Hojack Swing Bridge
Over the Genesee River
City of Rochester
Monroe County
New York

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

New York State Historic Preservation Office
New York State Office of Parks, Recreation and Historic Preservation
Peebles Island Resource Center
PO Box 189
Waterford, New York 12188-0189

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STATE LEVEL HISTORIC AMERICAN ENGINEERING RECORD

HOJACK SWING BRIDGE
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Over the Genesee River
City of Rochester
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Photographer: All views, Michael Hager, 2011

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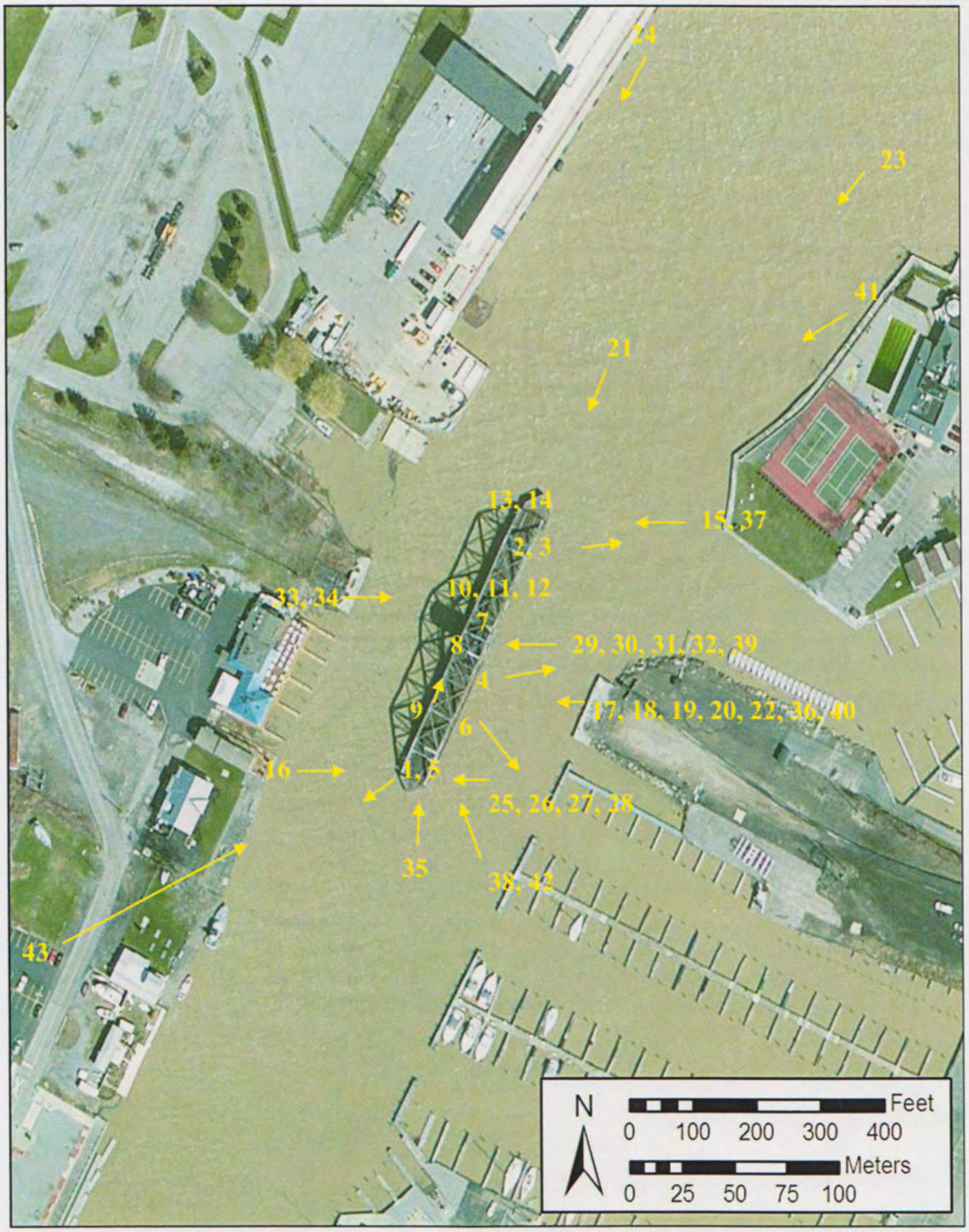
HOJACK SWING BRIDGE
KEY TO PHOTOGRAPHS



STATE LEVEL HISTORIC AMERICAN BUILDING SURVEY

HOJACK SWING BRIDGE

Location:	Spanning the Genesee River at milepost 94.0 on the Ontario Industrial Track, Rochester, Monroe County, New York (NY)
UTM:	Zone 18N Northing 4792261 Easting 288294
QUAD:	Rochester East
Date of Construction:	1875 (substructure)/1905 (superstructure)
Engineer:	Substructure: Unknown Superstructure: The King Bridge Company, Cleveland, Ohio (OH)
Builder:	Substructure: Delaware Bridge Company Superstructure: The King Bridge Company, Cleveland, Ohio (OH)
Present Owner:	CSX Transportation, Inc. (CSXT)
Present Use:	Railroad bridge constructed initially to serve the Lake Ontario Shore (nicknamed "Hojack") line on the Rome, Watertown & Ogdensburg (RW&O) Railroad division of the New York Central & Hudson Railroad (now CSXT). The Hojack Swing Bridge (Bridge) was last utilized in 1995 and is now maintained in the open to river traffic position.
Significance:	The Hojack Swing Bridge is considered eligible by the New York State Historic Preservation Officer (NY SHPO) for the National Register of Historic Places under Criterion C for its architectural style and association with the King Bridge Company.
Project Information:	The United States Coast Guard (USCG), under the Rivers and Harbors Appropriation Act of 1899, 33 USC Parts 401, 403, 406, 413, and 502 and 33 CFR Part 116, declared the bridge to be an unlawful obstruction to navigation of the Genesee River channel since it was no longer used for transportation purposes and ordered CSXT to remove the superstructure, supporting

center pier, pilings, starkwaters, fenders, and protective rip rap to below the dredge depth of the navigable bottom of the Genesee River. Recordation of the Hojack Swing Bridge prior to its demolition is a stipulation in the Letter of Resolution (LOR) among the NY SHPO, the New York State Department of Environmental Conservation (NYSDEC), and CSXT, which completed the review process under the New York State Historic Preservation Act; and is a stipulation in the Memorandum of Agreement (MOA) among the US Surface Transportation Board (STB), NY SHPO, the NYSDEC, and CSXT.

Part I. Overview of Swing Bridges and Physical Description of the Hojack Swing Bridge

Location, Setting and General Description of the Hojack Swing Bridge

The Hojack Swing Bridge is located in the Charlotte neighborhood of the City of Rochester[1] at milepost 94.0 on the former Ontario Industrial Track of the CSXT line. The bridge was constructed to cross the Genesee River (River), although it currently sits in the open position relative to River traffic (north/south direction) as it is no longer in rail transportation use. The Genesee River empties into Lake Ontario, and the Hojack Swing Bridge is located just south of the mouth of the River at River mile 0.9.

The area in which the Hojack Swing Bridge is located has undergone alteration since it was constructed in 1905. Originally more of an industrial area, the area on both sides of the River is currently characterized by marine and recreational land uses including: docks and piers (Shumway Marine's marina, Rochester Yacht Club, public boat launch, the River Street Marina, the Coast Guard Auxiliary station, the Port of Rochester Terminal Building); Ontario Beach Park; the Genesee River; restaurants and retail and office space; the O'Rorke Bridge and the 1800 Charlotte-Genesee Lighthouse. The Town of Irondequoit is located to the east of the bridge within a few hundred feet of the River. Located on the west side of the River is the Genesee River Trail, which has a direct view of the historically-significant Hojack Swing Bridge. The Genesee River Trail is a multi-use trail that provides recreational, historic, and cultural attractions and is an 18-mile corridor stretching along the Genesee River past the city's central business district to the New York State Barge Canal.

The Hojack Swing Bridge is a sub-divided Warren Truss horizontal swing bridge with a center pivot. The span is approximately 450 feet (ft) in length. The all-riveted superstructure consists of steel beams and timber ties, while the substructure material is predominantly masonry, steel, and concrete. The bridge "served both to connect the railroad on both sides of the Genesee River inlet to Lake Ontario and to allow unimpeded water passage."[2]

Overview of Swing Bridges

Swing bridges are one of three types of moveable bridges: swing, lift bridges (in which the deck raises), and bascule bridges (span opens by rotating on a vertical plane). The majority of moveable bridges are operated by electric or hydraulic mechanical drives with hydraulic cylinders or driven pinions.[3] Swing bridges typically were constructed as two-span trusses or continuous girder structures, in which these trusses or girders rotated horizontally. Operation

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[1] The Village of Charlotte was a separate entity from Rochester until its incorporation into the city in 1916. For the purposes of this narrative, it is understood that the Village of Charlotte is technically the location of this bridge until annexation. Only Rochester will be referenced to prevent any confusion over the location of this bridge unless there is a specific association necessary to identify, such as the name of a blueprint or in the historic context.

[2] Nagel and Darlington, *Phase IA and IB Cultural Resource Survey for the Port of Rochester Harbor Improvement and Ferry Terminal Project* (On file at the City of Rochester, 2000).

[3] Ryan, Hartle, Mann, and Danovich, *Bridge Inspector's Reference Manual FHWA NHI 03-001* (On file at Michael Baker Jr., Inc. 2006).

of a swing bridge relies on the spans to provide balance to the structure "longitudinally and transversely about the center" rather than end abutments or wingwalls.[4] When closed, the spans are supported by a center pier and abutment at each end with wedges driven in to lift the bridge ends, preventing damage to the bridge under live load conditions. As a result, swing bridges are generally either center-bearing structures or rim-bearing ones. The bridge load in center-bearing swing bridges is carried on the central pivot with balance wheels placed on a circular track on the outside of the central pivot to prevent tipping. In rim-bearing swing bridges, the pivot pier spaces the structure load on a circular girder or drum to beveled rollers.[5] These rollers are located within the pier on a circular track, spaced by concentric spacer rings. The central pivot in this type of swing bridge also carries part of the structure load. The majority of modern swing bridges constructed today are center-bearing swing bridges because of cost-efficiency and ease of design.

Five key elements have been identified as key to swing bridges: pivot bearings, balance wheels, rim-bearing rollers, wedges, and end latches.[6] There are specifically two types of pivots in a swing bridge: a rim-bearing pivot and an axially-loaded pivot. The Hojack Swing Bridge has a rim-bearing pivot. The pivot bearing in a rim-bearing bridge is enclosed and radially-loaded, versus axially-loaded bearing bridges. The radially-loaded pivot bearing allows the pivot shaft or king pin to maintain its position. Balance wheels are found only in center-bearing swing bridges. As the structure load is balanced on the center pier, it is vital to have this type of mechanism support unbalanced loads. Rim-bearing rollers are tapered, and serve to provide balance to the structure at all times. The tapered design allows for differential rolling between the inside and outside circumference of the rail circle. Wedges come in two types: the end wedge, which raises the ends of the span to support live loads, or the center wedge, which stabilize the center of the span. End wedges provide support at the four corners of the bridge, while the center wedge is centrally located to support live loads. Wedges can be connected through machinery to act together or remain an individual piece with its own actuator. End latches are utilized to ensure a swing bridge remains in the closed position. They can be located on one or both abutments or rest piers.

A truss bridge is, in simplest terms, a bridge whose superstructure is composed of load-bearing numerous trusses. A truss is a structure that acts as a beam, but is subjected primarily to tension and compression stresses only. There are a multitude of types of truss bridges, of which one is the Warren truss. This type of truss was created and patented by two British engineers, James Warren and Willoughby Monzoni. The basic Warren truss design is a system of equilateral or isosceles triangles connected to the top and bottom chords of the bridge. These triangles can be further subdivided, creating the subdivided Warren truss, double Warren truss, or quadrilateral Warren truss.

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[4] Ibid.
[5] Ibid.
[6] Ibid.

Physical Description of the Hojack Swing Bridge

The Hojack Swing Bridge was described in 2000 as follows:

> This design contains a diagonal structural system with secondary vertical bracing for the triangular web system. The structure is subdivided with diagonal tertiary support. The mid-section of the bridge contains a polygonal top-chord and the housing unit for the bridge operation [control house]. Finally, to complement the structure, the bridge contains latticed portal struts, latticed top lateral bracing and latticed sway bracing.[7]

Describing the bridge in detail means discussing the substructure and the superstructure. The substructure contains all elements below the deck of the bridge, such as piers and operation equipment. The superstructure includes the deck and anything above it, making it the more recognizable portion of a bridge. Abutments are an element of their own, belonging to neither the substructure nor the superstructure. The Hojack Swing Bridge was received by a concrete abutment, sometimes called resting piers, on each bank of the River when locked in the open-to-rail traffic position. These abutments serve both as a location to wedge and lock the bridge down, but also as retaining walls for the river bank.

Large-format photographs meeting the requirements of the Historic American Engineering Record (HAER) documentation standards for the Hojack Swing Bridge are included with the narrative. The index of these photographs and a key to the locations of where the photographs were taken are located at the beginning of this written narrative. At the time of this documentation, access to the interior of the control house was restricted due to safety concerns. Digital photographs of the interior of the control house, as well as digital images of blueprints for the bridge, are located towards the end of this written narrative per HAER written narrative format requirements.

<u>Substructure</u>

The substructure of the Hojack Swing Bridge consists of a single central pier, timber fender system, and north and south timber starkwaters. The central pier is cut masonry block, which provides support for the entire bridge structure. The dimensions of the blocks vary, but on average measure 3 feet (ft.) 0 inches (in.) by 5 ft. 0 in. by 3 ft. 0 in. The center pier sits on a timber mat supported by timber piles, while the central masonry cut block pier was reinforced at an unknown date with a wrought iron jacket and concrete infill. Located on the center pier are the various individual elements that comprise the substructure.

One of the most definitive elements of the bridge, if not one of the least visible, is the center pivot bearing. This mechanism is located on the center pier as part of the bridge substructure. The center pivot bearing has two primary purposes: to keep the bridge centered while in rotation and to provide support for the weight of the bridge when it is in open-to-boat traffic

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[7] Nagel and Darlington, *Phase IA and IB*, 2000.

position. It measures 6 ft. 6 in. in diameter and 4 ft. 0 in. in height. Its total weight is approximately 20,000 pounds (lbs.).

The balance wheels, track, and rack are also located on the center pier below the truss. These three interdependent elements provide three specific functions. The balance wheels stabilize the superstructure during rotation and while in the open position. The track is integral with the rack and provides the flat surface on which the balance wheels operate. The rack is a 360 degree curved toothed gear that attaches to the track and pivot pier to move the bridge. The movement is powered by an engine pushing the spur pinion gears that swing the bridge. The balance wheels measure approximately 3 ft. 0 in. by 2 ft. 0 in. by 2 ft. 6 in with a weight of approximately 2,000 lbs. each. The track and rack measure approximately 2 ft. 0 in. in width, 1 ft. 0 in. in height, and have a circumference of 85 ft. 0 in. and a radius of 13 ft. 6 in. The weight of the entire track and rack assembly is approximately 14,000 lbs.

The timber fender system located under the deck originates from the center pier and extends in either direction from the center pier, ending with the starkwaters at either end of the bridge. These features provide protection to the pier, allowing for a buffer against water vessels potentially hitting the bridge. Fender systems were primarily constructed of wood, with vertical buffer piles and horizontal timbers, often called wales. They are lashed or bolted together, and modern navigation regulations require appropriate lighting, reflectors, and fog signals. In the case of the Hojack Swing Bridge, the vertical piles and wales were braced with X braces. A boat access ladder is bolted to the fender system on the west truss to the south of the center pier. Starkwaters are structures placed on the center pier and are shaped to deflect flood-borne debris and ice, as well as to ease the flow of the water around the bridge to reduce the damage caused by erosion.

Superstructure

The superstructure of the Hojack Swing Bridge includes everything from the deck and above. The deck is a combination of timber and steel components. The floor beams are steel and support the timber railroad ties. Hollow stringer beams support the load of the deck. The tubular stringers are solid steel on the sides with lattice slats forming the top and bottoms. The top of the deck is a combination of railroad track and steel grating. There are two railroad tracks on the bridge, which are separated by the centrally-placed, two-foot wide steel grate. The guard rails on either side of the deck are steel.

The subdivided Warren truss structural system is comprised of steel beams and appears to be divided into three sections. The central portion of the bridge extends higher into a polygonal shape top chord. Overall, the bridge has a symmetrical appearance with the portal struts and bracing, lateral bracing, and sway bracing all forming a latticed design. The diagonal chords on the structural system, obvious because of their diagonal placement and exterior lattice pattern, measure 1 ft. 10 in. by 1 ft. 0 in. by 10 ft. 0 in. They weigh approximately 1,500 lbs. each. The bridge also contains eight portal frame brackets, including two at each end of the bridge and two on either side of the control house. These elements function as braces to support the lateral load of the bridge. Each one measures 10 ft. 0 in. by 10 ft. 0 in. by 1 ft. 0 in. and weighs approximately 2,000 lbs.

Within this structural system is a series of stairs and catwalks providing access to the control house. A set of stairs on the north side of the bridge (when in the open to River traffic position) leads to the lower catwalk. This catwalk serves as the platform for the control house. It is comprised of checkered plate and steel framing, with a steel handrail. The polygonal center section with the control house is not open framed in order to support the control house structure and the operation machinery. The lower catwalk only extends from the stairs to the control house and does not run the length of the bridge. The upper catwalk, which is accessed from a set of stairs by the lower catwalk, runs the length of the bridge. The upper catwalk is comprised of steel framing. The upper catwalk does not have checkered plating, presumably because there are no structures on this catwalk.

The swing movement of the Hojack Swing Bridge was operated by the machinery located in the control house. The control house is located in the center of the polygonal top chord and is a small one-story building with a front gable roof. The exterior material of the control house is corrugated metal, and it has minimal fenestration and door openings. One door opening is located on the north (when in the open to River traffic position) elevation and is a single metal door. Each elevation has either one or two original two over three windows. The interior of the control house was an open space. The control house sits atop checkered steel plating and steel framing.

The most significant element of the control house is the machinery it housed. Four specific pieces of machinery operated the Hojack Swing Bridge. The first was the steam engine (believed to have been retrofitted in the 1950s with a diesel engine) and flywheel of which there are two present. This piece of machinery rotated the bridge and operated the wedges to lock it into closed position. It measures 10 ft. 0 in. by 10 ft. 0 in. in the plan area and 3 ft. 0 in. in height. Each element weighed approximately 1,300 lbs. each. The second piece of machinery was the wedge indicator face and stand. This feature showed the open-closed position of the wedges as they were operating. It measured 2 ft. 0 in. by 2 ft. 0 in. in the plan area and 4 ft. 0 in. in height and weighed approximately 200 lbs. The third piece of equipment was the lever assembly. It controlled the speed of the engine, provided a braking mechanism, controlled the swinging of the bridge, and the movement of the wedges. The lever assembly measured approximately 4 ft. 0 in. by 4 ft. 0 in. in the plan area and 4 ft. 0 in. in height and weighs approximately 750 lbs. The final component was the bridge rotation indicator and stand. This element showed the open-close position of the bridge while in operation and measured 2 ft. 0 in. by 2 ft. 0 in. in the plan area and 3 ft. 6 in. in height. It weighs approximately 200 lbs. Markings on the bridge rotation indicator and stand identify it as a King Bridge Company design. The machinery that operates the Hojack Swing Bridge has been removed or is in extreme disrepair due to a lack of use and maintenance and the collapse of portions of the control house roof. No piece of machinery appears to be completely intact, with items such as the engine and the wedge indicator face and stand having the most pieces removed. The flywheel, brakes, and lever assembly appear to be largely intact.

