Recycling of the Curve Planning in Gat Technology (Auto Cad) Program

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ABSTRACT
In construction engineering, a curve with a given radius must be perfectly planned. Nowadays, given the development of GAT technologies, their electronic processing further increases the accuracy of the result. Designed with this in mind, this program improves the engineer's workflow and reduces the time of work performed.

KEYWORDS: *The radius of the curve, the given cross-sectional length, the central, right-angled coordinate system corresponding to the angle.*

Introduction. Engineering geodesy is an integral part of existing construction. In particular, the planning of the existing network and the perfect design of the level of accuracy set for them is the task of the science of engineering geodesy. In addition, the science of engineering geodesy plays an important role in various construction projects of the national economy. In particular, before building a road or digging a canal, it is necessary to choose a convenient location for the road or canal route and carefully plan the existing turns (turns), taking into account their thoroughness, cheapness and rapid completion. Such work is called reconnaissance. Before construction begins, it is necessary to indicate the main points of the project, ie the location of construction. This is called moving the project. Relocation of the project will also be carried out by geodetic measurements. Geodetic works are divided into two parts. The first is that the fieldwork is done on-site using a variety of geodetic instruments, and the location of the dots is determined by the location of the measurements. The second is that the camera work is done by drawing a plan based on the results measured in the field and plotting the position of the points on the plan.

The purpose of the work. to process the values given in the camera work in electronic form and to automatically draw a diagram of it, showing the dimensions found using the program Auto CAD, and to explain the ease of operation of the program.

The main part. Planning the curve is called perfect planning of the curve, which determines the position of the given points every 10 m. In this case, the following work is done. The beginning of the curve is marked, and this point is the starting point of the coordinate. Then the end point of this curve is found, and this point is fixed and fixed with pegs, indicating their position. You will then be assigned one of these defined points as the coordinate head. The radius of a given curve is determined by the results of field measurements using a steel strip. Let us define this radius as 200 m. The values of points X and Y are calculated according to the following formulas, depending on how many meters the position of the points on the curve is determined by the angle.

$\mathbf{X_n = R \sin n \varphi}$ - to find the distance of a given point on the x-axis

$\mathbf{X_n = 2 R \sin^2}$ -to find the distance of a given point on the y-axis

In this: **is the number of the point to be found; is the central angle corresponding to the arc**

between the two points; R is the radius of the curve.

The central angle for each angle is calculated as follows.

In this: **k is the length of the angle (20 meters), R = 200 (meters), (constant value).**

The program is very simple to operate and requires you to enter the following values. We calculated the following values and placed them accordingly in the table.1

Table. 1

k-section length	20 m	40 m	60 m	80 m
Point on the x-tangens axis	19.97 m	39.73 m	59.1 m	77.88 m
Signed point on the y-axis	1.00 m	3.99 m	8.93 m	15.79 m

Based on the given coordinates, the position of point x1 is measured at a distance of 19.97 m from the stumbling pile at the origin, and the position of point y1 below this value is measured at a distance of 1.00 m perpendicular to the point on the x-axis and marked with a pile.

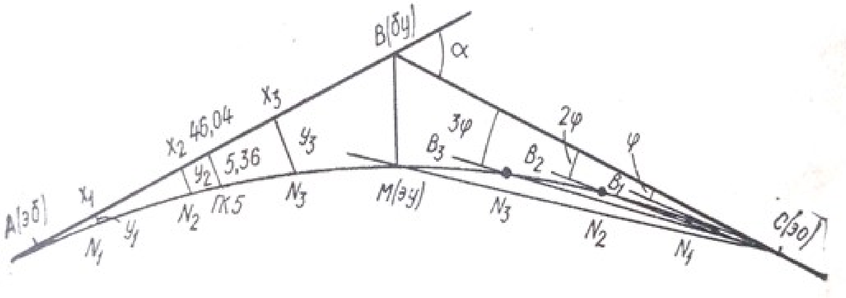

Fig. 1

In this case, each found point is marked in the same way, and you have to draw in millimeters on paper. The program is designed to perform this task, enter values and enter them, and when you press the calculation button, it automatically starts the program Auto CAD on the values and prepares an electronic drawing.

In determining the length of a given section, the position of the points is always calculated from the origin. For example, if the distance from point x0 to point x1 is 10 m, then the distance to point x2 is 20 m.

Here's how to enter values to run the program.

