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STUDY OF EXISTING HYDROTECHNICAL STRUCTURES AND THEIR TECHNICAL CONDITION AT THE HEAD DAM OF THE "DOSTLIK" CANAL

Annotation: This article provides complete information about the geology and hydrology of the area where the main structure of the "Dustlik" canal is located, as well as about the existing hydraulic structures at this hydro node. The current technical condition of the hydro node is also studied. Suggestions and recommendations for improving the technical condition of the hydro node are presented.

Keywords: Hydro node, dam, main structure, water supply channel, dump.

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ИССЛЕДОВАНИЕ СУЩЕСТВУЮЩИХ ГИДРОТЕХНИЧЕСКИХ СООРУЖЕНИЙ И ИХ ТЕХНИЧЕСКОГО СОСТОЯНИЯ НА ГОЛОВНОЙ ДАМБЕ КАНАЛА «ДОСТЛИК»

Аннотация: В данной статье представлена полная информация о геологии и гидрологии района, где расположено основное сооружение канала «Достлик», а также о существующих гидротехнических сооружениях на этом гидроузле. Также было изучено текущее техническое состояние гидроузла. Даны предложения и рекомендации по улучшению технического состояния гидроузла.

Ключевые слова: Гидротехнический узел, плотина, основное сооружение, канал водоснабжения, водосброс.

The main structure of the "Dustlik" canal is located in the Bekabad district of the Tashkent region. According to the management system, it is part of the "Mirzachul Hydro-Construction and the Dustlik Canal" department of the Syrdarya Basin Water Management Association. The geological structure of the structure base consists of light sandy loam (loam) and some gypsum loam (supes) and sand, with seepage waters located at a depth of 2...4 m. The layer thickness is 30-50 m. The filtration coefficient of the soils is 5 - 7 m per day. The mineralization of groundwater is 1.0...3.0 gpl, the type of mineralization: hydrocarbonate-chloride (sodium; magnesium; calcium).

The hydraulic structure consists of the following structures:

1. Water intake basin; 2. Water transfer facility to the Dostlik Canal; 3. Discharge facility.

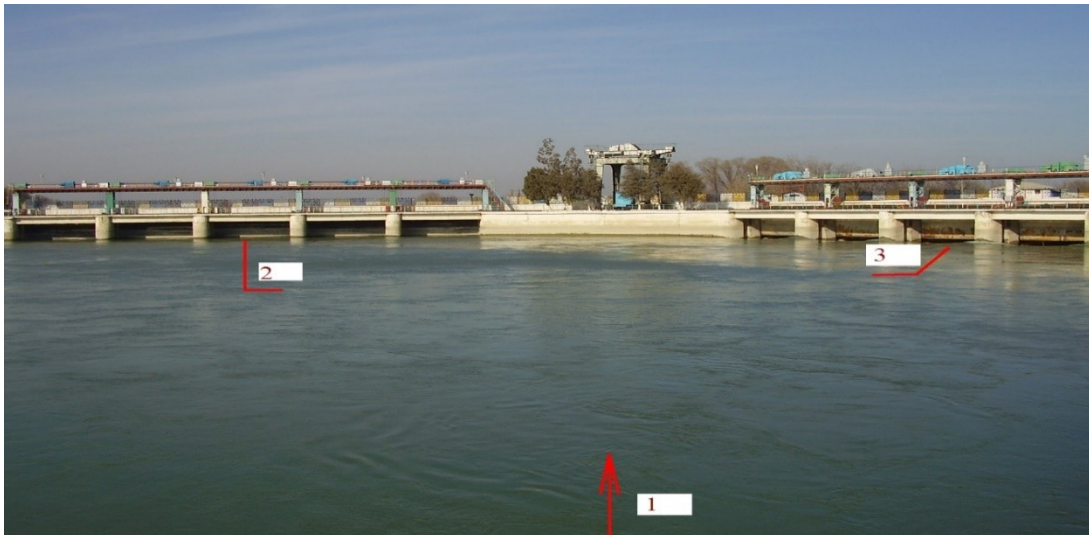

Figure 1. Water intake basin.

