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METHOD OF EXPERIMENTAL STUDY OF SHEAR STIFFNESS OF PROFILED FLOORING DIAPHRAGM

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ABSTRACT

The article presents the methods of conducting experimental studies of the shear stiffness of diaphragms made of profiled flooring. The issues of testing for shear fragments of profiled flooring, as well as testing for cross-section connections of profiled sheets with each other and with the elements of the frame of buildings are considered.

KEYWORDS: *Rigidity, Diaphragm, Profiled Flooring, Horizontal Load, Wind Load, Experiment, Shearing, Joining, Frame.*

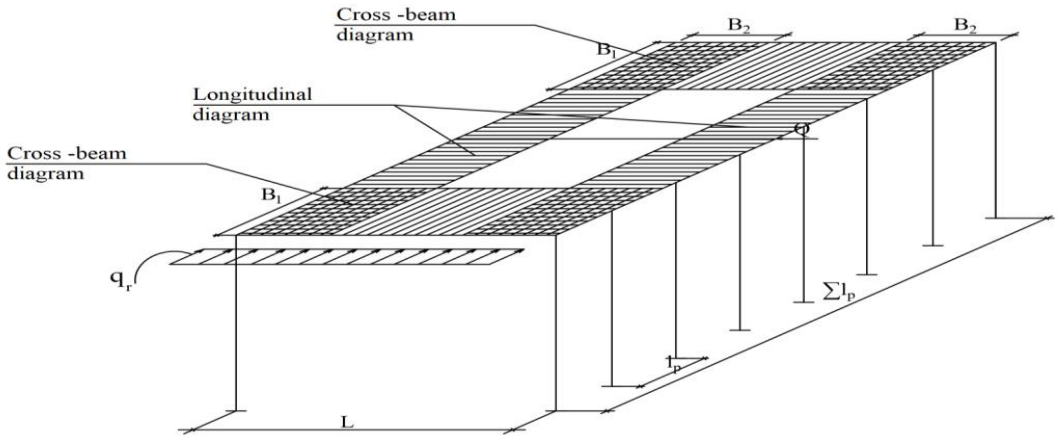
INTRODUCTION

The stiffness of a profiled floor diaphragm is characterized by the amount of shear forces generated by the horizontal forces acting on the building in the longitudinal and transverse directions. Such forces mainly include wind pressure force, force generated by bridge cranes, and seismic forces.

MATERIALS AND METHODS:

The stiffness of the profiled floor diaphragm is often due to the fact that its roof load-bearing elements are attached to the prongs (sarrov). Profiles to which the profiled bearings are fastened must have high strength against torsion. They are therefore fastened to the load-bearing structures using bolts and brackets.It is recommended to fasten the profiled lining to the load-bearing structures of the roof by means of self-drilling bolts in the connecting diaphragms, and

by using rivets combined to fasten the lining in the longitudinal direction along the corrugation. To assess the true displacement of the diaphragm in the profiled bed, it will be necessary to conduct experimental studies involving two types of tests.



1. Try to move the profiled floor fragments;

2. Trying to cut the joints of profiled roofing, forming a floor with the elements of the frame and the frame of the building;

RESULTS AND DISCUSSION:

The tests are carried out in a rectangular reinforcing frame made of high-strength steel elements, the size of which is 3x6 meters. On one side of the horizontally placed frame, the long side is firmly attached, and the other sides are in a free position. The long sides are joined by one or two transverse elements in the center or at a distance of one third (Fig. 1).

The long and short thighs of the ram are raised to the long thighs of the ram with the help of cylindrical hinges. The test specimen in the form of a 3x6 meter sloping frame should be attached to the elements of the reinforcement frame as shown in the actual obstruction design. All joints with the reinforcement frame must be arranged flat on the page.

Various types of corrugated profiled metal sheets and various bonding methods can be used to prepare the test sample. The frames are placed on the long side of the frame in a corrugated or transverse direction.

