Northridge-USA-17-01-1994

M = 6.7, 4:31 a.m. t = 20 seg, Foco: 20Km

Edición: A. San Bartolomé. Fuentes:

http://www.ceia.uns.edu.ar/cursos/Sismico/SESION-02.pdf

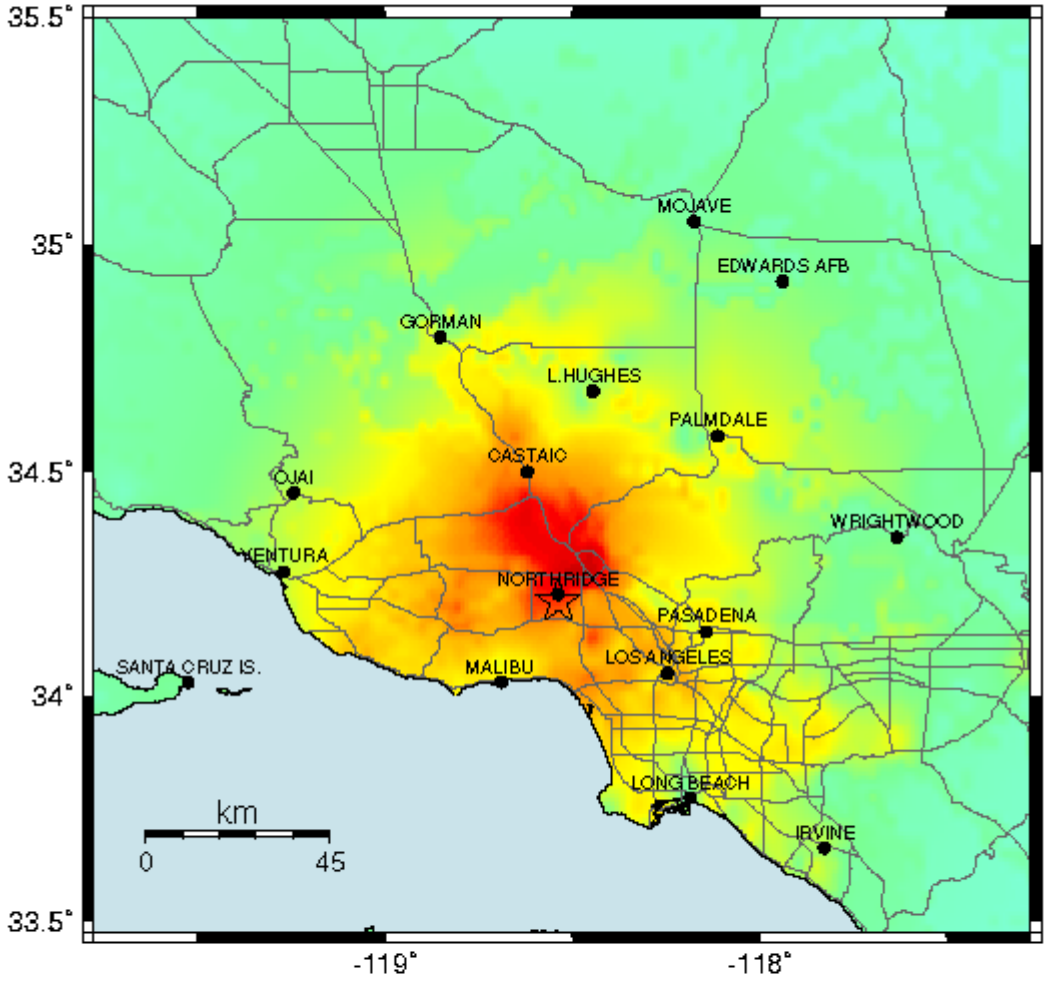
http://translate.google.com.pe/translate?hl=es&langpair=en%7Ces&u=http://www.fotosearch.com/photos-images/northridge-earthquake.html

http://www.weldreality.com

www.smate.wwu.edu/.../eq-CA-SanFernd.html

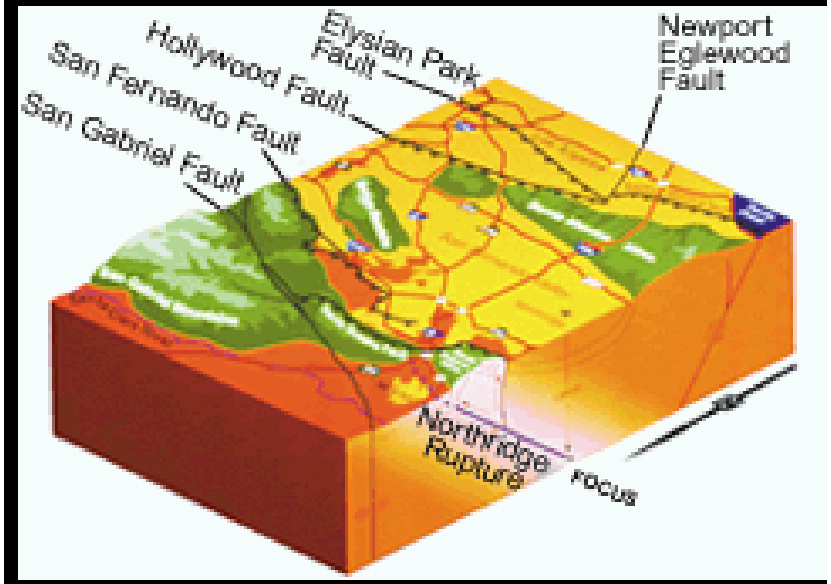
TriNet Rapid Instrumental Intensity Map for Northridge Earthquake

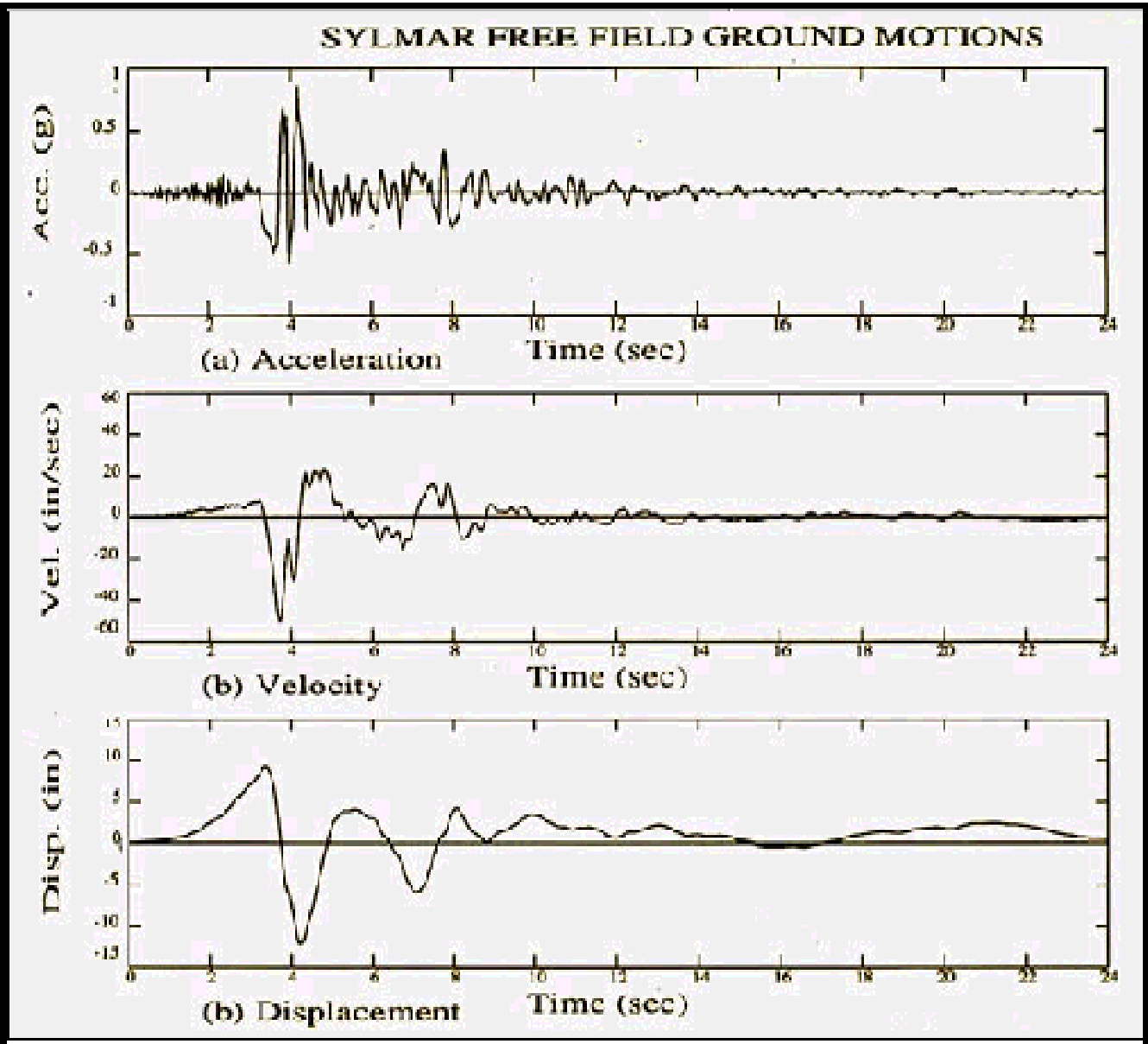
Mon Jan 17, 1994 04:30:55 AM PST M 6.7 N34.21 W118.54 ID:Northridge



