

United States Department of the Interior
National Park Service

National Register of Historic Places Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *How to Complete the National Register of Historic Places Registration Form* (National Register Bulletin 16A). Complete each item by marking "x" in the appropriate box or by entering the information requested. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, architectural classification, materials and areas of significance, enter only categories and subcategories listed in the instructions. Place additional entries and narrative items on continuation sheets (NPS Form 10-900a). Use a typewriter, word processor, or computer, to complete all items.

1. Name of Property

historic name Arch Street Bridge over the Passaic River
other names/site number Passaic County Bridge No. 15 / SI&A # 1600015

2. Location

street & number Arch Street over the Passaic River not for publication
city or town Paterson City vicinity
state New Jersey code 034 county Passaic code 031 zip code 07505

3. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act, as amended, I certify that this nomination request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property meets does not meet the National Register criteria. I recommend that this property be considered significant nationally statewide locally. See continuation sheet for additional comments.

Signature of certifying official/Title Date

State or Federal agency and bureau

In my opinion, the property meets does not meet the National Register criteria. See continuation sheet for additional comments.

Signature of certifying official/Title Date

State or Federal agency and bureau

4. National Park Service Certification

I hereby certify that this property is:	Signature of the Keeper	Date of Action
<input type="checkbox"/> entered in the National Register. <input type="checkbox"/> See continuation sheet.	_____	_____
<input type="checkbox"/> determined eligible for the National Register. <input type="checkbox"/> See continuation sheet.	_____	_____
<input type="checkbox"/> determined not eligible for the National Register.	_____	_____
<input type="checkbox"/> removed from the National Register.	_____	_____
<input type="checkbox"/> other, (explain:) _____ _____ _____	_____	_____

5. Classification

Ownership of Property (Check as many boxes as apply)	Category of Property (Check only one box)	Number of Resources within Property (Do not include previously listed resources in the count.)		
<input type="checkbox"/> private	<input type="checkbox"/> building(s)	Contributing	Noncontributing	
<input checked="" type="checkbox"/> public-local	<input type="checkbox"/> district	0	0	buildings
<input type="checkbox"/> public-State	<input type="checkbox"/> site	0	0	sites
<input type="checkbox"/> public-Federal	<input checked="" type="checkbox"/> structure	1	0	structures
	<input type="checkbox"/> object	0	0	objects
		1		Total

Name of related multiple property listing
(Enter "N/A" if property is not part of a multiple property listing.)

Number of contributing resources previously listed in the National Register

0

6. Function or Use

Historic Functions

(Enter categories from instructions)

TRANSPORTATION: Road-related (vehicular)

TRANSPORTATION: Pedestrian-related

Current Functions

(Enter categories from instructions)

TRANSPORTATION: Road-related (vehicular)

TRANSPORTATION: Pedestrian-related

7. Description

Architectural Classification

(Enter categories from instructions)

OTHER: Parker Through Truss

Materials

(Enter categories from instructions)

foundation

walls METAL: Steel

roof

other Abutments: Brownstone

Narrative Description

(Describe the historic and current condition of the property on one or more continuation sheets.)

See Continuation Sheets, Section 7.

8 Statement of Significance

Applicable National Register Criteria

(Mark "x" in one or more boxes for the criteria qualifying the property for National Register listing.)

- A** Property is associated with events that have made a significant contribution to the broad patterns of our history.
- B** Property is associated with the lives of persons significant in our past.
- C** Property embodies the distinctive characteristics of a type, period or method of construction or represents the work of a master, or possesses high artistic values, or represents a significant and distinguishable entity whose components lack individual distinction.
- D** Property has yielded, or is likely to yield, information important in prehistory or history.

Criteria considerations

(mark "x" in all the boxes that apply.)

Property is:

- A** owned by a religious institution or used for religious purposes.
- B** removed from its original location.
- C** a birthplace or grave.
- D** a cemetery.
- E** a reconstructed building, object or structure.
- F** a commemorative property.
- G** less than 50 years of age or achieved significance within the past 50 years.

Narrative Statement of Significance

(Explain the significance of the property on one or more continuation sheets.)

Areas of Significance

(Enter categories from instructions)

ENGINEERING
TRANSPORTATION

Period of Significance

1905-1906

Significant Dates

1906

Significant Person

(Complete if Criterion B is marked above)

N/A

Cultural Affiliation

N/A

Architect/Builder

William L. Whitmore (Engineer); George H. Blakely
(Consulting Engineer); Owego Bridge Company (Builder)

9. Major Bibliographical References

Bibliography

(cite the books, articles, and other sources used in preparing this form on one or more continuation sheets.)

Previous documentation on file (NPS):

- preliminary determination of individual listing (36 CFR 67) has been requested
- previously listed in the National Register
- previously determined eligible by the National Register
- designated a National Historic Landmark
- recorded by Historic American Buildings Survey # _____
- recorded by Historic American Engineering Record # _____

Primary location of additional data

- State Historic Preservation Office
- Other State agency
- Federal agency
- Local government
- University
- Other

Name of repository:

Office of the County Engineer, County of Passaic; Paterson Museum; Paterson Free Public Library

Arch Street Bridge
Name of Property

Passaic County, New Jersey
County and State

10. Geographical Data

Acreage of property Less than one acre

UTM References

(Place additional UTM references on a continuation sheet.)

1 18T 569879 E 4530571 N

3

Zone Easting Northing

2

Zone Easting Northing

4

See continuation sheet

Verbal Boundary Description

(Describe the boundaries of the property on a continuation sheet.)

Boundary Justification

(Explain why the boundaries were selected on a continuation sheet.)

11. Form Prepared By

name/title Samantha Kuntz, Preservation Planner samantha.kuntz@aecom.com

organization AECOM Technical Services, Inc. date August 2017

street & number 437 High Street telephone 609-386-5444

city or town Burlington state NJ zip code 08016

Additional Documentation

Submit the following items with the completed form:

Continuation Sheets

Maps

A **USGS map** (7.5 or 15 minute series) indicating the property's location.

A **Sketch map** for historic districts and properties having large acreage or numerous resources.

Photographs

Representative **black and white photographs** of the property.

Additional items

(Check with the SHPO or FPO for any additional items)

Property Owner

(Complete this item at the request of the SHPO or FPO.)

name _____

street & number _____ telephone _____

city or town _____ state _____ zip code _____

Paperwork Reduction Act Statement: This information is being collected for applications to the National Register of Historic Places to nominate properties for listing or determine eligibility for listing, to list properties and to amend existing listings. Response to this request is required to obtain a benefit in accordance with the National Historic Preservation Act, as amended (16 U.S.C.470 *et seq.*)

Estimated Burden Statement: Public reporting burden for this form is estimated to average 18.1 hours per response including time for reviewing instructions, gathering and maintaining data and completing and reviewing the form. Direct comments regarding this burden estimate or any aspect of this form to the Chief, Administrative Services Division, National Park Service, P.O. Box 37127, Washington, DC 20013-7127; and the Office of Management and Budget, Paperwork Reductions Projects (1024-0018), Washington, DC 20503.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number 7 Page 1

Description Narrative

Summary Paragraph

The Arch Street Bridge (Passaic County Bridge No.15; SI&A# 1600015) is a single-span, two-lane Parker truss bridge over the Passaic River that connects the residential and industrial banks of Paterson in New Jersey (Photographs 1 and 2). Completed in 1906, it is the third bridge to hold this location after the original iron Fink through truss bridge (ca. 1872-1877) and a subsequent concrete arch bridge (1902) were destroyed in the Floods of 1902 and 1903, respectively (Photograph 3). The current Arch Street Bridge is a continuous single-span Parker through truss steel bridge built between 1905 and 1907 as part of a county-led rebuilding effort following the Flood of 1903.

Narrative Description

The Arch Street Bridge is 184 feet in total length (the span alone runs 178 feet), 30.8 feet cartway width, and rests on coursed ashlar brownstone abutments (Photograph 4). The abutments, likely the same supports used by the 1902 bridge as engineers attempted to salvage as much possible material from the second Arch Street Bridge to build the third, are original to the bridge and have not been greatly altered. They are lined on either side by earlier stone wing walls. The only modification to the abutments is concrete infill on the south abutment (Photograph 5). At its central point, the truss peaks at a clearance of 14.25 feet (Photograph 6). It displays the character-defining features of the Parker Truss bridge type, including: inclined end posts, a polygonal top chord, stepped-length verticals, and diagonals in the panels between verticals (Photographs 7 and 8).¹ It features 11 panels with pinned connections, common to the Parker truss type (Photograph 9). All of the main truss components are original. Some of the steel beams bear the mark "PHOENIX," for Phoenix Iron Works (then known as the Phoenix Iron Company), manufacturer of the bridge's components (Photograph 10).

The bridge deck, supported by a floor beam and stringer system, is composed of cinder concrete beneath layers of sand, vitrified brick (the historic decking material) and bituminous concrete. Jersey barriers rest on the deck. Two 7.2-foot-wide pedestrian walkways flank the vehicular portion of the deck and are separated from the river by replacement steel pedestrian railings that match the truss infrastructure (Photograph 11). The walkways were an integral part of the original design of the bridge for facilitating all modes of transit into Paterson's industrial core.

Though the truss retains integrity of design and materials, the bridge has undergone slight alterations throughout the 20th century. At some point between the closure of the trolley routes circa 1930 and the earliest record of county engineer intervention in 1959, the vitrified brick decking and steel trolley tracks were covered with 1.5 inches of bituminous concrete. County engineers replaced the curbs and pedestrian sidewalks in 1959 and 1960, and in 1974 the truss was repainted in response to standard wear and tear. Yet the most significant rehabilitation occurred in 1997 after nearly two decades of recommendations from the Passaic County Engineering Office to service the deteriorating Arch Street Bridge. A new concrete deck was poured; the mid-century metal guardrail was replaced with new concrete Jersey barriers (referred to as parapets in bridge inspection reports); impact attenuators were added to the end of the Jersey barriers to

¹ Parsons Brinckerhoff and Engineering and Industrial Heritage, "A Context for Common Historic Bridge Types, NCHRP Project 25-25, Task 15," (New York, NY: Parsons Brinckerhoff and Engineering and Industrial Heritage, October 2005), 3-35.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River
Name of Property
Passaic County, New Jersey
County and State

Section number 7 Page 2

prevent collision with the steel truss structure; the floorbeams, roadway and sidewalk stringers, horizontal eyebars, splice connections, and pins were replaced; the steel trusses were cleaned and repainted; the approach sidewalks received new concrete and curbing; and new concrete sidewalks and steel railings were added to the pedestrian walkways (Photographs 12 and 13).

