Assessment of Earthquake Potential and Levels of Expected Seismic Shaking

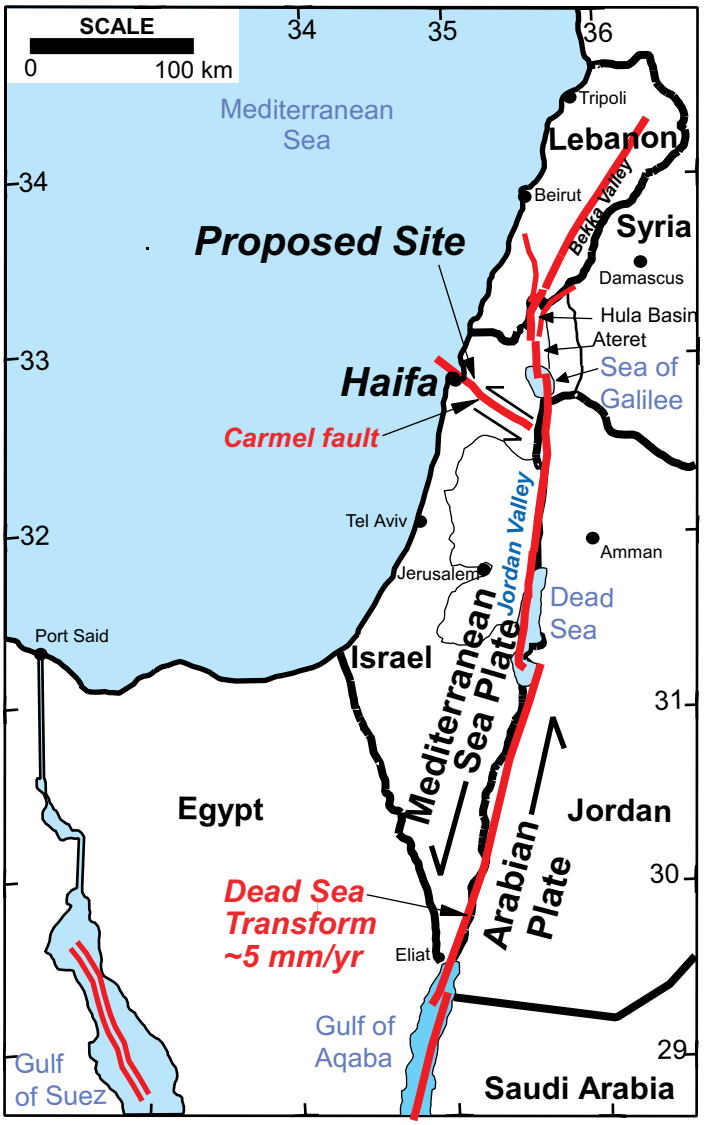
for an Industrial Site Near Haifa, Israel

PROJECT DESCRIPTION

Earth Consultants International assisted our client in assessing the earthquake potential and levels of expected seismic shaking at a proposed concrete factory site near Haifa, Israel. The most significant seismic source in the area, the Dead Sea Transform (DST) fault lies only 50 km east of the site. The DST allows for northward translation of the Arabian Plate relative to the Mediterranean Sea Plate at a rate of ~5 mm/yr. In addition, the Carmel fault, an element of the DST, runs directly beneath the proposed site. *Earth Consultants International's* job was to assess when, where, and how large future earthquakes are expected and their potential impact on the site.

SOLUTION

To answer our client's questions, we used the past occurrence of earthquakes to forecast location and magnitude of future seismicity, and then used these estimates to calculate ground motions in the Haifa area. First we compiled and evaluated historical seismicity data. We then calibrated our data to better match geological and structural conditions in Israel and then used the Bakun and Wentworth (1997) method to estimate the size and location of historic earthquakes. Our analysis determined the Jordan Valley portion of the DST as the most likely source for a damaging earthquake. There is a 29% conditional probability for a M7.2 earthquake during the next 50 years on the DST. Assuming the occurrence of a M7.2 earthquake along the DST, we calculated an expected peak ground acceleration of 0.21g at the proposed site. We also found the Carmel fault is likely active, albeit with a much lower strain rate than the DST. Furthermore, additional work is required to assess the level of activity of the Carmel fault and its earthquake potential. However, assuming a reasonable slip rate for the Carmel fault, the likelihood of a large earthquake from this source during the next 50 years is only 2%.



Map of the Middle East showing the proposed site location, cities in the region, tectonic plates, major faults (red), and bodies of water (blue). The black arrows show the relative plate motion.

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