EXECUTION OF A LAYOUT WORK FOR REHABILITATION OF A MILK FACTORY IN IZVIN, TIMIS COUNTY WITH EUROPEAN FUNDS

LECTURER PH. D.DRAGOMIR L.[1] ; LECTURER PH. D. BÂRLIBA LUMINIŢA LIVIA[1] ; LECTURER PH. D. BÂRLIBA C. [1] ; ASSOC. PROF. PH. D. CALINOVICI I.[2]; PROF.PH.D. POPESCU COSMIN[1]

[1] Banat University of Agricultural Sciences and Veterinary Medicine"King Mihai I of Romania" from Timisoara, Romania

[2] "Aurel Vlaicu" University of Arad, Romania

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ABSTRACT

Purpose of this paper is to present a model for preparing and implementing of a layout work for surface construction work in order to put into practice to large projects for the modernization of rural areas and creating new opportunities in the area.

Development work is based on the topographic survey of the investment location and the layout project in order to construct "industrial building" based on investment projects in agriculture.

In order to perform this work it was necessary hardware and software structure very well put together, highlighted in particular by the use of software such as AutoCAD 2013 and Leica GeoOffice Tools.

Topographic surveying for the situation plan were made in the field using a total station Leica TCR 805.

INTRODUCTION

The construction project of Izvin Milk Factory is part of a larger project of the area development that includes a complex (plant) for processing agricultural products, both animal and plant products, mentioned in the General Urban Plan of the town of Recaş:

- extension of the facilities and complementary functions area in the village
- extension and location of industrial functions

They will be equipped with the necessary facilities, delimitation of land through fences, respectively depending on the surfaces provided in the Land Registry extracts with their location on the ground surface.

This project is mentioned in the Urban Plan of the town and it consists of a a plot in property and the appropriate by-roads used as pasture (grazing field). As a result of the development of Izvin town, the area will be developed further on from the urban point of view and the built-up area will be expanded up to the limits set in this PUZ (Zonal Urbanism Plan)

MATERIAL AND METHOD

The plot is located in the north-eastern part of the village of Izvin, at the exit of the village on DN6 (National Road 6) towards the commune of Recaş. Adjacent to the plot (nearby) in the Eastern part there is a channel HCn 2973, in the South it lies the DN6 (National Road 6), at the Northern limit the plot borders an arable plot A3435 and in the South-east the built-up area of Izvin village.

A part of the plot under study is located in the extended built-up area of Izvin village. The total area under study , the areas property of the beneficiary and the by-roads is of 43.000 square meters.

The area under study, whose beneficiary is S,C. EUROCHESSE S.R.L. is divided into plots for the location of industrial halls and free plots. Taking into consideration the large area, the network equipment of the industrial area will be achieved in stages, as the lands will get a precise destination.

The beneficiary of the work: S.C. EUROCHESSE S.R.L Izvin

Data concerning the location:

From the location point of view: the land is placed in the proximity of Izvin village, bordering

on the North side: A3435, arable land

on the West side: the built-up area of Izvin village

on the East: the channel HCn 2973

on the South: the national road 6 (ND6).

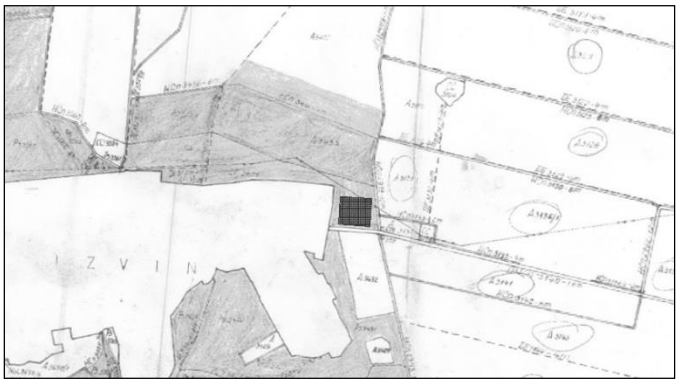

Figure 1. Location plan in the area

Data concerning the land delimitation

The limits of the land, object of these topographic (survey) works, are marked by a wire mesh fence placed on the entire length of its sides.

