

Buried channel delineation using a passive surface wave method –Example in Soka City-

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A passive surface wave method has been applied to the delineation of buried channels in urban area of Japan. S-wave velocity structure down to 100m is very important in the local site effect of strong ground motion. We have tried to delineate three-dimensional S-wave velocity structure down to 100m in terms of the passive surface wave method. The test site is in Soka city, Saitama prefecture, Japan and the size of the site is about 3 km square. Sixty-two passive surface wave methods were carried out. The main purpose of the survey is the delineation of buried channels in the area. The depth of channels is about 50m and the channels were filled with alluvial deposits. Array size is about 50m to 100m and triangular or L shape arrays with 10 or 11 receivers were used. A spatial auto correlation method was applied to the approximately ten minutes vertical component of micro-tremors data. Phase velocity curves were calculated in the frequency range of between 2 and 10 Hz. Fundamental mode of phase-velocity curves are clearly obtained in all observation points. A one dimensional inversion using a non-linear least square method has been applied to the phase-velocity curves and one-dimensional S-wave velocity structures were obtained. The resultant one-dimensional structures were interpolated into a three-dimensional structure. The result clearly shows the shape of buried channel and agrees with existing borehole data very well.

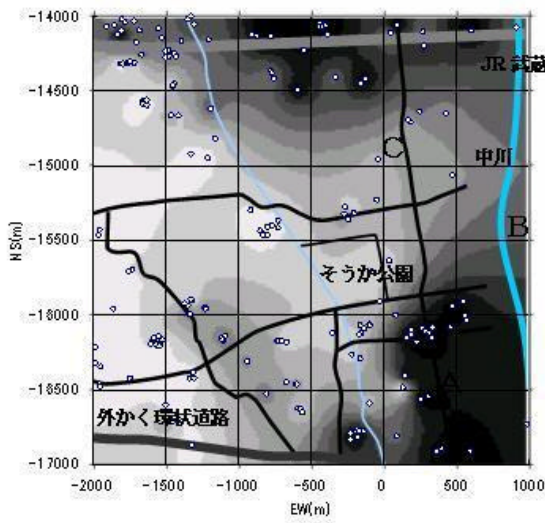


図-1 既存のボーリング位置(○)と推定された沖積層下面深度。

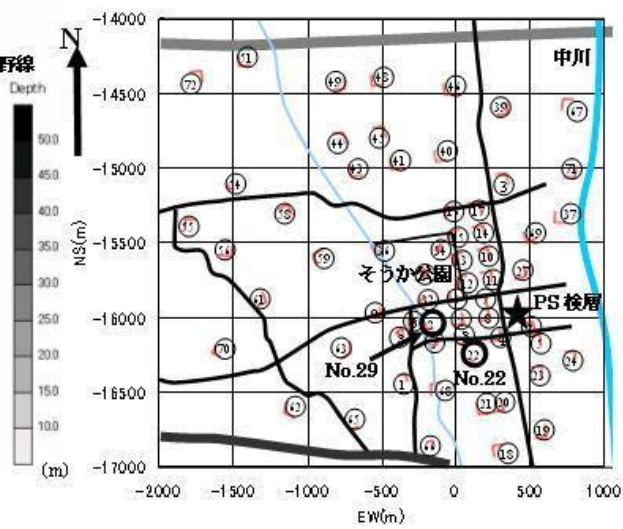


図-2 小規模微動アレイ探査測定点。L字や△は受振器アレイを示す。

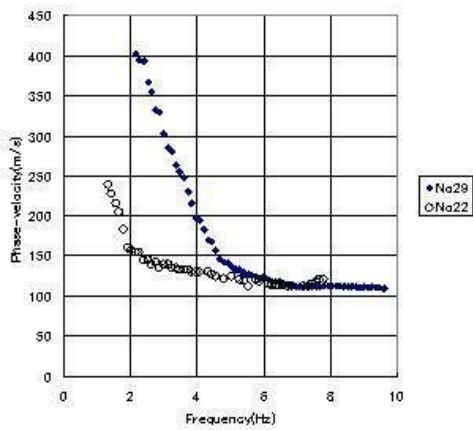


図-3 段丘上と思われる29番と谷中と思われる22番の分散曲線の比較

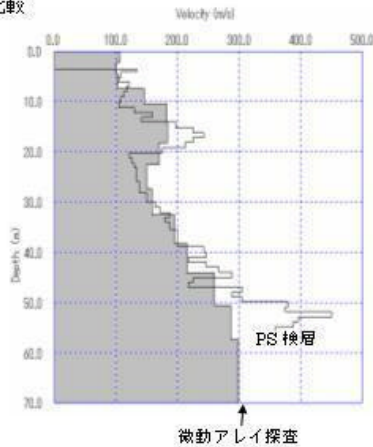


図-4 PS検層結果と8番の地点のS波速度構造の比較

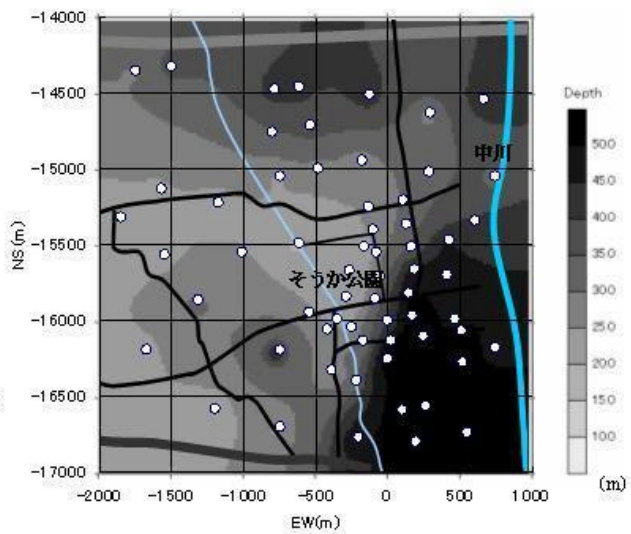


図-5 小規模微動アレイ探査から推定した沖積層下面深度。図中の○は小規模微動アレイ探査の測定点を示す。