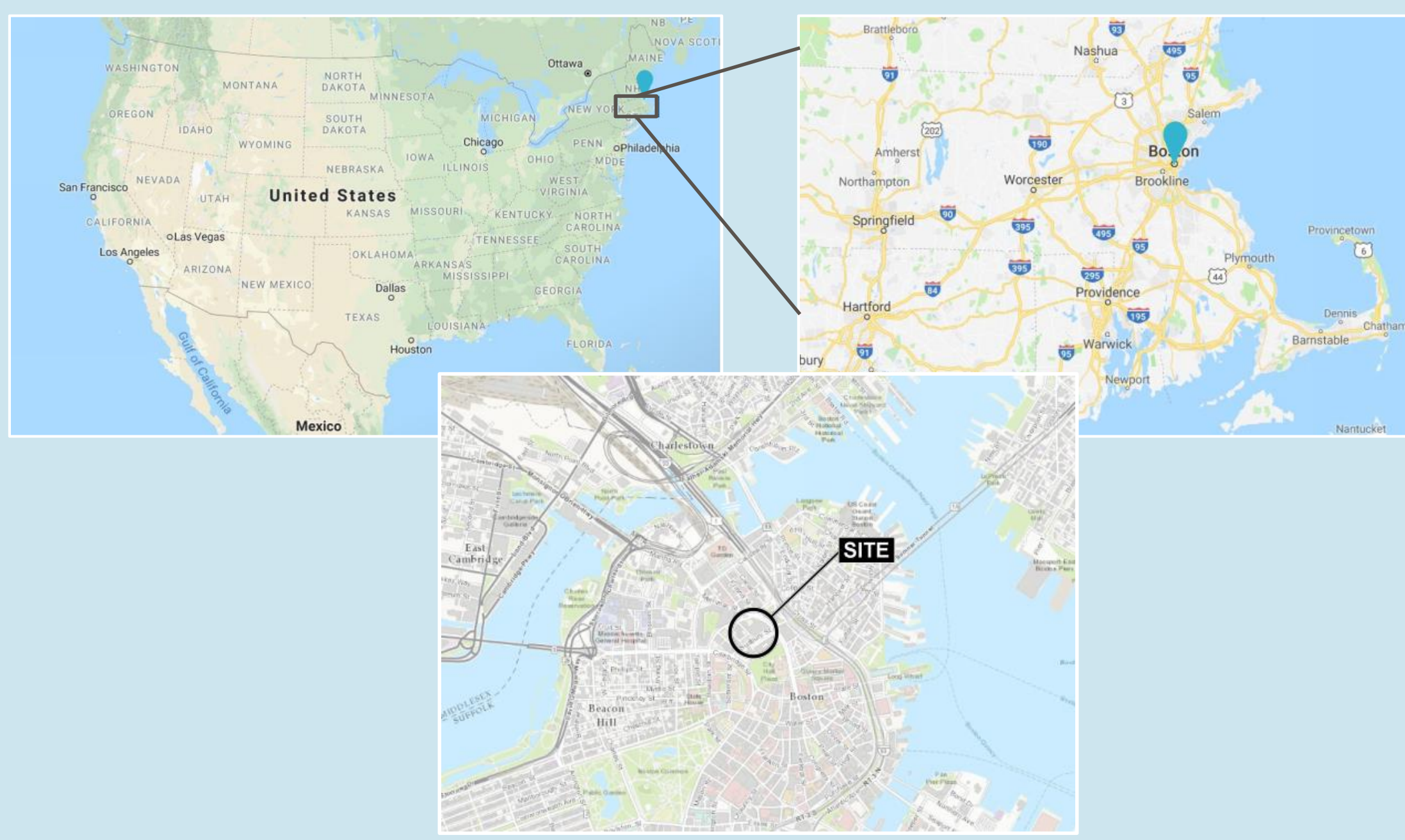
