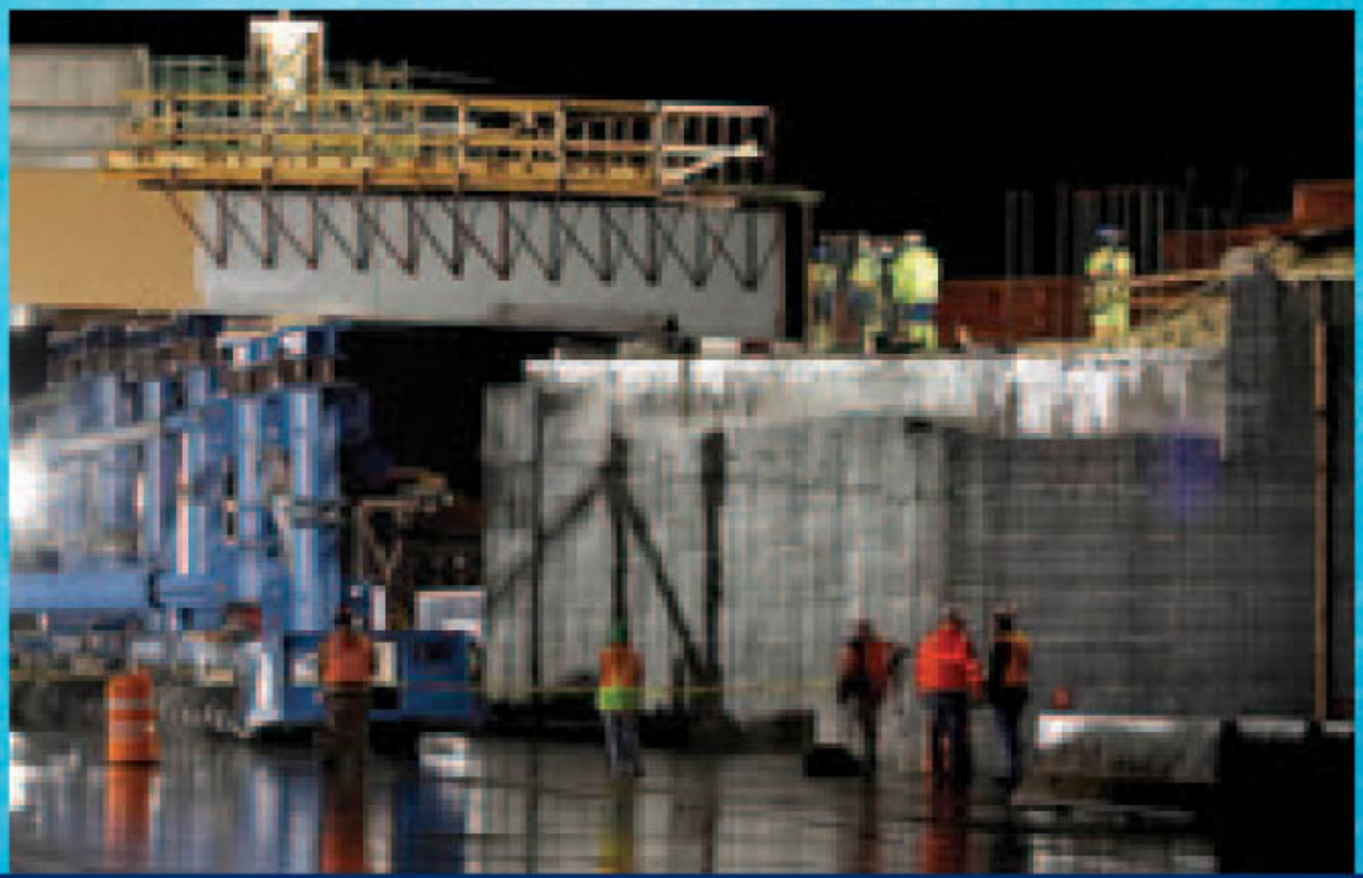
Cold Regions Engineering 2015



Developing and Maintaining Resilient Infrastructure

Edited by W. Spencer Guthrie, Ph.D.

ASCE

COLD REGIONS ENGINEERING 2015

DEVELOPING AND MAINTAINING RESILIENT INFRASTRUCTURE

PROCEEDINGS OF THE 16TH INTERNATIONAL CONFERENCE ON COLD REGIONS ENGINEERING

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Salt Lake City, Utah

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Preface

Developing and maintaining resilient infrastructure are critical responsibilities of civil engineers in cold regions. Challenges associated with repeated and/or extended occurrences of freezing temperatures are present across all aspects of infrastructure management, from design to construction to operation to maintenance. This compilation of papers uniquely addresses issues and solutions related to the built environment, including pavements, railways, foundations, buildings, bridges, and utilities in cold regions, and it also provides deeper understanding about the processes of freezing and thawing as they occur in the surrounding natural environment. Recommendations for characterizing and controlling the effects of snow and ice are provided, and applications to urban centers, rural areas, and remote sites are given. In addition, innovative technologies for assessing material properties and evaluating infrastructure condition are described, and the efficacy of numerical simulation for analysis of selected cold regions problems is demonstrated in many examples.

The papers included in this volume were presented at the Sixteenth International Conference on Cold Regions Engineering, which was held in Salt Lake City, Utah, from July 19 to 22, 2015. The conference was sponsored by the Cold Regions Engineering Division of the Committee on Technical Advancement within the American Society of Civil Engineers; the Cold Regions Engineering Division was established in 1979 (as the Technical Council on Cold Regions Engineering) to assess and report effects of cold regions environments upon engineering design, construction, and operations. The conference papers portray the experience and expertise of authors at institutions in several countries, including Australia, Canada, China, Finland, Japan, and the United States. Each paper was subjected to at least two formal peer reviews, and additional review was applied after the authors revised the papers in response to the reviewers' comments. Following completion of revisions by the authors, the papers were edited in preparation for publication in these proceedings.

Acknowledgments

The success of the Sixteenth International Conference on Cold Regions Engineering is due to a large group of individuals who devoted numerous hours to planning, organizing, and managing the conference. Sincere appreciation is extended to the conference committee members, authors, reviewers, editors, speakers, moderators, and administrators for their respective contributions. In particular, the assistance of Daniel P. Ames, Hillary M. Argyle, Michele L. Lechtenberg, Brian A. Mazzeo, Darren J. Medeiros, and Jon E. Zufelt in preparing the proceedings and technical program was invaluable. In addition, the significant value added to the conference by the participation of many exhibitors and sponsors is gratefully acknowledged.

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