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DESIGN AND ANALYSIS OF THE ACCURACY OF SUPPORTING NETWORK OF MYROPIL DEPOSIT OF GNEISSOID GRANITES

Gneissoid granites are rocks that crystallize deeply in the earth's crust, or during the cooling of magmatic melt under pressure, or during the movement of magma, resulting in a parallel arrangement of mica (more rarely, of other minerals). Taking into account the conditions of Myropil deposit of gneissoid granites, we will build a supporting network around the quarry. Laying the supporting points, we take into consideration not only the existing terrain, but also the shape of the developing deposit, the consistent direction and the final development of mining operations and waste heaps, as well as the design and terms of construction of basic technical facilities, and transport communications.

The moves are laid between two output characters in the form of single moves or the system of moves with one or several nodal points. It is not allowed to lay the closed moves supported by both ends on the same source mark.

The precision of the projected move will be characterized by the marginal error of the point in the weakest place of the move after its alignment. In the polygonal path, before the alignment takes place, the greatest error will characterize the point set at the end of the path. When linking the end of the path to the starting point, the smallest accuracy after the alignment of the coordinates will have the point set in the middle of the run as the most distant from both starting points.

The supporting network of Myropil deposit of gneissoid granites is the network of referencing stations of UA-EUPOS / ZAKPOS, the coordinates of the points determined by the RTK method (GPS + GLONASS) in the coordinate system SK-63 zone 2. The height of the points is determined in accordance with the requirements of level IV leveling, the point coordinates are determined with the accuracy that corresponds to polygonometry of rank 2 (Fig. 1).

Table 1

Comparative table of the proposed parameters of the planned polygonometric network and the corresponding indicators specified in the instruction

№	Function	Polygonometry of rank 2	Known indicators
1	Perimeter of ground, km	12	2,1
2	Length of move side, km • Biggest • Smallest • Average	 0,5 0,08 0,2	 0,41 0,17 0,24
3	Number of sides per move, no more	15	7
4	Relative error of move, no more	1:5000	1:2000
5	Angular misalignment of move, angular seconds, no more, where "n" is the number of angles per move	$20\ \overline{n}$	52,95
6	Average square error of measured angle, angular seconds, no more	10	2
7	Average square error of measurement of side length, cm up to 500 m 500 m –1000 m more than 1000 m	 1 - -	 1 - -

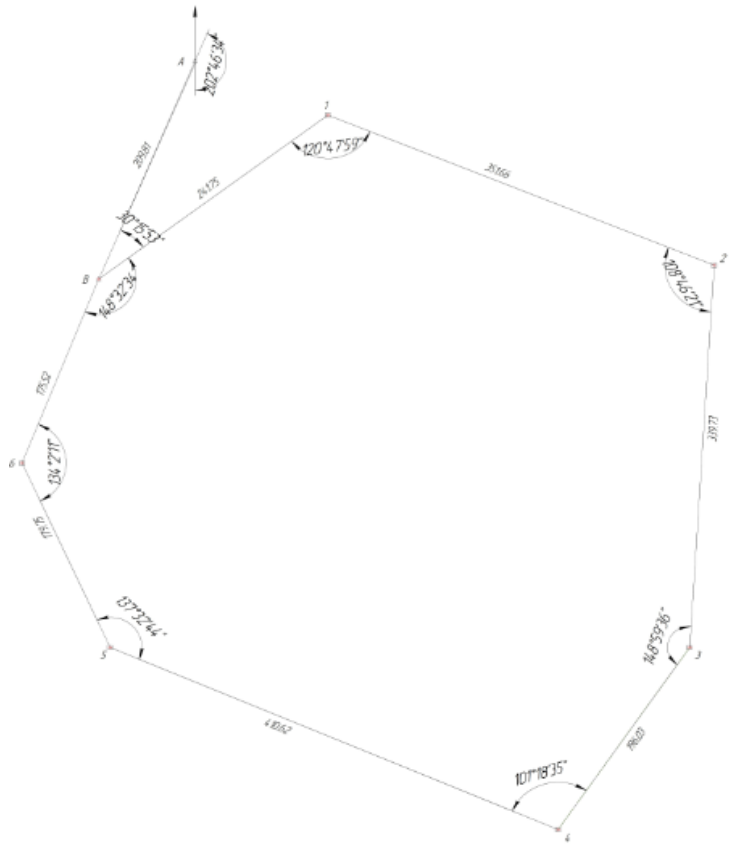

Fig. 1 Polygonometry network scheme of Myropil deposit

We perform the analysis of the accuracy of the supporting network using the measured and calculated values and then determine the general error of the point place:

$$M = \pm\sqrt{M_X^2 + M_Y^2} = \pm\sqrt{0{,}035^2 + 0{,}034^2} = \pm 0{,}049 m;$$

$$M_X = \pm\sqrt{m_{X_\beta}^2 + m_{X_S}^2} = \pm\sqrt{0{,}026^{\,2} + 0{,}024^{\,2}} = \pm 0{,}035\, m;$$

$$M_Y = \pm\sqrt{m_{Y_\beta}^2 + m_{Y_S}^2} = \pm\sqrt{0{,}028^{\,2} + 0{,}019^{\,2}} = \pm 0{,}034\, m;$$

where: Mx, My – average square errors of the coordinates of the point;

$m_{X_\beta}^2$, $m_{X_S}^2$ - errors of the coordinates of the point, and the errors depend on the measurement of the angles;

$m_{Y_\beta}^2$, $m_{Y_S}^2$ - errors of the coordinates of the point, and the errors depend on the errors of measurements of the lengths of the sides.

The value of the expected error is calculated by the formula:

$$M_{OЧ} \le 3M$$

$$M_{OЧ} \le 3 \times 0{,}049 = 0{,}146\, m$$

The allowable error is calculated on the basis of the "Instructions on surveying performance". According to this document, the allowable error should not exceed 0.4 mm. on the plan, that is, 0.8 m for M1: 2000.

Due to the conducted analysis of the accuracy of the supporting network of Myropil deposit of gneissoid granites, we determined that the established geodesic network meets the requirements specified in the instructions for the networks of this type. As a result, we got the error of 0.146 m., which does not exceed the allowable error.