APPLICATION OF COMPLEX TOPOGRAPHIC METHODS NECESSARY TO ACHIEVE A PROJECT IN ORDER TO CREATE A POULTRY COMPLEX

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Keywords: poultry farm, topographical maps, RTK method

ABSTRACT

In order to achieve this work, it follows framing of the poultry complex in actual European Standards using high precision topographic works. Theme approaches the problems of a topographic survey work made for founding a familiar farm in the poultry activity, made using rural development project applied at Size 121 and execution of the necessary surveys for execution foundation of the afferent buildings, executed in Jimbolia, Timis County. For the construction of the main pavilion, it is necessary to process the data from the field determined by the GPS, RTK method in order to achieve a situation plan. Further, after obtaining approvals and building permit, based on documents it was executed elements calculation for survey on the field of buildings and surroundings, survey made using the method of polar coordinates.

INTRODUCTION

The work aimed to determine the areas and quotas of all the existing and future planimetric details related to this work provided in PUZ (Zonal Urbanism Plan) and PUG (Detailed Urban Plan) Jimbolia, being also important for the continued development of the material and technical database as an objective necessity to achieve a higher rate of economic development at regional level. By carrying out this work we aim to frame the Poultry Complex according to the actual European Standards by using high precision topographic (survey) works.

The European Fund for Agriculture and Rural Development (EAFRD) is a financing tool created by the European Union to support the member countries in the implementation of the Common Agricultural Policy. The Common Agricultural Policy is a set of rules and mechanisms governing the production, processing and marketing of agricultural products in the European Union and which pays special attention to the rural development. The European Fund for Agriculture and Rural Development (EAFRD) represents a financing opportunity for the Romanian rural space, in amount of about 7.5 thousand millions (billion) Euros, since 2007 and until 2013. The European Fund for Agriculture and Rural Development (EAFRD) is based on the principle of co-financing private projects investments

The European funds for agriculture can be found (accessed) under the key – document the National Rural Development Program (NRDP)

MATERIAL AND METHOD

Jimbolia is a city situated in the Banat low plains, in the western part of the county of Timiş, in the Torontal plain. It represents an association of low plains, formed by the

rivers Timiş, Tisa, Bega, Barzava and Nera. Bordering Serbia to the west (4 km far from the Romanian- Serbian border), the town of Jimbolia covers a total area of 10,818.23 hectares, of which:

- agricultural land – 9,735.21 hectares
- non-agricultural land – 1,083.02 hectares

Of the total area of agricultural land :

- arable : 8,980.42 hectares
- grazing fields: 724.76 hectares
- hay-fields: 12.30 hectare.

The poultry farm site is located on the outskirts of Jimbolia town, on the national road DN59A , 43 km far from Timisoara, Timis county residential town. The national road 59A crosses the city and reaches the Jimbolia Road Border Crossing Point .

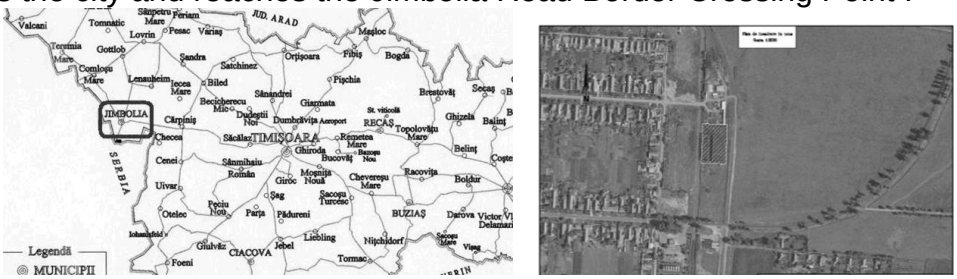

Figure 1. Location of the future poultry farm

The geodetic / land (topographic) survey was performed by modern methods using the RTK system, being able in this way to determine all the existing data in the field, necessary to prepare the documentation

After having processed the details with Topcon Link software, we obtained the points imported in AutoCard, which helped us to prepare the lay-out (site) plan and to calculate the surfaces.

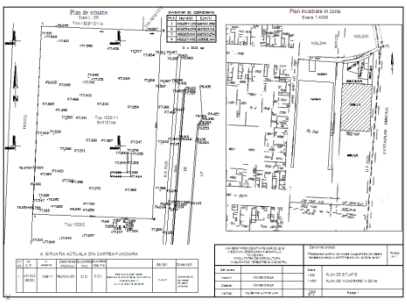

Figure 2. The lay-out (site) plan

RESULTS AND DISCUSSIONS

It was necessary to go (pass) through several stages in order to perform the setting-out of the building. Thus, based on the execution of the construction projects, in order to apply them in the field, a number of topographic operations have been performed operations that form the overall topographic preparation of the setting-out.

