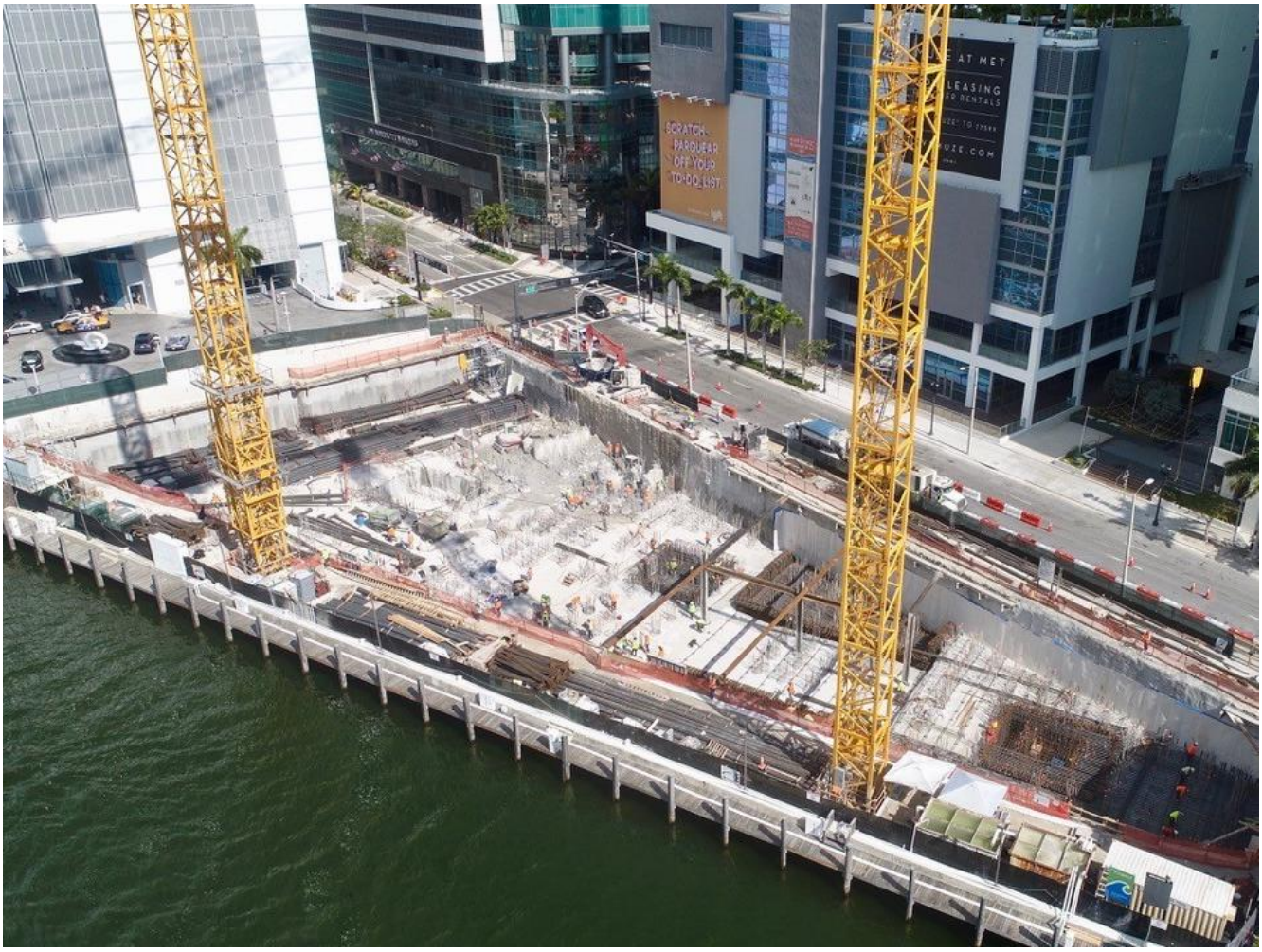
Aston Martin Residences

Miami, Florida, USA

Keller’s multi-technique solution provides groundwater control and deep foundations for luxury high rise constructed feet away from Biscayne Bay.



The project

Adjacent to Biscayne Bay, the iconic carmaker Aston Martin constructed a 66-story building with one below grade level. The luxury high-rise features 391 units, sitting on a sail-shaped tower block. Construction of the building parking garage required a 20 ft excavation support system within 10 ft of the bay. Subsurface conditions comprised backfill materials over loose sands and silts overlaying layered limestone. Groundwater was encountered less than 2 ft below the ground surface.

The challenge

Site access was constrained and located in busy downtown Miami, requiring close coordination for deliveries and staging. Existing pre-cast concrete piles and sheet piles were encountered throughout the entire site.

The solution

To provide a solution that would facilitate a dry excavation and provide deep foundations to support the superstructure, Keller recommended a soilcrete bottom slab to minimize groundwater permeation through the base of the excavation. Keller constructed a design-build solution including:

- Permeation grouting to underpin the existing buildings on either side of the site.
- Deep soil mixing (DSM) columns across the site. When obstructions were encountered, jet-grouted columns were constructed to maintain slab continuity and encapsulate the obstruction.
- A tremie seal to support the foundations for the construction cranes.

The perimeter retaining wall consisted of overlapping soilcrete columns installed by dual-axis mechanical soil mixing. On the south-west portion of the site, limited space next to the existing building prevented access for the soil mixing equipment. In this location, secant CFA piles were installed to replace the soilcrete earth retention. After the construction of the earth retention system, CFA piles were installed throughout the site to provide support for the building foundations. In locations where typical CFA piles could not be installed (due to obstructions), 500 tangent-bearing elements (TBE) were installed.

Project facts

Owner(s)
Aston Martin

Keller business unit(s)
Keller

Main contractor(s)
Coastal Construction

Engineer(s)
NV5, DeSimone, Keller

Solutions
Support of excavation
Deep foundations
Groundwater control and dewatering

Markets
Residential

Techniques
Wet soil mixing
Permeation (chemical) grouting
Jet grouting
Tangent Bearing Elements (TBEs)
CFA (auger cast) / ACIP piles
Cased CFA piles

Email address
info@keller-na.com

Phone number
1 (800) 456-6548