tion in construction in difficult geological conditions reveals a number of advantages in operation and reliability.

References

1. Timchenko R.A. Osobennosty konstruktyvnoho reshenyya massyvnoy podpornoy stenky dlya neblahopryyatnykh terrytoryi [The features of the constructive solutions of the massive retaining wall to unfavorable areas] / R.A. Timchenko, D.A. Krishko, O.V. Subota, O.S. Mokshyna // Visnyk Kryvoriz'koho tekhnichnoho universytetu. – Kryvyi Rih: KTU, 2007. – Vyp. 16. – pp. 136-139.

2. Pat. 62713 A Ukraina, MPK 8 E 02D 29/02. Pidpirna stinka: 62713 A Ukraina, MPK 8 E 02D 29/02 Timchenko R.O., Krishko D.A., Dmytriyeva K.Yu., Bondar Yu.M (Ukraina). – № 2003054143; Zayavl. 08.05.2003; Opubl. 15.12.2003, Byul. № 12. – 4 p.

Volodymyr Savenko
***R.O. Timchenko**, PhD, prof., research supervisor*
***S.A. Popov**, PhD, prof., research supervisor*
***D.A. Krishko**, PhD, senior teacher., research supervisor*
***N.O. Holiver**, PhD, assoc. prof., language adviser*
SIHE "Kryvyi Rih National University"

SOFTWARE APPLICATION FOR SYSTEM WORK MODELING "BASIS - ENGINEERING STRUCTURES"

In recent years, as the exhaustion of areas takes place that are most conducive to construction, it becomes more widespread construction in areas under difficult conditions (fake site, the foundations which are settling, karst areas and areas that are flooded), that are characterized by large irregular deformation of soils. Calculation methods that traditionally used in the design cannot meet all requirements of the exploitation. In recent decades, many countries widely use programs that are based on the finite element method. These programs have very broad in application and it is possible to determine the stress-strain state, including constructions, and in "basis - engineering construction" some of which are shown below.

SolidWorks is the core of integrated set of CAD. Tasks that are to be solved: hybrid parametric modeling, design parts, assemblies and products considering specific manufacturing, rapid analysis, design

drawings for ESKD.

Midas GTS NX is a fully integrated system in a single finite-element software system designed to perform comprehensive geotechnical calculations, which covers the entire range of engineering and geotechnical projects, including calculations of deep pits with a variety of mounting options, tunnels complex forms, calculations of consolidation and filtering, as well as calculations on dynamic actions and stability calculations.

The program PLAXIS is a finite elements package that are designed specifically for the analysis of deformation and stability of geotechnical structures. Simple graphic input allows to compose complex finite element models and the output devices to perform detailed presentation of calculation results. Calculation itself is fully automated and is based on stable numerical methods.

The calculations using PLAXIS allowed to analyze the stress-strain state of the soil mass and stability of retaining walls, the first variant - angled retaining wall; the second variant – retaining wall of a special type.

At the same soil basis – (geometry of layers and physics-mechanical properties), load and boundary conditions are obvious presence for the second version including the work of the entire array of ground and uniform redistribution of stresses on the front and base plates (under general stress); general uniformity of deformation structures and ground base, which in turn provides greater stability of retaining wall (the overall picture of movements).

The validity of the theoretical prediction of engineering structures behavior that interact with irregularly-deformed bases cannot be obtained through the regulatory framework. This gap can be filled in modeling system "foundation - engineering structure" using modern computer codes FEM.

References

1. Timchenko R.O. Napruzheno-deformovanyy stan pidpirnykh stinok spetsial'noho typu pry skladnykh deformatsiyakh [Stress-strain state of retaining walls special type for complex deformations] / R.O. Timchenko, D.A. Krishko, O.B. Nastych, V.O. Savenko // Stalezalizobetonni konstruktsiyi: doslidzhennya, proektuvannya, budivnytstvo, ekspluatatsiya. – Poltava: PoltNTU, 2014. – Vyp. 11. – pp. 295-301.

2. Timchenko R.O. Zastosuvannya prohramm zasnovanykh na metodi skinchen-

nykh elementiv (MSE) dlya modelyuvannya roboty systemy «osnova-inzhenerna sporuda» [Application programs based on the finite element method (FEM) for the simulation of the system "foundation - engineering construction"] / R.O. Timchenko, D.A. Krishko, V.O. Savenko // Stroytel'stvo, materyalovedenye, mashynostroenye. – Dnipropetrovsk, HVUZ PHASA, 2016. – pp. 143-148.

Volodymyr Savenko
***R.O. Timchenko**, PhD, prof., research supervisor*
***S.A. Popov**, PhD, prof., research supervisor*
***D.A. Krishko**, PhD, senior teacher, research supervisor*
***N.O. Holiver**, PhD, assoc. prof., language adviser*
SIHE "Kryvyi Rih National University"

USING A LINEAR REGRESSION MODEL FOR OPTIMIZATION OF CONSTRUCTIVE SOLUTIONS OF THE RETAINING WALL OF A SPECIAL TYPE

Designing the best constructive solutions of engineering structures under the specific operating conditions is one of the main engineering challenges. As for the retaining walls of a special type (RWST), applied on undermined territories with horizontal and vertical movements of the ground, this problem is particularly important. The experimental results showed that the stress-strain state of the base is largely determined by the characteristics of the structure. In this case there is a need to develop methodology for assessing the effect of these characteristics depending on the ground conditions and design parameters. Methods of experimental design were used for the implementation of this task.

Experimental Design is the precise organization of a pilot research that allows to collect the necessary data to apply for their analysis and statistical techniques to make accurate and objective conclusions. Optimizing is carried out using a mathematical model, represents a response function (maximum load on the ground, held RWST).

The subject of this study is RWST, namely monolithic angular type retaining wall which has vertical and horizontal elements on the surface, the contact side bearings has voids in the form of truncated pyramids of the same size and the smaller base directed vertical and