

**CROTON AQUEDUCT WEST 119<sup>th</sup> STREET GATEHOUSE**, 432-434 West 119<sup>th</sup> Street (aka 1191-1195 Amsterdam Avenue), Manhattan. Built 1894-95, New York City Department of Public Works; George W. Birdsall, chief engineer, Croton Aqueduct; Peter J. Moran, contractor.

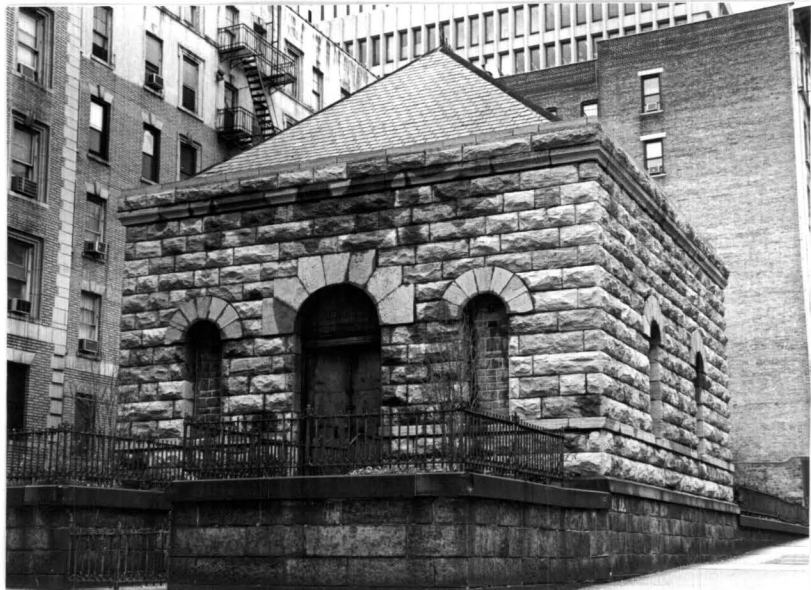
Landmark Site: Borough of Manhattan Tax Map Block 1962, Lot 35.

On December 14, 1999, the Landmarks Preservation Commission held a public hearing on the proposed designation as a Landmark of the Croton Aqueduct West 119<sup>th</sup> Street Gatehouse and the proposed designation of the related Landmark Site (Item No. 7). The hearing had been duly advertised in accordance with the provisions of law. Seven people spoke in favor of designation, including representatives of the New York Landmarks Conservancy, the Historic Districts Council, Community Board 9, the Morningside Heights Residents' Association, and Friends of the Old Croton Aqueduct. In addition, the Commission received letters in support of designation from State Senator Eric T. Schneiderman, Assemblyman Edward C. Sullivan, and Councilman Bill Perkins.

### Summary

The Croton Aqueduct West 119<sup>th</sup> Street Gatehouse was constructed in 1894-95 by contractor Peter J. Moran for the New York City Department of Public Works, under the supervision of George W. Birdsall, chief engineer of the Croton Aqueduct. The small but imposing one-story gatehouse is constructed of rock-faced granite, with round-arched openings with voussoirs and a hipped slate shingle roof. It replaced an older gatehouse for the aqueduct that had been located in the middle of the roadbed of Tenth (Amsterdam) Avenue at West 119<sup>th</sup> Street on "Asylum Ridge" (so called because of the Bloomingdale Insane Asylum). These gatehouses functioned as the southern connection between the cast-iron inverted siphon pipes, laid beneath the nearly mile-wide Manhattan Valley to the north, and the masonry aqueduct that continued southward. By the 1890s, as the Morningside Heights neighborhood developed, the old gatehouse had become a traffic impediment and was replaced by the existing one located on the east side of the avenue.

The Old Croton Aqueduct (1837-48, John B. Jervis, chief engineer), one of the first major municipal water systems in the United States, was New York City's first significant supply of fresh water. It remained the city's principal source of water until 1890, and supplied the city with water until 1955. The West 119<sup>th</sup> Street Gatehouse was in operation until 1990.



