European Journal of Innovation in Nonformal Education (EJINE)
Volume 2 | Issue 4 | ISSN: 2795-8612

Calculation of Flat Ram by the Method of Displacement

Gulom Farhodovich Pirnazarov, Feruza Islomovna Mamurova
Tashkent state transport university

Dilfuza Islomovna Mamurova
Bukhara State University

A B S T R A C T

The essence and unknowns of the method of migration. The degree of kinematic inaccuracy of the Ram. The main system of the method of migration. Canonical equations of the method of displacement. When calculating static immutable systems by the method of forces, the forces of tension (torque, longitudinal and transverse forces) in their overlapping connections are considered unknowns, and after determining the quantities of these stresses, the displacement of static immutable systems is considered.

A R T I C L E I N F O

Article history:
Received 16 February 2022
Received in revised form
14 March 2022
Accepted 11 April 2022

Keywords: the essence and unknowns of the method of migrations, the basic system of the method of migrations, canonical equations of the method of migrations.

Hosting by Innovatus Publishing Co. All rights reserved. © 2022

In construction, mainly static fixed systems are used. Methods of calculating static fixed systems were listed, in this report we will consider the calculation of flat Ram by the method of displacement.

When calculating static immutable systems by the method of forces, the forces of tension (torque, longitudinal and transverse forces) in their overlapping connections are considered unknowns, and after determining the quantities of these stresses, the displacement of static immutable systems is considered. In the method of migrations, first calculate the migrations formed in the Ramas, and then write the law of transformation of the internal forces of tension in its voluntary cross-sections, and the possibility of constructing their common epyura is formed. Under the influence of external forces, rama is deformed, and its nodes are angled and linear.

The 1-node of the Ram is angled, and the 2-node is angled, at the same time these nodes move in an amount in a horizontal direction. Raman divides into vertical elements and corners.

The deviation angle of the columns is expressed by the horizontal displacement of the nodes.

The deviation angle of the first column or. While the second ustunniki or. Since 1 and 2 are horizontal loops of nodes, it is possible to represent through the angle as follows:

$$\psi_1 = \psi_2 \frac{h_2}{h_1} \qquad (1.1)$$

When calculating the Ram by the method of displacement, as an unknown quantity, angular and linear displacement of nodes in them is accepted. When calculating these shifts, only the bending of the rama elements is taken into account, and their compression and stretching are not taken into account. It is also accepted that when the Ram is deformed, the distance between their nodes does not change. The degree of kinematic inaccuracy of the Ram. When calculating the Ramas by the method of displacement, the total

number of unknowns will be equal to the sum of the angular and linear displacement of their nodes:

$$n = n_{\varphi} + n_{\delta}\,, \qquad (1.2)$$

bunda: – bikr is the number of angled migrations of nodes, - the number of linear migrations of nodes. The number of common unknowns is called the degree of kinematic inaccuracy of RAM.

When calculating by the method of displacement, the Ram is divided into two groups:

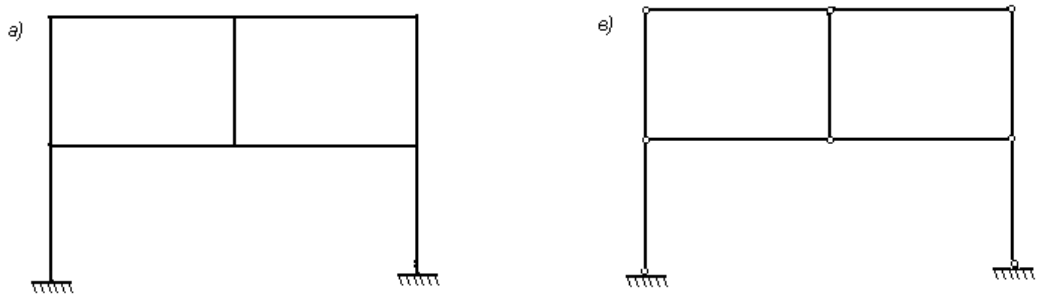
1. Free Ramas. The linear displacement of such Ram nodes will be zero ( ). The degree of kinematic inaccuracy of the free RAM will be equal to the number of angular displacement of their nodes.