Setting

The Passaic River is an approximately 80-mile mature surface river that meanders through northern New Jersey, terminating into Newark Bay. It flows northeast into the City of Paterson, where it drops over the Great Falls of the Passaic. North of Arch Street, the river turns abruptly south and forms the boundary between the City of Paterson in Passaic County to the west and the Boroughs of Fair Lawn and Elmwood Park in Bergen County to the east. The crossing at Arch Street is one of 110 crossings along the river, including vehicular and rail bridges. The Arch Street Bridge is situated approximately 264 yards upstream of the Main Street Bridge (1900) and 528 yards downstream of the Straight Street Bridge (1907) (Photograph 14). It spans one of the narrowest points of the Passaic River surrounding Paterson City (Photograph 15).

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number 8 Page 1

Statement of Significance

Summary Paragraph

The Arch Street Bridge over the Passaic River (hereafter “Arch Street Bridge”) meets National Register Criterion C as an important transportation resource of Paterson, New Jersey and as an important example of a rare Parker through truss roadway bridge. The Arch Street Bridge is representative of the extraordinary post-1903 flood reconstruction effort led by early 20th century Passaic County Engineer William Whitmore, whose leadership during the county-wide bridge reconstruction effort following the Flood of 1903 led to the use of the Pennsylvania truss at Straight Street (SI&A # 1600014) and the Parker truss at Arch Street. The period of significance begins in 1906, when the county began construction of the new Arch Street Bridge, and ends in 1907 when the new bridge was fully completed.

Criterion C: Engineering and Transportation

Under Criterion C, the Arch Street Bridge is a significant and rare application of the Parker truss design to a non-railroad bridge. It is one of only three identified Parker bridge types remaining in New Jersey today, and one of only two Parker bridge designs that utilizes the through truss typology in the state. Along with the nearby Straight Street Bridge, the Arch Street Bridge is also representative of the extraordinary post-1903 flood reconstruction effort led by then-County Engineer William Whitmore. It was Whitmore’s confidence in long-span steel trusses to replace the longer spans lost over the Passaic River with truss designs that led to the use of the Parker truss at Arch Street and the Pennsylvania truss at Straight Street. The Arch Street Bridge remains a high level of integrity – particularly in regards to the main truss components – having endured minimal modification throughout 100 years of use.

HISTORIC CONTEXT

The historic growth of the City of Paterson is inextricably tied to the Passaic River, which bends above the northern boundary of the city forming a hydrological boundary. The presence of this water source gave Paterson life by providing the resources necessary for an industrial hub. Paterson’s accelerated growth at the end of the 18th century is largely credited to Alexander Hamilton, then the Secretary of the Treasury. In 1791, Hamilton presented the *Report on Manufactures* to the House of Representatives, in which he promoted the formation of “a society...on behalf of which measures are already in train for prosecuting on large scale the making and printing of cotton goods”². This report proved the genesis for Paterson as one of the county’s early industrial towns. The Society for Establishing Useful Manufactures (S.U.M), a company created to spearhead the experiment, launched a bold city planning effort engendered by the federal government to stimulate the economy of the still nascent nation by developing a cluster economy predicated on the cotton industry. By 1796, the early manufacturing experiment had failed and S.U.M. was relegated to management of the town which it created.³ However, the industrial city model remained, and Paterson continued to develop as a manufacturing hub of the northeast.

² Alexander Hamilton, *Report on Manufactures*, Communication to the House of Representatives, December 5, 1791 (Washington, DC: United States Treasury Department, 1913), 55.

³ Walter Licht *Industrializing America: The Nineteenth Century* (Baltimore, MD: The Johns Hopkins University Press, 1995), 17; “S.U.M. Society for Establishing Useful Manufactures,” Paterson Friends of the Great Falls, accessed January 30, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number 8 Page 2

In the early years of Paterson's development, fords were established at approximately six shallow points in the Passaic River to convey pedestrians into the city's core.⁴ Access into the city, which amounted to access across the river, would become a predominant thread in Paterson's history extending from residential access to the industrial and commercial core to the need for railroads to move products in and out of the city. Thus Paterson developed into a city of bridges beginning in the 18th century. The first recorded bridge in Paterson was built prior to 1737 at present day Bank Street and predated the first formal pedestrian footbridge across the Passaic by at least five years. By 1774, bridge building and maintenance would become a responsibility of the county government.

The topography of the area and early construction techniques led to vulnerable bridges. As William Nelson writes in *History of Paterson*:

The earliest bridges were only ten or twelve feet wide, the piers being of hewn logs resting in boxes of stone. Every freshet damaged them seriously; in particular the spring freshets, breaking up and bringing down the ice, usually carried away a bent or two. The bents, or spans, were twenty to twenty-four feet long, and the numerous piers were an added obstruction to the river and menace to the bridges.⁵

Even as bridge development progressed with the introduction of cast iron and advances in engineering, the structures remained susceptible to the conditions of the Passaic River. Due to its location on the Passaic River and relatively low elevation compared to the surrounding land, Paterson has been repeatedly inundated by floodwaters over the course of its history.

The 1902 and 1903 Floods

The flood practically made two cities of Paterson [...] Thousands of men and women were lined up on either side of the rushing waters, watching the bridges and speculating as to how long it would be before some one of the structures would again become passable. Their hopes dropped when shortly after 1 o'clock, the Arch street bridge, unable to withstand the force of the current and debris, fell with a crash.

"Rushing Waters Engulf Our City," *The Paterson Evening News*, March 3, 1902.

While major flooding events in 1810 and 2011 bookend two centuries of an increasing number of major flooding events, the floods of 1902 and 1903 may loom largest in the city's history.⁶ Each coming on the coattails of other disasters that befell Paterson, both caused disruption and later damage to the city's numerous bridges across the river.

⁴ William Nelson, *History of the City of Paterson and the County of Passaic New Jersey*, (Paterson, NJ: The Press Printing and Publishing Co., 1901), 403.

⁵ Nelson, 403.

⁶ Northern New Jersey Flood Commission [NNJFC], *Report of the Northern New Jersey Flood Commission* (Somerville, New Jersey: Unionist-Gazette Association, 1904), 6; Sam Dolnick, "River, at 100-Year High, Ravages a City That Once Thrived on It," *New York Times*, August 31, 2011, accessed February 14, 2017, <http://www.nytimes.com/2011/09/01/nyregion/paterson-nj-is-devastated-by-floods-after-hurricane-irene.html>.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number 8 Page 3

Paterson had been devastated by a fire in early February 1902 which had destroyed 456 buildings in the city, largely in the commercial center of the city and more affluent residential neighborhoods. Just less than a month later the city experienced a disastrous flood when heavy rains and snowmelt upriver flowed into the Passaic River and downstream to Paterson. By March 3, the river had risen to 15 feet above normal, surpassing by about seven feet the height of the flood of 1882, which was the highest in living memory at that point. The silk mills of the city—largely spared by the previous month’s fire, but largely tied to the river for water power—were greatly damaged, as were the streets and sidewalks. Though several of the bridges in the city were submerged, it appears that only the Arch Street Bridge was reported washed out. Further downstream in the city of Passaic, the Outwater Bridge collapsed, claiming the lives of six men who were on it at the time. Though a majority of Paterson’s bridges survived the flood, many lost their railings and were damaged by debris that swept against them by the raging waters. The floodwaters had receded significantly by March 4, allowing an initial assessment of the damage. Though there was some relief that the rumors of more bridge collapses had turned out to be false, property damage from the flood was estimated to exceed \$1,000,000.⁷ At the time, the flooding that took place between February 25 and March 9, 1902 would constitute the region’s greatest flood since 1882.⁸

Paterson was once again hit by two disasters in 1903, though the first, a tornado in July, caused no damage to the city’s bridges.⁹ Starting October 10, however, the city was inundated by a flood surpassing that of the previous year in height and damage. Caused by what *Engineering News* called a “very heavy and unusually concentrated rainfall,” the high-water mark was approximately three to four feet higher than the flood of 1902.¹⁰ Five individuals were killed, and damage for the Passaic River Valley was conservatively estimated at around \$7,000,000. The waters swept away nine bridges in Paterson, and more outside the city limits. Even those bridges that technically survived – such as Arch Street, Main Street, Wesel (Market) Street, West Street, and Broadway – endured significant damage such as destroyed roadways and collapsed spans. Though newspapers announced that the Arch and West Street Bridges were soon open to pedestrian traffic, photographs and testimony reveal that they were largely washed out. One individual testifying to the county freeholders on October 20 reported that the Arch Street Bridge “was at the present time but a dam in the middle of the river and should be pulled down.”¹¹

In the aftermath of the Flood of 1903 contracts for some temporary pedestrian footpaths, such as those installed at Arch Street and Straight Street, were quickly awarded to help reconnect the different parts of the city, while other spans waited years to be built. County Engineer William Whitman, who had been appointed earlier in the year, led an assessment of damage to county bridges and created a list of priority

7 John T. Cunningham, “Three Weeks of Terror,” *Royle Forum*, March 15, 1970, 8-9; “Rushing Waters Engulf Our City,” *Paterson Evening News*, March 3, 1902, 1; “Worst of the Flood is Over,” *Paterson Evening News*, March 4, 1902, 1; “Six Dead in the Flood,” and “Paterson Flood is Falling,” *New York Times*, March 4, 1902, 2.

8 George Buell Hollister and Marshall Ora Leighton, *The Passaic Flood of 1902*, prepared for the Department of the Interior, United States Geological Survey, (Washington, DC: Government Printing Office, 1903), 51.

9 “Tornado Sweeps Over Paterson,” *New York Times*, July 23, 1903, 1-2.

10 “Flood Damage to Bridges at Paterson, N.J.,” *Engineering News* 50 (1903): 377; NNJFC, Report, 6.

11 “Flood Damage,” *Engineering News*, 377-79; NNJFC, Report, 6-7; “Paterson Faces a Greater Flood,” *New York Times*, October 11, 1903, 1; “Receding Waters Lay Bare Ruin,” *Paterson Daily Press*, October 13, 1903, 1; “Everybody Cleaning Up,” *Paterson Daily Press*, October 14, 1903, 1; “Bridge Building Coterie Got Solar Plexus Blow,” *Paterson Morning Call*, October 21, 1903, 1.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River
----- Name of Property
Passaic County, New Jersey
----- County and State

Section number 8 Page 4

projects for the county. He recommended that short and medium-length spans be replaced with steel stringer and girder bridges, while he chose to promote the use of long-span steel trusses for lengthier spans crossing the Passaic River. Within five years, the destroyed bridges had been replaced and county bridge construction sank back to its normal levels.¹²

The back-to-back floods also spurred efforts at flood prevention and mitigation along the Passaic River, and to that end the Northern New Jersey Flood Commission of 1903 and the Passaic River Flood District Commission of 1906 were established. Problems such as encroachment on the river channel, overdevelopment, and the draining of wetlands were identified, and a number of solutions were proposed, but nothing was implemented. After a flood in 1936, the Army Corps of Engineers was tasked with developing flood control measures for the river, but plans were rejected in the following years.¹³

Bridges of Arch Street

When [Arch Street Bridge] does smash into the stream, it will add another chapter to one of the most peculiar pieces of county work, that has been notable in many a year.