## DESCRIPTION AND ANALYSIS

### The (Old) Croton Aqueduct<sup>1</sup>

Until the mid-nineteenth century, New York City did not have an adequate and reliable source of fresh water. Citizens were forced to subsist on water from the Collect pond, various wells and pumps, and cisterns. But the serious pollution of these water sources, which were sometimes linked with diseases and epidemics, along with general civic filth and periodic fires exacerbated by lack of water, posed major problems. These were especially aggravated by the rapid growth of the population. Manhattan island, moreover, is located amidst saltwater estuaries, presenting substantial obstacles to bringing in potable water. As early as 1798, several plans were advanced to divert water from the Bronx River to Manhattan, but these were not implemented. After decades of discussion, an independent Water Commission was authorized by the state legislature in 1834 to plan and construct a water system. The city finally obtained a supply of fresh water in 1842 through the gravity-fed Croton Aqueduct, which was begun in 1837 and completed in 1848. An innovative engineering achievement, an outstanding (if expensive) public works project, and one of the first major municipal water systems in the United States, the Croton Aqueduct was planned under chief engineer David B. Douglass, the leading proponent of the Croton River as water source, but built under chief engineer John B. Jervis.

Water emanating from the Croton River and Reservoir in Westchester County, N.Y., traveled through an embanked tunnel, to the Harlem River. The High Bridge (1838-48, Jervis),<sup>2</sup> a significant engineering feat, was constructed to carry the water over the river. South of 151<sup>st</sup> Street, the aqueduct followed the course of the future Tenth Avenue to 108<sup>th</sup> Street, then proceeded to a receiving reservoir in what later became Central Park and also supplied a distributing reservoir at Fifth Avenue and West 42<sup>nd</sup> Street. Two valleys, Clendenning and Manhattan, were, like the Harlem River, obstacles that necessitated special engineering solutions, since the natural flow of the water was disrupted by drops in elevation at both locations. At Clendenning Valley, between West 95<sup>th</sup> and 102<sup>nd</sup> Streets, a 1,900-foot-long earth-and-masonry embankment was constructed to carry the aqueduct. It was pierced by three arches to allow streets to pass through it.

Manhattan Valley was 4,180 feet wide and 105 feet below the aqueduct's grade. Instead of an embankment or viaduct, it was decided to employ an

underground "inverted siphon" with two 36-inch cast-iron mains. "At the lowest point [of the inverted siphon], the water is under maximum pressure which, in effect, forces it up the other side... and back into the open channel of the Aqueduct."<sup>3</sup> Gatehouses for the aqueduct were located in the middle of the roadbed of Tenth (Amsterdam) Avenue at West 142<sup>nd</sup> Street and West 134<sup>th</sup>-135<sup>th</sup> Streets at the north end of Manhattan Valley, and at West 119<sup>th</sup> Street at the south end. The latter gatehouse on "Asylum Ridge" (so called because of the Bloomingdale Insane Asylum, located since 1821 between West 113<sup>th</sup> and 120<sup>th</sup> Streets) functioned as the southern connection between the cast-iron pipes and the masonry aqueduct that continued southward. These gatehouses were planned to accommodate two additional pipes for eventual system expansion.

### The Maintenance and Extension of the (Old) Croton Aqueduct System<sup>4</sup>

The Croton water system was placed under the jurisdiction of the Croton Aqueduct Department from 1849 to 1870. With the explosion of the city's population, accompanied by the emergence of indoor plumbing and ever-increasing water usage, an additional water supply system became a municipal necessity after the Civil War. Attempts were first made to increase the capacity of the water flow of the existing (Old) Croton Aqueduct, and various extensions were constructed. In 1853-54 and 1861-62, third and fourth water mains (larger 48-inch cast-iron pipes) were laid across Manhattan Valley. A new receiving reservoir was placed in Central Park (1858-62),<sup>5</sup> with gatehouses on the north and south sides, as well as a "junction gatehouse" at Ninth Avenue and West 92<sup>nd</sup> Street, at which water could be diverted to either the old or the new reservoir. Alterations were made to the High Bridge (1860-63), including the installation of a much larger pipe. The masonry section of the aqueduct between West 85<sup>th</sup> and 92<sup>nd</sup> Streets was replaced by underground mains (1865-66). The High Bridge Water Tower (1866-72, Jervis)<sup>6</sup> and reservoir were constructed to supply water to the higher elevations of northern Manhattan. A hydrographic survey of the Croton River watershed in 1857-58 resulted in plans for fourteen additional reservoirs outside the city; this plan was mostly carried out between 1866 and 1911.

