



At left: USTA site during construction.

Above: The completed Arthur Ashe Stadium, part of the USTA facility.

United States Tennis Association (USTA) National Tennis Center Expansion & Renovation

Queens, NY

Mueser Rutledge Consulting Engineers (MRCE) served as the Project Geotechnical Engineer for the USTA National Tennis Center Expansion & Renovation in Flushing Meadows Park from 1990 until the project's completion in 1997. The existing facilities were expanded from a 30-acre site to 45 acres in size. The project includes the new 28,000-person-capacity Arthur Ashe stadium, including a 200,000-sf footprint, renovation of the existing Louis B. Armstrong Tennis Stadium and Grandstand Court, new field tennis courts and grandstands, a food court building, food and merchandise concession buildings, box office, and new pavements and utilities.

MRCE's services have included planning and supervision of several subsurface investigation programs comprising 321 borings, 13 test pits, and 96 piezocone penetrometers; coordination and performance of an extensive laboratory testing program that included strength and consolidation testing on 326 undisturbed samples obtained from very thick and highly compressible soft organic soil deposits and a very deep moderately compressible deposit of glacial lake varved silt and clay; and an exhaustive research of site history establishing the extent and types of foundation remnants from previous structures that occupied the site, primarily during the 1939 and 1965 New York World's Fair.

MRCE also provided a wide range of engineering services, including detailed settlement analyses and studies for six foundation alternatives for the support of the new stadium that involved conventional pile caps supported on deep pipe piles in excess of 200 feet long; Monotube piles or 85 foot long TPT piles; a mat foundation designed to "float" in the fill over the deep, compressible, soft organic soil deposits; a "combined" mat partially supported on piles and partially "floating"; and a fully pile-supported mat supported, in part, on piles from previous structures. The final design consisted of conventional pile caps supported on moderately deep piles driven to bear in the glacial lake varved silt and clay. MRCE also provided geotechnical design recommendations for all other appurtenant structures supported on shallow spread foundations bearing in the existing fill and for all pavements, including new tennis courts. The firm also planned, supervised, and interpreted three pre-construction pile test programs in order to evaluate different pile types in terms of load carrying capability and variation in length.