UDC 631.1.001

STRENGTH CALCULATION fiber concretes ring ELEMENTS OF NORMAL SECTION To the longitudinal axis of strain METHOD FOR

MO Davydenko, Ph.D.

In the article the dependence for calculating the strength of fiber concretes elements ring cross section normal to the longitudinal axis from the main prerequisites to meet the new national standards Ukraine.

Strength, element, reinforcement, basalt, fiber.

Problem. Existing methods of calculating the value of the coefficients and low reliability of the materials used in the regulations for the design stalefibrobetonnyh designs [1], lead to reduced reliability and durability of structures and do not meet European standards [2].

Analysis of recent research. In the article the dependence for calculating the strength of fiber concretes elements ring cross section normal to the longitudinal axis based on the following key assumptions that meet the new national standards [3]:

- Resistance stalefibrobetonu tensile stresses fsftd presented, distributed in the form of a resilient trapezoid in the stretched zone stalefibrobetonu;

- Resistance stalefibrobetonu compressive stresses are presented fcfd, distributed in the form of triangular diagrams of stresses in the compressed area stalefibrobetonu;

Based on the above the accepted assumptions given in Section dependence for calculating the strength of fiber concretes elements ring cross section normal to the longitudinal axis.

The value of N force and moment carrying capacity of M = Ne, perceived circular cross section, defined as the difference between these values for sections with diameters D and d. In determining the carrying capacity of the unknown is the height of the stretched zone X_t and bearing capacity N = Ne. Based on the hypothesis of plane sections X1 value is:

$$X_1 = \eta X_t = (1 - \lambda_{cftu}) \cdot X_t , \quad (1)$$

where $\eta = \dfrac{f_{cftd}}{E_{cf} \cdot \varepsilon_{cftu}}$, $\lambda_{cftu} = (1-\eta)$.

For fiber concretes element circular cross section, provided the amount equal to zero projections of all forces on the longitudinal axis and the amount of points given relatively compressed facets depending on the position of the neutral axis in circular cross-section.

If statement | Situation | neutral axis outside the ring section (Fig. 1) adopted equilibrium equation in the form:

$$\int_{X_{t-D}}^{X_t} f_{fctd} \cdot B_z \cdot dz - \int_{X_{t-D}}^{\eta X_t} f_{fctd} \frac{\eta X_t - z}{\eta X_t} \cdot B_z \cdot dz -$$

$$- \int_{X_{t-D}}^{X_t} f_{fctd} \cdot b_z \cdot dz - \int_{X_{t-D}}^{\eta X_t} f_{fctd} \frac{\eta X_t - z}{\eta X_t} \cdot b_z \cdot dz = N \qquad (2)$$

$$\int_{X_{t-D}}^{X_t} f_{fctd} \cdot (z - X_t + D) \cdot B_z \cdot dz - \int_{X_{t-D}}^{\eta X_t} f_{fctd} \frac{(\eta X_t - z)}{\eta X_t} \cdot (z - X_t + D) \cdot B_z \cdot dz -$$

$$\int_{X_{t-D}}^{X_t} f_{fctd} \cdot (z - X_t + D) \cdot b_z \cdot dz - \int_{X_{t-D}}^{\eta X_t} f_{fctd} \frac{(\eta X_t - z)}{\eta X_t} \cdot (z - X_t + D) \cdot b_z \cdot dz = Ne \qquad (3)$$

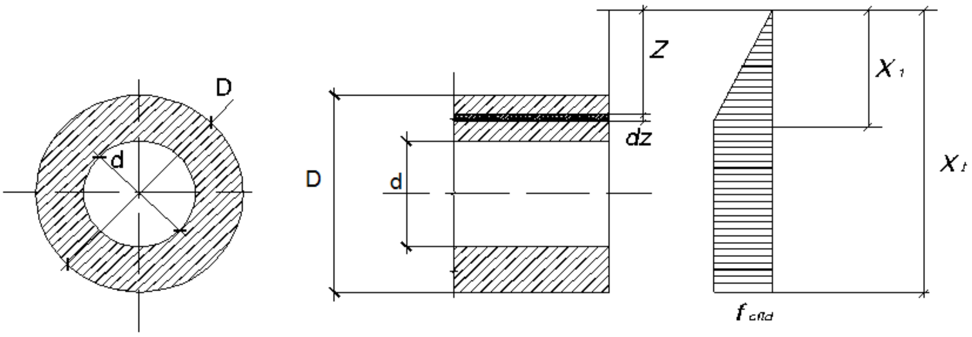


Fig. 1. Diagram fiber concretes | element circular cross section at $X_t \geq D$.

