Jet Grout Earth Retention at Chicago Subway

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Project Background

- Chicago Subway system constructed in the 40’s and 50’s
- Station at intersection of Grand Avenue and State Street
- Maintenance and renovation project included a major ADA upgrade
Site Location

Photo facing south along State Street
Earth Retention

- 40 ft. deep excavation below street grade
- Soil is soft clay ranging from less than 600 psf to 1,100 psf shear strength
- Two rows of jet grout columns used for the earth retention system
- Vertical reinforcement using #11 Bars in each column
- Three levels of internal braces provided lateral support
- All jet grout work performed from inside basement
Jet Grout Process
Existing Basement
Limited Headroom Access
Spoil Management
Excavation of Jet Grout
Internal Bracing System
Underpinning System

- Needed to support the foundation of the Rock Bottom Brewery
- Underpinning support had to allow for excavation beneath the footing
- Needle beams supported by micropiles were used to support the wall
Needle Beam Support
Plan View of Needle Beam Support

3'-6"Ø SOILCRETE COLUMN AT 3' O.C.

5.5"Ø MICROPILE TYP.

3'-0" TYP.
Preload Needle Beams
Underpinning successful
Project Performance

- Inclinometers and settlement surveys used to monitor movement of the system.
- Inclinometer readings showed about 1 inch of horizontal movement of the jet grout system (~0.3% of the height).
- Settlement of underpinned wall about $\frac{1}{2}$ inch.
Thank You!