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$138 Million Rehabilitation of New York City's Gilboa Dam Receives National Award for Engineering Excellence

Gilboa Dam Impounds Schoharie Reservoir, Which Provides About 15 Percent of New York City's High-Quality Drinking Water

Work is Part of On-Going Comprehensive $400 Million Upgrade to City's Drinking Water Infrastructure at Schoharie Reservoir

Photos of the Work are Available on DEP's Flickr Page

The New York City Department of Environmental Protection (DEP) today announced that the Gilboa Dam rehabilitation project has been recognized with a national award for engineering excellence from the American Council of Engineering Companies (ACEC). DEP, along with consulting engineers from Gannett Fleming and Hazen and Sawyer, were honored with the Grand Award at the council's annual Engineering Excellence Awards. Since 1967, ACEC has given the awards to projects that exemplify the year's most outstanding engineering accomplishments. Projects are judged by a panel of more than two dozen experts drawn from a cross section of industry, government, academia and media, and they are rated based on their uniqueness, innovative applications, future value to the engineering profession, social, economic and sustainable development considerations, complexity, and successful execution of plans.

"New York City is proud to receive this recognition from the American Council of Engineering Companies," **DEP Acting Commissioner Steven Lawitts** said. "The rehabilitation of Gilboa Dam was a complex and important project for the City's water supply and the thousands of people who live downstream of Schoharie Reservoir. This award underscores the skill and dedication of the engineers, planners, construction workers and others who collaborated to make this project a success."

"New York City DEP is to be commended for its commitment and allocation of resources necessary to complete this important project," **Gannett Fleming Vice President Rod Holderbaum** said. "The accomplishments at Gilboa Dam clearly

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demonstrate DEP's dedication to public safety and infrastructure. Gannett Fleming staff is proud to have been part of this important project."

"Working on the design of this important project was very rewarding," said **Richard Peters, Hazen and Sawyer's Project Director and Vice President**. "As recognized by ACEC, the technical challenges overcome as part of this project represent another step forward for the profession of water engineering. It is an honor to support DEP in maintaining the legacy of our engineering forefathers who initially designed New York City's visionary water system, as well as improving the reliability of the water supply of more than 9 million New Yorkers."

"The rehabilitation of the 89-year-old Gilboa Dam represents the best in engineering innovation," ACEC President & CEO David A. Raymond said. "Designed by the joint venture of Hazen and Sawyer and Gannett Fleming for the New York City Department of Environmental Protection, the project involved cutting-edge rock anchor technology to redesign the dam's spillway. As a result, the project was honored as one of the nation's top achievements in the recent ACEC 2016 Engineering Excellence Awards."

The ACEC award is the third earned by the Gilboa Dam project since it was completed in 2014. The project had previously been honored with top awards from the American Council of Engineering Companies of New York, and the Association of State Dam Safety Officials.

The $138 million reconstruction of Gilboa Dam was completed in 2014, two years ahead of schedule. The project included the addition of approximately 234 million pounds of concrete, molded and dyed to resemble the original bluestone face of the dam, along with more than 500 massive spillway slabs and upgrades to the abutment walls that support the dam.

Gilboa Dam is 2,024 feet long, 182 feet high, and more than 150 feet wide at its base. Several new features were added to the dam during its rehabilitation, including an inspection gallery inside the dam that runs its entire length. The gallery—which also includes instruments to constantly measure stress on the dam—will allow engineers to visually inspect the inside and outside of the dam on a regular basis. The dam was also designed with 3-, 6- and 12-foot steps that dissipate the energy of water as it spills from the reservoir. The east and west abutment walls that support Gilboa Dam were also strengthened through the installation of 40 post-tensioned anchors, or steel cables that pull them tight to the bedrock. The project employed as many as 180 tradesmen from in and around the watershed through an agreement with local unions.

The rehabilitation was completed ahead of schedule despite a nine-month setback in the wake of Hurricane Irene, which inflicted historic damage upon the Catskills. The powerful storm sent roughly 8 feet of water over the dam's spillway and destroyed much of the staging area for construction, along with access roads and work platforms.

DEP began a thorough investigation of the integrity of Gilboa Dam after the flood of 1996, which overtopped the spillway by 6.7 feet, a record at the time. An initial investigation, completed in 2003, found that Gilboa Dam would require a comprehensive rehabilitation and upgrade because it likely did not meet modern standards for dam safety. Additional engineering work in 2005 found that Gilboa Dam had a marginal factor of safety for flood conditions similar to the record flood of 1996. Following that report, DEP moved immediately to make emergency repairs. In 2006, a 220-foot-long by 5.5-foot-deep notch was cut from the top of the westernmost portion of the dam to control water spilling from Schoharie Reservoir and allow for the installation of 80 anchoring cables into the top and outer face of the dam. These post-tensioned anchors significantly improved the safety of the dam by pulling it tighter to the bedrock below.

While work on Gilboa Dam is complete, construction at the site will continue until approximately 2020. The rehabilitation of Gilboa Dam is part of a $400 million program to build and improve other facilities near the dam. This includes a permanent release tunnel that will replace the temporary siphons, giving DEP the ability to release water from Schoharie Reservoir around the Dam and into Schoharie Creek below. Work on the release works began this year. The remaining projects also include site restoration, rehabilitation work on the Shandaken Tunnel Intake Chamber, and the construction of a public information

kiosk off Route 990V.

Gilboa Dam was built from 1919 to 1927 and impounds Schoharie Reservoir, the northernmost reservoir in the City's water supply system. Schoharie Reservoir can store up to 19.6 billion gallons of water, and it accounts for roughly 15 percent of the drinking water delivered to New York City each day. Schoharie Reservoir collects water from a 314-square-mile watershed. It diverts that water through the 18-mile Shandaken Tunnel, which discharges into the Esopus Creek where it travels another 5 miles before entering Ashokan Reservoir. From Ashokan Reservoir, the water flows south through the Catskill Aqueduct to New York City. The original Gilboa Dam cost $7.8 million to build by the time it was put into service in 1927.

DEP manages New York City's water supply, providing more than one billion gallons of high quality water each day to roughly 9.5 million New Yorkers. This includes more than 70 upstate communities and institutions in Ulster, Orange, Putnam and Westchester counties who consume an average of 110 million total gallons of drinking water daily from New York City's water supply system. This water comes from the Catskill, Delaware, and Croton watersheds that extend more than 125 miles from the City, and the system comprises 19 reservoirs, three controlled lakes, and numerous tunnels and aqueducts. DEP has nearly 6,000 employees, including almost 1,000 scientists, engineers, surveyors, watershed maintainers and other professionals in the upstate watershed. In addition to its $70 million payroll and $157 million in annual taxes paid in upstate counties, DEP has invested more than $1.7 billion in watershed protection programs—including partnership organizations such as the Catskill Watershed Corporation and the Watershed Agricultural Council—that support sustainable farming practices, environmentally sensitive economic development, and local economic opportunity. In addition, DEP has a robust capital program with nearly $14 billion in investments planned over the next 10 years that will create up to 3,000 construction-related jobs per year. For more information, visit nyc.gov/dep, like us on Facebook, or follow us on Twitter.

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