



Upper left: Aerial view of completed convention center in 2003. Upper right: Cross-section of the convention center showing position of the subway and underground structures in relation to the building. Above: Convention Center site excavation taken from south end in July 2000.

## The New Washington Convention Center

Washington, DC

### Foundation Engineering Project Highlights

- Protection of WMATA subway tunnels and station during construction
- Innovative dewatering and groundwater cutoff
- Design of the slurry wall which provides temporary support of excavation and doubles as the permanent structural wall
- Slurry wall relies on tiebacks, rakers, buttresses and shear walls for temporary and permanent lateral earth support
- Design of a less costly spread footings founded on the cretaceous clay
- Design of a low flow rate underdrainage system

Washington DC's new 2.3 million square foot exhibition venue is one of the largest in the United States, and three of its largest exhibition spaces are underground. The construction of such a huge structure was very complicated. Because most of the exhibit space lies underground, a dry basement was a necessity. But the geology of the site made groundwater cutoff for a deep basement very tricky. Also, site restrictions and adjacent structures added complications. The 6-city block site is in an historic district with severe height restrictions for new construction. To overcome these restrictions, the building stairsteps down from 80 feet high on the south end to 20 to 25 feet high on the north end, so that it is not taller than the historical row houses along this side. An existing Metro station and subway tunnel run nearly the entire length along the east side, and it was imperative to protect these structures during construction. They remained open and running throughout the entire construction period.

Mueser Rutledge Consulting Engineers (MRCE) conducted the site investigation, prepared a geotechnical report including foundation and dewatering recommendations; designed the slurry wall which provides temporary support of excavation and doubles as the permanent structural wall, and relies on tiebacks, rakers, buttresses and shear walls for temporary and permanent lateral earth support; designed foundations, base slabs, and the underdrainage system. During construction, MRCE personnel supervised slurry wall, tieback and raker installation and reviewed monitoring data. This project won the 2004 ACEC Engineering Excellence Award.