UDC 624.072.33(045)

V.N. Pershakov[1]
T.O. Petrova[2]
E.N.Lysnytskaya[3]

MODERN FRAME STRUCTURE BUILDINGS

National Aviation University
Kosmonavta Komarova avenue 1, Kyiv, Ukraine, 03680
E-mails: [1]pershakov@nau.edu.ua; [2]tagasun@mail.ru

The question of planning, building and introduction of reinforce-concrete frame constructions, is considered by tuning-ups 18, 21 meter for agricultural production buildings, hall apartments of public buildings and houses and buildings of the airfields of agricultural aviation. It is shown that structures belonging to the quickly assembled wireframe buildings and have advantages such as a significant space within the building and lower cost compared with other structures such purpose.

Key words: framework buildings, frame constructions, reinforced concrete frame structures.

Raising of problem

In the last years there is an increase of production of stock-raising goods volumes in Ukraine, Russia and other countries. Attaining high indexes is possible only on condition of correct maintenance of animals. This problem is settled by building of modern buildings for agriculture. Today the first place is occupied by an economy and high-rate of editing, that is why fully obviously, that traditional capital building is lost by actuality. It does not foresee the decision of this problem in the compressed terms with the minimum bringing in of labour force and build technique. An exit from a situation is the use of technology of quickly assembled buildings.

A stock-raising is perspective industry of agriculture. Presently it is the developed industry of rural production which provides a population wide assortments of products.

For this reason the poultry farmings, stock-raising and other types of farms have an enormous value for the economy of any country. That is why building of stock-raising farms continues to have stable demand.

Building of stock-raising farms of any kinds lately belongs to the sphere of building of quickly assembled of framework buildings. As buildings must have a maximally low cost, the most acceptable variant is consider building of stock-raising farms on the basis of construction of frame framework.

Farms, built on this technology, do not have intermediate supports and have such advantages:

1) considerable space inside the building;
2) a lower cost is in connection with absence of superfluous charges on build materials (Figure.1)

Figure. 1. Internal view of framework building

Analysis of previous researches

The analysis of structural decisions rotined that frame reinforce-concrete constructions in our country and abroad widely apply at building of industrial, production and public buildings. All was considered and analysed 5 oversea constructions of frames; 47 constructions of frames and 15 inventions of countries of the CIS [1; 2].

Framework buildings from three-hings frames differ the applied tuning-ups, longitudinal steps of frames, heights of chimneys, inclinations of rigeliv, re-enforcement, class of concrete and other indexes, that does not answer the requirements of the unique module system and standardization of overall charts of agricultural buildings.

Most economic on the expense of concrete and steel by comparison to constructions beam for a chimney the systems are reinforce-concrete three-

hings frames t-shaped a cut by tuning-ups 18 and 21 m. T-shaped form transversal the cut of rigeliv and chimneys is most economic after resource-demanding by comparison to a rectangular cut. The analysis of the considered structural decisions allows to formulate a purpose and basic tasks of researches, which are directed on the decision of scientific and technical issue of the day.

The purpose of work is experimental research, theoretical generalization, development of theory of calculation, after durability, firmness, deformations, and fracture and constructing of effective reinforce-concrete frame frameworks had resource-demanding buildings variable a cut [2]. Improvement of structural decisions of buildings with application of frame constructions it follows to examine and decide as one of major tasks of technical progress in agricultural building.

Framework buildings are from frame constructions

A review and analysis of achievements is conducted in directions of development of theoretical methods of calculation and to constructing of buildings with reinforce-concrete frame framework. Basic tendencies are certain in the use of reinforce-concrete frameworks of buildings of the different setting, basic approaches are analysed in relation to their effective planning, making and use [1; 2].

Similar buildings can be created from the combined teams of reinforce-concrete or steel easy constructions. A building project includes for itself the report of framework, editing of flags of coverages and wall panels which are responsible for a microclimate and instrumental in creation of the light differentiated day, and also computer-aided manufacturing.