In 1870, the New York City Department of Public Works was established under Commissioner William M. ("Boss") Tweed, and the (Old) Croton Aqueduct came within its jurisdiction. The department continued attempts to increase the capacity of the system. A new

main was laid south of the High Bridge reservoir (1873-74). The aqueduct was altered (1870-75) between West 92<sup>nd</sup> and 113<sup>th</sup> Streets, with the removal of the above-ground embankment at Clendenning Valley and the installation of 48-inch underground mains; gatehouses were built at West 92<sup>nd</sup> and 113<sup>th</sup> Streets (1875-76). An additional pumping engine was put into operation at High Bridge Water Tower (1875-76). The aqueduct was reinforced (1875-89) to enable it to withstand increased water pressure (it had originally been designed for 72 million gallons a day, but eventually was forced to deliver up to as much as 120 million gallons). A second high service water tower was built on West 98<sup>th</sup> Street, near Ninth Avenue (1879-81), with an additional pumping engine (1890-91). By 1892, the gatehouses on the north side of Manhattan Valley at West 134<sup>th</sup>-135<sup>th</sup> and 142<sup>nd</sup> Streets were removed after the completion of the new 135<sup>th</sup> Street Gatehouse (1884-90, Frederick S. Cook),<sup>7</sup> at Convent Avenue, which was built to regulate the water flow from both the Old and New Croton Aqueducts (the latter began service in 1890). The Central Park reservoir was deepened (1890-95). The Old Croton water system and its gatehouses were continually adapted to address the increasing demands of New York City's expanding population.

#### The West 119<sup>th</sup> Street Gatehouse<sup>8</sup>

By the 1890s, as the Morningside Heights neighborhood developed, the old Asylum Ridge gatehouse in the middle of the roadbed of Amsterdam Avenue at West 119<sup>th</sup> Street had become a traffic impediment. It was replaced in 1894-95 by the existing Croton Aqueduct West 119<sup>th</sup> Street Gatehouse, located on the east side of the avenue on land that the City had acquired in 1877. George W. Birdsall, chief engineer of the Croton Aqueduct in the Dept. of Public Works, reported in June 1893 that plans and specifications were in preparation for the removal of the old gatehouse and for the construction of a new one. Peter J. Moran signed both contracts at the end of the year. Moran was listed in New York City directories during the 1890s as a civil engineer, contractor, or surveyor; at the time of the gatehouse construction, he resided at Amsterdam Avenue and West 125<sup>th</sup> Street. Workers had excavated the foundation of the new gatehouse by March 1894, and by June they completed the chamber and received stone for the exterior. Water began running through the gatehouse apparatus in July. The department reported in September that the old gatehouse had been torn down. The new gatehouse structure was completed "except doors, windows and railing" by December, and the grounds and sidewalks

were "put in order." The total cost of the completed gatehouse as recorded in March 1895 was nearly \$40,000. The one-story gatehouse is constructed of rock-faced granite, with round-arched openings with voussoirs and a hipped slate shingle roof. Small but imposing in appearance, the gatehouse follows the tradition of building stone structures for both the Old and New Croton Aqueduct systems. These structures are distinctive representations of New York City's water supply system, one of the most significant of the city's nineteenth-century engineering achievements.