The final component of the Hojack Swing Bridge superstructure is the end wedge mechanism. Most bridges rest on abutments, and as such, do not require a mechanism to lock it into place during use. However, the Hojack Swing Bridge contained this component and it served to provide a final element of support to the train loads crossing the bridge. The wedges were withdrawn prior to the bridge swinging into the open position. These pieces of machinery measured 10 ft. 0 in. by 4 ft. 6 in. by 2 ft. 0 in. and weigh approximately 8,000 lbs each.

Current Condition

The Hojack Line ended operations in 1978. The Hojack Swing Bridge has been out of operation since the middle of the 1990s, with the last train crossing the bridge in approximately 1995. It has been in a state of deterioration since this last use as the bridge has not been provided the necessary maintenance and upkeep. Overall, there is overgrowth of weeds on the deck, avian waste from the birds using the bridge, wood rot in the timber ties, and rust and deterioration of metal elements. The substructure elements are covered with debris and show rust and possible oil/grease staining. The superstructure is primarily covered with rust, although areas around the control house and the railings in general show signs of where the rust has fully deteriorated the metal and caused framing deterioration. Isolated places on the deck and the boat access ladder also have been recommended to be avoided for safety reasons.[8] As such, the boat access ladder was removed in the early Spring of 2012. Some of the machinery within the control house has been removed or could not be located. Some of the machinery has also been updated or replaced, including the pivoting mechanism which was originally powered by a steam engine and was retrofitted in the 1950s with a diesel engine.

II. History of the King Bridge Company, Transportation in Rochester, and the Hojack Swing Bridge

King Bridge Company

The King Bridge Company was founded by Zenas King in 1858, and operated until 1923, when his eldest son James passed away. King was born in 1818 in Vermont to a family of farmers and woodcutters.[9] King left Vermont with a high school education, moving to Milan, Ohio. He eventually married there and established himself in home construction and as a clothing store merchant. According to family lore, King tired of his current occupations and took a job as a salesman for a company out of Cincinnati that produced corn milling equipment and iron boilers.[10] King began to see the merit of iron, and joined forces with Thomas H. W. Moseley, who invented an inexpensive type of bowstring bridge that he produced out of his Cincinnati, Ohio factory. King gained a working knowledge of iron bridges through his work as a salesman for Moseley, and in 1858, he joined with Peter Frees

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[8] Anthony J. Borelli, *Removal of Hojack Swing Bridge Structural Assessment Memo* (On file with Bergmann Associates, 2011).
[9] Allan King Sloan, *The King Bridge Company Through the Decades*.
[10] Ibid.

to design and build bridges and iron boilers on their own. He chose Cleveland, Ohio as the city from which to operate his business.

King and Frees weathered the Civil War by selling their wares within the state and surrounding areas. They patented a tubular bowstring design in 1861, but within just a few years, they divided the company. The tubular bowstring design became the foundation of King's development and growth as a bridge builder.[11] The use of the tubular bowstring was not an innovation in design, but its mass production using wrought-iron boilerplate was. King utilized this material to make a tube that increased in size at cross sections and reduced in size at the abutments, which King and Frees theorized helped distribute the stress of the loads being transported on the structure.[12] King would later patent a design for the swing bridge using this tubular design.

King retained control of the bridge design while Frees received the iron boilers portion of the company.[13] A new iron works was built adjacent to the Cleveland & Pittsburgh railroad, which brought in other iron foundries to produce components necessary for King's bridges. King again patented a bridge design, this time with friend Cyrus Force, for a swing bridge using hollow girders made of boilerplate. It was an efficient, inexpensive, reliable type of bridge that proved more dependable than the existing timber bridges.

In 1871, King took the first step towards making a national name for himself by incorporating the King Iron Bridge and Manufacturing Company. King planned to gain success by allying himself with bridge designers and builders, iron producers, and railroad officials to ensure that he had access to a major share of the developing bridge industry.[14] Finally, he brought his family into the business to operate branches, such as his son James, who operated Zenas King and Sons in Topeka, Kansas. His work began to appear in Iowa, Kansas, Minnesota, Nebraska, and Texas. By the 1880s, company records claimed that over 5,000 bridges had been constructed.[15]

The nature of the bridge industry had changed by the 1880s, transitioning from one of innovation and growth to a more cutthroat approach to business. A "bridge trust" was established that included 16 major bridge companies, including King's, to share profits and control costs for highway bridge projects.[16] In time, this bridge trust came under fire for antitrust (anticompetitive) practices. King's company flourished during this period as he focused on designing and building monumental bridges associated with projects that were large and complex. As a result, his company was recognized for bridges that were considered state of the art at the time of their construction: the Willamette River Bridge (cantilever bridge) in Albany, Oregon; Central Bridge (cantilever bridge) across the Ohio River at Cincinnati; Cedar Avenue Bridge (arch bridge) over Jones Falls in Baltimore, Maryland;

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[11] David A. Simmons, *Bridge Building on a National Scale*. (Industrial Archaeology N.D.).
[12] Ibid.
[13] Sloan, *The King Bridge Company Through the Decades*.
[14] Ibid.
[15] Ibid.
[16] Ibid.

Grand Avenue Viaduct in St. Louis, Missouri; and the Central Viaduct across the Cuyahoga River Valley in Cleveland, Ohio.

The King Bridge Company started the 1890s with Zenas King turning the company over to his eldest son James in 1892 and officially shortening the name to the King Bridge Company. The company was nationally known, and production expanded to different types of bridges and non-bridge development.[17] In addition to standard trusses, the company began to design and produce moveable bridges, spandrel arches, railroad and highway viaducts, and decorative bridges, as well as armories, grandstands, markets, and office buildings. Over the course of this decade, production increased to the point that the King Bridge Company was one of the top 20 bridge companies in the nation.

The nature of the bridge construction industry again changed with the advent of the twentieth century. The iron and steel industry began to dominate bridge development, and players such as J.P. Morgan established the American Bridge Company. Andrew Carnegie eventually became the primary stockholder, and within the first year of its operation, approximately 24 of the top bridge companies were purchased by the American Bridge Company.[18] These 24 companies represented approximately 50 percent of the bridge construction industry, and the ramifications of this action was intense for the companies, such as King's, that remained independent. The King Bridge Company was caught up in antitrust litigation, resulting in the company losing its foothold in Ohio after King's sons were found guilty of anti-trust practices, and many of its engineers were leaving the company. Bridge design and construction still occurred, including Cleveland's Center Street Bridge in 1901, steel fabrication for bridge construction for the Baltimore & Ohio Railroad, the Charlotte Bridge (Hojack Swing Bridge), and construction of the center span of the Detroit-Superior High Level Bridge.

James King died in 1922, and with his death, the company entered its last stage of operation. Zenas King's other three sons, Harry, Norman, and Charles, either had little interest in the company or were disinherited. Within a year, the company closed down. One can speculate that it may have remained operational if it had become part of the American Bridge Company conglomerate, but the transition of the bridge industry from iron to new materials like concrete and rebar, and the continued dominance of larger corporations, meant that ultimately the company may have declined regardless. Its legacy remains though in the bridges it has built.

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[17] Ibid.
[18] Ibid.

Transportation in Rochester and the Hojack Swing Bridge

The Hojack Swing Bridge is located just south of the mouth of the Genesee River with Lake Ontario in the City of Rochester, Monroe County, New York. It operated as a railroad bridge on the Hojack Line, which extended along the shore of Lake Ontario from Oswego to Niagara Falls, providing rail access to surrounding towns and farmland communities that did not have access to the Erie Canal or the New York Central & Hudson River Railroad main line several miles to the south. The access provided by the Hojack Swing Bridge contributed to the development of the City of Rochester, which was one of the first cities in the nation to experience exponential economic growth in a short period of time. Railroads would ultimately be associated with these "boomtowns" such as Rochester.

Rochester has been defined by several natural elements that contributed to its growth and the growth of the transportation industry in the region. The Genesee River proved to be a valuable power source. Locations such as the High Falls, which is the first in a series of three falls, originally served to power flour mills and other facilities. Today the three falls are utilized for hydroelectric power. From the foot of the Lower Falls, which are north of the City's original boundary but were eventually annexed into the City, the Genesee River provided shipping access to the River's mouth approximately five miles northward at Lake Ontario. Through the port on the Genesee River, Lake Ontario, a Great Lake, provided an outlet for transporting goods, especially in the era before the railroads. Lake steamers would transport a variety of goods through the five Great Lakes, until the twentieth century, when a system of locks and the evolution in merchandising technology allowed for international transportation of the goods. Lake Ontario is connected to the Atlantic Ocean by the St. Lawrence Seaway and to other rivers and Lake Erie via the Welland Canal.

The element that helped make Rochester a "boomtown" was the Erie Canal. The Erie Canal was designed to connect the eastern seaboard to the western interior at the Great Lakes. Discussion regarding this canal originated in 1807, although construction did not begin for another decade in Rome, New York. It was finished in 1825 and encompassed 363 miles from the Hudson River to Lake Erie. The Erie Canal ultimately lowered the cost of shipping, provided greater access to foreign markets, and altered the ethnic makeup of the City of Rochester as immigrants arrived for work.

Transportation history in Rochester is a combination of waterways and railroads. Two primary canal systems ran through Rochester: the well known Erie Canal and the Genesee Valley Canal. The Genesee Valley Canal was proposed to extend from the Erie Canal through the Genesee Valley before crossing the Allegheny River at Olean. It was never fully completed, and proved less successful then the Erie Canal. The Erie Canal had originally served as the primary mode of transportation of goods, primarily flour, making Rochester famous as the "Flour City" due to all the flour mills in the region.

The impact of these waterways and canals were immense on the development of Rochester, but it would be the railroads that opened up new, more efficient ways of getting goods to more markets. By 1836, railroad enthusiasm had reached northern New York, and lines were constructed from Albany to Syracuse, Auburn to Rochester, and Syracuse to the Port of Oswego.[19] The Watertown and Rome was built to link Watertown with Rome, New York on the Syracuse and Utica Railroad, one of the original roads to consolidate into the New York Central in 1853. A line was constructed from Rome to Camden in 1848, with it finally reaching Watertown in 1851. It was later extended further to Cape Vincent. Simultaneous to this construction, a line was being established between Ogdensburg and Rouses Point on Lake Champlain at the Canadian border, with a focus on the Great Lakes rather than industrial development within the Watertown area. In 1857 the connection to Montreal was built, bringing this area of New York into a new network of business opportunities.

Railroad companies at this time often experienced financial difficulties. By 1859, the Potsdam & Watertown Railroad was having such problems, and by 1861 it had merged fully with the Watertown & Rome Railroad, making the Rome, Watertown & Ogdensburg (RW&O) Railroad. By the 1870s, it was connected to the Syracuse Northern line and the New York & Hudson River Railroad. The goal was to gain access to northern markets in Canada, as well as expand west. Prior to the current Hojack Swing Bridge, another bridge was constructed at the same location built in 1876 for the RW&O Railroad. Railroads in the region had been gaining momentum prior to the Civil War, but had not reached the Rochester area because of the Hudson River and Niagara Falls. The Lake Ontario Shore (LOS) Railroad had initially run through the region connecting to the Canadian line to the north. As was common at the time, the LOS Railroad was experiencing financial difficulties and in 1876 declared bankruptcy. The RW&O purchased the LOS Line with the intent to complete it to Niagara.[20] The LOS Railroad had carried primarily agricultural products, resulting in it not being accessible to the industrial centers. It was also impeded by the Genesee River. On March 3, 1873, by an Act of Congress, authorization was given to the War Department, who at the time oversaw such construction, to construct a lift bridge on the Genesee River.[21]

By the 1870s, the RW&O was connected to the Syracuse Northern line and the New York Central & Hudson River Railroad (NY Central). The goal was to gain access to northern markets in Canada, as well as expand west. By the 1890s, the RW&O was a first class operation with over 700 miles of track. It had become almost a regional monopoly, and plans were made to move the line into Rochester. A small rail line running alongside the Genesee River was purchased with this intent. The president of the RW&O, Charles Parsons, wanted to make his name and became problematic for the Vanderbilt family, one of the nation's most influential families. In 1891, after making the extension plans for Rochester, the Vanderbilts bought Parsons out, and the RW&O became a subsidiary of NY Central.

The proposed lift bridge was never constructed, but rather a novel type of bridge was completed and used until 1905: a metal swing bridge.[22] This type of bridge was chosen because of the boat traffic, which required access to the River, and the topography surrounding the River. High level construction, such as the Portage Bridge in Letchworth

[19] Margolis, *The Hojack Swing Bridge,* 2012.
[20] Margolis, *The Hojack Swing Bridge,* 2012.
[21] Secretary of War, *Report of the Chief Engineers* Government Printing Office, 1874).
[22] Margolis, *The Hojack Swing Bridge,* 2012.

Gorge, was not possible across the Genesee River, where there is no gorge. The swing bridge originally constructed was located in the center of the channel, where it would pivot on a fulcrum. This fulcrum was located on a concrete pier that had been sunk into the River.[23]

The NY Central Railroad was at this same time purchasing roads that terminated at the Niagara River. The Genesee River was still a problem for the RW&O Railroad line, but new plans for a swing bridge to cross the River slowly began to formulate. As noted previously, the topography of the River prevented a high-level track, making the swing bridge an even more feasible option.[24] The King Bridge Company utilized a modified version of its patented tubular technology to design what was originally called the Charlotte Bridge, named for its host village, which would ultimately be annexed into the City of Rochester in 1916. Typical tubular bridges built by the King Bridge Company consisted of fully enclosed square beams made of wrought-iron boilerplates; however, the girders used to construct the Charlotte Bridge were only solid on the sides while iron slat latticework formed the top and bottoms. One of the following men designed the bridge: A.H. Porter, W.P. Brown, J.B. Larned, L.G. Brown, or Charles C. Morrison, although the exact engineer is not known.[25] Discussion of a new bridge across the Genesee River occurred as plans were being made to expand the Erie Canal.[26] The hope was these improvements would push Rochester's industrial growth even further.

Once complete, RW&O's Hojack Line contributed to the growth of Rochester. and the surrounding area by providing access for railroads to an area that had not previously been served without interfering with the commercial shipping traffic using the Genesee River. It was called the Hojack Swing Bridge in part because the line had for years been referred to as the Hojack line.[27] The more popular explanation for its name was:

> Many people fondly called the RW&O by its nickname, "Hojack." It seems that in the early days of the railroad, a farmer in his buckboard drawn by a bulky mule was caught on a crossing at train time. When the mule was halfway across the tracks, he simply stopped. The train was fast approaching and the farmer got naturally excited and began shouting "Ho-Jack, Ho-Jack." Amused by the incident, the trainmen began calling their line the "Ho-Jack."[28]

At its greatest extent, the Hojack Line ran from Buffalo to Niagara Falls, then east through the City of Rochester to Oswego. The Hojack Line ended operations in 1978.

Over the span of approximately 90 years of use, the Hojack Swing Bridge has undergone alterations and improvements as railroad technology and train loads altered. There have been stories of boats hitting the bridge, although no collisions were a major catastrophe. Ownership

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[23] Ibid.
[24] Ibid.
[25] Ibid.
[26] Ibid.
[27] Ibid.
[28] Ibid.

of the line has changed hands, with Conrail taking ownership before being bought out by CSXT.

The Hojack Line ceased operations in 1978. The bridge itself has not been used for transportation since approximately 1995. Since then, it has been left in the open position to allow for the passage of river traffic. The structure has been sitting unused for almost 20 years, resulting in deterioration to the bridge.

Part III. Summary and Purpose of the Project

In 2002, the United States Coast Guard (USCG) notified CSXT that pursuant to the terms of the bridge's permit, which allowed for the bridge to remain in and over the Genesee River only for so long as it was used for transportation, that CSXT must remove the bridge in its entirety down to the natural bottom of the Genesee River. Given the public interest in trying to develop a feasible preservation plan, the USCG subsequently extended the removal deadline to allow interested parties to develop one. Over the course of nine years, no group or individual has come forward and presented to either USCG or CSXT a specific and funded proposal to acquire and preserve the bridge.

In 2011, the USCG initiated an enforcement proceeding requiring CSXT to remove all elements of the bridge from the Genesee River in order to comply with federal law that requires the removal of railroad bridges over navigable waters when they are no longer used for transportation.

The purpose of this project is to develop and preserve a detailed historic narrative on the bridge consistent with State Level II HAER standards as one of a series of measures to mitigate the adverse impacts associated with the removal of the bridge. These mitigation efforts are being performed because of the bridge's eligibility for listing on the National Register of Historic Places (NRHP). This written narrative serves to provide an engineering record and historic context of this resource.

Part IV. Documentation Efforts

A survey was completed by Ben Steele, of the Office of Parks, Recreation, and Historic Preservation (OPRHP), in 1979 after the bridge was no longer used actively as a railroad bridge. Mr. Steele recommended the bridge as significant "due to being a rare survivor of a standard design, as swing bridges were common in the late nineteenth century but became less common in the early twentieth century".[29] The bridge was again assessed in 1996 by the OPRHP, whose staff recommended the resource as eligible for the NRHP under Criterion C for its architecture and material integrity.[30]

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[29] Ben Steele, Jr., *Building Structure Inventory Form, Hojack Swing Bridge, 055-40-1471*. (On file at the New York State Office of Parks, Recreation, and Historic Preservation 1979).
[30] OPRHP, *Eligibility Evaluation of the Rochester Swing Bridge*. (On file at the New York State Office of Parks, Recreation, and Historic Preservation 1996).

In 2001, a report for the US Army Corps of Engineers (USACE) on documentation and mitigation planning for the proposed removal of the Hojack Swing Bridge pursuant to Section 106 of the National Historic Preservation Act, as amended, was prepared by Hartgen Archaeological Associates, Inc. and Black and Veatch (Hartgen).[31] The USACE was considering a proposal to remove the bridge as one of a number of proposed items to improve the Rochester Harbor on the Genesee River. The Hartgen Report confirmed the recommendations of eligibility and further commented on possible mitigation methods for the adverse impact of the demolition. Since more than two decades had passed since the initial determination of the level of significance of the bridge, professionals within the OPRHP and the National Park Service (NPS) were consulted to determine the exact level of significance of the bridge. The initial recommendation of national significance changed, when Robert Englert of OPRHP disagreed with Hartgen's eligibility recommendation stating that, while the bridge had local and state significance, it did not have national significance. Eric DeLony, former Chief of the HAER in Washington DC, also was identified as saying the bridge is not of national significance due to lack of extant swing bridges in general, and none associated with the King Bridge Company in particular.[32] The recommended level of HAER documentation was Level II due to the lack of national significance.

The Hartgen Report concluded that although the bridge is representative of the earlier twentieth century industrial district, it is no longer consistent with the present landscape. The report identified the landscape as primarily recreational in nature, and the massive industrial structure of the bridge does not match its scale and character. The Hartgen Report also concluded that it would be infeasible to adaptively reuse or move and display the bridge at another location. The recommended mitigation for the Hojack Swing Bridge was that it be documented at HAER Level II standard suitable for a structure of statewide significance; that historical markers should be placed near the site of the bridge; and that some artifact(s) of the bridge be preserved for public display. The USACE, however, elected not to remove the bridge as part of the Rochester Harbor Improvement Project, and therefore, the USACE's Section 106 process never concluded with a signed MOA.

Since the USCG initiated its enforcement proceeding in 2011 requiring removal of the bridge, CSXT has consulted with the NY SHPO, NYSDEC, the STB, the regional HAER office, and an array of interested agencies, groups and individuals to develop a suitable set of measures to mitigate the adverse impact of removing the bridge on historic resources in accordance with Section 106 and its New York State counterpart, Section 14.09 of the Parks, Recreation and Historic Preservation Law. A series of mitigation recommendations were raised and considered based on previous documentation recommendations, economic feasibility, safety concerns, appropriate level of preservation, spatial limitation, and waterway guidelines.

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[31] Hartgen Archaeological Associates, Inc., *Documentation and Mitigation Planning for Historic Preservation*. (On file at Hartgen Archaeological Associates, Inc. and Black & Veatch 2001).
[32] Ibid.

Early on in the consultation process, Lisa McCann of the regional office of HAER notified CSXT that HAER has no interest in the archival documentation of the bridge because its policy is to accept documentation only for structures with national significance.

