

NORTHERN CHILE EARTHQUAKE OF AUGUST 8, 1987

— Prof. Rafael Riddell
(EERI, 1980),
Universidad Catolica de Chile.

(See the Insert on the March 5, 1987 earthquake, in the August, 1987 Newsletter.)

The earthquake occurred on August 8, 1987 at 11:48 AM local time. A 6.8 magnitude was reported by the Chilean Seismology Institute, while a 5.5 magnitude event, possibly a foreshock, was reported by the Geophysical Institute of Peru. Total duration of felt shaking was about 2.5 minutes. Modified Mercalli intensities were: 7 in Arica (population 140,000) and Pisagua, 5-6 in Iquique, 4-5 in Tocopilla and Calama, 2-3 in Antofagasta.

Four people were killed, two in Arica, one of whom was a child killed in a slide which displaced about 200 tons of

material from the "Morro", a rock outcropping above the coastal highway. The coastal highway was closed at several locations in northern Chile from slides. It was still closed 5 days later.

One bridge was reported damaged about 60 km south of Arica. 49 people were injured in Arica: 6 seriously, 29 less so, and 14 with minor injuries.

A total of 350 people were injured, many in small towns, from the collapse of adobe or unreinforced masonry buildings. 120 dwellings of adobe or unreinforced masonry were damaged in Arica: 8 totally destroyed, and 40 required demolition. Two schools will require extensive repairs. Most damage is in the older portion of Arica. There is a 12-story reinforced concrete building in Arica, reportedly undamaged, and several 4-story

reinforced concrete buildings also reportedly undamaged. Electricity was off for a day, and the water was shut off in Arica.

There were no reports of tsunamis.

Previous minor seismic activity between Arica and Tocopilla: 6 events in March and April, 1987; 20 events in June, and 20 events in July 1987. There was quiet for 2 weeks prior to the earthquake.

An earthquake with magnitude greater than 8 in 1868 was the last previous largest earthquake. The area has been quiet until this year. The 1868 quake produced a tsunami. Clippings and photos may be available at a later date.

The university at Santiago does not intend to send a team to investigate the quake.

CAPE MENDOCINO, CA EARTHQUAKE OF JULY 31, 1987

Accelerograms from the California Strong Motion Instrumentation Program --A. F. Shakal (EERI, 1980), and staff.

Accelerograms of particular interest, recorded at CSMIP stations during the Cape Mendocino earthquake of July 31, 1987, are shown. Eleven accelerograms were recovered at nine stations including two buildings, one bridge and six free-field stations. The stations were 10 to 50 km from the preliminary epicenter (USGS), which is about 2 km offshore from Cape Mendocino. The preliminary magnitude estimate is 5.5 (ML, BRK).

The locations of CSMIP stations and the preliminary earthquake epicenter are shown on the attached map. Peak accelerations for all records recovered, the station coordinates and distances from the epicenter are

continued page 6

TABLE 1

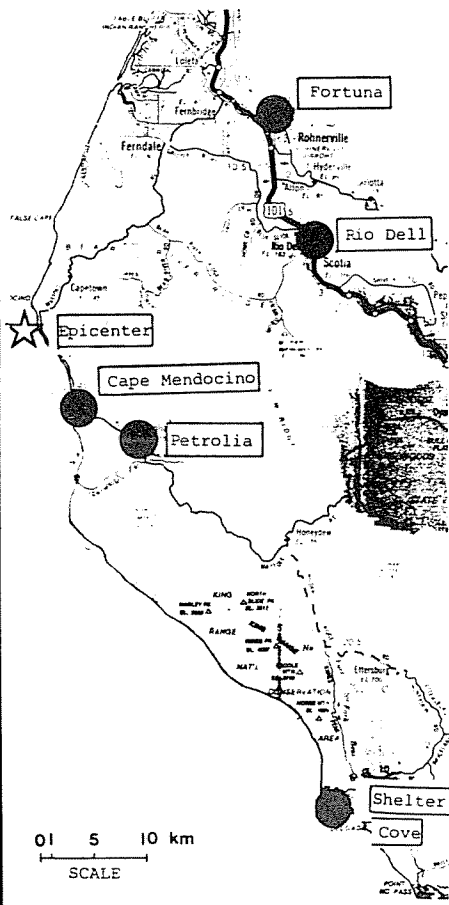
CALIFORNIA STRONG-MOTION INSTRUMENTATION PROGRAM (CSMIP)
DATA RECOVERED FROM RECENT EARTHQUAKES

Cape Mendocino, California Earthquake
31 July 1987, 16:57 PDT 5.5 ML (BRK)
Epicenter (Preliminary): 40.426N, 124.400W Depth = 17 km (USGS)

Station No.	Name	N.Lat.	W.Long	Epicentral		Max. Acceleration
				Dist(km)	Az*	
89005	Cape Mendocino	40.348	124.352	10	(155)	0.24g Horiz., 0.07g Vert.
89156	Petrolia	40.325	124.287	15	(139)	0.62g H, 0.16g V
89324	Rio Dell - Hwy 101/Painter St. Overpass	40.503	124.100	27	(71)	Ground: 0.15g H, 0.04g V Structure: 0.34g H, 0.27g V
89486	Fortuna - Safeway Freefield	40.584	124.145	28	(51)	0.15g H, 0.04g V
89473	Fortuna - Safeway Supermarket (1-story Masonry)	40.584	124.144	28	(51)	Ground: 0.18g H, 0.05g V Structure: 0.58g H
89530	Shelter Cove - Airport	40.026	124.069	53	(147)	0.23g H, 0.08g V

