SUBSURFACE SOIL STABILITY ANALYSIS

for a major San Francisco construction project

A construction project is estimated at over 10m US Dollars to renovate the Levon Hagop Nishkian Bascule Bridge.

POPULARLY KNOWN AS the 3rd Street Drawbridge the new bridge is needed to accommodate the ever increasing flow of vehicles and with rising tide conditions the Nishklan Bridge will also require elevating above its current height.

The City of San Francisco recognized the need to improve the bridge due to its age and structural stability. With on average, 50,000 cars crossing the bridge every day as well as transit trains, the increased weight of cargo trucks and the number of daily passenger vehicles has led to the decision to improve the 1945 built bridge.

Robertson Geo customer Norcal Geophysical Consultants Inc (a Terracon company) has a wide-ranging portfolio of services including geotechnical, environmental and infrastructure solutions. It commissioned the use of the PS Logger probe and surface equipment to analyse the shear-wave and compressional velocity data for subsurface soil stability for the new construction foundations that will be required, with consideration that the foundations for the new improved bridge could be set as deep as 200ft.

OFFSHORE WIND FARM

Robertson Geo seabed investigation

THE PROJECT WAS to investigate the small strain moduli of the sea bed down to 45m using the Robertson Geo PS Logger. The acquired data would then be used to calculate the parameters for constructing the Vesterhav offshore wind farm off the North West coast of Denmark. The geologic formations were typically sands, clays and mudstone.

Logging was conducted from the support vessel Freja, which has a compensated drilling platform. The PS Logger provided high resolution, shear wave and compressional velocity data in rock and soils at depths up to 500m, from measurements within a single borehole. Often it proves technically superior and more cost effective than a downhole or cross-hole seismic survey.

Thirteen boreholes were logged over a period of 10 weeks to obtain the P and S wave velocities of the sea bed down to approximately 45m at 1m intervals. These velocities were then applied to the small strain moduli equations with the addition of density, to give Shear, Bulk and Youngs modulus.

The logging probe was successfully deployed with 100% reliability; boreholes were logged from approximately 45m up to the overburden casing. Following logging operations, the operator would quickly process the data acquired. Robertson Geo Engineers were on-board the Freja throughout the project and available for logging through 24 hours each day.