Landmarks Preservation Commission
March 23, 1981, Designation List 141
LP-1035

CROTON AQUEDUCT GATE HOUSE (135th Street Gate House), 135th Street and Convent Avenue, Borough of Manhattan. Built 1884-90; Architect Frederick S. Cook.

Landmark Site: Borough of Manhattan, Tax Map Block 1971, Lot 18 in part.

On March 13, 1979, the Landmarks Preservation Commission held a public hearing on the proposed designation as a Landmark of the Croton Aqueduct Gate House and the proposed designation of the related Landmark Site (Item No. 11). The hearing had been duly advertised in accordance with the provisions of law. Two witnesses spoke in favor of designation. There were no speakers in opposition to designation.

DESCRIPTION AND ANALYSIS

One of the major developments in America during the 19th century was the unprecedented growth of urban centers. The increase in the size of cities placed tremendous pressure on limited municipal resources, none more than the supply of fresh potable water. In the 17th and 18th centuries most cities had relied on local waterways, springs, and wells for their water supply. The increasing population, however, soon put a strain on these natural resources. Poor sanitary conditions frequently caused sewage to mix with the water supply and in many localities the water became so contaminated that it was undrinkable. In addition, the lack of an adequate supply of water hindered the work of local fire brigades and led to extensive property loss.

For urban growth to be sustained, a reliable supply of fresh water was required. In the late 18th and early 19th centuries, municipal governments slowly began to take responsibility for the delivery of clean water. The colonial government of New York City first became involved in providing water to the populace in 1774, but it was not until the completion of the Croton Aqueduct in the 1840s that New Yorkers were assured of a safe water supply. As the city grew, the relatively small Croton system proved inadequate; it was supplemented in 1890 by the New Croton Aqueduct, in the early 20th century by the Catskill System, and later by the Delaware River System.

The Old and New Croton Aqueducts were two of the premier engineering works of the 19th century, successfully supplying New York with some of the world's finest water. The 135th Street Gate House, designed in 1884 by Frederick S. Cook, was the major above-ground structure built within the city limits as part of the New Croton Aqueduct. This structure is more than just a utilitarian enclosure for water pipes; it is a bold architectural statement that symbolizes the importance of the Croton Aqueduct to the growth of New York City.

Early Water Systems [1]

When the Dutch first settled on Manhattan in 1624, they found a hilly

island endowed with an adequate supply of fresh water. The main source for fresh water was a 48 acre pond, called the Kalch-Hook, located near present-day Franklin and Pearl Streets. The Kalch-Hook, which was surrounded by swampy marshes, was fed by a natural spring and was drained by a narrow creek that ran to the Hudson River along Canal Street. As the English influence became dominant in New York the name Kalch-Hook was anglicized to Collect Pond. This pond remained the major source of New York's water until the mid- 19th century. In addition to the Collect, numerous private and public wells were dug in the settled parts of the city, tapping the large supply of pure water in the subsoil. Unfortunately, as New York's population increased, the water in the Collect Pond and in the underground wells became polluted by the garbage and sewage that either were dumped or slowly seeped into it. Large numbers of people died in epidemics of cholera, yellow fever, typhoid, and other diseases caused by contaminated water and poor sanitary conditions. By the 1770s the water supply had become so inadequate, that the municipal government sought to improve the system. In 1774 the city commissioned English civil engineer Christopher Coles to build a reservoir on Broadway between Pearl and White Streets, with water to be supplied from wells dug near the Collect. In 1776 the system was put into operation, but because of the outbreak of the Revolutionary War, the project was never fully completed. The new reservoir relied on the polluted Collect Pond, and the quality remained poor.

