

**Abstract:** A joint Canada/France investigation of the effects of frost heave around a cold pipeline is described. The experiment has been designed for the purpose of scientific examination of fundamental behaviour of freezing soils around a pipeline. Controlled experimental conditions are supported by bench size studies of creep and stress generation in freezing soils carried out at Carleton University and Ecole Polytechnique.

A section of pipeline buried in a controlled environment lab in Normandy, France is described. The enclosed facility allows experimental parameters of soil moisture and temperature to be maintained and observed with great accuracy. Experiments centred on the thermodynamic behaviour of freezing soils are reviewed. Both conventional and specially developed instruments have been used to record primary and secondary frost heave. Results of the difference in behaviour within the two soil types are described. The experiment is an interesting illustration of the frost heave problem; more important, however, is the understanding being gained of the unique behaviour of frozen ground as a material.