From this topographic preparation (plan), it resulted:

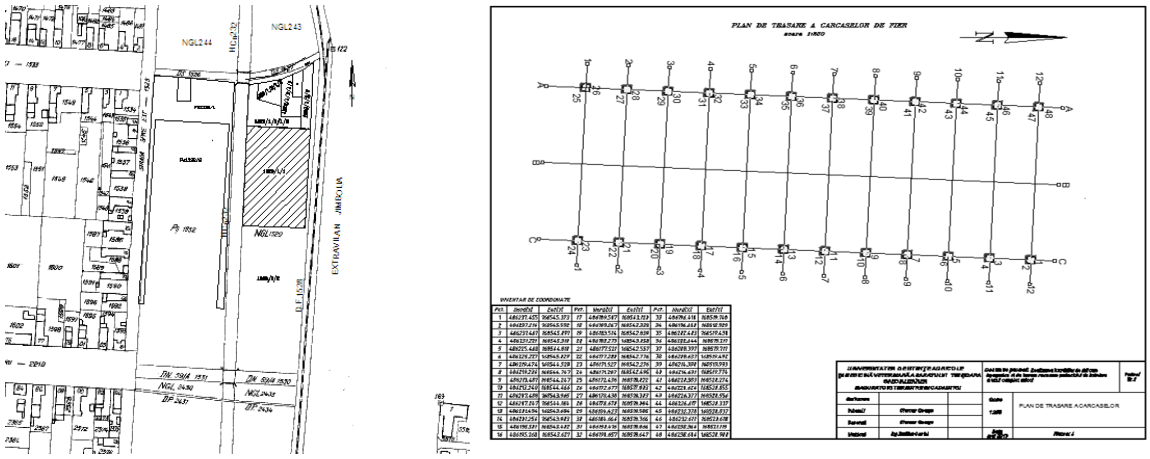

Figure 3. General lay-out (plotting / mapping) plan

The laying / setting-out support network was achieved by standing with the total station in ST 1 terminal with orientation to ST 2 terminal and the verification on ST 3 terminal and finally we determined the ST 4 point.

For achieving the network of the building it is advantageous to create a point system in which the direction of the axes should coincide with the direction of the axes of the designed buildings and to have a as large as possible visibility over the plot. The X, Y, Z rectangular coordinate system corresponds to the 1970 stereographic projection system.

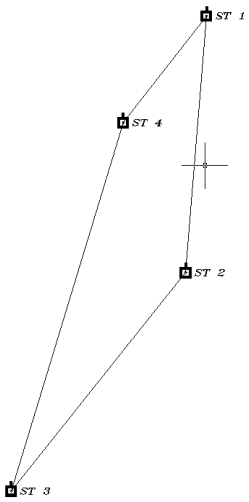

Figure 4. Network of points for lay-out

The lay-out was performed by using the Topcon 3000 LN total station.

In the first phase the axes have been drawn on witness poles (control stakes) at a distance of 2 m standing on the “ST 4” supporting point, pointing towards the “ST 1” supporting point , and after that the lay-out of the leading mark was performed by using the polar coordinates method based on the following plan:

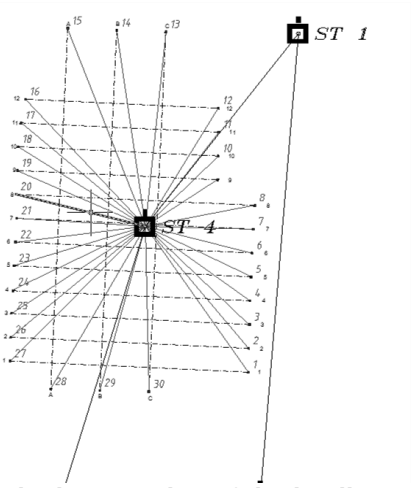

Figure 5. The lay-out plan of the leading marks

The points from the S 4 station necessary for the laying-out were extracted from the graphics programs by computing and they are presented in the following table by polar and rectangular coordinates.

Table 1.

The list of the coordinates for the lay-out supporting network points with their topographical descriptions

