9. EARTHQUAKE EFFECTS ON SOILS AND DAMS

9.1 Effects on Soils

The earthquake caused several rock slides on San Marcos Pass, the section of State Highway 154 which runs northwesterly through the Santa Ynez Mountains from U.S. Highway 101 between Goleta and Santa Barbara. A photograph of one of the slides is shown in Fig. 5.3. Although no motorists were injured by the slides, the highway was closed throughout the following day or two for removal of loose boulders, and blasting in some areas. Extension fractures also opened in at least one area on a steep slope which forms the shoulder of the highway.

Some minor slides also occurred along the cliffs at the coastline, and some other rock slides occurred off the roads in the Santa Ynez Mountains. However, no major landslides occurred in the Los Padres National Forest areas in the Santa Ynez Mountains.

As previously noted, the major fault motion occurred offshore in the Santa Barbara Channel. Consequently, no surface traces of fault motion have been found onshore in Goleta or elsewhere. However, evidence of some extension fractures resulting from lateral spreading was found near Goleta beach near the northeast entrance to the UCSB campus. As shown in Figs. 9.1 through 9.4, several cracks opened in the bicycle path leading to the University. These cracks indicate a northward sense of slip of an arcuate slab, 200 feet long and 25 feet wide, of the south bank of the flood channel of Goleta slough. The maximum extension is approximately 1½ inches. No vertical relative slip was apparent. The cracks extended a considerable distance into the brush on each side of the path. Soil in this general vicinity is a relatively soft alluvial fill at the mouth of the Goleta slough.

Lateral spreading and differential settlement of from 3 to 6 inches occurred in localized areas of the sand spit near the mouth of the lagoon on the UCSB campus (see Fig. 3.2). Settlement of approximately 6 inches occurred around parts of the sea water pumping facility of the UCSB Marine Science Institute as shown in Figs. 9.5 and 9.6. This large differential settlement contributed to the rupture of large water lines inside the pumping facility. No evidence of liquefacation has yet been reported.

Evidence of lurching was found in some areas near the Married Student Housing facilities of UCSB on Los Carneros Road, and on Los Carneros Road north of Hollister Avenue. Shown in Figs. 9.7 and 9.8 is a north-south section of concrete sidewalk along Los Carneros Road north of Hollister Avenue. As a result of sudden acceleration of the ground beneath it and being constrained at the south end, the sidewalk evidently buckled upward, fractured, and fell upside down as shown in the photograph. An inspection of the surrounding area revealed no evidence of surface ruptures, buckling, or damage of any kind to the adjacent asphalt pavement, concrete curb and gutter, or ground.

An east-west section of the sidewalk at the southern edge of the UCSB Married Student Housing facility is shown in Figs. 9.9 and 9.10.

Fig. 9.1 Extension fracture in the bicycle path northeast of UCSB. Note misalignment of centerline. Building at upper right is Biological Sciences II, UCSB. Cracks runs in a northwesterly direction.

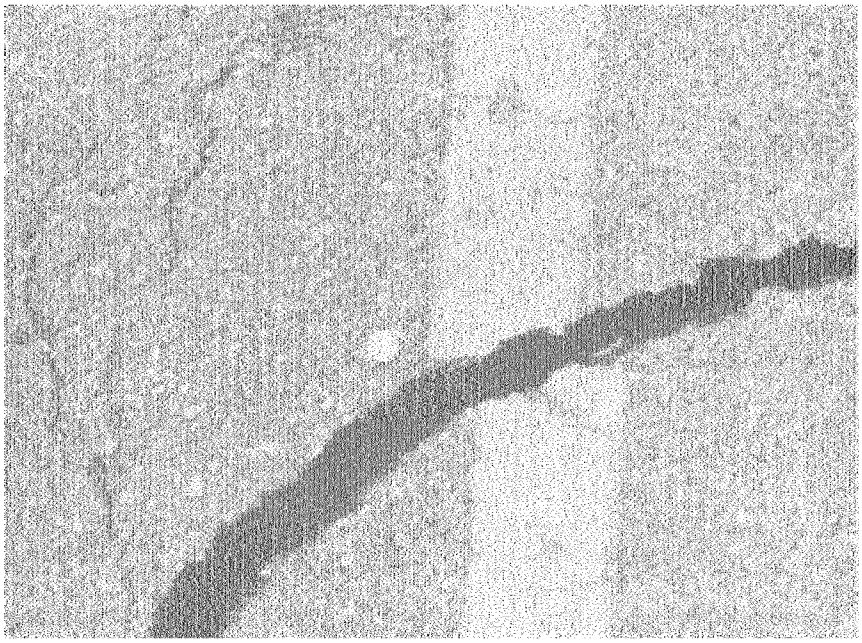

Fig. 9.2 Close up of extension fracture shown in Fig. 9.1. Scale given by the coin (quarter) in the center of the picture.