CHAPTER 5

SEISMIC AWARENESS IN EMERYVILLE INDUSTRY AND COMMERCE

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Introduction

Industry and commerce comprise a large part of any urban setting today. Industry fulfills the needs of a growing population and also employs many people. A major earthquake in Emeryville would disrupt industry and could cause major economic trouble. This paper attempts to find out if industry has made any preparations toward policies regarding seismic safety in Emeryville. It is important that industry know there are ways to minimize the potential damage an earthquake can cause.

Geological Setting

Most of the industrial firms surveyed in Emeryville are located in the bayfront area, especially on Hollis Street and Park Avenue (FIGURE 1). This area is underlain by bay mud and

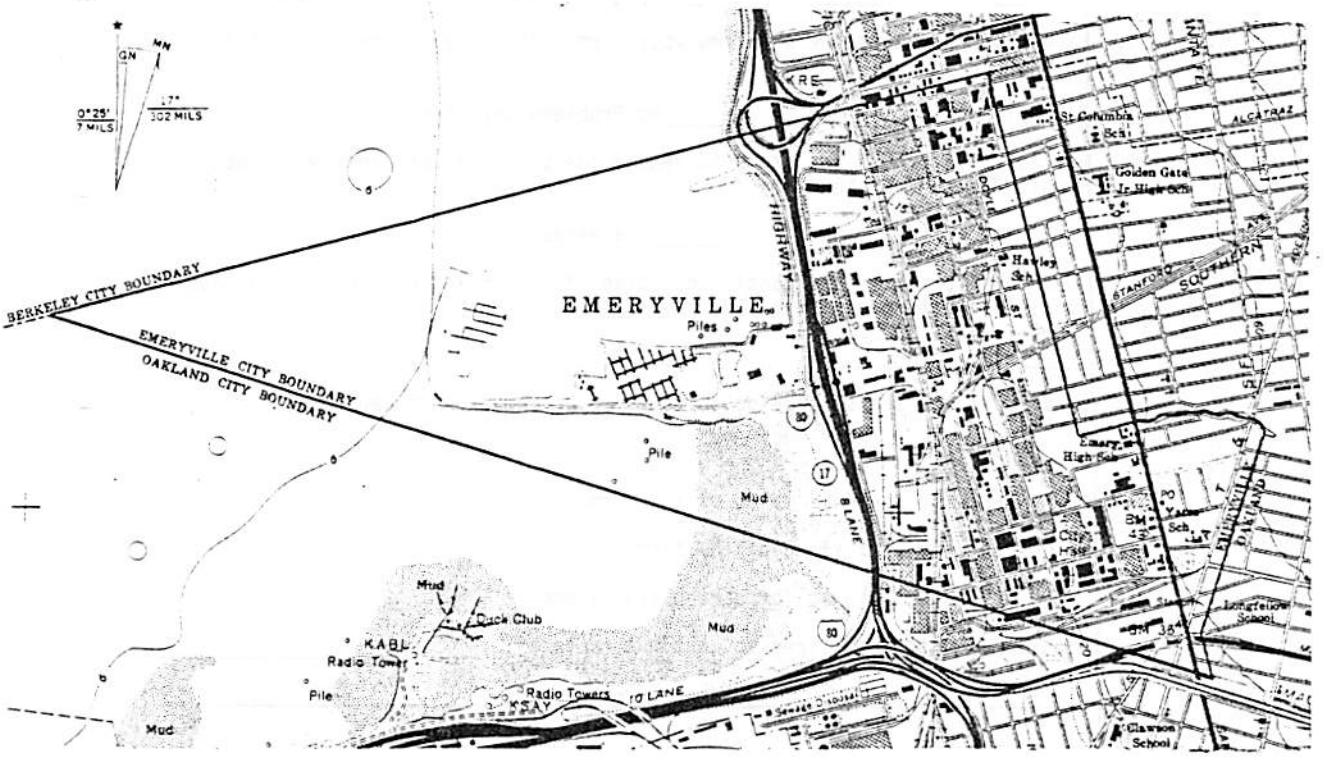

FIGURE 1. Map of Emeryville
Base Map: Oakland West Quadrangle
7 1/2 Minute Series, USGS

artificial fill. Approximately one-third of Emeryville consists of fill placed over bay mud. The general composition is imported clayey and/or sandy soil combined with construction and industrial waste materials. The most serious problem facing these industries in an earthquake is the potential instability of bay fill due to liquefaction and ground shaking.

