

## Bottom Up Excavation

Bottom up, also referred to as open pit, is the traditional method of excavation for below grade construction. In principle, this method provides temporary shoring for an open, safe area allowing the foundation work to progress upwards until surface elevation is reached. This is the first phase of the project, otherwise known as the “critical path.”

### ► Today’s Construction

Parking is a necessary but costly aspect of property development. It permanently consumes valuable area, robbing the Owner of potential revenue. Most residential, commercial or mixed use developments in coastal regions are built with above grade parking structures.

The long term issues of aesthetics, cladding and zero revenue leave a bad taste in any developers’ mouth, but it is still more palatable in comparison to the conventional cost of going below grade on a high water table site. That is until Skyline introduced the versatility of steel sheet piles as both temporary shoring and permanent wall element. This revolutionary concept is changing those preconceived below grade notions and demonstrating how sheet piles not only perform in groundwater, but also reduce conventional material and schedule costs.

### ► Method of Excavation

For a mixed use development in Miami, FL, the value of the permanent sheet pile application was recognized. The challenge was to evaluate the most cost effective method of excavation. This seven acre footprint is designed with two levels of subterranean parking submerged twelve feet

below the water table. With six independent mid-rise structures designed above, the foundation contractor chose to reduce pumping costs on the base slab and perform a tremie seal pour in the wet. Based on these site conditions and project scope, it was determined that bottom up construction would be most economical.

Sheet piles were first driven around the perimeter. Temporary sheet piles were then installed to partition and break up the site into manageable one acre sections, enabling multiple phases of the excavation to progress.

### ► Bottom Line

Below grade parking garages are real anomalies in Florida. In the past, high water table, conventional shoring costs and long term maintenance issues have deterred owners from the inherent benefits of underground structures.

The permanent sheet pile application reduces traditional foundation cost and schedule by upwards of 50%. Constructed bottom up, this innovative application offers the fastest method of below grade excavation, getting your critical path out of the ground.



Waterfront and coastal properties are a popular draw, but come with difficult construction issues



Excavation site: temporary sheet piles were used to partition sections for different construction phases



Finished parking garage with exposed sheet pile as the permanent wall element