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WINTER CONCRETING FULL-SCALE FIELD TRIAL OF ROCK TOWER FOUNDATIONS

Chris Petrich, Irina Sæther, and Bård Arntsen ⁽¹⁾

(1) Northern Research Institute (Norut) Narvik, Norway, PO box 250, Narvik, Norway

Abstract

Winter concreting can be an attractive option for construction in remote areas where concerns about wildlife and soil integrity are prioritized. In order to minimize disturbance of wildlife and to be able to access remote sites with minimal damage to the soil, partial winter construction of a power line is being considered in northern Norway. Ice formation has to be prevented during the early stages of concreting of mast foundations in order to ensure design properties, long transportation ways have to be considered, and quick setting and achievement of the ultimate design strength are desired. Conventional materials in conjunction with artificial heating are considered to provide a potential solution. In the current field trial we investigated the feasibility of grouting anchor bolts (rock anchors) at ground temperatures below freezing using a vertically-installed hydronic heating system to warm up the rock prior to grouting. Also, hydronic heating of the footing during winter concreting has been tested. We found that the method is able to maintain temperatures well above freezing.

Keywords: Concrete, winter casting, hydronic heating