ALGORITHM FOR DETERMINING THE NON-WASH RATE OF A TRAPESIADAL CHANNEL FLOW WITH A GRANULAR GRUNT

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ABSTRACT

being one of the criteria that assess the quality of water obtained from River hydrozels for use in various sectors of the world economy, is the amount of river flows that fall in the channels. Despite the large number of sources of literature on the issue to be investigated, no complete solution to the problem of leak transport has currently been found. Therefore, in the future, it is required to improve the calculation methods for determining the non-flushing rates of flow and the consumption of leaks in the channels that are designed and operated without coverage. From these, great attention is paid to the development of effective accounting methods for the design, construction and reliable operation of grunted channels in the USA, Germany, the Netherlands, France, Russia, China, Uzbekistan and other countries, taking into account various factors that lead to transverse and longitudinal deformations.

In the world, special attention is paid to targeted R & D work dedicated to the development of accounting methods to prevent deformations in grunted channels and these negative consequences. Therefore, one of the problematic questions today is the development of technologies and new methods for increasing the ability to transport water flow in deformable channels. To do this, it becomes necessary to take into account various factors that affect the deformation of the gutter.

Keywords: grunt channels, deformation, velocity, water flow, open water seeps, flow depth, particle density, trapesiadal channels, bottom of flow.

Currently, a large number of studies are being carried out in our Republic to study factors that affect their excellent development in the design and effective operation of grunt irrigation channels, as well as to determine the conditions for their assessment and application. In 2017-2021, in the strategy of Action for the further development of the Republic of Uzbekistan, the tasks of “reducing energy and resource consumption to increase the competitiveness of the national economy, developing networks of melioration and irrigation facilities, widespread introduction of resource-efficient technologies into production" are outlined. One of the important tasks is the implementation of these tasks, including conducting research work aimed at the development of effective rational methods of design and use based on the accounting of damage, failures and accidents, as well as situations of tension-deformation, which occur in the operation of hydraulic structures of irrigation systems in submersible grunts during a shortage of Water Resources.

The literature on the research of deformation processes occurring in open water bodies was created by most scientists. S in time with theoretical and experimental studies of the main natural processes in the aquatic environment.X.Abalyans, I.I.Levi, M.A.Velikanov, V.N.Goncharov, I.V.Egizarov, V.M.Mccaveev, K.I.Rossinsky, N.V.Grishanin, A.N.Gostunsky, G.I.Shamov, N.A.Rjanisin, G.V.Zheleznyakov, A.V.Karaushev, V.S.Altunin, S.E.Mirshulava, A.m. Mukhamedov,Q.Sh. Latipov N.S.Znamenskaya, Yu.A.Ibad-zade, I.F.Karasev, N.A.Mihailov, H. Sh.Shapiro, V.S.Lapshenkov, A.Shields, R.Begnold, Van-Rhein, Meyer-Peter, G.Einstein, Akkers, White, Miller, P.Thomson, and other scholars were engaged.

Our republic has been divided with significant scientific achievements in terms of the ability of open channels to transport. According to the hydraulic calculations of deformable water bodies S.X.Abalyans, A.M.Mukhamedov, K. Sh. Latipov, R.M.Karimov, M.R.Bakiev, E.J.Makhmudov, A.M.Arifzhanov, D.R.Bazarov, S.S.Eshev, H.X.Isakov, Sh.Rakhimov, H.X.There are scientific works of Ishanov and other scientists, which are now widely used in a number of projects.

In the world, research is being carried out on the creation of methods for calculating open self-deformation processes in stationary and non-stationary movements of flow, including in the following priorities: development of model-in methods of large open self-deformation processes with grunts; development of methods for calculating the transport of leaks in open holes; development of perfect calculation methods for determining morphometry of

Currently, there are a number of completed studies on the deformations of grunt irrigation channels in our republic, but they are can not fully cover all factors that affect the deformation of the groove. The task of developing accounting methods of flow non-wash rates and flow transport in open-Grung channels is manifested.

Information given:

1.h - flow depth;

2. **t** - lying side slopes

2. $\mathbf{d}_{\mathbf{m}}$ - the mean diameter of a granular grunt particle is;

3. **. ρi** ρ_ω - density of water and grunt particle.