New York suffered tremendous losses during and immediately after the Revolutionary War; much of the city had burned and a large part of the population had moved elsewhere. The more immediate problem of reconstructing the city precluded any initiatives in the direction of supplying New Yorkers with pure water, and the water supply continued to deteriorate. In 1798 Dr. Joseph Browne became concerned with the sanitary condition of the city and its effect on the health of the population as well as with the lack of water for fire fighting. Browne presented a proposal to the New York City Common Council, suggesting the use of water supplied from outside of Manhattan. Browne's proposal sought to channel water from the Bronx River by constructing a dam across the river at West Farms. From West Farms the water would travel through a canal to the Harlem River and then through cast-iron pipes to a reservoir in Manhattan. This idea was favorably received and on March 30, 1799, the State Legislature passed an act "for supplying the City of New York with pure and wholesome water." Unfortunately, the legislature placed the exclusive right to supplying water in the hands of a private corporation.

This newly formed corporation, the Manhattan Company headed by Aaron Burr, was required to start supplying water to the city within ten years and to continue to supply water to all who wanted it, but on terms set by the company. In addition, the corporation was given permission to use its surplus capital for other uses, which in effect, established the Manhattan Company as the city's second bank. The Manhattan Company chose not to follow Browne's plan for tapping the Bronx River, but instead sunk more wells at the Collect Pond. The water was then piped to a new reservoir on Chambers Street with a 550,000 gallon capacity. The Manhattan

Company chose this plan because it was so much cheaper than Brown's proposal, and the corporation had found that banking was far more lucrative than supplying water. They invested only a minimum effort in creating a suitable water system. By 1830 Manhattan Company water was available to only about one third of the city's population, the water was of poor quality, and the corporation was imbroiled in law suits concerning the condition of streets where pipes had been laid.

The inadequacy of the Manhattan Company's water supply led to a number of alternate proposals. In 1823 the New York and Sharon Canal Company was incorporated with the idea of building canals and a water system from the Housatonic River at Sharon, Connecticut to New York City, and in 1824 a new plan for using water from the Bronx River was proposed. In 1828 the city suffered a severe fire that caused the Committee on Fire and Water of the Common Council to request the construction of a new reservoir on Broadway and 13th Street to be supplied by wells and used exclusively for fire fighting. This reservoir was built with public money and can be considered as the real beginning of New York City's public water system.

The Old Croton Aqueduct

By 1830 it was evident that the Manhattan Company was not adequately supplying the growing city with the needed quantity of fresh water. After an epidemic of Asiatic cholera in 1832, the Common Council's Fire and Water Committee engaged civil engineer DeWitt Clinton to investigate new sources of water. Clinton recommended that water be brought from the Croton River in Westchester County noting that:

> this supply may...be considered as inexhaustible, as it is not all probable (sic) that the city will ever require more than it can provide.[2]

Clinton suggested the construction of a dam on the Croton River. An open aqueduct would then be built from the Croton reservoir to the Bronx. A bridge over the Harlem River would carry the water to Manhattan where pipes would be laid to take the water to a distributing reservoir.

A temporary water Commission was established in 1833 and Major David B. Douglas was appointed to survey the proposed site. His recommendations were similar to Clinton's, except that he suggested the replacement of the open aqueduct with a masonry conduit. On May 2, 1834 the State Legislature passed an act "that provided for supplying the City of New York with pure and wholesome water" and gave New York City authority to establish a permanent Water Commission and to construct a municipal waterworks. On April 14, 1835 the city held a referendum on the proposal -- 17,330 people voted to support the Croton plan; 5,963 opposed it.

Douglas set to work making detailed plans for the aqueduct. This work progressed extremely slowly, either because Douglas was insufficiently trained as an engineer, or because he was being too thorough. A

devastating fire on August 12, 1835 prompted the Water Commission to demand quicker action and Douglas was asked to resign. He refused and the Commission fired him, hiring John B. Jervis to complete the plans and supervise construction.

The major problem that Jervis faced in the construction of the aqueduct system was the spanning of the Harlem River. Jervis favored the construction of a low bridge, but encountered tremendous opposition since navigation on the river would have been adversely effected. The State Legislature requested that Jervis construct either a higher bridge or a tunnel. Although cheaper, the construction of a tunnel was rejected as being too dangerous and High Bridge, one of the city's great engineering works was designed.

