Journal of Young Scientist, Volume III, 2015
ISSN 2344 - 1283; ISSN CD-ROM 2344 - 1291; ISSN Online 2344 - 1305; ISSN-L 2344 – 1283

EXTENSION OF THE WATER NETWORK IN THE TOWN HOLBAV TECHNICAL AND LEGAL ASPECTS

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Abstract

In this work it is desirable to show legal and technical aspects of extension of the water network in the town Holbav, Brașov county. Having regard to geographicalpositioning and orographic for the locality, legal aspects of this work aimed at removing some land areas of forest fund.To perform the measurements necessary to project the extending the network of water use has been made of a total station SOKKIA and apparatus GNSS. Total station was used in carrying out the lift network, being a network supported on known points.GNSS equipment has been used in determining the points station using their positioning by process static and the procedure Real Time Kinematics (RTK). On this occasion shall be investigated and process accuracy Real Time Kinematics (RTK) for the forestry sector and the factors that influence the accuracy. In the work of extending the network of water in this town Holbav, Brasov county desired positioning of a new water basin at an altitude of upper front positioning existing basin, with a view to enlargement, as well as more advantageous uses of the network, and profitable in relation to the cost of use of the network. From a technical point of view, the network of lifting has been carried out between the existing and new pit they wanted to place it virtually. Whereas it is desirable to place a new water basin inside Holbav locality, in a wooded area, concerned into the forestry of this territorial administrative units will reach legal aspect. So for the area where it is desirable the location of water basin must be that this area will be taken permanently out of the forest, and for the surface where it will place new pipes must be temporarily out of forest fund(for the work of fitting and location). In conclusion, in order to achieve a work for the forestry sector must be attained both legal aspects of the job, but special attention should be paid totechnical aspect from the point of view of the difficulty with which can also be done from the point of view of accuracy which is difficult to attain.

Key words*:RTK,topographicsurvey***,** *compensation, forestry.*

INTRODUCTION

In the locality Holbav, Brașovcounty, it is intended to extend the water network, placing a new water basin at an altitude superior to existing water basin in that area.It is desired location basin of water in that area to facilitate distribution of water in the locality. Considering that the new location is a mountain area must make a documentation in order to obtain approval for permanent or temporary employment removal from the national forestry Fund lands.The entire documentation to be done, I will be focus in this work on raising the topographic surface required for removing definitive/temporary employment of national forest fund. In carrying out the topographic surface network I will use both GNSS equipment and methods, as well as total station and classical methods traverse and lifting plan details.

MATERIALS AND METHODS

In order to achieve raising the topographic surface required for removing definitive/temporary employment of national forest fund has been used in the determination GNSS equipment end-points and the points of station within traverseson the newlocation. GNSS equipment was used to determine details coordinates in the field.

To determine the end points of the traversehas been used static positioning.

Static measurements receivers are fixed in the time concerned measurements - also known as "sessions". The results shall be deducted from subsequent successive measurements carried