In equations (2), (3) B (z), b (z) - function corresponding to the width of the cross section diameter:

$$B(z) = 2\sqrt{R^2 - y^2} = 2\sqrt{R^2 - (z - x_t + R)^2}, \; b(z) = 2\sqrt{r^2 - (z - x_t - r)^2}, \qquad (4)$$

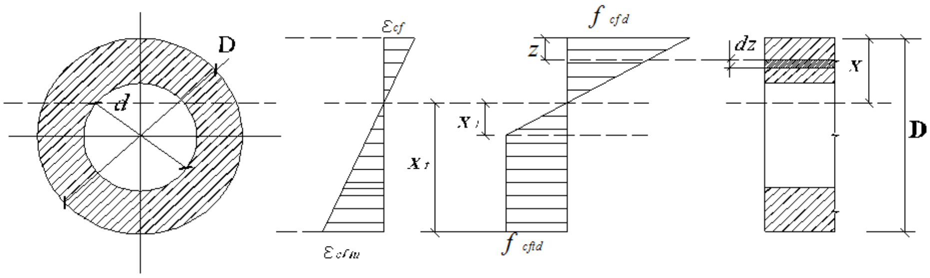
where the value (y) submitted to the relevant sections of the form:

$$y = z - x_t + R, \; y = z - x_t + r, \qquad (5)$$

If the position of the neutral axis outside the ring section (Fig. 2) adopted equilibrium equation in the form:

$$\int_{X_{t-D}}^{X_t} f_{fctd} \cdot b_z \cdot dz - \int_{X_{t-D}}^{\eta X_t} \frac{f_{fctd}(X_1 + X - z)}{X_1} \cdot b_z \cdot dz - \int_0^X \frac{\varepsilon_{fctu} \cdot E_{fc} \cdot (X - z)}{X_1} \cdot b_z \cdot dz = N \qquad (6)$$

$$\int_{X_{t-D}}^{X_t} f_{fctd} \cdot z \cdot b_z \cdot dz - \int_{X_{t-D}}^{\eta X_t} \frac{f_{fct}(\eta X_t + X - z)}{\eta X_t} \cdot z \cdot bz \cdot dz - \int_0^X \frac{\varepsilon_{fctu} \cdot E_{fc} \cdot (X - z)}{X_t} \cdot z \cdot b_z \cdot dz = Ne \qquad (7)$$



Rice. 2. Diagram fybrobetonnoho element circular cross section at $X_t \leq D$.

Comparison of experimental medium series [4] and theoretical values of maximum bending moment and concentrated forces are given in Table. 1.

1. Comparison medium series of experimental and theoretical values of the maximum bending moment and concentrated forces.

Number series	M_{max}^{ex} $кН \cdot м$	M_{max}^{th} $кН \cdot м$	$\frac{M_{max}^{th}}{M_{max}^{ex}}$	$\frac{\nu}{\beta}$	P_{max}^{ex} $кН$	P_{max}^{th} $кН$	$\frac{P_{max}^{th}}{P_{max}^{ex}}$	$\frac{\nu}{\beta}$
T 40	5.227	4.65	0.89	5.08 / 2.90	72.25	64.32	0.89	3.26 / 1.83
T 60	8.416	7.79	.926	3.71 / 1.86	79.00	73.15	.926	2.67 / 1.24

Note: ν - Coefficient of variation, β - The value of the relative error.

Conclusion. The reduced dependence reliably dis-circular cross-sections rahovuvaty fiber concretes: Service performed after checking-ing conditions equal to zero efforts compressed and stretched zone self-keel section (2), (6), check the condition of strength-section (3), (7).

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In Article pryvedenы dependence for calculating prochnosty fybrobetonnыh elements koltsevoho cross-section normalnыh for prodolnoy wasps on the basis of major predposыlok, kotoрые otvechayut join the new standards natsyonalnыm Ukraine.

Prochnost, element, armyrovanyya, basalt, Fibro.

The paper presents the dependences for calculation of strength ofsteel fiber-reinforced elements of circular cross-section normal to the longitudinal axis on basis of basic preconditions which meet national standards of Ukraine.

Strength, element, reinforcement, basalt, fiber.

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MATHEMATICAL MODELING OF TRANSPORTATION vibrating Forage mixture

VS Loveykin, PhD
Y. Chovniuk, AV Hudova, Ph.D.

The mathematical model of vibration transport Forage mixture. The basic characteristics vibroreolohichni Forage mixture in the course of transportation.

Mathematical modeling, vibration, transportation, Forage mixture.

Problem. When vibration in nonlinear mechanical systems having peculiar phenomena that are not inherent in linear systems. On the one hand, these effects should be considered, since they lead to unwanted side effects. On the other hand, these effects can be used to produce beneficial effects in various fields of engineering and technology (including agricultural production and processing of raw materials).

Among these events are:

1) the effect of vibration displacement Forage mixture;