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ISSUES CONCERNING DELIMITATION OF BOUNDARIES IN LAND CONSOLIDATION

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Abstract

Land consolidation plays an important role in rural areas management by stimulating the areas to develop and contributing in particular to the creation of favourable conditions for agriculture. Land consolidation process enables to form a new state of ownership and is crucial for the improvement of area structure of Polish agricultural holdings. Efficient rural areas management necessitates reliable information about property boundaries. Determination of property rights requires a precise space delineation of those rights by establishing the position of parcel boundaries, which determines future land utilization and possible directions of property development. Clear, unequivocal and reliable establishment of boundaries determines the feasibility of future investments, particularly in the field of technical and social infrastructure.

The paper presents technological and legal aspects of the performance of geodetic works concerning the establishment of the position of boundary points in the proceedings of land consolidation. In the study there were examined existing legislation and technical regulations relating to the process of land consolidation. The records were examined in terms of land demarcation procedure, led particularly by district governor, in relations to the outer boundaries of land consolidation area and in terms of establishment, indication and marking on the ground of newly planned boundary points, resulting from land consolidation project. Theoretical research was confronted experimentally based on the selected land

consolidation object. Conducted theory and practice research allowed to submit proposals for changes to the binding land consolidation procedure.

Key words: boundary point, boundary line, land consolidation, technologically-legal area of borders of land parcels.

INTRODUCTION

Land consolidation is an instrument that serves in Poland for the development of the rural areas and the agriculture (Sobolewska-Mikulska et al., 2014). The process plays an important role in stimulating rural areas to develop and contributing in particular to the creation of favourable conditions for agriculture. Considered as a comprehensive tool in rural planning and management, land consolidation can improve farm productivity (Miranda et al., 2006). It can be used for amending the spatial structure of whole villages (Janus, 2011). However, Markuszewska (2013) notices that land consolidation in Poland is encountering with a number of obstacles, inter alia cumbersome formal and legal policy. According to the authors one such obstacle is the occurrence of many legal regulations concerning the determination of borders in rural areas which are not mutually compliant. Efficient rural areas management necessitates reliable information about property boundaries. Determination of property rights requires a precise space delineation of those rights by establishing the position of parcel boundaries, which determines future land utilization and possible directions of property development. Clear, unequivocal and reliable establishment of boundaries determines the feasibility of future investments, particularly in the field of technical and social infrastructure.

The determination of the borders in the land consolidation process is a particularly delicate work (Roncevic et al., 2016). The issue of determination of agricultural land borders in Poland is problematical and difficult, inter alia due to the methods of land and buildings register establishment in the years 1955-1970 (Stępień et al., 2016). However, land consolidation works have direct impact on the improvement of quality of cadastral data in a comprehensive way and allow to create a cadastre of standard value in regard to rural districts in so called proceedings of „cadastral land consolidation" (Taszakowski et al., 2016). Issues concerning the coherence of the technological and legal space of parcel boundaries in land consolidation processes was undertaken by Łuczyński (2009), who reviewed legal and technical regulations concerning land consolidation, existing at that time, and analysed determination, surveys, marking of surveying points and documenting locations of boundaries of both existing and newly planned status, using the example of two sites where land consolidation was performed in 1987 and 2007. The incentive to perform the new analysis of locations of

boundaries in land consolidation works were new legal regulations, in particular the decree on technical standards (2011) and the novelty of the decree on land and buildings registers (2001). The new legal regulations introduced important changes comparing to provisions of technical instructions G-4, G-5, O-1 and the technical instruction no.1 on land consolidation, of 1983, quoted in the work by Łuczyński (2009).