For building of agricultural buildings (hogcotes, cowsheds, poultry houses) the enterprise of ZOKL offers the simple, reliable, technology of building which is based on the use of reinforce-concrete framework and non-load-bearing constructions from the cassette panels of sandwich tested decades. Buildings with a span roof have a width 18, 21 and 24 m with the step of columns – 6 m (figure. 1, 2).

Advantage of this technology consists in that at the identical cost of buildings and installation works the cost of reinforce-concrete framework of building is to 1,5 time more cheap of steel, and cassette sendvich-panels at identical resistance of heat transfer to 30% more economic from glued three-layered sendvichiv. In addition, installation of the envelope cassette sandwich panels is simple and is done without the use of cranes.

Usually there is an aggressive environment in agricultural buildings (for example, in stock-raising buildings). Reinforce-concrete frameworks do not need the special treatment and eliminate appearance of corrosion (unlike metallic framework). Cassette sendvich-panels have a smooth air-tight internal surface, that allows easily to conduct the sanitization of building.

Materials for the thermal insulation of the roof and building envelope have the ability to absorb excess moisture from the premises and carry it in a ventilated roof gap, thus regulating the moisture characteristics of the room. Thus there is not piling up of harmful matters of ammonia, carbon dioxide, bacteria, in heat insulation as a result of the special antibacterial impregnations and ability of material to «breathe» – to carry humidity from understrata outside.

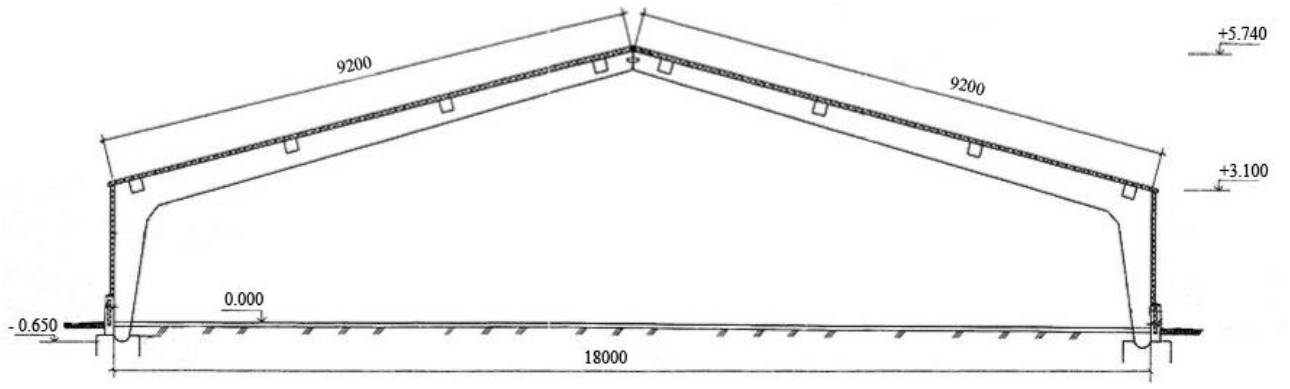

Figure. 2. Construction of reinforce-concrete framework of building

It is recommended to execute a floor a concrete, as it must remain a bar in relation to influence of personification facilities. Monolithic floors are reinforced for avoidance of cracks and removing layer by layer.

Modern development of business stipulated a change in technology of building and, as a result, replacement of many build materials in accordance with new decisions. Brick and concrete replaced the light metal which application has been made possible thanks to the new engineering solutions. The result of these changes was the widespread introduction of technology the construction of buildings, which are based on modular steel structures (figure. 3). Today, these technologies are priority.

Figure. 3. Metallic frameworks of module buildings

Specialization of factory of non-load-bearing constructions of company SMK Lipecka – making of metallic constructions of any complication, in particular frameworks quickly assembled industrial buildings, metallic constructions for building of compositions, shopping centers, and other

A company SMK developed the row of projects from a report from metallic constructions stock-raising, poultry farmings and sheep-breeding complexes with the maximal level of automation and minimum charges. During planning and building of agricultural buildings of SMK all features and modern front-rank European technologies which are used in a stock-raising are taken into account.

