TOPO-CADASTRAL WORKS REGARDING THE REALIZATION OF THE GAS DISTRIBUTION NETWORK IN THE LOCALITY OF CONSTANTIN DAICOVICIU

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Abstract: *The research presented in this paper has been done in Constantin Diacoviciu commune, Peștere locality, Caras-Severin county in order to achieve the technical reception documentation for obtaining the OCPI approval with the aim of: Establishing natural gas distribution. To perform this work, the SOKKIA GSR 2700 IXC dual frequency equipment was used and the data processing was performed with the Carlson SurvCE software. In addition to Glonass tracking capability, the GSR2700 ISX includes support for the new L2c and L5 GPS signals. The system also offers many additional enhancements, including improved RTK performance, seamless GPS network support with GSM and GPRS / NTRIP, refined multipath migration, and multiple Bluetooth connectivity options. The system is wireless and easy to configure and works in basic and rover modes. The receiver has a display panel and provides sound notification in the field. These notifications are available in several generic languages and tones. The measurements were performed entirely by satellite technology through the Real Time Kinematic (RTK) procedure, receiving corrections from the permanent GNSS Resita station. In the topo-cadastral field - a concern of more than two millennia of people to measure and study the shape and size of our planet - new problems are constantly emerging, problems whose solution must be provided by current and future geodetic engineers. The road route was designed along the traffic arteries, as the sides and points of the road will be more accessible. The road points were located in places away from destruction. Between the neighboring travel points was made the location of the points with a perfect visibility, so that the directions and lengths can be measured without difficulty. Imagine a network of roads consisting of highways, national roads and streets that cross cities. The former ones have more lanes in each direction and ensure greater traffic flow, the latter having a single lane, being also the narrowest. The infrastructure of the gas pipelines is organized in the same way.*

Keyword: OCPI , Carlson SurvCE, GNSS, RTK, Glonass, Sokia

INTRODUCTION

The geodetic network of compaction and lifting is made by triangulation, trilateration, polygonometric road networks or by satellite recordings. They are created to ensure the number of points required for detailed topographic and cadastral measurements. The points of the geodetic lifting networks are determined by forward intersections, retro-intersections, combined intersections, polygonometric routes, with the use of points from the geodetic support and compaction network. The procedure applies exclusively to works for the extension of natural gas systems for connection. The works for making the connections to the system and the works for making the use installations are not subject to the provisions of the Procedure, because they are supported from the applicant's own funds. The works for the extension of the natural gas systems that are provided as the task of the operators within the service concession contracts are carried out by the operators from their own funds, considering that the feasibility studies prepared in advance, for the purpose of concession of the service, have highlighted their economic efficiency.

Points of entry / exit into / from the natural gas transmission system, at the entry point into the natural gas transmission networks, the system user delivers, by contract, natural gas to the transmission networks of the adjacent systems and starts the transmission of natural gas through the networks of natural gas transmission.

At the exit point from the natural gas transmission networks, the system user takes over, by contract, natural gas from the natural gas transmission network to the adjacent systems and completes the natural gas transmission from the transmission system.

MATERIAL AND METHODS

The research presented in this paper was carried out in the commune of Constantin Daicoviciu (Cavaran) located in Caraș-Severin county (figure 1), being located southwest of the Poiana Rusca mountains, in the Timiș meadow at the contact of two depressions, formed by the villages Constantin Daicoviciu (residence), Maciova, Mâtnicu Mare, Peștere, Prisaca and Zăgujeni.

All the villages have accessible connections with the commune center, as well as between them. The geographical location of Constantin Daicoviciu commune has wide implications on its development in all aspects and the way of life of the population.

Fig. 1 – Study of area

From a historical point of view, the name of the village has known several forms throughout history: Caran, Caaran, Cauran, Cavaran, and the documents in which they were mentioned have often been attributed by some specialists to the history of the remote city of Caransebeș, of about 15 km. If the status of the locality in the XIII-XVI centuries is still uncertain from the point of view of historians, the archeological excavations carried out in the 1940s in the place traditionally called “fortress”, in the immediate vicinity of the village, undoubtedly highlighted the existence of a medieval church. In 1974 the name of the locality was changed to "Constantin Daicoviciu".

In the documentation phase of the work, the existing situation was analyzed, according to the data and documents held by the owner, in relation to the existing elements in the field and updated information was requested from the Caras-Severin OCPI database. DJ 608 connects the two localities, Constantin Daicoviciu and Pestere.

The methods used to execute the topo-cadastral work are the following: to determine the coordinates of the points that define the building which is the subject of this documentation and other existing planimetric details in the area of interest, in order to define the cadastral boundaries of the building, we used GPS RTK methods service

ROMPOS; this procedure ensures a precision that falls within the technical norms of the A.N.C.P.I. in force and were applied according to the local conditions in the field; topographic survey of contour points through the "Real Time Kinematic" process; data processing and report generation; determining the coordinates of the contour points, in the STEREOGRAPHIC 1970 projection system, according to the attached inventory.

The measurements were performed entirely by satellite technology through the Real Time Kinematic procedure, receiving corrections from the Permanent GNSS Station RESIȚA (RESI).

