Intense increase in major construction in the Central Asian republics calls for rational use of land in construction. The problem is especially sharp in Tadzhikistan, where the plains regions constitute the main reserve for agriculture and the built-up land amounts to about 7% of the area of that republic.

Development of the economy and industrialization have accelerated the process of urbanization in the different regions of our country, including Tadzhikistan. Over the period 1963-1981 alone, the urban population of Tadzhikistan increased from 1,034,000 to 4,007,000, and the number of communities with urban settlements increased to 61. The increase in the built-up area took place not on account of rational use of the city areas, but mainly by urbanization of agricultural land. During 1963-1981, the land taken for urban construction in the republic totaled about 20,000 ha, according to land balance data.

It is possible to preserve fertile land by urbanizing only the areas which are not suitable for farming, in particular the hilly or "adyr" zones. Such areas, formerly considered unsuitable for construction, can become a substantial reserve for development of cities and rural settlements.

The development of the "adyr" territories, covered by collapsible loess soils, is connected with many difficulties determined mainly by the possibility of occurrence of slide phenomena, since construction inevitably causes changes in the engineering-geologic and seismic conditions of the region. For this reason, at the Construction--Architecture Department of the Scientific-Research Institute of Bases and Underground Structures, multipurpose investigations were carried out which were directed toward solution of problems connected with engineering preparation of soil bases under conditions involving complex relief, collapsibility, and seismicity. The mechanism of formation of slides under wetting and seismic-blasting action was studied. The investigations permitted developing a procedure for prediction of slides, a technique for wetting collapsible soils under complex relief conditions, and a method for evaluating the dynamic stability of slopes consisting of collapsible soils under natural stress conditions and loaded by weights of structures. The behavior of different types of foundations was evaluated to ensure strength and stability of the structures.

### Table 1

<table>
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<tr>
<th>Section No. x</th>
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<tr>
<td>Depth, m</td>
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Gosstroi Institute of the Tadzhik SSR. Construction--Architecture Department of the Scientific-Research Institute of Bases and Underground Structures. Translated from Osnovaniya, Fundamenti i Mekhanika Gruntov, No. 4, pp. 5-8, July-August, 1983.
In the first stage, the investigations were focused on the dynamic stability of natural slopes having different steepnesses, consisting of collapsible soils with different degrees of collapsibility under wetting and subjected to seismic-blasting action of a specified intensity, which was created after stabilization of the collapse deformations under wetting, i.e., the effect of the dynamic (seismic-blasting) action on the stability of the wetted collapsible soil slopes was experimentally determined.

The investigations were carried out on three sections, the slope values of which varied from 12° (section 1) to 30° (sections 2 and 3). As a rule, the geometric parameters of the experimental sections exceeded the thickness of the collapsible soils and amounted to 20-25 m for a width of 15-20 m.

The slopes consisted of large masses (several tens of meters thick) of loess soils, which were collapsible in the upper part. The thickness of the collapsible soils was 10-15 m in the first stage, and 6-10 m in the other stages, for which the total collapse is 15-20 cm and 5-10 cm, respectively (Table 1).

As seen from Table 1, the properties of the soil in the second section are similar to the corresponding properties of the first, with small deviations. Subsequent wetting of the slopes led to further decrease of these differences.

For observation of the horizontal and vertical deformations of the soils, different methods were used, from surveying, geophysical, and strain-gage measurements to field measurements of the distortion of holes filled with a marking material.

The slopes, provided with the above system of observations, were wetted to a degree of saturation of 0.7 along the depth of the collapsible mass through trenches opened across the slope, and in sections 2 and 3 (30° steepness) they were additionally wetted through trenches in the lower and upper parts of the slope, which ensured relatively uniform wetting of the entire slope (controlled by hole drilling) and preservation of the natural relief of the experimental sections.

Sections 2 and 3 were cut from the adjacent mass along the depth of the possible sliding zone, using narrow trenches. On the trench walls a polychlorovinyl membrane was fixed, and the trenches were filled with kneaded soil.

The plane front of the seismic waves having the specified intensity and duration was obtained by successive blasting of the explosive charges in the holes, using the specified delay intervals (0.4-0.45 sec). The length of the rows with concentrated explosive charges exceeded the linear dimensions of the section by a factor of 1.5-2.0 (Table 2).

The soil vibrations and stress waves under blasting were recorded by seismometric and strain-gage devices.

All sections were wetted to a degree of saturation of 0.7-0.8. After nominal stabilization of the collapse deformations, dynamic (seismic-blasting) actions were created which...