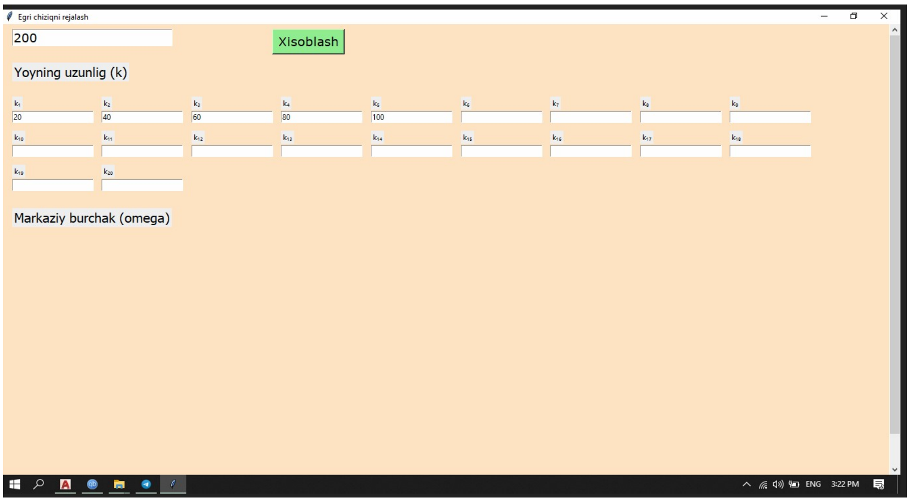

Fig. 2

Enter the radius of the curve in the cell above, then enter the length of the section in the cells below, ie cells k1, k2, k3…, and press the calculate button.

The bottom row (Central Angle: Omega) shows the values of the center angles for each angle.

Then, if you have Auto CAD software on your PC, it will start automatically. Then the drawing in the program will be ready in the electronic Auto CAD program.

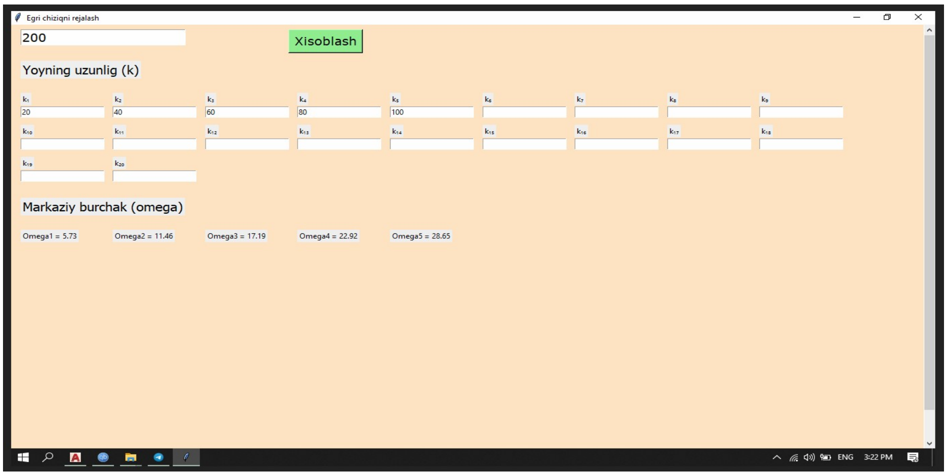

Fig. 3

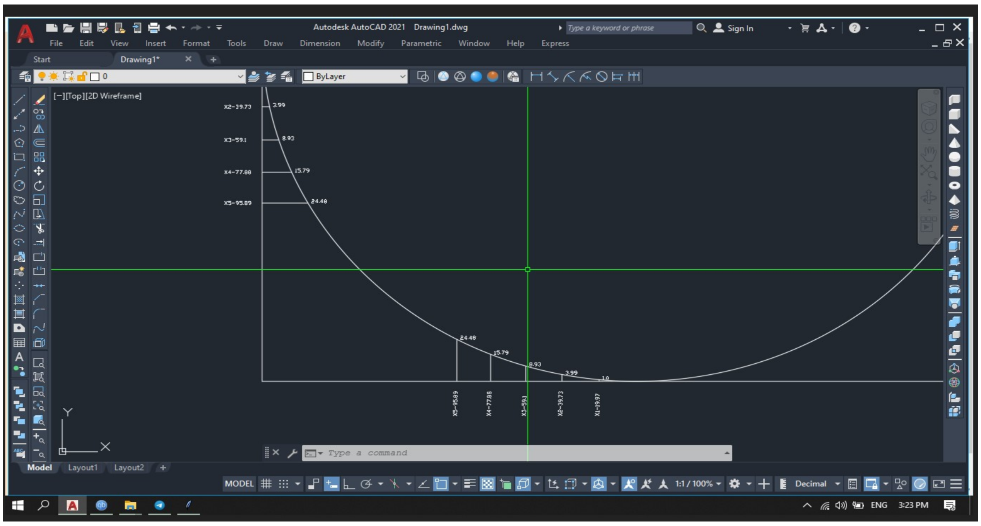

Fig. 4

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