In its final form, Croton water ran through pipes from the Croton Watershed to the Harlem River, passed over the High Bridge to Manhattan and was piped down Tenth Avenue to a receiving reservoir constructed between 79th and 80th Streets and Sixth and Seventh Avenues, an area that was later to become part of Central Park. The water then proceeded to the famous Egyptian Revival style distributing reservoir on the site of the New York Public Library at Fifth Avenue and 42nd Street. Water first flowed into the receiving reservoir on June 27, 1842.

Amid great festivities the distributing reservoir was filled on July 4, 1842, although construction had not yet been completed on all parts of the system. The aqueduct was completed in early 1844 with the exception of High Bridge which was finished four years later. Although improvements were made to the system later in the century, including the construction in 1858 of a new reservoir in Central Park and the erection of High Bridge Water Tower and the 113th Street Gate House in 1870, the Old Croton Aqueduct served as the major source of water for the burgeoning City of New York until 1890.

The New Croton Aqueduct

As early as the 1870s there was a general recognition that the Old Croton Aqueduct could not be relied upon indefinitely to fill New York City's growing demand for water. A survey was undertaken to determine if the East Branch of the Croton River should be used for additional water resources to relieve the strain on the Old Croton System. Fiscal troubles aggrevated by the Panic of 1873 precluded the construction of a new and expensive water system. A severe drought in 1880-81, however, revived interest in augmenting the water supply. In April 1881, Issac Newton, Chief Engineer of the Croton System, submitted a report to Hubert O. Thompson, Commissioner of Public Works, noting that although the Croton Aqueduct was delivering its maximum capacity of water to the city, 95 million gallons per day, millions of gallons were running over the Croton Dam and being wasted. Newton believed that with the construction of a new aqueduct, at least 200 million additional gallons of water could be delivered.

In February 1882, Thompson presented Mayor William R. Grace with Newton's revised plan. This plan recommended the construction of a

high masonry dam across the Croton River near Quaker Bridge, thereby creating a reservoir with a storage capacity of 32 billion gallons supplied from a drainage area of 361 square miles. The reservoir would insure a daily flow of 250 million gallons. Newton proposed a pipeline with a twelve foot diameter that would stretch 31.89 miles from Quaker Bridge to Central Park, via a tunnel laid under the Harlem River.[3] A citizens' committee examined and accepted these plans, with the exception of a three inch increase in the diameter of the aqueduct. On June 1, 1883 the State Legislature passed an act authorizing the construction of the New Croton Aqueduct and the establishment of a Board of Aqueduct Commissioners to prepare the plans and obtain the necessary land. Construction began on the New Croton Aqueduct in January 1885 and the flow of water was inaugurated on July 15, 1890. The aqueduct was built in three parts: the first section was a masonry conduit that extended 23.92 miles from Croton Lake to the proposed Jerome Park Reservoir (not begun until 1894); the second part, also a masonry conduit, ran 6.83 miles under pressure from Mosholu Avenue (now Mosholu Parkway) under the Harlem River to the gate house at 135th Street--(this section was constructed in the form of an inverted siphon (see glossary); the final section ran 2.35 miles from 135th Street to Central Park.

135th Street Gate House

The gate house at West 135th Street and Convent Avenue is the most impressive architectural feature of the New Croton Aqueduct located within the city limits. The building was constructed to regulate the amount of water flowing from the masonry aqueduct to pipes leading to the reservoir in Central Park and to localities in Northern Manhattan. Although built for utilitarian purposes, the gate house is a carefully designed structure, erected during a period when buildings for even the most functional purposes were given carefully articulated and expressive treatment. The gate house is located on a raised site in an area that was sparsely settled in 1890. For this site architect Frederick S. Cook the assistant engineer of the Draughting Bureau,[4] designed a building with a massiveness that belies its diminutive size. The building looms up like a medieval fortress, an appropriate symbol since, just as a fortress served physically to protect the population of a medieval city, this gate house is the symbolic protector of New York, for without an adequate supply of pure water, the modern city could not exist.

