

ELABORATING DOCUMENTATIONS FOR CHANGING THE CATEGORY OF USE TO CONSTRUCT A FIELD OF PHOTOVOLTAIC PANELS

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Keywords: topographic documentation, surveying network, category of use

ABSTRACT

Determination of the land contour points was achieved in the RTK-Real Time Kinematic (using real-time differential corrections from the reference stations integrated RGN-GNSS – Corabia and Slatina. The purpose of this work was the preparation of a site plan for reception PUZ in Caracal, T122, P12 and P13, buildable area, Olt County to build a photovoltaic park. Beneficiary of the aforementioned land, has the objective of developing an investment in renewable energy production.

INTRODUCTION

The purpose of project implementation is to produce photovoltaic park electricity by harnessing the renewable energy of solar radiation represented in the overall context of sustainable development that involves:

- The responsible management of fossil fuels by harnessing renewable resources viable for generating electricity;
- Reducing emissions of greenhouse gases in order to reduce global warming by using energy and clean technologies;
- Reducing risks to human health and environmental quality.

The energy produced will be delivered to the National Power System.

To achieve the photovoltaic field is required preparing the topo-cadastral documentation for the PUZ reception and park design.

MATERIALS AND METHODES

The purpose of this work was the preparation of a site plan for reception PUZ in Caracal, T122, P12 and P13, buildable area, Olt County to build a photovoltaic park.

Beneficiary of the aforementioned land, has the objective of developing an investment in renewable energy production. This investment consists of the placement of groups of photovoltaic panels that will capture solar energy and transform it into electricity. In addition to these panels, this field will be placed a transformer unit. The capacity of this facility is expected 7mW.

The area on that going to be placed photovoltaic field is composed of two properties.

The first property located in Caracal, T122, P12, buildable area, Olt County, the area measured is arable use category and an area of 10.0045 ha measured. The second property is located also in Caracal, T122, P13, buildable area, Olt County, category of use for measured parcel is arable, the area resulting from measurements being 7.0 ha.

Geodetic network for thickening and surveying was done to ensure the number of points required for topo-cadastral measurements.

The equipment used for measurements was LEICA GS09 GPS and Leica TS06 total station.

Transmission of coordinates in the working area was made methods of GNSS (Global Navigation Satellite Systems) position determination autonomous geo-spatial. Topographic measurements were performed in the coordinate system of the state geodetic network.

RESULTS AND DISCUSSIONS

The accuracy of determining the points was made according to ODG 634 and Decision No. 1 concerning achievement of GNSS cinematic measurements, issued by the Director of Geodesy and Cartography of the ANCPD displayed on ANCPD site:

If kinematic determinations were performed in the RTK Real-time Kinematic (using real-time differential corrections from a reference station RGN-GNSS integrated or specialized service ROMPOS), then it will be presented:

- Name and coordinates in the national system (Stereo70), geocentric Cartesian (X, Y, Z) and / or ellipsoidal (B, L, h) of points surveying network used;
- Name and coordinates in the national system (Stereo70), geocentric Cartesian (X, Y, Z) and / or ellipsoidal (B, L, h) of points of detail determined;
- Text files (ASCII) on magnetic media containing information on:
 - a) Project name (job);
 - b) the name / identifier determined in the RTK point;
 - c) the date and time when it was determined that point;
 - d) determining RTK option: a real or virtual reference station;
 - e) type of solution for the coordinates determined (fixed, float);
 - f) the geocentric coordinates of points of detail determined (average of two determinations for points materialized) and accuracy in the geocentric Cartesian system and / or ellipsoidal;

For points of detail evidenced in the the land, which define the limits of property, there will be a double determination of coordinates in the kinematic mode using one of the options below:

- Two determinations (through initialization) at different time points using differential corrections from different real reference stations;
- Two determinations (through initialization) at different times points using differential corrections from real reference station and one or more virtual reference stations;
- Two determinations (through initialization) at different time points using differential corrections from the same reference station.

Noted that since September 2014 entered into force the order of the Director ANCPD 700/2014, which repeals all previous regulations relating to the preparation of cadastral documentation.