The legal status of the land:

The owner of the land is S.C. EUROCHESSE S.R.L Izvin

RESULTS AND DISCUSSIONS

The topographical (surveying) measurements for the lay-out (situation) plan were made in the field by means of a TCR 805 Leica total station.

The station point was established and marked with a FENO type terminal, the apparatus (device) was put into the station, the operation consisting in pressing-on (leveling) and centering, the total station having an optical system centering device. The tripod (three-legged support) was removed and the apparatus (device) was fixed with a screw pump. Once the apparatus (device) centered and pressed-on (leveled), the point station was set with 100 IZ. The measurements are usually performed in local coordinates following that the retro intersection (resection) be calculated in the office, after that the plan is implemented in stereographic coordinates. We established the local coordinates X (N) = 10000 m, Y (E) = 10000 m. Since this is a total station, the difference in level (level difference) between the station point which has Z = 100 and the rest polar (radiated) points was also calculated. The software also requires the working height, this being measured with a ruler, being of 1.63 m, and the height of the prism being established to 2.3 m.

The prism was amounted (fixed) to this height because there are obstacles in the field that could aggravate (worsen) the deletion of the points of detail. These settings are required (must be always met) before executing measurements. After the completion of the apparatus (device) settings, the retro intersection (resection) was performed.

Hz = 0.0000 degree was set oriented towards the Catholic Church of Recaş town being well defined (determined). We focused on the cross of the church at its base, blocking the horizontal movement, setting zero with “enter” for confirmation. The next operation was to focus the supporting points from the state geodetic base.

The function H – Vz was set from the menu "measurement" so that the device may read only angles; in this case only horizontal and vertical angles are stocked in the memory of the device.

Table 1

Targets pointing towards the supporting points

Order nr.	Station points	Targeted point	x	y	Orientation (alignment)
1	(100-IZ)	Odai signal	484588.64	225872.24	345.5214
2		Catholic Church Recaş	483804.83	228289.1	89.1633
3		Bazoş Vechi Church	479908.8	227166.8	159.5488
4		Chatolic Church Izvin	483781.53	225013.47	246.2401

The resection (retro-intersection) calculation was made in the office resulting the stereographic coordinates of the station point. The coordinates of the station point are X = 488179.852 m and Y = 222005.020 m.

The lifting of the points of detail has been achieved from the station numbered S 100-IZ resulting from the resection (retro-intersection), of which the previous determined points were targeted from the state geodetic network, it was materialized in the field with the FENO terminal. In order to achieve an accurate location (site) plan in the field, a number of 50 points of detail were removed both for the interior elements and for the characteristic elements from the field concerning the neighbors, channels, namely roads adjacent to the cadastral numbers Apj 3434/1; 3434/2; 3434/3/c.

The measurements were made in about 5 hours by a team of three persons. After the completion of the measurements the apparatus (device) was downloaded by using the Toposys program, the data were transferred and set into the program as units in meters, applying to a precision of three decimal points, the data of the different types of angles were set in degrees with the accuracy of four decimal places and the data concerning the direction were set for North and Zenith. After having set them, the data (electronic field book) were transferred from the instrument in the computer by using the transfer cable and the data transfer program; they were downloaded under the form of a “idx” file extension (both polar and absolute coordinates) as well as in Leica Geosystems format “gsi” (Geo serial interface).