PROCESSED: Tue Mar 6, 2001 11:35:21 AM PST,

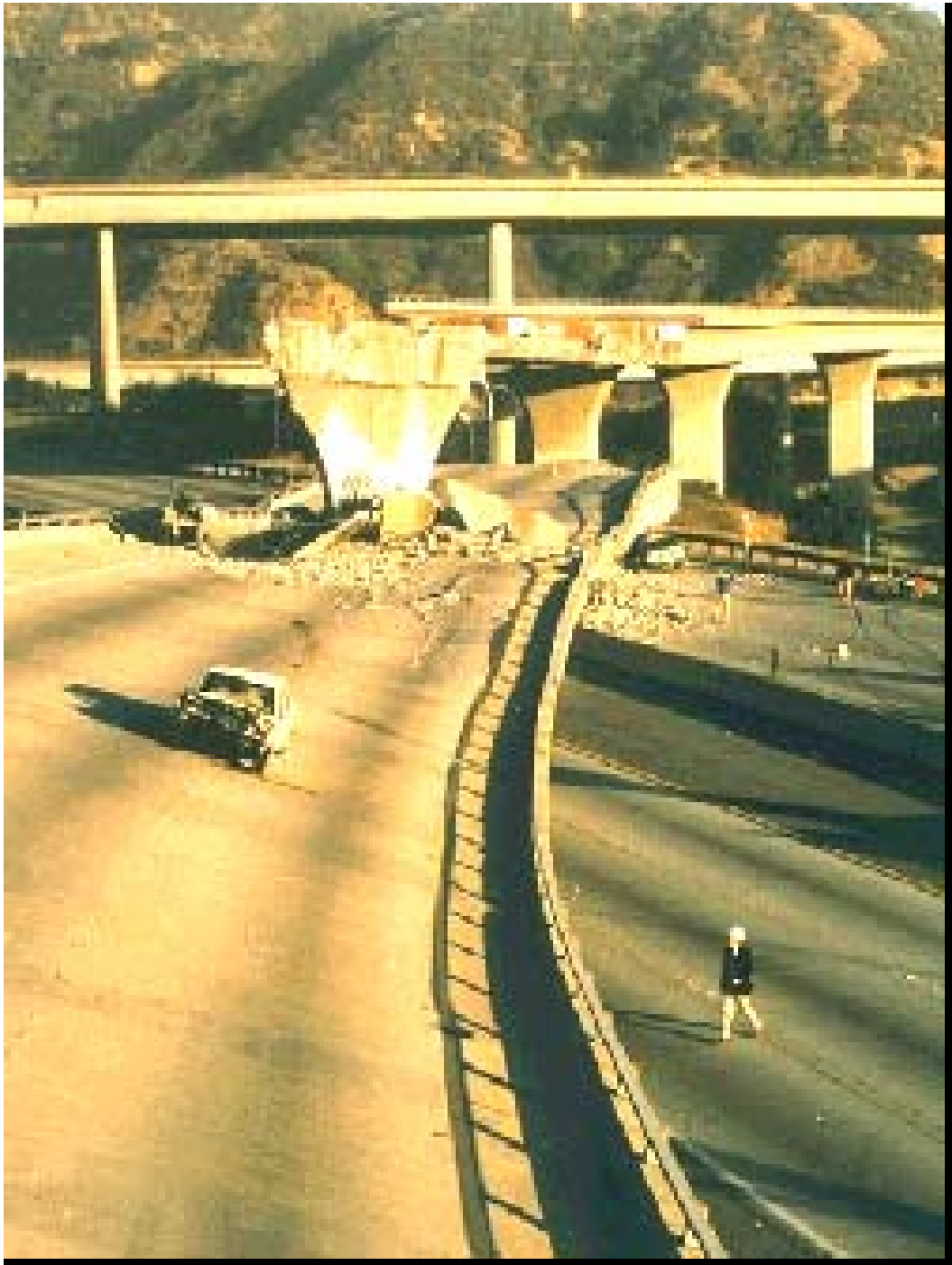
PERCEIVED SHAKING	Not felt	Weak	Light	Moderate	Strong	Very strong	Severe	Violent	Extreme
POTENTIAL DAMAGE	none	none	none	Very light	Light	Moderate	Moderate/Heavy	Heavy	Very Heavy
PEAK ACC.(%g)	*<.17*	*.17-1.4*	*1.4-3.9*	*3.9-9.2*	*9.2-18*	18-34	34-65	65-124	>124
PEAK VEL.(cm/s)	<0.1	0.1-1.1	1.1-3.4	3.4-8.1	8.1-16	*16-31*	*31-60*	*60-116*	*>116*
INSTRUMENTAL INTENSITY	I	II-III	IV	V	VI	VII	VIII	IX	X+

