

THE GOAT LICK BRIDGE AVALANCHES OF 1979 AND 1982

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On February 13, 1979 the Goat Lick Bridge on Highway 2 over Snowslide Gulch near Essex, Montana was carried away by an avalanche. The 33.5 m long, 199 metric ton pony truss bridge had been in place since 1930. The wet avalanche carried the bridge to the river valley below and deposited it 114.3 m south of the centerline of the avalanche path. The loss of this bridge necessitated a 563.3 km detour for all east-west traffic in northern Montana. A new bridge was completed in August 1981. On February 15 and 20, 1982 wet avalanches again ran down Snowslide Gulch. The first passed under the new bridge and terminated in the river below. The second struck the south abutment, piling 7.31 m of snow on the south end of the bridge and covered the road 6.1 m to 7.6 m deep for 304.8 m south of the bridge. The avalanche deviated 50° from its flow direction to flow down the road. Calculations of velocity near the bridge were made using the difference in flow height of shear walls on the sides of the channel and a sliding block model for flow down the road. Velocity was estimated to be about 48.3 km/hr. All three avalanches occurred during warmup periods accompanied by rain to considerable elevations. All ran in a series of surges so that later surges rode on top of debris left in the channel by earlier releases. Field evidence indicates this path has also carried large dry snow avalanches.