

01-74-03 SIDE A

Symposium on Alaska earthquake 1964 with Ruth Schmidt and Ernest Dosrovolny

Recorded in August 1964

University of Alaska Fairbanks

Fairbanks, Alaska

Questions about Aldermissen presentation.

There was a question about time duration. Aldermissen said they were all eye witness reports so they were just estimates.

Announcement about sessions three and four. Other announcements.

Moderator Cole introduces Dr. Schmidt.

Dr. Ruth Schmidt's talk is "Earthquake triggered landslides in the Anchorage area."

Dr. Schmidt said at 5:36 p.m., Friday March 27<sup>th</sup> [1964] the city of Anchorage was struck by a major earthquake originating in the Prince William Sound area. Unstable surface areas were triggered into disastrous landslides and destroyed bluff area downtown and the Turnagain residential area. In Turnagain expensive homes were completely devastated and in the adjoining area closely spaced fissures created severe damage to homes and weakened and destabilized the ground. In downtown Anchorage earth shocks exposed zones of subsurface weakness. Outside of the slide area earth movement during the earthquake accounted for a great amount of damage to structures. The duration of the severe ground roll is believed to be responsible for the damage in the non-slide areas. Her report is concerned with the engineering geology of the slide areas. According to a 1959 USGS bulletin the Anchorage area is underlain by different types of quaternary glacial fluvial deposits overlying tertiary and Mesozoic bedrock. She discussed the deposits overlying clay. There were five major landslides on the bluff areas. Samples of the landslide areas were examined. She discussed bootlegger clay underlying the Anchorage area and field mapping. In the greater Anchorage area cracks and minor displacements were reported throughout the area. They were related to topography and surface conditions. The Mountain View area on the south side of Ship Creek had no fractures reported immediately after the earthquake. The area was built on well drained sand and outwash. At the time of the earthquake pressure ridges and ice were formed at most of the lakes. Dams on two lakes were breached. Water levels dropped on some lakes. At the bluff the most damaging slides were in the vicinity of Rabbit Creek and DeArmond Road which is an area with a history of landslides. The Alaska Railroad tracks were displaced as much as fifty feet at this location. Houses were damaged. She talked about the underlying strata on some of the slides. Damage to the city dock area was discussed. In the downtown area there were five major slides including the L St. slide, the 4<sup>th</sup> Ave slide, 1<sup>st</sup> Ave slides and the Government Hill slide. The magnitude of damage was di-

rectly proportional to the amount of down dropping. She discussed the properties of the slide areas and displacement. Schmidt said the surveys by city engineers also show that the maximum lateral or horizontal movement of the slides was approximately 11 feet. She discussed the Turnagain area damage and the moisture content of the slide. Critical damage in the Anchorage area occurred in the bluff slide areas. Most principle damage areas to least extensive areas affected were the Turnagain slide, the L St. slide, the 4<sup>th</sup> Ave slide, the Government Hill slide, and the 1<sup>st</sup> Ave slide. Maximum horizontal movement was 1200 feet in Turnagain and the maximum down dropping was 30 feet in Government Hill. The failure within the Bootlegger Cove Clay caused the landslides. With exception of the bluff areas the Anchorage area appears to be relatively stable.

The moderator had announcements.

Mr. Dosrovolny is introduced. His talk is titled "The effects of the Good Friday Earthquake on Anchorage, Alaska and urban reconstruction."

Ernest Dosrovolny said Anchorage is located in an active seismic area. The city used the uniform building code for seismic zone three. There existed a documented record of recession of part of the block along Knik Arm and instability of certain Pleistocene units. The principle effects of the earthquake were shaking, triggering of landslides with associated fracturing back of the head of the landslide scarps, differential settlement particularly in artificial fill, compaction fracturing in grounds near and far removed from the landslides, and subsidence which was in part tectonic and part compaction of surficial materials. By far the greatest amount of damage to buildings and service facilities was in the areas of landslides. The landslide locations are shown on a slide. He said throughout the area of sliding the surface is underlain by sand and gravel from ten to thirty feet thick. Beneath the sand and gravel is the Bootlegger Cove Clay which is a deposit of estuarine silt and clay more than 140 feet thick. All of the larger landslides moved out in essentially a horizontal plane. Separation took place in the Bootlegger Cove Clay. Effects on construction, reconstruction, and regulations applying to building were many and varied. New construction was halted and designs were changed. Existing buildings were surveyed and some were condemned. They were no longer fit for habitation. The geological evaluation group under the auspices of the Alaska State Housing Authority conducted the first extensive survey of the effects of the earthquake on the ground conditions. This worked primarily as a guide for the city. It also served as a guide for the Alaska State Authority in applying for appropriations and allotment of funds for aid in the reconstruction of the city. He showed the map of urban renewal. It resembles the maps of the geological group. He thinks other maps will be issued as more information is available. He said these are valuable lands. The city requested the Corps of Engineers to conduct studies of the landslide areas. There was an extensive geophysical and soils testing program. He said there are now very few geologic units that have been tested as well as the Bootlegger Cove Clay. In April the Federal Reconstruction and Development Planning Commission for Alaska organized task forces to help with the reconstruction

and development. One of these was the engineering and scientific task force known locally as task force nine. The primary charge was to review proposed engineering investigations and conclusions related to reconstruction and make recommendations to the Commission. The task forces members were drawn from the U.S. Coastal and Geodetic Survey, the Corps of Engineers, and the U.S. Geological Survey. He is one of the members of the field team. In order to provide a uniform guide for all of the federal lending agencies such as the Small Business Administration the Scientific and Engineering Task Force was requested to prepare risk maps. He shows the first of the maps which were rather simple. The legend contained two categories, nominal risk and high risk which required further investigation. Criteria used in drawing the boundaries between these two categories was topography and underlying materials. They also used the results of information from the Alaska State Housing Authority. Significant land sliding occurred along fairly steep bluffs that were underlain by the Bootlegger Cove Clay. Some minor displacement took place in bluffs underlain by till and sand. The purpose of the map was to release the area classified as nominal risk for loans by federal lending agencies. Most of the greater Anchorage area was unaffected by landslides and there is room for expansion. Most of the area is at an altitude below the 500 foot contour intervals. There are excellent building sites. He poses the question about why some areas had slides while other areas did not. They hope to have answers through the drilling and testing program. He shows the latest risk map. He said one more map will be required. The later maps were more complex with more categories of risk and geologic explanations. He lists the special considerations on the map. He answers a few questions from the audience.