ESTABLISHMENT AND DELIMITATION OF BOUNDARIES

The act on consolidation and exchange of lands (1982) states that determination of boundaries and size of the land consolidation area is included in the resolution concerning the commencement of the land consolidation process; following the Geodetic and Cartographic Law (1989) this decision substitutes the decision concerning delimitation of real estates. Therefore, following the act (1989) and the decree on delimitation of real estates (1999), concerning delimitation of real estates, generally performed by a mayor or a city president, according to the decree on technical standards (2011) concerning renewal of boundary marks, location of boundary points and boundaries should be determined, marked, surveyed and documented in land consolidation proceedings, performed by the starost. Following the act (1982) the land consolidation process covers lands located in one or several villages or in their parts. Therefore, boundaries of cadastral districts, which were marked and fixed during works related to creation of the land register, following the decrees (1955) and (1962) will be the subject of the procedure of restoration of boundary marks, following Art. 39 of the act (1989). Boundaries determined in the past and marked by boundary marks cannot be delimited, if it is possible to reconstitute primary locations of boundary marks basing on the existing documentation. Following §30 of the decree (2011) renewal of boundary marks, including preparation of documents concerning the renewal of boundary points, is performed using data from observations, which determine positions of boundary marks, basing on the geodetic control which was used to acquire this data; the procedure is performed after notification of interested parties, according to Art. 32 of the act (1989).

Art. 20 of the act on consolidation and exchange of lands (1982) says that „conditions of property and possession of land, areas and classes of lands are determined on the basis of land and buildings register data". It should be stressed that the above statement is not compliant with the act on property registers (1982), which says that „property registers are maintained in order to determine legal conditions of a real estate".

Following the instruction (1983) „basing on the newly established geodetic control boundaries of a consolidated village should be determined and surveyed and the area should be calculated, based on coordinates, assuming it as

binding", however, in the case when „the difference between the area of lands, calculated from coordinates and the area of lands listed in the cadastral records exceeds values specified in Table IX (Annex 48 to the Instruction) the area of those lands should be modified in the cadastral documentation". Although the binding legislation, approved after the instruction (1983) was published (i.e. the act (1989), the decree (2001)and the decree (2011)) regulate the rules of updating the land and buildings registers and the rules of disclosing new areas of lands in the cadastre, the above provisions of the instruction (1983) may be considered as reasonable. It is highly probable that – after delimitation or renewal of boundary marks and utilisation of a more accurate method of area calculations – the size of the land consolidation areas will change comparing to the existing value, specified in the cadastre. In order to avoid the situation when the size of the land consolidation area, specified in the resolution differs from the value specified in the decision, the coherence between records in property registers and in the land and buildings register should be ensured and the land and buildings register should be modernised. The disadvantage of this solution is the necessity that two independent procedures are performed by the starost: modernisation of the land and buildings register and than the land consolidation process.

The land consolidation plan is developed by the surveyor (the designer of land consolidation works), authorised by the starost; the plan is developed in cooperation with the advisory commission. Following the instruction (1983) differences between data presented in the land register and the real conditions (in the field) should be presented in the list of changes and considered when the register is created prior to land consolidation. This provision is not compliant with Art.20 of the act (1982), which requires that the register prior to land consolidation presents data included in the land and buildings register. Therefore it is useful to modernise the land and buildings register before implementation of the land consolidation process.

Development of the land consolidation plan includes marking and surveys of boundaries of residential parcels and detailed plan of new parcels. The land consolidation plan determines proposed boundaries of delineated lands and the rules of acquisition of possession of those lands.

The land consolidation plan is marked in the field using method which allows to achieve the required accuracy, according to requirements of the decree (2011). Sketches of delimitation of the land consolidation plan and the geodetic control are the basis of delimitation of the land consolidation plan in the field. The geodetic control is the detailed control and the minor control. The accuracy of the minor control should be maintained according to the decree on technical standards (2011), which says that the minor control should be established with the accuracy of 10 cm, as the minimum with respect to the higher order control, and the accuracy of the detailed control is specified by the decree on geodetic controls (2012).

