

Appendix IV Summary of Landslides in The Vicinity of The Upper Van Norman Lake during The 1971 San Fernando Earthquake^{(5),(6),(16),(17)}

During the 1971 San Fernando earthquake, large landslides occurred in the vicinity of the Upper Van Norman Lake, as shown in Figure IV-1, 2. From the numerous sand volcanoes observed nearby, these landslides were assumed to have been caused by the liquefaction of a sandy layer. One of largest displacements occurred at the Juvenile Hall and its outline is as follows.

Figure IV-2 shows the permanent ground displacements and the locations of sand volcanoes and cracks observed on the ground surface. The ground surface in this area is gently sloped, with a gradient of 1 to 2%. An area with tongue-shaped with 300 m width and 1300 m length slid along the slope.

Figure IV-3 shows the soil layer profile along section B-B' which is roughly parallel to direction of the displacements. A silty sand layer with a

thickness of 3 to 4 m can be found 3 to 5 m below the ground surface and the ground water level is mostly higher than this silty sand layer.

Figure IV-4 shows the soil condition along section A-A' which is perpendicular to the landslide direction. The loose silty sand layer is lenticularly distributed, the width being about 300 m, almost the same as that of the area where the displacements occurred. According to the reference (16) it is reported that the displacement was caused by the liquefaction of silty sand layer, based on the results of soil condition surveys including a triaxial vibration test.

In the analysis of factors influencing the magnitude of the permanent ground displacement in Chapter 4, the data of the landslide at the Juvenile Hall, mentioned above, was also used by dividing the slope into two segments, as shown in Figure IV-3.

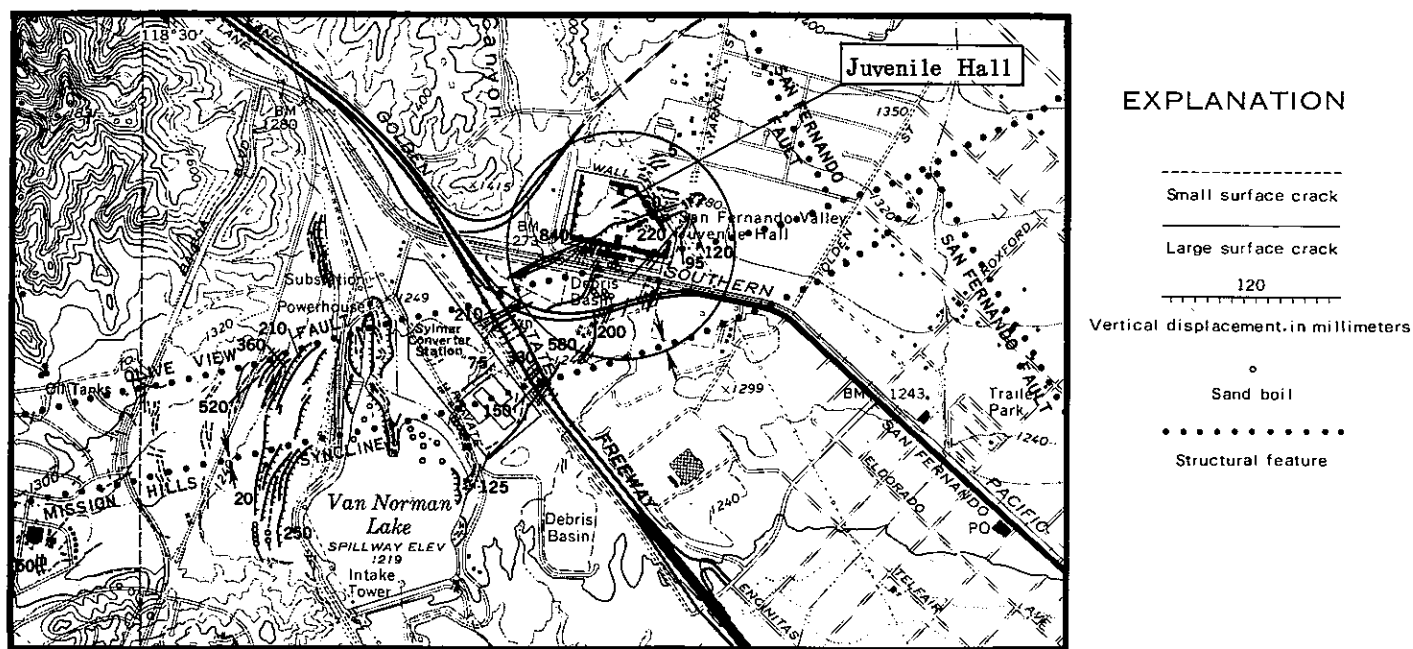


Fig. IV-1 Displacement in the vicinity of the Upper Van Norman Lake during the 1971 San Fernando earthquake