out by the receiver at specific time intervals pre-set called "era of measurement", as a rule common to all receivers involved in a working session. (Chițea& All, 2013)
For the positioning of the station traverse points in the new location and the detail of the existing water network was used purely cinematic method, i.e. the method to real-time kinematic (RTK).
Method Real Time Kinematic (RTK) is a method for the determination of the relationship between a point known to control and a point unknown carriers using measurements of the phase. A base station with known position transmit corrections toward the receiver or receivers mobile.Procedure provides a high accuracy in real-time, and the results obtained are not features processed. In the early days GPS, kinematic positioning and high were not frequently used for that the methods of resolution ambiguous were still ineffective. Later, when the resolution ambiguous, such as on-the-fly (OTF) have become available, Real time kinematic and other similar methods of positioning have become widely used. (Chițea& All, 2013)
All topographical lift to achieve has been used Total station and classical method of traverse supported on known points (point what have been previously determined with equipment and techniques GNSS). Using this method have been measured points of detail on the ground on section of new location. Total station and traverse method has been used only to the portion of the field where it is desirable to location of water basin, area that new location.
Method traverse, apart from the fact that it constitutes a method of distinct thickening of the support network is a method of carrying out the topographic networks raise, but can be a lifting way detail. (Chițea& All, 2011)
Traverse is a broken polygonal line, where mutual position of the points is determined by measuring distances between the point of breakingand by measuring the angle at the point of breakingof polygon element. In each workstation traverse shall be measured horizontal angular directions, distances and Vertical angles. As a rule of measurement we can establish that first point in the measurement to be the point of traverseat rear (base station or the point of previous guidance), and the second to be the point of traverse next. (Manea)
In a classic traverse to measure horizontal angles in all the old and new points, with a value of "0" on the horizontal circle always introduced on the previous point (back).. Horizontal angles during traverse shall be measured on the same side of traverse. (Chițea& All, 2011)
Vertical angles (tilt angles) using Total station are measured automatically, once with endorsing required point. It also distances are measured electronically. For the calculation of coordinates of points from both the traverse and the measurement of details (further measurement operation), will use horizontal angles, tilt angles and distances reduced on the horizon, to be obtained from the distance at an angle and the tilt angle (data measured in the field).

RESULTS AND DISCUSSIONS

GNSS equipment using static method of measured points were end of lift network, these being measured and RTK method.
For the positioning of the station points, the end of the lift network, but also for other significant detail in the work was pure cinematic process use in real time.In the positioning of these points has been given special attention, therefore, to define more precisely the position of each point we achieved successive measurements. The final coordinates of points resulting in average.
In this respect I will analyse the accuracy of positioning of points depending on HRMS and VRMS, as average of all measurements to determine the coordinates of a point (Table 1), (Figure 1).

Table 1. Accuracy HRMS, VRMS of the points of station

No Point	1	2	3	4	5
HRMS Avg	0.0031	0.0032	0.0035	0.0054	0.0035
VRMS Avg	0.0054	0.0059	0.0082	0.0115	0.0064
No Point	6	7	8	9	10
HRMS Avg	0.0035	0.0040	0.0083	0.0034	0.0043
VRMS Avg	0.0062	0.0071	0.0107	0.0064	0.0071

HRMS represents tolerance defined by radius of a circle which contains 50% of individual measurements which are carried out, or less

than the radius circle inside which there is a probability of 50% to find out they, respectively position accuracy in the horizontal plane.(Carlson Software, 2007)

VRMS shall mean tolerance as defined by a sphere where a point can be found, with a probability of 50 %, respectively accuracy in the vertical plane. (Carlson Software, 2007)

HRMS and VRMS are expressed in meters. Both the table and the graph can be seen as positioning accuracy in both horizontal and vertical plane is very good. On the horizontal plane can be seen as most haveaccuracy for positioning of 3 mm.And in the vertical plane can be seen as an average for positioning is 7 mm.