- o "That Other Fellow," *The Paterson Evening News*, October 15, 1903.

Both the 1902 and 1903 floods severely impacted the bridge at Arch Street, which crosses the Passaic River on the western edge of Paterson City. Arch Street developed alongside the Paterson City's grid pattern, which had fully emerged by 1850 alongside the growth of industrial development and worker housing in the mill-driven city. Arch Street is predominantly based in the northwestern portion of Paterson that extends from the northern bank of the Passaic River. The road is visible on historic maps from 1835, 1854, and 1861, running northwest from Water Street (now Presidential Boulevard). Arch Street did not extend over the Passaic River until after 1872, when the first Arch Street Bridge was constructed. Though the bridge does not appear on the 1872 Beers Atlas, a survey of the bridge from 1981 posits the earliest bridge's construction between 1872 and 1877.¹⁴ A bridge at Arch Street first appears on the 1895 Menger map of Paterson, which depicts Arch Street crossing over the Passaic River into the industrial core the city and connecting to Bridge Street at a 45-degree angle.

The first structural crossing of the Passaic River at Arch Street was an iron Fink through truss type, believed to have been constructed between 1872 and 1877. The Fink through truss design was first patented by German immigrant Albert Fink in 1854 and grew in popularity through the 1850s and 1860s as a

¹² "Bridge Building Coterie," *Paterson Morning Call*, 1; Abba Lichtenstein, et al., *The New Jersey Historic Bridge Survey: Passaic County*, prepared by A. G. Lichtenstein & Associates, Inc. for the New Jersey Department of Transportation and the Federal Highway Administration, September 1994. On file at the New Jersey State Historic Preservation Office, MULT GB 199 v6., 7-8, 10.

¹³ Charles H. Capen Jr., "History of the Development of the Use of Water in Northeastern New Jersey," *Journal of the American Water Works Association* 28 (1936): 977; NNJFC, Report, 8-9, 12-13; J. Sanderson Stevens, Phase 1A Archaeological Investigations for the Proposed Bridge Replacement or Rehabilitation of Bridge No. 1600009 (Fair Lawn Avenue Over Passaic River), prepared by Parsons Engineering Science, Inc. for the North Jersey Transportation Planning Authority and the Passaic County Engineer, February 2000. On file at the New Jersey State Historic Preservation Office, MULT F 536a, 4-20.

¹⁴ James C. McCabe, "Architectural Survey: Arch Street and Straight Street Bridges Area, Paterson, N.J.," (NJ HPO, 1982).

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River
Name of Property
Passaic County, New Jersey
County and State

Section number 8 Page 5

replacement for outdated railway wooden bridges.¹⁵ Though no documentation of the original Arch Street Bridge's construction remains, an 1890 photograph of the original Arch Street Bridge published by the *Patterson Morning Call* in 1905 clearly shows the characteristic box shape of the Fink through truss type with verticals in compression and diagonals in tension (Figure 1). It appears on the 1887 Sanborn map as "Iron Suspension Bridge" surrounded with dense industrial development on the southern bank of the Passaic River. Whereas the northern bank of the Passaic River was more residential, the southern bank held clusters of mills. In 1887, the point where Arch Street crosses the river was home to McGrogan's Saw Mill on the western corner of Arch Street and River Street and Louis Franke and Co. Raw and Thrown Silk Manufacturer's on the eastern corner. The saw mill was converted to row housing in the following decade but the mill remained, as H&M Levy Silk Ribbon Manufacturers, in 1899. That particular site would remain a silk mill under different owners well into the 20th century.

Had it remained, the first Arch Street Bridge would have been a highly significant engineering resource as there are no surviving examples of the Fink through truss type in the United States. This structure spanned the Passaic River for little more than two decades before collapsing in the Flood of 1902 (Figure 2). Passaic County's Board of Chosen Freeholders stepped in following the Flood of 1902 to manage the significant damage wrought by the twelve-day flood, creating (amongst other things) an Arch Street Bridge Committee to oversee the bridge's redevelopment. Less than a month after the flooding receded, the county sent William L. Whitmore and F. W. Schwiars, engineers and surveyors, to survey the bridge site. Then in April 1902, the Arch Street Bridge Committee successfully convinced Freeholders to allocate funding for a temporary walkway to appease "First Warders" commuting from the west bank of the Passaic River.¹⁶ Finally, in June 1902, the Freeholders approved a construction bid from regionally prominent bridge contractors F. R. Long Co. to reconstruct the Arch Street Bridge for \$34,500.¹⁷ Though no individual or firm is has been associated with the design of the second Arch Street Bridge, it is conceivable that Whitmore – who would later serve as County Engineer for Passaic from 1903 to 1906 – and Schwiars prepared the plans for the rebuilding based on their March 24, 1902 survey of the project area.

Such decisions were well-regarded by Paterson residents at the time; however, all good will established by the Committee and the Freeholders in approving the footbridge and ushering along the development of a new bridge was offset shortly after due to decision-making surrounding debris removal. The Freeholders soon alienated the public when the fallen bridge was sold for \$300 – a decidedly low price for the material that comprised the debris.¹⁸ As the *Paterson Evening News* recalled more than a year later:

[...] remember that it was an iron bridge, and there were lots of valuable material in it. There were several people in town who knew this fact, and had an eye on that bridge. Even if it lay on the bottom of the stream it was worth much money for the material which was in it.¹⁹

¹⁵ Kevin Murphy, "Raritan River Fink Through-Truss Bridge (Hamden Bridge)," HAER No. NJ-18 (Washington, DC: National Park Service, U.S. Department of the Interior, June 1984), 2.

¹⁶ "Will Build a Footbridge," *The Paterson Morning Call*, April 22, 1902.

¹⁷ "Scooped Every Bridge in Sight," *Paterson Evening News*, June 10, 1902.

¹⁸ "That Famous Arch St. Bridge," *Paterson Evening News*, November 5, 1902.

¹⁹ "That Other Fellow," *The Paterson Evening News*, October 15, 1903.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number 8 Page 6

Despite broad interest in the debris, the Freeholders did not put the Arch Street Bridge wreckage to auction for public bid. They divested the county of the rubble for a paltry sum; however, the new owner did not fulfill any promises to remove the debris. The fallen Arch Street Bridge instead remained in the riverbed until an interested party offered the new owner \$1,500 (three times the county's original selling cost) for the debris.²⁰ This ordeal led to public distrust of the Freeholders' decision-making and expenditures regarding bridge development at Arch Street.

F. R. Long nevertheless proceeded with the approved plans for a new bridge at Arch Street, which was completed by the end of 1902. Unlike its predecessor, the second Arch Street Bridge was a three-span, concrete arch bridge. The design called for the concrete to be reinforced with steel – a relatively young practice for bridges at the turn of the 20th century – to increase its strength. Like other early examples of reinforced concrete bridge construction, the design was largely experimental and likely led by local or county engineers.²¹ It was built at-grade with the existing Paterson street grid to accommodate a single trolley track, a feature not present on the first Arch Street Bridge. This latter detail proved a fatal flaw for the structure less than a year later, when the Flood of 1903 swept through the city. When the flooding reached its peak after heavy rainfall from October 8 to 9, 1903, the newly built Arch Street Bridge became one of thirteen county bridges to collapse into the Passaic River.

Flooding led to the failure of the Arch Street Bridge's northernmost pier, causing the northerly span to collapse. The impact of this event put strain on the other arches, cracking the central span and seriously undermining the southerly span.²² By October 10th, 1903, the Arch Street Bridge was entirely submerged under the Passaic (Figures 3, 4).

As the second-built Arch Street Bridge fell to the Flood of 1903 less than a year after its construction, local newspapers were quick to criticize the Freeholders for mismanaging the reconstruction efforts. Such cynicism is discernable in the following description by *Paterson Evening News* of the second Arch Street Bridge following its collapse:

Of course when it was completed the freeholders accepted it, but this [sic] Arch street bridge has been a laughing stock ever since it was opened to the public. There is no use in asking who is responsible for the wretched misfit, now clinging over the falling waters of the river. No answer would come if the question were asked, but there are the thousands of dollars of taxpayers money, tumbling into the river, and the bridge, which carries the money down to Dundee Dam.²³

Officials also cast blame on the county for the bridge's failure. In March of 1904, the established Flood Commission wrote that:

One of the most flagrant features of channel encroachments is exemplified in the highway and a few railroad bridges with one or two notable exceptions were built to accommodate established street grades rather than the demands of the river. It is evident, too, that the lesson of the flood of 1902 was not sufficient for county

²⁰ "That Famous Arch St. Bridge."

²¹ Parsons Brinckerhoff and Engineering and Industrial Heritage (2015), 3-56.

²² "Flood Damage to Bridges at Paterson, N.J. (Illustrated)," *Engineering News*, vol. L no. 18 (October 29, 1903), 378.

²³ "That Other Fellow."

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number 8 Page 7

authorities, for the bridges which failed at that time were replaced along the same grade lines, and in a few cases the aperture beneath was considerably reduced by numerous piers and low spring arches. This is especially notable at West and Arch streets in Paterson.²⁴

In retrospect, the second Arch Street Bridge was fated for destruction as its design failed to adequately account for environmental demands. Sources agree that the structural flaws of the bridge came down to one critical aspect: water flow.²⁵ By constructing a three-span, concrete bridge less than 200 feet in length, the county enabled the development of a bridge whose piers would occupy a substantial amount of space in the narrow channel, obstructing the flow of water. This could have been alleviated by raising the height of the bridge to allow more space for water pass under the arches; however, the bridge had been built at-grade to accommodate trolley tracks. Therefore water rushing the structure during the flood was unable to pass through and or to rise, causing considerable stress to the structure as flood water rammed the surface area. The bridge – devised out of context with its surroundings and without respect to environmental conditions – was condemned from the start.

In the aftermath of the second flood, the Arch Street Bridge Committee was reestablished and Whitmore, now county engineer, secured a leading role in the infrastructure rebuilding effort.²⁶ While the county worked on planning for a new bridge at the site, arrangements were made for a temporary bridge to cross the Passaic at Arch Street to support pedestrian traffic. Unlike the flood of 1902 that completely demolished the Arch Street Bridge, the 1903 flood left the bridge marginally intact, which led to people using the collapsed bridge as a shortcut across the Passaic River. The county expanded the debris removal contract of local mason Adrian Wentink to include construction of a temporary crossing to discourage use of the unsound bridge.²⁷

The temporary pedestrian bridge was hastily built, heavily used, and quickly worn. As the *Paterson Morning Call* noted in June 1904, “it is estimated that at least 5,000 persons traveled over the wooden bridge daily and time and time again attention has been called to the fact that it was in an unsafe condition.”²⁸ Despite such concerns, the temporary bridge surprisingly did not fall under the weight of overuse. Instead, on June 22, 1904, the ruins of the Arch Street Bridge – which had been tethered to a local gas main for support – collapsed onto said gas main, sparking an explosion that wrecked the temporary bridge.²⁹ This event would become the first of many incidents to impede the progress of the new bridge’s construction.

