Floating foundations for flexible snow nets on permafrost and creeping slopes – 10 years experience

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ABSTRACT

Increasing effect of climate change is felt on permafrost ground at high altitude. Not much research is available, as not much infrastructure is installed at such high altitudes and the access is often difficult. The only relatively common infrastructure, especially in Switzerland, is represented by cable car stations, mountain huts and avalanche mitigation measures. The example of the flexible high tensile steel wire snow nets installed at Wiisse Schijen (test site for permafrost monitoring of the WSL) in 1990 showed the importance of taking ground destabilisation, due to permafrost change, into account. After 17 years, instead of an estimated ~80 years, significant repairs were necessary to keep the system up (Phillips et al. 2008), anchors were for example exposed due to soil creep. This led to the development of so-called "floating" foundations, a specially constructed baseplate for the posts, to accommodate for creep over the years. These floating foundations were installed at Wiisse Schijen in 2008 and subsequently used for all flexible high tensile steel wire snow nets.

This contribution now summarises the experience acquired over 10 years at Wiisse Schijen in permafrost ground evolution and behaviour of the flexible snow nets and worldwide.