ELGIN, JOLIET & EASTERN RAILWAY, CALUMET RIVER BRIDGE
Chicago Bridges Recording Project
Spanning Calumet River, N. of Ewing Ave.
Chicago
Cook County
Illinois

HAER No. IL-149

PHOTOGRAPHS

HISTORIC AMERICAN ENGINEERING RECORD
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HISTORIC AMERICAN ENGINEERING RECORD

INDEX TO PHOTOGRAPHS

EAST DIVISION STREET BRIDGE (DIVISION STREET CANAL BRIDGE) HAER No. IL-147
Chicago Bridges Recording Project
Spanning North Branch Canal at West Division St.
Chicago
Cook County
Illinois

Jet Lowe, Photographer, summer 1999.

IL-147-1 PERSPECTIVE SHOWING CROSS-TRUSSES, STITCHPLATES, WITH NORTH HALSTED BRIDGE IN BACKGROUND, LOOKING SOUTH FROM DECK.

IL-147-2 PERSPECTIVE VIEW OF WEST PORTAL, LOOKING EAST FROM NW SIDEWALK.

IL-147-3 VIEW OF EASTERN PORTAL LOOKING WEST FROM SE SIDEWALK.

IL-147-4 VIEW OF EAST CANAL PIER FROM WEST; ALSO DECK SUPERSTRUCTURE.

IL-147-5 VIEW OF COUNTERWEIGHT AT LOWER BUFFER, LOOKING WEST FROM WEST CANAL PIER.

IL-147-6 DETAIL OF TRUNNION SUPPORT JOURNAL LOOKING WEST FROM WEST CANAL PIER.

IL-147-7 VIEW OF REDUCTION GEARS. TRUNNION SUPPORT GIRDERS, SIDES OF COUNTERWEIGHTS, WITH LOWER BUFFERS, LOOKING WEST FROM WEST CANAL PIER.

IL-147-8 VIEW OF DRIVE TRAIN, RACK AND PINION. LOOKING NE FROM WEST GEAR ROOM.

INDEX TO COLOR TRANSPARENCIES

All color xeroxes were made from a duplicate color transparency.

Jet Lowe, Photographer, summer 1999.

IL-147-9 PERSPECTIVE VIEW OF WEST PORTAL, LOOKING EAST FROM NW SIDEWALK.

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HISTORIC AMERICAN ENGINEERING RECORD

EAST DIVISION STREET BRIDGE
(DIVISION STREET CANAL BRIDGE)

HAER No. IL-147

Location:	Spanning North Branch Canal of the Chicago River at West Division Street, Chicago, Cook County, Illinois. USGS Quad: Chicago Loop UTM: 16/446145/4639040
Date of Construction:	1903
Designer:	Roemheld and Gallery (Jules E. Roemheld and John J. Gallery), Chicago, Illinois
Builders:	Roemheld and Gallery (Jules E. Roemheld and John J. Gallery) Chicago, Illinois
Present Owner:	Chicago Department of Transportation, Chicago, Illinois
Present Use:	Highway bridge
Significance:	When Chicago became a major commercial and industrial center after the Civil War, the most common American drawbridge was the swing bridge, horizontally rotating on a center pier to open two channels. The center pier, however, became a navigational hazard for the ever-larger craft of the late nineteenth century, especially on crowded, narrow waterways such as the Chicago River. During the late 1890s, Chicago City Engineer John Ericson initiated a planning study to find an alternative to the swing span. Finding inspiration in the 1894 Tower Bridge in London, England, the municipal engineering staff developed a new movable-bridge design. The type was known as a double-leaf bascule, French for "seesaw." Each movable leaf rotated vertically on a fixed, horizontal steel axle, or trunnion, leaving the entire river channel open for shipping. With the front of each leaf counterbalanced by weights at the rear, relatively small motors could open and close the span. Completed in 1903, the East Division Street Bridge embodied the earliest version of the city-sponsored bascule design selected for construction.

Historian: Jeffrey A. Hess, August 1999.

Project Description: The Chicago Bridges Recording Project was sponsored during the summer of 1999 by HABS/HAER under the general direction of E. Blaine Cliver, Chief; the City of Chicago, Richard M. Daley, Mayor; the Chicago Department of Transportation, Thomas R. Walker, Commissioner, and S. L. Kaderbek, Chief Engineer, Bureau of Bridges and Transit. The field work, measured drawings, historical reports, and photographs were prepared under the direction of Eric N. DeLony, Chief of HAER.