#### George W. Birdsall<sup>9</sup>

George W. Birdsall (1836-1911), born and educated in New York City, spent most of his professional career in the construction and maintenance of the water supply systems of New York City. He was an assistant engineer in the waterworks division of the Dept. of Public Works after 1871, serving as first assistant engineer from 1875 to 1879 and from 1881 to 1884. Birdsall was appointed "chief engineer of the Croton Aqueduct" in the Dept. of Public Works in 1880 and also served in that title from 1885 to 1898; this position initially gave him responsibility for the Old Croton Aqueduct system. Birdsall is also credited with the supervision of construction of the Bronx and Byram Rivers water system.<sup>10</sup> In 1883, the New York City Aqueduct Commission was created for the construction of the New Croton Aqueduct, which was built between 1885 and 1907 under chief engineers Benjamin S. Church and Alphonse Fteley. The Dept. of Public Works was given responsibility for surveys, drafting plans for New Croton works, and, jointly with the Commission, plans for reservoirs and dams; after 1891, the Dept. of Public Works was responsible for the maintenance of all completed New Croton works, as well as the control and distribution of New Croton water.<sup>11</sup> Thus, Birdsall, as chief engineer, played a major role in the planning, construction, and maintenance of the New Croton Aqueduct. The chief engineer of the Croton Aqueduct was also charged with "general supervision of the construction of bridges over the Harlem river."<sup>12</sup> In this capacity, Birdsall supervised the 155<sup>th</sup> Street Viaduct (1890-95, Alfred Pancoast Boller) connecting to the Macomb's Dam Bridge, and assisted in the design and construction of the Harlem Ship Canal Bridge (1893-95, with William H. Burr and A. P. Boller) at the north end of Manhattan, among others.<sup>13</sup> After Consolidation in 1898, Birdsall became chief engineer of the Dept. of Water Supply, Gas & Electricity, but became a consulting engineer to the department after 1902, apparently due to politics of the day. He oversaw the

construction of the High Pumping Station (1901-06),<sup>14</sup> Jerome Park Reservoir, the Bronx, and in 1902 supervised the crew that conducted the earliest survey for the Catskill water system.

#### Later History<sup>15</sup>

The Old Croton Aqueduct remained the city's principal source of water until 1890, when the much larger New Croton Aqueduct was put into service. Eventually, the capacity of New York's water supply was greatly expanded with the Catskill (1907-29) and Delaware River (1937-50s) water systems. The Old Croton Aqueduct no longer supplied New York City with water after 1955, though its water route within Manhattan continued to be used. The Croton Aqueduct West 119<sup>th</sup> Street Gatehouse remained in operation until 1990.

#### Description

The one-story gatehouse is constructed of rock-faced granite, with round-arched openings with voussoirs and a hipped roof. The building is embellished by a watertable, sill course, and cornice/parapet. All openings, except for the entrance, are currently sealed with stone. **North elevation**

There are three openings; the central one is the entrance. The entrance has a stepped arch, double metal-paneled doors, and a multi-pane transom (covered with mesh). **West elevation** There are two openings. Due to the sloping site on the hill, this elevation has an ashlar base below the watertable that is a continuation of the retaining wall of the north and south yards. **South elevation** There is one central opening. **East elevation** There are two openings. **Roof** The roof is covered with slate shingles and retains part of its iron cresting at the ridge. **Grounds** The lot has a stone retaining wall on the north and west sides. The north end of the lot has two raised yards that flank a small iron gate, concrete sidewalk, and stone steps leading to the entrance. The entire lot is surrounded by a decorative iron fence set on capstones (sections of fence are currently missing at the northeast and northwest corners of the lot).

Report prepared by  
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#### NOTES

1. NYC Dept. of Public Works, *Quarterly Report* (June 1879), 38-39; Larry D. Lankton, "Manhattan Life Line: Engineering the Old Croton Aqueduct" (Washington, D.C.: Hist. Am. Eng. Rec., 1979); Jerome Park Conservancy, *History and Evaluation of the Jerome Park Reservoir Draft Report* (Aug. 1998), prepared by Robert J. Kornfeld, Jr.; N.Y. State Office of Parks, Recreation and Historic Preservation, "A Walker's Guide to the Old Croton Aqueduct," Linda G. Cooper, ed. (1992); Hudson River Museum, *The Old Croton Aqueduct: Rural Resources Meet Urban Needs* (Yonkers: HRM, 1992); Gerard Koepfel, "A Struggle for Water," *Invention & Technology* (Winter 1994), 18-31; Eric A. Goldstein and Mark A. Izeman, "Water," *The Encyclopedia of New York City*, Kenneth T. Jackson, ed. (New Haven: Yale Univ. Pr., 1995), 1244-1246; Charles H. Weidner, *Water for a City: A History of New York City's Problem from the Beginning to the Delaware River System* (New Brunswick: Rutgers Univ. Pr., 1974); Edward Wegmann, Jr., *The Water-Supply of the City of New York 1658-1895* (N.Y.: John Wiley & Sons, 1896); John B. Jervis, *Description of the Croton Aqueduct* (N.Y.: Geo. F. Nesbitt & Co., 1851), 7; Geo. W. Bromley and E. Robinson, *Atlas of the Entire City of New York* (1879); E. Robinson, *Atlas of the City of New York* (1885).
2. High Bridge (altered in 1860-63 and 1923) is a designated New York City Landmark.
3. Hudson River Museum, 32.
4. Wegmann, 51-99; NYC DPW, *Qtrly. Rept.* (June 1879); Weidner.
5. The Central Park Reservoir is located within the designated Central Park Scenic Landmark.
6. The High Bridge Water Tower is a designated New York City Landmark.

