



The Beaucatcher Mountain Standpipe Failure

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The
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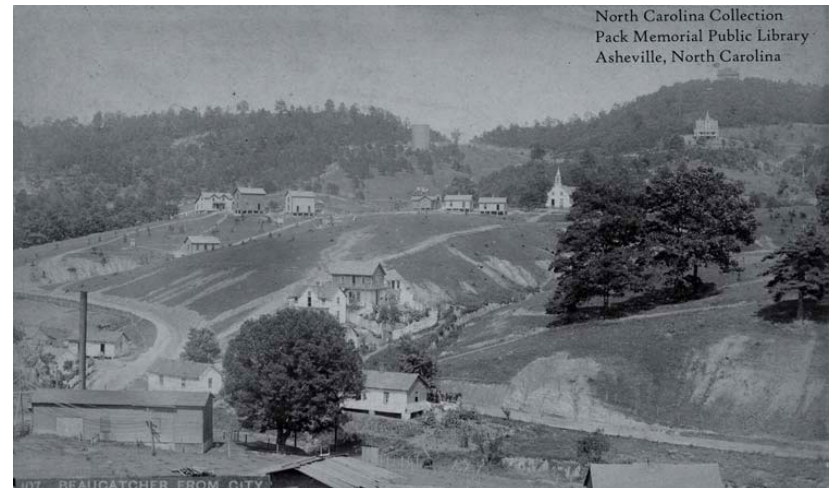




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Ice brings down Asheville's first water tank in 1893

A deteriorated stone foundation on the side of Beaucatcher Mountain is all that remains of Asheville's first steel water tank. In the period after the Civil War, residents of Asheville relied primarily upon individual wells and springs for their supply of water.



View of Beaucatcher mountain and standpipe, late 1800s





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The first tank, or technically a standpipe, was constructed in the winter and spring of 1886–87, as part of improvements to the original central water system first constructed in 1883.

The standpipe was 45 feet in diameter, stood 60 feet tall, and held 713,000 gallons. It was built by Alfred Webb & Co. of Chattanooga, TN, at a cost of \$9,965; the stone masonry foundation cost an additional \$2,000.

Shortly after the erection of the tank was complete, and prior to being filled with water, a strong windstorm collapsed the upper portion of the tank, folding one side in upon the other.

It was reported that the tank was repaired in the following manner: *“The builders secured an eyebolt to the indented portion of the pipe, and, with the aid of a windlass rigged on the slope of the hill, pulled the plates into shape ‘as good as ever’, with only a slight wrinkle remaining to show where the collapse had stopped”.*





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The “slight wrinkle” is evident in a post-card picture published by T. H. Lindsey. The tank operated more-or-less trouble free for the next 4 years, although the water level in the tank rarely exceeded half its height. With the tank only partially full, the negative effects of the wind continued to be problem.

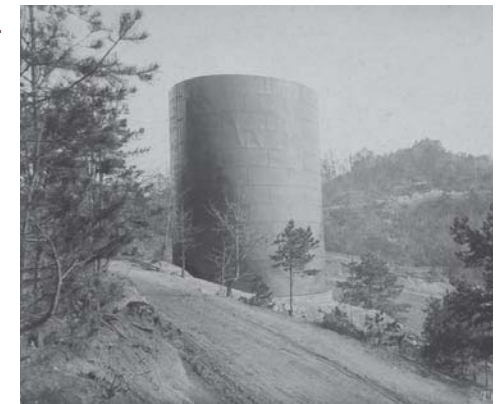


Photo Showing “Slight Wrinkle” In Standpipe

Residents observed the sides of the tank vibrating violently in the wind, causing a loud rattling sound. This condition continued until 1891 when the wind caused a break to occur in the steel angle that se-cured the base of the tank to the foundation. The broken angle was not repaired, although guy wires were attached to the tank to reduce the vibrations.

In January of 1893, a period of unusually cold weather occurred, causing a tube of ice 7- or 8-inches thick to form inside the tank





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against the cold steel walls. During this time, people nearby reported loud cracking sounds coming from the tank. This cold snap was followed by a few days of warmer weather then a sudden drop in temperature on the night of the failure.

A newspaper report provides the following details concerning the event:

“On Sunday morning, just before day, the mother returned home from attendance at a sick room. While seated near the fire suddenly there was heard a sharp, cracking, tearing sound so awful in its note that the woman crouched in speechless terror, and the awakening children began to cry.

The report was instantly followed by a terrific roar that made the earth tremble and that shook the little cabin, then came the wild rush of the tumbling waters that filled the gorge, surrounding the house, and hurled the rocks and ice against its sides. The shrieking





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children dove under the beds, and the appalled parents were certain that the house would be washed away.

An attempt was then made to get to the higher ground, but the water covered their shoes and they gave it up and returned to the house, where they remained till daylight. Serious damage was sustained by the family in the loss of their supply of clothing, which had been left hanging upon bushes about the house. Not a trace of a garment could be found; everything had been swept away.”

Although similar scenes of destruction were repeated down the mountainside that night, incredibly there were no reports of death or serious injury resulting from the collapse. Damage to the tank was instantaneous and nearly complete.

A fracture split the tank from bottom to top, spiraling upward over one-half of the tank’s circumference. The tank fell clear of its foundation by nearly 10 feet, falling downhill in a flattened mass. The





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top thirty feet folded over upon itself while the remainder split and laid out flat.

An engineering assessment performed after the collapse cited ice formation as the probable cause of failure, assisted by the presence of the broken base angle. The period of warm weather permitted the ice adjacent to the tank wall to temporarily thaw and then refreeze.

The formation of the ice in this confined space exerted great pressure on the tank wall. The break in the base angle was all the weakness needed for the fracture to begin. Once started, the tank literally “unzipped” up to the level of the water and ice.

Immediately following the failure, various repair and replacement schemes were considered. City officials would obviously be concerned with repairing the failed tank for further use, although the cost would be significantly less than that of a new tank.





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In the end, the tank was rebuilt, although to only half of its original height. This loss of capacity, together with the continued growth of the city, would lead officials to consider an entirely new water supply system only four years later.

Special thanks to Zoe Rhine at North Carolina desk of Pack Memorial Library, and Charlie Casey, Manager of Water Production for the City of Asheville.

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