

Appendix II Accuracy of Measurement of the Permanent Ground Displacements in Niigata City

A procedure similar to the case of Noshiro City (Appendix I) was applied to examine the accuracy of the measurement of the permanent ground displacements by the aerial photograph survey.

However, in Niigata City, an on-ground survey was not conducted and the coordinates of the datum points, which were compared with the coordinates by the aerial survey for the examination of the accuracy of the aerial survey, were determined from an 1/25,000 scale map.

As shown in Table II-1, the accuracy of the permanent ground displacements measured in Niigata City was estimated as ± 72 cm in the horizontal direction and ± 66 cm in the vertical

direction.

Two reasons can be considered for the accuracy of the permanent ground displacements in Niigata City being much lower than that in Noshiro City. One is that the reduction scale of the photographs used in Niigata City was 1/11,000 and 1/12,500, which is larger than those in the case of Noshiro City (1/8,000).

And the other reason is that an on-ground survey was not conducted and the coordinates of the datum points were determined from an existing 1/25,000 scale map. Improvement in accuracy can be expected if an on-ground survey, similar to that taken in Noshiro City, is conducted in the future.

Table II-1 Accuracy of Measurement of the Permanent Ground Displacement

Aerial Survey	Pre-earthquake	Post-earthquake
Total Number of Datum Points	11	11
Accuracy of Aerial Survey (Standard deviation of differences of coordinates by 1/25,000 map and aerial surveys)	± 0.49 (Hori.) ± 0.50 (Vert.) <div style="text-align: right; margin-right: 20px;">(m)</div>	± 0.51 (Hori.) ± 0.43 (Vert.) <div style="text-align: right; margin-right: 20px;">(m)</div>
Accuracy of Measurement of Permanent Ground Displacement	$\pm \sqrt{(0.49)^2 + (0.51)^2} = \pm 0.72$ (Hori.) $\pm \sqrt{(0.50)^2 + (0.43)^2} = \pm 0.66$ (Vert.) <div style="text-align: right; margin-right: 20px;">(m)</div>	