24 “Report of the Northern New Jersey Flood Commission, March 4th 1904,” (Somerville, NJ: The Unionist-Gazette Association, State Printers, 1904), 42.

25 Marshall Ora Leighton, *The Passaic Flood of 1903*, Prepared for the Department of the Interior, United States Geological Survey (Washington, DC: Government Printing Office, 1904), 23.

26 Abba Lichtenstein, et al, *The New Jersey Historic Bridge Survey: Passaic County* (Prepared for the New Jersey Department of Transportation and the Federal Highway Administration, September 1994), PAS-8.

27 “Foot Bridge is Dangerous,” *The Paterson Morning Call*, January 4, 1904.

28 “Bridge Gives Way,” *The Paterson Morning Call*, June 23, 1904.

29 *Ibid*;

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number 8 Page 8

Whitmore had previously examined the ruins of the Arch Street Bridge in April 1904. During his inspection, he had declared the remaining span sound and recommended that it was safe to remain where it stood in the Passaic River. His expertise as county engineer informed the Arch Street Bridge Committee's recommendation that the concrete arch bridge remnant serve as the foundation for a new bridge. The Freeholders approved this approach to rebuilding, and quickly secured bids for the construction of a new Arch Street Bridge atop the former, fallen bridge. However, the collapse of the remaining section of the old bridge and the subsequent explosion it created foiled the county's plans for rebuilding. Simply stated by the *Paterson Morning Call*, "as the span that it was expected the contractors would utilize has toppled over, the committee will be compelled to solicit new bids".³⁰ The ruined bridge, now twice collapsed, remained in the Passaic River (Figure 5).

The Freeholders solicited new bids for Arch Street Bridge in July 1904 and contracted De Vogel & Collins for the bridge's reconstruction in August 1904. The company's bid of \$25,480 was accepted over seven other bidders, including F. R. Long, contractors of the previous iteration of the Arch Street Bridge and builders of the Straight Street Bridge (1907).³¹ Yet by January 1905, De Vogel & Collins had still not begun construction on a new bridge. The local papers speculated several causes for the delay ranging from difficulty obtaining materials to disagreements between the builder and Whitmore, who likely designed the original plans. According to the *Paterson Morning Call*:

It has been learned that an entirely new set of plans has been drawn for the bridge and these will be submitted to the board on Wednesday morning. The reasons for this move are withheld at present, but it is understood that some errors were made in the original set of plans, or else there were some points in the form of construction that have since been disapproved by the county engineer.³²

The most plausible reason for the redesign, however, is that the county was still negotiating with a local street car company, the Public Service Corporation, over use of the bridge for trolley tracks. The previous bridge held tracks on the southbound side of traffic, but Freeholders had not yet incorporated public transportation into early designs of the bridge.

That changed in early 1905. While still under contract with De Vogel & Collins, the county decided to amend Whitmore's original plans to accommodate a double trolley track. George H. Blakeley, the county's consulting engineer, drafted a new set of plans for the Arch Street Bridge (Figure 6). Blakeley's changes to the plans ultimately added \$2,780 to the bridge's initial construction quote, but not before effectively stalling the project for months while De Vogel & Collins sought additional funding for the revisions.³³ By the time the financing was fully resolved and work on the bridge started in November 1905, De Vogel & Collins had sold the contract to build the county bridge to the Owego Bridge Company. Owego assumed responsibility for Arch Street Bridge and began construction in November 1905. By January 1906, the substructure had been completed and "the main structure [was] in position to commence riveting."³⁴ After

30 "A.P. Boller Said Bridge Would Fall," *The Paterson Morning Call*, June 24, 1904

31 "Rehashing that Old Grievance," *The Paterson Morning Call*, July 15, 1904.

32 "New Plans for Bridge?," *Paterson Morning Call*, January 1, 1905.

33 "Work on Arch Street Bridge to Begin," *Paterson Morning Call*, April 6, 1905.

34 "Whitmore's Last Report," *Paterson Morning Call*, January 2, 1906.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River
----- Name of Property
Passaic County, New Jersey
----- County and State

Section number 8 Page 9

years of delay, both pedestrian walkways opened to the public on May 7, 1906 with vehicular traffic expected to follow shortly after.³⁵

The Arch Street Bridge opened to pedestrian and vehicular use before the close of 1906, but construction was not technically completed until the Freeholders and the Public Service Corporation came to a resolution over rights of use and trolley tracks laid in 1907. In January 1907, the county accepted the trolley company's offer to pay \$365 per year for 20 years for use of Arch Street Bridge as a trolley route.³⁶

History of the Parker Through Truss Type

The Parker through truss bridge type was first patented in 1870 by Charles H. Parker of Boston, Massachusetts as an improvement on the common Pratt truss. It is essentially a Pratt truss with a polygonal top chord, but the new patent sought to increase the strength and accommodate longer spans than previously supported by the Pratt construct. According to the Historic Context for Common Historic Bridge Types, the Parker truss instituted three changes that set the new design apart from its predecessors: an inclined end post that reaches past hip vertical to connect to the top chord; a new design for joining the top and bottom connections to the chords; and simplified top and bottom chord connections.³⁷ These changes allowed for longer spans than previously made possible by the Pratt truss.

Four subsequent bridge types – the Camelback, Parker Pony, Pennsylvania, and K-Truss – are typically viewed as variants of the Parker truss design. The Camelback is a Parker Truss with exactly five slopes; the Parker Pony is a Parker without struts, sway bracing, or lateral bracing; the Pennsylvania or Petit truss is a Parker truss without sub-struts or without sub-ties; and the K-Truss is a Parker truss with distinctive structural panels bearing Ks formed by vertical and diagonal members.³⁸

The Parker truss design and its characteristic pinned connections were typically used for railroad bridges in the late 19th and early 20th centuries. The use of this form for the Arch Street Bridge is therefore unique, as the Parker truss was less commonly used for city streets. However, as noted by the Historic Context for Common Historic Bridge Types, the Parker truss required fewer materials and was thus economically preferable to the Pratt Truss design for highway pony and through-truss bridges after the turn of the century.³⁹

The Arch Street Bridge is a highly significant example of its type because it has retained the character-defining features of the Parker truss for over a century. Furthermore, the Arch Street Bridge is the only identified historic Parker through truss type in Passaic County and one of only three surviving Parker truss types (pony or through) in the entire State of New Jersey.⁴⁰

³⁵ "Footpath Open," *Paterson Morning Call*, May 8, 1906.

³⁶ "At Last and At Last! Arch St. Bridge Opens," *Paterson Evening News*, January 11, 1907.

³⁷ Parsons Brinckerhoff and Engineering and Industrial Heritage (2015), 3-34.

³⁸ "Trusses: A Study by the Historic American Engineering Record," (Bordentown, NJ: The Roebling Chapter of the Society for Industrial Archeology, National Park Service, 1976).

³⁹ Parsons Brinckerhoff and Engineering and Industrial Heritage (2015), 3-34.

⁴⁰ Other than the Arch Street Bridge, the only other identified Parker truss types in New Jersey are the US 1&9 SB over Conrail & Richards Lane Parker through truss (SI&A #0703161) in Newark City, Essex County and Burnt Hill Road over Beden's

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number 8 Page 10

Late 20th Century Repairs and Rehabilitation

The Arch Street Bridge remained in constant use throughout the 20th century, with minimal alterations to its structure. The earliest change to the structure was to the deck at some point after 1930, when the vitrified brick decking and steel trolley tracks were covered with 1.5 inches of bituminous concrete. The original curbs and pedestrian sidewalks were replaced in 1959 and 1960, respectively. Also in 1960, a metal guardrail was added for the protection the truss system against collision. The bridge was repainted in 1974, but by that point the condition of the bridge had deteriorated beyond cosmetic concerns. The county set in motion a formal system for evaluating all bridges in Passaic County in 1978; and by the time the first cycle survey for Arch Street Bridge was conducted in 1979, the bridge was in need of significant repairs in order to sustain continued use (Figures 10, 11).

The 1979 report noted that “the structure is in marginal condition, with a structural integrity dependent upon the condition of the concrete arch desk, stringers, and floorbeams.”⁴¹ It went on to recommend several repairs to increase the safety of the bridge, which was estimated to have only 10 years of use remaining without intervention. However, no changes were made in the ensuing years to repair the damages compromising the safety of the bridge. By the time of the next bridge inspection cycle in 1986, the Arch Street Bridge’s condition was worsening to the point that replacement was recommended (Figures 12, 13).

The following excerpt comes from the 1986 inspection report regarding the poor condition and dangerous use patterns of the bridge:

The [Arch Street] bridge is in poor condition. The drop in the rating is due to the severe deterioration of the deck arch along the curblines and the low ratings calculated for the structural members mentioned in the report. The load carrying capacity of the bridge has dropped since the previous cycle inspection due to continued corrosion on its structural members. This load capacity is still much higher than the current load limit posting of 3” tons “no trucks or buses”. However, trucks and buses were observed crossing the bridge at the time of this inspection, both of which exceed the actual load carrying capacity presented in this report.

For reasons stated above, it is recommended that the bridge be replaced. It is estimated that the cost of replacement will be 2.5 million dollars.⁴²

The recommendation to demolish and rebuild suggests just how severe the bridge’s condition was by 1986. However, the county does not appear to have ever begun preparing to follow this recommendation. Instead, in 1989 County Engineer Gaetano Farina and consulting engineers A.G. Lichtenstein & Associates developed plans to repair the truss system and floorbeams. However, no alterations would be made to the bridge until nearly a decade later.

Brook Parker pony truss (SI&A #18D0207) in Montgomery Township, Somerset County. From the New Jersey Historic Bridge Database (2001).

41 Goodkind & O’dea, Inc., “Bridge Inspection and Rating, First Cycle Report 1979, Bridge No. 15, Arch Street over Passaic River, City of Paterson,” (NJDOT: 1979),19.