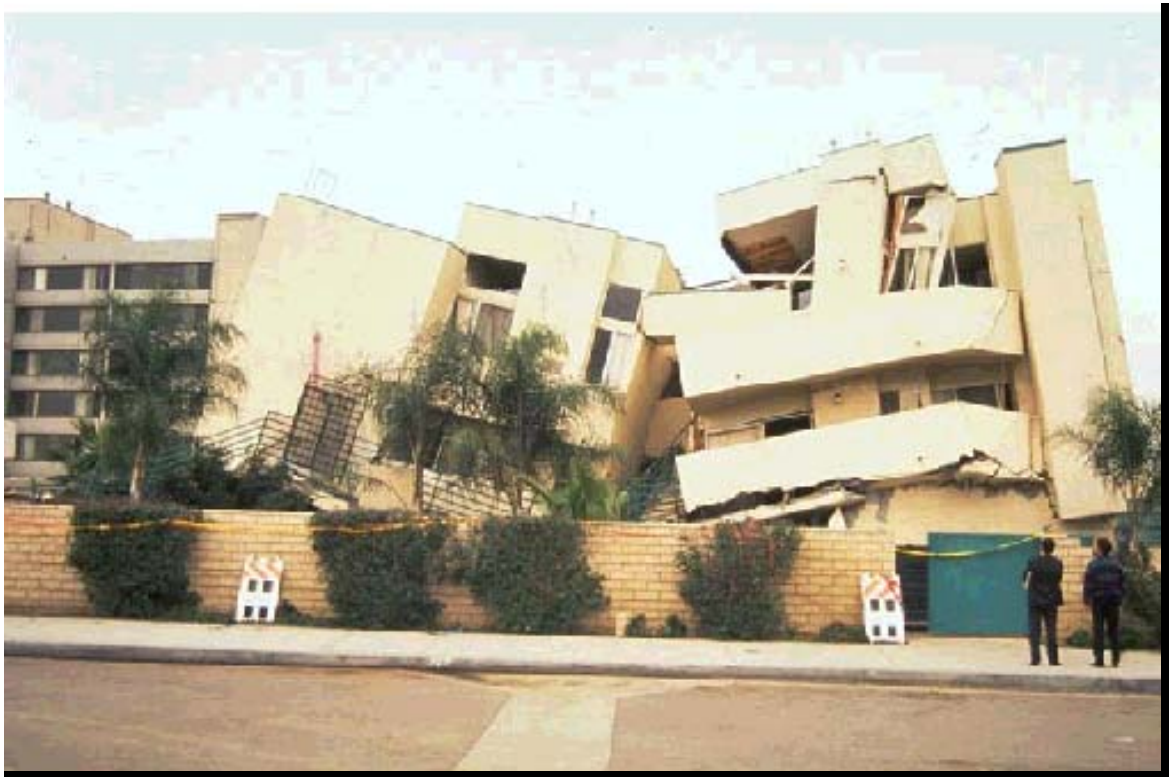




Strong Ground Motion

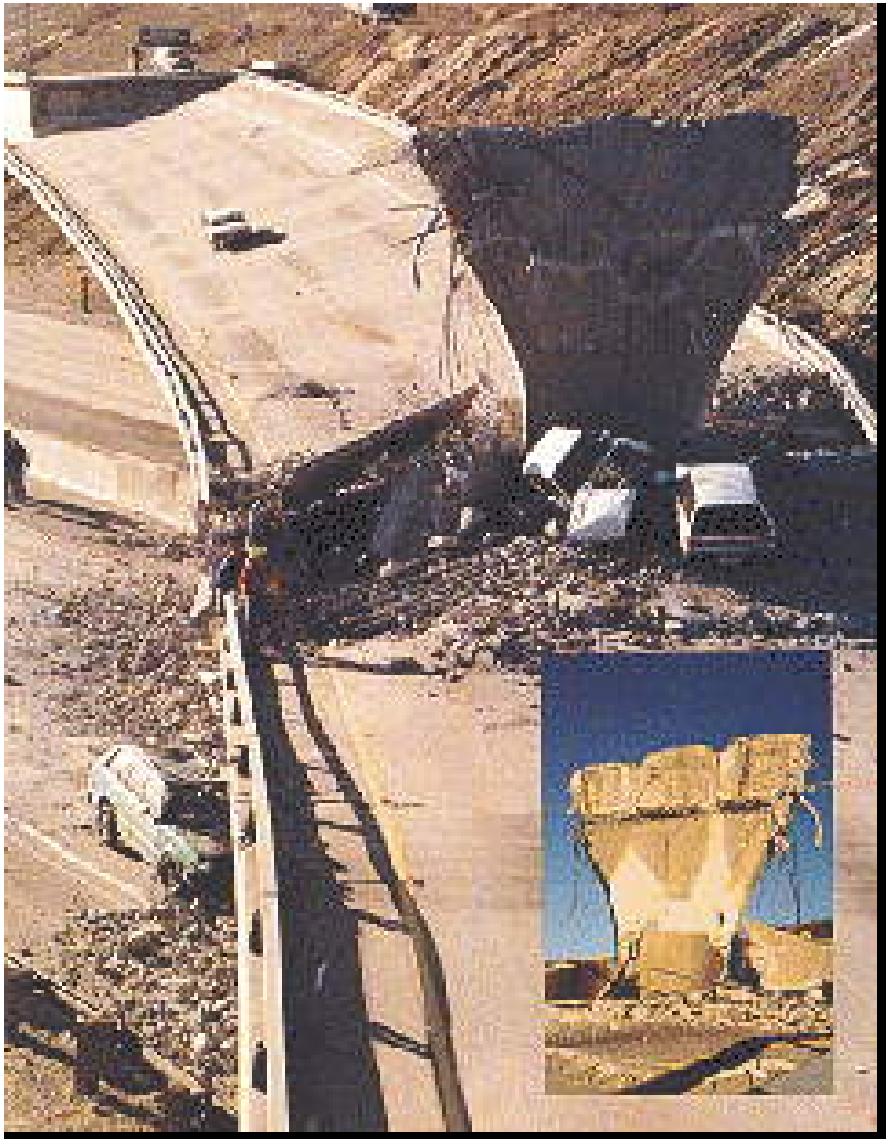
Ground motions recorded in the parking lot of the Olive View Hospital (N-S com-