Determination of of the land contour points was achieved in the RTK-Real Time Kinematic (using real-time differential corrections from the reference stations integrated RGN-GNSS - Corabia by coordinates: X = 252,902.747, Y = 460,039.364 and Slatina by coordinates X = 324965.112, Y = 449706.004) resulting points 0001, 001, 0002, 002, 0003, 003, 0004, 004, 0005, 005, 0006, 006 (Table 1).

Table 1.

**Coordinates of the contour points for surface
T122, P12 and P13, buildable area, Caracal, Olt County**

Point no.	X [m]	Y [m]
0001	289387.976	450550.809
001	289387.975	450550.808
0002	289219.477	450530.743
002	289219.461	450530.747
0003	289219.477	449975.553

003	289219.475	449975.547
0004	289387.976	449918.519
004	289387.974	449918.515
0005	289086.059	450514.852
005	289086.055	450514.856
0006	289086.059	450020.707
006	289086.063	450020.705

Surface calculation was performed by the analytical method, from the absolute coordinates of the points.

Table 2.

Calculation of the surface Caracal, T122, P12, buildable area, Olt County

Point no.	Contour points coordinates		Length of the sides
	X[m]	Y[m]	
1	289387.976	450550.809	169.69
2	289219.477	450530.743	555.19
3	289219.477	449975.553	177.89
4	289387.976	449918.519	632.29
Surface = 100045 sqm			Perimeter = 1535.06 m

Table 3.

Calculation of the surface Caracal, T122, P13, buildable area, Olt County

Point no.	Contour points coordinates		Length of the sides
	X[m]	Y[m]	
2	289219.477	450530.743	134.36
5	289086.059	450514.852	494.15
6	289086.059	450020.707	140.85
3	289219.477	449975.553	632.29
Surface = 70000 sqm			Perimeter = 1324.55 m

Graphical representation was made with AutoCAD 2012, allowing scale representation of that surface. The distances of the contour area were calculated from coordinates.

Were prepared following plans:

- framing in the region plan: scale 1/10000
- Site and boundary plan of real estate: 1/1000 scale.