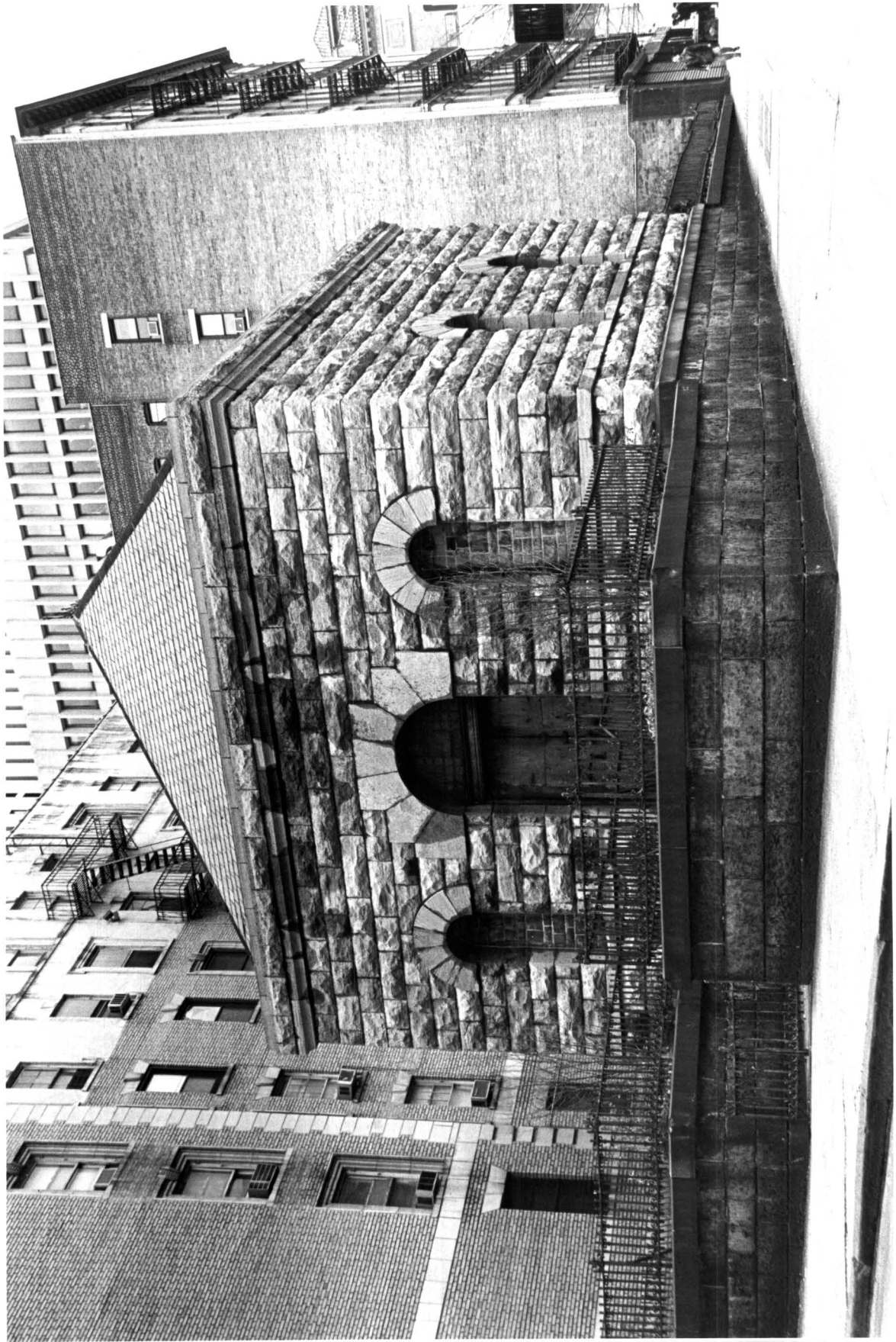
7. The 135<sup>th</sup> Street Gatehouse is a designated New York City Landmark.
8. New York County, Office of the Register, Liber Deeds and Conveyances; NYC DPW, *Qtrly. Rept.* (June 1893 - Dec. 1895); *New York City Directories* (1890-1899).
9. "Isaac Newton's Successor," *New York Times* [hereafter *NYT*], Nov. 12, 1884, 8; "George W. Birdsall Shifted," *NYT*, Oct. 17, 1902, 5; "Engineer Who Favored Ramapo Regains Power," *NYT*, Sept. 30, 1904, 16; Birdsall obit., *NYT*, Jan. 24, 1911; "George W. Birdsall," *Who's Who in New York City and State* (N.Y.: L.R. Hamersly & Co., 1908); LPC, *University Heights Bridge Designation Report* (LP-1455) and *Macomb's Dam Bridge and 155<sup>th</sup> Street Viaduct Designation Report* (LP-1629)(N.Y.: City of New York, 1984 and 1992), both prepared by Jay Shockley; Wegmann, 81, 93; NYC Dept. of Water Supply, Gas & Electricity, *Annual Report* (1904-11).
10. The Bronx and Byram Rivers water system, constructed in 1880-89, played a brief but significant role in supplying water to New York City. See: LPC, *Williamsbridge Reservoir Keeper's House Designation Report* (LP-2047)(N.Y.: City of New York, 2000), prepared by Jay Shockley.
11. Weidner, 70, 78, 96.
12. NYC DPW, *Qtrly. Rept.* (June 1895), 7.
13. The Macomb's Dam Bridge and 155<sup>th</sup> Street Viaduct is a designated New York City Landmark. Four spans of the Harlem Ship Canal Bridge were moved from Broadway to West 207<sup>th</sup> Street and incorporated into the University Heights Bridge in 1905-07. This bridge is a designated New York City Landmark, but has subsequently been partially rebuilt.
14. The High Pumping Station, 3205 Jerome Avenue, is a designated New York City Landmark.
15. Weidner; NYC, Dept. of Environmental Protection, Bureau of Water Supply and Wastewater Collection, "Relinquishment of Water Supply Property" memorandum (Oct. 11, 1990).