The Instruction (1983) specifies that boundary points are marked by surface and underground marks. It should be stressed that these guidelines are not the law and it should be considered whether the obligation to mark boundary points with surface marks in rural areas is justified due to agricultural works performed within those areas. The issue of marking boundary points has not been regulated in the act (1982), what means that there is no legal obligation to mark new boundary points. Such obligation exists for outer boundaries of the land consolidation area only, for which delimitation of real estates or renewal of boundary marks took place. This means that the issue of marking new boundary points depends only on participants of land consolidation, since they are charged by costs of those operations, due to the lack of the legal obligation to mark those points.

RESULTS OF EXPERIMENTS

The analysed site of the land consolidation project, of the total area of 1005 hectares, is located in three cadastral districts. The Chruszczobród cadastral district, of the size of 440 hectares, has been assumed as the test site. The land consolidation process was commenced by the resolution of the starost of October 1, 2012. Before land consolidation works were started, there were performed study works and consultations with appropriate state and local government bodies, which administered lands located in the analysed area. Preparatory works included the general assumptions for the land consolidation project, prepared in the descriptive and graphical forms.

Source data acquired from the District (Powiat) Geodetic and Cartographic Documentation Centre included: the descriptive database of the land and buildings register, the analogue cadastral map, the basic map, documentation of creation of the land and buildings register, documentation which amended the land and buildings register, including calculation of administrative boundaries of the district (powiat), the administrative units and cadastral districts in those units, as well as documentation concerning classification of lands, data of the geodetic control and digital elaborations of Phare 2003 Programme (the incomplete work with errors, which was not used in land consolidation operations).

Data in the descriptive database of the land and buildings register included in 604 items were coherent, readable and free of errors. The cadastral map was maintained in the analogue form. Some discrepancies occurred between data concerning lands in the land and buildings register and the master cadastral map. They were corrected in the documentation amending the land classification. The documentation of creation of the land and buildings register contained, among others, sketches and records concerning the location of the outer boundaries of the Chruszczobród Village including the description of location of bounda-

ries and the list of individuals who were present at the time when locations of boundaries were determined, as well as field sketches of surveys of possession, sketches of auxiliary surveys and records concerning the possession conditions. Performed land consolidation works also included data contained in all unit documents, which amended the land and buildings register for the Chruszczobród district. Those data included, among others, boundary protocols, lists of coordinates of boundary points and controls, basic sketches, field sketches and other materials which allowed to restore locations of boundary points, previously determined in the documentation.

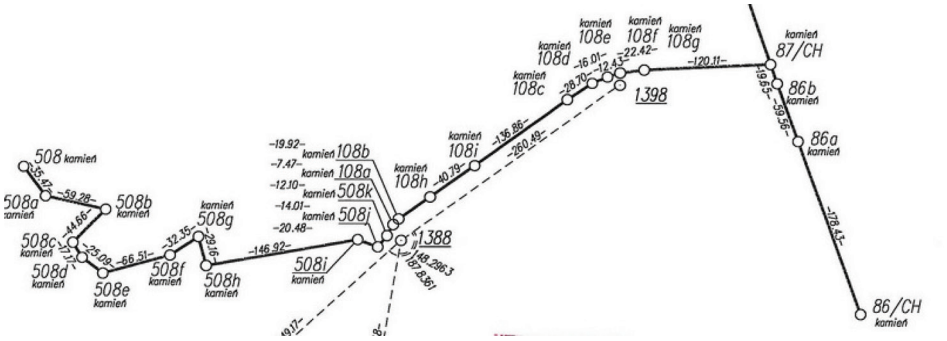
According to produced maps of comparative estimation of lands and the approved resolution concerning the adoption of estimation of lands of November 15, 2013, areas and estimated values of cadastral parcels were calculated and records of comparative estimation before the land consolidation were produced. Land consolidation works included the determination of locations of boundaries of built-up parcels. Boundaries were surveyed according to the legal status, the real status or according to indications presented by interested parties. Boundary points of built-up areas were marked (using boundary marks such as a concrete pillars + a bottle, a pipe or assuming the stable terrain features). A fragment of the sketch of boundary surveys of residential parcels is presented in Fig. 1.