Table 2

Readings and angles obtained after the data downloading and the coordinates of the marginal (contour) points in stereographic 1970 system

Point Code	Reading of the orizontal angle	Reading of the vertical angle	Slope distance	East	North	Elev Description
Odai signal	34552140	10044320	03377880			
Catholic Church Recaş	08163300	10004250	-			
Bazoş Vechi Church	15954880	10007440	-			
Chatolic Church Izvin	24624010	10021880	-			
102 IZ	22947420	10016750	01038450			
100 IZ	22577590	09943900	01883220			
1	22391280	10015770	02513640			
2	22794530	09985220	02516300	231884.55808	482284.37931	99.932 c
3	22947980	10017520	02463830	231643.33783	482295.54215	99.530 c
4	23216360	10044480	02242670	231441.45187	482305.29990	101.558 c
5	26600180	09984260	01630700	231417.85343	482309.55936	101.129 c
6	26963640	09999640	01516420	231413.92928	482309.49510	102.111 c
7	29372020	09878370	01542030	231397.06170	482314.66477	101.858 cf
8	26582900	10065150	01447310	231398.59826	482314.59461	101.851 cf
9	27310060	09967010	00802170	231393.51769	482252.00385	98.983 c

10	22094130	09962420	01916860	231324.71753	481980.94407	99.117 c
11	24586470	10065650	01334330	231338.25015	481970.89112	98.775 c
12	26878420	10077660	01163660	231337.57672	481964.02218	99.511 c
13	27251430	10023500	00797020	231268.36519	481766.01577	99.207 c
14	22896110	10028430	00618980	231188.03053	481458.07589	99.496 c
15	21878250	10006960	01331320	231153.50368	481318.31792	99.991 c
16	19409740	10006800	01559870	231171.71901	481312.34743	100.434 c
17	12536260	10139190	00366450	231171.95393	481307.57349	100.456 c
18	14132860	09882220	00768990	231420.84689	481297.13266	100.632 c
19	09049930	10008870	00467480	231679.27189	481281.18531	101.253 c
20	08856850	10061730	00586820	232021.59050	481260.25456	101.006 c
21	15648330	10005200	00975770	232023.00092	481264.11600	102.293 c
22	16566560	09995440	01569920	232027.14424	481250.89596	102.340 c
23	20953480	10024610	01963740	232029.95423	481257.60514	101.622 b
24	20915960	10026330	02001240	232031.46538	481258.08859	101.784 a
25	20921800	10016490	02050180	232383.36367	481234.86335	103.665 c
26	17517440	09689800	01844960	232381.51838	481228.34397	103.108 c
27	17527790	10329220	01804990	232431.04596	481464.48183	102.535 c
28	17511890	09676000	01765390	232458.04950	481605.18940	102.540 c
29	15804190	10082110	01955730	232452.58530	481606.29927	101.294 c
30	15757990	10084930	01876160	232493.12873	481837.67143	102.365 c
31	15651340	10079110	01836950	232513.92444	481952.85408	101.728 c
32	15398020	10075880	01870470	232549.86549	482236.90495	101.529 c
33	14781880	09952260	01162230	232484.69528	482245.70515	101.327 pod
34	14375080	09654310	01289500	232485.19255	482252.27490	101.281 pod
35	14468870	09858600	01189230	232477.58075	482252.73504	101.431 pod
36	18428690	10078210	01449180	232474.46175	482246.25641	100.858 pod
37	18768700	10045550	00898200	232469.33492	482244.28555	101.172 c
38	19816770	10065550	00430060	232470.38219	482254.46897	101.260 c
39	20903400	10233000	02047280	232200.78734	482266.83165	100.413 c
40	20953480	09960520	01963740	232185.77032	482275.47575	100.522 pod
41	20915950	09897140	02001240	232190.39564	482291.20779	100.538 c
42	21315950	10001200	02011240	232184.49058	482268.24739	100.295 pod
43	15515850	10001230	01502410	232177.77309	482269.14092	100.379 pod
44	09015200	09960542	01002410	232178.69948	482276.66145	100.343 pod
45	08015300	09995620	01152350	232176.68915	482277.99237	100.405 c
46	05045800	09987561	00802150	232179.30160	482294.39795	100.535 c
47	34560280	10012102	00582150	232173.67961	482265.81179	100.403 pod
48	24625860	10012546	00605410	232173.34963	482259.79803	100.359 pod
49	15502510	09987520	00802540	232170.80988	482242.50194	100.488 c
50	12002510	09985452	00506250	232157.55110	482255.77390	100.669 c
100ST				232165.95732	482259.48905	100.376 pod
101OR				231892.40000	482284.52000	100.000 STA
				228289.10000	483804.83000	100.000 OR

