



*Clockwise from upper left: Model of new WTC; 50 ton max caisson lateral load test; installation of additional caissons from grade; general excavation and exposure of caissons.*

## Reconstruction of World Trade Center 7

New York, NY

Mueser Rutledge Consulting Engineers (MRCE) is the geotechnical and foundation engineer for the 50 story office building under construction at the site of the 7 WTC structure which collapsed on September 11, 2001. As a result of community input and city planning changes, the replacement 7 WTC structure is taller and on a smaller footprint. Based on the new building loads and plan configuration, approximately half of the existing foundation caissons could potentially be used for support of the new building, in combination with the installation of additional new caissons.

During the planning stages for construction of the new building, MRCE reviewed the existing caisson foundations and provide recommendations for their reuse. The existing foundations, which supported the original building constructed in the 1980s at the site, consist of New York City type caissons socketed into rock. Visual inspection of the site immediately after removal of debris from the collapsed building did not reveal any obvious damage to the caissons from the collapse, indicating that the existing foundations might be suitable for support of the new building. An investigation was conducted to determine to what extent, if any, the caisson steel and concrete were damaged as a result of the fire. To that end, a metallurgical investigation of the caissons' steel was conducted and concrete samples were taken for mechanical property evaluation.

Additional new caissons with capacities of 1750 tons and 2500 tons were designed by Mueser Rutledge Consulting Engineers. The new caissons are 36 inches in diameter, reinforced with a heavy wide flange section and socketed from 10 to 16 feet into hard rock. During construction Mueser Rutledge Consulting Engineers performed controlled inspection of caisson installation per the requirements of the New York City Building Code.