In 2008-2010, institutions, associations UKRNDIAGROPROEKT, Ukrainian state and cooperative design and survey research and experiments union drafted construction and renovation of existing farms to create maternity units on dairy farms, in barns, milking and dairy units, poultry and some poultry houses in Kyiv (village Big Krupil), Poltava (village Shtompelivka), Rivne (village Bereji), Dnipropetrovsk (village Ekaterinivka), Kharkiv (village Komunarske), Donetsk (village Volnovaha) areas using concrete frame structures spans of 18 and 21 m.

In 1990–2000 by the institute of UkrNDI-civil'sil'bud, three civil buildings are projected the Ukrainian research and project institute of civil rural building and built with hall apartments with the use of reinforce-concrete frame constructions by a tuning-up 18, 21 m in the Dnepropetrovsk, Zhytomyr and Kievan regions (gymnasium, pool, movie theater).

In 2011, 8 houses are projected and built with shopfloors with the use of reinforce-concrete frame constructions by a tuning-up 18, 21 m in village Shpitki of the Kiev region.

In projects Ukrainian state project-technological research institute of civil aviation of «UKRAEROPROEKT» building and reconstruction of production buildings (hangarages of business aviation, bases of spectransportu, workshops and compositions of the different setting) is foreseen with the use of reinforce-concrete frame constructions by a tuning-up 18 and a 21 m in air-ports Lviv, Dnipropetrovsk and Odesa.

Conclusions

Framework buildings from frame constructions by a tuning-up 18, a 21 m use buildings in many industries:

1. Agricultural production buildings: stock-raising buildings, poultry farms, poultry houses, buildings, for a roughing-out rural-economic products, mechanized composition for a hay, compositions of dry forage of grain, material and technical compositions, garages, workshops, for technical maintenance, covers.
2. Hall apartments of civil buildings: gymnasia, trainer halls, fitnes-centers, shooting-galleries, pools, akvaparki, summer cinemas-theaters, clubs, vaudeville grounds, exhibition pavilions, riding halls, circuses, markets, rural supermarkets, hothouses, apartments, for growing of mushrooms, garages.
3. Houses and buildings of the air fields of agricultural aviation and business aviation: hangarages, slipways of business aviation, base of the special motor transport, fire trucks, repair shops, fire-departments, compositions of poisons and chemicals, compositions of dry mineral fertilizers, official buildings, for implementation of air-chemical works, block of boiler room, control-travel points, camouflage shelters for a military technique.

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The article acted to the release

V.M. Pershakov[1],T.O. Petrova[2]. E.N. Lysnytskaya[3]. Modern frame structure buildings
National Aviation University, Kosmonavta Komarova avenue 1, Kyiv, Ukraine, 03680
E-mails: [1]pershakov@nau.edu.ua; [2]tagasun@mail.ru

The article deals with the design, construction and implementation of reinforced concrete frame structures with span 18, 21 m for agricultural production buildings, hall-premises of public buildings and buildings of agricultural aviation. Structures are prefabricated frame buildings and have such advantages as large space inside the structure and lower cost compared with other facilities with same purpose.

Key words: agricultural industrial buildings; frame structures; reinforced concrete frame structures.