Madera, 3 pisos

Supermercado

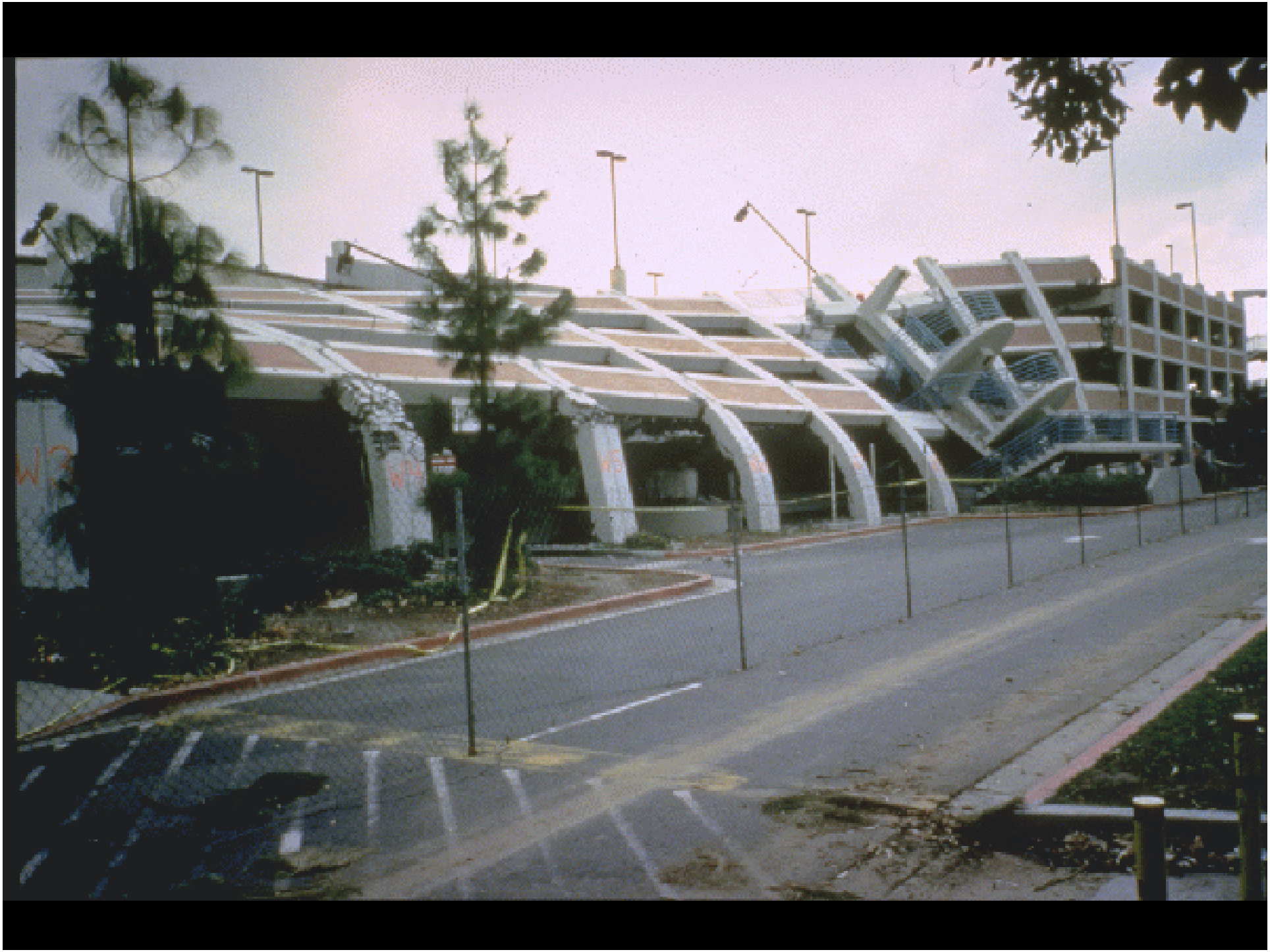


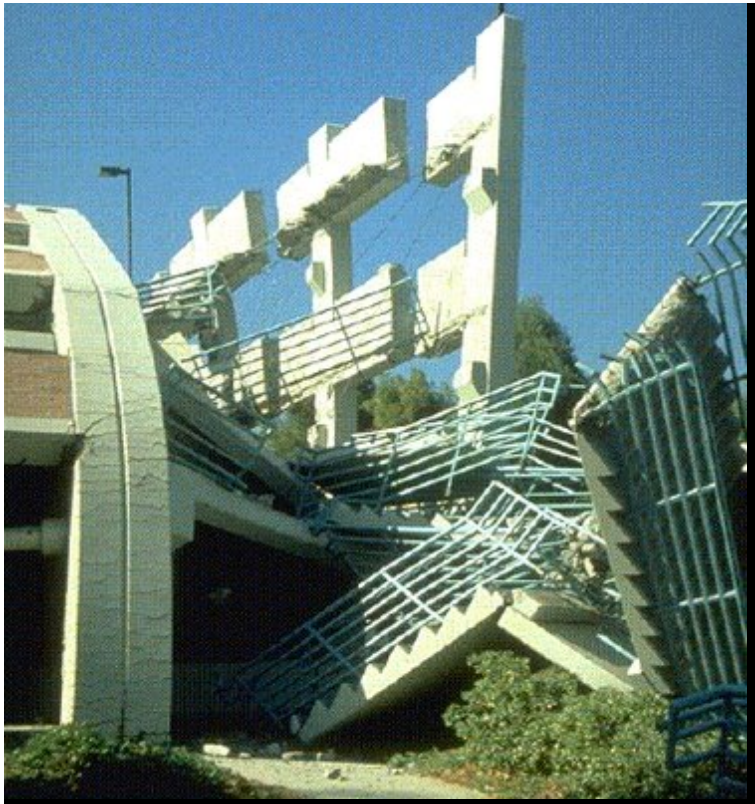

WEST


1
2


Licuación


mazda

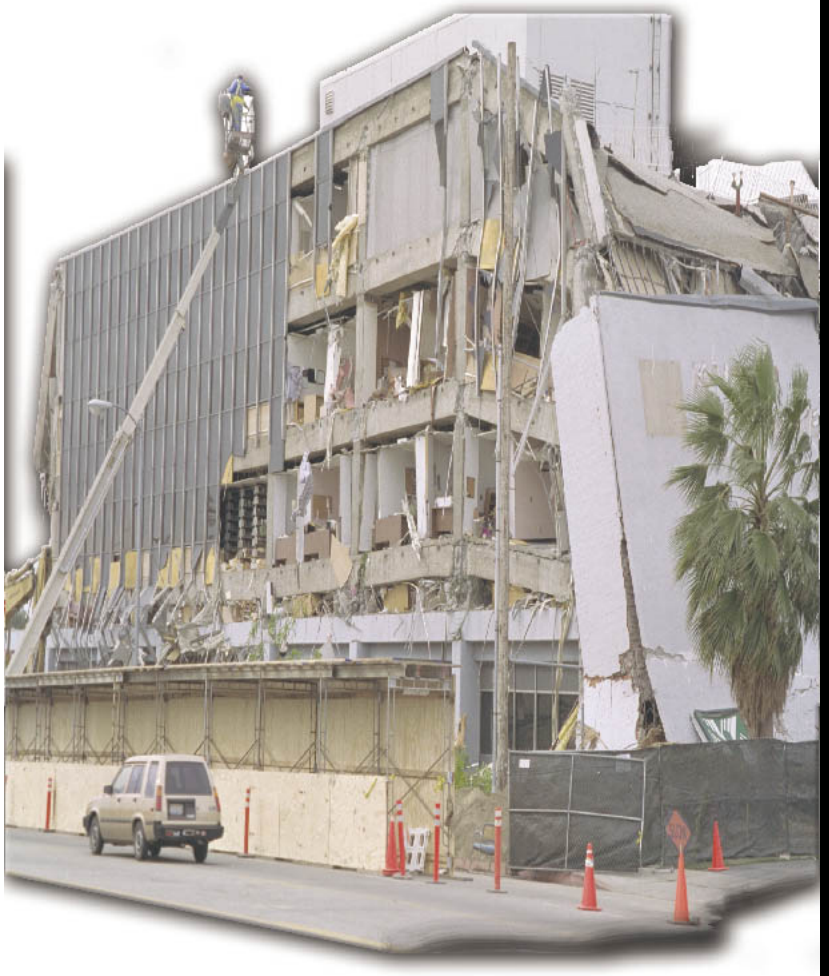


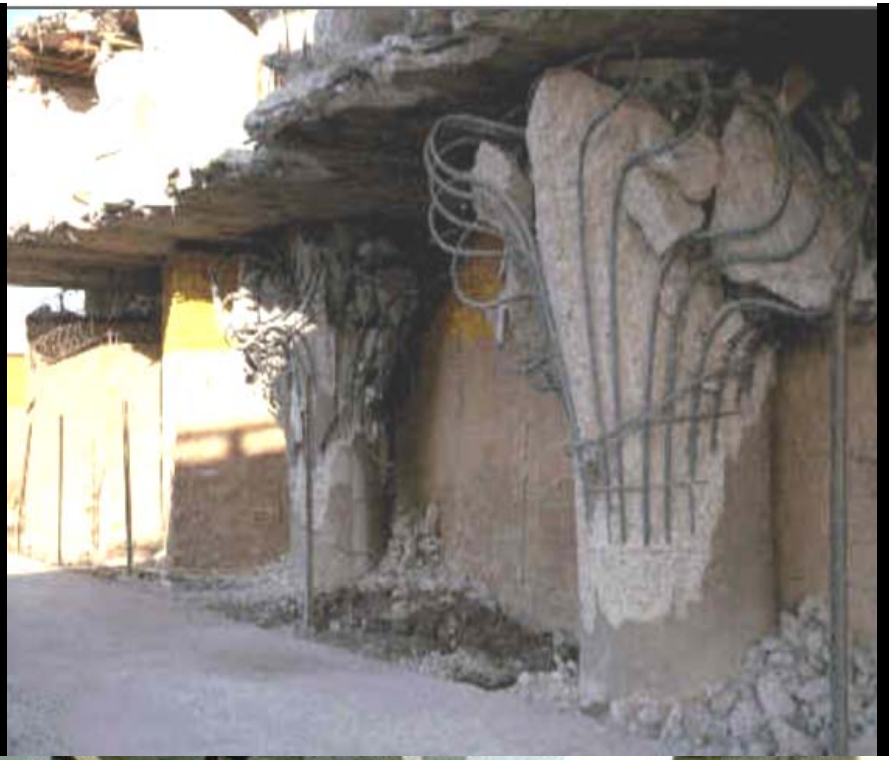


Antes

Después


deslizamiento



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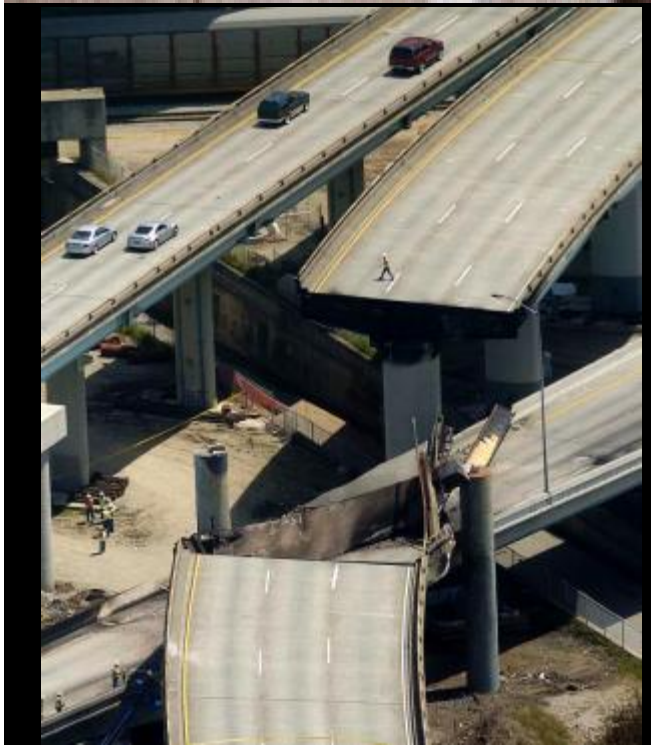
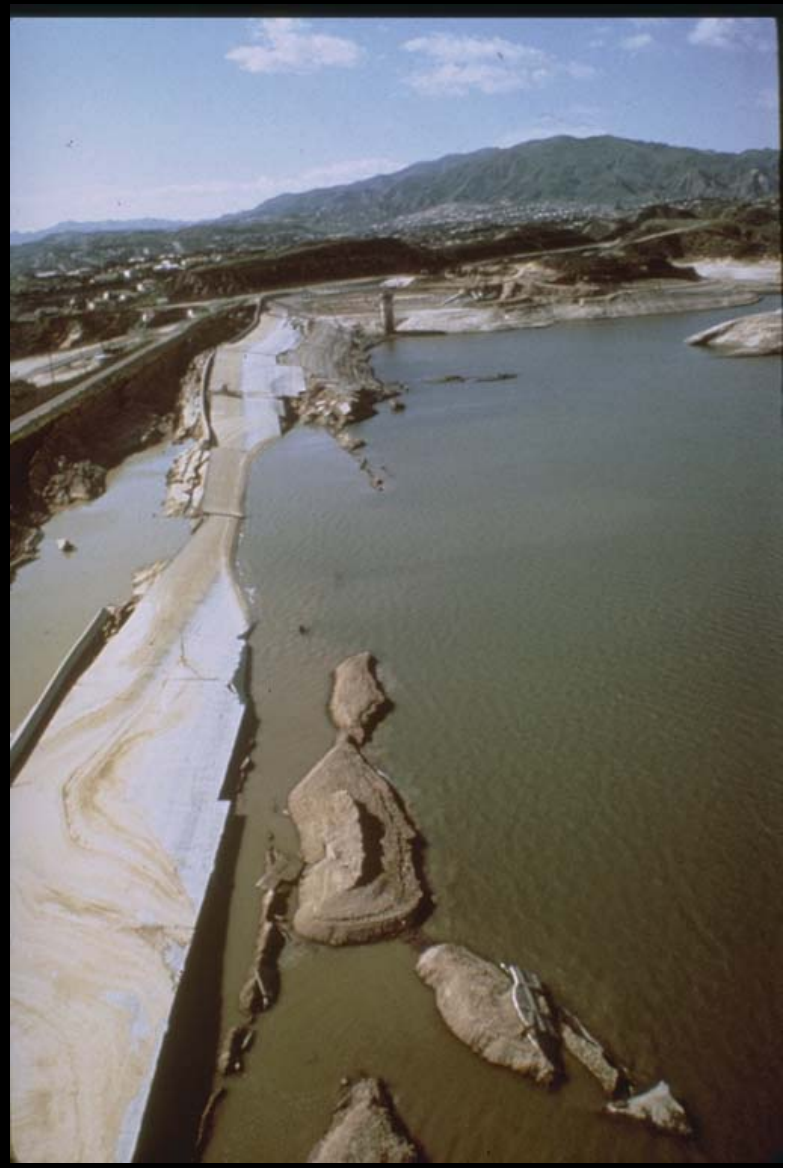
California Governor's Office of Emergency Services