After several months of review and consultation, CSXT, OPRHP and NYSDEC entered into an LOR committing to perform the following series of historical mitigation measures to satisfy State Section 14.09 mitigation requirements. Similarly, STB put out for public comment a proposal to incorporate the same set of mitigation measures into a Section 106 MOA to be executed by CSXT, STB, NY SHPO, and NYSDEC. The approved mitigation measures include development and preservation of documentation to the State Level II HAER standard, including this narrative and the photographs and other records described below; large-format photographs detailing the engineering aspects of the bridge and control house, its setting, and blueprints associated with the bridge; two final attempts to find a buyer willing and able to take delivery of the bridge's superstructure and/or control house for preservation and display at another location (completed in September 2011 and April 2012); identifying and offering salvageable parts of the bridge that will be donated to museums for public display; the creation of interpretative sign boards to be placed at two locations near the bridge; creation and funding of a $30,000 Bricks and Mortar Fund to support one or more projects associated with a resource listed on or eligible for listing on the NRHP in the City of Rochester and preferably in the vicinity of the bridge or an educational component promoting preservation and creative reuse; and the digitization of select private historic photographs. The digitized images are included on the CD provided with this narrative report, as are indexes to the images. This collection includes historic photographs of the bridge and city, newspaper articles, and non-photographic images, such as artistic renderings and historic postcards.

In addition to the mitigation measures listed above and the 2001 Hartgen Report, other efforts have been made to preserve the bridge. One such effort was a book by Richard Margolis entitled *The Hojack Swing Bridge: Its History and Its Future* published in 2012. This book is a compilation of text written by Mr. Margolis on the history of the Bridge and the preservation efforts, articles by other authors on the history of the bridge and swing bridges in general, photographs and illustrations of the Bridge and other structures described in the articles, oral histories about the Bridge, and correspondence associated with the preservation efforts.

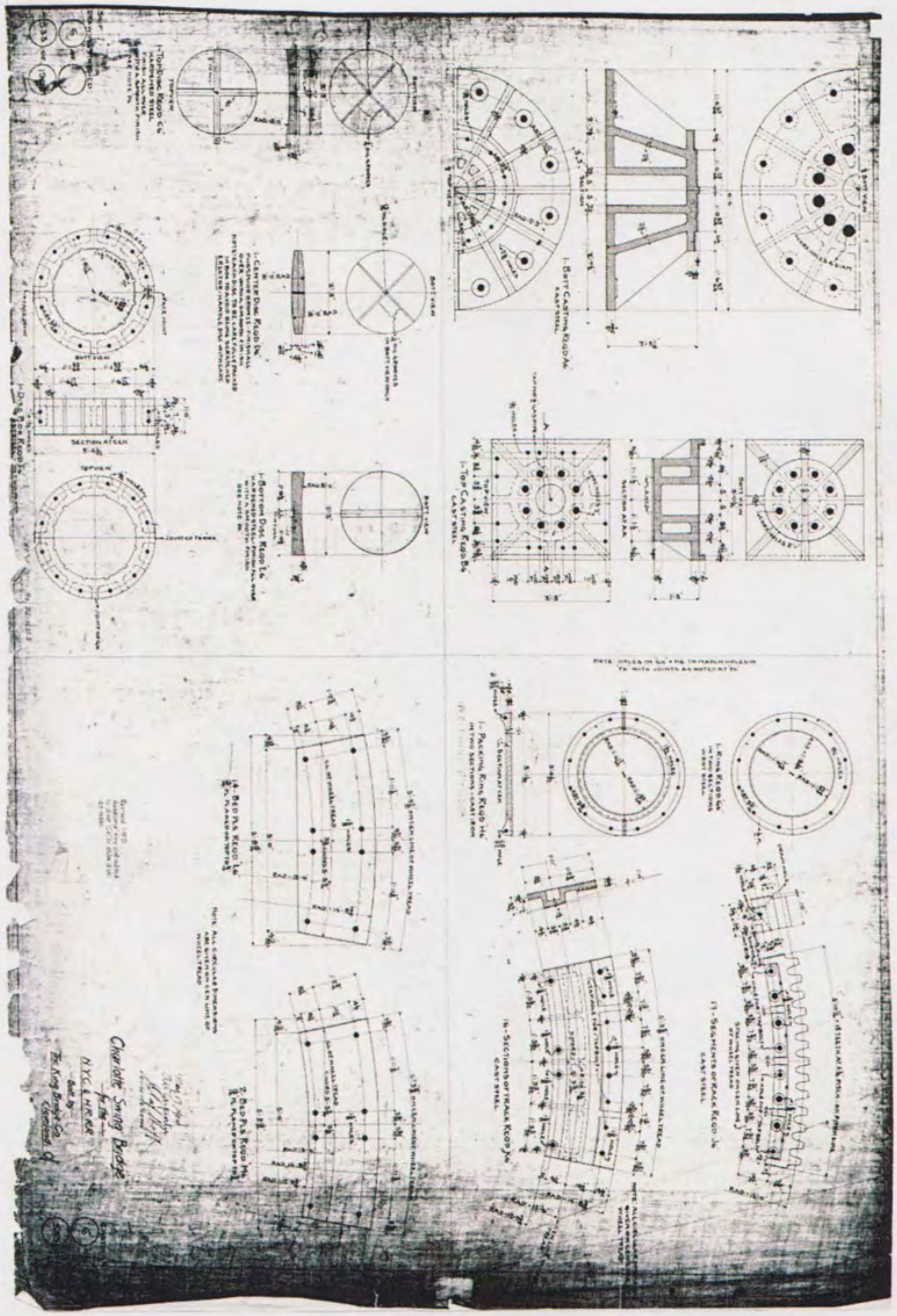

Figure 1. 1904 blueprint by the King Bridge Company showing the pivot machinery design.

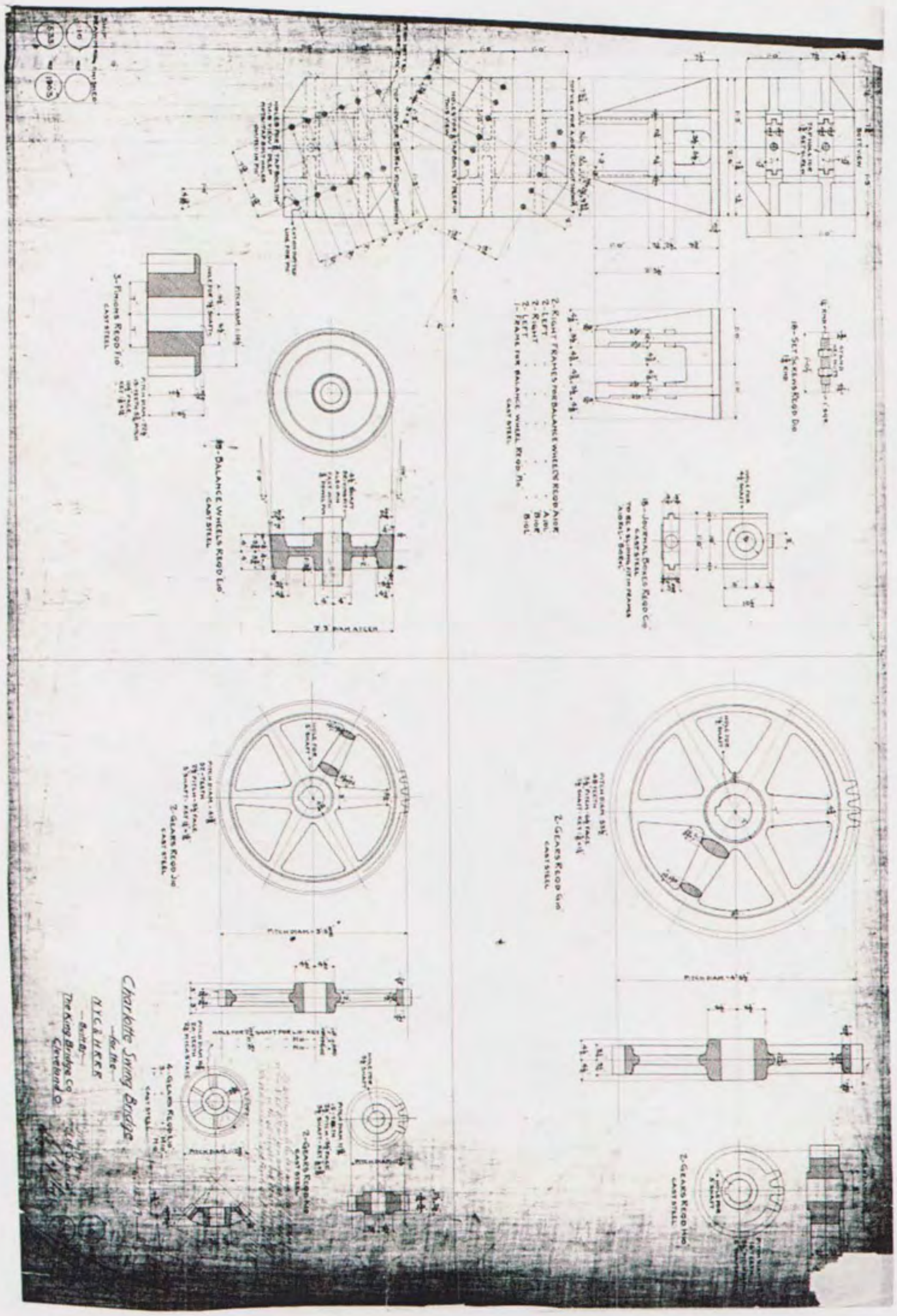

Figure 2. 1904 blueprint by the King Bridge Company showing the pivot machinery design.

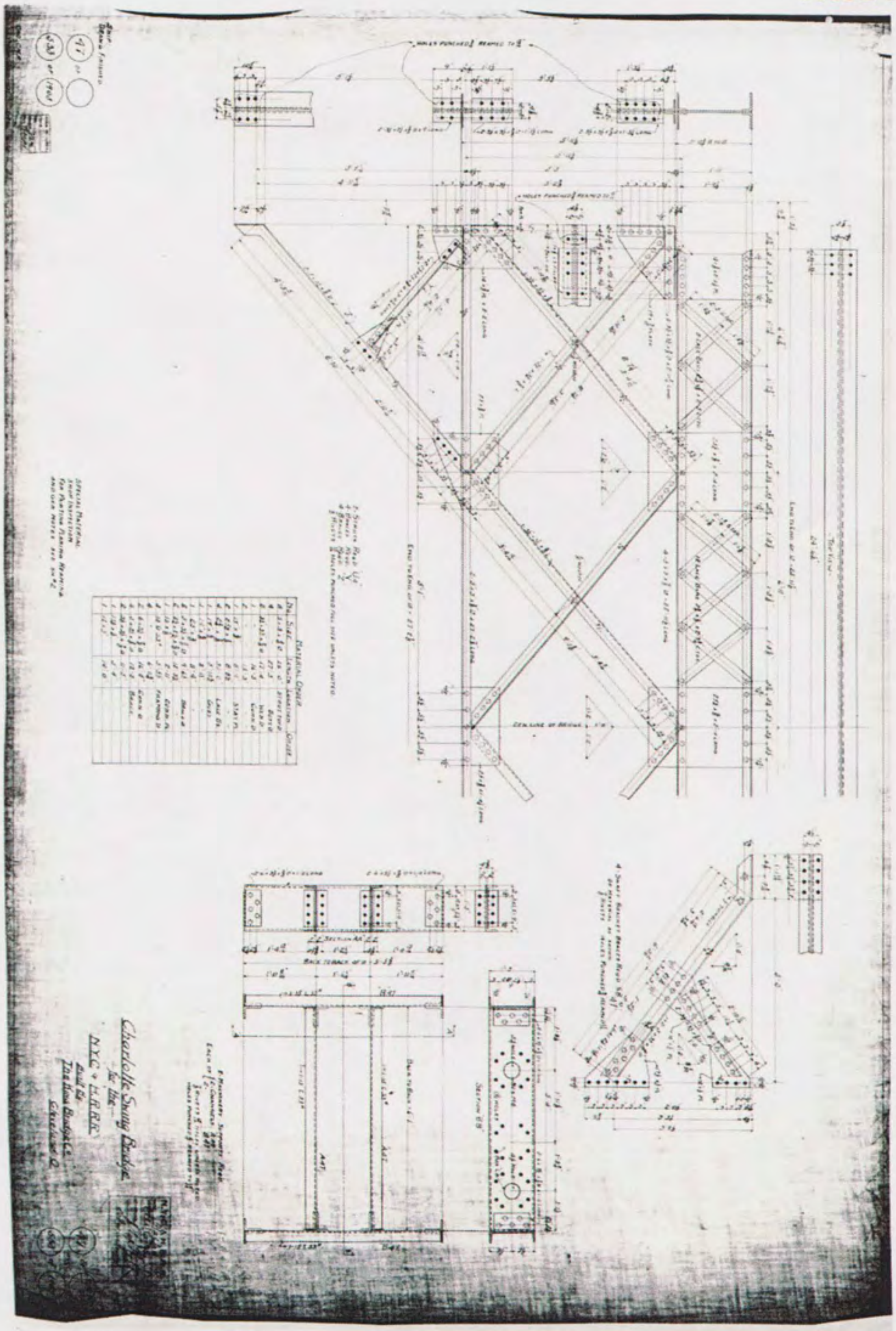

Figure 3. 1904 blueprint by the King Bridge Company showing the subdivided Warren truss design.

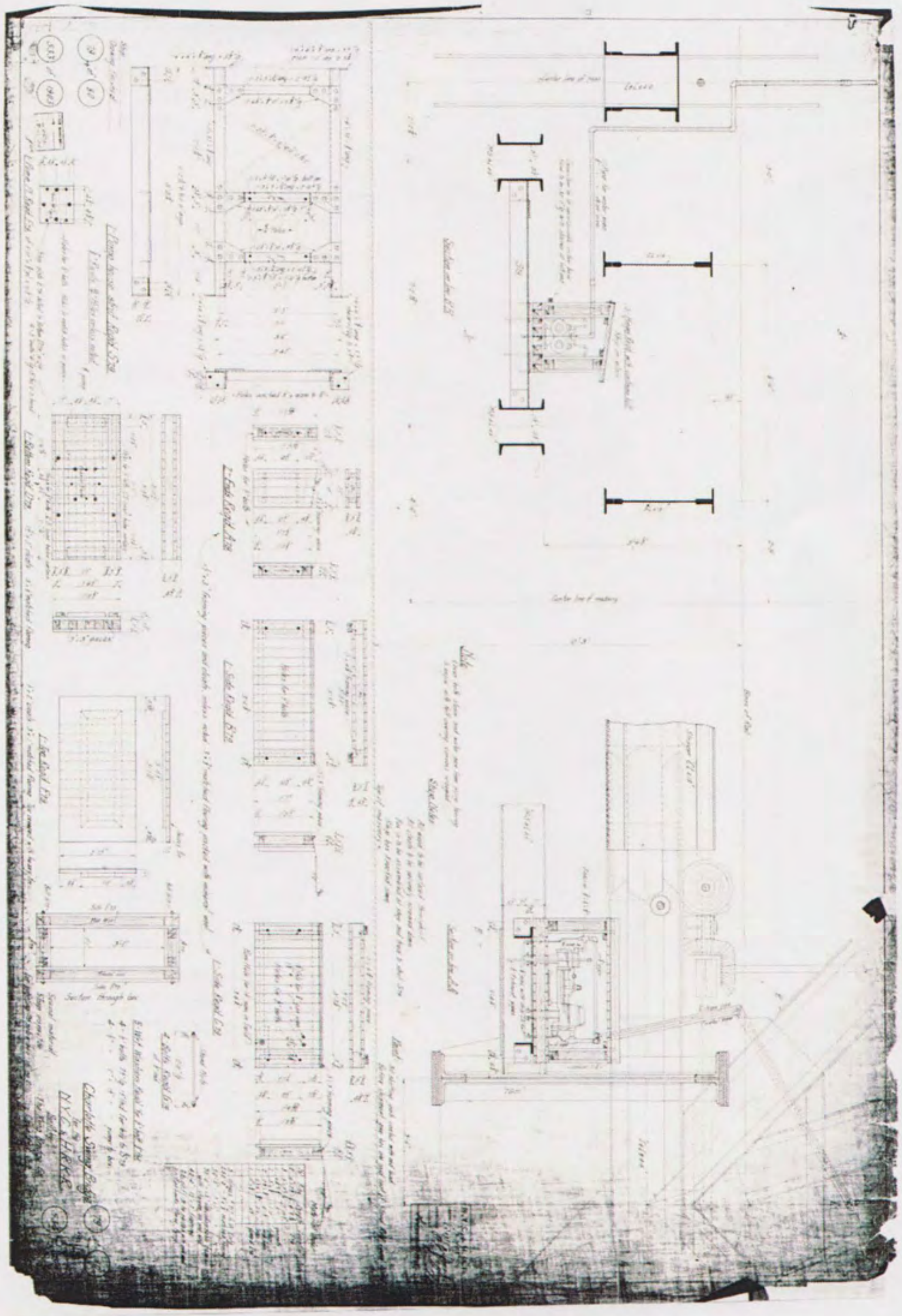

Figure 4. 1904 blueprint by the King Bridge Company showing the operational machinery inside the control house.

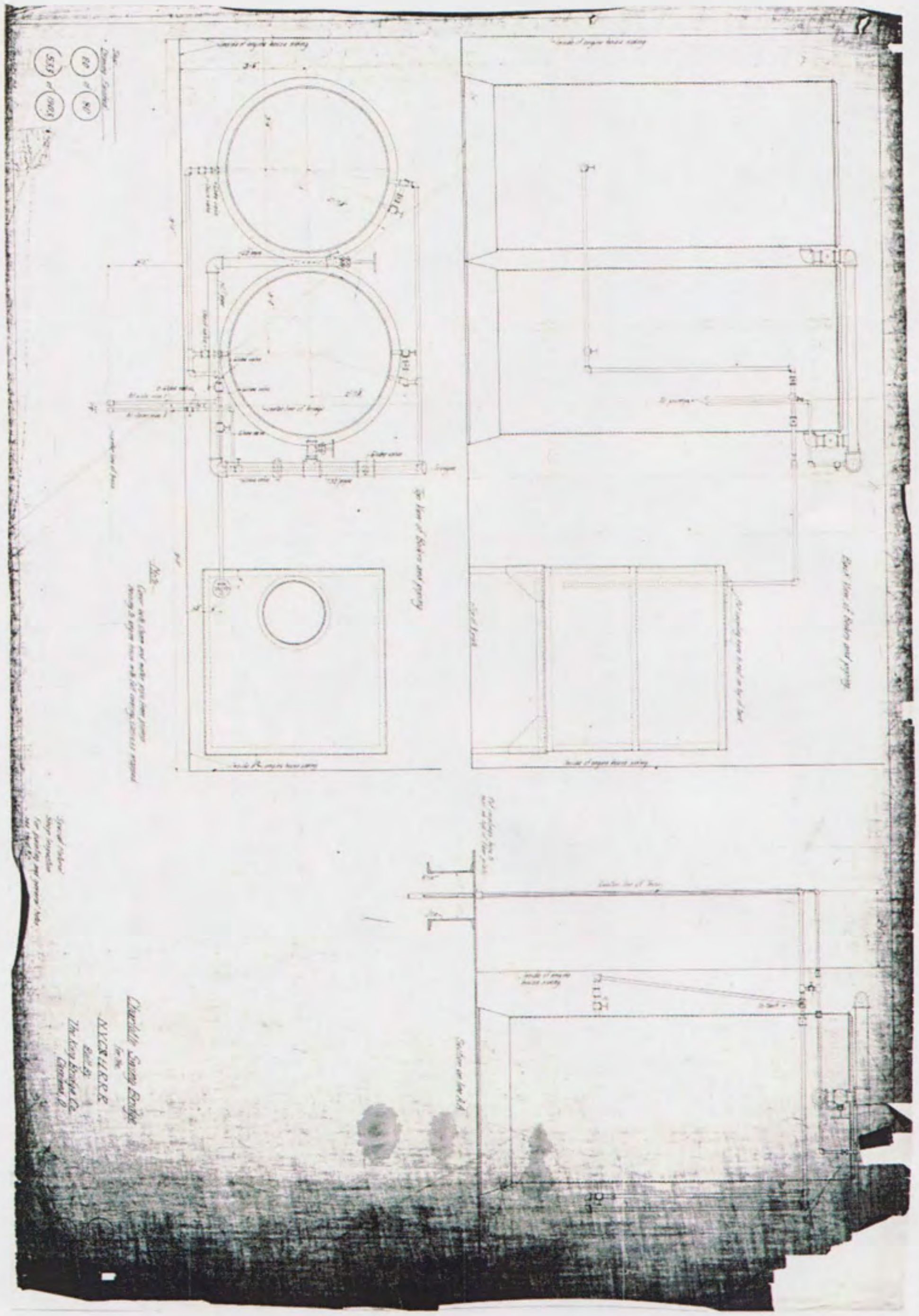

Figure 5. 1904 blueprint by the King Bridge Company showing the operational machinery inside the control house.