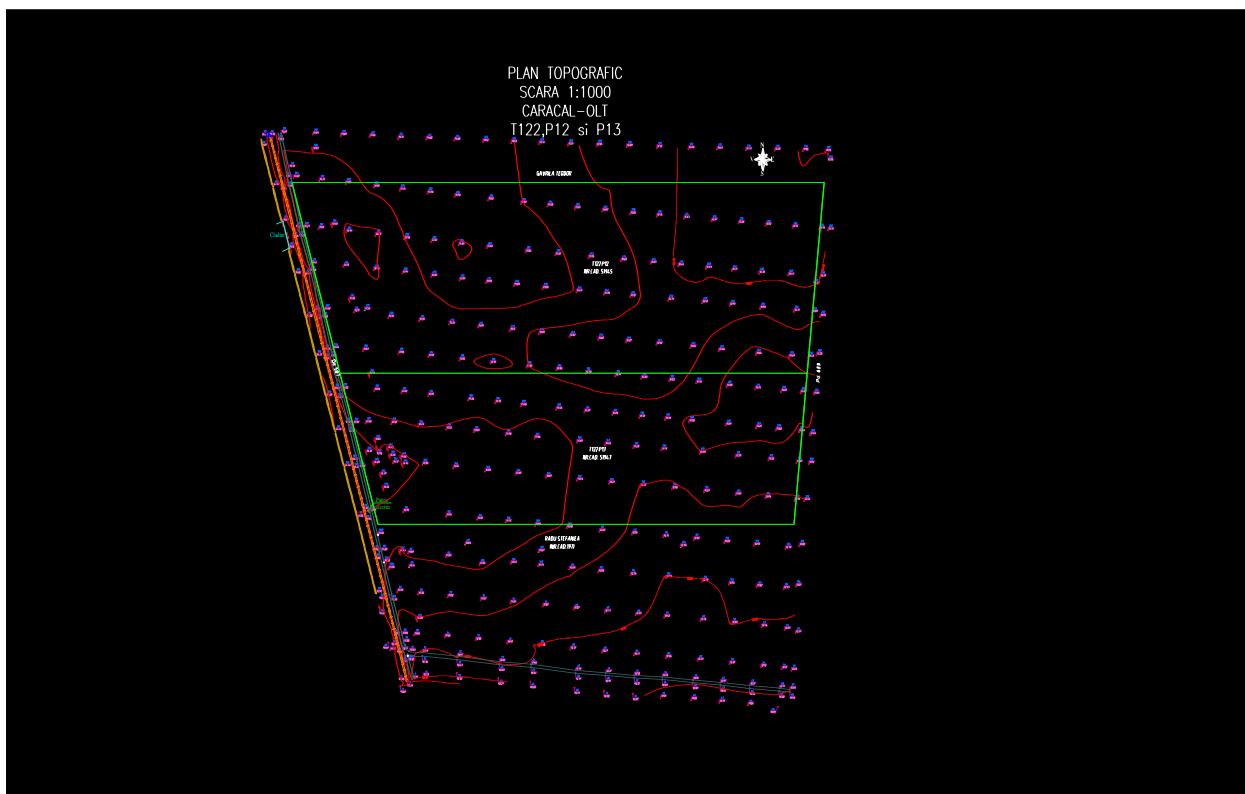


Figure 1. Topographical plane

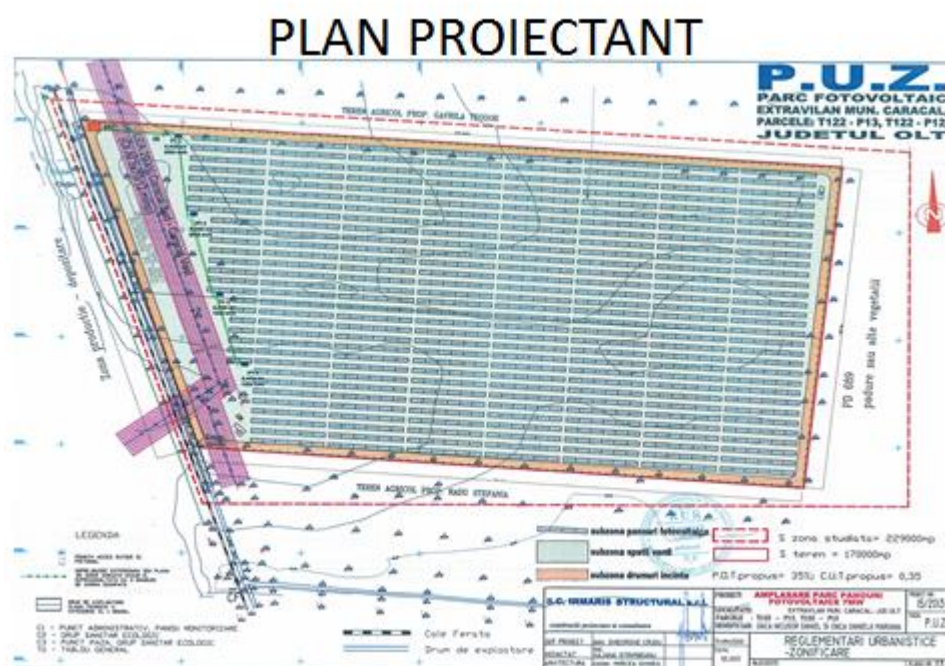


Figure 2. Designed plane

CONCLUSIONS

Documentation for reception of PUZ topographical support included:

- Technical memorandum: methods, instruments used, processing and storage mode, organization and data representation, accuracies obtained, the surface on which was executed the work (ha);
- Copy of notice of commencement of work;

- Plan framing in the area at an appropriate scale, which will highlight PUZ limit to existing urban limit, if executed in buildable PUZ sites;
 - Topographical Plan (analogue and digital - dxf), scale 1: 1000, which highlighted the PUZ limits and boundaries inside PUZ buildings which have been granted cadastral numbers
 - Measurements made thickening network with classical technology or GNSS technology (GPS) in digital format
 - Inventory coordinates of inflection points that define the boundary PUZ in digital format
 - Analytical calculation of area bounded through PUZ
 - Planning certificate approving investment
- Without the help of modern means and methods of lifting, drawing topo-cadastral documentation would have been difficult and would have lasted longer.

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