

EXPERIMENTAL ANALYSIS OF A GRATING WITH BY-PASS

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Abstract: *The paper presents the steps and materials needed for the construction of an experimental grating with manual cleaning and the results obtained from its experimental analysis.*

Key words: *pollution, water, grating, coarse residues.*

1. INTRODUCTION

The main problems which arise in sizing or choosing grids retaining large particles, in wastewater, in addition to the problems outlined above are:

- sizing grate bars in terms of mechanical strength;
- mechanical cleaning effort appears to rakes;
- speed cleaning rake depends on the volume of deposits.

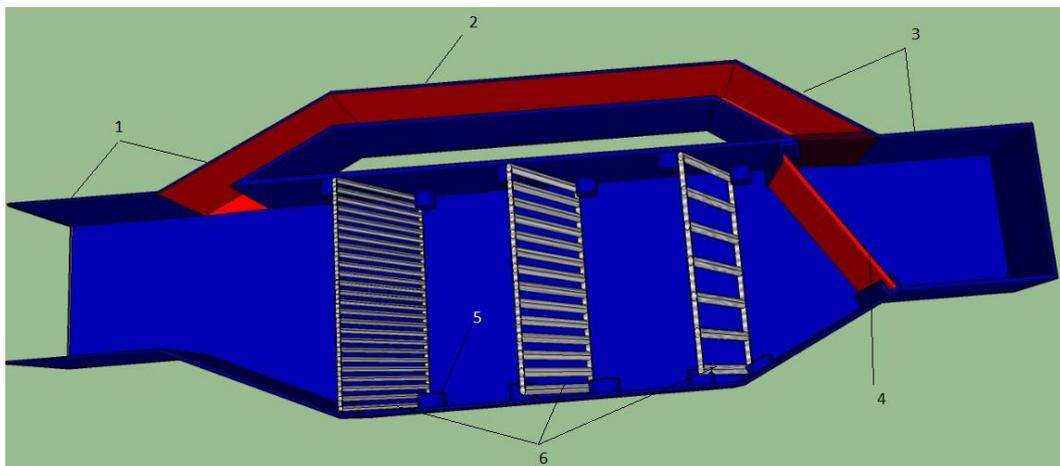
The grid chosen for construction was one type bypass. For sizing grate experimental bypass proceeded to sizing each

component of the experimental system in software design and 3D simulation.

Components of the grate with bypass are:

- grating room,
- roof panels placed one against the other at intervals of 5, 10 respectively 15 mm,
- confuser grate,
- speaker grate,
- by-pass,
- waste water diversion system,
- fixing of panels bearing bars
- support.

Is a diagram of the grid with the by-pass is shown in Figure 1.



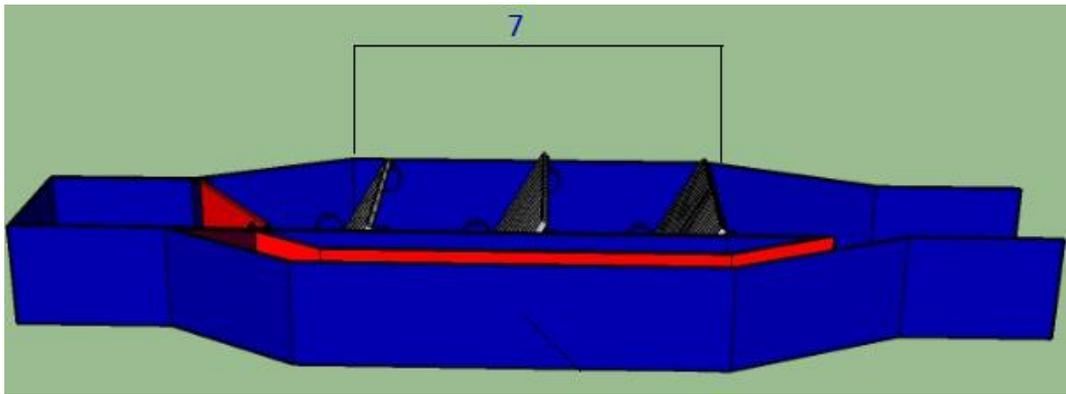


Figure 1. The grate construction scheme of the bypass

1 - Confusion; 2 - by-pass; 3 - speaker; 4 - waste water discharge system in bypass; 5 - bearings; 6 - panels with round bars, 7 - grating room.

2. CONSTRUCTION GRATING BY-PASS

For producing barbecue bypass the following materials were used:

- fiberglass;
- resin;
- hardener;
- mold release wax;
- stainless steel electrodes;
- wooden roller;
- rectangular pipe,
- car paint,
- finishing putty.

The first step in the construction of the grid covered experimental panel consisted of manufacturing a glass fiber followed by transposing the dimensions geometry of each component of the grate experimental fiberglass panel, and then were driven stages of cutting, assembling parts of the experimental grid.

Experimental grating was placed on a rectangular pipe support, and to prevent negative action of UV it was grouted and painted in the colors of standardized technical (Fig. 2).



Figure 2. Experimental grate

3. EXPERIMENTAL

Experimental attempts to retain coarse material from the effluent were carried out using a mixture of water + clay + solid residue with a different grain size.

The volume of organic residues retained on the surface of each panel was measured using a grill cylinder, and the mass of clay was weighed in an analytical balance.

Experimental tests using coarse residue retention experimental grate involved the following steps:

- have identified the constituent elements of the test stand;

- wastewater was prepared sample (5 l water and 600-650 cm³ solid residues - chopped apples, potatoes, etc.);

- wastewater was introduced in speaker grill, maintained at a higher level to grill, to facilitate gravity flow wastewater grill (Fig. 3).

- solid residues were taken from each bar and panel were introduced into the cylinder;

- measured amount of residue retained on the surface of each roof panel.



Figure 3. Testing experimental grating

Table 1. Results obtained from experimental tests

Nr. Crt.	Initial volume of waste [cm ³]	Volume retained by panel nr. [cm ³]			The randament grating in the three trials [%]
		1	2	3	
1	600	200	160	100	76,66
2		214	169	107	81,66
3		220	175	112	84,5

The results of the tests were tabulated in Table 1 and determined the degree of retention.

To calculate the degree of retention for each panel apply the following formule:

$$GR = 100 - \left(\frac{V_0 - V_{1,2,3}}{V_0} \cdot 100 \right) [\%]$$

(1.)

where:

GR - Grade retention [%];

V_0 - volume of effluent waste water used to prepare [cm³];

$V_{1,2,3}$ - the volume of residue retained by each panel of the grating [cm³]

CONCLUSION

1. The grating was chosen for experimental analysis one with bypass
2. Experimental grid sizing was done to calculate (sizing) of each component of the experimental system in software design and 3D simulation.
3. The final conclusion that can be drawn from the interpretation of the results presented in Table 1 is that the experimental grid bypass materials can retain sediment at a rate of between 76.66 and 84.5 [%].
4. The yield depends on the size distribution of experimental plant material and suspended sediment from the wastewater and the period of cleansing bar panel.

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