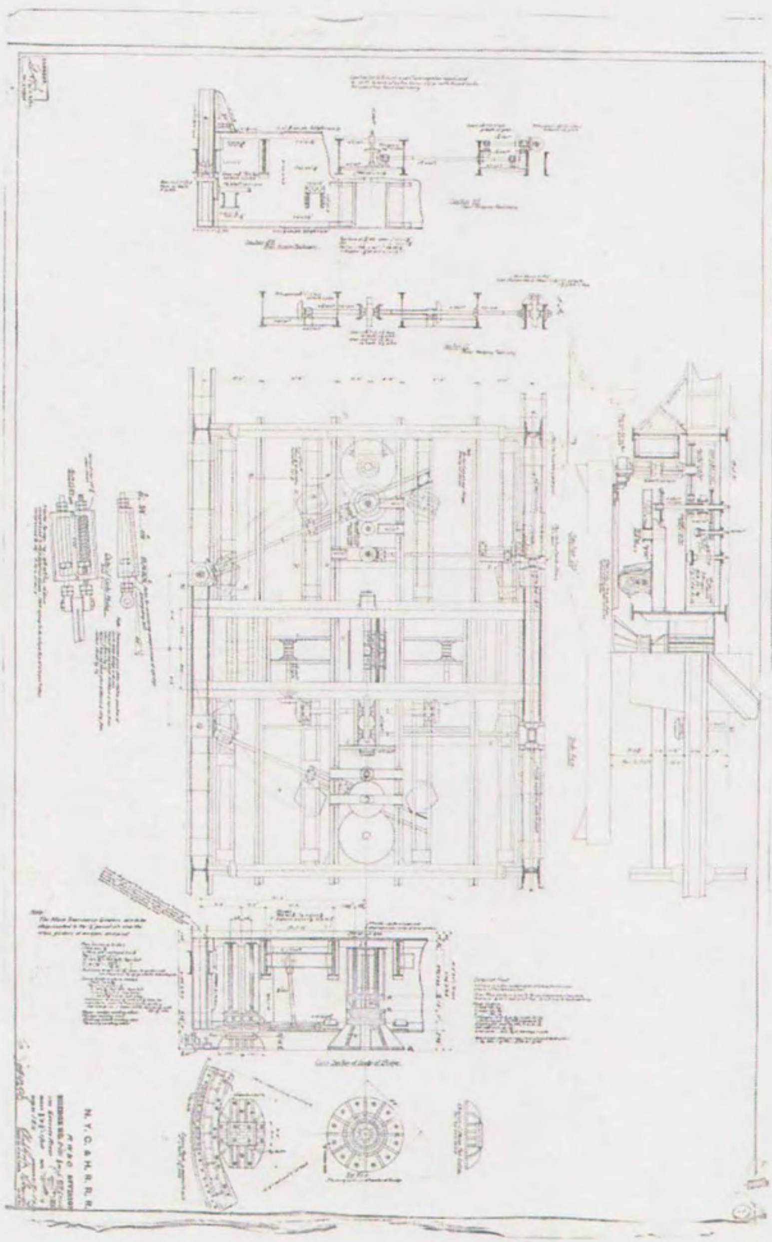

Figure 6. 1923 blueprint showing swing machinery and wedge.

Figure 7. Exterior photograph of the south and east elevations of the control house.

Figure 8. The north and west elevations of the control house.

Figure 9. Detail of south side roof of the control house.

Figure 10. Detail of north side of roof of the control house.

Figure 11. Interior office area of control house.

Figure 12. Machine room in the control house.

Figure 13. Machine room in the control house.

Figure 14. Machine room in the control house.

Part V. Sources of Information

Hartgen Archaeological Associates, Inc. and Black & Veatch, *Documentation and Mitigation Planning for Historic Preservation*. On file at Hartgen Archaeological Associates, Inc. 2001.

Margolis, Richard. *The Hojack Swing Bridge.* Rochester: Mercury Print Productions, Inc., 2012.

Nagel, Brian and James Darlington. 2000 *Phase IA and IB Cultural Resource Survey for the Port of Rochester Harbor Improvement and Ferry Terminal Project.* Rochester: Bergman Associates, 2011.

OPRHP. *Eligibility Evaluation of the Rochester Swing Bridge*. On file at the New York State Office of Parks, recreation, and Historic Preservation, Waterford 1996.

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Simmons, David A. Bridge Building on a National Scale: The King Iron Bridge and Manufacturing Company. Industrial Archaeology, ND.

Sloan, Allan King. *The King Bridge Company Through the Decades*. On file at the Charlotte Village Museum, ND.

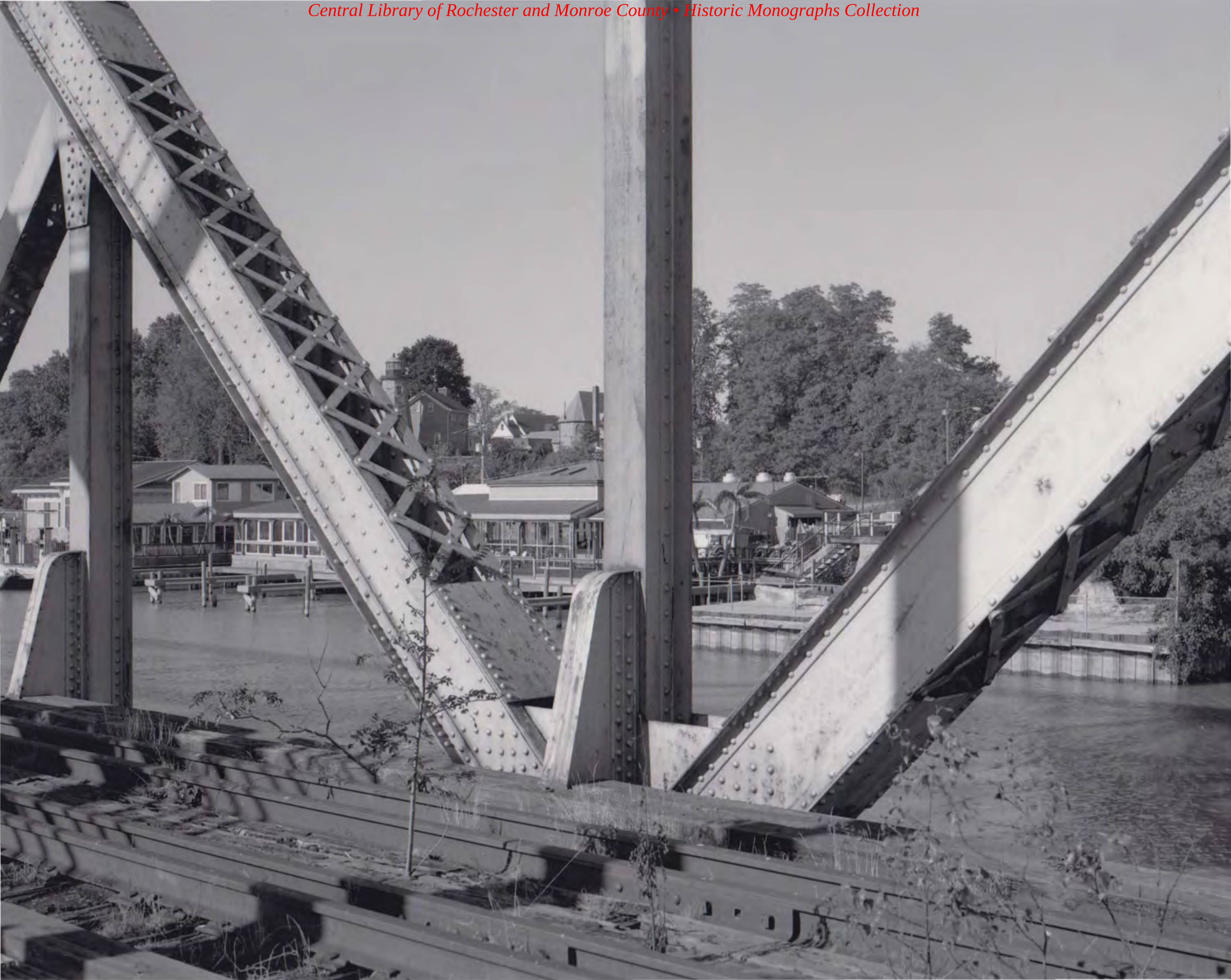
Steele, Ben Jr. *Building Structure Inventory Form, Hojack Swing Bridge, 055-40-1471*. On file at the New York State Office of Parks, Recreation, and Historic Preservation, Waterford 1979.

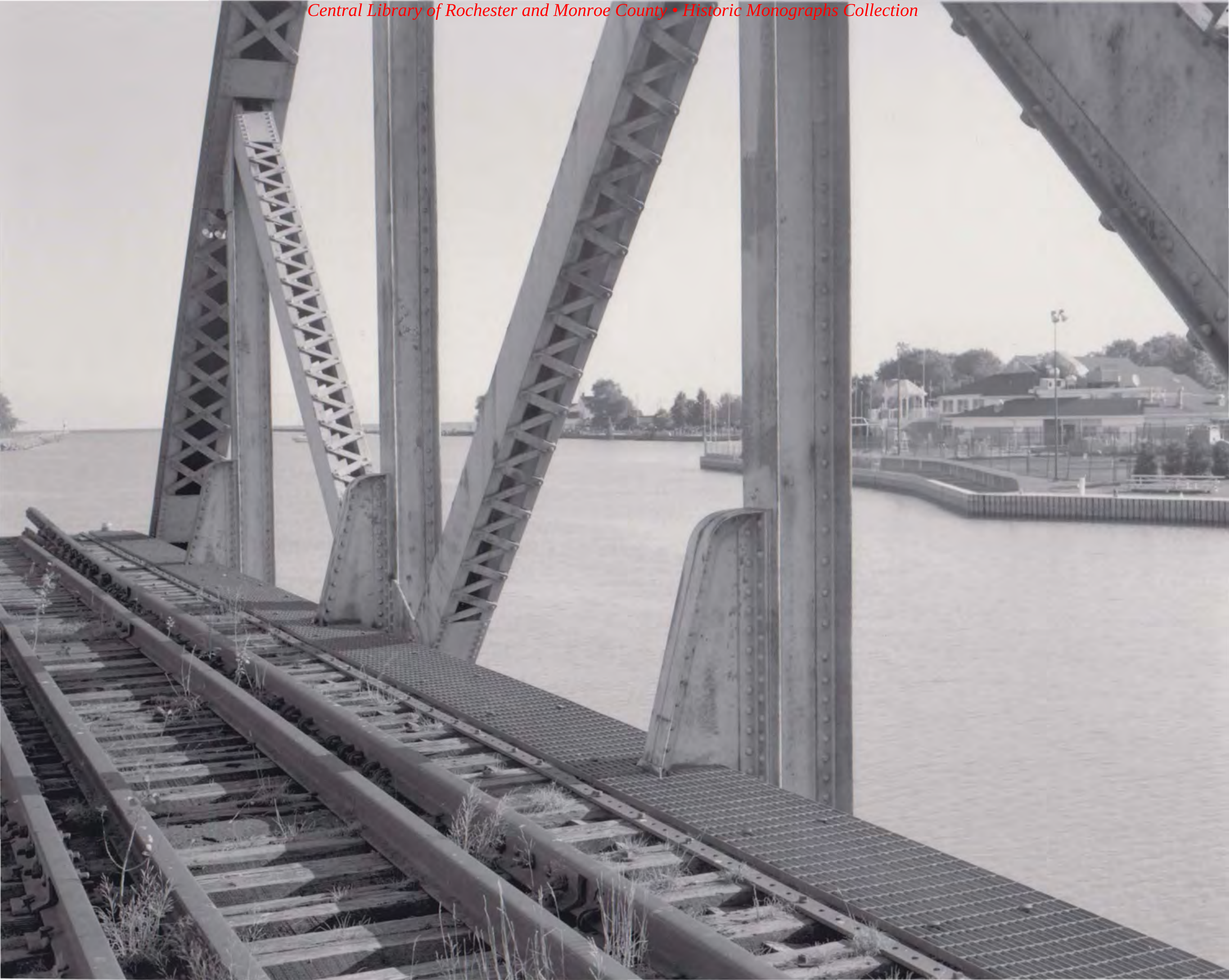
Part VI. Project Information:

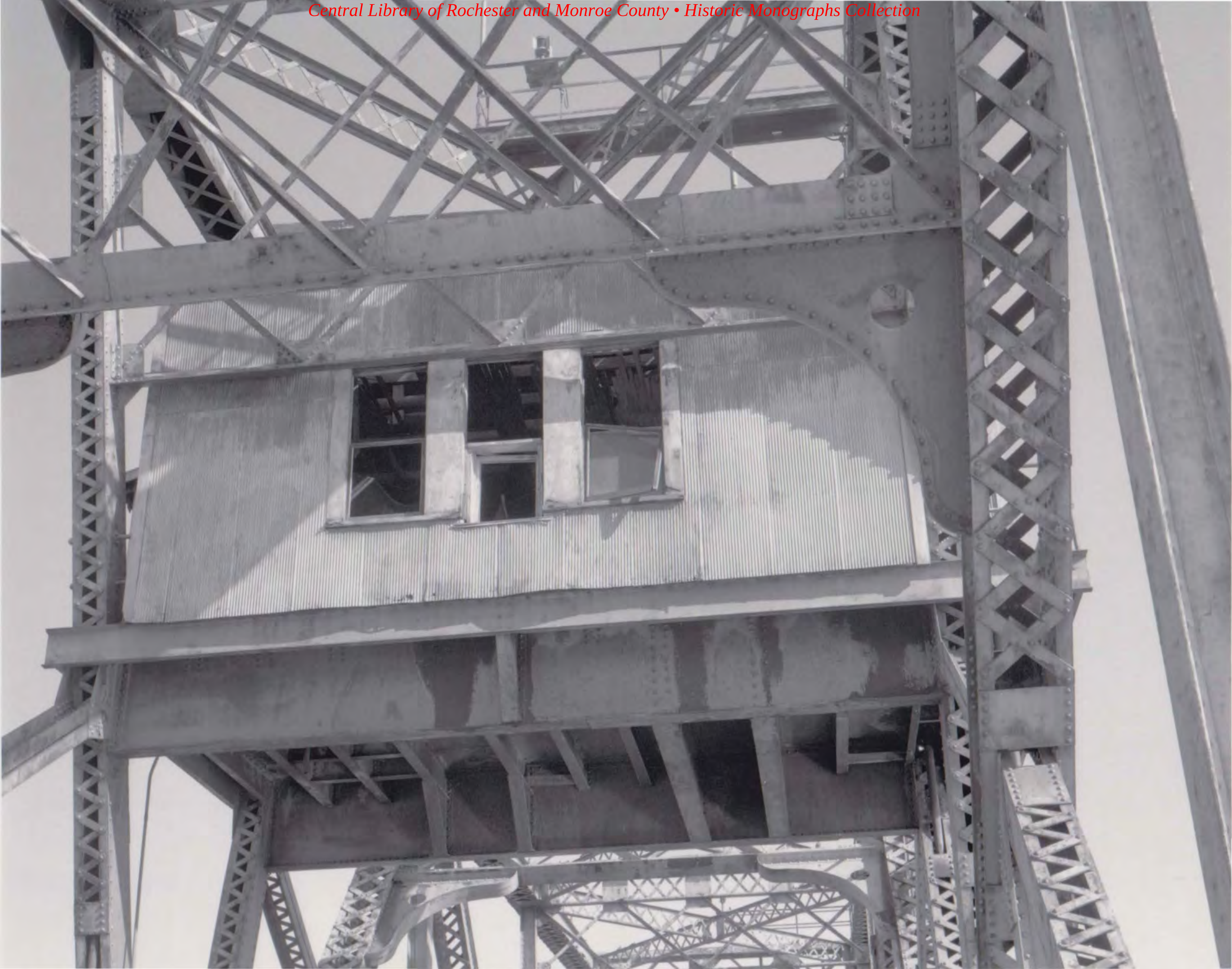
State level Historic American Building Survey documentation was prepared on the Hojack Swing Bridge in consultation with the New York State Historic Preservation Office located in the Office of Parks, Recreation, and Historic Preservation.

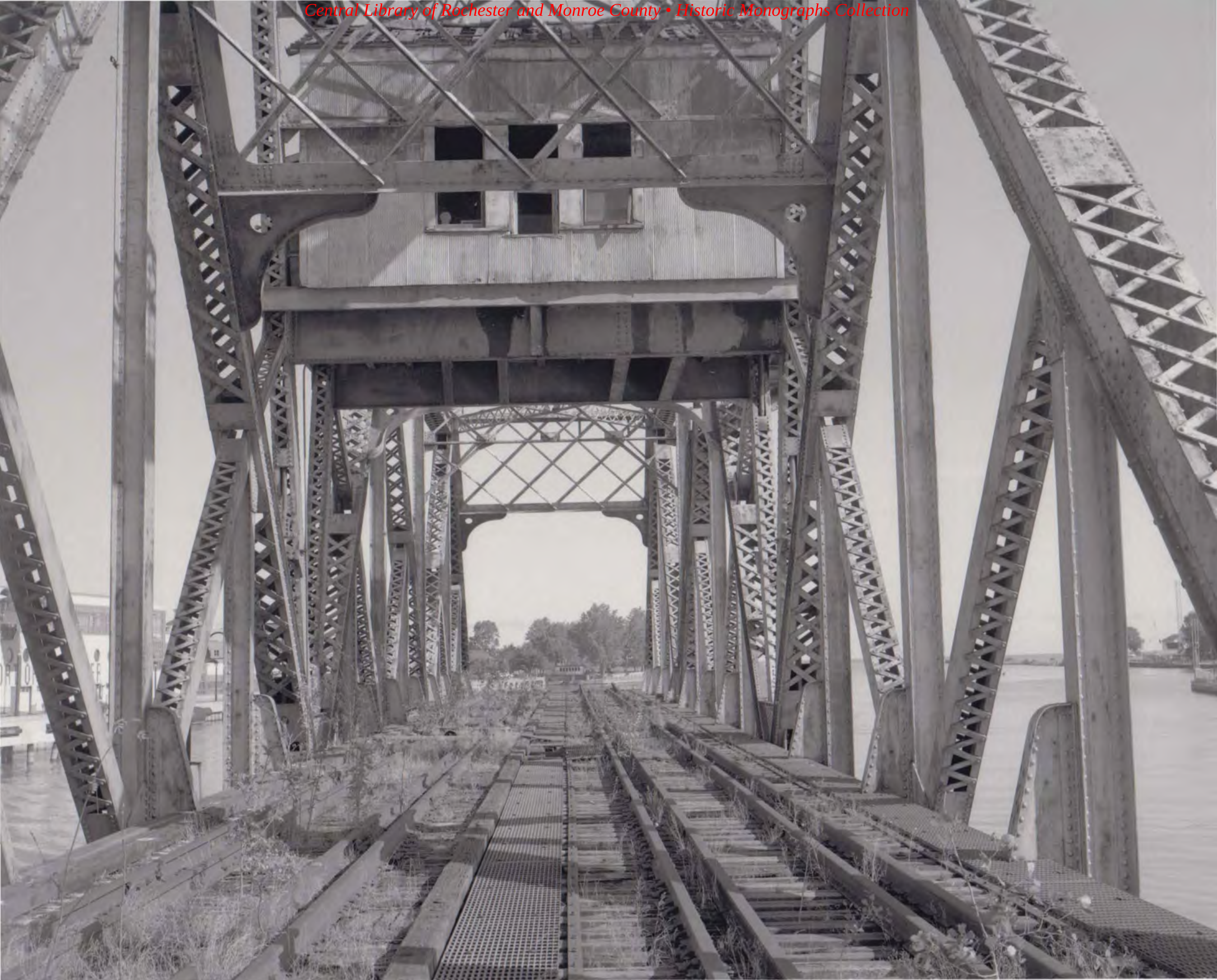
Mathia N. Scherer, historian/architectural historian, AMEC Environment & Infrastructure, Inc., 690 Commonwealth Center, 11003 Bluegrass Parkway, Louisville, Kentucky 40299 (502-267-0700), under contract to CSXT, prepared the narrative report. Research was completed in September 2012.

