The relative error in determining the relative settlement of frozen clay during thawing

$$\frac{\Delta \delta}{\delta} = \frac{\Delta X}{X} 42.5 = 1.83, \text{ or } 183\%.$$

Actually, when $\Delta X/X = \pm 4.3\%$ a value of X equal to 1.019 or 0.935 can be obtained in the case under consideration. The first value is impossible. The relative settlement when $X=0.935$ is equal to 0.065, and the relative error in this case

$$\frac{\Delta \delta}{\delta} = \frac{0.065 - 0.023}{0.023} = 1.83.$$

It is practically impossible to determine the value of X from physical characteristics with a relative error less than $\pm 4\%$. The permissible value of the error of relative settlement during thawing of frozen clays can be different depending on the design requirements. If we take permissible values of the relative errors $\Delta \delta/\delta \leq 0.1$, and $\Delta X/X \leq 0.04$ and proceed from the aforementioned known relationship between the relative errors of the difference and subtrahend, then we obtain reliable settlement δ only when $X/\delta \leq 2.5$. It follows from Eq. (2) that this corresponds to the case when $\delta \geq 0.286$.

Thus, Eq. (1) can be recommended for determining the relative settlement of frozen ice-rich clays settling considerably during thawing.

LITERATURE CITED

1. SNiP II-18-76. Design Standards. Bases and Foundations on Permafrost [in Russian], Stroiizdat, Moscow (1977).
2. Instructions on Determination of the Relative Compression of Frozen Ground during Their Thawing under Pressure [in Russian], Stroiizdat, Moscow (1958).

ERRATA

There was a misprint in V. Ya. Kopeiko's article "Experience in Constructing underground structures at ferrous metallurgy installations" (No. 2, 1978). On p. 5, 25th line from the top it should read: "...ladles 3 and 4 by means of two pull rods 5; antipouring device 6....by means of lift rope 7, the other - closing the ladles by means of runner rope 8."