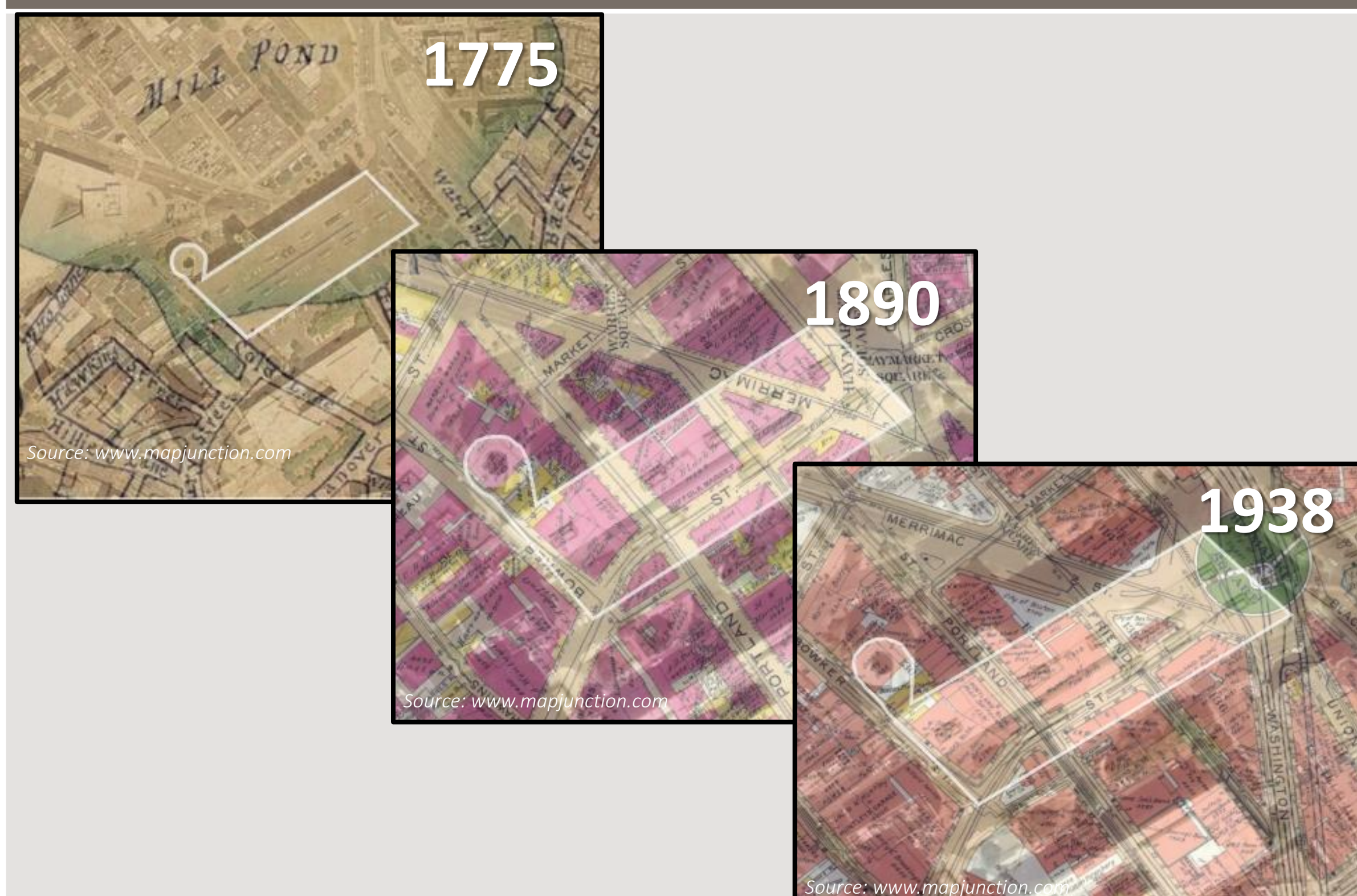