RESI permanent station

X=426168.097

Y=256908.054

H=256.109

The equipment used to make the topographic surveys was a Sokkia GSR 2700 IXC dual frequency receiver, where the data processing was performed with the Carlson SurvCE software for downloading data from the device. The equipment is shown in figure 2.

Fig. 2 - GPS Sokkia GSR 2700 IXC

The determination of the position refers to obtaining from satellite observations (measurements) performed at points of interest, the coordinates (absolute or relative) of these points in a well-defined reference system. Satellite observations consist of various types of measurements made between or near the satellite receiver on the ground and one or more satellites evolving in orbit around the earth (figure 3).

The methods for determining the position are based on observations made using satellite signals broadcast in the microwave field. The emission flow of the satellite signal is usually continuous or may be pulsed at regular intervals. The reception of these signals is done in a similar way.

Satellites play an active role by broadcasting signals that are received by specialized instruments (receivers) that decode this signal. After decoding the signal from it, the information necessary to determine the position of the receiver is extracted.

```
JB,NMDAICOVICIU 14.10,DT01-05-2008,TM20:33:26
MO,AD0,UN1,SF1.00000000,EC0,EO0.0,AU0
--SurvCE Version 3.02
--CRD: Alphanumeric
--User Defined: ROMANIA/Stereographic 1970 TransDatRo Source Code 1.02
--Equipment: GSR2700 ISX  SN:NCD08080022 GSR2700 ISX
--Antenna Type: [SOK_GSR2700ISX  NONE],RA0.1080m,SHMP0.0370m,L10.1236m,L20.1232m,--P/N 502-0-0045 REV 4.02
--Localization File: None
--Geoid Separation File: \Program Files\SurvCE\Data\Romanian_ETRS89v102.gsf
--Grid Adjustment File: None
--GPS Scale: 1.00000000
--Scale Point not used
--RTK Method: RTCM V3.0, Device: Internal GSM, Network: NTRIP RO_VRS_3.1_GG
BP,PN169,LA45.302470798228,LN22.094373399173,EL217.8798,AG0.000,PA0.000,--
--Entered Rover HR: 2.0000 m, Vertical
LS,HR2.1236
GPS,PN1,LA45.302539859266,LN22.094382065743,EL220.553879,--COTA
--GS,PN1,N 449189.2165,E 278424.7287,EL174.8975,--COTA
G0,2015/10/14 12:40:55,Base ID read at rover: 168
G1,BP168,PN1,DX-13.09390,DY-3.29827,DZ16.84420
G2,VX0.00019893,VY0.00006418,VZ0.00029802
G3,XY0.00006729,XZ0.00019292,YZ0.00009065
--GT,PN1,SW1866,ST304871000,EW1866,ET304871000
--HSDV:0.012, VSDV:0.023, STATUS:FIXED, SATS:15, PDOP:3.463, HDOP:1.125, VDOP:3.276, TDOP:2.445, GDOP:4.240
--DT01-05-2008
--TM20:33:28
GPS,PN2,LA45.302539290099,LN22.094371570789,EL220.107833,--COTA
--GS,PN2,N 449189.1217,E 278422.4455,EL174.4514,--COTA
G0,2015/10/14 12:41:03,Base ID read at rover: 168
G1,BP168,PN2,DX-12.43111,DY-5.53039,DZ16.47610
G2,VX0.00020648,VY0.00006622,VZ0.00031190
G3,XY0.00007054,XZ0.00020242,YZ0.00009557
--GT,PN2,SW1866,ST304879000,EW1866,ET304879000
--HSDV:0.012, VSDV:0.023, STATUS:FIXED, SATS:15, PDOP:2.317, HDOP:1.109, VDOP:2.035, TDOP:1.493, GDOP:2.756
--DT01-05-2008
--TM20:33:35
```

Fig. 3 – File rw5

Global Navigation Satellite Systems (GNSS) are systems that allow the high-precision determination of the position in a geocentric reference system, at any point located on the earth's surface, near or outside it, using artificial satellites of the Earth.

RESULTS AND DISCUSSION

Following the measurements, the following stages were elaborated:

The first stage that was the basis for the elaboration of the topo-cadastral documentation regarding the realization of the gas distribution network, was, the unloading of the measurements (figure 4) and the processing of the raw data (figure 5).

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1,453546.805,278383.517,161.502,+45.324640154267,+22.093479516893,4144066.233,1687759.923,4530183.775,COTA,HSDV:0.022,VSDV:0.032,STATUS:FIXED,SATS:13,PDOP:1.545,HDOP:0.898,VDOP:1.257,
2,453553.364,278385.756,161.545,+45.324661643107,+22.093488756991,4144061.119,1687760.005,4530188.452,COTA,HSDV:0.021,VSDV:0.032,STATUS:FIXED,SATS:15,PDOP:1.544,HDOP:0.855,VDOP:1.286,
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4,453561.164,278385.981,160.825,+45.324686915785,+22.093488515557,4144055.514,1687757.665,4530193.403,COTA,HSDV:0.021,VSDV:0.032,STATUS:FIXED,SATS:14,PDOP:1.608,HDOP:0.906,VDOP:1.328,
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```

Fig. 4 – Fieldbook Report

All determinations were made in the 1989 European Terrestrial Reference System (ETRS89), introduced in Europe as a geodetic reference system, but they were automatically transformed due to the implementation in the receiver used of the eTransDat software in the 1970 National Stereographic Reference System (STEREO 70).