Pershakov Valeriy. Doctor of Engineering. Associate Professor. Professor of Department of Reconstruction of Airports and Motorways, National Aviation University. Education: Kazakh Polytechnic Institute (Alma-ata, Kazakhstan), "Industrial and Civil Engineering" (1966). Research area: theoretical and experimental study of the issues of reinforced concrete, steel structures of industrial, civil, agricultural buildings and structures, as well as roads and airports. Publications: 200.
E-mail: pershakov@nau.edu.ua
Petrova Tetiana. Student of the National Aviation University. Research area: theoretical and experimental problems of reinforced concrete, steel structures of industrial, civil, agricultural buildings and structures. Publications: 5.
E-mail: tagasun@mail.ru
Lysnytskaya Ekaterina. Graduate student of the of Reconstruction of Airports and Motorways, National Aviation University. The direction of research: the calculation and analysis of the reliability of the buildings of the risk of progressive damage.
Publications: 4.
E-mail: misslivets@mail.ru

В.Н. Першаков[1], Т.А. Петрова[2], Современные здания в рамных конструкциях
Национальный авиационный университет, пр. Космонавта Комарова, 1, Киев, Украина, 03680
E-mails: [1]pershakov@nau.edu.ua; [2]tagasun@mail.ru

Рассмотрены вопросы проектирования, строительства и внедрения железобетонных рамных конструкций пролетом 18, 21 м для сельскохозяйственных производственных зданий, зальных помещений общественных зданий и зданий и сооружений аэродромов сельхозавиации. Показано, что сооружения относятся к быстровозводимым каркасным зданиям и имеют такие преимущества, как значительное свободное пространство внутри сооружения и более низкая стоимость по сравнению с другими сооружениями такого назначения.

Ключевые слова: железобетонные рамные конструкции; каркасные здания; сельскохозяйственные производственные здания.

Першаков Валерий Николаевич. Доктор технических наук. Доцент. Профессор кафедры реконструкции аэропортов и автодорог, Национальный авиационный университет. Образование: Казахский политехнический институт (г.Алма-Ата, Казахстан) по специальности “Промышленное и гражданское строительство” с отличием, (1966). Направление научной деятельности: изучение теоретических и экспериментальных вопросов железобетонных, металлических конструкций промышленных, гражданских, сельскохозяйственных зданий и сооружений, а также автомобильных дорог и аэродромов. Количество публикаций: около 200.
E-mail: pershakov@nau.edu.ua
Петрова Татьяна Александровна. Студент Национального авиационного университета. Направление научной деятельности: изучение теоретических и экспериментальных вопросов железобетонных, металлических конструкций промышленных, гражданских, сельскохозяйственных зданий и сооружений. Количество публикаций: 5.
E-mail: tagasun@mail.ru
Лисницкая Екатерина Николаевна. Аспирант кафедры реконструкции аэропортов и автодорог ,Национальный авиационный университет.
Образование: Национальный авиационный университет (2010).
Направление научной деятельности: расчет и анализ надежности зданий с учетом рисков прогрессирующих разрушений. Количество публикаций: 4.
E-mail: misslivets@mail.ru

Першаков Валерій Миколайович. Доктор технічних наук. Доцент. Професор кафедри реконструкції аеропортів та автошляхів, Національний авіаційний університет. Освіта: Казахський політехнічний інститут (г.Алма-Ата, Казахстан) за спеціальністю «Промислове та цивільне будівництво» з відзнакою, (1966). Напрям наукової діяльності: вивчення теоретичних і експериментальних питань залізобетонних, металевих конструкцій промислових, цивільних, сільськогосподарських будинків і споруд та автомобільних доріг і аеродромів. Кількість публікацій: близько 200.
E-mail: pershakov@nau.edu.ua

Петрова Тетяна Олександрівна. Студент Національного авіаційного університету. Напрям наукової діяльності: вивчення теоретичних та експериментальних питань залізобетонних, металевих конструкцій промислових, цивільних, сільськогосподарських будинків та споруд. Кількість публікацій: 5.
E-mail: tagasun@mail.ru
Лисницька Катерина Миколаївна. Аспірант кафедри реконструкції аеропортів та автошляхів, Національний авіаційний університет. Напрямок наукової діяльності: розрахунок і аналіз надійності будівель з урахуванням ризиків прогресуючих обвалень. Кількість публікацій: 4.
E-mail: misslivets@mail.ru