The maximum vertical deformations are expecting on Ural section, up to 5 m at the current frontal part of the onshore slope and up to 0.5-1.2 m within the beach and the tide flat. Yamal section is characterized by minor deformations.

In 2005 the coastal monitoring network were renewed. Now it can serve as a reliable base for well-timed revealing unfavorable trends in the coastal processes (e.g. under changes in temperature regime and sea-level rise due to climate warming) and taking appropriate engineering protection measures.

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Key words: Arctic coastal dynamics, pipeline safety

Discussion on some design principles for cold region engineering

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Abstract：Based on construction experience and numerical simulation test, 5 important considerations in the design of the frost foundations are discussed and the new design concepts are proposed:①the dominative factor for the cube duct design is the controlled gate; the cube should be lain as lower as possible;②the real cooling mechanism of the crushed rock slope for frozen foundation depends on the difference of the wind velocity in summer and winter, and the differences of the temperature in night and day;③it is a misunderstanding for the crushed rock as a foundation embankment;④designing ideas for tunnels in frozen soil is to prevent frozen pressure instead of thaw;⑤the pile foundation design principle in frozen soil is to prevent negative friction, cooling tension effect on pile and to reduce the refrozen time.
Key Words：Frozen foundation design；ventilated duct；Crushed rock slope；Pile；Tunneling

Thermal Conductivity Measurements of Road Construction Materials in Frozen and Unfrozen State

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Abstract: Construction and maintenance of road and railway routes in high altitude areas like the Qinghai-Tibet-Plateau is complicated by frequent melting and freezing processes of the used

building materials and the underground soil. A key parameter which may undergo significant changes as a consequence of temperature variations is the thermal conductivity of the materials. We report on a series of experiments performed in summer 2005, using a big climate chamber at the CAREERI in Lanzhou. The size of the chamber allowed the preparation of relatively big samples (70cm x 70cm x 35cm) in a controlled thermal environment. Three types of sensors were used to determine the thermal conductivity and/or diffusivity:

1. A grid of PT1000 temperature sensors, evenly distributed inside the sample, supplied by CAREERI.
2. Two thermal conductivity sensors of the type HUKSEFLUX TP02, supplied by IWF. They allowed a direct measurement of the local thermal conductivity value.
3. Two "EXTASE" thermal diffusivity sensors, provided by IfP. These sensors are actually a spin-off from the space experiment MUPUS, which has been built for the ESA comet mission Rosetta (*http://ifp.uni-muenster.de/pp/MUPUS/*). They consist of a series of individual temperature sensors integrated into a glass fibre rod, which both can be used for passive temperature sensing and can be actively heated in order to determine the thermal diffusivity more directly.

The general set-up of the experiments is illustrated in the figures below. The following sample materials were used: fine-grained reddish sand from the Gansu area, coarse-grained moist sand, gravels with various grain size distributions from <1cm up to about 6cm, and for comparison and calibration pure water (with convection suppressed by adding agar-agar), compact water ice, and compact granite. Of particular interest are the measurements with composite samples, like stones embedded in an agar-agar matrix. The results of these measurements may also contribute to a better theoretical description of thermal conduction in multi-component materials generally. We give an overview on the experiments performed and present their results as far as they are relevant in support of road engineering and maintenance.

Key words: Laboratory experiments – thermal conductivity – permafrost – engineering

Problem of operation of hydraulic engineering constructions in Norilsk an industrial district

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Abstract: Specificity of development of any mountain metallurgical base of region it is connected to the inevitable device dump (ash dump, tailings, tailing dump etc.) for warehousing dead rock - waste products from concentration non-ferrous metal. For normal modern economic development permafrost it is necessary erection and operation hydraulic structures.

Norilsk industrial district (NID) is one of the largest industrial areas of the world and the world's largest center located in permafrost, in a zone of forest-tundra, in conditions of a subarctic climate (compare year t =-9,50C).

Safe operation of hydraulic engineering constructions in conditions of Far North is actual engineering-cryopedology and an environmental problem. The tailing dumps contain