

Esa Eranti • George C. Lee



COLD REGION STRUCTURAL ENGINEERING



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E. ERANTI

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PREFACE

Because of the many research interests among its faculty, the Center for Cold Regions Engineering, Science, and Technology (CREST) was formally established at the State University of New York at Buffalo in 1979. The areas of expertise of the participants at the Center cover a wide range of fields in engineering and in the natural sciences. Shortly after the formation of CREST, the first author joined the engineering school as a research associate, working with the second author on a cold region structural engineering research project. During 1979 we held extensive discussions and concluded that there is a lack of published material summarizing available information on structural design and construction in cold regions. This led to our collaborative effort to collect and review available information and to the publication of two summary reports, "Introduction to Ice Problems in Civil Engineering" and "Introduction to Cold Regions Structural Design and Construction," which formed the basis of this book.

The field of cold region engineering covers a wide range of topical areas; however, it is not possible to summarize all the information in a single volume. Therefore, we do not claim that this book is, in any way, all inclusive. We have concentrated our efforts on some of the cold region engineering areas that have relatively practical significance. Special attention has been given to alternative engineering solutions and practical approaches, including simple design formulas, graphs, and tables. The theoretical backgrounds of selected problem areas are also briefly discussed as introductions to the subjects.

Because cold region engineering is multidisciplinary and international in nature, we have attempted to include most of the relevant information from North America, Scandinavia, and, to the extent possible, the Soviet Union, in order to provide the reader with a relatively uniform view of

some of the most feasible approaches and solutions to cold region engineering problems.

Although much emphasis has been given to practical engineering approaches, this book can also be used as a reference book in cold region engineering courses. The list of references contained in this book is fairly extensive, and it should be useful for those interested in furthering their understanding of the current state of the art.

In our effort to collect and digest the available information, we received invaluable assistance from the U.S. Army Cold Regions Research and Engineering Laboratory and the Technical Research Centre of Finland. It would not have been possible for us to complete the manuscript without the technical information provided to us by these two organizations. Further, we would like to acknowledge the support of the State University of New York at Buffalo and of Erkki Juva Consulting Engineers and Finn-Stroi Ltd. of Finland. We would also like to express our appreciation to a number of individuals who assisted us in various capacities during the preparation of the manuscript, including Jenn-Shin Hwang, Helen Liu, Liisa Viitanen, Leena-Marjut Rautio, and Pat Doeing.

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@inproceedings{Eranti1986ColdRS, title={Cold Region Structural Engineering}, author={E. Eranti and G. Lee}, year={1986} }. E. Eranti, G. Lee. Published 1986. Engineering. A truly comprehensive reference on all aspects of cold region structural engineering, this work stresses up-to-date design methods and alternative solutions to engineering problems in cold climates. It covers, in depth, construction materials for cold region applications, concrete construction techniques, ice problems in civil engineering, and seasonal frost problems in design and construction. Theoretical information provide Cold region structural engineering Hardcover â€“ January 1, 1986. by. E Eranti (Author).Â Best-sellers rank #5,239,946 in Books (See Top 100 in Books) #1,842 in Structural Engineering #454,666 in Reference (Books). Tell the Publisher! I'd like to read this book on Kindle. Cold Regions Engineering evaluates the effects of cold regions environments upon civil engineering practice. books and standards. Climate-Resilient Infrastructure.Â The 2019 Cold Regions Engineering Student Poster Awards will be held at the 18th International Conference on Cold Regions Engineering and the 8th Canadian Permafrost Conference, at the QuÃ©bec City Convention Centre, in Canada, from August 18-22, 2019. ALL Cold Regions news. continuing education. Show More. January 25,2021Live Webinar. Ethics in Sustainable Development for Civil and Structural Engineers - NEWOnline1.5 PDHs. ALL Cold Regions courses. Journals. Recent articles from Cold Regions Journals. Cold Regions Engineering Division. Structural Engineering Guidance for Optimizing Admixture Dosage Rates for Cold Weather. 175. Admixture Systems L. Barna and C. Korhonen Sustainable and Durable Design of Concrete Bridges in Cold Regions.Â The AIR convection rayleigh number. 2. Cold Regions Engineering 2012: Sustainable Infrastructure Development in a Changing Cold Environment Â© ASCE 2012. 3. The air convection in the openings of crushed rock layer can be seen as a kind of natural convection in porous medium (Lai, 2003).