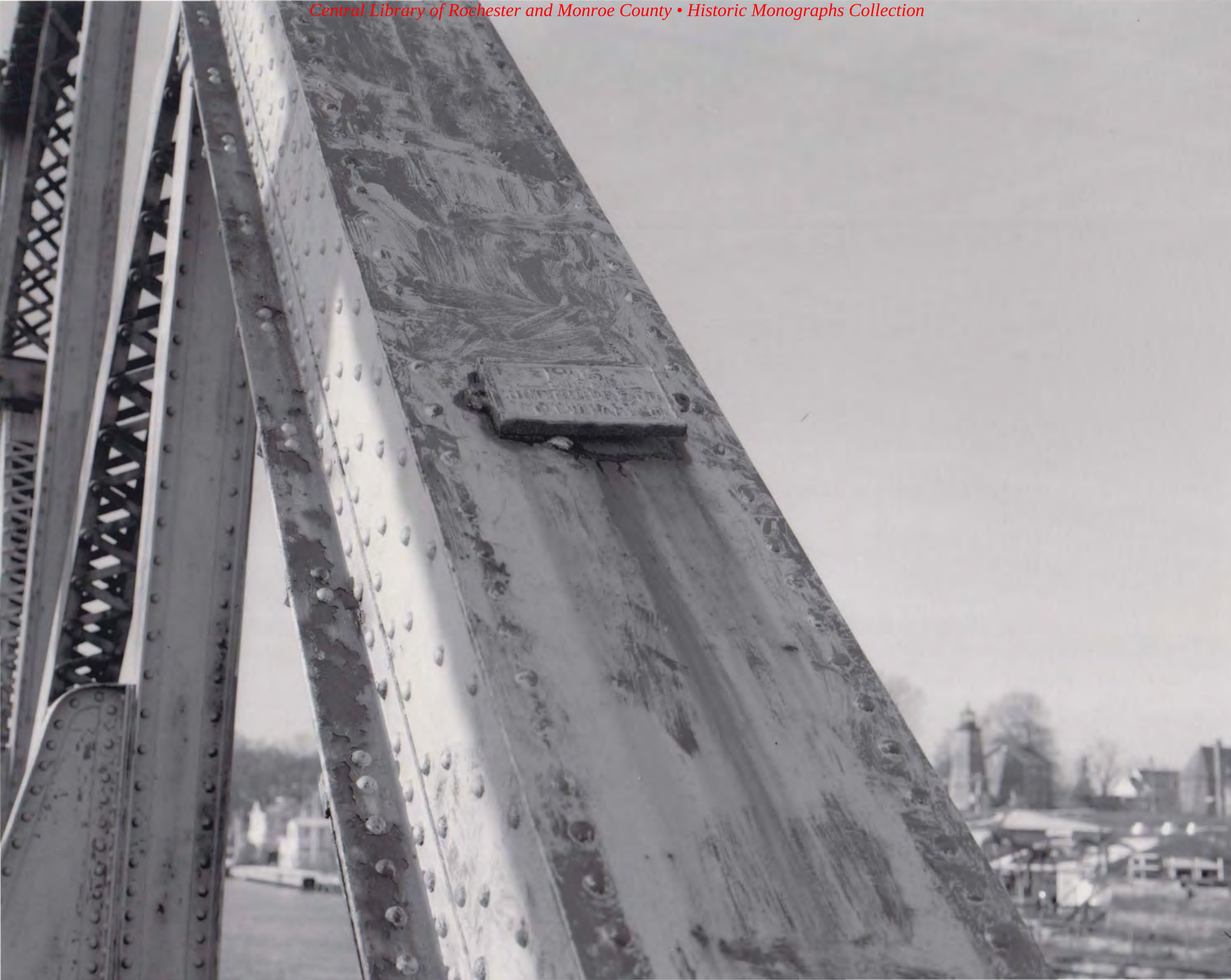
Michael Hager, architectural photographer, of Museum Photographics, 11 Center Pike, Rochester, New York 14614 (585-232-3980), under contract to AMEC Environment & Infrastructure Inc., photographed the site in 2011.

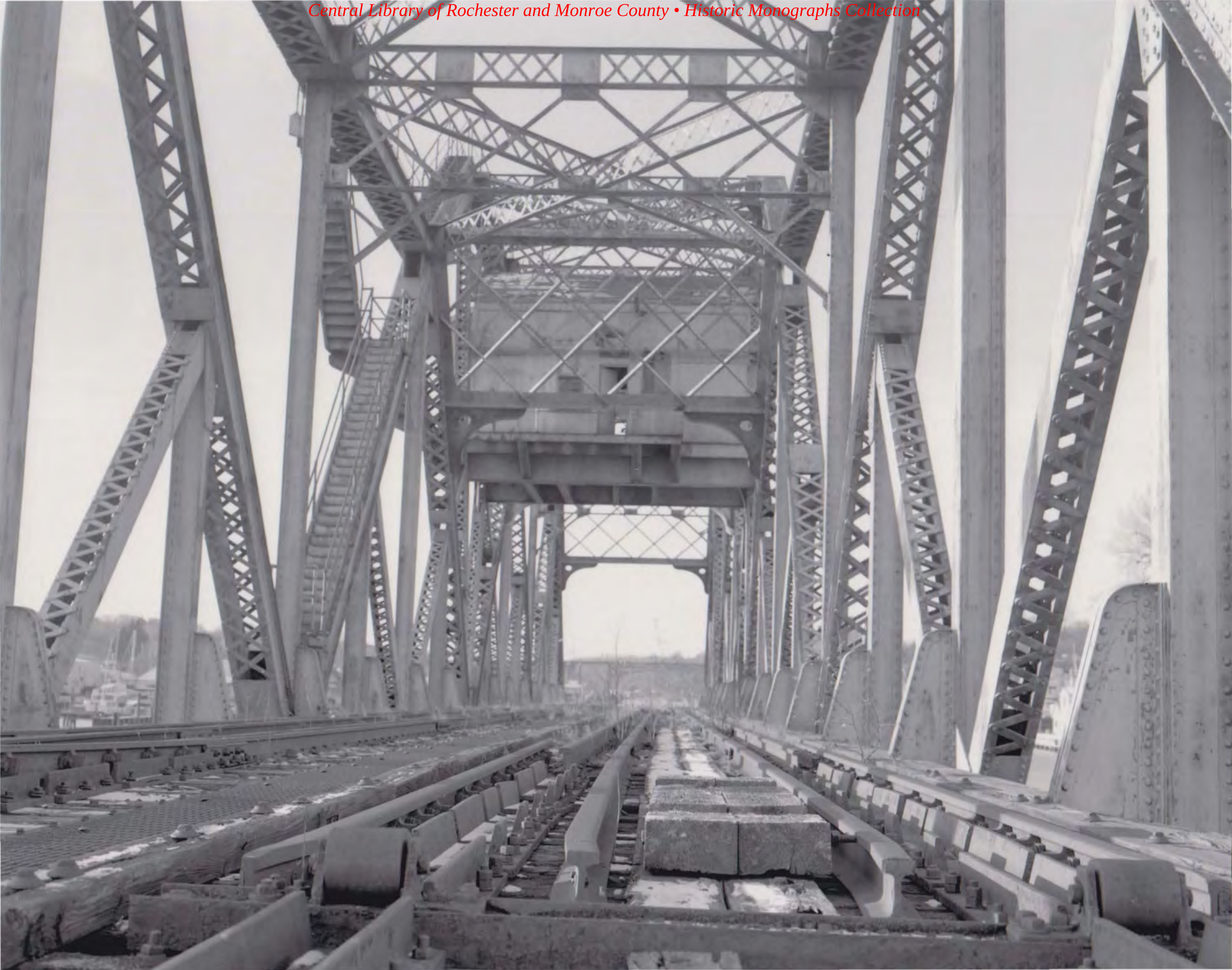


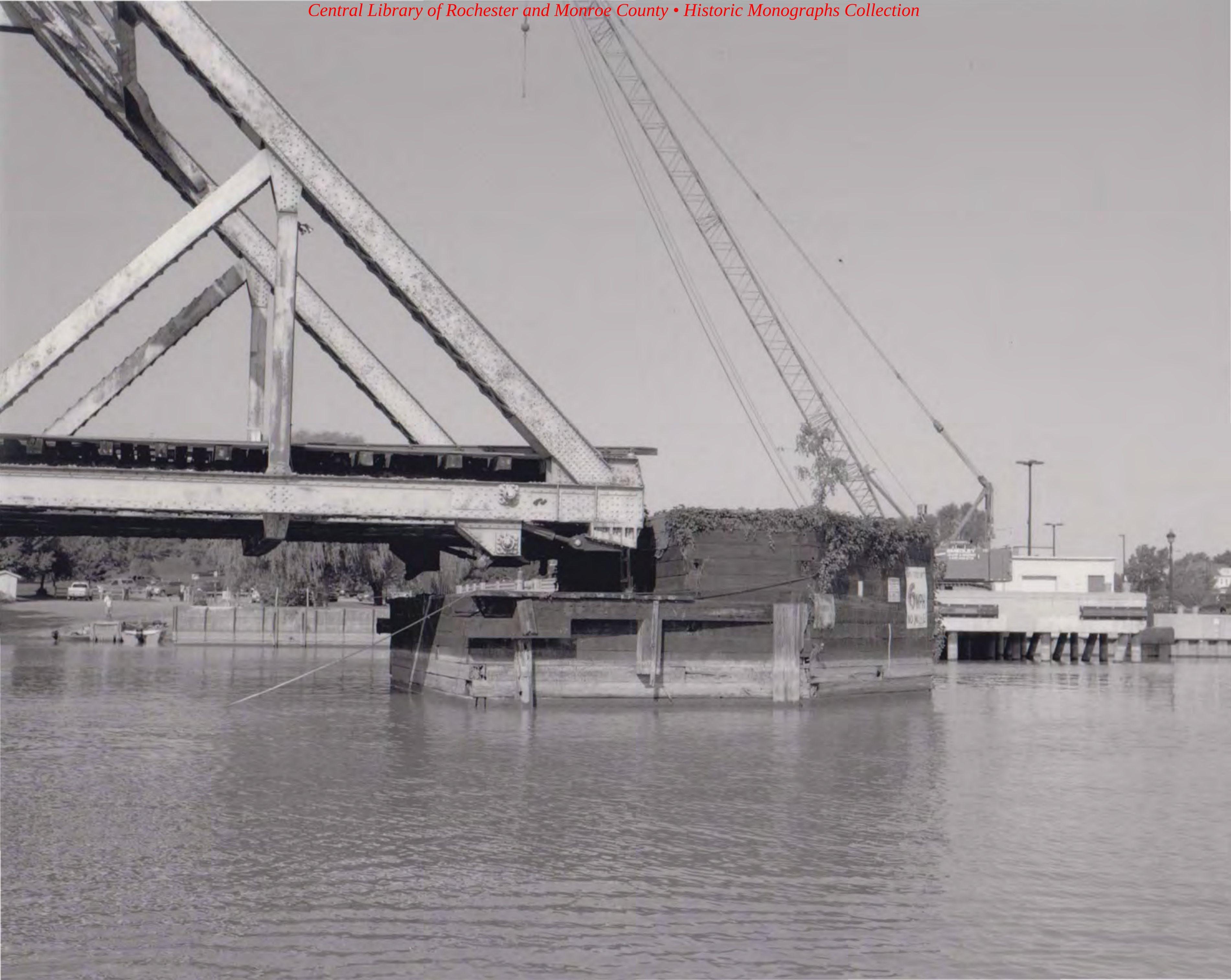


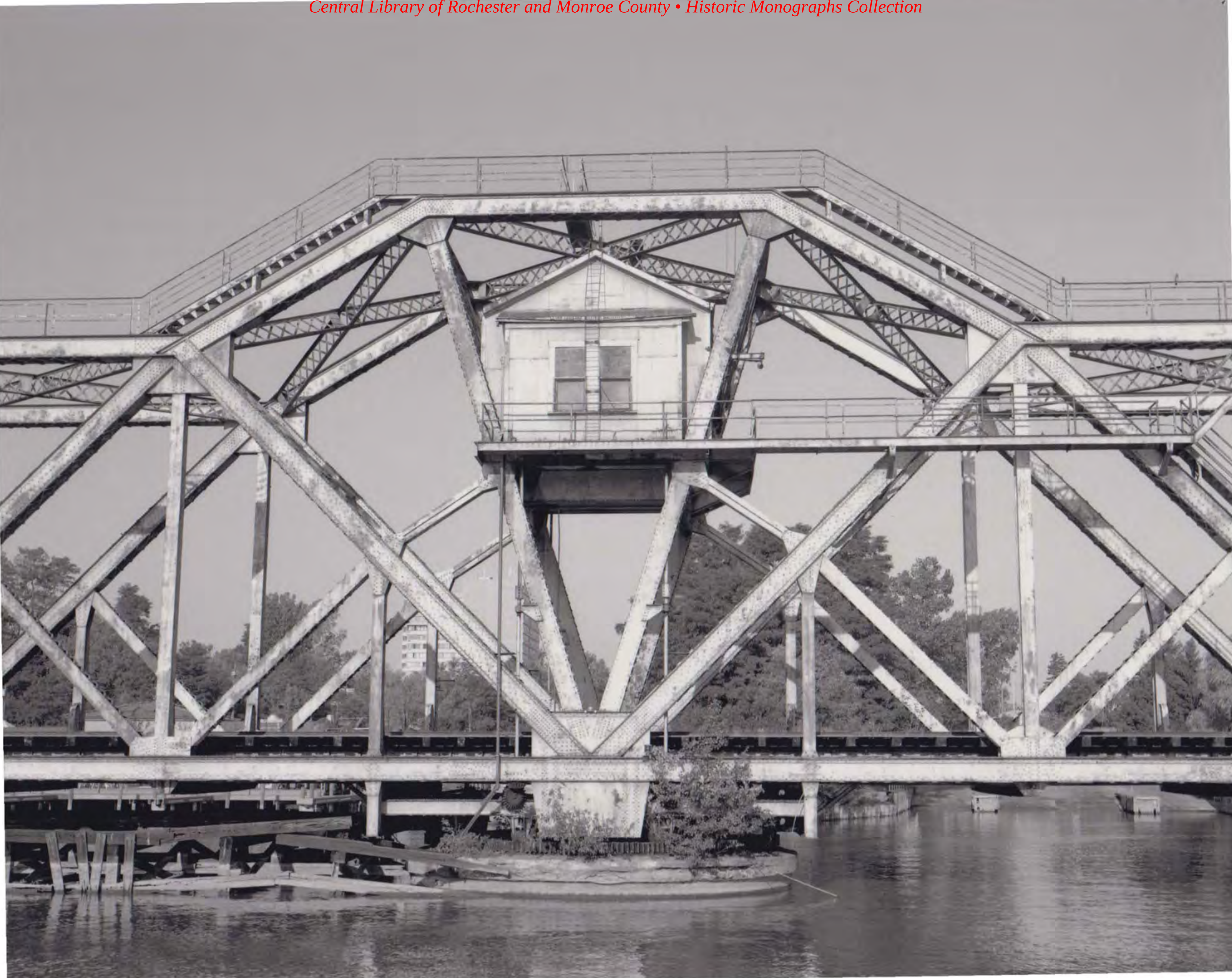










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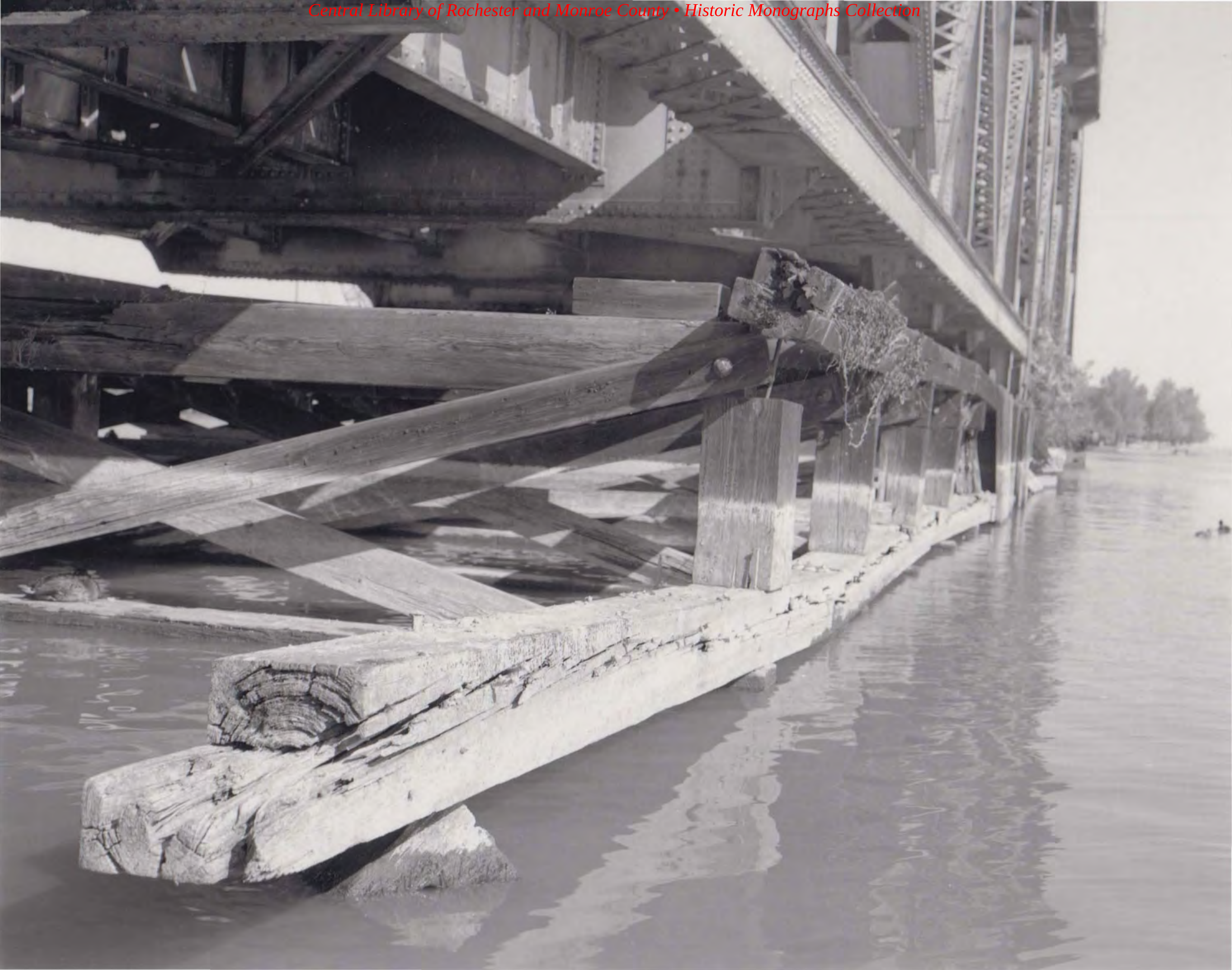