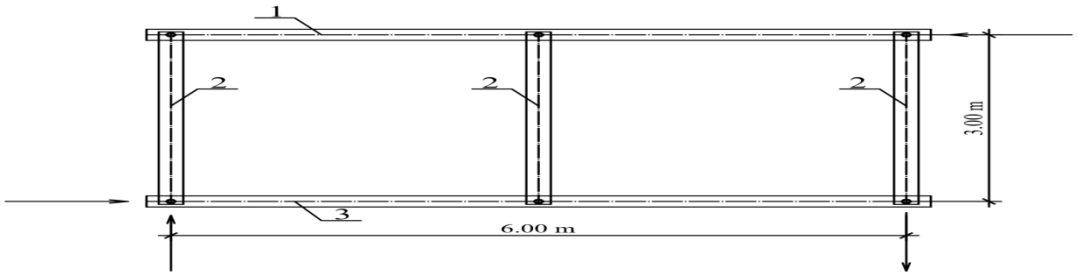


Fig. 1. Scheme of load equipment
1-moving part
2-cross-beam
3-unmoving part

The moving experimental loads are placed horizontally along the free longitudinal side of the reinforcement frame. Before closing the floor, the frame is stretched, that is, the specific resistance of the frame to slipping is determined.The first sample is tested by constantly increasing the load until it loses its carrying capacity.

The second sample is loaded step by step with a load equal to 1/10 of the strength limit of the first sample, but not greater than 2.0 kN. At each stage, the load is held for 5 minutes, then the loads are completely removed and the load is increased to the amount of the next stage.

In the third sample, the first and second samples are tested with no variable sign (direction) equal to 0.4 of the average value of the average strength limit obtained according to the test results.

During the test, the probability that the free longitudinal side of the reinforcing frame slides in the direction of the shear force and the accidental displacement of the fixed longitudinal side of the frame is determined.

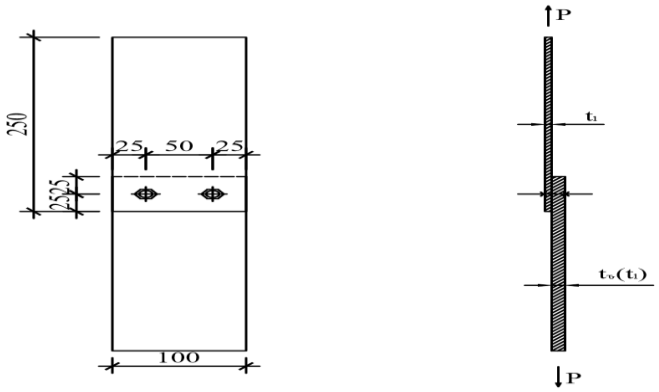


Fig.2. The sample for testing of joining flooring

t_1-thickness of profiled flooring

t_t-thickness of construction shelf, load-bearing

DISCUSSION:

Figure 2 Testing of profiled floor joints;

Screws, bolts and cracks are used to connect the profiled sheets to the construction and materials (Fig. 2).

Simple samples should be independently tested to determine the strength and stiffness characteristics of the floor joints affected by the moving loads. (Figure 2).

The thickness and quality of the sheets used for the samples must match the floor and the carcass elements that support it. Each type of compound is tested in at least 10 samples. The first sample is tested with a constant overload until a state of degradation occurs, while the remaining samples are tested step by step at 1/10 of the same destructive force, but not more than 0.5 kN.

At each stage, the load is held for 5 minutes, then all the loads are removed and the loads are increased to the amount of the next stage. Testing of joints with different sign loads is possible only if the sign of the driving forces acting on the profiled floor is also different.

CONCLUSION:

In the process of sampling the joints, it is determined that the joints of the joints are displaced according to the amount corresponding to the test load and the load-bearing capacity of the joints.

The test results can be used in the design of frame structures and fastening systems of buildings, including floors and panels made of profiled metal sheets.

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