

Landmarks Preservation Commission
November 24, 1981, Designation List 150
LP-1094

IRT BROADWAY LINE VIADUCT (Manhattan Valley Viaduct), West 122nd Street to West 135th Street, Broadway, Borough of Manhattan. Built 1900-04; William Barclay Parsons, engineer.

Landmark Site: The portions of the roadbed of Broadway containing the above described structure, Borough of Manhattan.

On September 11, 1979, the Landmarks Preservation Commission held a public hearing on the proposed designation as a Landmark of the IRT Broadway Line Viaduct (Manhattan Valley Viaduct) and the proposed designation of the related Landmark Site (Item No. 8). The hearing had been duly advertised in accordance with the provisions of law. One witness spoke in favor of designation. There were no speakers in opposition to designation.

DESCRIPTION AND ANALYSIS

The IRT Broadway Line Viaduct is the most imposing and visually impressive above-ground engineering structure of the IRT subway system. Spanning the deep Manhattan Valley between 122nd Street and 135th Street along Broadway, the viaduct, designed by the engineers of the Board of Rapid Transit Railroad Commissioners, under the direction of chief engineer William Barclay Parsons, is an excellent example of a double-hinged parabolic braced arch structure. Supporting both the tracks and the 125th Street station, the viaduct is a testament to the skill of the engineers and contractors who designed and built New York City's first subway between 1900 and 1904.

Proposal for an underground rapid transit system to alleviate traffic congestion in New York had been put forward as early as the 1860s. In 1864 the Metropolitan Railway Company was incorporated; the intent was to build an underground railway. Because of political opposition and the competition for franchise rights, the scheme was not successful. Between 1868 and 1870 Alfred Ely Beach (1826-96), inventor and editor of Scientific American, secretly constructed a subway to be operated by pneumatic power beneath Broadway between Murray and Warren Streets. While it proved a popular novelty, Beach's subway ultimately failed due to the opposition of Boss Tweed and lack of financing to expand the subway tunnel. Instead of an underground system, elevated steam railroads were built, beginning in 1868, which quickly spanned important sections of Manhattan and Brooklyn.

The New York State Legislature created a Rapid Transit Commission in 1891 to explore the possibility of a subway system. To meet the problem of construction costs, the City of New York was authorized in the Rapid Transit Act of 1894 to issue bonds and enter into contract with a private corporation to build and operate an underground railroad. Although several years of delay and litigation followed, a contract was finally let by the City on October 11, 1899, to the Rapid Transit Subway Construction Company, formed by John B. McDonald with the financial backing of banker August P. Belmont, Jr. Belmont created the Interborough Rapid Transit Company (IRT) in 1902 to lease the subway from the City and to operate it for fifty years.

McDonald was a railroad and public works contractor who had performed construction work for the Baltimore and Ohio, Pennsylvania, West Shore and Potomac Valley Railroads between 1881 and 1889. In 1889, when the Board of Rapid Transit

Railroad Commissioners was first planning the subway, McDonald began the construction of the Baltimore Belt Railroad, successfully completing it in 1895. At the time McDonald bid on the subway, he was working on the Jerome Park reservoir. In February 1900 the Board of Rapid Transit Railroad Commissioners announced that he had been selected to construct all four sections of the subway.

The 1899 contract called for the construction of a subway system according to a route and plan that had been devised by William Barclay Parsons (1859-1932). William Barclay Parsons had graduated from Columbia College in 1879. The following fall he entered the Columbia School of Mines, from which he received a degree in civil engineering in 1882. Shortly thereafter, he joined the Erie Railroad, where he was assigned to the division engineer's office at Port Jervis, New York. From Port Jervis, Parsons moved to Rochester, where he supervised the reconstruction of the Erie's "Rochester Division." His experiences of the Erie provided him with the material for his two textbooks on railway maintenance of way, Turnouts (1883), and Track (1884). At the urging of his brother-in-law, civil engineer S.A. Reed, he returned to New York City to establish himself as a consulting engineer. Once in New York, Parsons devoted a portion of his time to subway construction, a new field of civil engineering. He served on the engineering staff of two companies, The New York District Company and the City Railway Company, which sought, unsuccessfully, to construct underground rapid transit railways. While neither the District nor the City company succeeded in constructing its underground road, Parsons gained valuable experience and a thorough knowledge of Manhattan's geography and transit needs. Between 1886 and 1891, Parsons worked with the Denver Railroad and Land and Coal Company, as well as with a number of waterworks ventures in Mississippi.

In 1891 Parsons was appointed deputy chief engineer of the Rapid Transit Commission and in 1894 was named chief engineer, thus assuming the main planning and engineering responsibility for the IRT system. Parsons devised a subway route in 1895 which was revised in 1897. It began with a loop under City Hall, went up the east side of Manhattan along Lafayette Street and Fourth Avenue to Grand Central Station at 42nd Street, then went west to Times Square and turned north along Broadway to 96th Street; there it branched into two lines leading to the Bronx. Construction began in March 1900. A second contract extended the route south from City Hall into Brooklyn where it terminated at the Long Island Railroad Terminal at Flatbush and Atlantic Avenues. Work was begun on this section of the route in 1902.