Source: WBGiTR Częstochowa, PODGiK Zawiercie

Figure 1. Fragment of a sketch of boundary survey of residential parcels.

Boundaries of the land consolidation area were determined basing on data from the documentation of creation of the land register for the Chruszczobród Village and the digital elaboration of the powiat boundaries and the source technical documentation. Surveys were performed using the GNSS (RTN) or polar method for the 3rd class control. „Sketches of determination and surveys" were made for performed operations (Fig. 2). However, those works were performed without making the protocols of renewal of boundary marks,

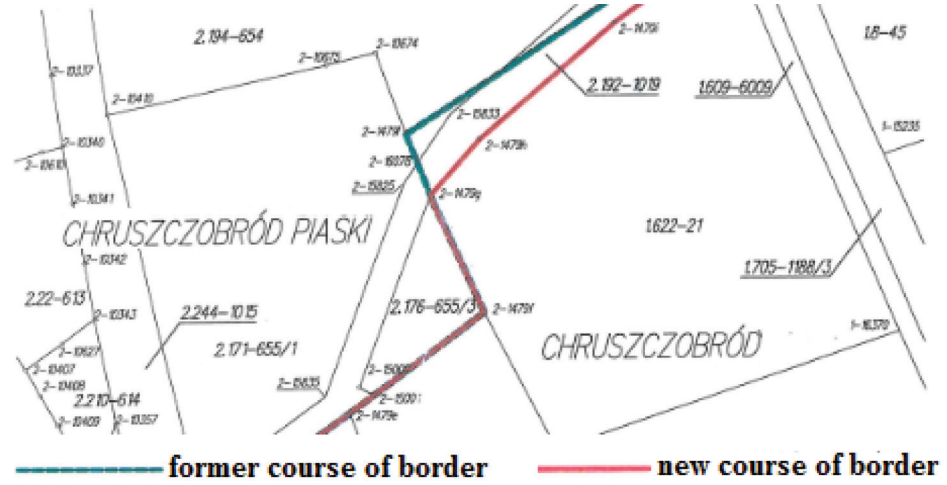
presenting the location of boundary lines in the frames of presentation of the land consolidation plan.



Source: WBGiTR Częstochowa, PODGiK Zawiercie

Figure 2. Fragment of a sketch of determination and survey of cadastral districts boundary points.

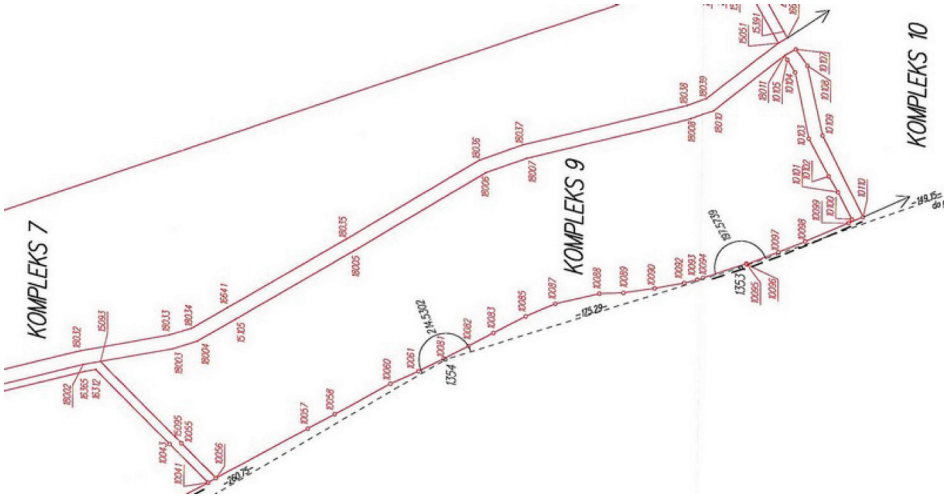
As a result of modifications of locations of boundaries between Chruszczobród and Chruszczobród Piaski cadastral districts (Fig. 3) the difference in the district area, equal to 5.2923 hectares was created. The real area covered with the land consolidation project was calculated; it equals to 439.8923 hectares.



