

And the very method of home construction became the subject of conversation among the wealthy and their friends. Most every structure (at least before the high-rises began to dot the neighborhood in the twentieth century) was supported by untreated wood piles driven into the ground through the landfill sediment to reach firmer layers of sand, gravel, and blue clay. The upper ends of the piles, which were spruce tree trunks measuring about twelve inches in diameter and between twenty and forty feet long, were cut off below the water table to prevent rotting (exposure to air would produce mildew and fungi and expose the wood to insects such as termites). Workers dug trenches below the average level of high tide under each building foundation and the piles were driven in them. According to Holton and Newman, the average row house was supported by 270 piles under the foundation walls, spaced eighteen inches to three feet apart. The mathematics are astounding. With 270 piles under a house and between thirty-six and forty-two houses in each block (assuming there is no church or other institution), the total number of piles per block ranged from ninety-seven hundred to more than eleven thousand. With more than eighteen blocks in the state's portion of the Back Bay alone, approximately two hundred thousand tree trunks supported the residential buildings in the newly created neighborhood.



Figure 3. The jewel of the Back Bay was Commonwealth Avenue, shown here in the late 1870s, a broad thoroughfare more than two hundred feet wide and a mile and a half long, with a pedestrian park in its center extending the full length of the avenue and rows of trees planted along the roadway. *(Photo courtesy of the Boston Public Library, Print Department)*

Larger buildings required more piles, of course. Trinity Church in Copley Square is supported by more than forty-five hundred piles under its foundation, primarily to bear the weight of its ninety-five-hundred-ton central tower. To support the massive Arlington Street Church tower on the corner of Arlington and Boylston, the church's building committee reported that workers "rammed in concrete" between thousands of wood piles to form a solid bed upon which granite blocks were laid, each block resting on two piles. "A solid pyramid of granite blocks cemented together to form a single mass and weighing more than a thousand tons was then erected to seat the tower," the report points out.

Local newspaper reports reassured doubters that the pile-driving approach was safe and provided "permanent" support. "[Some] have to be reminded that . . . piles are driven until unyielding clay is reached," the *Daily Advertiser* wrote in an 1862 editorial expressing exasperation at the skeptics. "Here is a foundation as immovable as the solid rock . . . the structure [will] have a firmer foundation—one less liable to change from accidental causes—than one laid upon natural land."

To call the Back Bay building construction "innovative" hardly seems adequate. "Consider the large, dense inverted 'forest' of spruce trees buried in the ground below the Back Bay neighborhood," Holton and Newman write in wonderment. Or as a mid-1890s report pointed out about filling the Back Bay: "Whole forests from the State of Maine . . . [had] been put to service in . . . furnishing pilings and solid foundations." For its day—more accurately, for a period of nearly forty years—the construction of Back Bay homes, churches, and other buildings represented an exquisite engineering marvel, yet another Boston achievement whose impact stretched far beyond her borders.