JCPenney


FIRE
HOSE

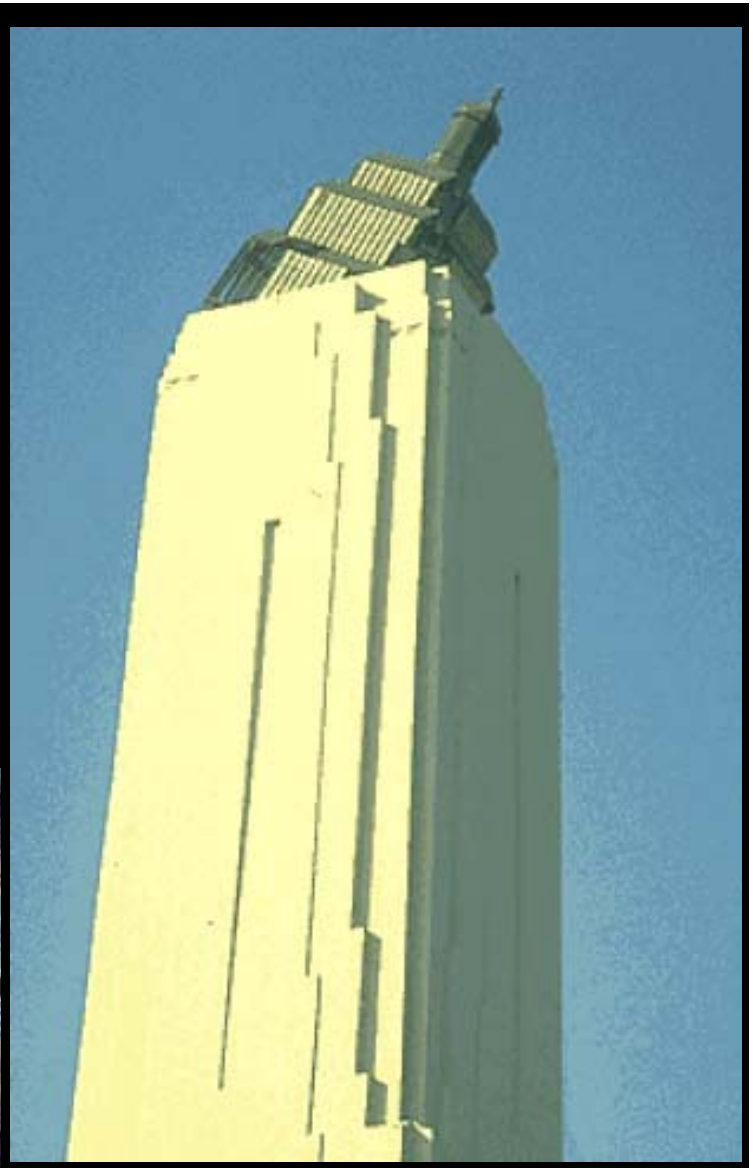



© 2009 Gary D. Avey




STEAM PLANT


Placa de concreto armado




NATIONAL

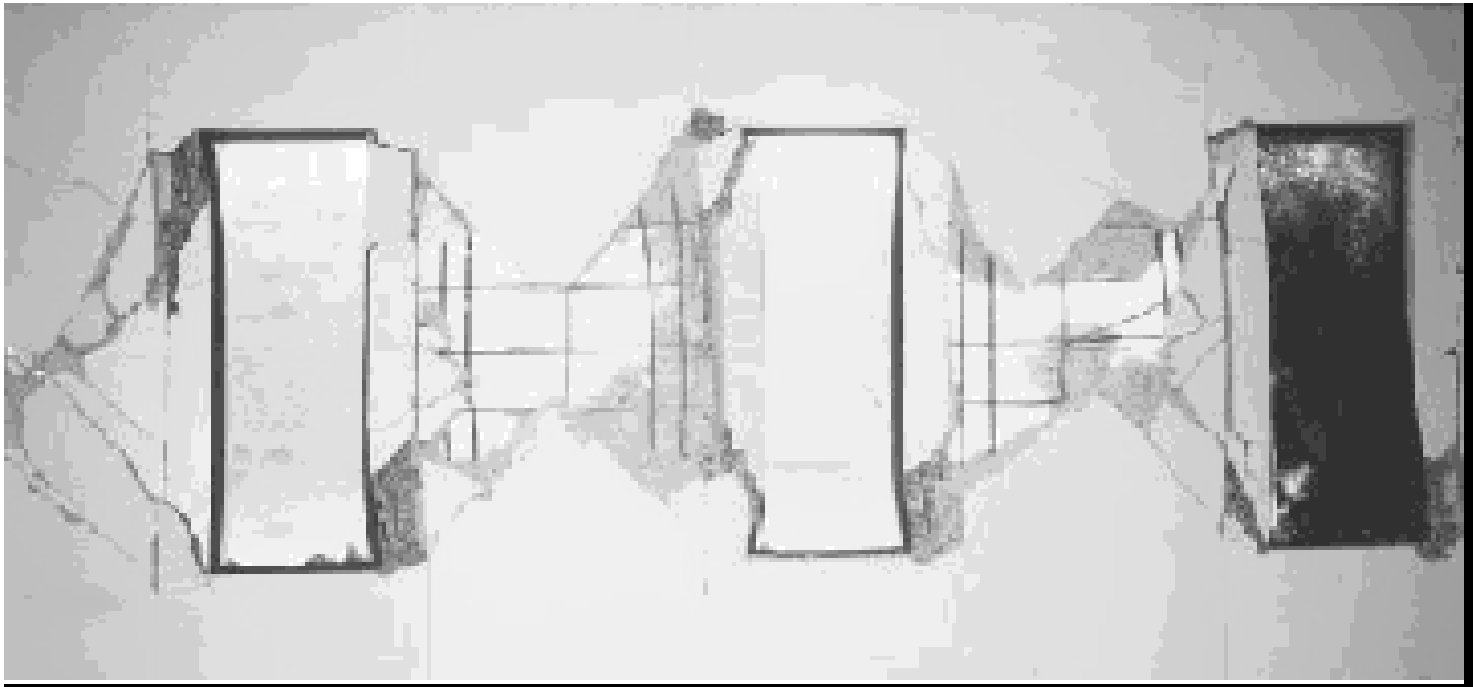

STOP

Cercos hechos con bloques de concreto

Tejas

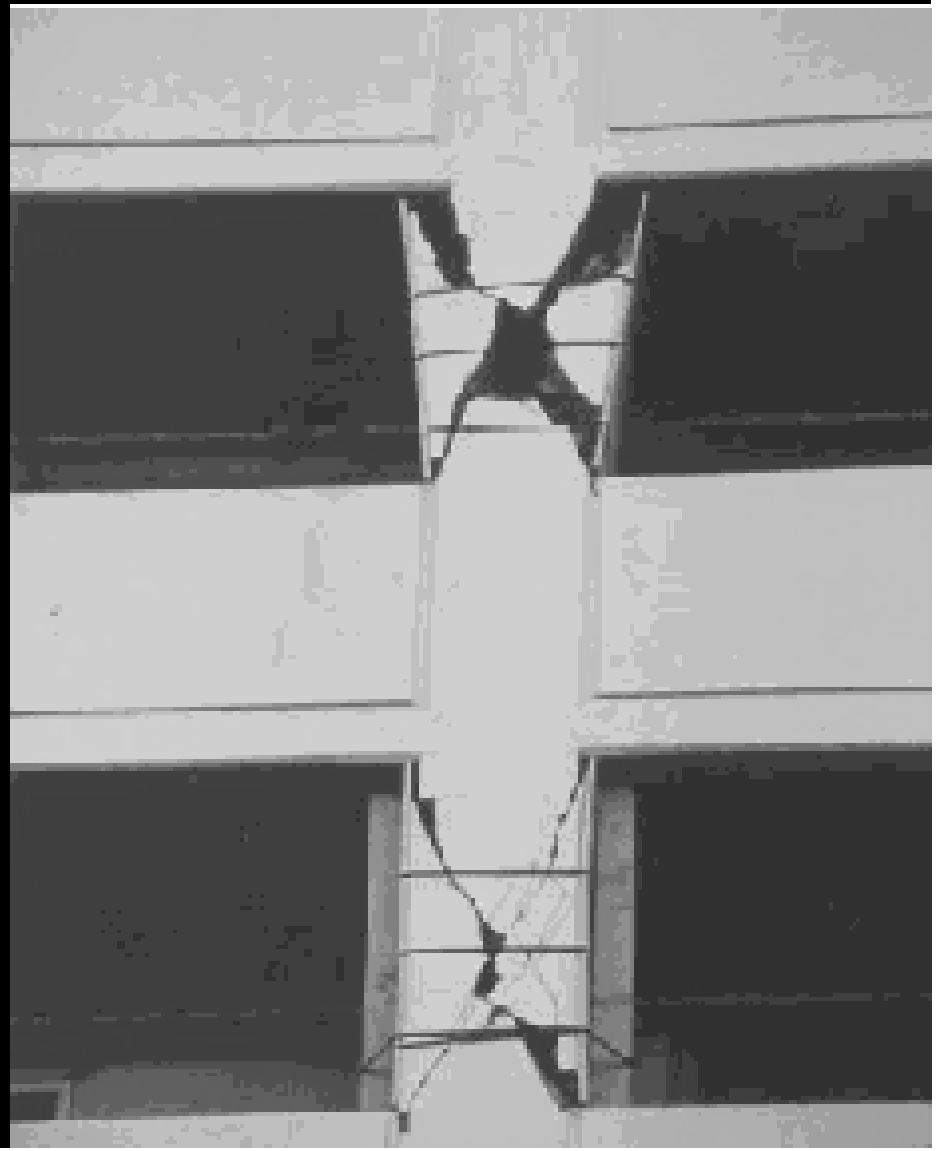
Tanque de oxígeno

Cielo raso

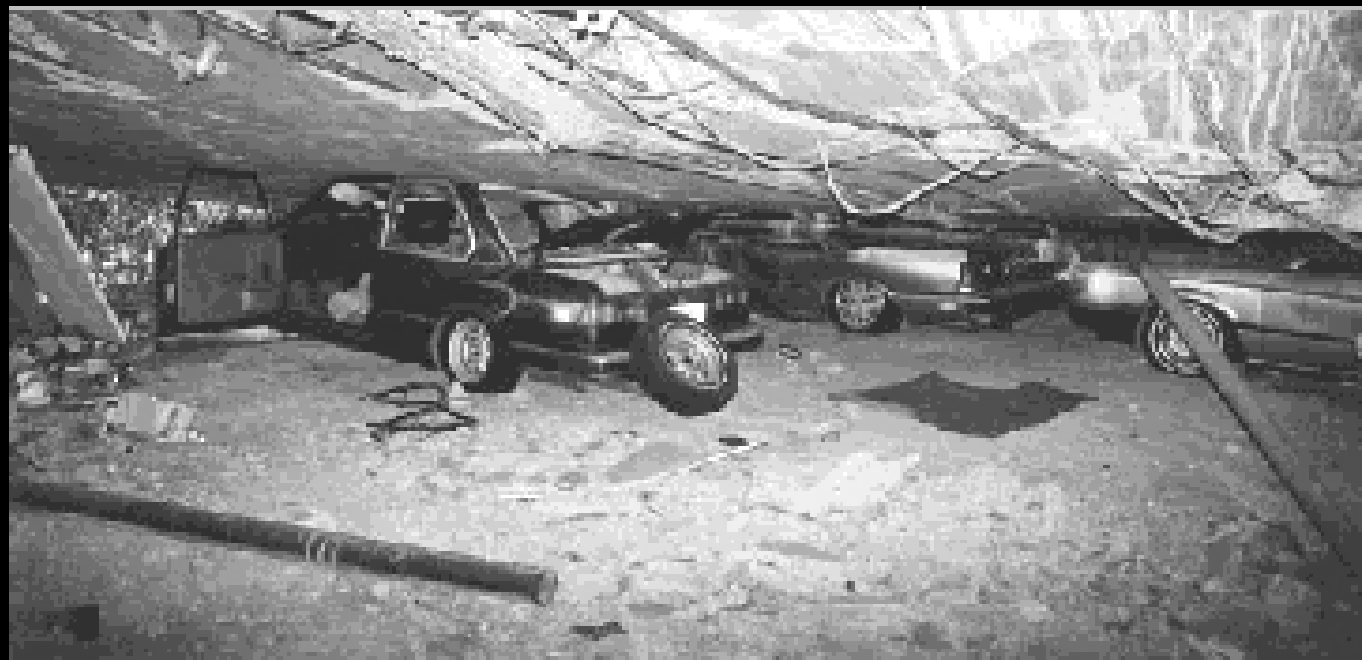