Source: PODGiK Zawiercie

Figure 3. Change in the position of the boundary of the cadastral district.

Following the assumptions of the land consolidation plan boundaries of roads and planned design units (complexes) were determined. The majority of surveys were performed using the GNSS (RTN) method. The detailed control of the 3rd class was utilised as control points. Boundary points were measured twice, using the polar method or the GNSS (RTN). Points of apex of roads were marked (using such marks as a concrete pillar + a bottle, a pipe or assuming permanent terrain features). A fragment of a sketch of establishment of boundaries of design units ("kompleks 7", "kompleks 9", "kompleks 10") is presented in Fig.4. The areas and estimated values of new design units (complexes) and roads were calculated basing on performed surveys. Then, the participants of the land consolidation project were asked to present their expectations and requirements and the preliminary plan of new parcels was prepared. After consideration of individual comments presented by the individual participants of the land consolidation process, equivalent items were planned and the records of comparative estimation of lands after land consolidation were produced.



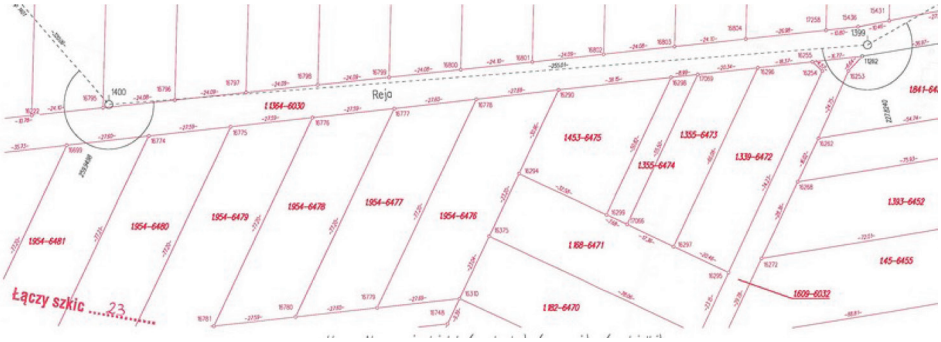
Source: PODGiK Zawiercie

Figure 4. Fragment of a sketch of establishment of boundaries of design units.

The agreement concerning the assumption of possession of newly delineated lands was made on April 28, 2014 with the participation of the council of participants of the land consolidation process. The land consolidation plan for the village of Chruszczobród was developed; it was presented to the participants between June 3 and 13, June 16 and 24, and July 25 – 26, 2014. Following provisions of the act (1982), the notification of the period of presentation of the land consolidation draft was publically announced – it was displayed for the period

of 14 days on advertisement boards in Chruszczobród, at the Powiat (District) Management Office and at the Municipal Office, before the plan was presented. The report on presentation of the land consolidation plan was made. The surveyor communicated the conditions of the assumption of possession of lands delineated after land consolidation and the details of the land consolidation plan to the participants of land consolidation.

Delineation and presentation of the land consolidation plan in the field were based on the detailed control of the 3rd class. Delineation of boundary points was performed using the GNSS (RTN) and polar methods. Boundary points were marked with poles. Boundary points were additionally fixed as underground marks, with concrete pillars with bottles, at the costs of the land consolidation participants. Then, boundary points were surveyed – deviations resulting from comparing the coordinates did not exceed +/ – 10 cm; therefore designed coordinates of boundary points were approved. Sizes and estimated values of newly planned parcels were calculated; calculations of planned design complexes were also performed and the register of lands and maps after land consolidation and sketches of delineation of the land consolidation plan were produced. (Fig. 5).



