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TITLE: Construction Problems in Fairbanks, Alaska

ABSTRACT

The Fairbanks area is prone to many of the same geologic hazards as
the more temperate parts of the state, with the added difficulties
posed by the presence of discontinuous permafrost. The frozen soils
can range from sands and gravels which have minor settlement potential
to silts containing large masses of ice, where settlement potential
is measured in feet. Even when the silty soils are unfrozen, there
is the risk of settlement from the collapse of thermokarst voids,
cavities which once contained ice. Construction is further complicated
by the problem of frost heaving in fine-grained soils.

Much of Fairbanks occupies the floodplain of the Chena and Tanana
Rivers. A shallow water table presents problems both during and
after construction, and until recently, flooding was a serious threat.
The alluvial deposits below the water table are often loose, presenting
a risk of liquefaction or dynamic consolidation. This problem is
perhaps one of the most serious related to the seismic activity of the
Fairbanks area. The water table aquifer is also highly permeable,
resulting in the potential for transport of contaminants. Other
hydrologic problems are related to the presence of permafrost, including
the formation of icings by artesian flows, and problems with water
availability and sewage disposal.

Development in the hillsides surrounding Fairbanks has not yet resulted
in many slope stability problems, but highway construction has shown
that the potential exists. The loessial silt which blankets the hills
is also highly susceptible to erosion.

Generally none of the factors described above is serious enough to
preclude development if the siting and design processes carefully
address the potential problems. In particular, a thorough geotechnical
investigation is necessary to provide input and recommendations to
the designer.