The water supply channel is trapezoidal in shape. The width of the uning tagine is 80 m, the maximum depth is 6.06 m and the height of the hole is 2.0 tenge. The mark of the canal at the mouth of the hydroelectric unit is 282.10 m, the maximum water level in the canal is 288.16 m, the normal water level is 286.73 m ha, the mark of inshoot damming is 288.70 m ha. Water feeder channeling maximum water consumption 470 m^3 / sec.

The main structure of the "Dostlik" canal was built in 1948 at the end of the water-carrying channel of the Farkhod HPP (length 5,235 m).

The maximum water throughput capacity of the Dostlik canal main structure is 230 m3/sec, today it cannot pass more than 220 m3/sec.

The main structure design is open. The number of spans is 5. The span dimensions are 10.0 x 5.35 m. The main structure spans are equipped with flat working locks with a maximum pressure of 6.06 m. Devices for repair locks are made in front of the working locks. A port crane with a width of 6.0 m and a lifting capacity of 30 t is installed to lift and lower the working and repair locks. Lock control is controlled from the dispatcher's room or from the site. The spans of the structure are equipped with sensors indicating the state of the lock.

The main structure has four concrete spans, the dimensions of which are: length - 16.7 m, thickness - 2.0 m, height - 6.8 m. A crane road, service and automobile bridges are built on the spans.

The main structure's culvert is made of concrete, its dimensions are: length - 15 m, width - 58 m, and thickness - 0.4 m. In the front part of the culvert, the bottom and banks of the water supply channel are reinforced with large stone rubble. The culvert elevation is 282.10.

The water energy discharge well built in the downstream of the main structure is 56.45 m long and 62 m wide. The water well is made of concrete and its thickness varies along its length, that is, it is 2.3 m thick at the entrance and 1.0 m at the end. To additionally absorb the water energy, a series of checkers

with a width of 1.0 m, a height of 0.9 m and a length of 1.6 m are installed inside the well.

A berm 15 m long was created at the end of the water well by quarrying large stones. The water-carrying channel of the main structure is made of earth and its dimensions are as follows: the width of the bottom is 40.0 m, the slope of the bank is 2.0.

The main structure is connected to the trapezoidal channel at the front with a “revolving wall” type entrance, and to the water-carrying channel at the back with a wing in the form of a “plunging wall” with a length of 19.75 m.

Figure 2. "Dustlik" channel main building.

Monitoring of filtration and deformations of structures in the hydropower plant.

Since the hydropower plant is not equipped with piezometric wells and control measuring instruments, monitoring of the filtration regime and deformations is not carried out.

Technical condition of structures located in the hydropower plant

- Metal structures in the hydropower plant are not treated with anti-corrosion coating;

- The lifting mechanism of all locks in the structures is not equipped with a load relay;

- The crane equipment installed in the hydropower plant requires repair.

- Due to the ineffective operation of the water well installed on the hydropower plant embankment, the bottom of the embankment and the stones thrown onto the shore were washed away.

Impact of the hydropower plant on the environment.

Protection zone. The protection zone of the main dam of the Friendship Canal is 300 m in accordance with the Resolution of the Cabinet of Ministers No. 174 of April 7, 1992.

Measures to reduce the environmental impact of the hydropower plant.

In order to reduce the environmental impact of the hydropower plant, it is advisable to implement the following measures:

a) develop measures to reduce the operating costs of the main dam;

b) constantly monitor and control the operation of the facilities;

c) develop plans for operational activities and other work.

The main indicators of the technical condition of hydraulic structures and canals are:

a) ensuring the water flow capacity specified in the design;

b) minimizing filtration and operational-organizational water losses;

c) to muddy the top of the structure, to the growth of plants,

g) the way to wash the bottom and side walls of the hydrocell not to put

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