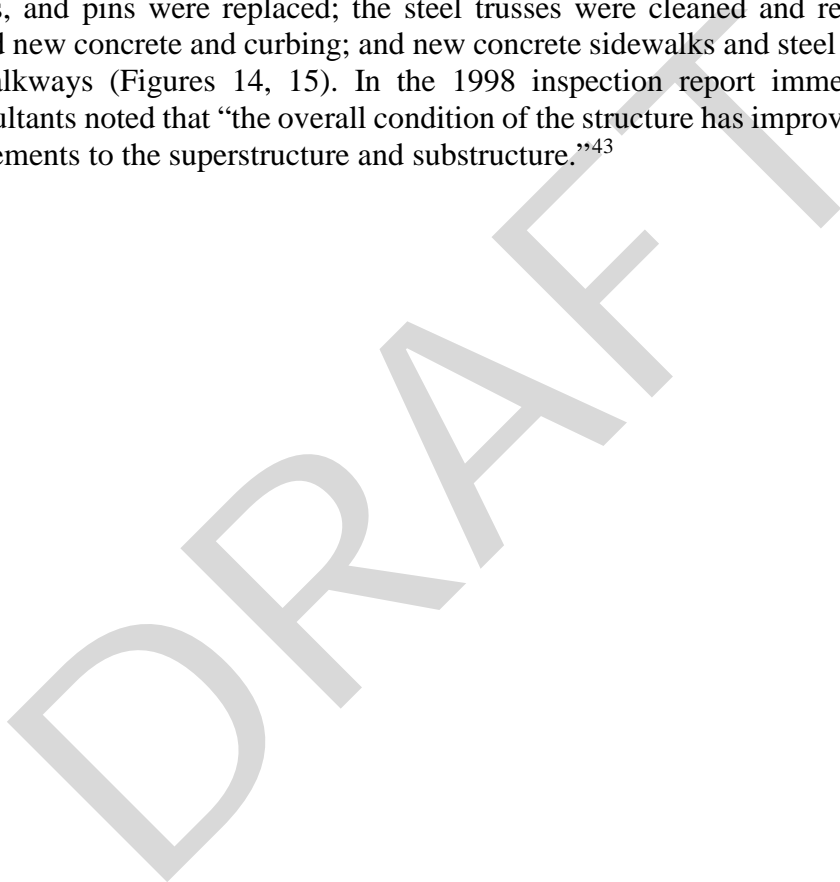
42 Howard Needles Tammen & Bergendoff, “Re-Evaluation Bridge Survey and Rating, Cycle No. 2, Structure No. 1600015, Arch Street over Passaic River, City of Paterson, Passaic County,” (NJDOT: March 1986), 2-8.

**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number 8 Page 11

In 1997, the Arch Street Bridge underwent a significant rehabilitation to address nearly all structural failures addressed in four previous inspection reports. During this intervention, a new concrete deck was poured; the mid-century metal guardrail was replaced with new concrete Jersey barriers (referred to as parapets in bridge inspection reports); impact attenuators were added to the end of the Jersey barriers to prevent collision with the steel truss structure; the floorbeams, roadway and sidewalk stringers, horizontal eyebars, splice connections, and pins were replaced; the steel trusses were cleaned and repainted; the approach sidewalks received new concrete and curbing; and new concrete sidewalks and steel railings were added to the pedestrian walkways (Figures 14, 15). In the 1998 inspection report immediately following the intervention, consultants noted that “the overall condition of the structure has improved from failed to good due to the improvements to the superstructure and substructure.”⁴³



⁴³ Pickering, Corts & Summerson, Inc., “Re-Evaluation Bridge Survey and Rating Report of Bridge No. 1600-015, Arch Street over Passaic River, City of Paterson, Passaic County, Cycle No. 5,” (NJDOT, March 1998).

**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number 8 Page 12

Arch Street Chronology

<u>Month</u>	<u>Year</u>	<u>Event</u>
	1872 -1877	An iron Fink through truss bridge becomes the first bridge constructed over the Passaic River at Arch Street.
February- March	1902	The twelve-day Flood of 1902 destroys the original Arch Street Bridge.
March	1902	William L. Whitmore and F. W. Schwiens survey the Arch Street bridge site, ostensibly to develop plans for the replacement bridge.
April	1902	Board of Freeholder’s votes to construct a temporary walkway over the river at Arch Street while awaiting new bridge construction.
	1902	F.R. Long Co. constructs a three-span, concrete-arch bridge at Arch Street to replace structure lost in the 1902 flood.
October	1903	Flood of 1903 leads to the collapse of the new Arch Street bridge, after undermining its northern pier. Debris remains in riverbed for months to come.
January	1904	Local mason Adrian Wentick commissioned to construct a temporary footpath over the river at Arch Street while awaiting new bridge construction.
April	1904	Remnants of the 1902 Arch Street Bridge determined to be in unsafe conditions by consulting engineer George H. Blakeley. County Engineer William Whitmore disagreed and allowed the ruins to remain across the Passaic, likely because the Board of Freeholders intended to use the remaining spans as the foundation for the new bridge.
June	1904	Final remnants of the destroyed Arch Street bridge collapse, causing an explosion after hitting a public service gas main. Temporary wooden walkway seriously damaged and unsafe for continued pedestrian use. The Board of Freeholders accepts bids for the construction of a new Arch Street Bridge, recommending the award to the lowest bidder.
August	1904	Contract for new Arch Street Bridge awarded to De Vogel & Collins.
January	1905	Temporary footbridge increasingly unstable and unsafe for continued use; however, no progress has been made at this point on the new Arch Street Bridge.

**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number 8 Page 13

<u>Month</u>	<u>Year</u>	<u>Event</u>
February	1905	Consulting engineer Blakeley recommends several changes to the proposed bridge design, including adjustments to accommodate a double trolley track.
March	1905	Blakeley submits revised plans for Arch Street Bridge to the Freeholders for review. The Board of Freeholders approves Blakeley's new plans. Work on bridge stalls as the Freeholders and De Vogel and Collins battle over financing for the proposed changes.
May	1905	De Vogel and Collins sublet their contract to Owego Bridge Company.
November	1905	Owego Bridge Company resumes work on the Arch Street Bridge.
May	1906	Pedestrian footpaths on both sides of the bridge open to the public.
June	1906	Local businesses sign petition to allow trolley tracks to operate on Arch Street Bridge, but Board of Freeholders continues to refuse the privilege of use to the Public Service Corporation.
January	1907	Agreement struck between Public Service Corporation and the Board of Freeholders concerning trolley use on Arch Street Bridge. The Public Service Corporation agrees to pay the county \$1 per day for 20 years to secure the right to build tracks – which the bridge had be engineered to support, after design intervention by Blakeley.
	1959	Curbs and pedestrian sidewalks rebuilt based on plans by county engineer George W. Mason.
	1960	New guide railing added to the bridge.
	1974	Cosmetic alterations include repainting the steel trusses.
	1997	Arch Street Bridge rehabilitation work includes: new concrete deck and parapets; new approach parapets; new concrete approach sidewalks and curbs; new floorbeams, roadway and sidewalk stringers, horizontal eyebars, splice connections and pins; steel trusses cleaned and painted; waterproofing sealer on bridge seats; new sidewalks and pedestrian railings.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge

Name of Property

Passaic County, New Jersey

County and State

Section number 9 Page 1

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United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge

Name of Property

Passaic County, New Jersey

County and State

Section number 9 Page 2

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United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number 9 Page 3

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United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge

Name of Property

Passaic County, New Jersey

County and State

Section number 10 Page 1**Verbal Boundary Description**

The nominated boundary encompasses the footprint of the bridge as shown as a dashed line on the accompanying site plan, and includes the abutments and wing walls, the approach roadway railings, and the superstructure

Verbal Boundary Justification

The boundary includes the historic bridge and road easement historically associated with the bridge. Due to the loss of historic manufacturing facilities and workers housing that once surrounded the bridge, the boundaries are limited to the structure and its character-defining features.

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United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number --- Page 1

Photo Log

Name of Property: Arch Street Bridge

City or Vicinity: Paterson City

County: Passaic State: New Jersey

Photographer: Benjamin Buckley and Samantha Kuntz

Date Photographed: January 25 and February 15, 2017

Description of Photograph(s) and number, include description of view indicating direction of camera:

- 1 of 15. Bridge approach from the south abutment, view northwest.
- 2 of 15. Bridge approach from the north abutment, view southeast.
- 3 of 15. Contextual surroundings of the southern approach in Paterson, view southeast.
- 4 of 15. North abutment, view northwest.
- 5 of 15. South abutment from across the Passaic River, view southeast.
- 6 of 15. Contextual view of the bridge from Straight Street Bridge, view southwest.
- 7 of 15. Truss detail, showing the polygonal top chord, stepped-length verticals, and diagonals in panels, view west.
- 8 of 15. Detail of decorative stamp in portal bracing, view north.
- 9 of 15. Detail view of pinned connection, view southwest.
- 10 of 15. Steel manufacturer's imprint, view west.
- 11 of 15. View of the northern pedestrian walkway, view northwest.
- 12 of 15. View of the deck showing alterations such a new decking and concrete Jersey barriers, view northwest.
- 13 of 15. View of the rehabbed floorbeam and stringer system and the debris caught in the substructure of the bridge, view south.
- 14 of 15. Facing the Straight Street Bridge upstream, view northeast.
- 15 of 15. Contextual view of the bridge from the banks of the Passaic River, view northeast.

Index of Figures

Figure 1. The Passaic River in 1890, prior to the Floods of 1902 and 1903, view northeast.

