DEFORMATION OF THE BOUND GROUND ROAD IN THE LOWER BYEF OF THE STRUCTURE

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Abstract: *Radical changes in the natural hydrological regime of the river, caused by the construction of a hydroelectric complex on it and the annual and sometimes long-term redistribution of fluid flow, partial or complete retention of runoff by the reservoir, as well as significant daily fluctuations in flow velocities and levels when regulating the capacity of hydroelectric power plants, cause channel changes in the lower reaches of the hydroelectric complex.*

Keyword:*Type of bound soil, flow rate, flow depth, flow velocity, channel bed width, channel lateral slope coefficient, channel slope.*

A general decrease in the flow of liquid in the lower reaches is observed during the integrated use of reservoirs and the use of part of the water in them for irrigation, discharge into other river basins, and other purposes. These circumstances must be taken into account when calculating channel transformations. Calculations related to the increase in water flow in the lower reaches must take into account situations involving the discharge of other river runoff into the reservoir and channel transformations in the lower reaches.

It is known that the soils of the canal bed are bound and unbound. Connected soils are characterized by the nature of cohesion between individual aggregates, which includes clays, loams, and sands. For non-cohesive soils, the adhesion indicator "S" is determined based on soil sample cross-sectional testing. The standard adhesion value "S" is determined for all soil samples under study using the least squares method. The following safety factor, taking into account the probability of deviation from the normative value of the cohesion force value when determining the limit non-eroding flow velocities “K_c” will be added.

$$K_c = \frac{1}{1 - t_\alpha \frac{\sigma}{c^H}} \quad , \qquad (1.1)$$

here σ - fusion “S” of value “S^n” mean square deviation of ; t_α - tests on soniga va given one-sided α is a coefficient adopted depending on the reliability probability, and when calculating channel processes, it should be taken as 0.95. In the absence of soil sample test data regarding shear, it is assumed that $K_c = 2$ can be taken as .

For bound soils $C^н$ can be taken from Table 1.1 in the work based on the consistency and porosity, which are the main characteristics of the soil.

The soil consistency can be determined as follows:

$$J_L = \frac{w_H - w_p}{W_L - W_p} \quad ; \qquad (1.2)$$

Here :W_H - natural soil moisture ; W_L, W_P - moisture at the boundaries of fluidity and plasticity.

Table 1.1.

Connected soils $C^н$ average standard value of adhesion

Soil type	Consistency	δ porous $C^н$, kPa,

	J_L	0.3	0.325	0.35	0.375	0.4	0.425	0.45	0.475	0.5	0.525
Supes	0-0.25 0.25-0.75	16.5 14	13.5 11.5	11.5 9.5	9 7	7.5 5	- 3.5	- -	- -	- -	- -
Suglinok	0-0.25 0.25-0.5 0.5-0.75	49.5 40 -	44 37.5 -	38 35 -	33.5 31 27.5	29.5 27 24	25.5 23 20.5	22.5 19 17	20.0 16.5 15	18 15.5 13	- - 11
Mud	0-0.25 0.25-0.5 0.5-0.75	- - -	- - -	31.5 - -	74.5 60.5 47	65 56 44.5	55 51 41	49 45 38	43.5 39.5 34.5	38.5 34.5 31	33.5 29.5 26.5

The regulatory documents provide limit non-eroding velocities for non-cohesive soils.

The rate of non-erosion of the flow for the soil under consideration is characterized by its strength at the bottom of the flow. In this case, the particle flows with different probabilities.

can be shown, characterizing various conditions characterizing root disconnection. In particular, it is customary to distinguish between two cases. The first case determines the strength of an individual soil grain at the bottom of the stream, while the second determines the strength of the surface soil layer as a whole. When calculating the transformation of a channel, it should be noted that the state of full stabilization of the flow characterizes the boundary strength of the soil at the bottom of the flow υ_{kr} reaching the limit non-eroding velocity value. in this case, the movement of individual soil particles is observed, but there is no rupture. Current υ_0 average speed value υ_{kr} begins to exceed the value of the non-washing rate, then $\upsilon_0 = U_0$ at speeds leading to a violation of the strength of the surface layer of the soil, the rupture of individual particles begins. Here "U_0" According to V.N. Goncharov, the discontinuous flow velocity is defined as follows:

$$U_0 \cong \sqrt{2}\upsilon_0 .$$

(1.3)

This breaking velocity is taken as the main indicator in the calculation of total leaching and local leaching of non-uniform non-cohesive soils.

Currently, when determining non-eroding flow velocities in bound soils, the following dependencies of QN and Q are used, as well as the dependencies of S.E. Mirskhulava presented in regulatory design documents:

$$\upsilon_H = \left(\lg\frac{8.8h}{d}\right)\sqrt{\frac{2m}{2,6\rho n}\left[g\left(\rho_{gr}-\rho\right)d+1,25C^n_{k.m}k\right]} \quad ; \qquad (1.4)$$

$$\upsilon_{\Delta H} = 1.25\sqrt{\frac{2m}{2,6\rho n}\left[g\left(\rho_{gr}-\rho\right)d+1,25C^n_{km}k\right]} \quad , \qquad (1.5)$$

Here k- is the homogeneity coefficient of bound soils $k = 0{,}5$ can be taken as equal to the value; n- is a stress coefficient, which in a developed turbulent flow $n = 4$ can be taken as; $C^n_{\text{k.m}}$– standard strength fatigue for cohesive soils, Pa , $C^n_{\text{k.m}} = 0{,}35C_n$; C_n – is a normative specific unit of the surface layer of soil in the canal bed, determined based on experimental data using the spherical stamping method for soil samples taken from the canal route.

Normative specific coupling k the product of the coefficient of uniformity of the gun can be taken as the design specific engagement:

$$C_{his} = C_n k .$$

In preliminary calculations, the formula (MIrs) can be used.

SUMMARY

1. When the water level in the lower reaches drops, resulting from the predominance of general washing during channel changes, a deepening of the local washing funnel occurs in the vicinity of structures. Changes in the shape of local erosion, as well as the settlement of materials carried away by the flow from the erosion pit into the channel, lead to a change in the flow plan in the expansion zone, which in turn leads to the re-formation of the channel in this section.

2. Currently, when determining non-eroding flow velocities in channels in bound soils, the dependencies QN and Q, as well as those provided in the design regulatory documents of S.E. Mirskhulava, are used.

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