Name of Firm: _____

Type of Business: _____

Number of Employees: _____

Name of Person Answering Survey: _____

Position of Person Answering Survey: _____

Phone Number: _____

I wish to have all answers on this survey kept confidential:

_____Yes _____No

1. What year was the building(s) your firm occupies constructed?

   _____

2. Does this building meet present Uniform Building Code standards for seismic safety?

   _____Yes _____No _____Don't Know

3. Have you considered the problems your firm might face in the event of an earthquake?

   _____Yes _____No _____No Problems Expected

4. Has your firm taken any steps to reduce the potential problems which would result from an earthquake?

   _____Yes _____No _____None Necessary

5. Does your firm have any contingency plans for checking damage or hazardous conditions after an earthquake?

   _____Yes _____No

6. Does your firm's insurance policies cover earthquake-induced damage?

   _____No

   _____Yes, for the full value of the firm

   _____Yes, for part value of the firm

   _____Yes, self insured for earthquake damage

Additional comments (feel free to continue on back): _____

_____

FIGURE 2: Sample of Survey Sent to 39 Emeryville Industries

Methodology

No published information on seismic awareness in industry is available. A list of industries was obtained from the Emeryville Industrial Association. Therefore, to get further information, thirty-nine surveys were sent out. The survey was a short checklist (FIGURE 2) designed to take a minimum amount of time to get the maximum return of responses. The survey asked for names and phone numbers for a follow-up investigation. However, whether or not the response was favorable, it was decided to contact as many firms as possible to obtain more conclusive results. A significant item in the survey was a confidentiality option--to alleviate the fears of exposing industrial policy. The private sector is usually very sensitive towards any type of investigative reports; therefore the majority of information compiled in this report remains anonymous.

RESULTS

Written Survey - The return rate of the written survey was good; twenty-eight percent (11) of the 39 firms responded (TABLE 1). Almost all of the firms provided the name of the person who

	WRITTEN SURVEY		PHONE SURVEY	
	NUMBER	%	NUMBER	%
Responses	11	28	15	75
Name and Position Filled In	9	81	15	100
Phone Number Filled In	11	100	15	100
Confidential Option - Yes	8	72	13	86
Meets Uniform Building Code - Yes	3	27	6	40
No	2	18	2	13
Don't Know	6	54	7	47
Considered Earthquake Problem - Yes	5	45	6	40
No	2	18	3	20
No Problems Expected	4	36	6	40
Taken Steps to Reduce Problem - Yes	4	36	5	33
No	5	45	6	40
None Necessary	2	18	4	27
Have Contingency Plans - Yes	6	54	8	53
Insurance for Earthquakes - No	6	54	8	53
Yes - Full Value	1	9	3	20
Yes - Part Value	3	27	4	27
Yes - Self Insured	1	9	-	-

TABLE 1. Response to 39 Written and 20 Phone Surveys Regarding Seismic Awareness in Emeryville

had answered the questions, making the survey invaluable for establishing contacts within the company. Over three-fourths of the firms requested that all information be kept confidential, confirming the idea that seismic safety in industry is a sensitive issue.

The results showed fifty-four percent of the firms did not know whether their building meets the present Uniform Building Code for seismic safety, although forty-five percent of the firms surveyed said they had considered problems in the event of an earthquake. In Emeryville thirty-six percent of the firms responding had taken some steps toward hazard reduction, while fifty-four percent of the firms had some sort of contingency plan for after an earthquake. Finally, fifty-four percent of the firms surveyed did not have insurance to cover earthquake-induced damage. There was only one firm in the study which was completely protected for earthquake losses.

Phone Survey - An additional twenty phone calls were made to firms who did not respond to the written survey. Fifteen firms (75%) were willing to answer questions (TABLE 1). One of these responses eventually led to a tour of an industrial plant. In general the results of the phone survey were similar to those of the written survey. For example, over eighty-five percent of the firms surveyed showed a positive response to the confidentiality option. Also, forty-seven percent did not know whether their building meets the Uniform Building Code.

