

THE CADASTRAL WORK CONTENT IN THE KAZAKHSTAN REPUBLIC

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Abstract. *The article describes production of the land-management project by means of geodetic engineering. It sets a complex of measures and actions to provide geodetic and cadastral system of the country. Geo-information technologies are widely used in the city and land cadastral. In the article the project activity is connected with interests of both the market so as industry. The model can be used as the basis to develop private technologies which needed to solve the problems set for private and state licensed organizations. This article refers strictly to the Land Code of the Kazakhstan Republic. It establishes conditions to keep the land cadastral, its content, competences of the government specially authorized bodies.*

Keywords: *the land-management project, geodetic engineering, the Cadastral System of the Kazakhstan Republic, the land cadastral, geo-information technologies, the general plan, Polygonometry, land survey.*

Keeping the cadastral is not possible without geodetic engineering the tasks of which are geodetic works, project work and bringing the projects to the field, geodetic supplying of land management and cadastral.

A cadastral is a set of data about natural, legal, industrial, economic and geographic position of non-movable assets given according to the specific requirements.

The materials of the geodetic works are basis to do land, geo-botanical and other examinations and research, planning and rational using of land, describing of location and defining in the field the boundaries of the land management objects and inter-industrial land planning.

Keeping the cadastral is impossible without modern geodetic provision.

Organizing the land cadastral works is done by the territorial bodies of the Kazakhstan Republic Agency on Land Management.

Physical and juridical people who do land cadastral works must have the corresponding license to perform the mentioned types of work according to the Law of the Kazakhstan Republic «On License».

The conditions of keeping the land cadastral, its content, competences of the specially authorized bodies, the procedure is outlined in the Land Code of the Kazakhstan Republic on 20, June, 2003 № 442-II (with changes and additions on 15.06.2015).

The land cadastral works can be performed by the people who have a corresponding special license.

This report deals with the issue of the land management project by means of geodetic works.

The general plan of the city is the basic Urban Planning Code that defines conditions to form living, directions and boundaries of living territories development, territories zoning, development of engineering, transport and social infrastructures and etc. The general plan of settlements is developed and adopted by the local authority bodies.

The main structural element at developing the project of planning the housing is a micro-area and in the industrial zones – a block-quarter of industrial buildings and structures. The elements of living and industrial building are limited by red lines.

The detail planning project is an urban planning documents developed for some territories of the city and out-of-town settlements.

The elements of the planning structure:

- Red lines and lines to regulate building;
- Boundaries of plots of land;
- Parameters of the streets, routes, pedestrian zones and also constructions and facilities, transport, communications and etc.

The task of the detail planning project is specifying and developing of the decisions adopted in the general urban plan to the level that allows designing tasks to make building projects. The detail planning project includes:

- the location scheme of the project area in the urban system;
- the design (the red lines plan);
- the layout drawing of red lines;
- the scheme of engineering preparation and vertical planning by routes directions;
- the scheme of engineering frameworks;
- the template of planning and building.

The red lined plan is a constituent part of the general plan of settlement and it can be a separate urban construction document.

The city polygonometry is a backbone geodetic framework. In big cities it is put between the points of triangulation and in small ones where triangulation development is not provided polygonometry is the only backbone framework.

Polygonometry serves not only for large scale surveys but also to perform such works as:

- a) bringing the projects of planning and building cities and settlement to the field;
- б) marking the networks of urban underground facilities (water system, sewage system, gas system, telephone, electric and heating systems and etc.);
- в) bringing and control of red lines; current checking of buildings and constructions in work in the industrial, civil and housing complexes;
- г) special survey connected with improvement and engineering equipment of the cities;
- д) projecting and building of the metro, canals and bridges.

The projects of polygonometry of the built and inbuilt territories are developed with account of their further possible densification to do the survey on the scale 1: 500 and on its results to do different marking work for building.

The projected routes must be put depending on the scale of the survey performed on this territory with account of the instruction demands.

In the settlements they create, as a rule, polygonometry of 4 class (1st and 2d category). [1]

Polygonometry is a method to create planned geodetic frameworks that are to build frameworks of routes which measure all angles and sides.

Landmark boundaries framework (LBF) is a special geodetic framework created to coordinate provision of the State Land cadastral, state land monitoring, land management and other actions to manage the land resources of Kazakhstan.

Cadastral survey framework is a geodetic net of density created to survey the land plots, land inventory and performing other works to create the state cadastral of non-movable assets.

The land survey is a complex of works to demarcate, refixate and mark in the field the boundaries of the land plot, to determine its location and square.

Table 1. The basic characteristics of geodetic frameworks created by polygonometry methods

	4 class	1 category	2 category
1.The route ultimate length, km	15	5	3
2. The polygon ultimate perimeter, km	30	15	9
3. The ultimate sides length, km	2	0,8	0,35
4.The number of sides in the route	15	15	15
5.The route relative error	1/25000	1/10000	1/5000

Depending on the specificity and type of fixation in the field they are divided into:

- points of landmark boundaries (PLB), put for a long (not less than 5 years) period of time;
- boundary marks put on the turning points of the boundaries made of cheap materials;
- boundaries along "natural stows" (rivers, strings, streams, watersheds and etc.);
- boundaries coinciding with linear constructions (fence, buildings fronts, elements of the road frameworks and etc.);
- ploughed lines of the upland boundaries.