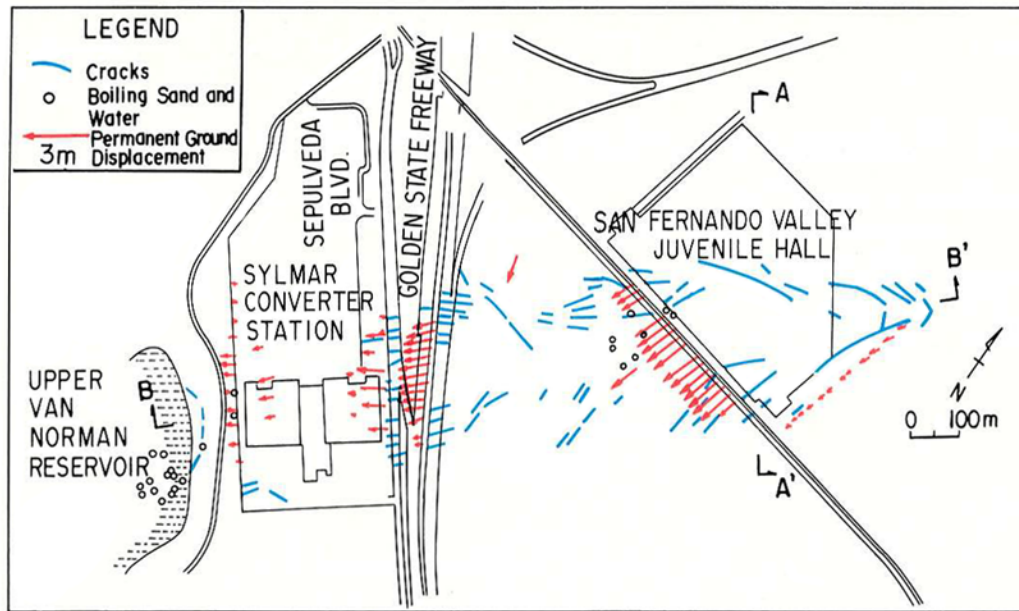


Fig. IV-2 Permanent ground displacement and ground failure at Juvenile Hall

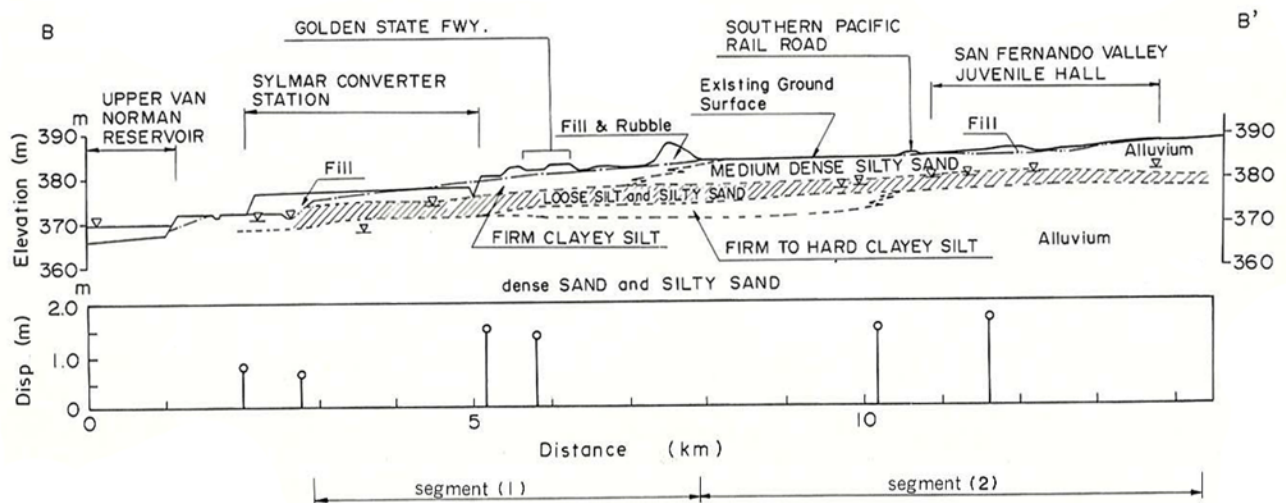


Fig. IV-3 Soil layer profile along Section B-B'

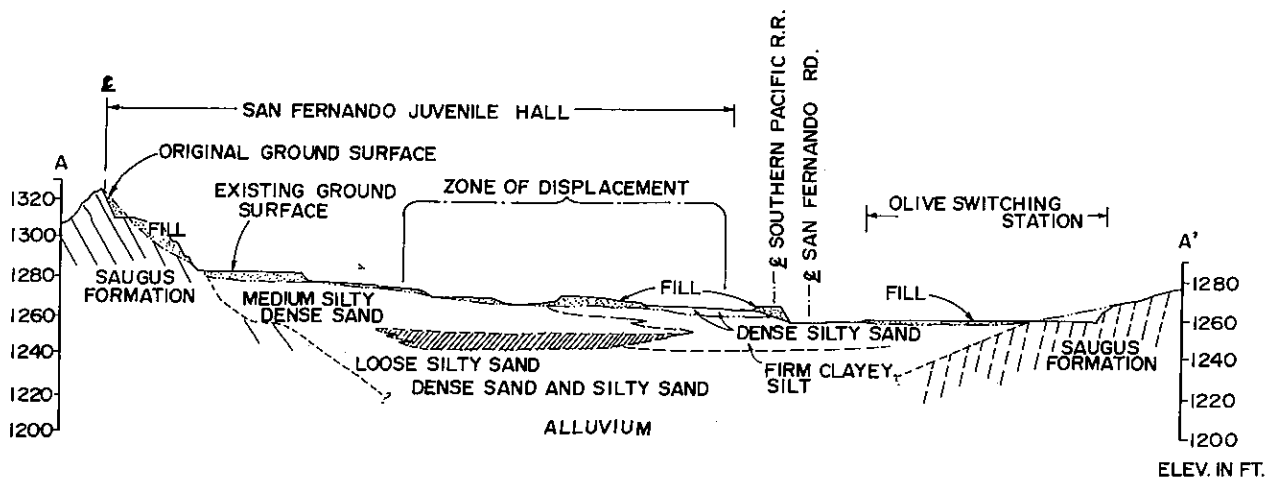


Fig. IV-4 Soil layer profile along Section A-A'