Figure 2. View of the collapsed Arch Street Bridge after the Flood of 1902, view south.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number --- Page 2

- Figure 3. View of the Arch Street Bridge damage after the Flood of 1903, view east.
- Figure 4. Detail view of the damaged Arch Street Bridge deck after the Flood of 1903, view northwest.
- Figure 5. View of the collapsed Arch Street Bridge in the Passaic River, two years after the Flood of 1903, view southwest.
- Figure 6. Arch Street Bridge plans from 1905 by consulting engineer George H. Blakeley.
- Figure 7. 1908 Map of Paterson, New Jersey.
- Figure 8. 1919 Map of the City of Paterson, Haledon and Borough of Prospect Park.
- Figure 9. 1935 Map from the Riparian and Stream Survey of the Passaic River by the Emergency Relief Administration.
- Figure 10. Detail view of the damaged Arch Street Bridge deck from wear and tear in 1979, view south.
- Figure 11. View of the pedestrian walkway in 1979, view southeast.
- Figure 12. Detail of deck condition in 1986, view northwest.
- Figure 13. View of severe deterioration between stringers in 1986, view of north abutment.
- Figure 14. Rehabilitated deck in 1998, view northwest.
- Figure 15. Detail of new cover plates between pedestrian walkway and the newly installed jersey barriers in 1998, view north.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River
Name of Property
Passaic County, New Jersey
County and State

Section number --- Page 3

Photograph Location Map



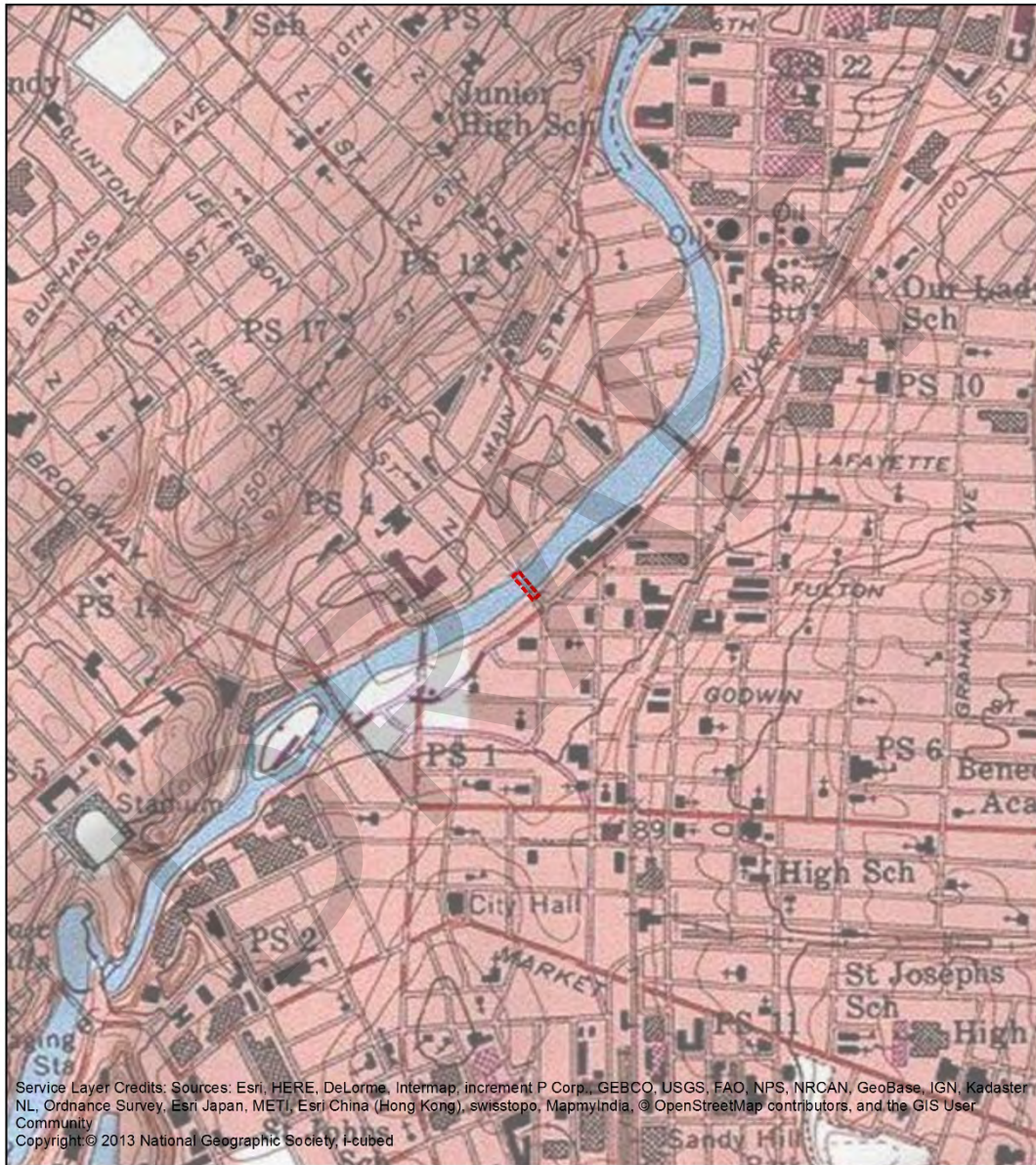
ARCH ST. BRIDGE: PHOTO LOCATION KEY		
	Historic Truss	
	Pedestrian Walkways	



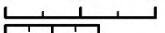
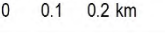

**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River
----- Name of Property
Passaic County, New Jersey
----- County and State

Section number --- Page 4

USGS Location Map



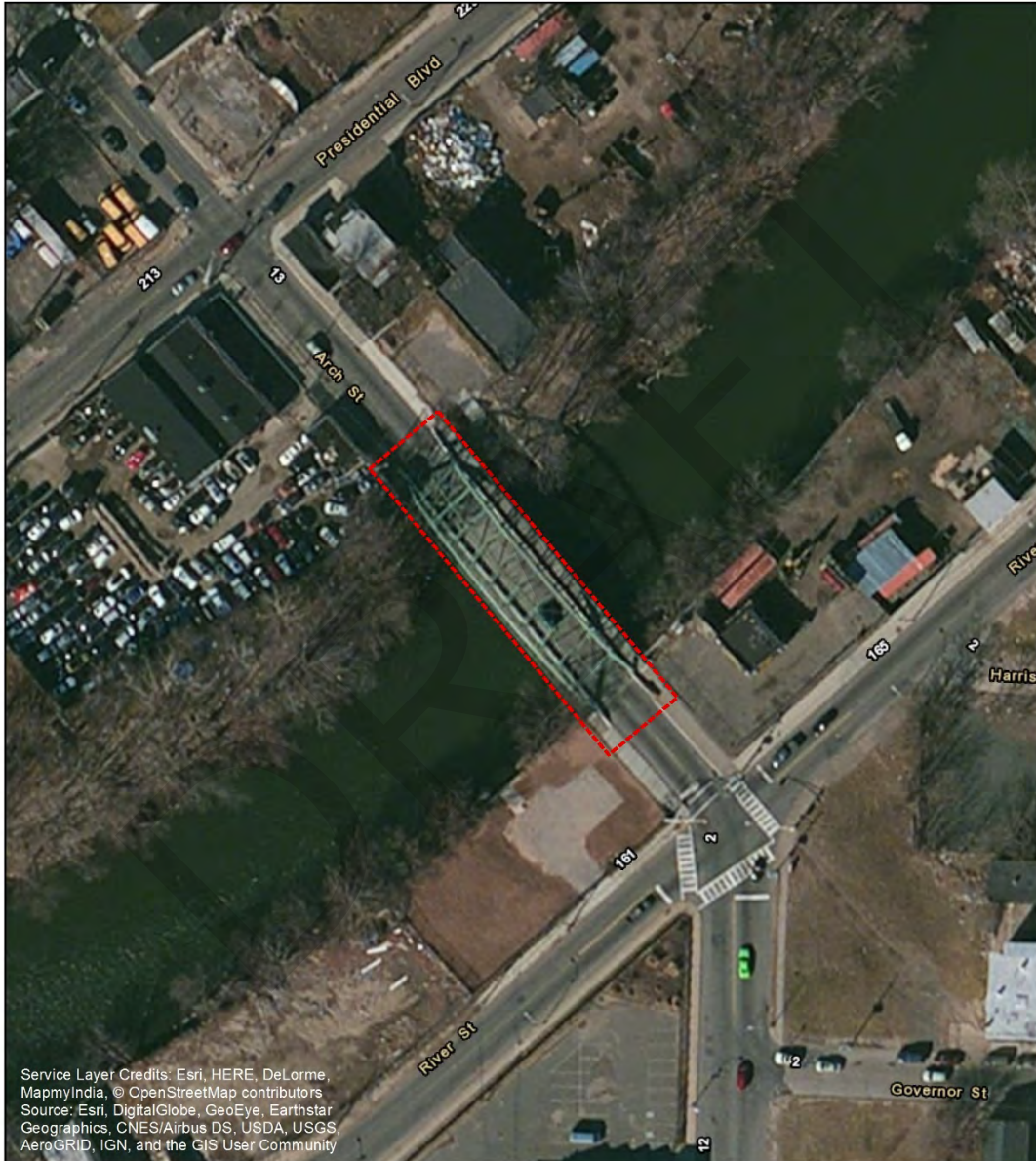
<p>AECOM Project Location Map Arch Street Bridge Paterson City, Passaic County, NJ</p> <p> National Register Boundary</p>	<p>N</p>  <p>0 0.1 0.2 mi</p>  <p>0 0.1 0.2 km</p> 	 <p>New York Harrisburg Philadelphia AND apolis</p>
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**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River
----- Name of Property
Passaic County, New Jersey
----- County and State

Section number --- Page 5


Site Boundary Map



Service Layer Credits: Esri, HERE, DeLorme, MapmyIndia, © OpenStreetMap contributors
 Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community