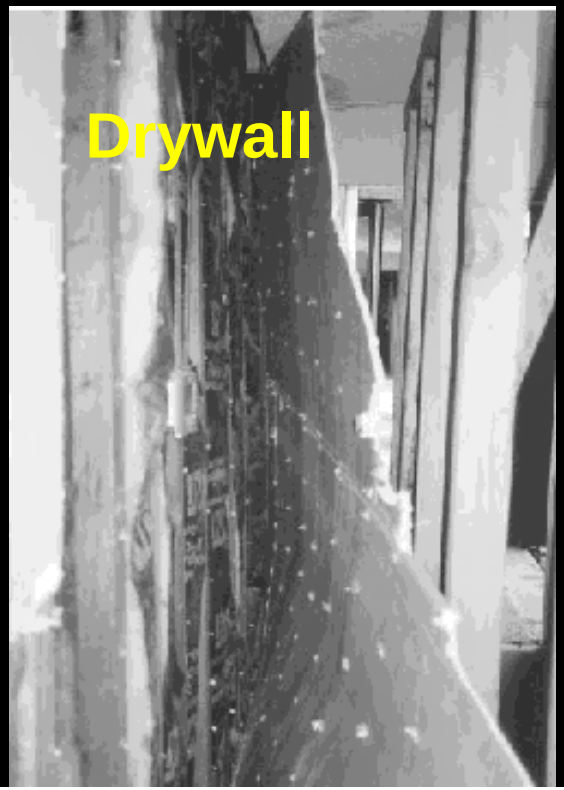
Placa

Talón de un muro de albañilería armada



cochera




Drywall

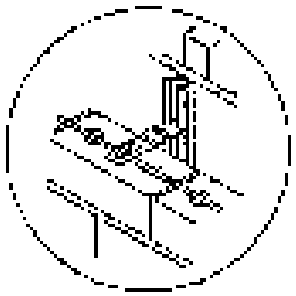

TOYOTA
albañilería

Albañilería Armada

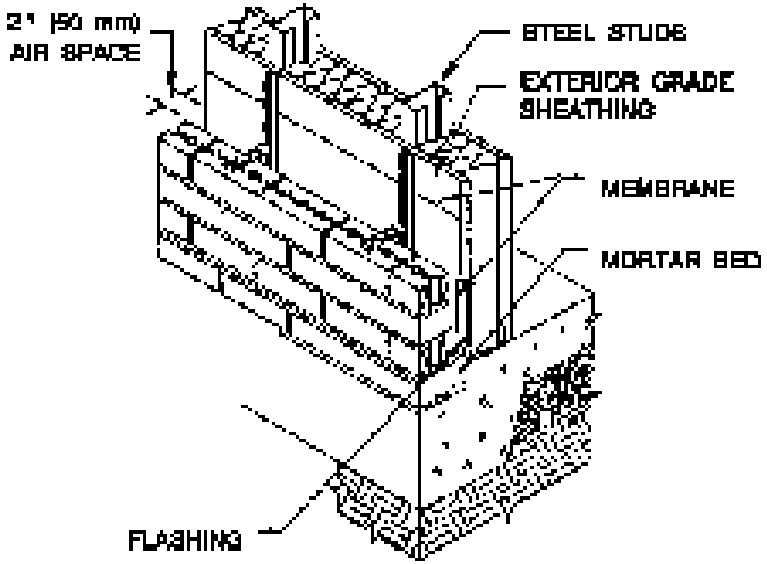
Albañilería Laminar (tipo Sandwich)

Veener Wall

(albañilería decorativa)



Typical Detail Using
Light - Gage Hat Channel
(NOT RECOMMENDED)