Although small, the gate house contains a complex series of water chambers, sluice gates, stop planks, and stop cocks that originally received and distributed all the water conveyed to Manhattan via both the Old and New Croton Aqueducts. The building is divided into two sections--the main part which receives water from the New Croton Aqueduct, and a lower portion, located to the west, that was originally conected to the Old Croton System. Located on an elevated site so that water could easily flow, by force of gravity, to destinations throughout the city without the necessity of constructing pumping stations, the gate house was, in addition, excavated to a depth of 29 feet so that if necessary the Jerome Park distributing reservoir could be fully drained. The gate house was connected to the new aqueduct tunnel by a well located below the tower at the northeast corner of the building. This well, lined with

brick and coped at the floor level by granite stones twelve inches thick, descends 84 feet from the floor. From the well the water passes to the main water chamber via two arched passages of granite five feet wide and 28'3" high. Each passage has two sets of grooves fitted with stop-planks that can shut off the flow of water.

The main water chamber, 69.5 feet long, fourteen feet wide, and 43.5 feet deep, is the largest space in the structure. To withstand the water pressure, the floors are paved with eighteen inch thick granite blocks laid on a concrete foundation and the walls are faced with two foot thick granite stones laid in regular courses on a backing of rubble masonry. This chamber serves to hold the water until it is sent on to its final destination. In addition to being fed by the main well, the chamber receives water from the Old Croton Aqueduct. Three sluice gates in the west wall connect the chamber with the western extension which received water from the older system. Water from the Old Croton Aqueduct entered the gate house on the north side of the low extension. The water then flowed into a 31 foot long chamber from which it proceeded either to the main water chamber, or through stop cocks to pipes that led to the gate house on 113th Street and Amsterdam Avenue.

On the south side of the water chamber are eight small pipe chambers formed by arched granite piers topped by a brick wall. Each pier has two sets of grooves for stop-planks that regulate the flow of water from the main chamber to the stop-cock vaults beyond. Each pipe chamber is fitted with a cast-iron reducer pipe that contains a sluice gate which carefully regulate the flow of water into the stop-cock vaults. Each of these vaults, also known as stop-cock chambers, contains a stop-cock that regulates the flow of water to a 48 inch pipe that sends the water out of the gate house. Four of these pipes lead to the Central Park Reservoir, while the others send water to areas of New York City located to the north of the reservoir. Although never publicly accessible, the interior of the gate house was given an ornamental finish reflecting the pride and care taken in designing this utilitarian structure. The interior is constructed with carefully hewn granite blocks and has walls faced with yellow brick trimmed with buff and black brick that create an exciting polychromatic effect.

For the exterior, Cook designed a building with the solidity of an impregnable medieval fortress. Romanesque Revival in style, the building is atypically picturesque with its octagonal tower, naturalistic setting, and romantic medieval imagery. In plan the gate house is basically rectangular, but it is enlivened by a series of projecting elements including the entrance pavilion an octagonal tower and open terrace located at the northeast corner, and the low polygonal pavilion at the west that was the connection to the Old Croton Aqueduct. The building is constructed of heavy rough-hewn materials that add to the sense of strength and impenetrability. The basement of the gate house is of an uneven height, in response to the hilly terrain and is constructed of large blocks of rock-faced brownstone that seem to grow directly from the landscape. The main portion of the facade is divided into two

