SURVEYING DATA PROCESSING FOR EXTENSION, LAND REGISTRATION AND CONSTRUCTION IMPROVEMENT

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ABSTRACT

In this work were pursued both measurement methods so that the time spent determining the points to be greatly reduced, but also how the selection and use programs designed for quick and accurate processing with a high control over measurements with which values obtained are closer to reality.Impact of technology-method can be successfully applied in the case of topo-cadastral works. The main quality characteristics of solution adopted in this case are represented by alignment techniques, methods and modern standards and the need to use modern technology, practically independent of increasing productivity and reducing costs.

INTRODUCTION

The paper brings current existing problems topo-cadastral measurements regarding the methods of measurement and data processing. All the industries seeking to apply advanced technologies in the field, to reduce costs and the time required to solve problems by adopting solutions that streamline the methods for measuring and processing of data and information collected.

The related topo-cadastral works were located inside the municipality Craiova, Dacia Boulevard (Figure1), Dolj County, on an area of 9881 sqm. Physical components were represented by:

- C1 (formerly C3 - hall) with an area of 1078 sqm, ground and first floor, total built area (S_{cd}) = 1568 sqm, built area (S_c) = 1489 sqm, construction system consists of reinforced concrete foundations, steel structure, built in 2007.
- C2 (formerly C4) - constructed of reinforced concrete foundations, steel structure, built in 2013.
- C3 (formerly C5 - hall) built of reinforced concrete foundations, steel structure, built in 2013.

The goal of surveyng measurements was: building expansion (C3); construction registration (C4); construction improvement (C5); address notation; determine the exact points bounding surfaces; analytical calculation of the surface; preparation of a site plan and boundary with neighboring and contour distances for registration construction; preparation of reports (surveying) for each existing body of land on the surface.

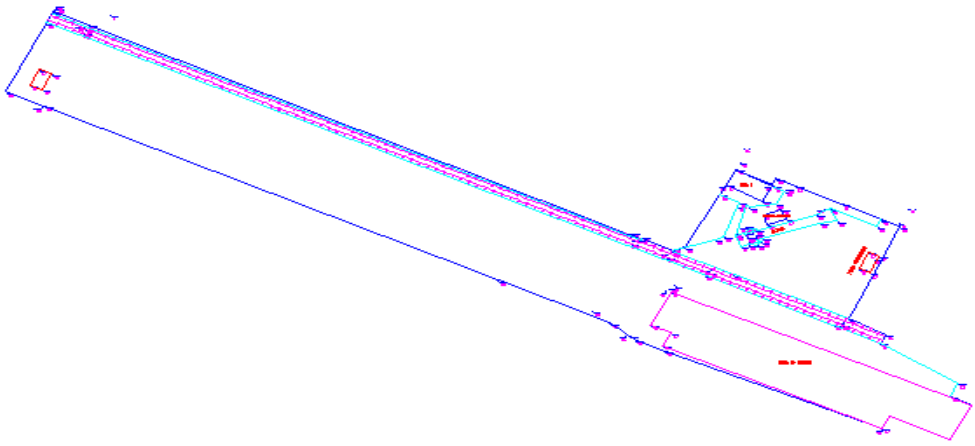

Figure 1. Outline of the area

MATERIALS AND METHODS

Measurements were made with GPS devices (GPS SOUTH S82V) and total station (Leica TC 307). By postprocessing using ROMPOS system records data from permanent stations ROMPOS SLAT (Slatina) and CRAI (Craiova), was determined station point S1 (Figure 2).

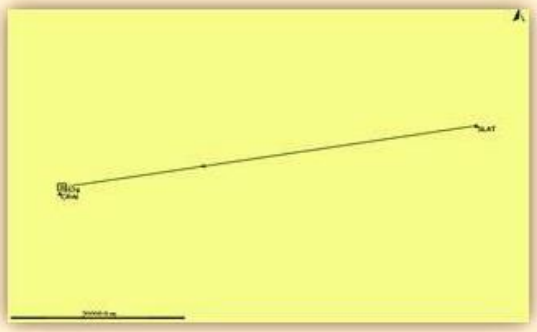

Figure 2. The graph the stops GPS

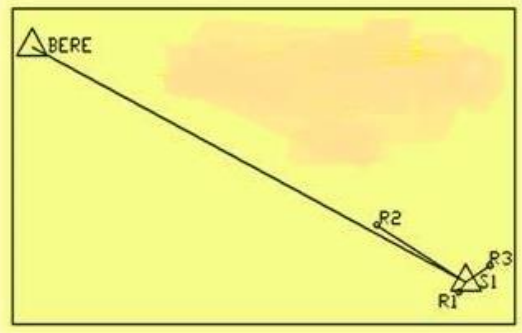

Figure 3. Surveying network

To achieve surveying network was stationed with the total station in GPS point S1 and orientation visa on Beer Factory were sideshots station points R1, R2 and R3. From S1station and R1, R2 and R3 points, were collected points of detail and contour required for the location and boundary plan.