**Arch Street Bridge
 Paterson City, Passaic County, New Jersey
 UTM coordinates: 18T 569879 E 4530571 N**

 National Register Boundary

N



0 20 40 60 80 100 Feet

0 10 20 30 40 50 Meters

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number --- Page 6

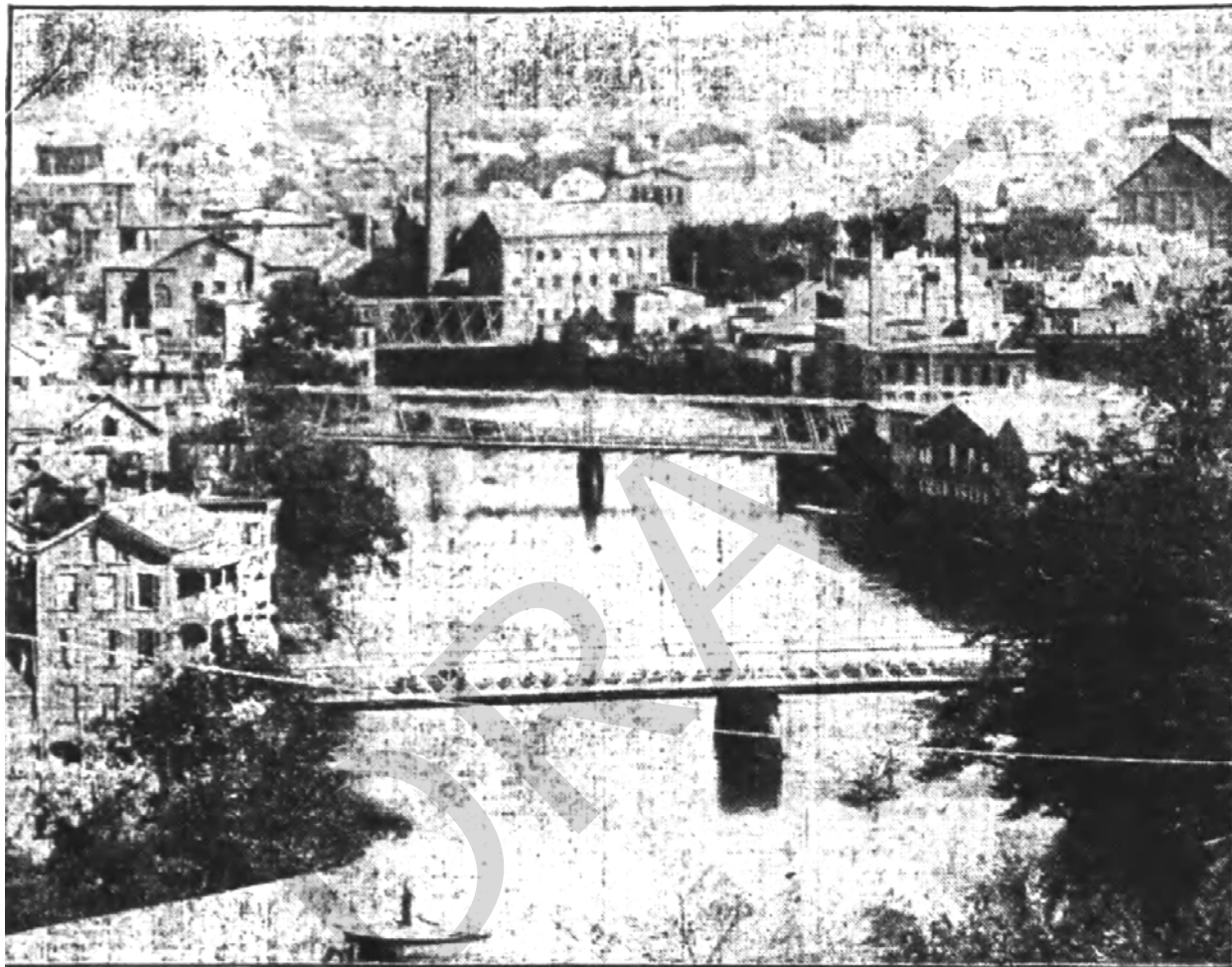
Historic Maps and Figures

Figure 1. View northeast up the Passaic River from 1890, prior to the Floods of 1902 and 1903. The original Arch Street Bridge (ca. 1872-1877) is visible in the far ground, behind Main Street Bridge (middle) and West Street Bridge (front).

Source: "The Stolen River," The Paterson Morning Call, July 24, 1905.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 7



Figure 2. A view of the collapsed Arch Street Bridge following the Flood of 1902 facing south.

Source: Paterson Museum, Arthur Holms Collection.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number --- Page 8

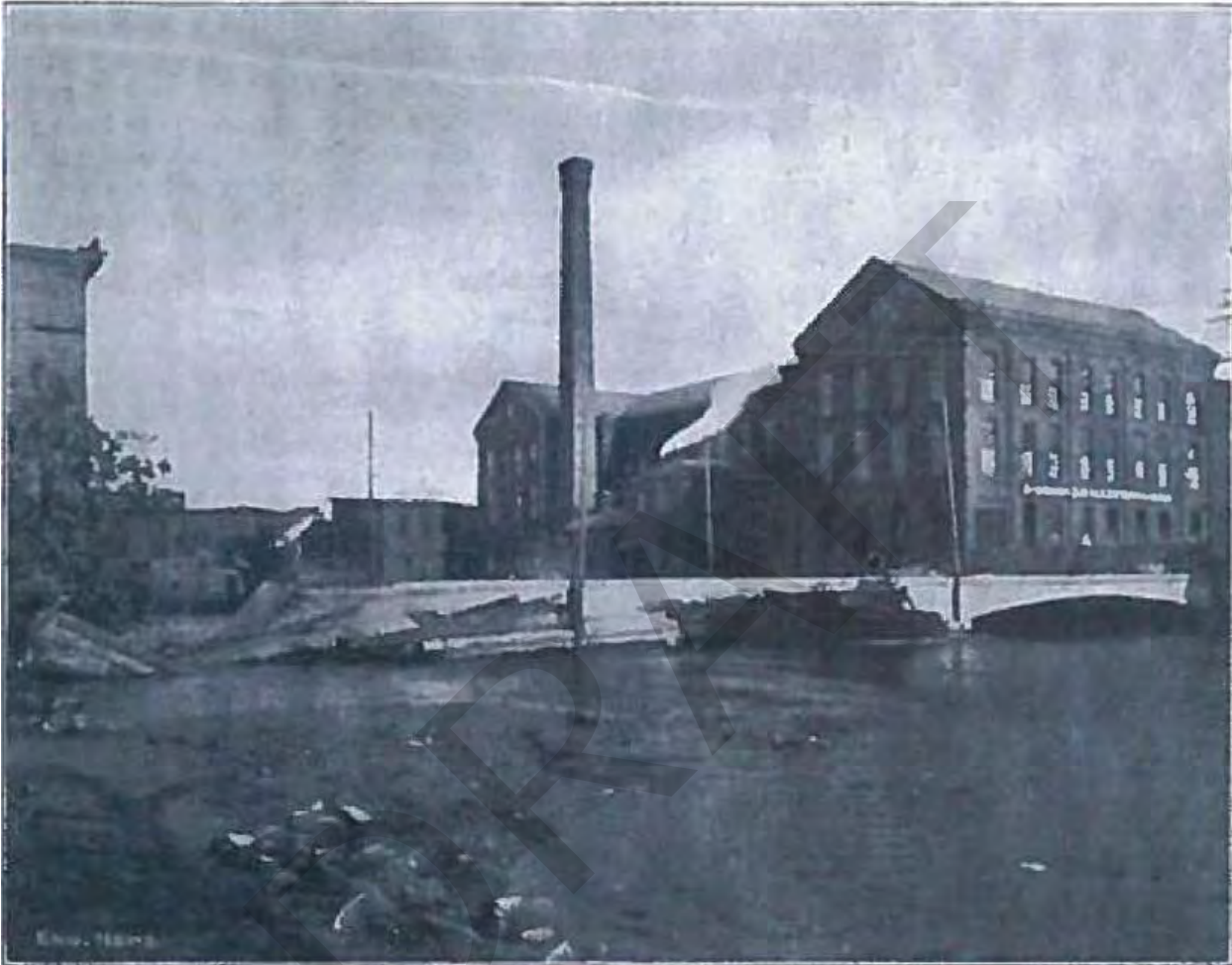


Figure 3. View east of the damaged concrete-arch bridge after the Flood of 1903.

Source: "Flood Damage to Bridges at Paterson, N.J. (Illustrated), Engineering News vol. L no. 18, October 29, 1903.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number --- Page 9



Figure 4. View northwest of the damaged deck of the Arch Street Bridge after the Flood of 1903.

Source: "Flood Damage to Bridges at Paterson, N.J. (Illustrated), Engineering News vol. L no. 18, October 29, 1903.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number --- Page 10



Figure 5. View southwest from the collapsed Arch Street Bridge in July 1905. The riverbed of the Passaic is seen dried out and littered with debris of all the collapsed bridges – almost two years after the Flood of 1903.

Source: "The Stolen River," The Paterson Morning Call, July 24, 1905.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River
Name of Property
Passaic County, New Jersey
County and State

Section number --- Page 11

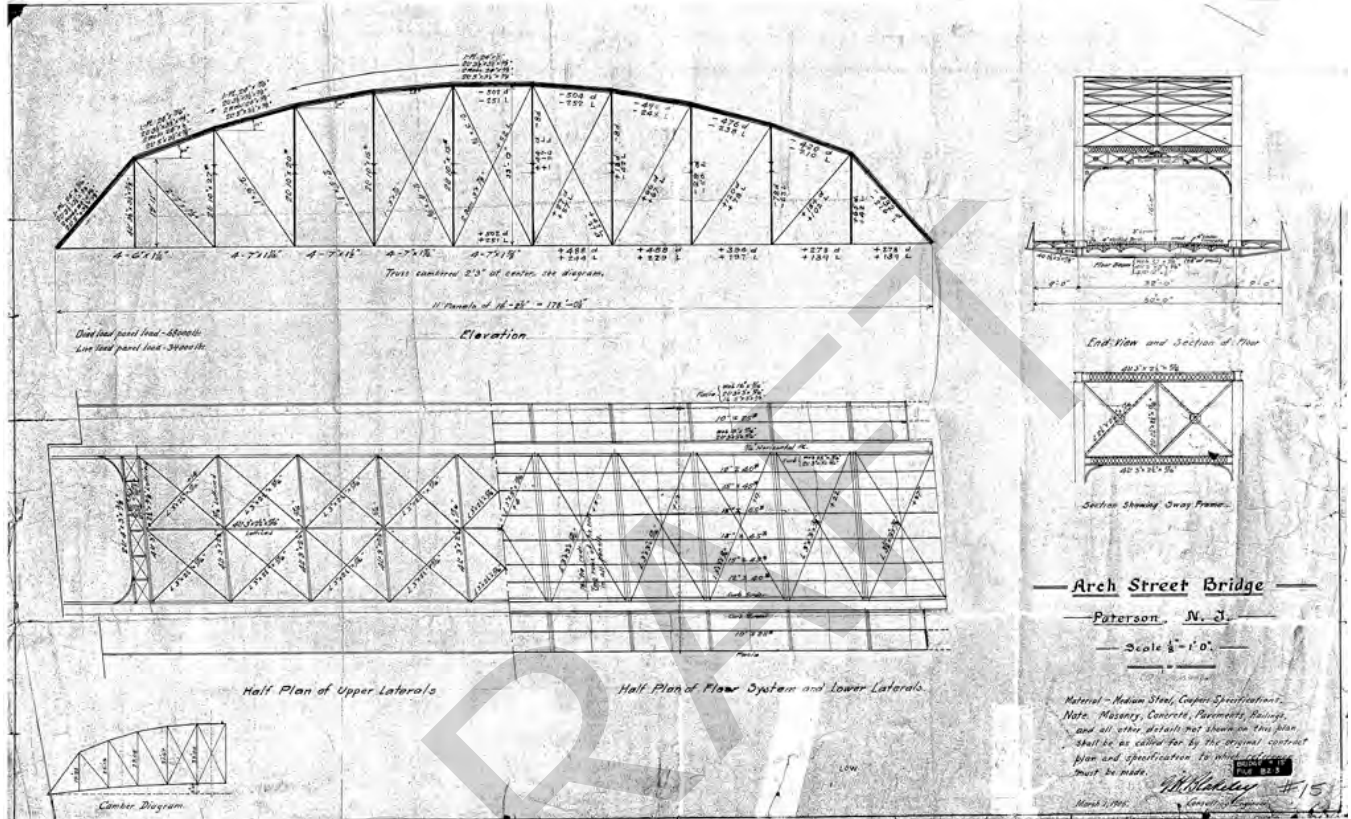


Figure 6. Arch Street Bridge plans from 1905 by consulting engineer George H. Blakeley. Blakeley's work is a revision of an earlier plan by William L. Whitmore, and though more costly, this served as the blueprint for the bridge that stands today.

