

Visualization and Computer Animation of 3D Basic Map of Highway

Jan HARDOS, Slovakia

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SUMMARY

Historically the 1st Basic Map of Highway in 3D digital system in Slovakia was mapped and processed in the 1st half of year 2004 for the final „as-built“ documentation. The customer was SLOVAK ROAD ADMINISTRATION, the contractor of highway construction was DOPRASTAV Inc. Bratislava and the subcontractor for geodetic part of “as-built” documentation (mapping and processing 3D map) was SIGEO Ltd. Bratislava.

The new constructed highway section 11.5 km in length is situated directly in Bratislava (capital of Slovakia) with a lot of complicated structures (bridges, crossroads, flyovers, underpasses, double deck bridges with highway and railway, etc.). As a mapping method the classical terrestrial method (prismless totalstations and GPS) has been used. Besides the highway itself, also the adjacent strip (250 – 400 m in width) was measured. All objects of highway and adjacent strip were measured and processed in 3D system (highway constructions, traffic marking and signs, adjacent objects – as for example buildings, roads, streets, plots with fences, terrain and all kind of utility lines with joined database of lines features in Microsoft Access).

The technical directive for 3D Basic Map of Highways for Slovak Road Administration was developed by the Faculty of Civil Engineering STU Bratislava - Department of Surveying. According to this directive all data were processed and drawn in MicroStation (Bentley) software with 17 reference files in 3D (for each type of objects – 1 reference file), except 1 reference file with the cadastral situation in 2D system. Besides the digital form of 3D map also the printing form of classical 2D map (map sheets in the scale 1:1000) was delivered.

In addition to the technical directive, and besides the contract, the visualization and computer animation (“the fly of bird” over and under all sections of mapped highway) was prepared by geodetical subcontractor to show to customer the new technical possibility of 3D maps and to demonstrate the real situation in the map in more acceptable manner for human eye. Entire visualization and animation was performed directly in MicroStation over the digital map. Besides, I would like to emphasize that the visualization and computer animation of 3D map is also a very good tool for checking up the errors in 3D drawings.

The main purpose of this paper is to present these results directly on-line on the computer, and therefore this written form is very short.

BIOGRAPHICAL NOTES

Education: (1970-1975) Slovak Technical University Bratislava, Faculty of Civil Engineering, specialisation: geodesy and cartography. He attained the certificate of Authorised Surveyor for the Engineering Geodesy in 1980 and for the Cadaster in 1992.

Professional experience: Since 1975 he performed and managed the surveying works, mainly at the Engineering Geodesy (investment construction, deformation measurements, mapping operations). In years 1985 – 1989 he acted as a Czechoslovak expert for the Ministry of Water Economy of Algeria at geodetic assurance of construction of 4 dams in North-East Algeria. Since 1993 he is the Managing Director and part-owner of the private geodetic company SIGEO Ltd. Bratislava.

Membership in professional organisations. (1990-1995) the member of chair of Slovak Union of Surveyors, since 1996 till now he is the member of the Board of Directors in the Chamber of Surveyors and Cartographers, national delegate in 6th Commission of FIG since 1998 and the delegate of Slovakia (Chamber of Surveyors and Cartographers) in CLGE (Council of European Geodetic Surveyors) since 1999.

CONTACTS

Dipl.Ing. Jan Hardos
SIGEO Ltd.
Racianska 71
832 59 Bratislava
Slovakia
Phone: + 421 2 44458342
Fax: + 421 2 44635772
E-mail: sigeo@netax.sk
Web site: www.sigeo.sk