THE ANNALS OF "DUNAREA DE JOS" UNIVERSITY OF GALATI
FASCICLE XIV MECHANICAL ENGINEERING, ISSN 1224-5615
2002

THE CONSOLIDATION EQUIPMENT WORK DEVICES VIBRATIONS FREQUENCY INFLUENCE ABOUT THE RAILWAY STABILIZATION PROCESS

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ABSTRACT

In this work presented the experimental research realized on the stand in the laboratory. The experimental researches have as the goal the study of the influence the frequency vibration of the work device concerning the railway consolidation. The utility of correlations knowledge dislocation force and transversal displacement of the half-sleeper is obvious by offering information concerning the stabilization process of the railway superstructure.

1. Introduction

The railway without joints stability lose tendency oppose the following resistance forces: the lateral resistance, the railway longitudinal resistance and the torsion resistance.

In general at the experimental researches we use as the parameter the lateral resistance *F* which represent the resistance that are opposed by the ballast bed at the sleeper lateral displacement.

2. The experimental research on the stand concerning the vibration influence of the vibrating device work organ about the railway consolidation.

The measurements achieved on the stand in the laboratory [2]. The stand is base on constructive solution of consolidation equipment [1], [3].

The experimental research were done by measuring the transversal displacement of an isolated half-sleeper charged with a know load, knowing that the resistance opposed by the ballast bed at her lateral displacement represent, an average of 60% from the global resistance *F*, which are opposed by the ballast at the lateral displacement of a sleeper. Thou, it was studied the relationship between the half-sleeper dislocate force F_{60} and the half-sleeper transversal displacement δ. The results are graphically presented in rectangular coordinates (fig. 1), in abscissa is presented the half-sleeper lateral displacement and in ordinate the dislocate resistance.

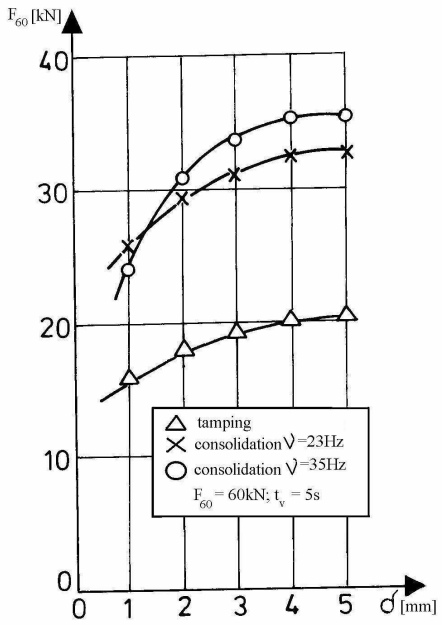

Figure.1

It was drawing some curves and as variable parameter it has been used the organ vibration frequency. From the own experimental results analyze it take the following conclusions:

a) The relation of the dislocation force and lateral displacement variation, keep the logarithmic character for the limited by δ_1 = 1 mm and δ_5 = 5 mm represented by the following expression:

$$F_{60} = a_{HS} + b_{HS} ln\delta \quad (1)$$

where:

a_{HS}, b_{HS} are coefficients which are related with consolidation process parameter (vibration frequency, railway superstructure elements etc.).

Using the least squares method obtains the empiric equations presented in table 1.

Table 1

The values of variables a_{HS}, b_{HS} and the regression r coefficient for the curves from figure 1.

Technological activity	a_{HS}	b_{HS}	r	Regression
Tamping	15,988	2,915	0,995	F_1=15,988+2,915$ln\delta$
Consolidation, ν= 23Hz	26,503	4,194	0,972	F_2=26,503+4,194$ln\delta$
Consolidation, ν= 35Hz	25,072	7,234	0,958	F_3=25,072+7,234$ln\delta$

b) The a_{HS} and b_{HS} coefficients values are in function of work type, which done about the half-sleeper and of the railway strengthening degree. The results that for the same transversal displacement corresponded with a certain resistance as bigger it can ensure for the half-sleeper a bigger stability degree by dynamic consolidation.

c) The vibration frequency has influence about the dislocation force values the wood half-sleeper (fig.2).

3. Conclusion

Concerning the relations established on own experimental results base can be easily determined, even the constant values will be modifies in other consolidation process characteristics.

The utility of knowing such type of relations is obvious. This is offering to users of the railway stabilizer information concerning the techno-technological parameters of the work organs to obtaining an increase of the consolidation degree of the railway superstructure. The relations offer, also, information concerning the influence of the superstructure elements about the railway stabilization process.

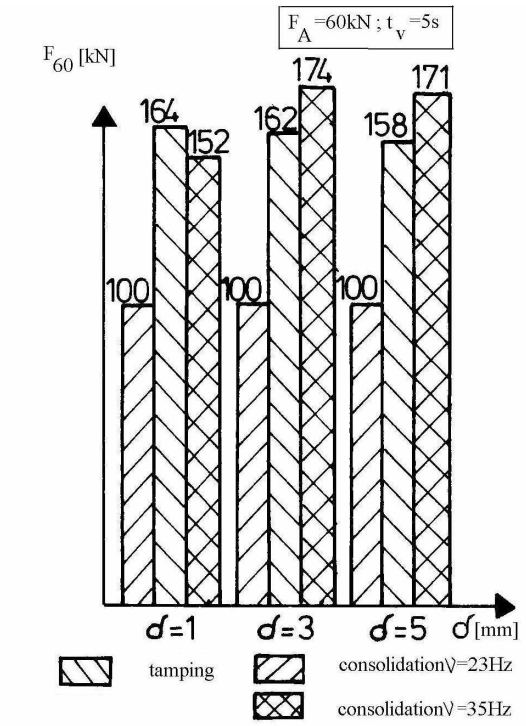

Figure.2

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