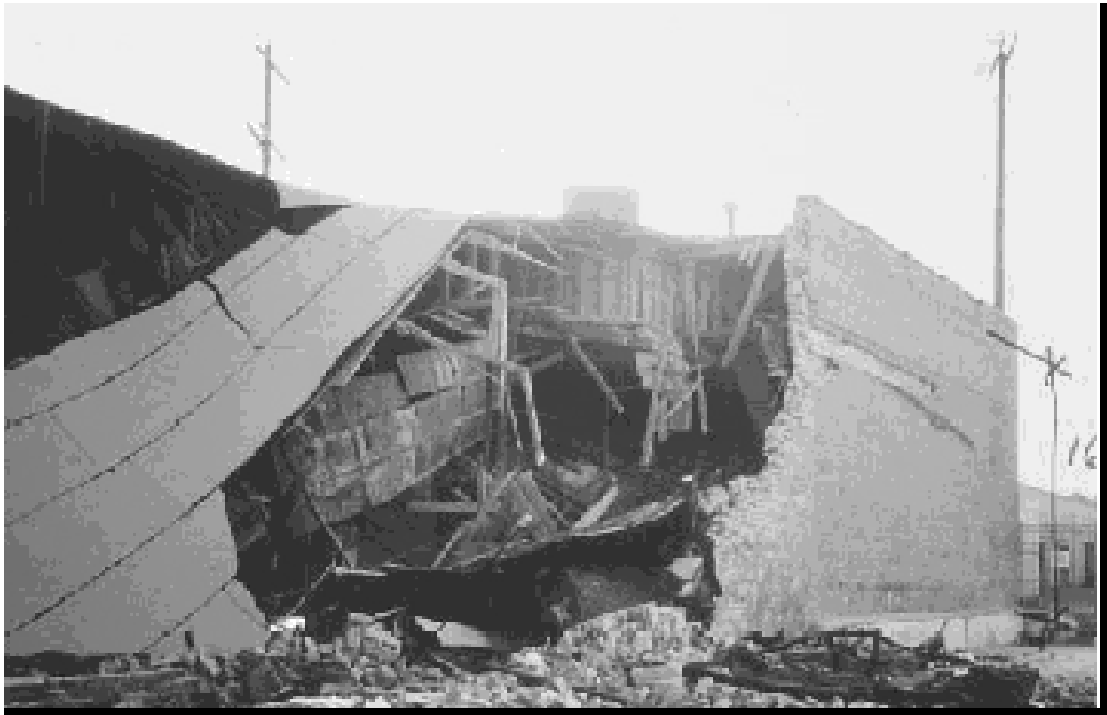


Recommended Detail Using Heavy -
Gage Channels

Albañilería No Reforzada

Albañilería No Reforzada

Albañilería No Reforzada



Albañilería No Reforzada

ADOBE REFORZADO
CONSTRUIDO EN 1940

Adobe No Reforzado

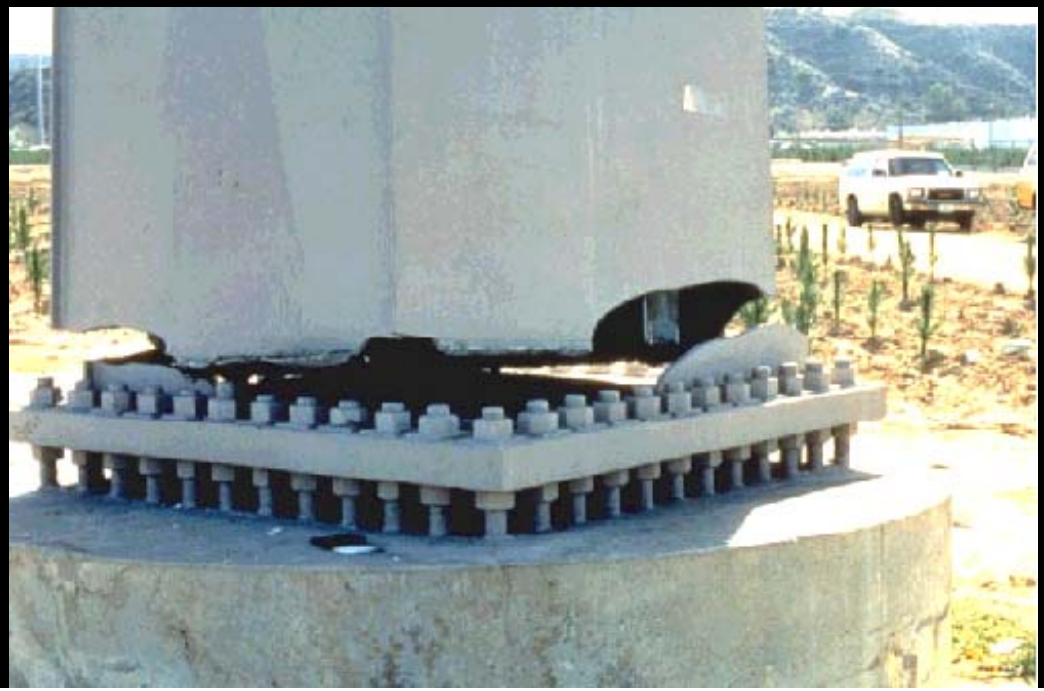
Estadio

Reparación con epóxico

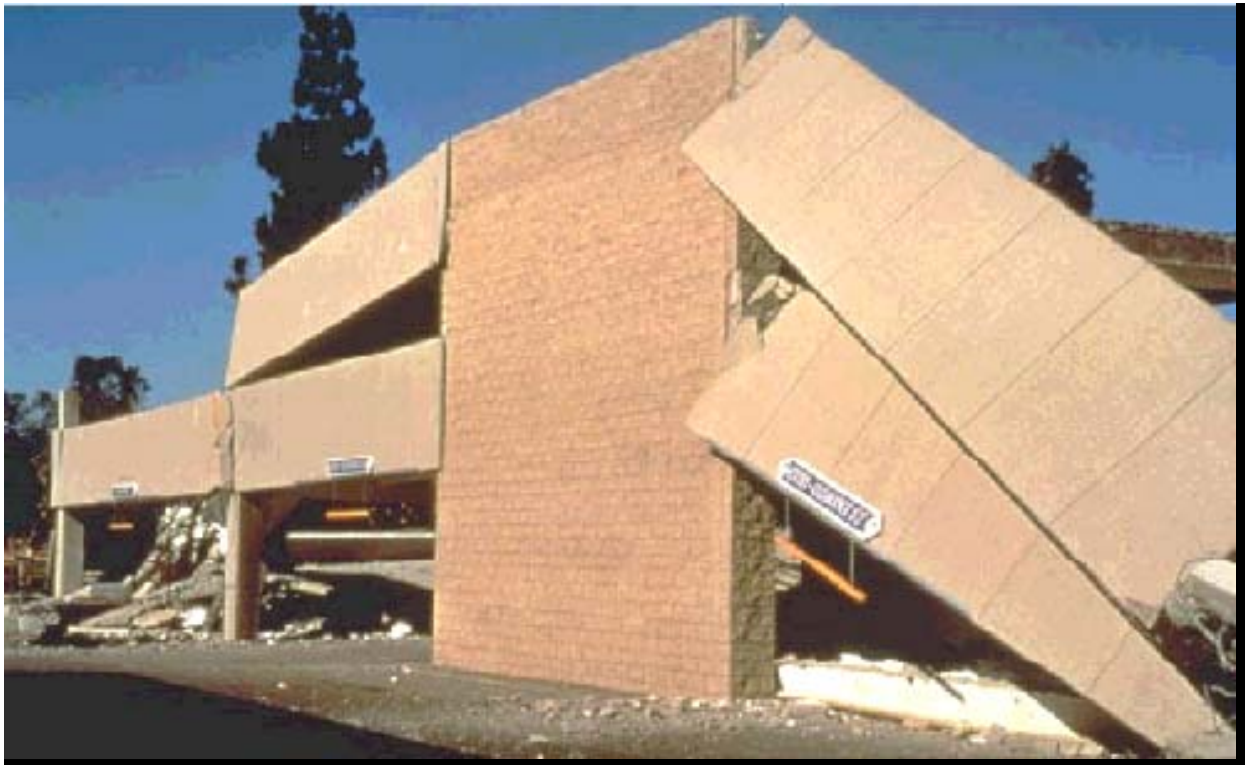
Aerial view of Pacoima Dam where strong ground shaking (over 2g measured on the abutments) caused extensive rock slides, opened a 2-inch wide gap between the dam and its thrust block on the southern abutment, and cracked the southernmost block of the dam in several places. Pacoima Dam is operated for flood control and its water level is seldom high.

One of the few sites of ground liquefaction, and the most significant, was Kings Harbor Marina in Redondo Beach, 27 miles from the epicenter. Two reclaimed areas, each about 150 feet 1000 feet, extend into the marina. Differential subsidence of the northern fill (slide 10) occurred over a distance of 300 feet. A 500-foot long section of the southern reclamation's retaining wall bowed out, reaching a maximum offset of 20 feet (slide 11).

The head scarp of an incipient slope failure appeared on the northern side of Mulholland Drive in the Santa Monica Mountains. The main section of this scarp extended 400 feet and had vertical offsets up to 12 inches and crack widths up to 4 inches.