## FINDINGS AND DESIGNATION

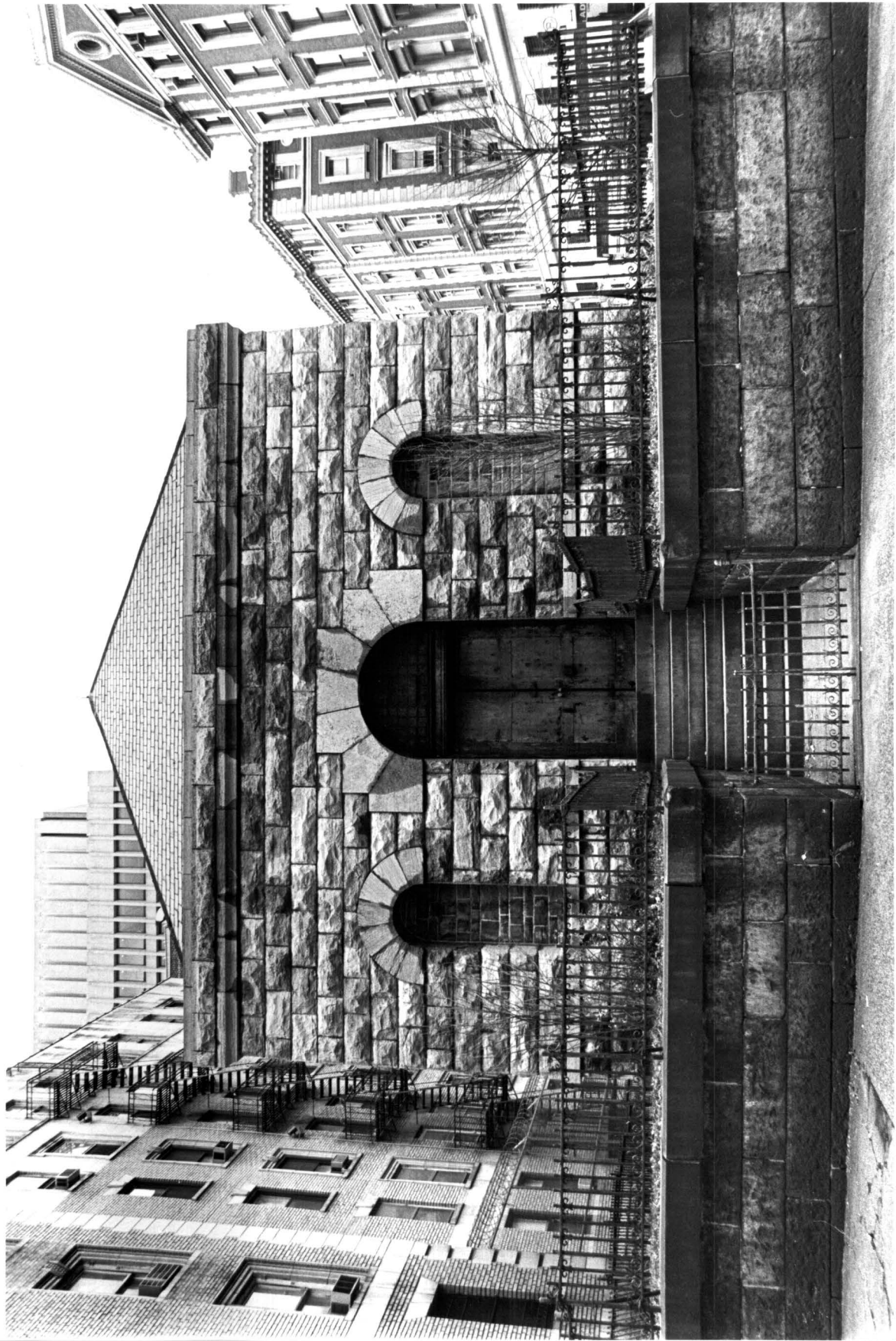
On the basis of a careful consideration of the history, the architecture, and other features of this building, the Landmarks Preservation Commission finds that the Croton Aqueduct West 119<sup>th</sup> Street Gatehouse has a special character and a special historical and aesthetic interest and value 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 West 119<sup>th</sup> Street Gatehouse was constructed in 1894-95 by contractor Peter J. Moran for the New York City Department of Public Works, under the supervision of George W. Birdsall, chief engineer of the Croton Aqueduct; that the small but imposing one-story gatehouse is constructed of rock-faced granite, with round-arched openings with voussoirs and a hipped slate shingle roof; that it replaced an older gatehouse for the aqueduct, located in the middle of the roadbed of Tenth (Amsterdam) Avenue at West 119<sup>th</sup> Street on "Asylum Ridge" (so called because of the Bloomingdale Insane Asylum), that functioned as the southern connection between the cast-iron inverted siphon pipes, laid beneath the nearly mile-wide Manhattan Valley to the north, and the masonry aqueduct that continued southward; that, by the 1890s as the Morningside Heights neighborhood developed, the old gatehouse had become a traffic impediment and was replaced by the existing one located on the east side of the avenue; that the Old Croton Aqueduct (1837-48, John B. Jervis, chief engineer), one of the first major municipal water systems in the United States, was New York City's first significant supply of fresh water, remained the city's principal source of water until 1890, and supplied the city with water until 1955; and that the West 119<sup>th</sup> Street Gatehouse continued in operation until 1990.

Accordingly, pursuant to the provisions of Chapter 74, Section 3020 of the Charter of the City of New York and Chapter 3 of Title 25 of the Administrative Code of the City of New York, the Landmarks Preservation Commission designates as a Landmark the Croton Aqueduct West 119<sup>th</sup> Street Gatehouse, 432-434 West 119<sup>th</sup> Street (aka 1191-1195 Amsterdam Avenue), Borough of Manhattan, and designates Manhattan Tax Map Block 1962, Lot 35, as its Landmark Site.

