survey should be followed by

HUD, as should the reactions to the findings by the International Conference of Building Officials.

Although both local public officials and the Northern California Building Industry Association are pleased with what is known thus far about the performance of post-1976 houses and light-frame structures, both sources emphasize that continuing and long-term assessment may reveal problems that were not evident in initial surveys. Barring such findings, it appears that problems of seismic action have been well-addressed by ICBO's 1976 Code and by homes built to these specifications.

It is therefore recommended that HUD focus its attention on the problems of housing built before 1976. Initiatives that can be taken to improve the safety of these homes under seismic conditions should receive top priority in HUD's activities in the field of controlling and minimizing earthquake damage.

The prevalence of dislodgement of manufactured housing from metal jack stands and truncated concrete pier foundations should cause concern among HUD and state authorities regarding the adequacy of these foundations types for use in earthquake-prone areas.

SUMMARY EXCERPTS FROM REPORT PREPARED BY
NATIONAL CONFERENCE OF STATES
ON BUILDING CODES AND STANDARDS

BACKGROUND

California Earthquake

On Tuesday October 17, 1989 an earthquake, measuring 7.1 on the Richter scale, struck northern California killing over 50 people and causing over a billion dollars in damage. The epicenter of the quake was located 10 miles north of Santa Cruz, CA. (See Appendix G.)

Investigations of earthquake damage to homes were conducted by NCSBCS on October 23, at four manufactured home parks in Santa Cruz County, CA. Two of the parks were located in Santa Cruz, CA, approximately 10 miles from the epicenter, and two parks were in the town of Watsonville, CA, approximately five miles from the epicenter. The average age of the damaged single and double wide units ranged from 10 to 15 years.

SUMMARY OF FINDINGS

California Earthquake

Minor damage was observed in both Santa Cruz parks. Although a majority of the homes showed no signs of physical damage, several homes were slightly damaged when a few of the piers had either been loosened from the I-beams or had broken. This was evidenced by the sagging ends of these homes. It was observed that one home had completely shifted off its piers.

The first of the two parks investigated in Watsonville was Meadows Manor. Approximately 10 to 20 percent of the homes in Meadows Manor had completely fallen from their piers (see Appendix G, photos 1 and 2) while other homes, like those in Santa Cruz, had only partially shifted. The second park, investigated in Watsonville was Rancho Cerritos. Approximately 75 to 85 percent of the homes had fallen from their piers.

One of the homes in Rancho Cerritos was totally destroyed by fire reportedly caused by the gas service line rupturing when the home shifted (see Appendix G, photo 5). The primary damage to the homes was caused by the piers penetrating the bottom board and, in several instances, penetrating the floor decking (see Appendix G, photos 7 and 8). The skirting around the homes was also damaged, as was service entrance fixtures (see Appendix G, photo 6).

Most of the homes had no means of anchoring, however, those homes that were anchored still shifted from their piers (see Appendix G, photo 9). A possible reason why the homes, both anchored and unanchored, fell is that the majority of piers used in these parks had a small surface bearing area (4 inch x 4 inch) for the I-beams. (See Attachment G, photo 10.) Therefore, the slightest movement would allow the beam to slip off the pier.

Several homes in the Watsonville park, which had shifted off their piers, were equipped with earthquake braces or jacks. These particular homes sustained no damage to the underbelly, because the jacks prevented the homes from falling onto the piers. (See Appendix G, photo 11 and 12.) Homes which still had axles and wheels attached to their frames sustained less damage than those in which the axles had been removed. The wheels provided temporary support for the homes, prevented floor penetration by piers and allowed the homes to be jacked up and reset more easily. (See Appendix G, photos 1 and 2.)

497-S

Additional copies of this publication may be purchased for **$4.75** per copy (includes shipping & handling), **plus current California sales tax.**

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