

INVESTIGATION OF BREAST-WALL SHELL
CONSTRUCTIONS ON EFFECT OF SEISMIC LOAD

by

A.N. Tetior^I, Yu.A. Shepljakov^{II} and A.A. RUBEL^{III}

Experimental studies of corner-type breast-walls in a shell form on effect of seismic load in the Crimea ground conditions were made by the authors.

The breast-walls in shell form - hyperbolic paraboloid and in fold form were tested. Specimens were manufactured of M200 concrete with steel framework of A-II and A-III class, 1,2 and 4,2 m high, 2,5 and 8 cm thick, respectively.

The breast-walls were first subjected to static loading (by weight of reverse filler - sandy or clay ground and with additional load up to 3 t/m² of intensity), then seismic effect was created by throwing off the load 0,3 t by weight (for models) and 3,5 t (for nature constructions).

In the process of tests parameters of ground and construction vibration (using the seismometer) and deformation of constructions (using the tensoresistors pasted on framework in stretched zone) were measured.

By the experiments the influence of the direction of seismic force effect (the position of wall with respect to seismic focus) on stressed condition of wall was also verified. For this purpose simulating effect on ground was made both from face side and from opposite one.

The process of deformation (formation and opening of cracks) of constructions and ground was tested by method of acoustic emission (AE) as well as using special installation operating in supersonic range with tape- and oscillograph recording of signals.

The main results of the tests of seismic load effect on breast-wall shells are as follows:

1. The direction of seismic force effect (the breast-wall position in respect to seismic focus) influences the stressed condition of the wall. More dangerous is the effect of seismic load from the side of reverse filler.

2. Depending on kind and degree of the filler and ground thickness seismic effect increases the absciss of the active pressure diagram of ground in static condition to some extent (to 10-15 per cent), each subsequent impulse gives rise to lesser increase of pressure up to its unchanged condition.

3. Reverse filler which is making active pressure of ground on the wall in respect to its thickness and density of the rest ground correlation, exerts isolating effect during passage of seismic waves and thereby reduces seismic load on breast-wall.

I Chairman of Building Constructions Division, Candidate of Technical Sciences, SDI, Simferopol, USSR.

II Engineer, SDI, Simferopol, USSR.

III Engineer, SDI, Simferopol, USSR.