The marginal (contour) points of the plots were saved in a dwg file from AUTOCAD. While opening the file the units of measurement were set in – m -, the precision of the length and angle measurement units of five and four decimal places, respectively. The dimension of the 0.5 point was also set in AUTOCAD. The marginal (contour) points were joined to the polyline command following that after the polyline was closed the polygon area be identified. The distance between the marginal (contour) points was marked by using the dist command and bodying up (thickening) the marginal (contour) points was performed by using the "donut" command where for the internal diameter was set to 0.2 and the external (outside) diameter to 1.5. The chosen scale was of 1:1000, by which all the survey details can be highlighted.

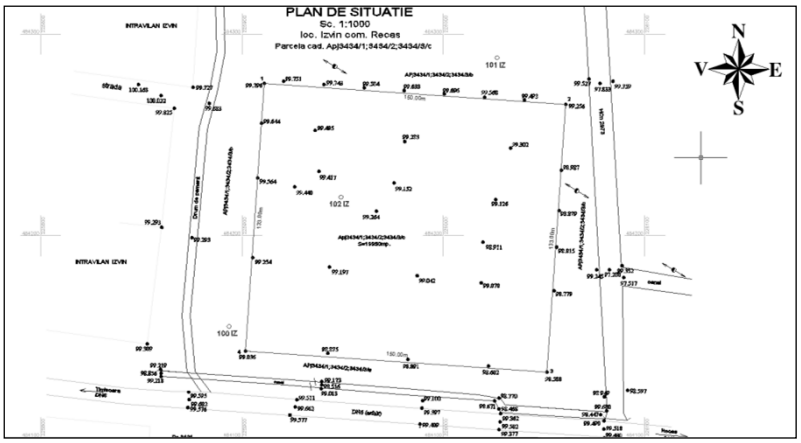

Figure 2. The resulted layout (situation) plan

As the measurements were performed by using the total station, the prior measurements and the actual (proper) layout were performed from the points previously established during the works carried out in order to identify the land, initially attributed when applying the laws on property. Thus, it was not necessary to post-process the measured data, the downloading of the apparatus (device) being made in “gsi” format and after that the data were imported into Autocad in order to process the layout (situation) plan.

When the layout (situation) plan was worked out and the found land limits were verified based on the documentation for the tabulation (registering) of the land, we overlapped the foundation plan (containing the centre (axes) lines of the future investment) provided by the specialized designer, by observing the spacing (distances) and location of buildings approved by the Certificate of Urban Planning and by the Building Permit.

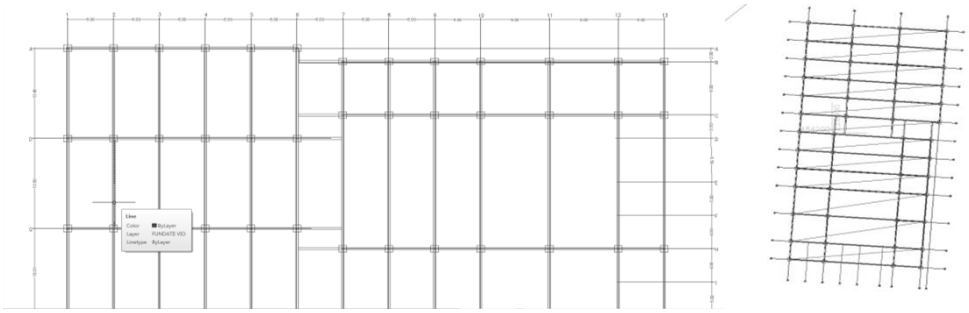

Figure 3. Placing a polyline through (across) all the axes (lines) of the investment

It was copied in the Notepad program, in txt format (ASCII) in order to be imported (stocked) in Excel and then in the Leica Geo Office Program Coordinate Editor for being transformed (converted) in gsi format and transferred in the total station in order to be applied in the field.