Under Decision Nr. 1 ANCPI on achieving kinematic GNSS measurements were performed checks by double radiation measurements point with known coordinates the nearby Beer Factory, previously determined by the static method. Following them was a small difference from the known coordinates of the point Beer Factory.

Marking points on the field was achieved by metal pickets for their land sighting were used measured distances to nearest fixed elements in the area (fence corners, pillars, etc.), being made an outline with topographical descriptions and locating the four points.

Were made measurements for the following details found on land: electric poles and any other kind; property boundaries; road axis; roadside; curbs; signs; concrete platforms; certain construction; other fixed relevant details. From previous documentations were taken the contour point coordinates, those being executed in Stereo 1970 projection system. Whole area was determined from rectangular coordinates of points.

RESULTS AND DISCUSSION

Since was used total station and GPS equipment the calculations of both the station and the new points of the detail were carried out using specialized programs for data processing. Data were downloaded with LEICA Geo Office Combined and measurements were imported in TopoSys 7.0. This program extracts site and boundary plan, sideshots points, coordinate inventory and field book. It automatically generates reports on measurements, calculations, accuracy, types of solutions chosen etc. For measurements with GPS devices SOUTH S82V data processing was performed with Topcon Tools software, which is based on modern methods of calculation and eliminate errors. Along with making several stops in the landmarks with known coordinates in our county ANCPI achieved TransDat Ro a transformation program, based on determining the coordinates of the points in both systems (national and European). Since 15 December 2009, the TransDat Ro program is implemented in all counties and Bucharest for performing, verification and reception of cadastre, geodesy, photogrammetry and remote sensing. For this operation TransDat Ro program uses version 4.01, based on determining the coordinates of points in both systems (European and national).

Coordinate inventory was made following the completion of measurements in the field and their computer processing. It contains rectangular coordinates, including altitudes in the 1970 Stereographic projection system of the station points but also all points of detail on the field measured and processed at the office. Points on the site and boundary plan are found in ascending order according to their type in coordinate inventory.

The site and boundary plan and reports processing of have been prepared by computer using AutoCAD software 2013 with the software TOPO-LT (Figure 4).

For convenience of processing were used code points recorded on field, the drawings made in the field, but also a photographic support consisting of digital orthophotos containing Craiova City area. To load and use these orthophotos at processing measurements was used AUTOCAD RASTER DESIGN 2013 specialized program.

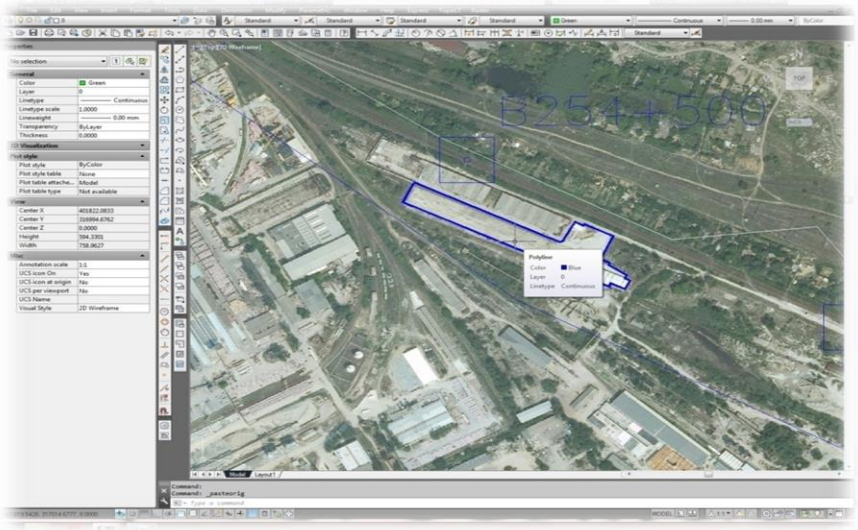

Figure 4. Orthophotomap

CONCLUSIONS

For extending, registration and improvement of related constructions were prepared: one draw which were represented buildings, showing their direction and size of each surface, for vehicle access routes were booked on the following utilities to be

executed in the future; after determining the terrain, were made construction reports to restore in the plan shape and dimensions; by knowing the details located within the block and the surface was performed site and boundary plan aiming at positioning roads by placing access roads, crossing lines that determine approximate property boundaries determined subsequently by the points measured in the field using total station; delineation of existing buildings and details on the surface.

As a result, was performed: construction extension (C3); construction registration (C4); construction improvement (C5), but also registration of the land on which the buildings are placed, according to the measurements resulting a surface S = 9881 sqm.

The main quality characteristics of solution adopted in this case are represented by aligning with techniques, methods and modern standards and the need to use modern technology, practically independent of increasing productivity and reducing the time and workload.

It is recommended the designer to follow topographic base established for the project but also the preservation and unalter new points with known coordinates determined in pursuit of future works, extensions and inspections in the area. It is necessary dialogue between the designer and surveyor to clarify possible questions about topographic layaut and topographic points landmarking.

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