

Receding groundwater threatens Boston's historic legacy

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By Ken Maguire, Associated Press Writer | December 3, 2005

BOSTON — The dried-out wooden pilings beneath Lewis Lloyd's multimillion-dollar Beacon Hill town house were rotting out from under him.

"You could stick a screwdriver in up to the handle," said the 67-year-old retired media executive.

Groundwater levels have been dropping for years in some Boston neighborhoods, exposing the wooden supports that have propped up the city for more than a century. Without the protecting embrace of water, the pilings quickly rot, posing expensive problems for property owners.

The water level below Lloyd's house — in the same affluent neighborhood that U.S. Sen. John Kerry and former General Electric boss Jack Welch call home — was two feet below the tops of his pilings.

Had he done nothing, he risked major structural damage. So Lloyd paid \$250,000 to "underpin" the five-story building, a job that entails digging up the basement, cutting off the rotted tops of the pilings, and replacing them with steel beams wrapped in concrete. Insurance doesn't cover any of it.

"I didn't think it was going to cost as much as it did," he said.

Much of the city — including the Back Bay and parts of downtown Boston — is built on tidal flats that were filled in during the 19th century to create neighborhoods that would house the city's exploding population.

Because the landfill alone couldn't support the buildings, pilings the shape and length of telephone poles were driven down until they hit solid clay. The foundations were then built on top of the pilings. Structures as big as the imposing Trinity Church, in Copley Square, were built in this manner. One estimate puts the value of properties sitting atop pilings citywide at \$10 billion.

The pilings can last hundreds of years — as they have in some European cities — as long as they remain submerged. But leaks in underground infrastructure, like sewer lines, subway tunnels and garages, have lowered the groundwater level, exposing the pilings. Above ground, streets, sidewalks and parking lots redirect rainwater into storm sewers instead of being absorbed into the ground.

Milwaukee has experienced similar troubles in its downtown, as have Amsterdam, Oslo and Stockholm.

"But there was no place that was filled as extensively as Boston," said Jim Lambrechts, an engineering professor at Wentworth Institute of Technology who is studying the problem.

Historians worry about the long-term impact on the city's architectural heritage.

"If nothing were done, a substantial part of the housing stock of the city of Boston and the history of Boston would be threatened," said Elliott Laffer, executive director of the Boston Groundwater Trust, a city-funded organization that monitors water levels. "People come to Boston to look at and study our historic buildings. Nobody comes here for the weather."

After years of complaints by property owners and citizens' groups, something is finally being done. Neighborhood activists began pressuring elected officials after several Chinatown homes had to be torn down in the 1980s because of rotted pilings.

"No study has been generated to indicate that a transit tunnel is the primary reason for groundwater levels dropping in any particular neighborhood," he said.

Mike Nairne, who lives nearby, paid a few thousand dollars to have engineers dig up his back yard and look at the pilings under his home. The diagnosis: minor damage. The water being pumped by the MBTA has restored the water levels around his pilings at no additional cost to Nairne.

"In three or five years our pilings would have rotted," said Nairne, who can now check his water levels through a monitoring well. "You'd have a real mess on your hands."

Despite evidence that water levels are dropping, lawsuits seeking to hold the city and state responsible for personal property damage have so far been unsuccessful because there's no law guaranteeing a right to groundwater, said James W. Hunt, Boston's chief of environment and energy.

More than a dozen Beacon Hill homeowners sued in the 1980s, claiming government agencies were responsible for the damage to their pilings after the state built a highway underpass on nearby Storrow Drive. That case was settled out of court and others are pending.

The owners of a waterfront office building have sued the Massachusetts Turnpike Authority, claiming the notorious Big Dig lowered groundwater levels and damaged its pilings.

But although the \$14.6 billion project created miles of new highway tunnels under downtown Boston and has been famously leaking ever since, it has so far contributed little to the problem, said Lambrechts. The comparatively tiny Storrow Drive underpass, for example, poses a greater threat to groundwater than the entire Big Dig.

One possible solution is to put barriers in the ground to prevent the groundwater from escaping, Lambrechts said. But such a solution would be costly and it's unclear who would pay.

"First and foremost we need to stop the leaks," said Hunt. "We'd love to find a silver bullet. We unfortunately haven't found that." ■