Source: PODGiK Zawiercie

Figure 5. Fragment of a sketch of delineation of boundaries of newly planned parcels.

After the presentation of the land consolidation plan 13 objections were submitted. All objections to the land consolidation plan of the Chruszczobród Village were investigated on July 30, 2014 by the representative of the starost, at the presence of members of the land consolidation commission and with the participation of the land consolidation planner and interested parties. On the day of investigations 4 individuals withdrew their objections, next 4 objections were considered not relevant and remaining 5 objections were considered justified and appropriate changes were introduced to the land consolidation plan.

The completed technical documentation was passed to the Powiat (District) Geodetic and Cartographic Documentation Centre (PODGiK). The land

consolidation plan was approved by the decision of the starost on August 14, 2014. As a result of this decision new locations of boundaries between the Chruszczobród and Chruszczobród Piaski districts were approved. This decision was also the basis for assuming the possession of lands by the land consolidation participants and disclosing the new status in the land and buildings register. The new status was also disclosed in property registers, created for the properties located within the area of the land consolidation project. According to the agreement of April 28, 2014, concerning the rules of the assumption of delineated lands by the participants, the date of September 30, 2014 was considered as the date of the assumption of post-consolidated lands by the participants of the land consolidation project.

CONCLUSIONS

As a result of confronting the binding legal and technical regulations with the results of tests performed for the test site, the following conclusions may be drawn:

1. Boundary marks of outer boundaries of the land consolidation areas were renewed without notification of interested parties. A report concerning the renewal of boundary marks was not prepared. „Sketches of the land consolidation area boundaries" were made. The presentation of that boundary to the interested parties was done as a part of the delineation of the land consolidation plan.
2. The act (1982) requires amendment. The property status – as it is confirmed by works performed for the test site – is assumed according to documents which confirm the legal status and not according to data from the land and buildings register. It is proposed that the modified Art. 20 of the act (1982) should say: „The property status is assumed according to documents which confirm the legal status of the property and areas of cadastral parcels, lands and soil classes are determined basing on the real estate cadastral data."
3. Surveys of boundaries of built-up parcels were performed as the part of land consolidation works. Boundaries of non-built-up parcels were not the subject of surveys. Therefore, in the register of the status before land consolidation there was not presented the real property status, but – according to Art. 20 of the act (1982) – areas were assumed from the land and buildings register. Discrepancies between the descriptive part and the cartographic part of the land and buildings register are the disadvantage of that solution. In order to avoid those discrepancies the land and buildings register should be modified, including determination of boundary points, before land consolidation works are

performed. This would highly simplify land consolidation works and allow to maintain the compliance between the real status in the field and the status presented in the cadastre.

4. According to intentions of the land consolidation participants, the boundaries of the new property status of the test site, were fixed in the field at their expenses, since only determination and disclosure of location of boundary points (e.g. marking using poles) may be covered by the costs of the land consolidation process.
5. Land consolidation is the only surveying procedure in rural areas which regulates the property rights and explicitly determines the extension of those rights. A new structure of lands is established. A new land register documentation is created. The full compliance between the real status in the field and the status disclosed in the real estate cadastre and in property registers, created for the newly created real estates, is ensured. In order to practically achieve such an ideal status the knowledge of many legal regulations is required, which are still not mutually compliant. Experienced surveyors who perform land consolidation works are still using the outdated instruction (1983), since it has not been updated for more than 30 years. Therefore they must adapt that instruction to the binding legislation. At the same time, another standard of performing land consolidation works and developing relevant documents, is still missing.

Apart from the required amendment of the act (1983), the key conclusion resulting from performed research works is as follows: the new technical instruction should be developed, which would concern implementation of land consolidation works; basing on binding legal regulations this instruction would also regulate particular stages of land consolidation works and include example documents created during such works. This instruction should also consider all complex operations of the land consolidation process, as well as environmental and ecological conditions of rural areas.

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