Polar Coordinates				Rectangular coordinates		
Point	Point	Distances	Directions	Point	X	Y
Station	Aimed	Reduced	Horizontal	100	486255.330	168579.296
100	1	86,089	92,757	1	486170.153	168566.797
	2	80,150	99,018	2	486176.148	168566.880
	3	74,194	105,143	3	486182.146	168567.098
	4	68,261	113,087	4	486188.143	168567.234
	5	62,323	121,028	5	486194.130	168567.519
	6	56,392	130,674	6	486200.122	168567.802
	7	50,478	143,331	7	486206.126	168568.027
	8	44,554	156,593	8	486212.117	168568.447
	10	36,694	366,317	10	486224.545	168559.328
	11	31,771	430,521	11	486230.551	168559.411
	12	27,399	519,703	12	486236.565	168559.332
	C	33,070	1,009,241	C	486255.810	168546.229
	B	45,326	1,011,476	B	486256.147	168533.977
	A	57,573	1,015,294	A	486256.713	168521.740
	12`	70,079	848,642	12`	486238.825	168511.188
	11`	72,805	800,294	11`	486232.864	168510.044
	10`	75,547	754,323	10`	486226.894	168509.305
	9`	78,124	709,461	9`	486220.901	168509.168
	8`	81,245	668,505	8`	486214.911	168508.819
	7`	84,226	628,251	7`	486208.895	168509.027
	6`	87,899	593,229	6`	486202.911	168508.738
	5`	91,906	561,537	5`	486196.918	168508.340
	4`	95,976	531,602	4`	486190.916	168508.147
	3`	100,284	504,556	3`	486184.928	168507.879
	2`	104,856	480,390	2`	486178.937	168507.470
	1`	109,403	457,171	1`	486172.945	168507.312
	A`	108,739	384,853	A`	486165.863	168517.492
	B`	102,570	321,061	B`	486165.530	168529.733
	C`	97,514	250,001	C`	486165.239	168541.979

After the phase of witness poles (control stakes) lay-out we plotted the iron cases of the buildings designed in the first phase only to determine the contour. This operation was also performed by using the polar coordinates method from the S1 point.

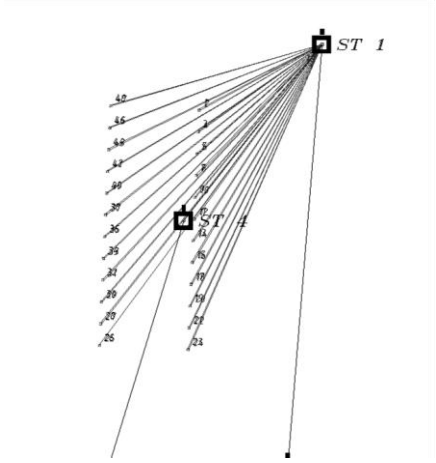

Figure 6. The lay-out plan of the iron cases

The checking operation of the lay-out execution was carried out by measuring the diagonals and by checking the contour from the S2 stations for iron cases and from S1 for the leading points, respectively, based on the checking plans prepared in advance while preparing the lay-out, prepared in the office and imported in the memory of the total station.

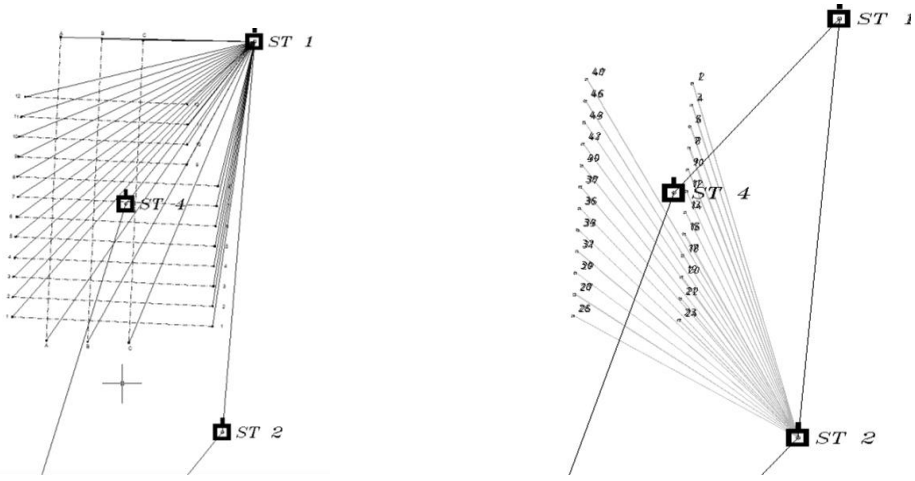

Figure 7.The plan concerning the checking of the leading marks / iron cases lay-out

Figure 8 Image during the execution of the work

In order to process the plans we used the AutoCAD 2013 program and the record was written in Microsoft Word and we drew up a record concerning the lay-out accompanied by the following annexes:

- Lay-out plan (site plan) and description of the surrounding (demarcation) area scale 1:2000;
- Lay-out plan (site plan) and description of the surrounding (demarcation) area superimposed on the orthophotoplan scale 1:2000;
- cadastral plan with the legal status of the plot of land, scale 1:2000;
- general lay-out plan, scale 1:500;
- lay-out plan of the iron cases, scale 1:250;
- lay-out plan of the control leading marks, scale 1:500;
- Report.

CONCLUSIONS

If two decades ago we used the pencil and paper for the calculations made in order to achieve a lay-out plan, and the drawing up required a considerable period of time, now the use of the PC computers and of the different computing programs like AutoCAD and TopoSys have significantly reduced the time required for design and office works and for preparing the field data.

The implementation of the works meant to design industrial and civil constructions can be done by using topographical instruments with high precision measurement and internal memory, thus reducing the execution time and also the number of people involved in performing the works.

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