

CASE STUDY

PPL Center

Micropile Reinforcement – Allentown, Pennsylvania

HISTORY

In an effort to stimulate economic growth, the City of Allentown procured funding to begin a large redevelopment project in the community's central business district. This project involved the construction of a new state-of-the-art arena, the PPL Center, to house the Phantoms, an American Hockey League Affiliate of the Philadelphia Flyers. The structure would consist of a 7-story hotel, multi-level office buildings, and two parking garages encompassing over 5 acres of two city blocks. The project was to be completed and ready for operation by the fall of 2014. This very aggressive timetable, which began in August of 2012, required continual communication amongst all parties involved, from contractors to vendors alike. A critical part in making this happen began with the foundation design and the teamwork of Force Drilling and Nucor Skyline.



PROBLEM

The PPL Center is built over the same lot where sinkholes wrecked the Corporate Plaza Building more than 17 years ago. As a result, a special foundation approach would be required to combat the presence of sinkholes and allow for heavy construction to begin. After careful review, a micropile foundation design incorporating Nucor Skyline threaded bars was selected. In order to meet the deadline of a Fall 2014 Grand Opening, the project needed to adhere to an extremely aggressive timetable and overcome potential logistical issues caused by limited traffic flow and site access.



SOLUTION

Force Drilling installed over 1,700 micropiles,

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with depths ranging from 25' to over 225' in some very challenging karst ground conditions, with limestone rock formations and which have been prone to sink holes. Micropiles ranged in size from 9-5/8", 7", and 5-1/2" diameter steel casing, reinforced with a full length #18, #20 or #24 Grade 75 Nucor Skyline threaded bar. This micropile foundation design allowed for the building and structural loads to be transferred to more competent rock formations deep underground. Additionally,



these same difficult sub-surface ground conditions caused numerous design changes, which in turn, required Nucor Skyline to supply threaded bars within a 24 to 48 hour timeframe. The deliveries required ongoing approval and monitoring from the county and PennDOT, as traffic flows had to be adjusted to allow for jobsite deliveries. Over the course of 9 months, Nucor Skyline delivered over 139,000' of Grade 75 ksi threaded bar and hardware - totaling over 1,300 tons.

PROJECT PARTNERSOwner's Representative

Hammes Company Sports Development –
Madison, WI

Construction Manager

Alvin H. Butz, Inc. – Allentown, PA

Subcontractor

Force Drilling – Waynesburg, PA

Structural Engineer

Martin/Martin, Inc. – Lakewood, CO

PRODUCT

40,000' #18 Grade 75 Threaded Bar

44,000' #20 Grade 75 Threaded Bar

55,000' #24 Grade 75 Threaded Bar

Total Tonnage: Over 1,300 Tons