The Association of
PROFESSIONAL ENGINEERS AND GEOSCIENTISTS
of the Province of British Columbia
PEACE RIVER BRANCH

The 1957 Peace River Bridge Collapse, Taylor BC

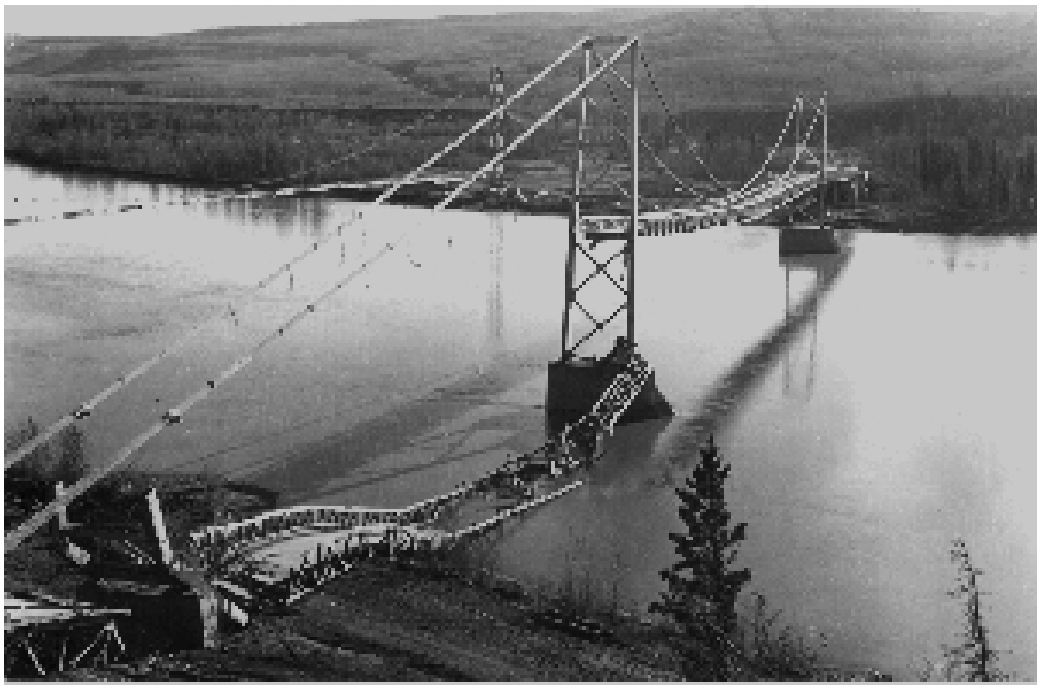
Did you know that one of Canada's most costly landslides occurred right here in the Peace River region? At a cost of 60 million dollars to dismantle and replace the collapsed Peace River bridge near Taylor, BC, the landslide that destroyed that bridge remains probably the costliest ever. This bridge collapse illustrates the important linkage between engineering and geosciences in the Peace River region.

The original bridge was built in 1942 by the US Public Roads Administration as part of the wartime construction of the Alaska Highway. At the time of its opening it was considered one of the great bridges in the Dominion of Canada. The bridge was a suspension type bridge. The length of the bridge was 647 m. At the time of the bridge collapse (October 16, 1957), the highway was part of the Northwest Highway System under the authority of the Government of Canada. The Princess Patricia's Canadian Light Infantry, based out of Whitehorse, Yukon, was responsible for the maintenance of the bridge and highway.

The suspension bridge over the Peace River near Taylor BC (1942 to 1952)

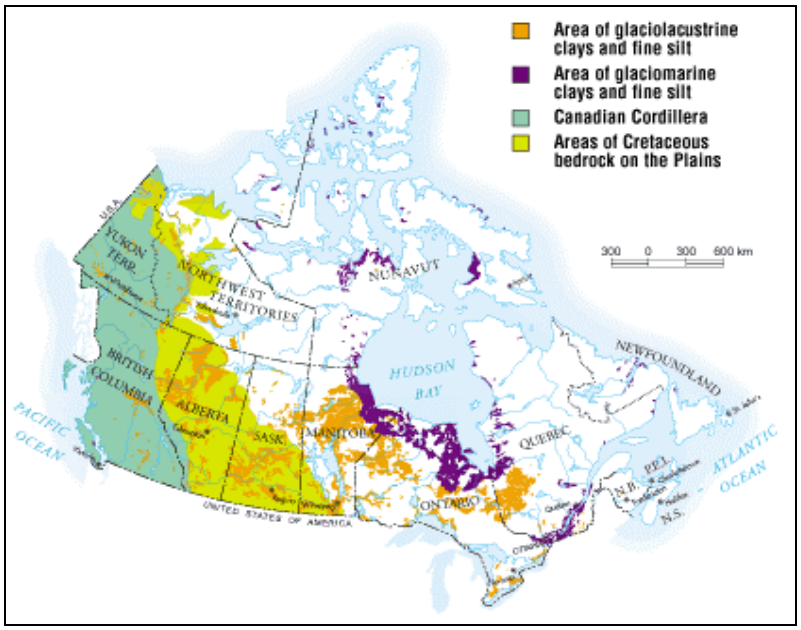
Movement of the bridge's north abutment was first noticed in 1952. A survey was conducted to monitor this movement. The survey was re-done in early October 1957 following a season of higher than normal precipitation (rain and/or snow). The survey showed that bridge structures at the north end of the bridge had moved. Cracks in the road leading to the bridge were also noticed. On October 15, 1957, an alert truck driver noticed unusual settlement in the road. Upon inspection, the army immediately closed the road. Throughout that evening, slow but continuous movement of bridge structures were observed. By just after noon on October 16, the bridge collapsed.

Later investigations found that the bridge failed due to a landslide in the shale bedrock beneath the bridge. A landslide is the down-slope movement or rock or sediment under the influence of gravity. The landslide was about 330 metres wide and extended some 35 metres off shore. The offshore extent of the landslide was indicated by a pressure ridge that stuck out above the water. A pressure ridge looks similar to a ridge pushed up by a bulldozer.



A landslide destroyed the bridge on October 16, 1957. The landslide was in Cretaceous shale.

At the time of construction, little was known about the problems with building on the shale rock type found in the region. Geologists call this shale the Shaftesbury Formation. The shale began as mud that was deposited on a sea floor during the Cretaceous period (65 to 144 million years ago), when dinosaurs walked the earth. At that time an inland sea occupied a large portion of North America. With time, the mud eventually became rock (shale). However, these rocks are very weak and quickly turn back into mud when they are near the surface and when they are exposed to water.



Major areas of Canada susceptible to landslides (source: Atlas of Canada)

Valley slopes in the Peace River region are susceptible to landslides because of the nature of the rocks and sediments that are found in the area. Building in the valleys can make this situation worse. It is now believed that deterioration of the stability at the site of the Peace River bridge likely began soon after the bridge was first constructed and continued for a number of years afterwards. However, the final trigger for the landslide was probably high precipitation.

More to Explore

Hardy, R.M. 1963. The Peace River Highway Bridge – A Failure in Soft Shale. Highway Research Record, 17, pp. 29-39.

Thomson, S. 1958 (May). Collapse of the Peace River Bridge. The BC Professional Engineer, Journal of the Association of Professional Engineers of BC, pp. 13-15.