Complexities of mixed foundation systems for Boston highrise

Site location



Site History

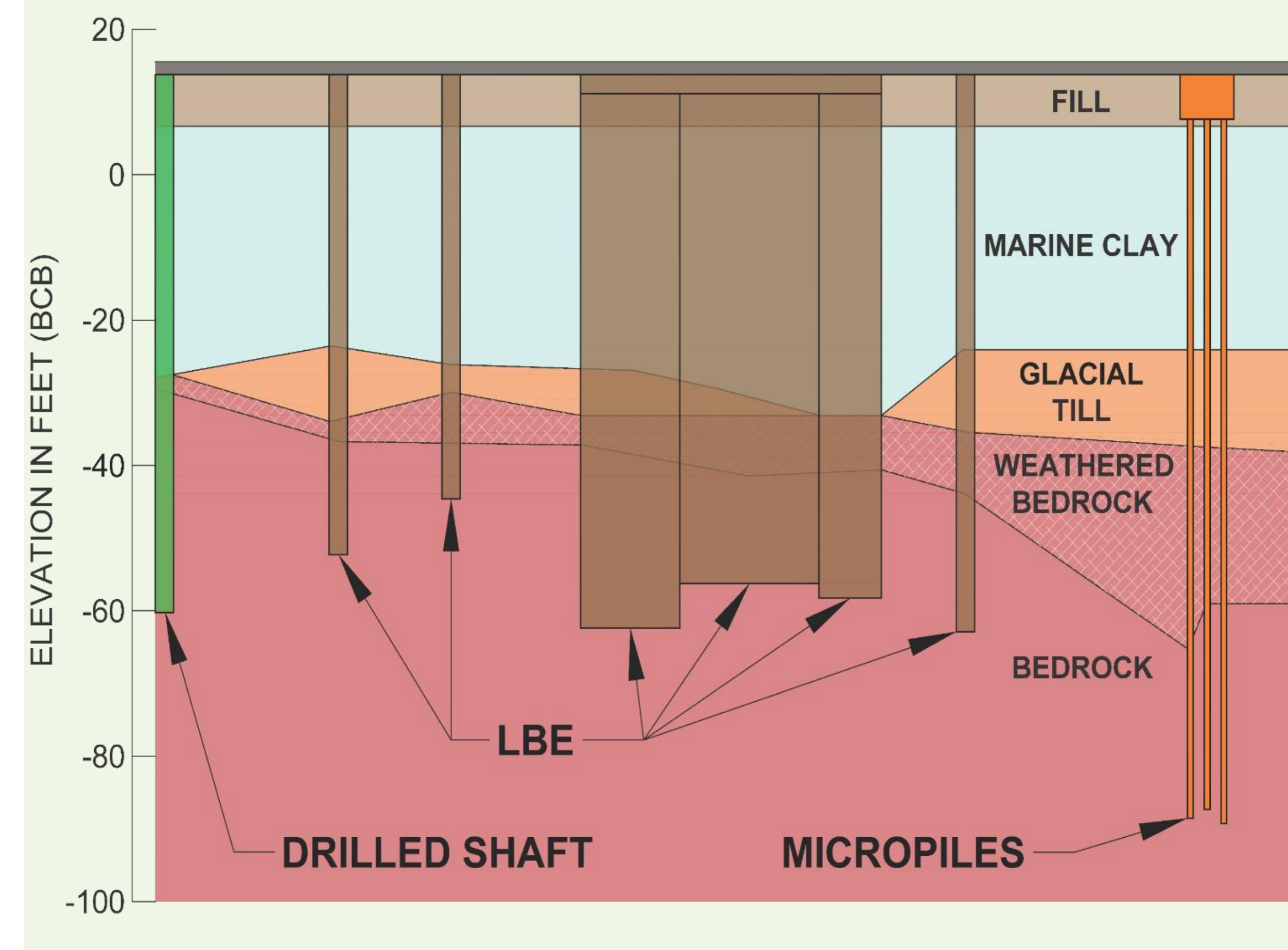


