

# Groundwater Levels May Mean Trouble



Area of possible groundwater trouble on Arlington, Boylston and nearby Providence Streets

PHOTO: GEN TRACY

**by Katherine Hawkins**  
**Courant News Writer**

Low groundwater levels under areas of the Back Bay, lower Beacon Hill and the Fenway may be causing the wooden foundations of buildings to rot.

Buildings in these areas that are over 80 years old rest on hundreds of 25 to 35 foot long wooden pilings, driven into the ground a few feet apart under the outside walls. These pilings need to stay saturated with water. If they dry

out, fungi and bacteria begin to eat away the wood. Jim Lambrechts, an engineer with the firm Haley and Aldrich which monitors water levels for Boston's Groundwater Trust, explained that, "After a while, they eat so

*continued on page 18*

## Groundwater

*Continued from page 1*

much that there's nothing left of the wood."

When pilings decay, a building starts to fall through the rotted section of the wood. Cracks form in the outside walls, and floors, windows and doorframes begin to slope. Eventually a building can lose its facade or collapse entirely.

Over half the observation wells in the city now show water levels that leave the tops of most pilings exposed to air and in danger of decay, according to data from the Groundwater Trust, the organization that has monitored the wells since January of 1999.

The lowest groundwater levels were recorded at the well at the corner of Arlington and Providence Streets, near Back Bay landmark Shreve, Crump and Low. The average water level there leaves more than four feet of a typical piling exposed. (Piling heights can vary by several feet, so a water level low enough to seriously damage one piling can leave another unharmed.)

Other problem areas include

St. James Avenue and Stuart Street in the Back Bay, Brimmer and Chestnut Streets on Beacon Hill and Hemenway Street in the Fenway. In contrast, every well along Commonwealth Avenue reported normal water levels.

Complete readings from every observation well are available on the Trust's website, [www.bostongroundwater.org](http://www.bostongroundwater.org).

Engineers and Trust members do not know how long groundwater readings have been this low, nor do they know how long it takes for the first cracks to appear in a building whose pilings have dried out.

Lambrechts said that the rate of pilings' decay depends on so many factors that it is impossible to say how long a building will take to show signs of damage above ground. "It could take as little as three years. It could take as much as ten or twelve or fifteen years. There's no way to know, unfortunately," he stated.

There is also no way to know whether the pilings at Arlington and Providence have been exposed to air for two years or ten. The Groundwater Trust was established in 1986, but it only began checking water levels last year. Before that, no one had

been regularly monitoring wells since 1940, Lambrechts said. The occasional studies that were done only looked at a few wells or only took one or two readings, making the data almost impossible to use.

Right now, the brownstones in the area do not show the sagging windows or cracked facades that result when a building settles through rotted pilings.

However, since cracks appeared in the walls of the Boston Public Library in 1929, buildings around the city have needed expensive repairs because of rotted pilings, and a few have been demolished.

Four buildings on Hadson Street in Chinatown were torn down in the late 1980s because of foundation problems that most press accounts blamed on rotting pilings.

Houses along Brimmer Street on lower Beacon Hill started showing signs of decayed pilings in the mid-1980s. Lambrechts remembered one house in the area that settled so much overnight that the owners could not open their door and had to call the fire department. The Inspectional Services Department ruled several homes unsafe, and homeowners had to spend

hundreds of thousands of dollars to make the necessary repairs, he said.

The Brimmer Chambers Condominium Trust, on behalf of over 60 Beacon Hill families, sued the City of Boston and several state agencies for the costs of the repairs. The case was settled in 1992 but the details of the agreement were sealed.

Galen Gilbert, the Fenway's representative on the Groundwater Trust, said that when these problems occur in the Fenway, "the land becomes more valuable than the building," because of the costs of repairs and the market for open land in the neighborhood. Gilbert said that two buildings on Hemenway Street were knocked down because of rotted pilings five years ago, and other apartments in the neighborhood were demolished in the 1970s.

According to Tim Mitchell, co-chair of the Trust, the lowered water levels are probably caused by leaks in underground structures like sewers, subway tunnels and underpasses.

The first step towards solving the problem, Mitchell stated, is to build a more complete set of observation wells. This would help engineers pinpoint the loca-

tions of the main leaks, and give residents a chance to address the problem before their homes are damaged.

The city needs "on the order about 1,000" wells to do this, Mitchell said. The reason so many wells are necessary is that groundwater levels can vary greatly over very small distances. Right now there are only about 150 wells, with 40 more under construction. There are currently no wells on Newbury Street or in most of the West Fens, while Beacon and Marlborough Street have just one well each in the Back Bay.

Lambrechts estimated that it costs \$1,200 to \$1,500 for every foot of a building's perimeter to repair pilings. He said that some cracks and sloping are normal in an old building, but if the problems seem to be getting worse owners should consider having engineers dig a test pit to check wood pilings' conditions.

Most buildings built since 1920 were constructed on concrete or metal pilings, and are not affected by low groundwater levels.