Multidisciplinary site investigations for improved infrastructure design in Qaanaaq, North Greenland

This contribution presents a case study of permafrost geotechnical conditions in Qaanaaq, one of the northern-most communities in Greenland. Severe problems with differential settlements are observed while the community is faced with major needs for infrastructure expansion. A combination of investigation techniques, involving geotechnical drilling, electrical resistivity tomography and ground temperature monitoring were applied to characterize for the first time the geotechnical conditions in the area, to support more sustainable infrastructure development. We found that most of the town is built on relatively thaw-stable sediments. The observed problems with house foundations appear to be mainly linked to construction practices, freeze-thaw process and slope movement in the active layer, rather than the on-going permafrost degradation.

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