sections -- a base comprising rows of smooth granite blocks and a wide expanse of small, rock-faced brownstone blocks laid in a random manner. In addition "the voussoirs, window-sills, cornices, water-table, and other trimmings are all made of the best quality granite, the exposed faces being fine-hammered."[5] Of these elements, the massive voussoirs at the window and doorway openings are particularly notable. Portions of the building are capped by granite parapets ornamented by inset diamonds. This motif appears on many of the buildings that Cook designed for the New Croton Aqueduct. The building has a steep hip roof that was originally clad with slate tiles. The massive quality of the gate house is relieved by only a few ornamental details, the most notable being the heavy paneled doors leading from the tower to the terrace and the iron railings enclosing the terrace and lining the entrance stairs. Originally the exterior was given a bit of chromatic excitment by the "best quality of double-thick German or French glass" in the lower portion of the windows and "heavy cathedral stained glass" in the transoms.[6] These have all been removed and the windows have been enclosed with heavy stone blocks that are in keeping with the general character of the building.

The area surrounding the 135th Street Gate House has been substantially built up with apartment houses and buildings for City College, although the presence of Annunciation Park to the south gives a sense of the original open character of the neighborhood. The gate house remains an important link in New York's water supply system. The building is one of the tangible survivors of the pioneering water supply systems constructed during the 19th century and is a major symbol of the importance of a carefully planned water system to the growth and stability of New York City.

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FOOTNOTES

1. The major source for information about the history and construction of New York's early water systems is Edward Wegmann's The Water System of the City of New York 1658-1895 (New York: John Wiley & Sons, 1896).

2. Wegmann, p. 24.

3. As finally constructed the aqueduct ran 33.10 miles.

4. Most drawings of the gate house are marked with Cook's name and signed by Benjamin S. Church, Chief Engineer. This has made the attribution of the building difficult. A perspective drawing in the Aqueduct Commission Contract Drawings. Section 15. Gate House at 135th St. New York is signed by Cook. Little information about Cook has come to light. Benjamin S. Church's "Report of the Chief Engineer" in the Report to the Aqueduct Commissioners of 1887 says that "Mr. F.S. Cook, Special Assistant in charge of the draughting bureau, has not only directed the execution of accurate drawings for the dams and contract plans for the Aqueduct and designs for the Gate House superstructures, but he has supervised the numerous and detailed working plans required with marked ability." (p. 54.).

5. Wegmann, p. 135.

6. Wegmann, p. 135.

GLOSSARY

Reducer - A fitting having a larger size at one end than at the other.

Siphon - A pipe through which water is moved from a higher to a lower level by atmospheric pressure, forcing it up the shorter leg while the weight of the liquid in the longer leg causes a downward flow.

Sluice gate - A vertical slide that has been fit into a sluice, or a passage that regulates the flow of water.

Stop-cock - A small valve for regulating the flow of water through a pipe.

FINDINGS AND DESIGNATIONS

On the basis of a careful consideration of the history, the architecture and other features of this building, the Landmarks Preservation Commission finds that the Croton Aqueduct Gate House has a special character, special historical and aesthetic interest and value as part of the development, heritage and cultural characteristics of New York City.

The Commission further finds that, among its important qualities, the Croton Aqueduct Gate House is the major surviving building constructed for the New Croton Aqueduct within New York City; that it is an important link in New York City's water supply system; that it is a superbly designed Romanesque Revival style structure enlivened by atypical picturesque massing; that the massive quality of its construction belies the diminutive size of the building; that it is a major example of the 19th-century belief that even the most utilitarian structures were worthy of careful and sophisticated design; and that it is representative of the major feats of engineering involved in the construction of the Croton Aqueduct.

Accordingly, pursuant to the provisions of Chapter 21 (formerly Chapter 63) of the Charter of the City of New York and Chapter 8-A of the Administrative Code of the City of New York, the Landmarks Preservation Commission designates as a Landmark the Croton Aqueduct Gate House, Borough of Manhattan and designates Tax Map Block 1971, Lot 18 in part, Borough of Manhattan. as its Landmark Site.

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CROTON AQUEDUCT GATE HOUSE
(135th Street Gate House)
135th Street and Convent Avenue
Built:1884-90

Photo Credit:Andrew S. Dolkart
Landmarks Preservation Commission

Architect:Frederick S. Cook