

An interpretation result of the integrated geophysical survey at river levee using interpretation template

*Chisato Konishi¹, Hideki Saito¹, Toru Mogi²

1.OYO Corporation, 2.Hokkaido University

Safety of the river levee is assessed from existing soil profiles of the levee body and foundation based on drilling results as well as a detail investigation conducted at a specific location. Even though the soil type is confirmed at drilling locations, typical distance between the drilling wells is about 1 km long, so the soil profile between the wells is basically estimated by an engineer. On the other hand, geophysical survey provides geophysical property at every 10 m, for instance even though it does not directly reflect soil type. Therefore, the combination of the geophysical survey with the drilling results contributes to build a detailed soil profile, and it helps us to determine the location of the detailed investigation.

For a river levee investigation, cross-plot of S-wave velocity by MASW (Multi channel analysis of surface wave) and resistivity by CCR (Capacitive coupled resistivity survey) is used to evaluate levee body and foundation along a river. Here, the soil type classification by the interpretation template, which is proposed by Konishi et al. (2016), is applied to the cross-plot, and the result is verified by drilling.

Interpretation template can be generated by selecting any physical models, but it is hard to judge the validity of the template from the only geophysical dataset. Thus, in principle, the interpretation template must be checked and adjusted by drilling information. In this study, in order to verify the result of the estimated soil type, we separate several existing drilling wells into interpretation wells and validation wells. The interpretation wells are only used for the check and adjustment of the interpretation template, while validation wells are used to compare the estimated soil type with actual one.

The soil type profile estimated from the integrated geophysical survey suggests that the top of the clayey soil deposit is deep between the interpretation wells. The distribution of the clayey soil is confirmed by the validation wells. This result indicates the validity of the soil type estimation from the geophysical survey, and it means that we can build a detailed soil profile by combining the geophysical survey with drilling results.

Keywords: interpretation template, integrated geophysical survey