GALAXY INTERNATIONAL INTERDISCIPLINARY RESEARCH JOURNAL (GIIRJ)
ISSN (E): 2347-6915
Vol. 9, Issue 12, Dec. (2021)

THE COMPOSITION OF ENGINEERING AND GEODETIC SURVEYS OF LINEAR STRUCTURES

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ABSTRACT

In the production of engineering and geodetic surveys of linear structures, the geodetic basis is the points (points) of a planned high-altitude survey geodetic network created in the form of main passages laid along the route.The article discusses the composition of engineering and geodetic surveys of linear structures and general requirements for them.

Keywords: surveys of linear structures, their composition, leveling signs, geodetic signs, investment of materials, cameral tracing, technical report.

INTRODUCTION

The main passages of the survey geodetic network during surveys of linear structures should be linked in plan and height to the points of the state or reference geodetic network at least after 30 km (for surveys of main channels 8 km).

When removing the points of the state or support geodetic network from the highway at a distance of more than 5 km, it is allowed to determine, instead of the planned binding, at least 15 km away, the true azimuths of the sides of the main course.Methods for determining true azimuths and requirements for measurement accuracy should be established in the survey program.

When surveying linear structures on the territories of cities and other settlements, as well as industrial (agro-industrial) and mining enterprises, planned and high-altitude linking of the survey geodetic network to the points of the state or reference geodetic network is mandatory.

The structure of engineering and geodetic surveys for the construction of linear structures additionally includes:

cameral tracing and preliminary selection of competitive route options for field work and surveys, field tracing;

surveys of existing railways and highways, drawing up longitudinal and transverse profiles, intersections of power transmission lines, communication lines, radio communication facilities, radio relay lines and trunk pipelines;

coordination of the main elements of structures and external measurements of buildings (structures);

determination of the total and useful lengths of railway tracks at stations and the dimensions of the buildings.

During surveys for the construction of linear structures in undeveloped territories, the starting and ending points of the tracks (if they are not fixed on the ground), the tops of the turning angles, as well as the leaf points of rectilinear sections within mutual visibility (but at least after 1 km) should be fixed with temporary signs (wooden and reinforced concrete pillars, metal caps, etc.).

In built up areas pinning tracks, as a rule, is not possible and they must be used for at least three linear measurements to the constant of premetastatic (corners of buildings, structures, etc.).

To survey for the construction of linear structures levelling characters must be installed:

for roads and Railways,the main channels not less than 2 km;

along pipeline routes at least after 5 km (including at crossings over large watercourses and at organized water measuring posts).

At bridge crossings over large rivers, permanent reference points should be installed on both banks of the river.

Geodetic signs (reference points) fixing the axis of the route of linear structures are to be used as a center base during subsequent construction and must be transferred by act to the customer or the organization specified by him.

In the field, when exploring new routes of linear structures, it is necessary to perform:

reconnaissance survey of competitive route options and locations of structures, if necessary, visual (aerial) inspections to determine the completeness of the content and reliability of available materials;

route aerial photography for drawing up large-scale plans, planned-altitude binding and decryption of aerial photographs according to route options;

creation of a planned high-altitude survey justification and carrying out topographic surveying of concrete and complex areas on a scale of 1:5000- 1:2000 in cases where it is economically impractical and not possible to reproduce aerial photography;

laying of tacheometric moves with a set of pickets in characteristic places of relief and situation.

As part of the technical report on the routes of linear structures, the customer should be provided with the following documentation:

plans of the selected options for the route of linear structures;

longitudinal profiles according to route options (may not be compiled according to the customer's instructions);

the layout of the workings (points) or a copy from the map (plan), a catalog of the coordinates of the heights of the workings (points).

Technical indicators should be given in the reporting materials:

the length of the route according to the selected options;

the length of the route through arable land, forest, meadow, gardens, vineyards, swamps, etc.;

the passage of the route through areas with unfavorable construction conditions, built-up areas, mountainous areas, etc.;

the intersection of the route by watercourses, railways, highways, etc., their number and intensity;

the length of the route passing through the terrain without roads, areas of convergence or parallel following with railways and highways, power lines and communications, etc., possible demolitions of buildings and other indicators taken into account when choosing the direction of the route.

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