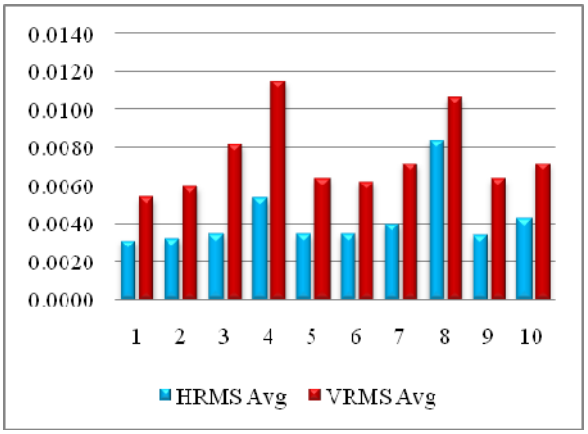

Figure 1. The positioning accuracy of the points of station

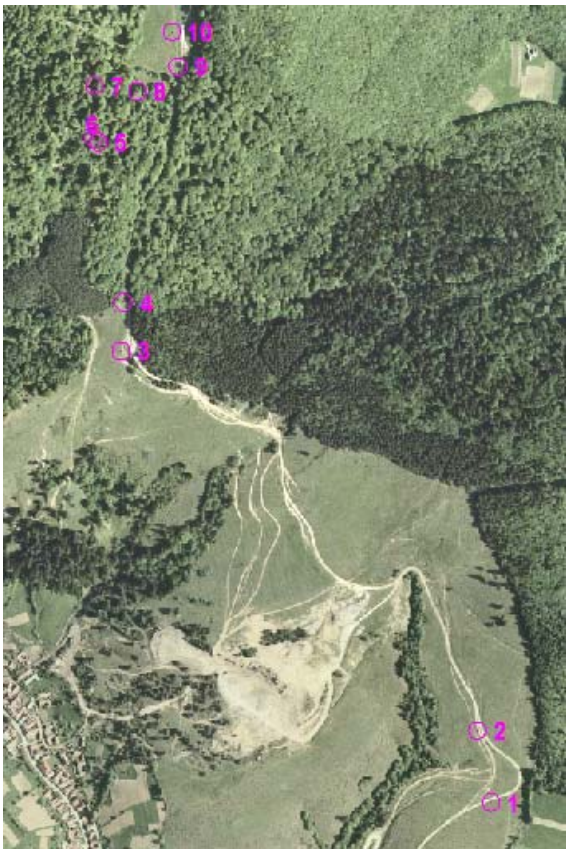

Figure 2. The overlaying of points collected with GPS on orthophotomap

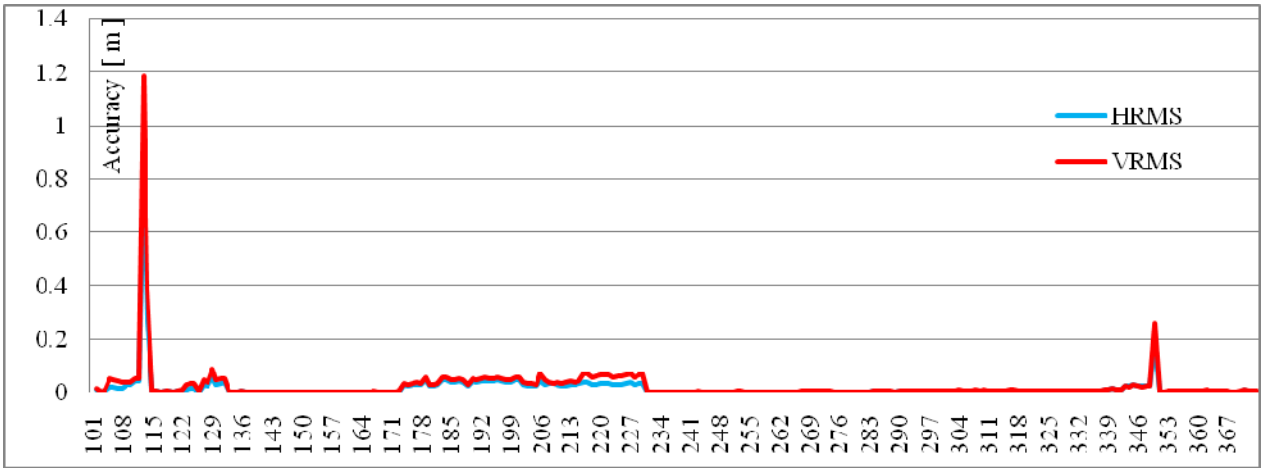

Figure 3. The positioning accuracy of the points of detail positioned by the method RTK

Here infer that points have been positioned with an accuracy particularly good taking into account the positioning method and the area in which they were carried out measurements. Taking into account an measurements have been carried out in a wooded area position

accuracy may suffer. What can be observed for items 4 and 8 (points surrounded by trees), these points with lowest accuracy on both horizontal and vertical planes (Figure 2).
It also can be analysis and position accuracy of points of detail determined by method Real time kinematic. These points of detail means vicinal road Vârf la Cruce-Măgura (new road). For the positioning of these points were not given special attention as in the above analysis points. The coordinates of these points have been determined through a series of single measurements. But you can see easily how vegetation can influence the accuracy of positioning both in horizontal and in vertical plane (Figure 3, Figure 4).