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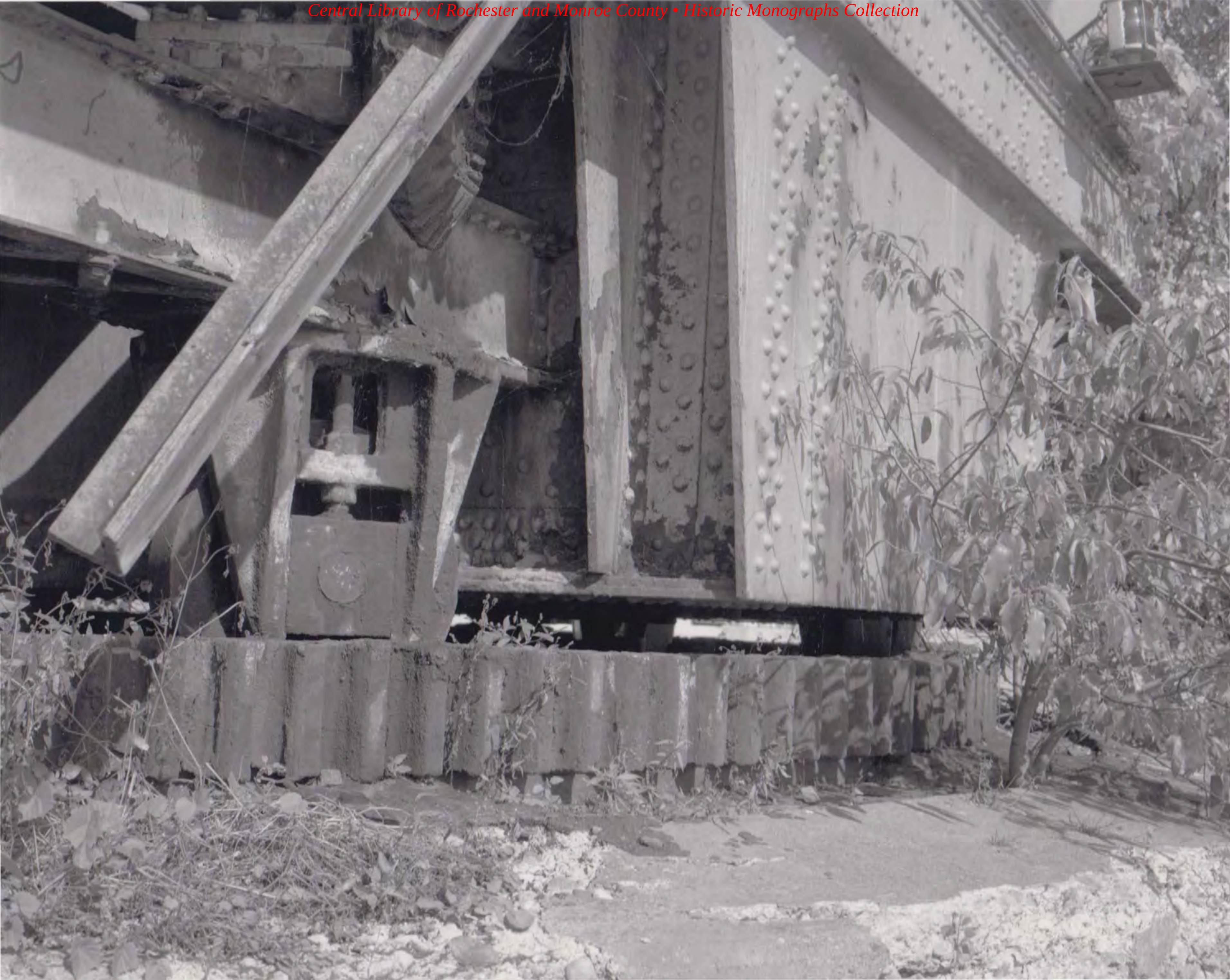

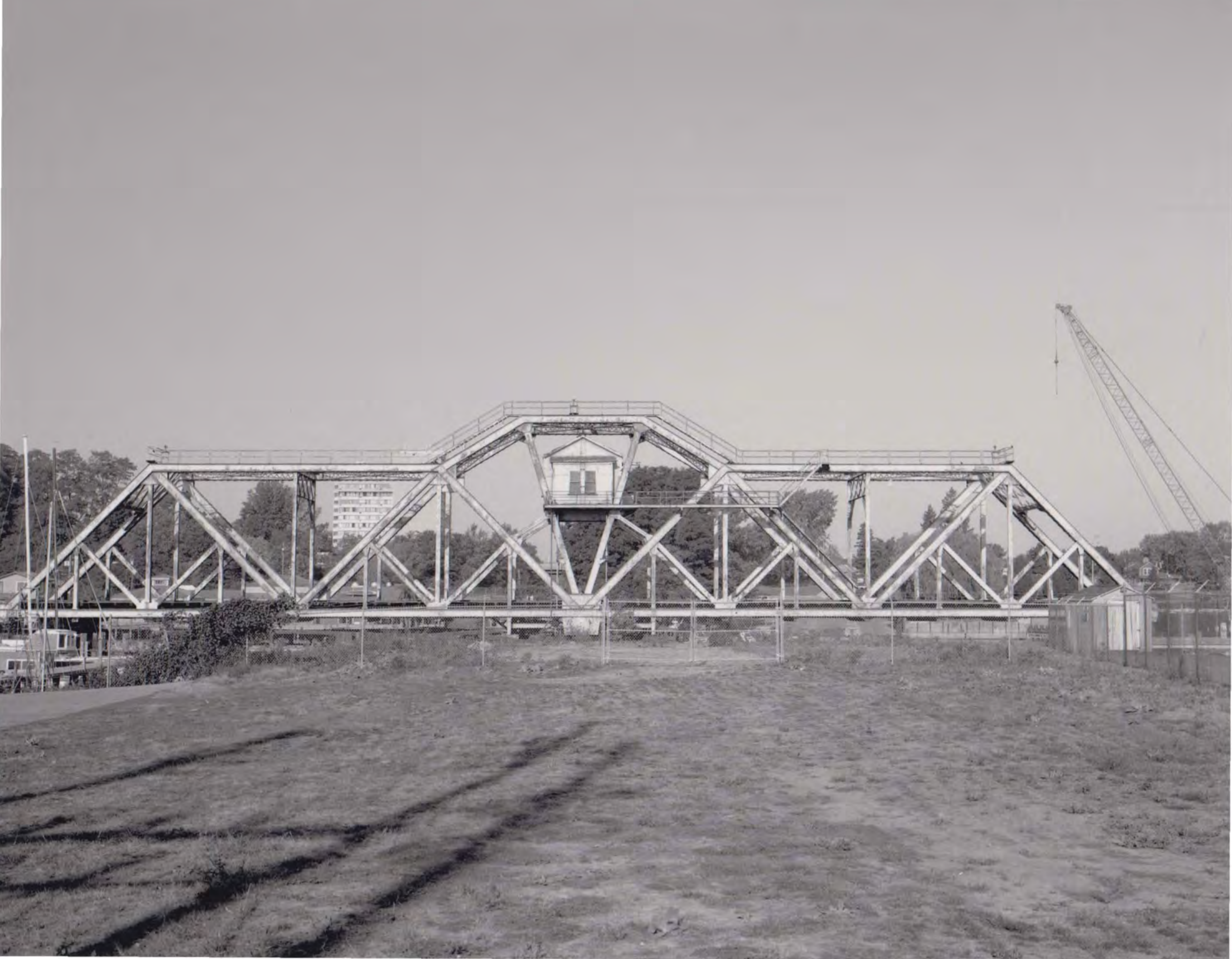

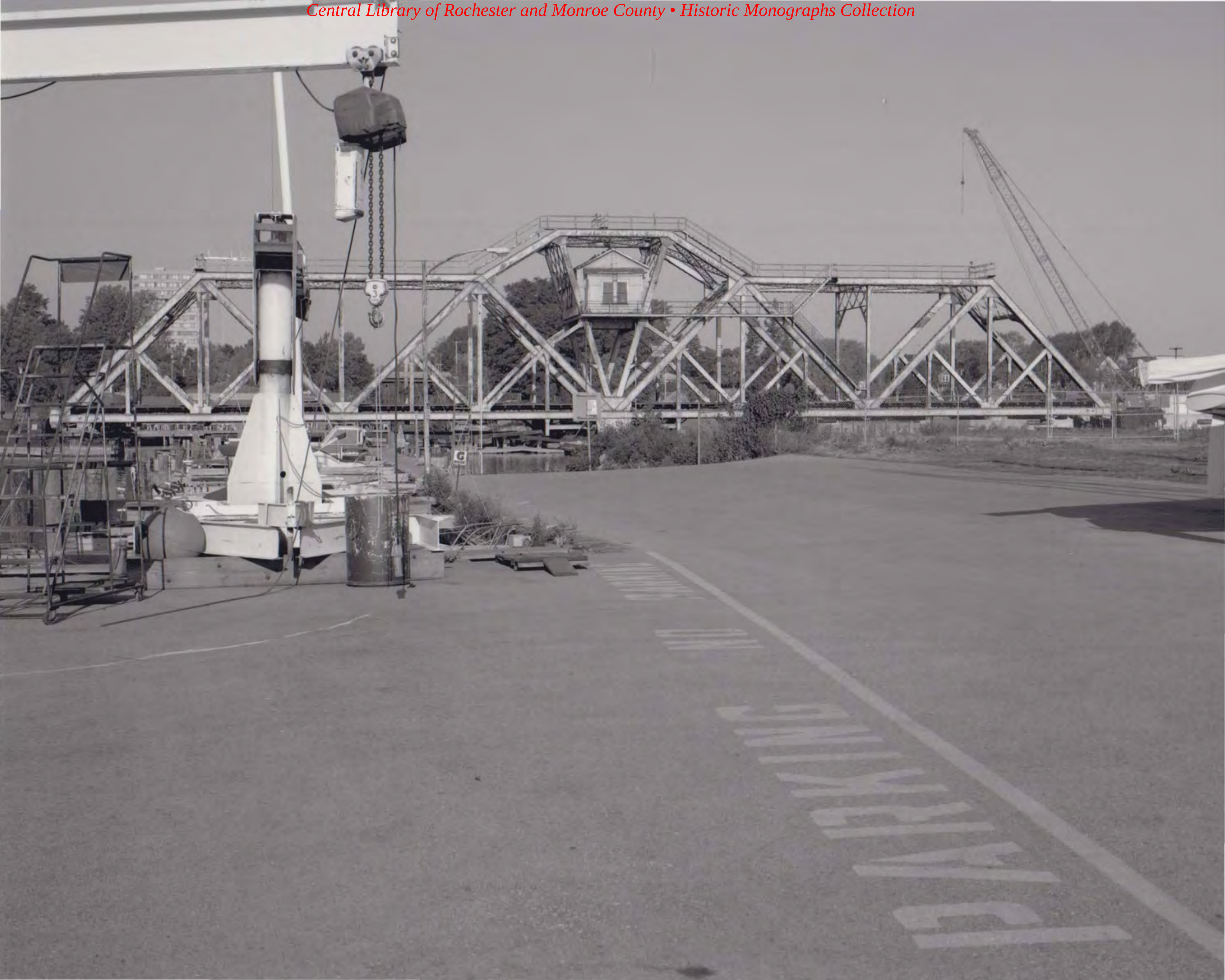
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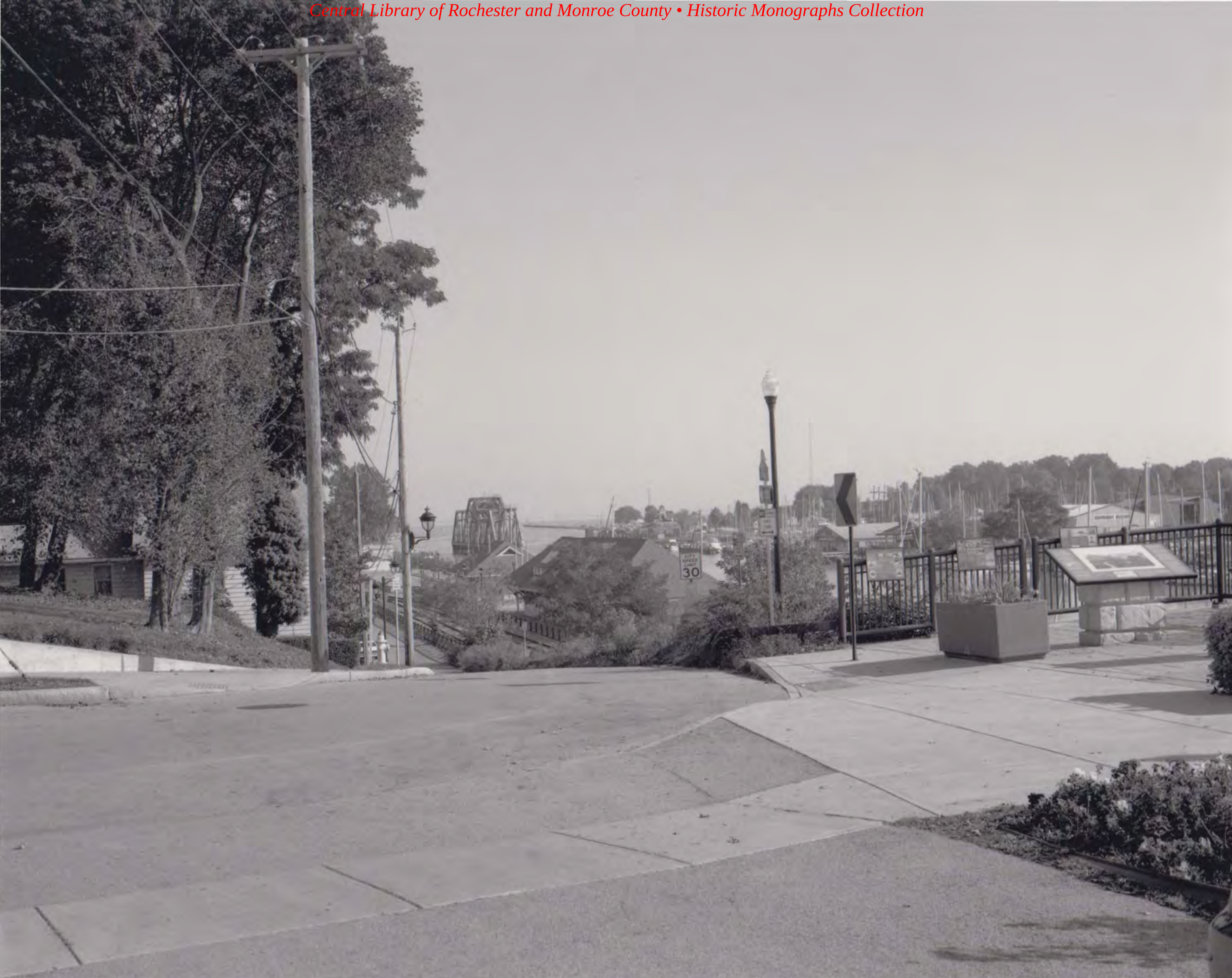
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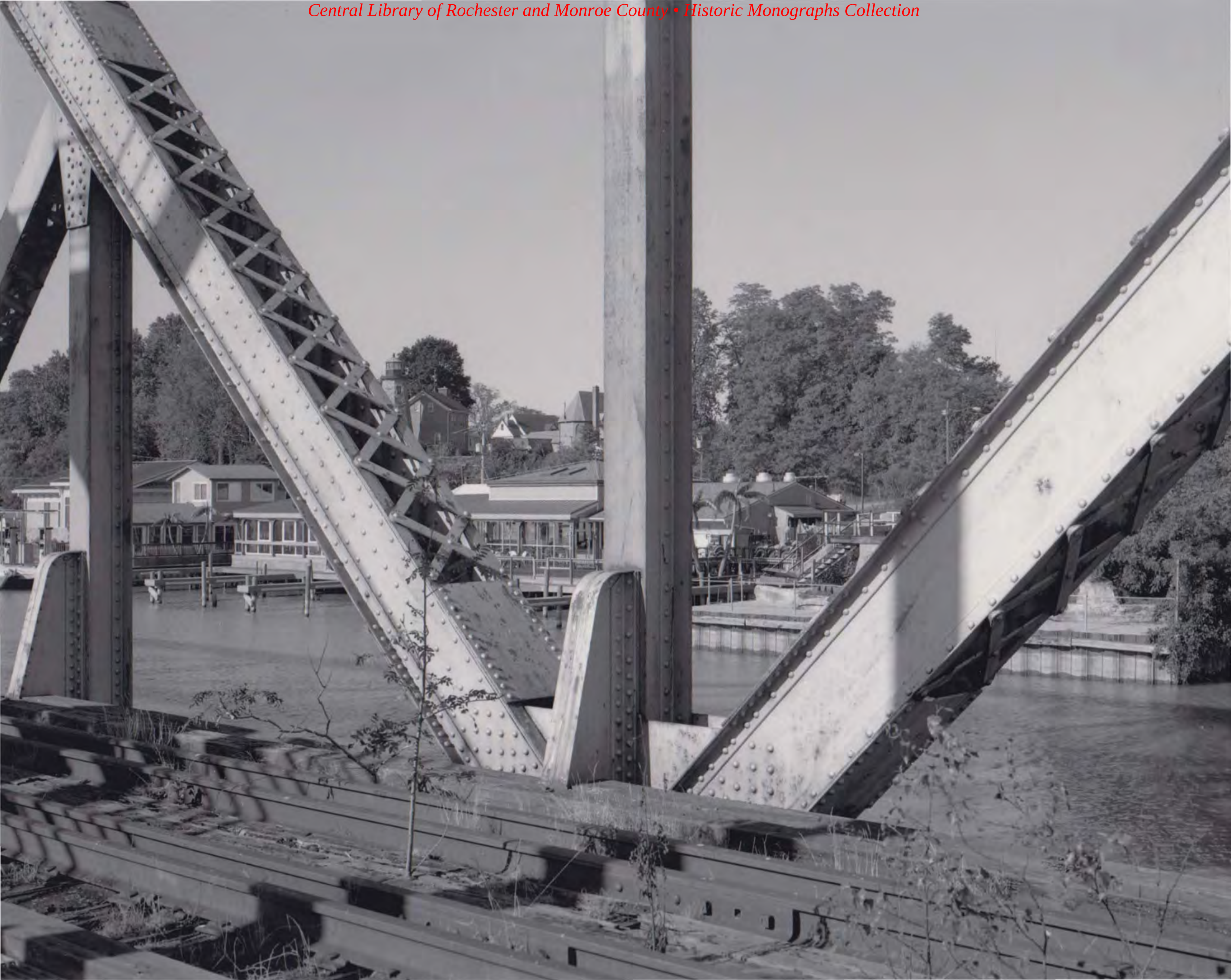