Site and subsurface Conditions

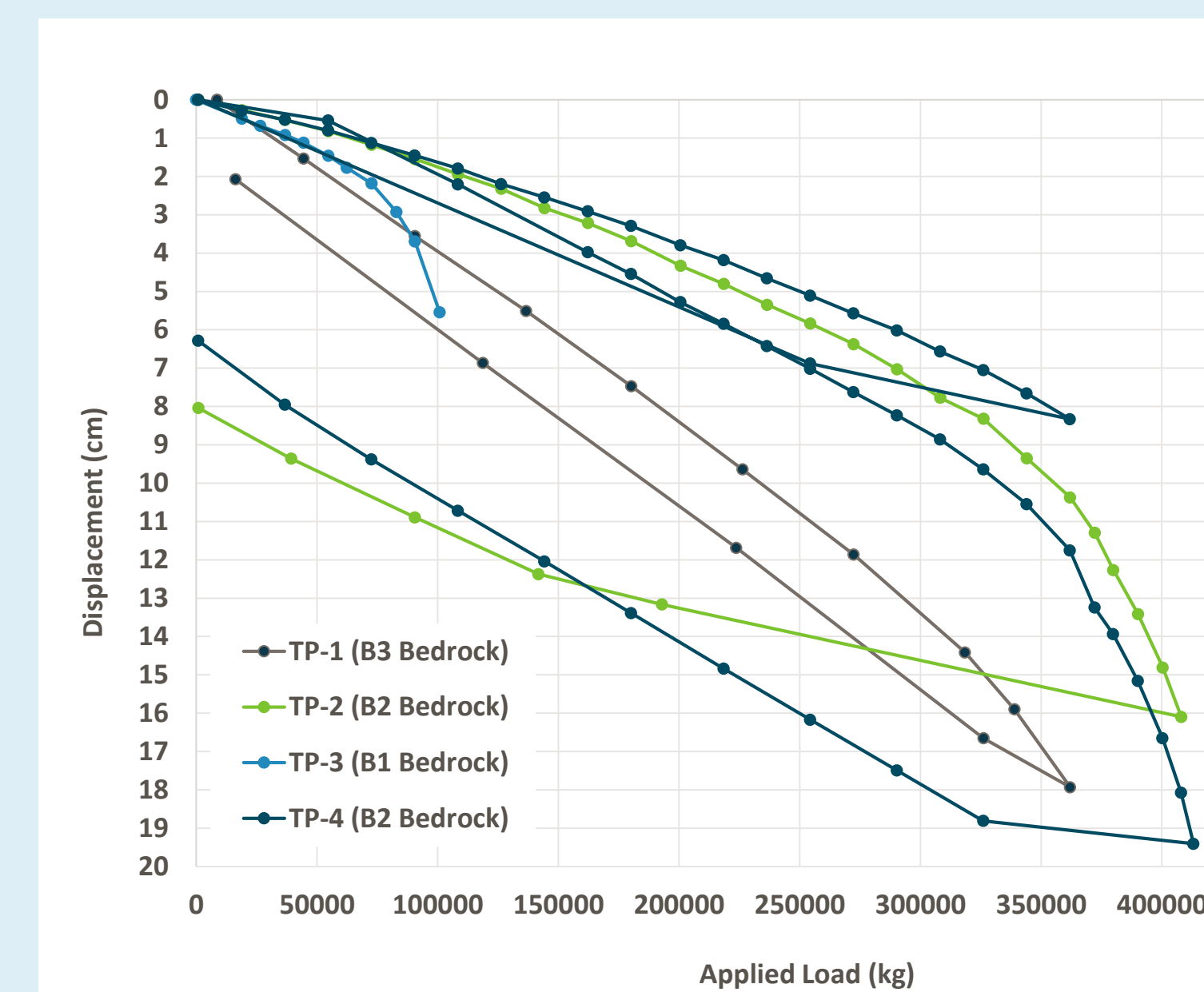
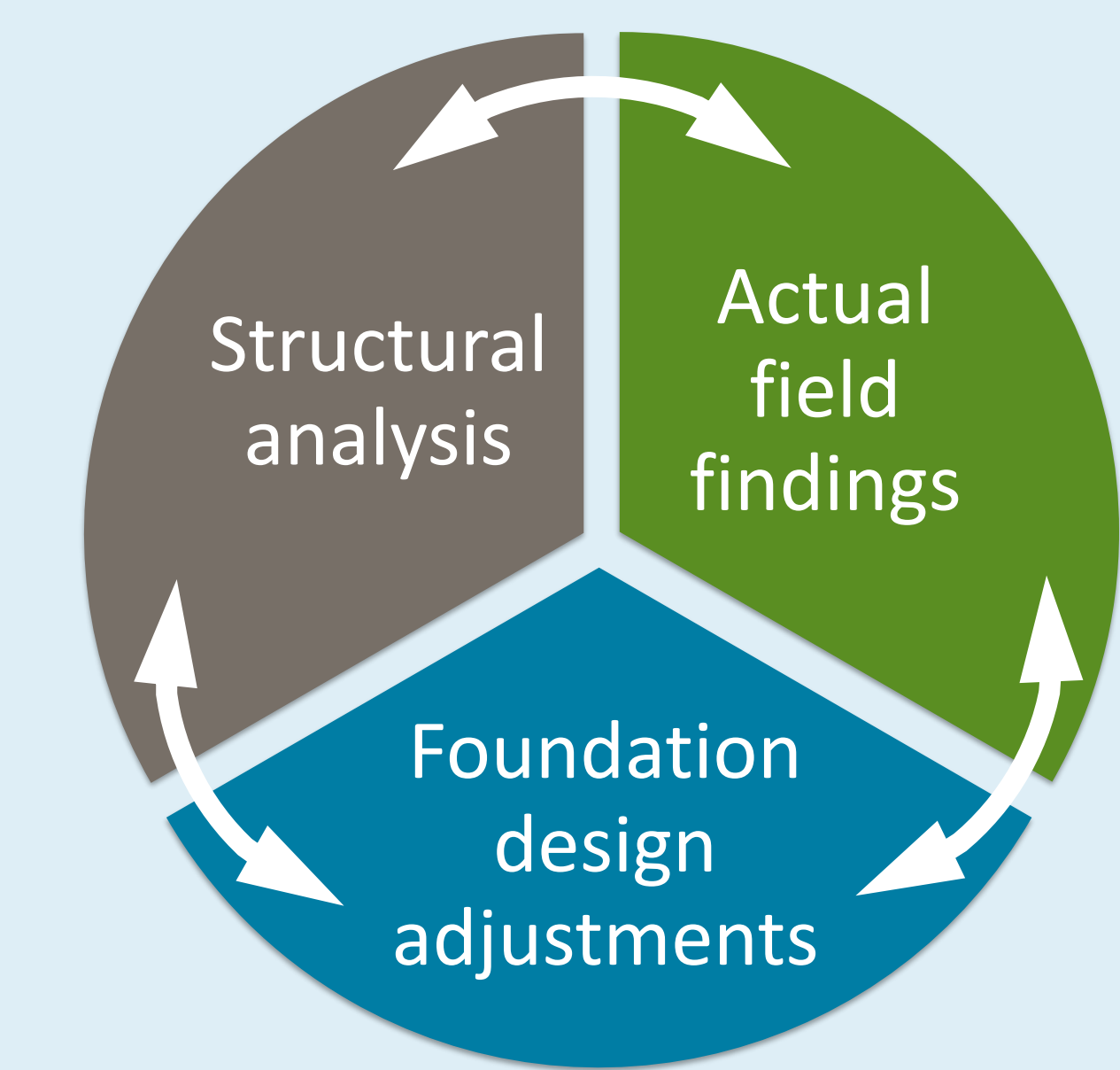
Site Conditions