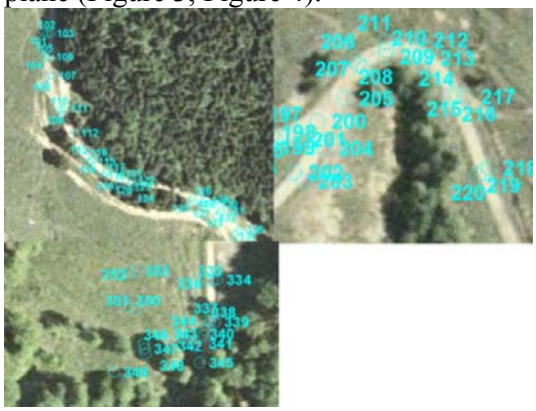

Figure 4. Overlapping points of detail on orthophotomap

For measuring network has used a type of SOKKIA total station. It is mentioned as a measuring network connects with vicinal road Vârf la Cruce-Măgura (new road) whose points have been determined previously (Figure 5).
Measuring network was achieved in locally, starting with arbitrary coordinates 1000,1000,800 (first point of station), which coincides with point 4 point determined with the GNSS equipment and methods. The orientation measured on the point 2 of station, concerned point 3 positioned with the GPS.
In total traverse contains 15 points, of which 13 of them are station points, and 2 points are orientation points, point 2 and 15 of the traverse what coincides with points 3 and 10 respectively determined with GPS. Traverse closes on point 14 of station (respectively point 9 positioned with the GPS), to the orientation on the point 15 (Figure 6).