In this case to receiving by the citizen a new land plot is a reason to survey the land.

The whole process of surveying lands by its content and place of realization can be subdivided into the following stages of works:

- preparation;
- in field;
- cameral.

During the preparation work we collected and analyzed the following initial material:

- the land management project, the land inventory materials;
- the act of the city's (settlement's) authority as to give a land plot to the citizen;
- records from the book of the land plot registration;
- data of the boundaries arguments about this land plot;
- the boundaries drawing or the cadastral maps (plans) with the boundaries of the land plot;
- topographic maps and plans;
- the schemes and lists of the points of the SGS;
- the schemes and lists of the points of landmark boundaries (PLB) coordinates;
- the lists of the boundaries marks in concern of the land management project and also the project coordinates of the newly made or transformed land plot;
- information of the special status of using the land.

As the result of the field survey we found out possibilities of using these or those methods and devices to fix the landmarks and detecting their coordinates.

As boundary marks we used the wooden stakes of height 75 - 80 cm, diameter 5-7 cm, metal stabs and pipes sunk in the ground 0,4 - 0,6 m deep.

The boundary marks on the surface without covering were dug around with a ditch of the inner diameter 0,8 m, depth 0,2 m and width in its lower part 0,2 m.

At the fixation the boundary mark was oriented so that its front side (with inscription) faced the next boundary mark along the boundary length clockwise.

The land surveying is done according to the technical project where the content, volume, labor cost, necessary materials, estimated cost, period of work execution and safety measures of work.

The technical project includes:

- the text;
- the graphic materials;
- estimated cost and calculation of necessary materials.

Establishing the boundaries of the land plot is done in the field in presence of the representative of the city's (settlement's) authorities, keepers', owners (user's) of the marked and next to it land plots and their representatives the authorities of whom are certified by the law.

The results of establishing and agreeing of the boundaries are certified by the act which is signed by the owner of the demarcated and next to it land plots, city's (settlement's) authority's body and the engineer-land surveyor who does the work. [2]

After fixing on the ground the boundary marks their plan location is determined with the GPS-navigator.

During the process and after completing the land surveying of the plot by the doer of the work the current control and approval of the finished product was done.

After the land surveying work the landmark case was prepared that included:

1. an explanatory memorandum;
2. the excerpt from the resolution of the municipal bodies on giving the land plot;
3. the lists of the boundary landmarks;
4. the check act of the previously fixed boundaries of the land plot;
5. the notice to summon the keepers, owners and users of the surveyed land plot and the next to it ones to participate in actions to landmark survey;
6. the act of establishing and agreeing of the land plot boundaries;
7. the act of control and acceptance of the land survey by the work doer;
8. the drawing of the land plot boundaries;
9. the sheet of calculation the square of the land plot;
10. the act of the state control as to establishing and securing the boundary marks.

The boundary case is registered and constantly kept in the land boundary archive of the Land Resources and Land Tenure Committee.

Nowadays it is quite topical to create an automated system for the city cadastral on the basis of modern computer technologies and telecommunications as a single complex to receive full information. Creating an automated system the task is divided into development of several separate types of provision: organizational, technical, program, information and also map-graphic. It is obligatory to require interoperability of the map-graphic system with other components. [3]

Choosing the program products it is vital to provide steady connections with different systems by file standard of exchange geometric and theme data. Taking into account the factor of constant modernization of information devices and modification of program means it is essential to provide security transmitting of data to new program devices mediums.

To the technical problems of supplying the work of information cadastral systems we refer projecting the mathematic basis for electronic maps, projecting the digital model of location, data transformation into its digital form tasks, geometric modeling of space information, problem modeling of the theme data and etc.

Of great interest are new GIS-technologies that provide operability, completeness and reliability of information such as about the current condition of the city's medium in the boundaries of this or that territory of the city.

GIS is a system of technical and program means, technological, organizational-methodical and information provision to collect, save, preserve, process, and display, analyze, disseminate and provide information about the spatial objects.

The cadastral works are required to describe the non-movable object as a right object. Thus, doing the cadastral work we create non-movable objects as objects of civil rights according to the Land Code of the Kazakhstan Republic on 20, June, 2003 № 442-II (with changes and additions on 15.06.2015). [4]

At the modern stage of economy development of Kazakhstan the cadastral works serve as basic mechanism of creating new land plots. Without cadastral works it is impossible to give and withdraw land plots.

To do cadastral works one must have competence on technical and juridical issues that is why it is especially important to involve highly trained professionals to perform cadastral works.

The competent licensed body on land management in the Kazakhstan Republic is RSE «SIClc».

The professional approach to cadastral works allow in no time giving the land plots under building and in this way increasing the economic indices of the realized investment projects.

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