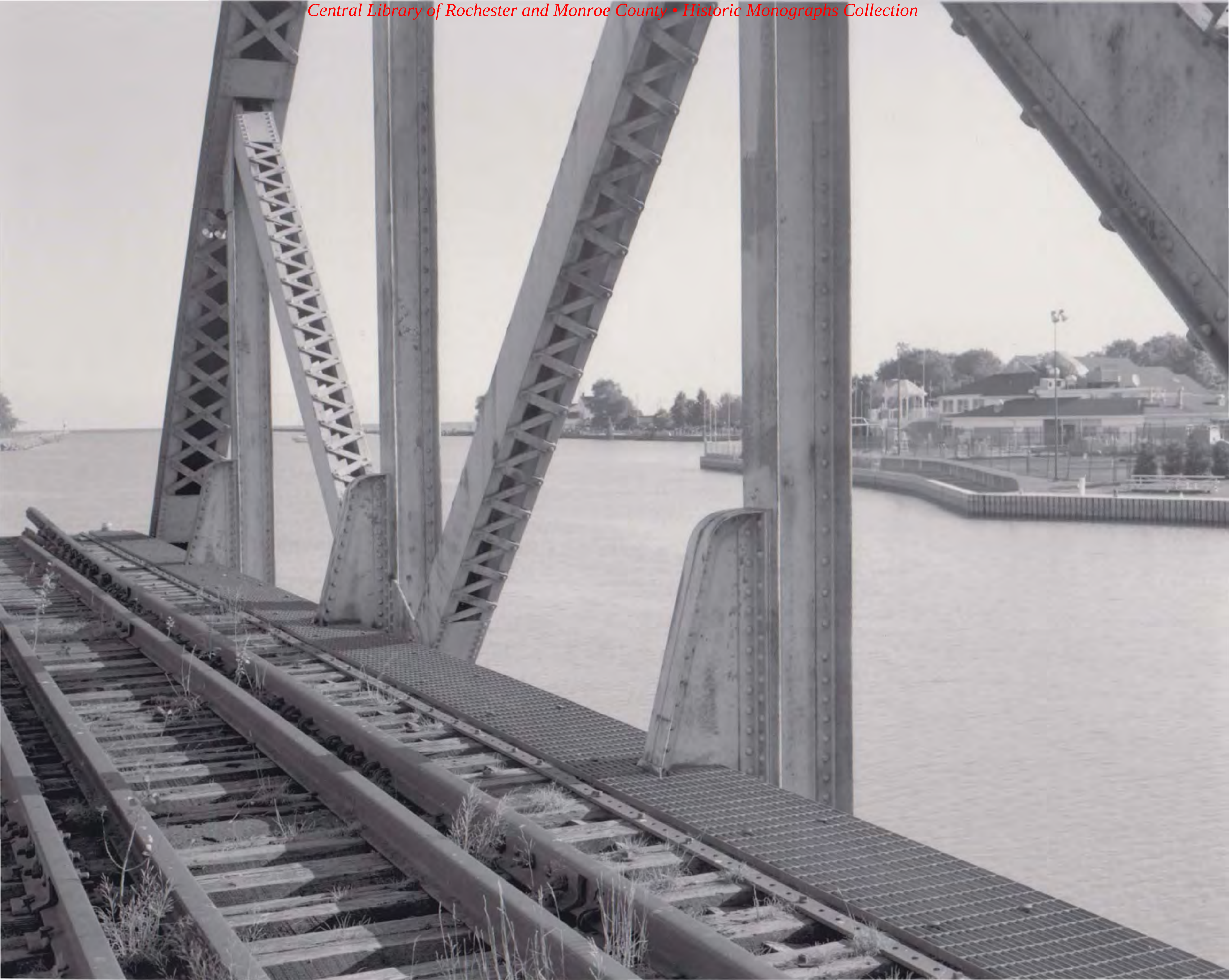

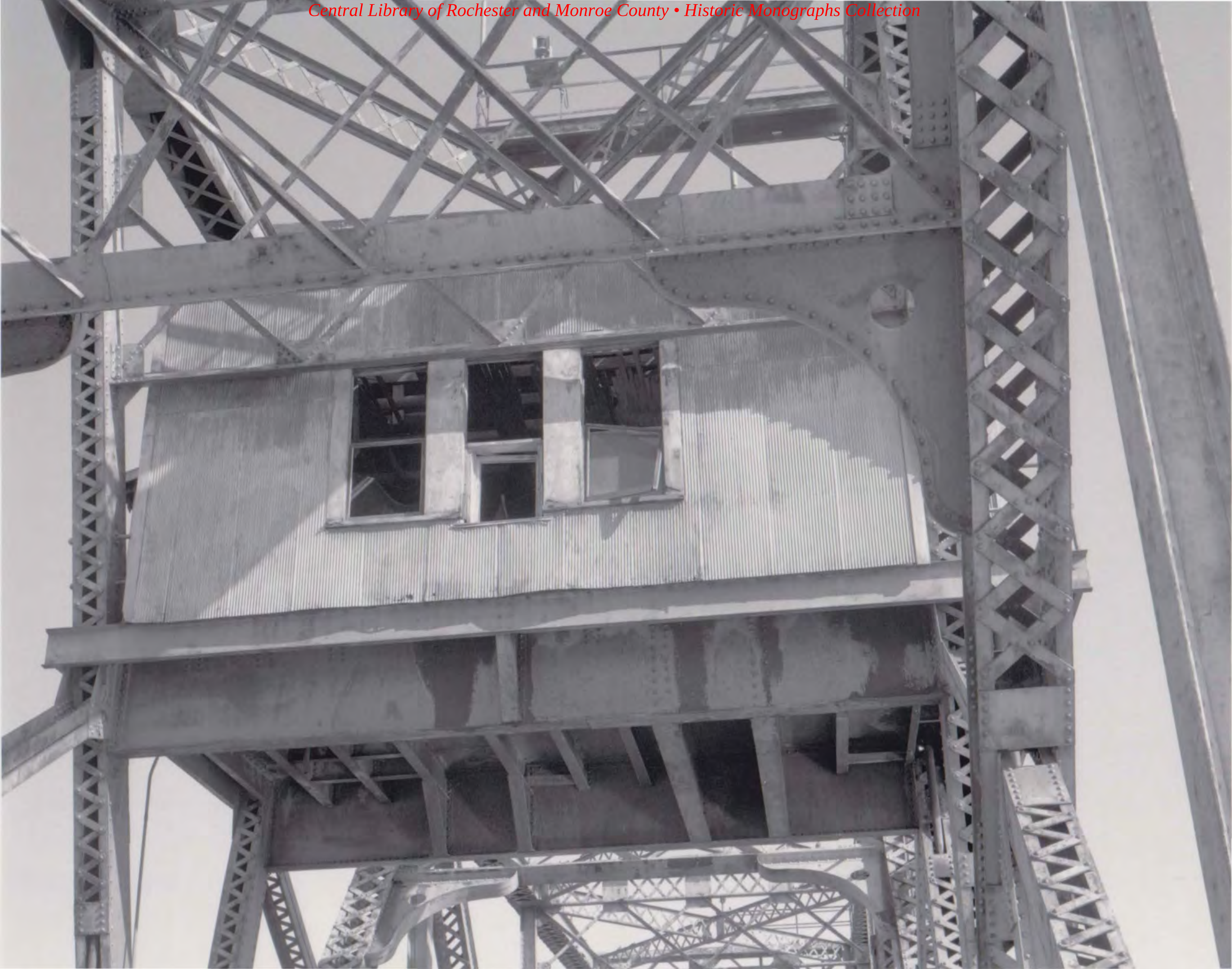

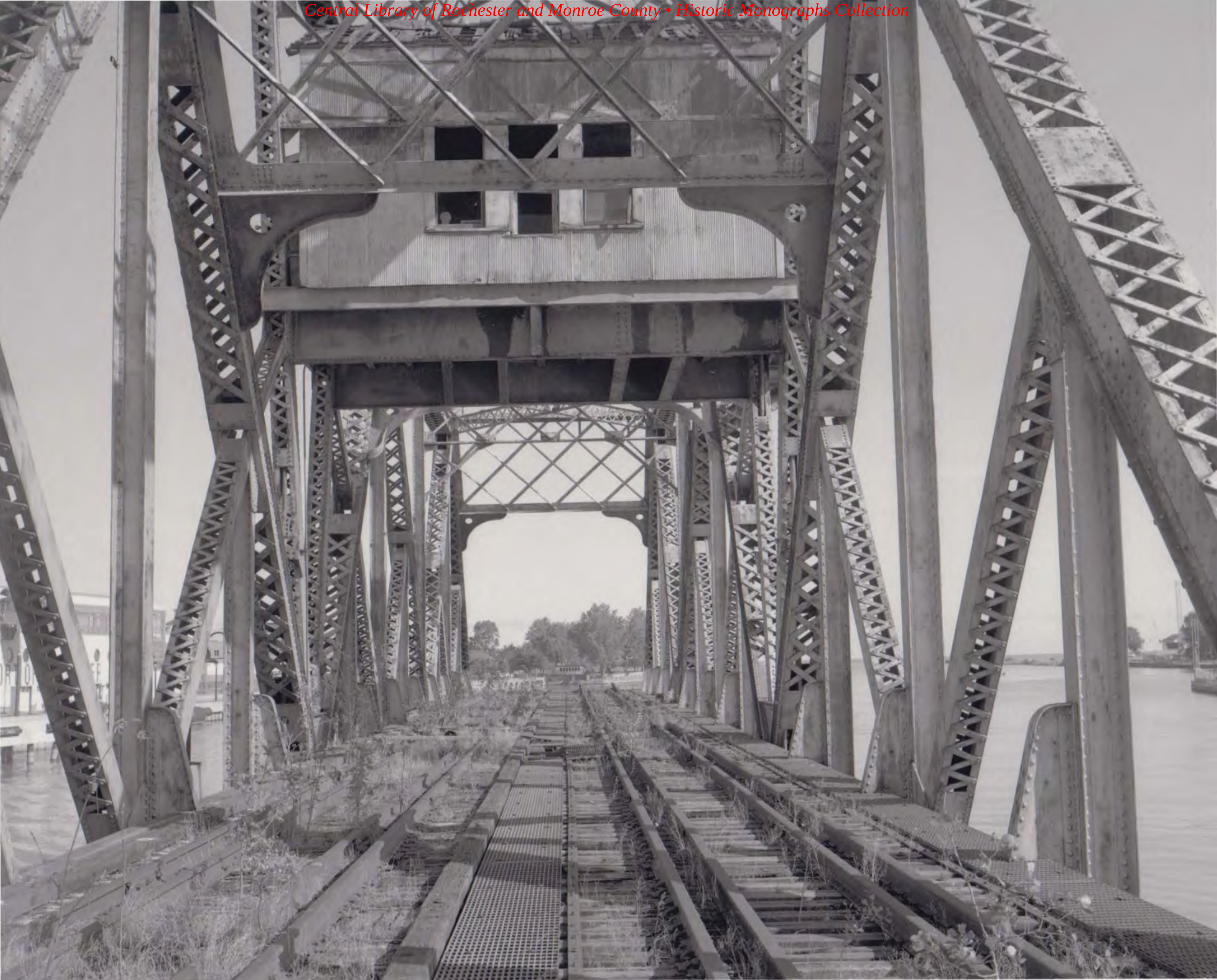

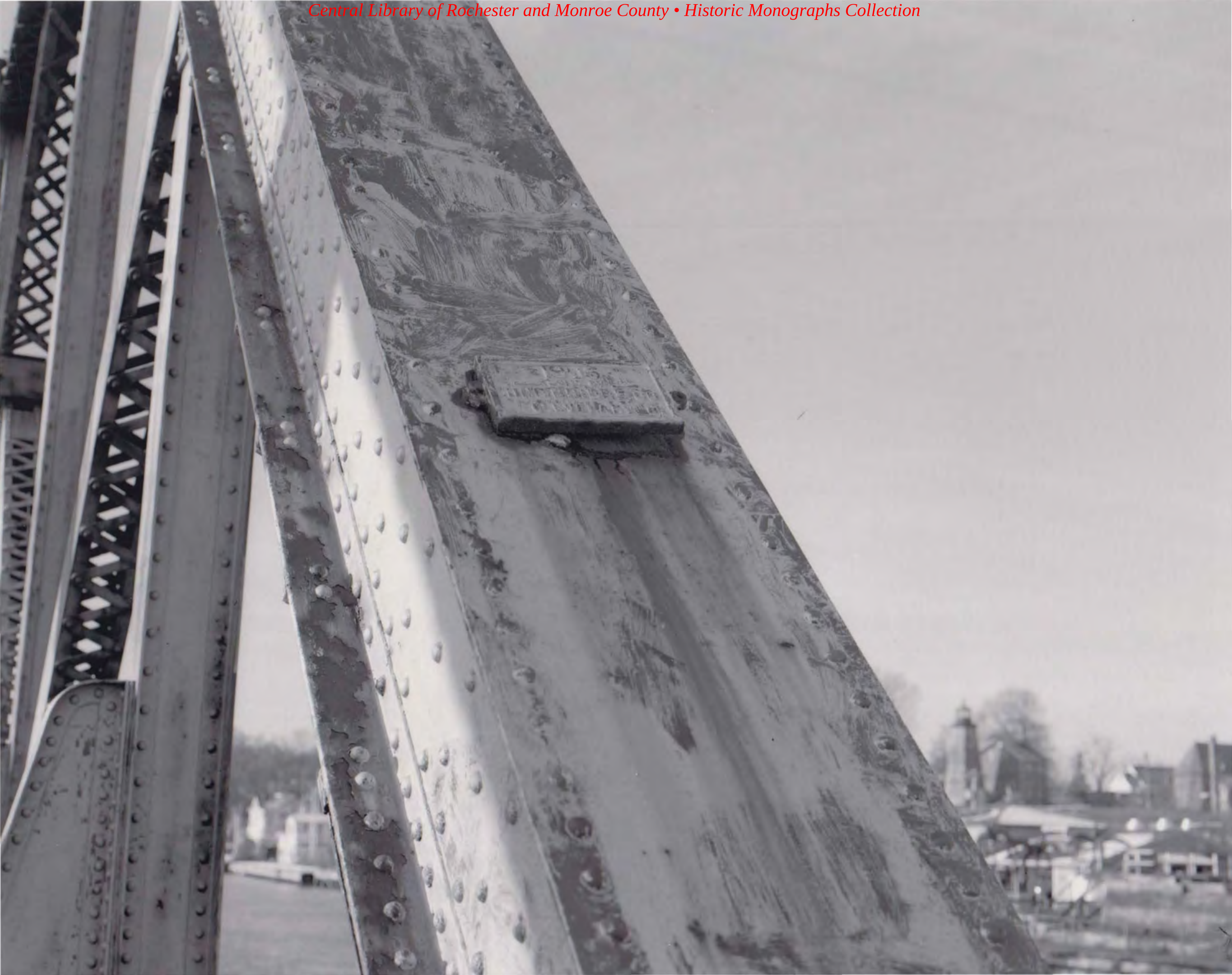

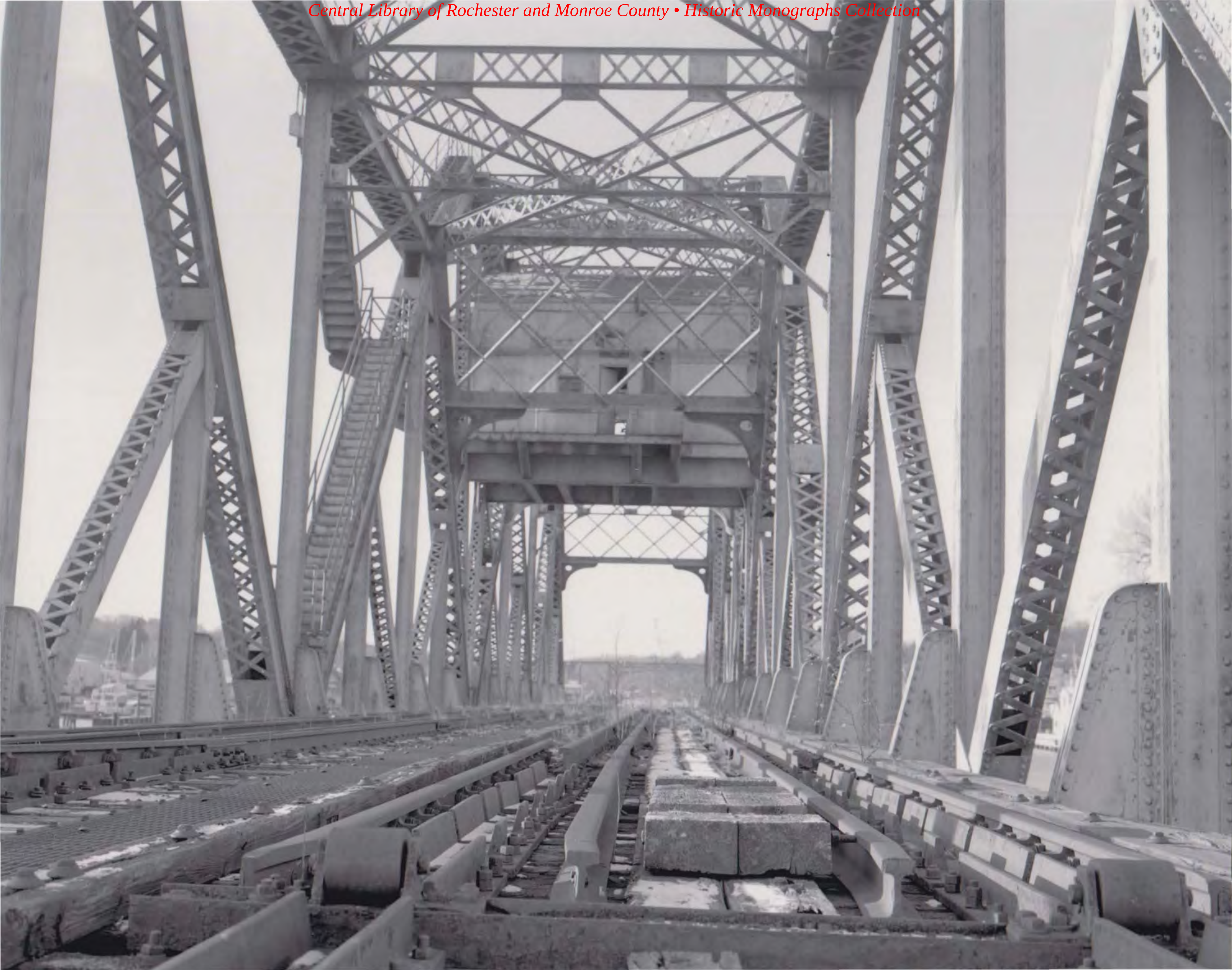

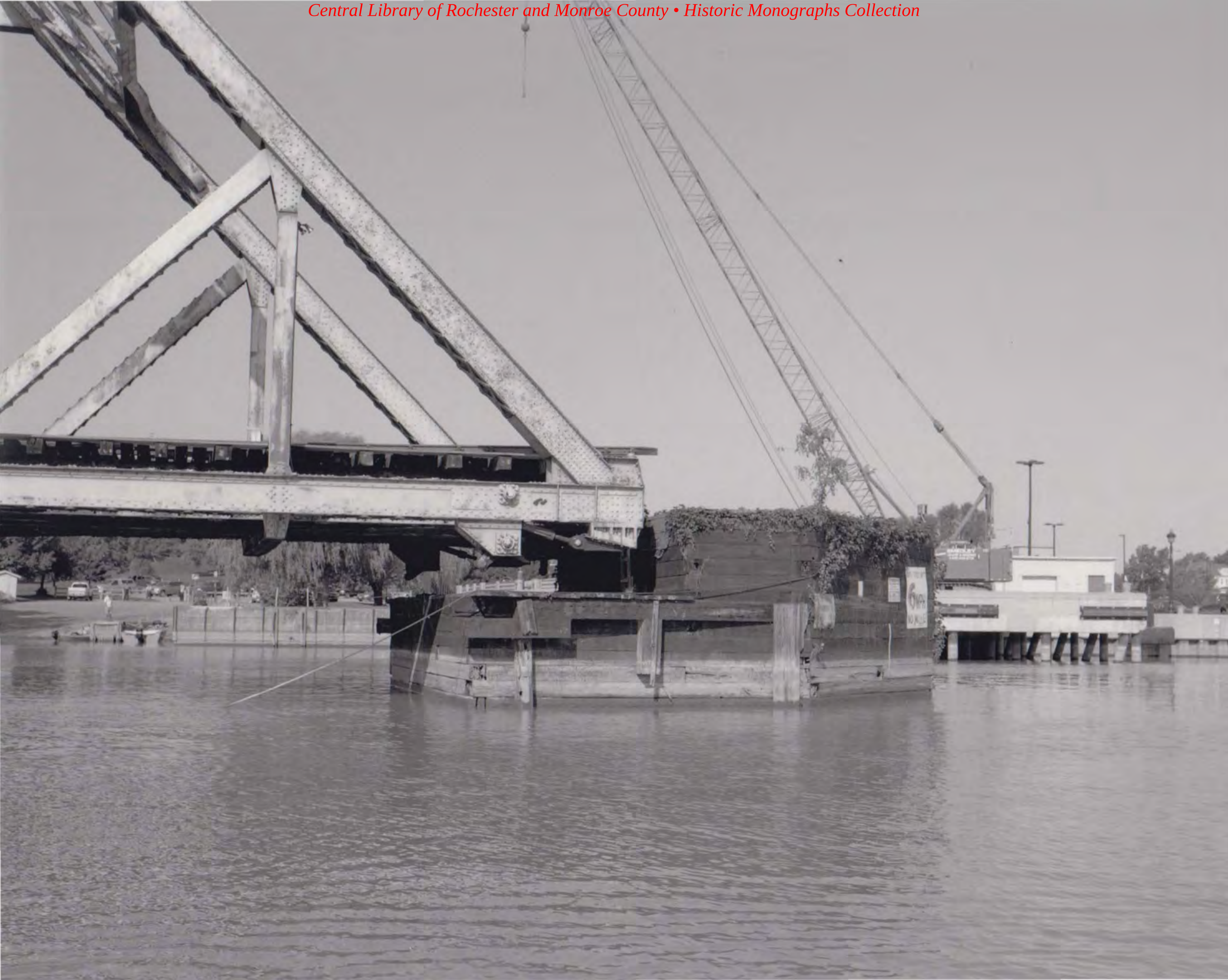

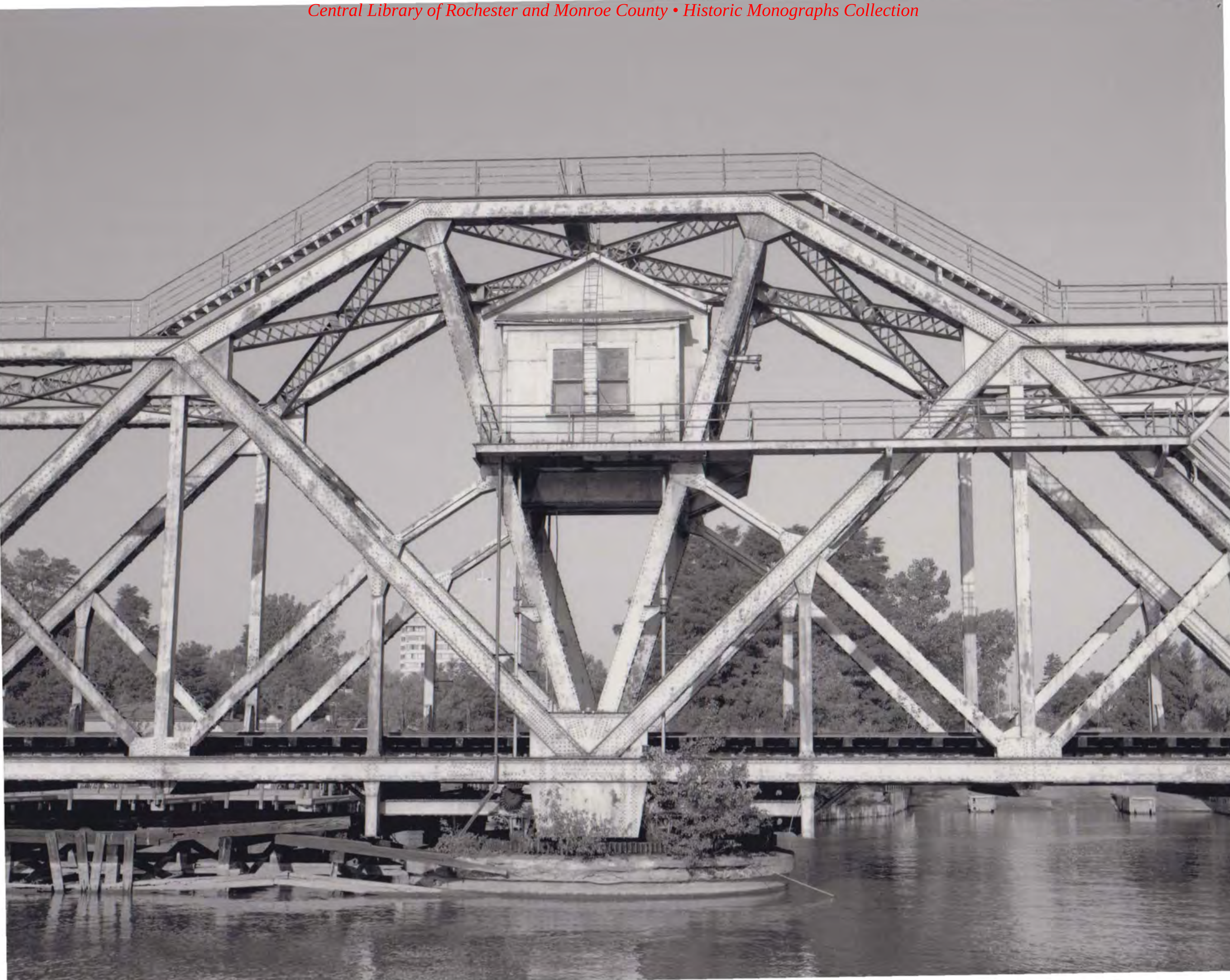