Contractor McDonald divided the subway construction project into fifteen sections, each placed under the direction of a subcontractor. Steel construction however, for the entire route was contracted to one firm, the Terry and Trench Company.

Because of the variegated topography of New York City, several methods of subway construction were necessary. The majority was undertaken according to the cut and cover method. That is, an open excavation, construction of the subway corridor, and then replacing and covering of all pipes and ducts which had been disturbed. Several locations along the route required tunneling, the largest areas being between 34th and 40th Streets, under Central Park between 104th Street and 110th Street and Lenox Avenue, and between 150th Street and Fort George, the present Dyckman Street. Topography and economics dictated the use of an elevated structure north of Dyckman Street on the local line and north of Melrose Avenue in the Bronx on the express line.

Along Section 12 of the subway route on upper Broadway, a deep depression in the topography required the erection of a viaduct between 122nd and 135th Streets over Manhattan Street, now 125th Street. Standard viaduct construction could not be used for the entire length of the valley since the supports would have necessitated a costly realignment of the angled intersection of Broadway and Manhattan Street.¹ For this reason, the center portion of the viaduct was created by using a double-hinged parabolic braced arch to carry the subway lines over Manhattan Street.

The Manhattan Valley Viaduct is actually composed by three different types of structures. The masonry approaches at both ends (from 122nd Street to LaSalle Street on the south and from 133rd Street to 135th Street on the north) are constructed of rough-faced granite piers with brick infill. A dressed stone molding runs along the tops of the piers supporting a stone guard rail holding name plates ornamented with guttae. These name plates were presumably to bear the name Interborough Rapid Transit Company, but were never filled in.

As the slope towards Manhattan Street increases, the stone approaches lead to steel structures of standard viaduct construction which support the tracks. This portion of the viaduct consists of impressive single-bent and double-bent steel towers spanned by plate girders. These towers in turn flank the center portion of the viaduct, a three-ribbed, double-hinged parabolic braced arch, spanning 168½ feet. Each rib is divided into fourteen panels, and from each panel joint a vertical post rises to support the floor system. Pins link the arch to the foundations which consist of two parallel rows of three concrete piers each. These arch foundations are carried to a depth of 30 feet below the street surface. The total length of the viaduct from 122nd Street to 135th Street (including the arch) is 2,174 feet, and the maximum height above 125th Street is 54 feet.²

The station structure, centered above the arch and serving the 125th Street station, is extremely utilitarian and constructed of steel beams and wooden sheathing. Changes have been periodically made to the station through the years. Decorative iron railings and lamp posts extend along the sides of the station platforms. New escalators have replaced the originals, and these extend beyond the viaduct on both sides of the station.

The Manhattan Valley Viaduct, constructed for a specific purpose, resulted from the unusual topography of this section of Manhattan. The intent of the parabolic arch at the center was "to present lines consonant with an attractive effect, and to avoid unnecessary obstruction to the street or blemish to the landscape."³ If function was paramount in the minds of the Rapid Transit engineers, the solution was beautiful as well as practical. With its bold masonry and graceful curves, the viaduct is both imposing and visually impressive, and is a major component of the IRT subway system.

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FOOTNOTES

1. Engineering News, 49 (February 19, 1903), 182.
2. For a more detailed account of the construction methods used see Engineering News, 49 (February 19, 1903), 182, and Engineering Record, 47 (March 28, 1903), 313-316; 48 (August 8, 1903), 156-157.
3. Engineering Record, 47 (March 28, 1903), 313.

FINDINGS AND DESIGNATIONS

On the basis of a careful consideration of the history, the architecture and other features of this structure, the Landmarks Preservation Commission finds that the IRT Broadway Line Viaduct (Manhattan Valley Viaduct) 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 IRT Broadway Line Viaduct (Manhattan Valley Viaduct), spanning the deep valley between 122nd Street and 135th Street, is one of the most imposing and visually impressive engineering structures of the Interborough Rapid Transit subway system; that its design resulted from the unusual topography of this section of Manhattan; that it is an excellent example of a double-hinged parabolic braced arch structure; that the viaduct is beautiful as well as practical; and that the Manhattan Valley Viaduct is a testament to the skill of the engineers and contractors who designed and built New York City's first subway system between 1900 and 1904.

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 IRT Broadway Line Viaduct (Manhattan Valley Viaduct), West 122nd Street to West 135th Street, Broadway, Borough of Manhattan and designates the portions of the roadbed of Broadway containing the above described structure, Borough of Manhattan, as its Landmark Site.

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Photo: Carl Forster

IRT BROADWAY LINE VIADUCT
West 122nd Street to West 135th
Street, Broadway, Manhattan

Built: 1900-04
Engineer: William
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