Calculation procedure

1. The formulas presented below include the K corrective coefficients, which take into account the slopes of the bottom and side**.**

1- table

t	2	2,5	3	3,5	0
K	0,76	0,78	0,83	0,88	0,93

2. The non-washout rates of flow on the bottom and side slopes of the channel in granular grunt conditions are determined using the following formulas, respectively:

For the bottom

$$\vartheta_{adm} = K_0\left(\lg\frac{8,8h}{d_m}\right)\sqrt{\frac{\gamma_c\left[g\left(\rho-\rho_\omega\right)d_m+2C_{yn}k_c\right]}{0,22\rho_\omega\gamma_\vartheta}} \quad (1)$$

$$\vartheta_{\Delta adm} = 1,25K_0\sqrt{\frac{\gamma_c\left[g\left(\rho-\rho_\omega\right)d_m+2C_{yn}k_c\right]}{0,22\rho_\omega\gamma_\vartheta}}; \quad (2)$$

For side slopes

$$\vartheta_{adm} = K\left(\lg\frac{8,8h}{d_m}\right)\sqrt{\frac{\gamma_c\left[g\left(\rho-\rho_\omega\right)d_m+2C_{yn}k_c\right]}{0,22\rho_\omega\gamma_\vartheta}}; \quad (3)$$

$$\vartheta_{\Delta adm} = 1,25K\sqrt{\frac{\gamma_c\left[g\left(\rho-\rho_\omega\right)d_m+2C_{yn}k_c\right]}{0,22\rho_\omega\gamma_\vartheta}} \quad (4)$$

from where K0 and K are the corrective of the subsurface and lateral slopes, respectively, obtained Table 1;

ρ i ρ_ω- density of water and grunt particles (kg/m3), respectively $\rho = 2650кг/м^3$; $\rho_\omega = 1000кг/м^3$ -is accepted as.

S_{yn} –-the attenuated strength at the junction of the unconnected grunt, i.e. the coefficient that takes into account the formation of significant bite forces in fine-grained (when) grunt with this parameter, is .

$$C_{yn} = 0,35C_n, \quad (5)$$

The weakened strength at the SN-grunt junction is estimated to be.

$$, \quad C_n = 1,72\cdot10^{-4}d^{-1}, \quad (6)$$

bunda (dm, m), Pa;

- coefficient that characterizes the probable deviation from the bite force equal to the average ( ) value;

- coefficient that takes into account the effect of leaks in the colloidal state contained in the stream on the ability to wash the stream, ;

- when the coefficient peregruzki pri d ≤ 0.001 m, the strain coefficient is determined from the following formula:

$$\gamma_{\vartheta} = 1 + \frac{1}{0,3 + \left(v^2 / gd^3\right)^{1/3}}; \qquad (7)$$

when d ≥ 0.001 M, = 4.

Example. Let the frequency of non-washing of the bottom of the stream in the granular grunt trapesiadal channels and the lateral slopes with t=3 be determined: the average depth of the water , the width of the water level and the average diameter of the unconnected grunt particle .

Account order:

1. $C_{yn} = 1{,}72 \cdot 10^{-4} / d_m = 1{,}72 \cdot 10^{-4} / 0{,}004 = 0{,}043$ PA define..

k_c=0,5; $\gamma_c = 1$ assuming that-coefficient peregruzki pri d ≤ 0.001 MB, we define the strain coefficient (3.37) from the formula $\gamma_{\vartheta} = 1 + \frac{1}{0,3 + \left(v^2 / gd^3\right)^{1/3}}$ since d≥ 0.001 m, we take = 4.

2. Taking the densities of the water and grunt particles to be respectively, we determine from the formulas (1) i (3) the rates of not washing the bottom and side slopes of my body:

For the bottom

$$\vartheta_{adm} = K_0 \cdot \left(\lg \frac{8,8h}{d_m} \right) \sqrt{\frac{\gamma_c \left[g(\rho - \rho_{\omega}) d_m + 2C_{yn} k_c \right]}{0,22 k'_T \rho_{\omega} \gamma_{\vartheta}}} =$$

$$= 0.93 \cdot \left(\lg \frac{8,8 \cdot 4}{0,004} \right) \sqrt{\frac{1 \cdot \left[9,81 \cdot (2,65 - 1) 0,004 + 2 \cdot 0,043 \cdot 0,5 \right]}{0,22 \cdot 1,41 \cdot 1 \cdot 4}} =$$

t = 3 for the side-stem bed

$$\vartheta_{adm} = K\left(\lg\frac{8{,}8h}{d_m}\right)\sqrt{\frac{\gamma_c\left[g(\rho-\rho_\omega)d_m + 2C_{yn}k_c\right]}{0{,}22k_T''\rho_\omega\gamma_\vartheta}} =$$

$$= 0.83\cdot\left(\lg\frac{8{,}8\cdot 4}{0{,}004}\right)\sqrt{\frac{1\cdot\left[9{,}81\cdot(2{,}65-1)0{,}004 + 2\cdot 0{,}043\cdot 0{,}5\right]}{0{,}22\cdot 1{,}50\cdot 1\cdot 4}} =$$

Based on scientific research experiments, it is recommended according to the calculation method of determining the non-washing rates of flow in trapesiadal channels with different lateral slopes lying on a granular grunt.

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