



Horizontal Control for Stabile Cadastre and Second Military Survey (1807-1869) in Bohemia, Moravia and Silesia.

V. Cada (1), M. Vichrova (2)

(1) University of West Bohemia in Pilsen, Czech Republic, (2) University of West Bohemia in Pilsen, Czech Republic. (cada@kma.zcu.cz / +420-377-63-2678)

History of horizontal control in Bohemia, Moravia and Silesia is very extensive. As early as 1806 - 1811 astronomical-geodetical works have been initiated and so in 1819 the whole territory of the Czech Lands was covered with the area trigonometric network that became a base for Second military survey project. These works have been further developed for the needs of Stabile cadastre applying modern scientific knowledge of that time.

1st order network has been established in Moravia and Silesia (1821 -1826) as follows in Bohemia (1824 - 1825 and 1827 - 1840). 2nd and 3rd order networks have been established according to needs of topographic mapping in Moravia (1822 - 1829) and Bohemia (1825 - 1840). 1st order triangulation stations enabled to place the theodolite for angular measurement while church towers were allowed to use in 3rd order triangulation only. Continuous trigonometric network in Bohemia incorporated 2623 stations of 1st to 3rd order (5 stations per 100 square kilometres) in the Gusterberg coordinate reference system. Similar network in Moravia incorporated 1069 stations (4 stations per 100 square kilometres) in St. Stephan coordinate reference system. Sensitive choice of stations, minimal expences and thoughtful organization were typical features of that project.

Reichenbach's repetition theodolites have been used for angle measurements (horizontal angles of 1st order network twelve times, zenith angles three times). An average closure error after consideration of spherical excess reached 2,1", maximum value

9,8". All distance measurements have been carried out in the fathom measure. The network dimension was derived from 4 geodetical bases (Wiener Neustad in Lower Austria, Wels in Upper Austria, Radauti in Romania and Hall in Tyrol). Voluminous documentation of triangulation for Stabile cadastre in Bohemia, Moravia and Silesia has been saved in archives and nowadays is accessible at the Land Survey Office in Prague.

Coordinates of above mentioned triangulation stations have been used to compilation of "global transformation keys" enabling unambiguous transformation of positional coordinates given in Gusterberg or St. Stephan coordinate reference systems into contemporary Czech national reference system (S-JTSK). These global transformation keys are important components of technology for digitizing the cadastral maps and georeferencing of topographic maps originated from the Second military survey (1806 - 1869).

The first author was supported by the Research Plan MSM 4977751301.