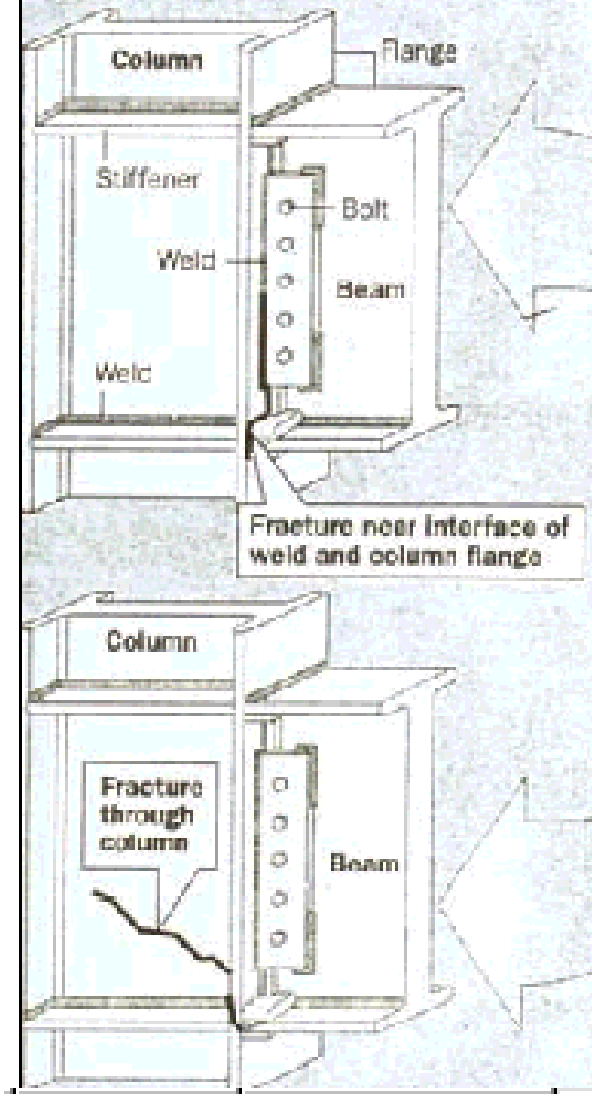

Fwy
WEST



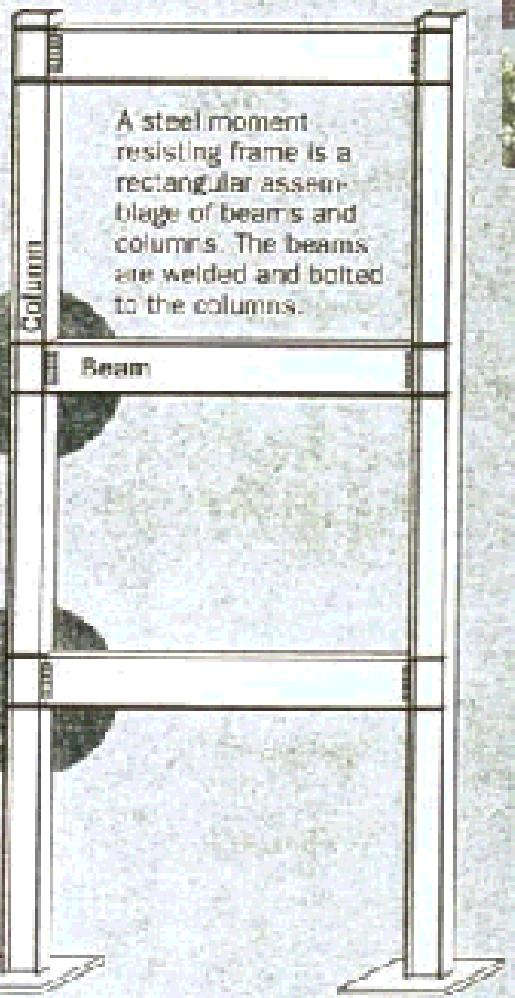
Quake Cracks Steel Buildings

In past earthquakes, unreinforced brick and stiffly designed concrete buildings were considered mo vulnerable to collapse. Buildings made of steel were deemed safer, because they tend to bend but no break. The Northridge earthquake shattered those assumptions. Engineers have identified a dozen more steel buildings as high as 10 stories with badly cracked welds and supporting steel columns. Although they did not collapse, they were seriously weakened.

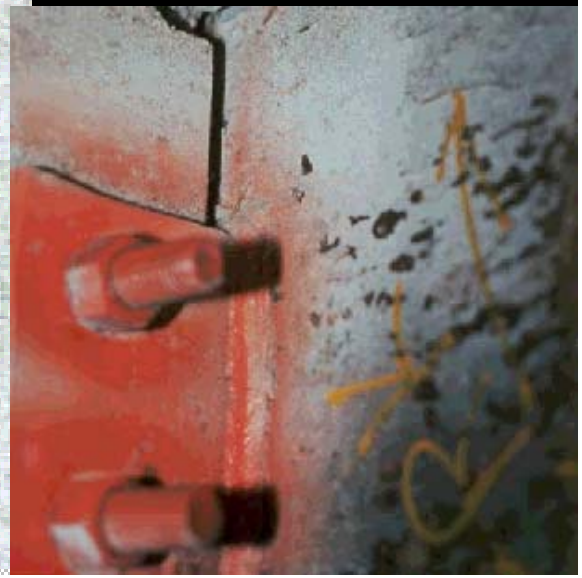
Two types of cracks



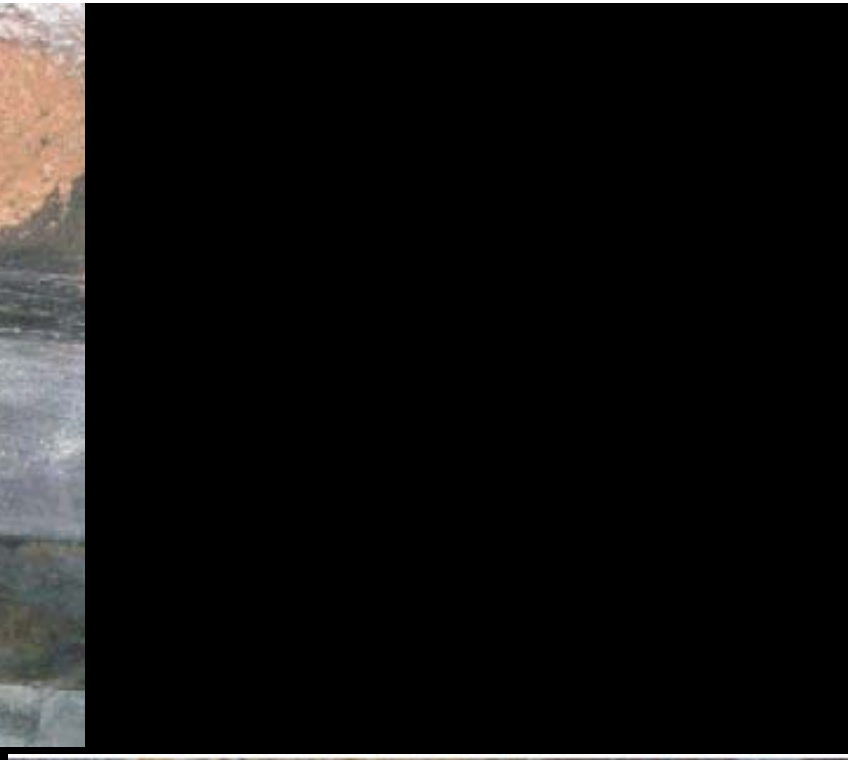
Moment resisting frame



Metálico

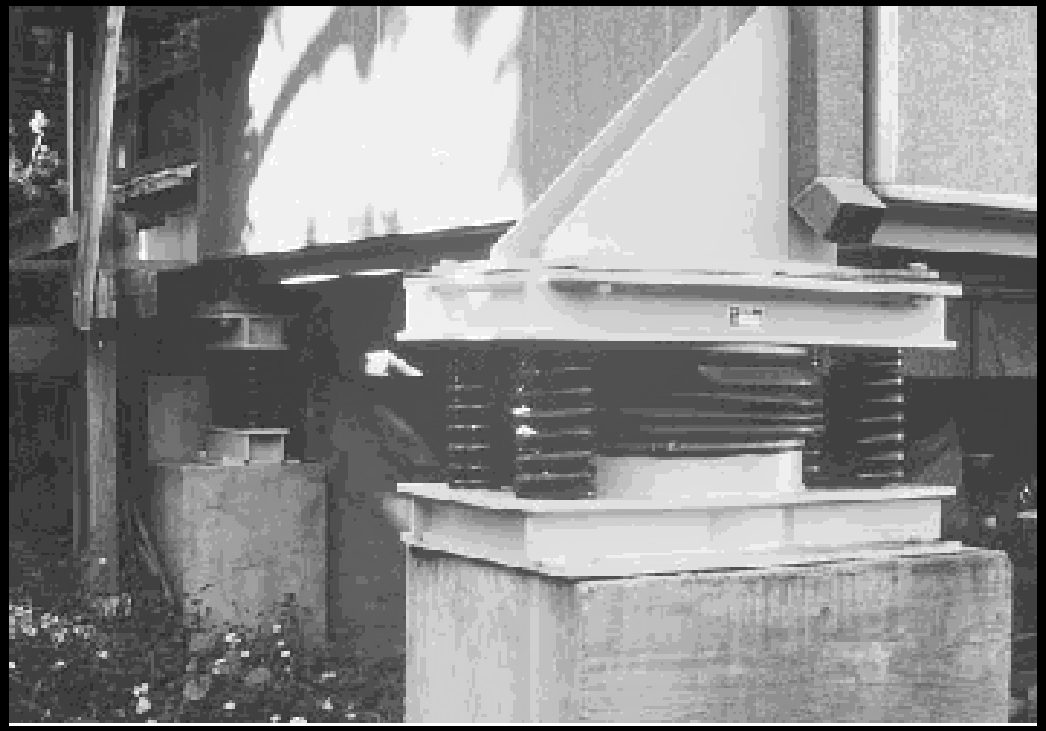



460



Daños no estructurales

Aisladores



Base Isolation

The U.S.C. Hospital, a 7-story braced frame building supported on lead-rubber isolators, suffered no damage to either structure or contents. Peak horizontal ground accelerations were .37g below the isolators and .21g at the roof. A major benefit of base isolation is protection of building contents.

Incendios

Broken gas and water mains on Balboa Boulevard in Granada Hills created this scene of flood and fire (slide 68). The fire burned five homes, as shown in the aerial view of slide 69. In the Sylmar area, about 100 trailers burned in three mobile home parks (slide 70). These fires were attributed to breaks in gas lines, and the multiple firegrounds shown indicate more than one ignition.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