2. Free Ramas. This group includes RAM slots with nodes angled and linear displacement. The degree of kinematic inaccuracy of free RAM is equal to the sum of the number of angular and linear displacements of their nodes.

The number of angular displacement – rama will be equal to the number of bikr nodes. To determine the number of linear displacements, a new geometrical variable spherical scheme is made by inserting a sphere into each bikr node of the RAM and the base of the bikr. The degree of freedom of this hinged mexanizm will be equal to the number of linear migrations of RAM:

$$n_{\delta} = W = 3D - 2Ш - C_T \quad . \qquad (1.3)$$

Let the degree of kinematic inaccuracy of the given ram be determined.



Solution. The kinematic non-accuracy rate of RAM is determined based on (1.2): the number of angular displacement of RAM from the number of bikr nodes is equal to 6. To determine the number of linear displacements of the Raman, it is replaced by a spherical scheme with a geometrical variable, by introducing a hinged scheme into its bikr nodes and bases, and the degree of freedom of this hinged scheme (1.3) is determined by expression:

So it turns out that the number of linear migrations of Rama nodes would be equal to. The number of unknowns will be equal to.

The main system of the method of migration. In the method of relocation, the main system is formed by introducing two different connections that resist the angular and linear relocation of the given ramadan nodes. The first kind of connections is bikr connections, which only resist angular displacement of nodes. The second type of connections is sterjenes, which do not allow linear migration of nodes. This means that the main system of the migration method is generated by limiting the angular and linear migration of the given rama nodes. In the method of migration, it is possible to specify a single basic system for rama (in the method of forces, the basic system options of RAM would be unlimited). Canonical equations of the method of displacement. There are two differences between the main system of the given rama and its method of migration:

1. Deformation difference.

2. The difference in power.

The deformation difference is that in the given rama nodes, the adjacent stergens are deformed under the influence of external load – their edge sections are angled, and the tip of the columns is moved to the distance.

In the main system of Raman, these deformations are zero, because by installing additional connections,

their formation is limited. In order to eliminate the above difference, additional connections in the main system of the Ram are removed from the nodes one by one, respectively, and the nodes are subjected to kinematics, each of which is twisted at the appropriate angle and transferred to the distance. After that, the knot is tightly closed again. As a result, the deformed state of the main system corresponds to the deformed state of the given Ram.

The difference in power is that in the additional connections built into the main system of RAM, the reaction forces occur under the influence of external load and kinematic (). These forces are not in the given ramada, because there are no connections in it. In order to eliminate this difference, the amount and direction of displacement ( ) to which the main system is affected is selected so that the reactions of the main system to be generated in additional connections will also be zero.

The above conditions are mathematically expressed as follows:

$$R_1 = 0; R_2 = 0; ...; R_i = 0; ...; R_n = 0. \qquad (1.4)$$

Here: - the main systemng - the reaction (moment or force) that is generated when connecting; - the degree of kinematic inaccuracy of the Ram.

Each reaction shown in (1.4) is an external load and quantity, equal to the algebraic sum of the reactions generated by the kinematic effects whose direction is unknown. In the method of declension, the amount of an unknown kinematic effect is written through the letter. Taking these into account (1.4), the following is taken into account:

$$R_{1(Z_1,Z_2,...,Z_n,P)} = 0;\ R_{2(Z_1,Z_2,...,Z_n,P)} = 0; ...; R_{i(Z_1,Z_2,...,Z_n,P)} = 0; ...; R_{n(Z_1,Z_2,...,Z_n,P)} = 0; \quad (1.5)$$

It is spread out according to the principle of Independence adopted in material resistance (1.5) :

$$\begin{cases} R_{1Z_1} + R_{1Z_2} + ... + R_{1Z_i} + ... + R_{1Z_n} + R_{1P} = 0; \\ R_{2Z_1} + R_{2Z_2} + ... + R_{2Z_i} + ... + R_{2Z_n} + R_{2P} = 0; \\ ..... \\ R_{iZ_1} + R_{iZ_2} + ... + R_{iZ_i} + ... + R_{iZ_n} + R_{iP} = 0; \\ ..... \\ R_{nZ_1} + R_{nZ_2} + ... + R_{nZ_i} + ... + R_{nZ_n} + R_{nP} = 0. \end{cases} \qquad (1.6)$$