- Urban environment/undocumented fill
- Lot line construction with stakeholders
- Abutting existing and partially demolished Government Center Garage
- Geometric constraints

Subsurface Conditions



Solutions through collaboration



Design and construction challenges

TODAY'S CHALLENGE

Remnant building debris

Shallow and sensitive utilities to-remain

Partial demo of active building

Tall/narrow structure sensitive to foundation changes

Variable subsurface conditions

Limited site with multiple ongoing operations

FUTURE CHALLENGE

SEE FIGURE 10 FOR GENERALIZED SUBSURFACE PROFILE

APPROXIMATE SCALE
FEET 0 30 60
METERS 0 9 18

LEGEND

- EXISTING FOUNDATION ELEMENTS
- PROPOSED DRILLED SHAFT
- PROPOSED LOAD BEARING ELEMENT
- PROPOSED DRILLED-IN MICROPILE

Foundation Element	Diameter or Plan Dimensions m (in.)	Estimated Range of Vertical Stiffness kN/m (kip/in.)
Micropiiles	0.27 (10.75)	1.4 x 10 ⁷ - 1.9 x 10 ⁸ (800 - 1,100)
LBEs	0.9 x 2.8 (36 x 110.4)	2.5 x 10 ⁷ - 2.8 x 10 ⁸ (14,000 - 16,000)
Tower Core LBEs	0.9 x 2.8 - 0.9 x 6.6 (36 x 110.4 - 36 x 261.75)	3.5 x 10 ⁷ - 7.0 x 10 ⁷ (20,000 - 40,000)
Tower Core Corner LBEs	0.9 x 7.2 - 0.9 x 7.8 (36 x 282 - 36 x 308.5)	6.3 x 10 ⁷ - 7.4 x 10 ⁷ (36,000 - 42,000)
Drilled Shafts	1.2 (48)	1.5 x 10 ⁷ (8600)
Existing Concrete-Filled Steel Pipe Piles	0.4 (14)	1.2 x 10 ⁷ (700)

Courtesy of McNamara Salvia