Table 3

Rectangular coordinates of the layout network

Point Nr.	X[m]	Y[m]
102 IZ	484219.225	225949.143
101 IZ	484288.250	220020.727

In order to achieve the layout a sketch was prepared based on the polar coordinates from the point 102, network point for laying-out the axes (lines) by the polar layout process, based on the field book, as:

Table 4

Rectangular and polar coordinates of the foundation axes (lines)
Stereo 70 Projection System

Point Nr.	Rectangular coordinates		Polar coordinates	
	X[m]	Y[m]	Horizontal distance (m)	Angle resulting from the difference between - ---
K1	484236.237	225993.020	47.059	22.7405
G1	484235.334	226005.994	59.089	28.7092
D1	484234.397	226019.462	71.937	32.7592
A1	484233.460	226032.924	84.981	35.5730
K2	225992.603	225992.603	44.837	30.4695
G2	484229.349	226005.577	57.335	34.9876
D2	484228.411	226019.045	70.503	37.9689
A2	484227.475	226032.507	83.771	40.0080
K3	484224.266	225992.187	43.338	38.8659
G3	484223.363	226005.161	56.170	41.5933
D3	484222.426	226018.629	69.559	43.3570
A3	484221.489	226032.090	82.978	44.5503
K4	484218.280	225991.770	42.638	47.6981
G4	484217.378	226004.744	55.632	48.4021
D4	484216.440	226018.212	69.125	48.8528
A4	484215.504	226031.674	82.615	49.1562
K5	484212.295	225991.354	42.776	56.6471
G5	484211.392	226004.328	55.738	55.2638
D5	404210.455	226017.796	62.210	54.3764
A5	484209.518	220031.257	82.686	53.7784
K6	484206.309	225990.937	43.744	65.3683
G6	484205.407	226003.911	56.485	62.0216
D6	484204.469	220017.379	69.813	59.8454
A6	484203.533	226030.841	83.191	58.3685
K7	484200.324	225990.521	45.490	73.5661
H7	484199.630	226000.497	54.965	69.4939
C7	484198.241	220020.448	74.329	64.5077
B7	484197.686	226028.429	82.160	63.1746
K8	484194.338	225990.104	47.929	81.0448
H8	484193.644	226000.080	57.000	75.9165
C8	404102.250	226020.032	75.836	69.4340
B8	484101.700	226028.013	83.535	67.6636
K9	484188.353	225989.688	50.961	87.7175
H9	484187.659	225999.604	59.572	81.8410
C9	484186.270	226019.615	77.797	74.1343
B9	484185.715	226027.596	85.310	71.9865
K10	484182.367	225989.271	54.486	93.5847
H10	484181.673	225999.247	62.614	87.2329
C10	404180.285	226019.199	80.151	78.5846
B10	484170.720	226027.180	87.462	76.1151
K11	154173.380	225988.647	60.510	101.0029
H11	1541/2.695	225998.622	67.921	94.3327
C11	484171.300	226018.574	84.362	84.7452
B11	484170.751	226026.555	91.336	81.9032
K12	404164.411	225988.022	67.202	107.0128
H12	484163.717	225997.998	73.946	100.3410
C12	154162.320	226017.949	89.284	90.2740
B12	484161.773	226025.930	95.901	87.1808
K13	484158.425	225987.605	71.944	110.3791
H13	484157.731	225997.581	78.280	103.8131
C13	484156.343	226017.533	92.905	93.6183
B13	484155.787	226025.514	99.281	90.4153

In order to perform the verification a second network point, net point 1001, was prepared by using the polar layout in order to verify the axes (lines) as follows:

Table 5

Polar coordinates of the foundation axes (lines)