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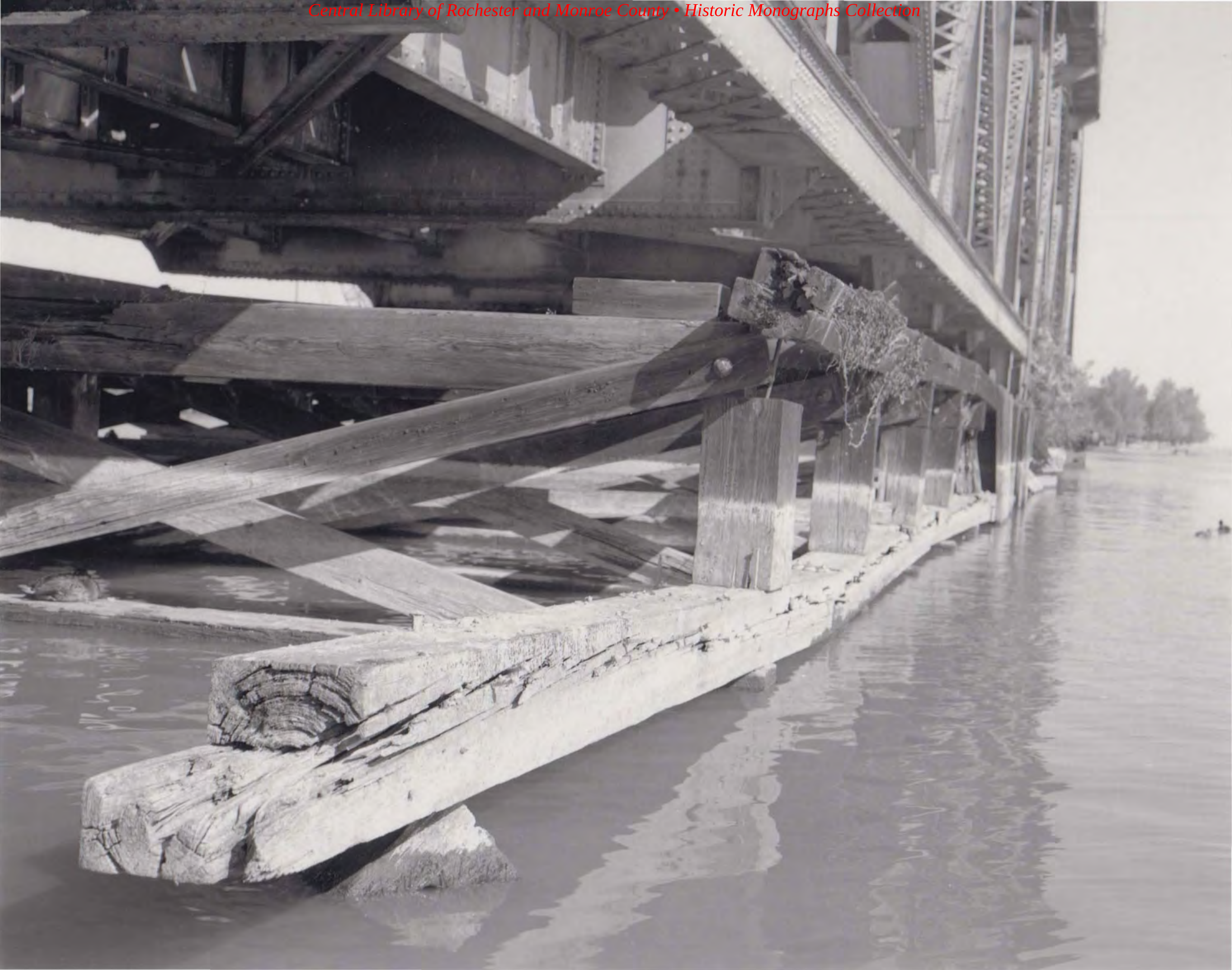


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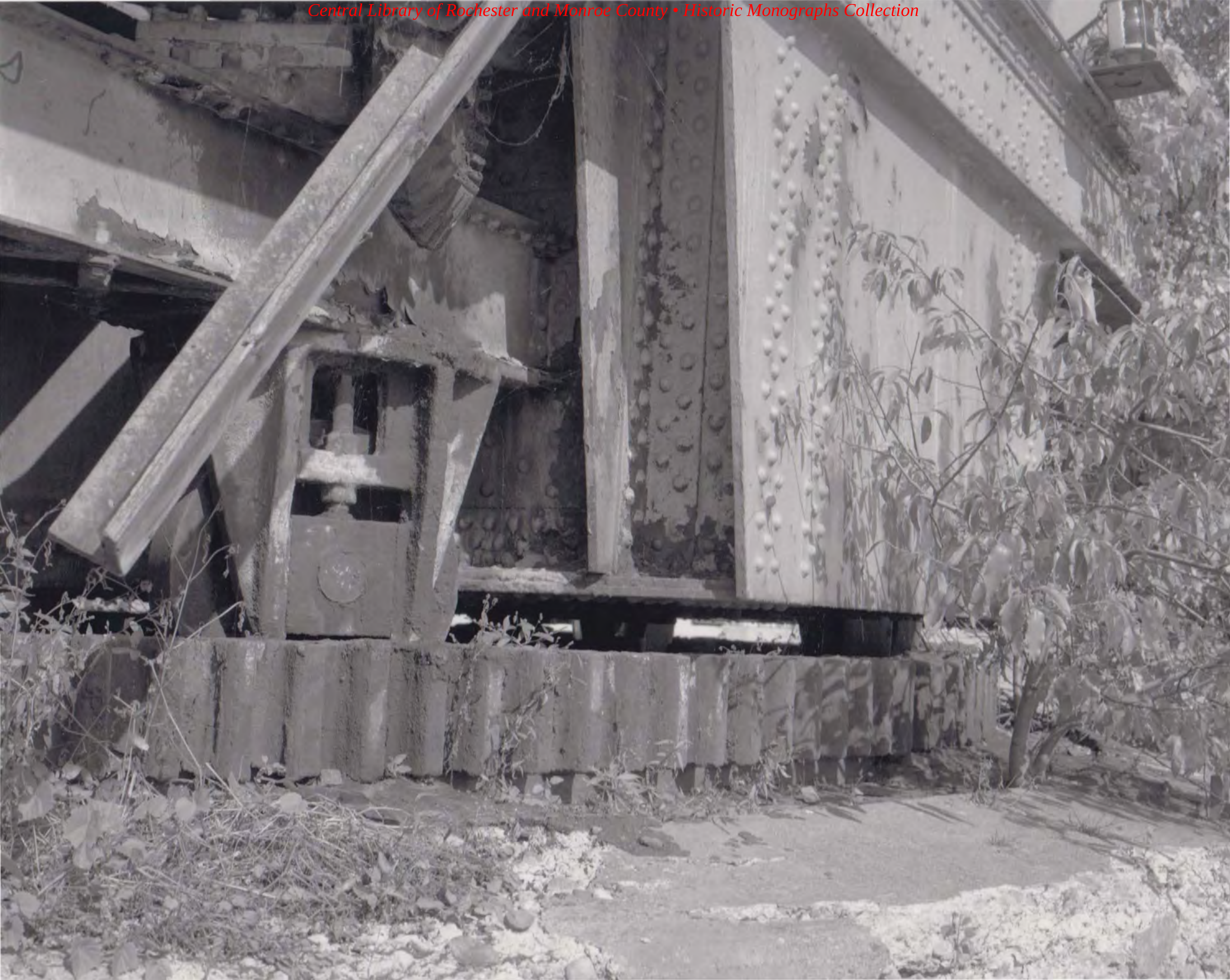

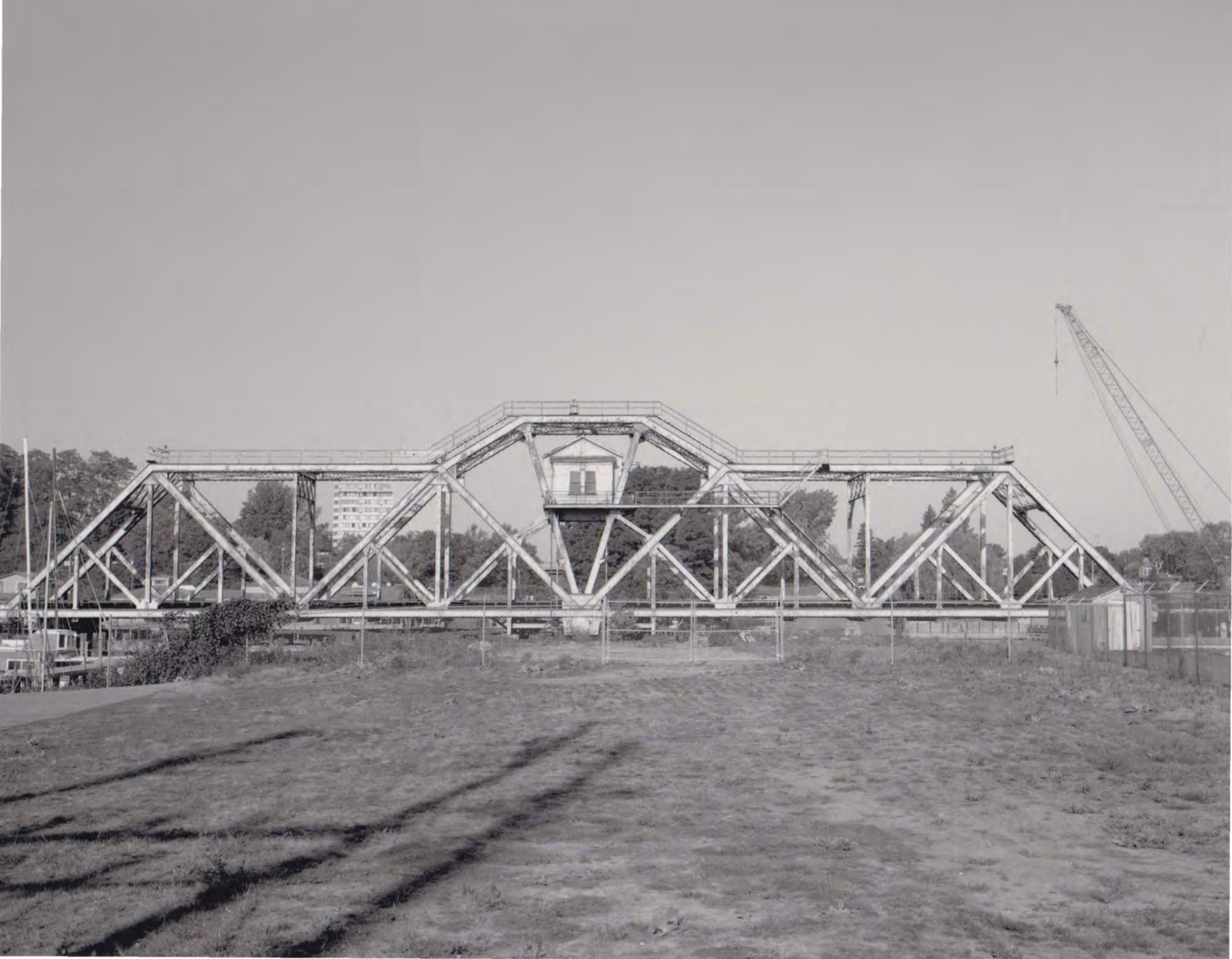

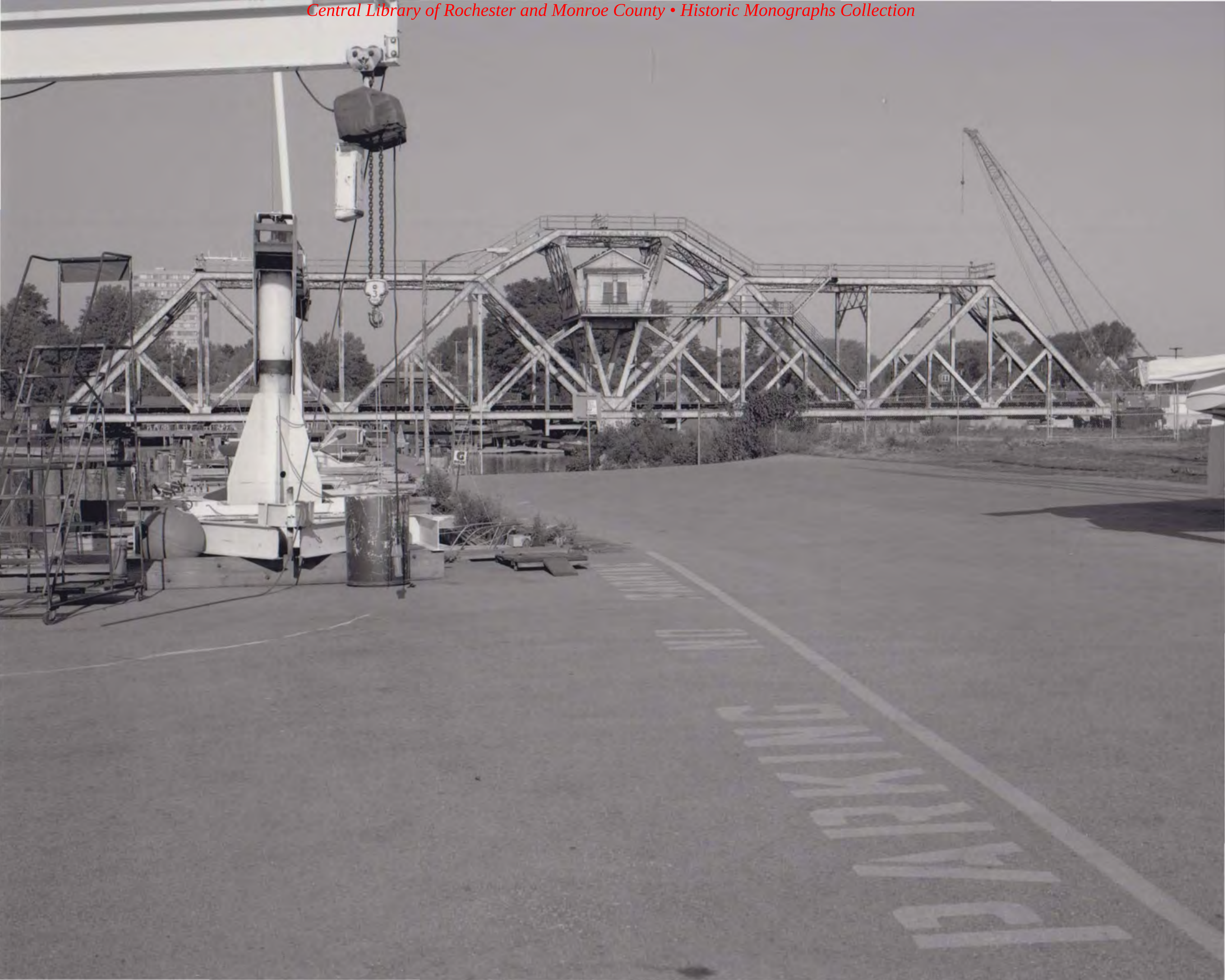
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