

Author: Jean-François Corte is an engineer who currently heads the geotechnical and pavement division of the Laboratoire Central des Ponts et Chaussées. A graduate of the Ecole Polytechnique, with an MSc from the University of California (Berkeley), he has lectured in soil mechanics at Ecole Nationale des Ponts et Chaussées, Ecole Normale Supérieure de Cachan and the Université de Nantes. He is secretary of the Technical Committee on Centrifuge Testing of the International Society for Soil Mechanics and Foundation Engineering, and is a member of the French Association for Earthquake Engineering and the French Society of Soil Mechanics.

Abstract: Alternative testing machines used for centrifuge studies in civil engineering are described; specifically, the basket machine at the Laboratoire Central des Ponts et Chaussées, in Nantes, Paris, and the drum centrifuge at Cambridge University. Centrifuges offer a considerable advantage in that the gravitational stresses are correct even though the feature under study is at model scale. It is suggested that a model spray ice island could be built and that resulting studies would be most valuable. Problems related to the centrifuge's inability to speed up deformation rates are reviewed and various options are discussed.

Short-term ice behaviour studies involving the strength of ice rather than the longer term deformation properties of this time-dependent material are considered to be more suitable to centrifuge studies. Examples are described and advantages reviewed. Few centrifuges are equipped for cold work; the reasons for this are discussed and solutions are suggested. Opportunities for future ice centrifuge research are reviewed.

"The Behaviour of Frozen Soils"

Roger Franck

Chef de la Section Fondation, Laboratoire Central des Ponts et Chaussées

Donald Shields

Professor of Civil Engineering, University of Manitoba

Author: Roger Franck is the head of the foundations section of the Central Laboratory of the French Highways Administration (LCPC) and, as such, is responsible for theoretical and experimental research on foundations and in situ testing and foundations design for current projects. Dr. Franck has joint research projects currently underway with Canada, Brazil, China, Greece, Italy, and the U.K. He is also an associate professor in soil mechanics and foundation engineering at Ecole Nationale des Ponts et Chaussées, in Paris.

Author: See previous paper for Donald Shields' resume.