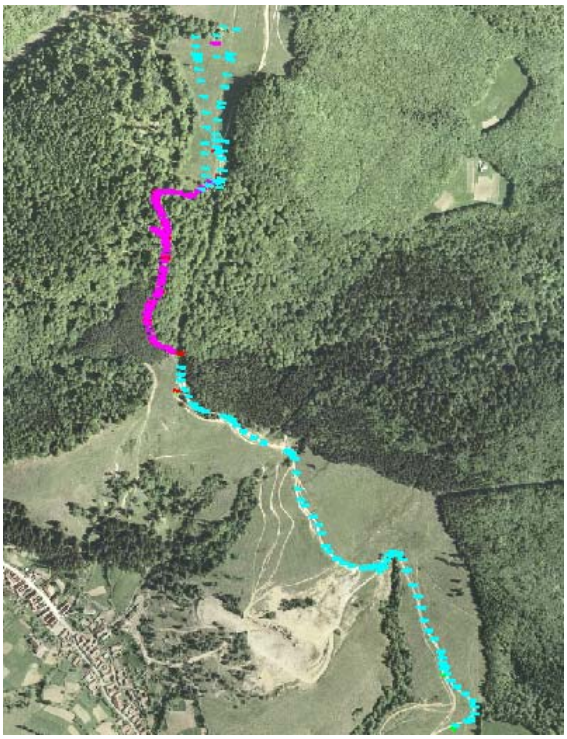

Figure 5. Points of detail taken over and RTK traverse

In the traverse have been measured and the details on the ground that the majority in cases means vicinal roadVârf la Cruce-Măgura(new road).
Download land license was done with Pro LINK software version 1.15 (Tereşneu, 2012), which automatically calculated from the coordinate traverse, depending on horizontal and vertical angles, distances and orientations measured in the field. Placing from arbitrary coordinates (1000, 1000, 800) for the first point of station, all measured points were positioned in a local reference system.
For the points in the traverse have coordinated in the reference system Stereographic 1970 we did coordinate transformation from common points 1, 2, 14, 15 (points stations in local system), and points 4, 3, 9, 10 (points determined with equipment GNSS, points determined in the system Stereograph 1970). This coordinate transformation was effected with TopoSys software version 4.2 (Tereşneu, 2012), using a spatial transformation using Helmert parameters
Subsequently the coordinate transformation operation have been compensated for station points within the measurement network. The classical compensation depending on the end points (orientation points), respectively known

points determined with particular attention in previous steps. After getting the coordinates of the station were compensated and corrected coordinates of detail points, measured in the traverse.

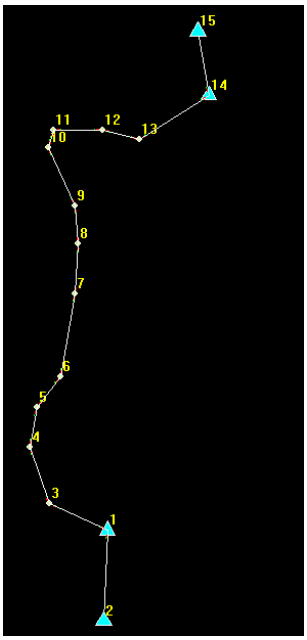

Figure 6. Traverse supported on end points

All of these operations means the appearance of technical work extending the network of water from the point of view of cadastre and land measurements. The measurements of the amount of land, processing and processing of the data collected necessary for carrying out the topographic surface lift required for removing definitive/temporary employment of national forest fund.

LEGAL ASPECTS

Documentation to be compiled in order to obtain approval for permanent or temporary employment removal from the national forestry fund lands includes the following information:
The eject request final beneficiary and/or temporary employment land in the national forest fund, which was addressed to the territorial subunitatii specialty of central public authority responsible for forestry place land;
Memorial techno-justifying the need of removal definitive or temporary employment of forest land in national fund;
Plan for Employment in the area;
The detail Plan objective of a site;
A copy of the map that is materialized landscape planners target site;
Technical Data transmission-grubbing;
Pedologicalstudy for land offered as compensation, in the case of applications for permanent putting with offset;
Raising the topographic surface required for definitive removal/temporary employment of national forest fund;
Documents, in hard copy, by which proof of ownership of land required for definitive removal/temporary employment of national forest fund;
The land register references land which shall be made available in offset or the land register references for the entire property on which it holds the recipient;
The subject of a favourable opinion by the county forest division which provides management or the provision of services for forest land required;
County forest division confirmed that manage/ forestry services, in the case of applications for temporary employment;
The Agreement of owner for forest lands in which to specify including that the land is not in dispute;
The Agreement of the environment or the point of view of the authority of the environment, as appropriate;
Copy of the document for the payment of the fee for permanent putting or guarantee for temporary use.
According to forestry Code (Law No 46/2008) this provides:
It may be permissible to reduce national forestry surface through removal final, for the achievement of the objectives of national interest, declared of public interest and in accordance with the provisions of the law.(Art. 36, para. (1))
On request, the applicant land on which are to be carried out objectives referred to in paragraph (1) can compensate for land area planted with an equivalent area and trustworthiness, in which case shall not be paid the equivalent of land national forest fund, but shall be paid in advance other obligations cash.(Art. 36, para. (2))
Compensation referred to in paragraph (2) shall be carried out in equivalent value, under the

conditions in which the surface of the site given compensation may not be less than the area land covered by forest removal from the fund. (Art. 36, para. (3))