In accordance with the principle of acceptability in resistance to materials, the reactions formed from the unknowns in (19.6) are replaced by the following expression:

$$R_{iZ_i} = r_{ii} \cdot Z_i \quad (1.7)$$

Here:-i-the reaction that is formed from the kinematic effect that is in the attachment. Taking into account (1.7), (1.6) is divided into having a system of canonical equations of the method of displacement if it is taken into canonical form:

$$\begin{cases} r_{11}Z_1 + r_{12}Z_2 + ... + r_{1i}Z_i + ... + r_{1n}Z_n + R_{1P} = 0; \\ r_{21}Z_1 + r_{22}Z_2 + ... + r_{2i}Z_i + ... + r`_{2n}Z_n + R_{2P} = 0; \\ ..... \\ r_{i1}Z_1 + r_{i2}Z_2 + ... + r_{ii}Z_i + ... + r_{in}Z_n + R_{iP} = 0; \\ ..... \\ r_{n1}Z_1 + r_{n2}Z_2 + ... + r_{ni}Z_i + ... + r_{nn}Z_n + R_{nP} = 0. \end{cases} \qquad (1.8)$$

(1.8) unit reactions located on the head diagonal of the system are called Prime reactions or prime coefficients, reactions located outside the head diagonal are called auxiliary reactions (coefficients). The unit is equal to each other coefficients, which are symmetrical in relation to the head diagonalalga, based on the theory of the interaction of reactions:

$$r_{ik} = r_{ki} \qquad (1.9)$$

Because unit reactions are located according to a certain law relative to the head diagonalalga (1.8) the

method of displacement of the system of equations is called the system of canonical equations, lar is called the free bounds or load reactions. Once the unit of reactions and free thresholds in the links of the main system are calculated, they are put into the system of canonical equations. The system of algebraic equations formed is determined by the unknown displacement, which is solved by the Gaussian method or by another method.