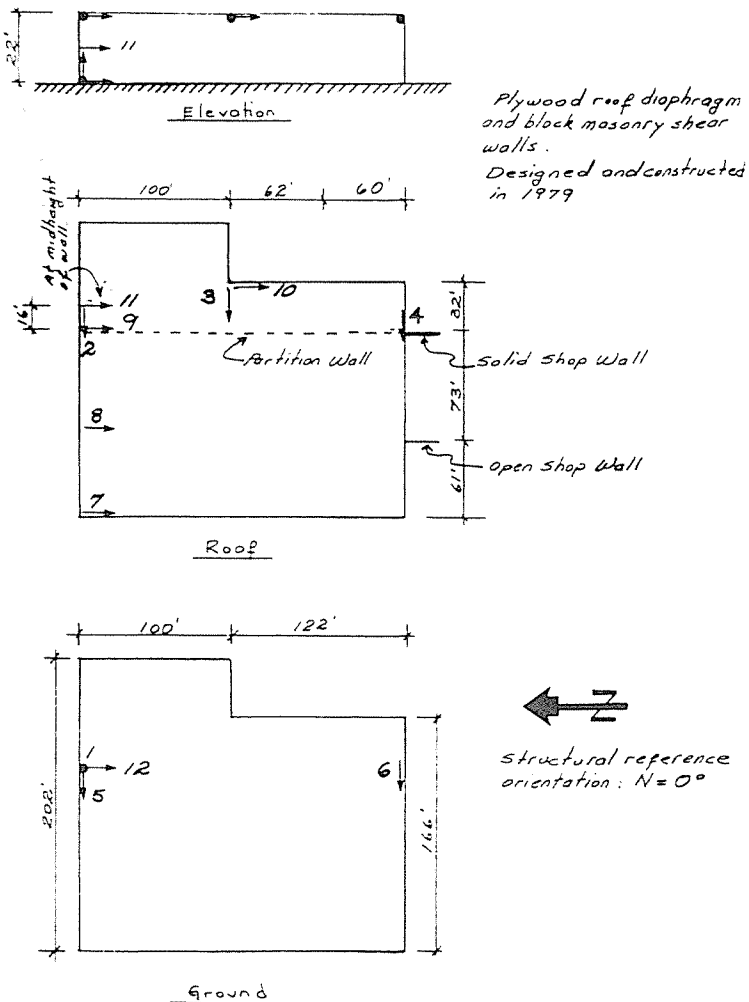
* Azimuth from earthquake epicenter to station, CW from N, 0-360 deg.

CAPE MENDOCINO, CA EARTHQUAKE OF JULY 31, 1987



Fortuna - Safeway
701 South Fortuna Blvd.
Fortuna, CA

INSTRUMENTATION SCHEME



Plywood roof diaphragm
and block masonry shear
walls.
Designed and constructed
in 1979

from page 5

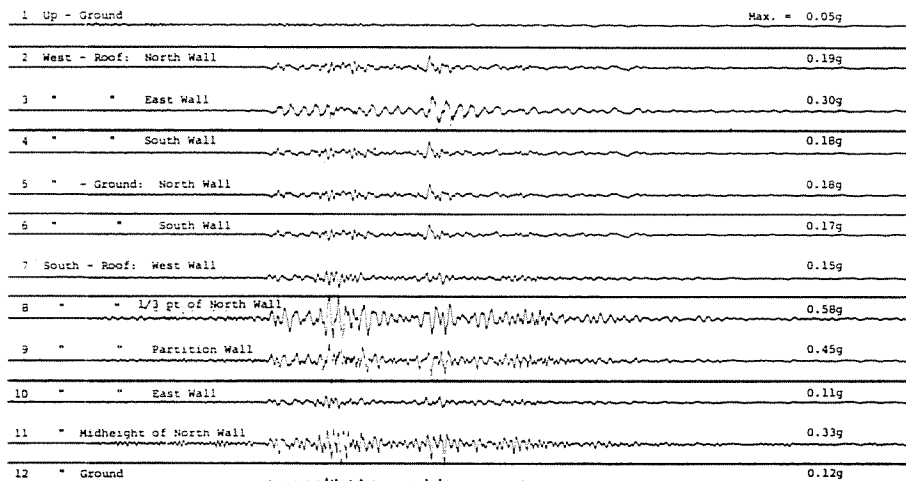
listed in Table 1. Only those stations with peak accelerations greater than 0.05 g are included.

The accelerograms include those from the Fortuna Safeway. This is the first record recovered from a long-span supermarket building. A peak acceleration of 58% g was recorded at the top of the side wall, in the out-of-plane direction; the peak at the base of the wall was 12% g. (Spikes visible on several traces appear to reflect actual motion of structural elements, rather than instrument problems.) The record from the nearby free-field site is quite similar to the building ground-level records.

Further information and the remainder of the accelerograms will be included in a standard data report, to be completed in one-two months. The data here may be copied as desired.

Fortuna-Safeway
CSMIP Sta. 89473

123:57:05 GMT



1 sec

Structural Reference Orientation: N = 0°