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**STUDY OF THE AERODYNAMIC PROPERTIES OF THE BUILDING
ASSEMBLY MODULE'S CONSTRUCTIONS**

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Today, the primary task for technical industries, in particular construction, is to fully promote the economic development of the state. It is also essential to improve the production processes associated with the initial inspection of construction sites damaged during the conduct of hostilities [1].

In fact, work at facilities located in post-war territories can be classified as work with increased risks arising during natural disasters (earthquakes, floods, fires, etc.) and artificial influences (artillery shelling, mining, chemical contamination, radioactive exposure etc). However, construction processes must be carried out in some cases. In particular, the operations performed by mechanized modules must ensure the processes of assembly, dismantling of structures, introduction of working tools and/or personnel into the working area.

The main approaches to creating new and improving existing systems are outlined in [2].

Taking into account safety regulations and technological needs of mechanized support of construction assembly operations, an assembly platform for personnel was developed [3].

The invention solved the problem of reducing the labor intensity of installation operations and increasing productivity during the installation of building columns.

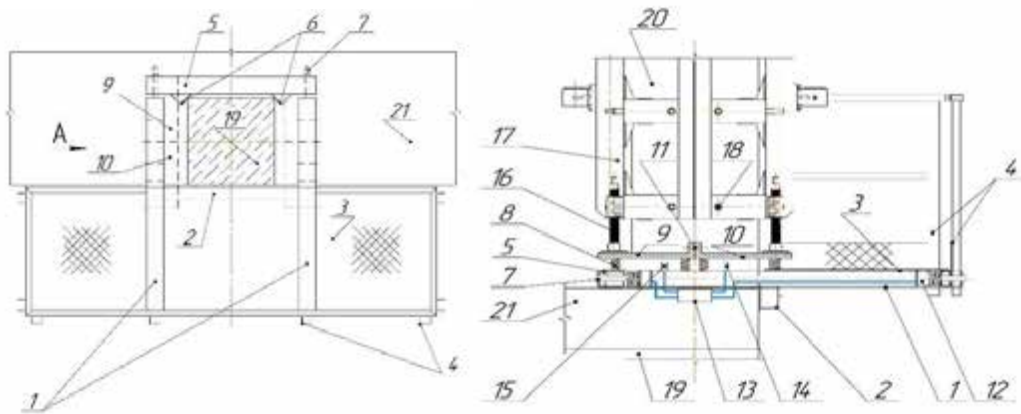


Figure 1 – General view of the installation module for maintenance: 1 – beam; 2 – crossbar; 3 – platform; 4 – fence; 5 – clamp; 6 – emphasis; 7 – fasteners; 8 – elastic elements; 9 – rear movable support; 10 – front movable support; 11 – fasteners; 12 – retainer; 13 – locking mechanism; 14 – sensor; 15 – retainer; 16 – supports; 17 – assembly assembly module; 18 – grips; 19, 20 – columns; 21 - overlapping

For this purpose, the front and rear supporting platforms for installing the conductor are mounted on the elastic elements of each of the beams. In the back part, the beams are connected to each other with a clamp with stops using fasteners. Also, the fence has the possibility of vertical extension and is fixed with a controlled latch. The vertical movement of the supporting platforms is fixed by sensors that control the locking mechanisms of the controlled latches of the fence and fastening of the platform clamp.

For the different with known one, this design allows to use the platform together with the technical module for the installation of columns, increase the safety of installation operations and increase the productivity of installation work.

The use of the assembly module for the installation of columns allows you to reduce the labor intensity of installation operations, and using it together with the assembly module allows you to increase the productivity of installation operations.

A separate task of using the assembly module is to ensure its stability during construction work. Since a significant part of construction assembly processes takes place at height, the stability of the assembly module is significantly affected by wind loads.

Most of the mounting devices have a lattice design, which in a certain way adapts them to the action of wind loads. In our opinion, the effect of such loads on the support platform of the mounting module is significant, since it has a significant flatness (even taking into account the lattice structure of the floor), and the wind loads taken into account during the design of such technical devices are based on average standardized values, which do not fully take into account the variability of wind loads (turbulence, gustiness, change of direction, etc.).

In order to study the effects of the structural forms of the elements of the assembly module, the regularities of their location when forming frame structures, the means of adjusting the balance and leveling the influence of wind loads, a scaled simulation (1:10) of the assembly platform (Fig. 2) is performed to study it in a wind tunnel on the influence of multidirectional flows wind load.

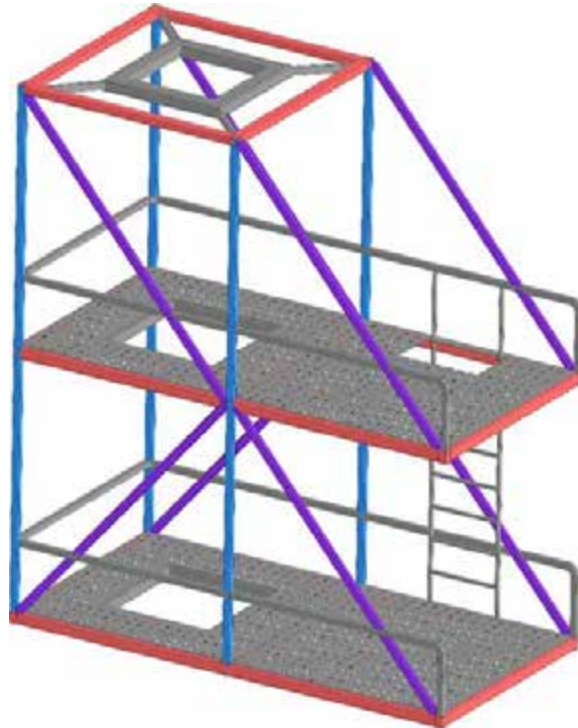


Figure 2 – Simulation model of the site of the assembly module

In our opinion, the study of the aerodynamic properties of the elements of the assembly module in the air pipe will allow to improve a number of indicators. Namely, to optimize the material capacity of the structure, increase corrosion resistance, increase the safety of using technological devices on the construction site, reduce dynamic effects on the retaining and fixing elements of the module, etc.

References

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**Національний університет біоресурсів і
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Факультет конструювання та дизайну



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Збірник тез доповідей ХХІІ Міжнародної онлайн-конференції науково-педагогічних працівників, наукових співробітників та аспірантів «Проблеми та перспективи розвитку технічних та біоенергетичних систем природокористування: конструювання та дизайн». – К., 2023. – 112 с.

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В збірнику представлені тези доповідей науково-педагогічних працівників, наукових співробітників та аспірантів факультету конструювання та дизайну НУБіП України, провідних закладів вищої освіти, в яких розглядаються завершені етапи розробок з машин і обладнання сільськогосподарського виробництва, промислового і цивільного будівництва, робототехніки, механізації сільського господарства, будівництва сільських територій, конструювання і надійності машин для сільського і лісового господарств, удосконалення та нових розробок біотехнологічних процесів і технічних засобів.

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