Literature

1. Karnovsky I. A., Lebed A. I. advanced methods of structural analysis. Canada.2010.
2. Mamurova, F. T., Abdullayeva, N. K., & Mallaboyev, N. (2019). USING THE «ASSESSMENT» METHOD IN ASSESSING STUDENTS KNOWLEDGE. *Theoretical & Applied Science*, (11), 80-83.
3. Mamurova, F. I., & Mustafoev, E. (2021, October). Aksonometrik Proyeksiyalarning Asosiy Teoremasi. Dimmetrik Aksonometriya Qurish. In *" ONLINE-CONFERENCES" PLATFORM* (pp. 100-103).
4. Mamurova, F. I., & ugli Mustafayev, E. I. (2021). SHADOWS IN A PERSPECTIVE BUILDING. *Conferencious Online*, 16-18.
5. Mamurova, F. I., & oglu Akmalov, J. O. (2021). ORGANIZATION OF GEODESIC WORK. STATE GEODESIC NETWORKS. *Conferencious Online*, 21-23.
6. Mamurova, F. I. (2021, May). ARTIST OF UZBEKISTAN MAKSUD SHEIKHZADE. In *E-Conference Globe* (pp. 176-178).
7. Mamurova, F. I. (2021). Factors for Forming the Professional Competence of Building Engineers in the Context of Information Education. *EFFLATOUNIA-Multidisciplinary Journal*, *5*(2).
8. Olimov, S. S., & Mamurova, D. I. (2021). Graphic Information Processing Technology and its Importance. *European Journal of Life Safety and Stability (2660-9630), 10*, 1-4.
9. Islomovna M. F. et al. DESIGNING THE METHODICAL SYSTEM OF THE TEACHING PROCESS OF COMPUTER GRAPHICS FOR THE SPECIALTY OF ENGINEER-BUILDER //Journal of Contemporary Issues in Business & Government. – 2021. – Т. 27. – №. 4
10. Khodjayeva N. S., Mamurova D. I., Nafisa A. IMPORTANCE IN PEDAGOGICAL TECHNIQUES AND EDUCATIONAL ACTIVITY //International Engineering Journal For Research & Development. – 2020. – Т. 5. – №. CONGRESS. – С. 5-5.
11. Мамурова Д. И., Мамурова Ф. И. Соотношения навыков черчения с опытом психологического исследования //Вестник по педагогике и психологии Южной Сибири. – 2015. – №. 1.
12. Mamurova D. I. Application of Advanced Information Technologies of Training at Drafting Lessons //Eastern European Scientific Journal. – 2018. – №. 6.
13. Islamovna M. D., Gulhumor M. PRINCIPLE OF TEACHING DRAFT GEOMETRY AND COMPUTER GRAPHICS //World Bulletin of Social Sciences. – 2020. – Т. 1. – №. 1. – С. 30-31
14. Мамурова Ф. И., Мамурова Д. И. КОМПЬЮТЕР ГРАФИКАСИ ФАНИНИ ЎҚИТИШ ҲОЛАТИ //TULAGANOV AA. – С. 145.
15. Мамурова Д. И. Минарет калян бухары и его орнаментальные ярусы из жженого кирпича //ЯЗЫК И КУЛЬТУРА. – 2016. – С. 222.
16. Mamurova D. I., Xalimova M., Bakhtyorova G. THE IMPORTANCE OF THEIR RHYTHMIC SEQUENCE IN EMBROIDERY TECHNIQUES AND COLOR SELECTION IN EMBROIDERY //International Engineering Journal For Research & Development. – 2021. – Т. 6. – №. ICIPPS21. – С. 5-5.
17. Mamurova F. I., oglu Amirkulov A. F. COORDINATE AND HEIGHT SYSTEMS USED IN GEODESY //Conferencious Online. – 2021. – С. 19-20.

18. MAMUROVA F. I. FACTORS OF FORMATION OF PROFESSIONAL COMPETENCE IN THE CONTEXT OF INFORMATION EDUCATION //THEORETICAL & APPLIED SCIENCE Учредители: Теоретическая и прикладная наука. – 2021. – №. 9. – С. 538-541.
19. Мамурова Ф. И. ЭФФЕКТИВНОСТЬ ФОРМИРОВАНИЯ ПРОФЕССИОНАЛЬНОЙ КОМПЕТЕНТНОСТИ БУДУЩИХ ИНЖЕНЕРОВ-СТРОИТЕЛЕЙ В СОВРЕМЕННЫХ УСЛОВИЯХ //Наука и образование сегодня. – 2021. – №. 4 (63). – С. 92-93.
20. Мамурова Ф. И. РОЛЬ ЗНАЧЕНИЕ И ПРИМЕНЕНИЕ ИНЖЕНЕРНЫХ КОММУНИКАЦИОННЫХ СИСТЕМ В ЗДАНИЯХ И КОНСТРУКЦИЯХ //В научный сборник вошли научные работы, посвященные широкому кругу современных проблем науки и образования, вопросов образовательных технологий 2020.-436 с. – 2020. – С. 414.
21. Олимов, Ш. Ш. (2013). Некоторые вопросы организации урока на основании педагогических технологий. *Молодой ученый*, (5), 752-754.
22. Olimov, S. (2020). The differentiation of education is an important factor of pedagogical technology. *European Journal of Research and Reflection in Educational Sciences*, *8*(11).
23. Олимов, Ш. Ш. (2015). Маънавий-ахлоқий тарбия асослари. (Монография). *T.:"Fan va texnologiya",-2015, 228*.
24. Olimov, S. (2020). The differentiation of education is an important factor of pedagogical technology. *European Journal of Research and Reflection in Educational Sciences*, *8*(11).
25. Олимов, Ш. Ш. (2013). Некоторые вопросы организации урока на основании педагогических технологий. *Молодой ученый*, (5), 752-754