ture and attractions; the development of urban engineering systems, improvement of transport services, increase of traffic safety and environmental situation of the city can be provided.

Further development of cities in Ukraine can not be predicted without developing a program for underground space integrated development, the implementation of which requires thorough study of European and Russian practice and research conduction. Principles of city's underground space development considering the issues of historic center environment of the largest cities of Ukraine should be developed.

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Artem Bogatynskiy
R.O. Timchenko, *PhD, prof., research supervisor*
D.A. Krishko, *PhD, senior teacher, research supervisor*
N.O. Holiver, *PhD, assoc. prof., language advisor*
SIHE "Kryvyi Rih National University"

CALCULATION OF ROUND FOUNDATION SLABS WITH NON-UNIFORM BASE DEFORMATION

In engineering practice, the calculation problem of structural elements lying on a continuous elastic foundation is frequently encountered. Tower-type round foundations of buildings and structures can be assigned to these structures. These tasks are much more compli-

cated in the case of non-uniform deformation.

The contact problem of round plate with constant bending stiffness factor is considered. Its stress state is described by the equations of technical theory of bending of plates. Plate material is considered to be isotropic and obeys the generalized Hooke's law. Winkler model is adopted for base with a constant factor in terms of rigidity. The calculations of such elements are assumed that the ground has elastic properties, and its deformation is proportional to applied load.

During the construction of buildings and structures on undermined territories or macroporous loess soils uneven base subsidence that is changing the stress strain state of the elements of the structure are inevitable.

Ground deformation parameters (subsidence, horizontal displacement, tilt, curvature, compression, tensile strain) are determined initially by model of prof. Kolbenkov. We have considered only the impact of vertical deformations of the ground surface.

The curved surface of the base is described by some arbitrary function $\eta(r, \theta)$ which is considered in the form of an analytic function.

If the constant thickness round plate is based on an elastic curved variable stiffness and loaded with an arbitrary transverse loading, calculation becomes more complicated. Plate is pressed into the base and bent nonlinearly under the influence of the load.

There are additional vertical displacement plate, depending on the size and nature of the vertical movement of the base plate plane, caused by bending it under the influence of lateral loads and base curvature, when the base is bending. Total plate subsidence can be represented as the sum of them.

Considering that as a function of the undermining base deformation $\eta(r, \theta)$ accepted by the model of prof. Kolbenkov, the particular solution of the differential equation will depend on this function`s parameters. To find the particular solutions of the equation we used the method of variation of arbitrary constants.

The general solution of equation has the form of the plate flexure function as the sum of the flexures from the action of external forces and non-uniform bending deformation of the base. Knowing this function, we can find the rest of the necessary parameters (angle of rotation, bending moments and internal forces).

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Artem Bogatynskiy
R.O. Timchenko, *PhD, prof., research supervisor*
S. A. Popov, *PhD, prof., research supervisor*
D.A. Krishko, *PhD, senior teacher, research supervisor*
O.O. Poliakovska, *language adviser*
SIHE "Kryvyi Rih National University"

DETERMINATION OF SAFE AREAS FOR BUILDING POSITIONING ON THE UNDERMINED TERRITORIES

Differential settlements and rolls caused by base deformations under difficult engineering and geological conditions are generally significantly higher than the corresponding values, which occur under ordinary geotechnical conditions. These are subsidence of forest soils by soaking, subsidence during thawing of frozen soil ice layers, raise of the ground surface by swelling or frost heaving, ground surface subsidence by underground mining or karst-suffusion processes occurrence, and others.

Areas of buildings and structures setting definition is an important issue in their design on undermined territories where the predicted deformation of the minework.

These areas should be defined on the basis of non-exceedance of permissible deformation values defined according to the standards.

We can note down the following conditions (considering the fact that the greatest deviation on the trough occurs in the radial direction):

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