Can be removed from national forest fund, only on condition that their compensation, without reducing forestry area and the anticipated payment of financial obligations, only those land necessary for the realization of or extending following categories of objectives:

a) exploitation necessary following mineral resources: coal, rocks useful, aggregated minerals, ores and mineral waters;

b) structures of receipt functions with tourism tourist accommodation, units of cult, objective social, sporting and medical, triplet of local interest, drinking water supplies, c)Homes or holiday houses, forest fund only in private property;

d) point installed in the forest before 1990, contained in the forest management plan in force on 1 January 1990, in the category "occupations and litigation" (Art. 37, para. (1))

Compensation referred to in paragraph (1) shall be carried out physically with a plot of land which has five times the value of the land which shall be removed permanently from the fund forestry, and surface of the site given as compensation may not be less than three times the surface of the site which is the subject of removal from the fund forestry. (Art. 37, para. (3))

Fields with which is carried out compensation referred to in paragraph (1) shall be the only outside national forest fund, but its adjacent suitable for woodlands. In a situation in which a minimum area of land which is carried out compensation is greater than 20 ha, it may not be adjacent forestry, but must be compact. Unable to achieve compensation of land situated in Alpine area and subalpina. (Art. 37, para. (4))

Land removed from the Fund and forest land received as compensation acquired legal status of the land on which they are intended to replace. (Art. 37, para. (8))

Temporary employment of forest land in the background is only permitted on a specified period of time, for the purpose of achieving the objectives of the kind referred to in Article 36 and in Article 37 (1) (a) and to ensure payment of financial obligations anticipated by the recipient of approval of removal of forest fund for that objective.(Art. 39, para. (1))

In the case in which, for the achievement of the objectives referred to in Article 37 (1) (b) - (c), are necessary and other adjacent land for the organization of construction site, they will be temporarily occupied, for a maximum period of one year and in an amount equal to not more than 10 % of the area requested to be permanently forest fund.(Art. 39, para. (4))

Period in respect of which it is hereby approved temporary employment of land from the fund forestry includes the time needed for carrying out the works lands under conditions to be suitable for woodlands. (Art. 39, para (5))

Considering all these mentioned and the fact that the surface wants to permanently remove from the forestry is 357 square meters, the surface you need to impersonate, equivalent must not be of a smaller area of 1071 square feet. But this condition is fulfilled, as equivalent will yield a surface of 2000 square meters stripped down from the pasture 2292254 square meters, registered with the topography number 1513/1/ 1/1/ 1/1/ 4/1/ 1/1, and to the number of Land Register 100295, pasture within one and the same localities.

In terms of the surface to be removed temporarily from the national forestry Fund, this is represented by the future water pipe in length from 2195 meters.

For it will submit in advance the financial obligations for approval to remove the forest for that objective. In this sense, there will lodge the security, equivalent to the fee charged for definitive removal of land from the forest compensation fund, which shall be paid in advance of issue of approval and shall be deposited in the fund for the improvement of agriculture fund with destination forestry; the rent, which shall be paid in the case of owner, forestry private property of the natural and legal persons, i.e. the public property of territorial-administrative units; for owned forests of the state, 50% of the lease payment shall be deposited in the fund for the conservation and regeneration of forests and 50% shall be paid administrator; The equivalent loss of growth determined by mass exploitation woody before the age technical exploitability disused objectives; the value of the land concerned; expenses for re-installing

forest vegetation. (Art. 42, para 1, a), b), c), d), e)).

CONCLUSIONS

First of all, it can be seen as a purely cinematic process in real time and offers a very good precision even in the forestry sector but accuracy can also be affected if the item you want to be positioned is vegetation and does not give enough attention during the measurement.

Also the use of GNSS equipment and suitable working methods for the forestry sector is advantageous because it reduces the working time. Even in the case of topographic networks use GPS presents advantages, thanks to its orientation points positioned near the workstations.

The works in the forestry sector is in general difficult both from the technical point of view because of the inhospitable terrain and vegetation, as well as in legal terms.

ACKNOWLEDGEMENTS

The research work was carried out with the guidance and support of my scientific coordinator, Lecturer Dr. Eng. Cornel Cristian Tereşneu.

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