This 19-story office tower was constructed in one of Boston’s most congested areas, directly adjacent to two existing mid-rise buildings.

Mid-rise buildings in Boston have traditionally been founded in the stiff clay layer generally found 30 feet below the ground surface. Development of parcels adjacent to existing buildings founded on the clay, as in this case, has often limited excavation and construction of underground levels to minimize construction impacts on the adjacent buildings. However, the increasing need for underground parking has resulted in re-evaluation of the feasible depth of excavations in the city. In order to provide the four levels of underground parking required for the 10 St. James Place office tower, construction of the basement required excavation below the base of the belled caisson and timber pile foundation systems for the adjacent buildings. Construction involved installation of a cast-in-place concrete diaphragm slurry walls. Prestressed pipe struts and a combination of internal and external support wales supported the slurry walls. The design was coordinated with construction of the basement levels using up-up construction techniques, which accelerated the construction schedule but required coordination between bracing installation and removal and construction of building framing.

As consultant for the slurry wall, excavation support, and foundation contractor, GEI provided all the geotechnical and structural services required to execute this project including:

- Prebid evaluation of adjacent buildings to determine risks associated with excavation and potential movement of the buildings.
- Design of slurry wall, steel framing and supports for the excavation system.
- Staged excavation sequence to minimize movements of adjacent buildings.
- Evaluation of post-tensioned garage floor slabs for construction loads during bracing removal.

Our design included evaluation of bracing system movements and impacts on adjacent buildings. Construction of the excavation support, slurry walls, and basement levels is complete, with excellent performance of the system and movement of adjacent structures well within contract criteria.

Key Elements

- Detailed Excavation Support System Design Coordinated with Up-Up Construction
- Evaluation/Minimization of Potential Movements of Adjacent Buildings