SOURCE WATER MAINTENANCE:
A LOOK INTO HOW A MUNICIPALITY IS PRESERVING THEIR INFRASTRUCTURE

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During 2011, the City of Fulton experienced a catastrophic collapse of a substantial municipal drinking water supply well. This older-style well, often referred to as a "kettle well", failed when the metal liner collapsed. This incident prompted concern to the Village of Baldwinsville water plant operator, Chuck McAuliffe, who knew that the Village operated a similar style well which was of similar age and construction.

In the Village of Baldwinsville's Water Works Office, there is a plaque on the wall commemorating the facility's construction in 1889. The kettle well is located outside of the office, measuring 20 feet in diameter and approximately 20 feet deep. This well was the main source of water for the Village until the 1960's. This well currently has a yield capacity of over 700 gallons per minute and supplies approximately one half of the Village's water demand. It is a valuable resource to maintain adequate fire protection. As a critical element of the Village's water system and aware that this well is over 100 years old, Chuck's concerns were justified.

Preparation and planning for the project began in 2013. The Village retained a consultant to determine the structural integrity of the well. A remotely controlled submersible camera was used to view the interior of the well. This inspection revealed excessive pitting and corrosion of the well casing. The Village's engineer, Steve Darcangelo, reported these findings to the Village Board of Trustees and recommended a project to reinforce the casing to preserve the well. With Board approval, Steve initiated a project to retrofit the well.

Design of the retrofit was completed in-house by Steve with assistance from an engineering firm. The design involved fabrication of a new well casing 18 feet in diameter that would be placed inside the existing 20 foot well. It also included the fabrication of a new cover with improved means of access to the interior of the well.

In the fall of 2014, the Village ordered the new casing. It was constructed of 3/8" steel and was shipped in 25 pieces. Five pieces make up one five-foot tall ring. The new well casing was designed to be placed inside the existing 20 foot well. The space between the new and old casing would be filled with concrete to improve structural support.

In February 2015, the members of the Village of Baldwinsville Department of Public Works began assembly of the well casing, cover, and mezzanine. The mezzanine was constructed inside the well just below suction piping in an effort to improve access and accommodate future operation and maintenance.

Plaque inside Baldwinsville Water Works Commemorating the Facility's Construction

Original Well Casing with Suction Lines Removed

After weeks of adjusting pump speeds and analyzing flow demands, the well was shut down, suction piping removed, and the first components were placed in the well. The first lift consisted of the three lower sections of new casing. After those sections were set in place, leveled and shimmed, the top section was set in the well and bolted in place. This lift consisted of the two top sections of the casing, the mezzanine legs and the mezzanine framework.

Approximately 45 cubic yards of concrete was then >>>

pumped into the void between the two casings.

The condition of well piping and valves were examined and the Village determined to replace these components at this time. Once all necessary parts were replaced, the cover was placed on the well. The well was shock-chlorinated for a period of 24 hours. A series of samples were then collected from the well and results were submitted to the County Health Department. Following Health Department approval, the well was placed back on line.

This well has been a reliable drinking water source to residents of the Village of Baldwinsville for over 100 years. There is a lack of information on the history of this well. Current and recently retired Village DPW employees can only recall minor maintenance requirements being performed on this well in the past. No known maintenance to this extent has been performed previously.

It was important for the Village of Baldwinsville to initiate this project in order to protect and ensure the longevity of a reliable source. The entire Village of Baldwinsville Department of Public Work's staff is proud to have been part of a project that they hope to preserve this piece of their water system infrastructure for perhaps another 100 years.

The Village of Baldwinsville would like to express their appreciation to those who assisted in making this project a success:

Plumley Engineering
Onondaga County Health Department
GHD Consulting Services, Inc.
Vitale-Robinson Concrete
CNY Boom Truck, LLC
Mattessich Iron, LLC
E.J. Prescott, Inc.

Spec al t anks to Steve Darcangelo, P.E. V llage of Baldw nsv lle, C uck McAul ffe, Department of Publ c Works Foreman, and V llage of Baldw nsv lle Department of Publ c Works Staff.

New Well Casings Assembled and Ready for Installation

Lower Three Well Casing Sections Being Assembled

Lower Three Casing Sections Being Lifted into Place

Lower Three Casing Sections Being Set Into Well

Lower Three Well Casing Sections Set In Place and Shimmed

Upper Two Casing Sections, Mezzanine Legs and Mezzanine Frame Being Readied for Installation

Well Casing Sections In Place and Being Bolted Together

Interior of Well Showing Suction Piping and Mezzanine

Completed Well Retrofit