Station	Point nr.	Horizontal distance [m]	Angle resulting from the difference between ----
101 IZ	K1	61.980	17.1064
	G6	89.416	27.4962
	K13	135.591	35.0792
	D6	84.301	46.6383
	B13	132.468	53.1292
	A6	84.817	56.8013
	A1	55.139	60.8816

The data storage in the memory of the total station was made concurrently with the sketches of the land for the project implementation on the ground as follows:

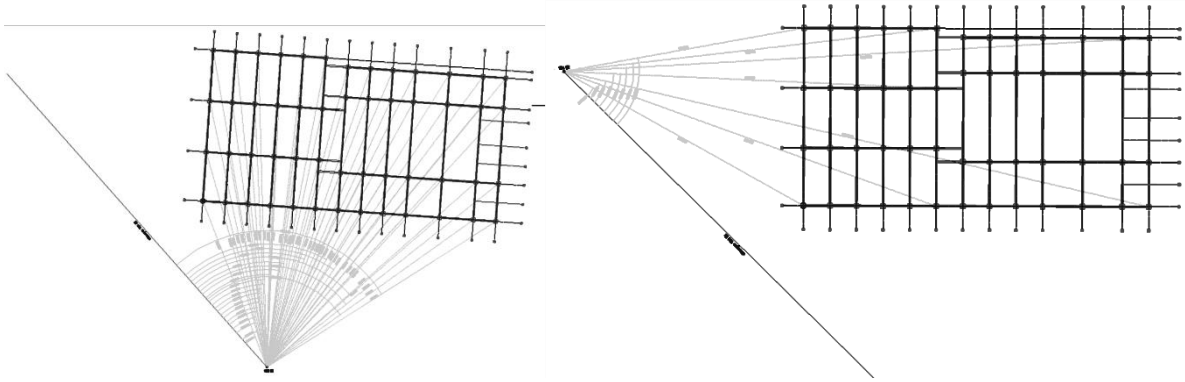

Figure 4. Layout sketch from the 102IZ point and the layout verification from the 101IZ point

The layout survey works of the investment were made according to the Guidelines C.83 – 75 and standard STAS 9824/1,2,3 -75.

After performing the perimetric surroundings (leading marks) all the interaxes (interlines) of the buildings were materialized by using wooden pegs and nails by respecting the distances stipulated in the project, and by placing them the axes (lines) were transmitted, by nails, on the upper edge (top) of the leading mark (beacons) planks.

Given the large sizes of the investment and its grate number of axes (lines), the verification was made both by verifying the distances, alignments and by verifying any possible angular deviations in the horizontal plane of the axes (lines) bringing the corrections required. If the buildings are small, the verification may be also carried out by measuring the diagonals of the interaxes of the building that must be equal.

CONCLUSIONS

In order to carry out the engineering survey works in the field (layout, pressing on/ leveling /survey of highs, surveying) the following steps and procedures will be taken into account:

All appliances (devices) must be verified and rectified.

The ribbons and the tapes should have the length printed on them, they should not to be broken, riveted and of course they should be verified.

The leveling poles / rods used in layout operation should be verified in terms of scale and be equipped with spherical levels for vertical lining

Before performing the layout, the planimetric position and the level-related plan of the points belonging to the support network (system) in relation to which the laying out will be performed must be verified.

The layout of the points must be carried out with extreme precision: metal chips, nails, nail stake, sign marked with a pencil or other precision elements, etc.

Any layout (procedure) must be accompanied by the verification operation, immediately after the layout points were marked. The items that have resulted from the layout should be especially verified.

Action will be taken for the conservation and protection of the layout points and of the points used for performing the layout.

During the execution, action will be taken in order to verify the position of the construction elements according to the execution project.

In case of using electronic devices for laying out distances, the measurement precision will be verified according to the standards in force, in order to comply with the permissible limits while performing the layout (process).

In order to ensure an execution as precise as possible, we must take into account all the stages and laying out procedures mentioned above.

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