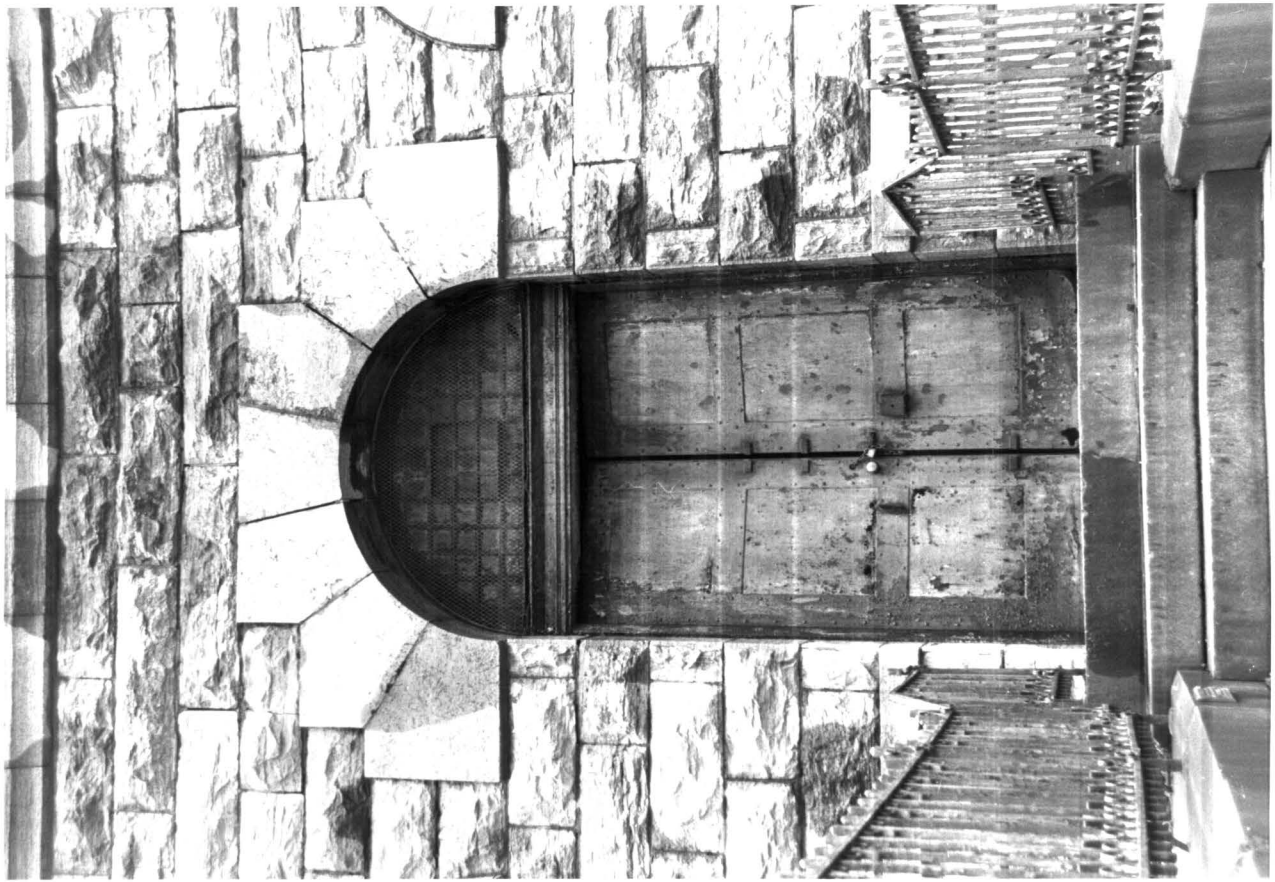


**Croton Aqueduct West 119<sup>th</sup> Street Gatehouse, 432-434 West 119<sup>th</sup> Street (aka 1191-1195 Amsterdam Avenue), Manhattan**  
Photo: Carl Forster



Croton Aqueduct West 119<sup>th</sup> Street Gatehouse, north elevation  
Photo: Carl Forster





**Croton Aqueduct West 119<sup>th</sup> Street Gatehouse**  
Upper: entrance Lower: south elevation and grounds  
Photos: Carl Forster