Source: Office of the County Engineer, County of Passaic, Paterson, NJ.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River
Name of Property
Passaic County, New Jersey
County and State

Section number --- Page 12



Figure 7. 1908 Map the City of Paterson, New Jersey. The zoomed in section of the map shows the newly constructed Arch Street Bridge with an electric trolley line.

Source: Rutgers Cartography Lab.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River
Name of Property
Passaic County, New Jersey
County and State

Section number --- Page 13



Figure 8. The Price & Lee Co's New Map of the City of Paterson Haledon and Borough of Prospect Park from 1919. The zoomed in section of the map shows the Arch Street Bridge still sharing the roadway with the trolley line.

Source: Rutgers Cartography Lab.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River
Name of Property
Passaic County, New Jersey
County and State

Section number --- Page 14

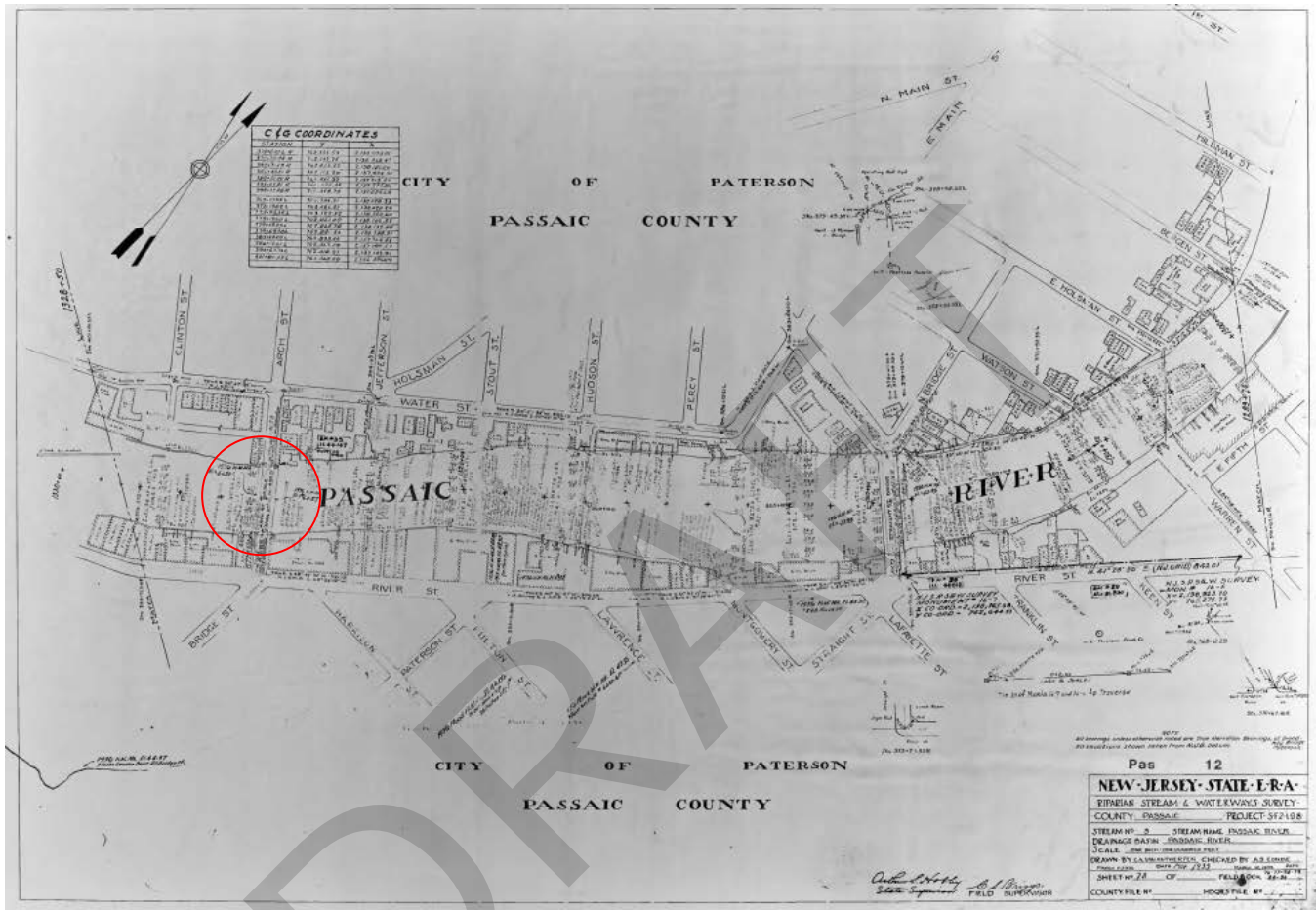


Figure 9. Passaic River Stream No. 3 field book 75-81-82-83-91 (sheet 78), March 1935.

Source: New Jersey Environmental Digital Library.

**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 15



Figures 10, 11. Conditions of the bridge in 1979 during the first Bridge Inspection Report. Left: potholes in the road expose original vitrified brick deck material and trolley tracks visible beyond the patching. Right: Pedestrian walkway prior to rehabilitation. Note that the visibility of the verticals prior to the replacement of guardrails with jersey barriers.

Source: Goodkind & O’dea, Inc., Bridge Inspection and Rating, First Cycle Report 1979, Bridge No. 15 Arch Street over Passaic River, 1979.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

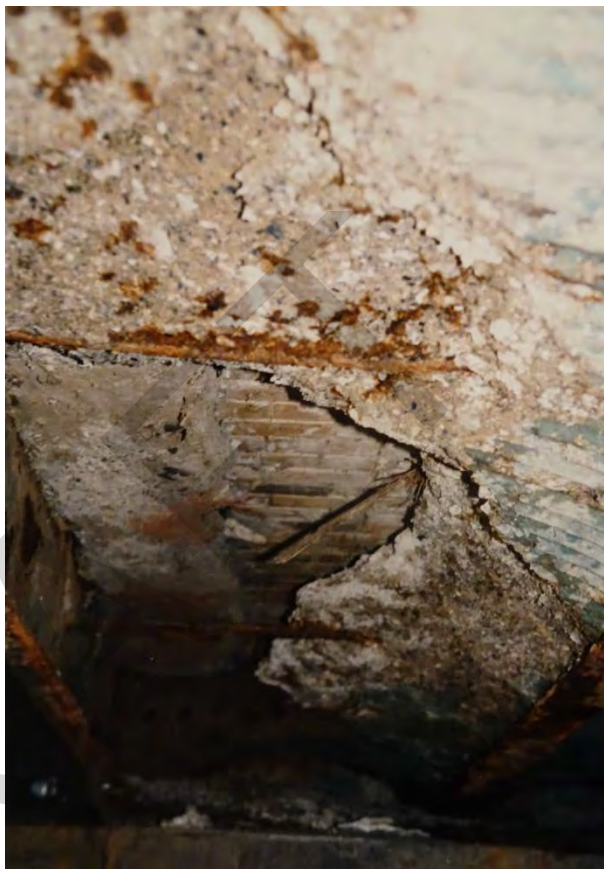
Arch Street Bridge over Passaic River

Name of Property

Passaic County, New Jersey

County and State

Section number --- Page 16



Figures 12, 13. Conditions of the bridge in 1986, leading up to the substantial rehabilitation efforts in the following decade. Left: view of the bridge from the south abutment showing the condition of the roadway. Right: view of the significant deterioration of the underside of bridge, with vitrified brick (the original deck material) visible between the stringers.

Source: Howard Needles Tammen & Bergendoff, Re-Evaluation Bridge Survey and Rating, Cycle No. 2, Structure No. 1600015, Arch Street over Passaic River, March 1986.

**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 17



Figures 14, 15. View of the bridge in 1998 shortly after its rehabilitation. Top: Roadway deck looking northwest, showing new concrete and the addition of jersey barriers, Bottom: Detail of new cover plates between pedestrian walkway and the newly installed jersey barriers.

Source: Pickering, Corts & Summerton, Inc., Re-Evaluation Bridge Survey and Rating Report of Bridge No. 1600-015, Arch Street over Passaic River, Cycle: No. 5, March 1998.

**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 18

Current Photographs



Photograph 1. Bridge approach from the south abutment, view northwest.

Source: B. Buckley, AECOM, January 25, 2017.

**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River Name of Property
Passaic County, New Jersey County and State

Section number --- Page 19



Photograph 2. Bridge approach from the north abutment, view southeast.

Source: S. Kuntz, AECOM, February 15, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River Name of Property
Passaic County, New Jersey County and State

Section number --- Page 20



Photograph 3. Contextual surroundings of the southern approach in Paterson, view southeast.

Source: S. Kuntz, AECOM, February 15, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 21



Photograph 4. North abutment, view northwest.

Source: S. Kuntz, AECOM, February 15, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 22



Photograph 5. South abutment from across the Passaic River, view southeast.

Source: S. Kuntz, AECOM, February 15, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 23



Photograph 6. Contextual view of the bridge from Straight Street Bridge, view southwest.

Source: S. Kuntz, AECOM, February 15, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River Name of Property
Passaic County, New Jersey County and State

Section number --- Page 24



Photograph 7. Truss detail, showing the polygonal top chord, stepped-length verticals, and diagonals in panels, view west.

Source: B. Buckley, AECOM, January 25, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River Name of Property
Passaic County, New Jersey County and State

Section number --- Page 25



Photograph 8. Detail of decorative stamp in portal bracing, view north.

Source: S. Kuntz, AECOM, February 15, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 26



Photograph 9. Detail view of pinned connection, view southwest.

Source: B. Buckley, AECOM, January 25, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 27



Photograph 10. Steel manufacturer's imprint, view west.

Source: S. Kuntz, AECOM, February 15, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 28



Photograph 11. View of the northern pedestrian walkway, view northwest.

Source: B. Buckley, AECOM, January 25, 2017.

**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 29



Photograph 12. View of the deck showing alterations such as a new decking and concrete Jersey barriers, view northwest.

Source: B. Buckley, AECOM, January 25, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 30



Photograph 13. View of the rehabbed floorbeam and stringer system and the debris caught in the substructure of the bridge, view south.

Source: S. Kuntz, AECOM, February 15, 2017.

**United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet**

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 31



Photograph 14. Facing the Straight Street Bridge upstream, view northeast.

Source: B. Buckley, AECOM, January 25, 2017.

United States Department of the Interior
National Park Service
National Register of Historic Places
Continuation Sheet

Arch Street Bridge over Passaic River ----- Name of Property
Passaic County, New Jersey ----- County and State

Section number --- Page 32



Photograph 15. Contextual view of the bridge from the banks of the Passaic River, view northeast.

Source: S. Kuntz, AECOM, February 15, 2017.



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #1



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #2



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #3



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #4



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #5



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #6



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #7



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #8



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #9



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #10



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #11



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #12



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #13



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #14



Arch Street Bridge over the Passaic River, City of Paterson, Passaic County
Photo #15