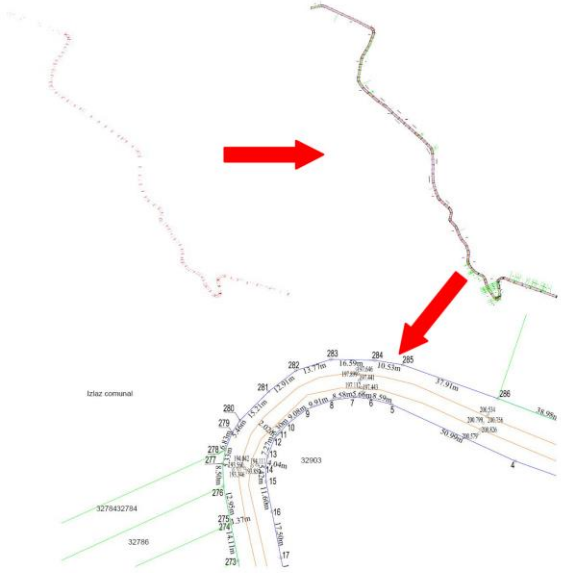

Fig. 5 – Data processing

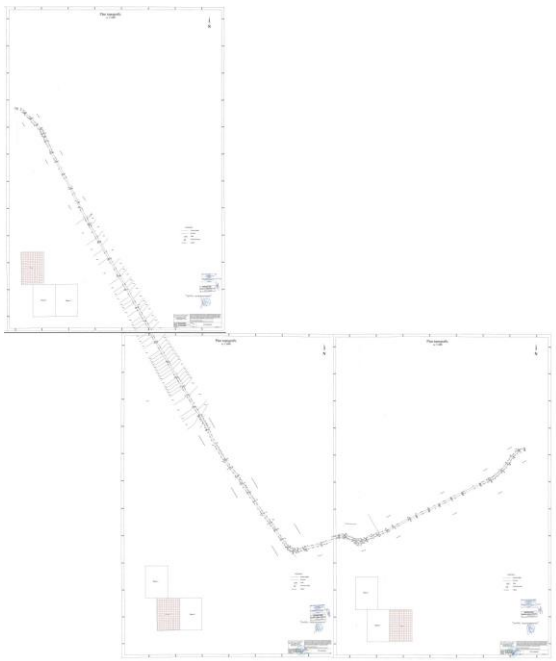

Fig. 6 – Topographic plans

Following the processing and processing of raw data, the Topographic Plan was made, which will represent the basis for the preparation of topo-cadastral documentation, being presented in figure 6.

The next step was to frame the building in the area, this method was designed in the following topographic plan which is illustrated in figure 7.

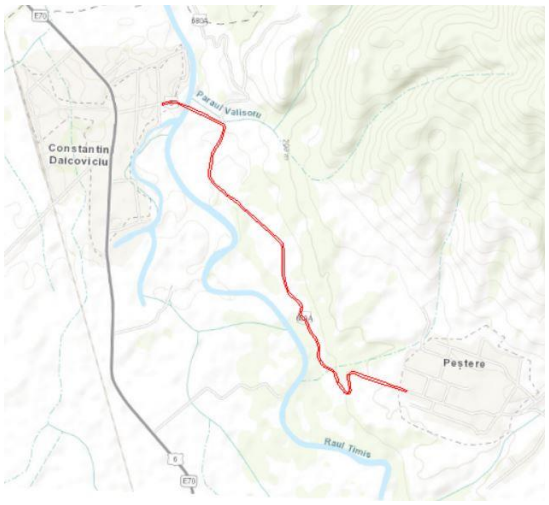

Fig. 7 – Development site plan

CONCLUSIONS

In conclusion, regarding the activity of connection to the natural gas networks of public interest, the main objective was to carry out an evaluation on the competitive mechanisms through which the activities carried out in order to connect the users to the natural gas distribution networks are contracted.

Analyzing the stages of the connection procedures to the natural gas networks, contained in the aforementioned regulations, it emerged that, presently, they have a high degree of similarity. Thus, there is currently a risk that a large part of the natural gas distribution operators will want to continue to carry out, with their own staff, the design, execution and verification activities for the realization of the connection installations. The measurements are made in a short period of time and with a high temporal resolution.

Thus, one could analyze, evaluate and effectively monitor the proposed programs of measures and the results obtained from the implementation of efficiency measures. The presentation of data in uniform formats will provide operators with a precise and easy to understand synthesis and the analysis of an annual monitoring of programs of measures to improve the efficiency of their networks, proposed by gas operators, and the possibility of adopting appropriate measures to achieve national objectives in the field.

Thus, from all the aspects, mentioned above that natural gas networks are efficient in everyday life and necessary for everyone.

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