Discussions/Conclusions

The results of the survey show that Emeryville industry is generally not aware of the earthquake problem. Most industrial buildings in Emeryville are one story high and would hold up fairly well in a major earthquake.[2] City government feels that the issue is well addressed in Emeryville's Seismic Safety Element. New construction on the Watergate peninsula is built on pilings and secured by beams sixty feet down to solid bedrock.[1] However, nothing is mentioned about solving the problem of liquefaction and uneven settling in Emeryville's Seismic Safety Element.

However, both surveys show a lack of information about earthquake safety for old buildings. The ages of the buildings surveyed in Emeryville ranged from the 1930's to the 1970's. No effort has been made on the part of industry or city government to upgrade old buildings to meet present earthquake standards. The problem is one of cost and assurance of stability.[2]

A few firms have taken steps toward reducing potential earthquake hazards. One firm that manufactures and distributes heavy machinery does not stack any of its stock, to avoid falling objects hazards. The same company has an emergency committee which is responsible for disaster planning and drills, which are conducted on a monthly basis. Other steps taken by firms are the replacement of glass with plastic windows in critical areas, which also protects against vandalism,

the reinforcing of critical storage tanks and bracing of heavy machinery.

Of those firms which indicated that they had made contingency plans, few had comprehensive plans. Most plans consisted of textbook procedures for fire, bomb threats, and nuclear disasters, but were insufficient for earthquake safety. One firm, Flecto, Inc., did have a general safety proposal that addressed earthquake safety as well as the other types of disasters mentioned above. However, it consisted largely of definitions and procedures that concentrated on fire and nuclear hazards rather than earthquakes.

A tour was taken through the Flecto plant to examine safety procedures and daily operations. The Flecto Company, Inc., is a manufacturer of varathane liquid plastic and other specialty coatings. The plant was well prepared in terms of fire protection. It had fire doors, an excellent sprinkler system and exercised extreme caution in determining height clearance for storage.[3] However, in terms of earthquake safety severe storage problems were evident. Chemicals were stacked right up against each other on the top floor of the building. Chemical drums were double-stacked on pallets without bracing of any kind. Tall storage racks that contained paint in cans were not bolted down and could topple over in an earthquake. Huge storage vats of chemicals could collide and cause spillage. It was evident that rearranging of the storage facilities of the plant was called for.

Recommendations/Final Summary

The tour and both surveys showed that a central coordinated effort for seismic safety by the city government and industry in Emeryville must be taken. The last revision in the Emeryville Safety Seismic Element was in 1975. Nothing has been done since then to encourage industries to adopt earthquake safety policies. The problem lies in convincing executives and owners of industries that it is profitable to be concerned about earthquakes.[3] One firm summarized the general feeling about earthquakes in the industrial community and stated: "We have taken into account the history of earthquakes in California and the next major one won't occur for another ten years." Maybe through the passing of laws or a federally supported project, industries could be convinced to build and manufacture if they were federally funded in case of an earthquake. In this case the industry would benefit as well as the community that prospers from the economic advantages that industry brings. If a major earthquake were to occur, those industries that were prepared would have an edge. Those industries that would be earthquake-proof would still be able to produce while industries that were not would be a pile of stone and rubble. Thus, by eliminating the competition the remaining industry would attract a larger share of the profits.

One specific recommendation is that a state committee be set up along the lines of OSHA to examine earthquake safety as it pertains specifically to industry. A revised checklist similar to the one that is shown in the building survey of the U.C. campus buildings (See page 106) would also be helpful. It is evident that there has not been enough research and published information on earthquake safety in industry. A positive outlook to promote the advantages of earthquake awareness are needed now before it is too late.

REFERENCES CITED

1. Close, Joe, 1979, Assistant to the Mayor of Emeryville, oral communication.
2. Montono, Antonio, 1979, Chief Building Inspector, Emeryville, oral communication.
3. Richards, Lou, 1979, Safety Supervisor Flecto Company, oral communication.