Description[1]

Located about one mile northeast of Chicago's main downtown business district, the East Division Street Bridge carries highway and pedestrian traffic over the North Branch Canal, a narrow waterway that bypasses a bend in the North Branch of the Chicago River. Between the river on the west and the canal on the east lies Goose Island, a mile-long artifact of the canal's completion in the 1850s.[2] Goose Island is widest at its middle, measuring about one-half mile across. At that point, it is bisected by Division Street, historically the area's main east-west thoroughfare. The island's first bridges on this route were center-pier swing spans, built over the river in 1869 and over the canal in 1870. They were known, respectively, as the West Division Street Bridge and the East Division Street Bridge, their designations reflecting their geographic orientation to the island. Initially, these historic names also applied to the two replacement structures constructed in the opening years of the twentieth century, the new East Division Street Bridge being completed in 1903 and the new West Division Street Bridge in 1904.[3] During this period, the area in the immediate vicinity of the East Division Street Bridge was given over to coal yards and lumber yards.[4] Although these businesses no longer survive at the scene, their former locations are, for the most part, still marked by open space. Redevelopment, however, has occurred south of the bridge on the west side of the canal in the form of a Federal Express service center, constructed in the last decades of the twentieth century.

The 1903 East Division Street Bridge was a movable bridge of the double-leaf bascule variety.[5] Named for the French word for "seesaw," a bascule provided a clear channel for

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[1] Unless otherwise noted, this description of site and structure is based on field inspections conducted by the author in July and August 1999.

[2] Perry R. Duis and Glen E. Holt, "Chicago's Only Island," *Chicago History* (February 1979):170.

[3] The dates of all Chicago highway bridges constructed before 1950 can be found in City of Chicago, Department of Public Works, Bureau of Engineering, Division of Bridges, "Bridge History and Data," Drawing Nos. 16188-16192, 1943, rev. 1950, in Chicago Department of Transportation, Plan File Archives, 30 North LaSalle Street, Chicago, Illinois (hereafter cited as CDT Plan Archives). For use of the historic names, see *Mayor's Annual Address and the Twentieth-Eighth Annual Report of the Department of Public Works . . . Fiscal Year Ending December 31, 1903* (Chicago: Allied Printing, 1904), 61. Eventually the historic nomenclature proved confusing, especially after city street maps began designating the bridges' shared route as West Division Street. To identify the two structures more clearly, city engineers adopted the practice of calling them the Division Street River Bridge and the Division Street Canal Bridge. This study, however, will refer to the canal crossing by its historic name, the East Division Street Bridge.

[4] City of Chicago, Bureau of Engineering, "Plat of Division St. Bridge and Vicinity, North Branch Canal," Drawing No. 2019, November 1899, in CDT Plan Archives.

[5] Roemheld and Gallery, Plans for Division Street Bridge, Drawing Nos. 24065-24073, 1900, in CDT Plan Archives; see also Donald N. Becker's brief comments on the East Division Street Bridge in "Development of the Chicago Type Bascule Bridge," *American Society of Civil Engineers Transactions* (February 1943): 274-276.

waterway traffic by vertically rotating a span, or leaf, around a horizontal axis. In the engineering literature, the East Division Street Bridge represented a distinct design known as a "Chicago Type Bascule," so called because it was originally developed, and then widely employed, by Chicago municipal engineers for the city's numerous highway crossings of the Chicago River.[6] As exemplified by the East Division Street Bridge, a Chicago Type Bascule exhibited the following basic characteristics: two counterbalanced, truss-supported leaves rotating on fixed, horizontal, steel trunnions, or axles; counterweights rigidly attached to the rear of the trusses beneath the bridge's deck, or roadway level; and electric-powered operating machinery that opened and closed the leaves by means of a pinion-activated rack incorporated into the rear of each truss.

Measuring about 240 feet in length from abutment to abutment, the East Division Street Bridge consisted of two symmetrical halves, each containing a fixed, steel-girder approach section and a movable leaf supported by three riveted, 101-foot-long, steel trusses spaced on 21-foot centers. The eight-panel trusses were modified versions of a Pratt truss, the most common form of highway bridge built in the United States during the early twentieth century. The East Division Street trusses differed from the standard highway Pratt in the configuration of their tail ends. Instead of displaying inclined end posts at the shore portals, the tail ends of the trusses arced upward from the roadway in a bold curve. To supply rigidity to these tall rear members, the trusses' portals incorporated deep overhead lateral bracing, which was ornamented with punched-out, inverted "Y" designs. The remaining forward panels gradually decreased in depth, so that additional overhead bracing was unnecessary. The East Division Street Bridge, therefore, resembled an overhead truss near the shore and a pony truss over the waterway. The approach section at each end of the bridge was 60-feet in width and carried a wood-decked roadway with wood-block pavers, flanked by ten-foot concrete sidewalks. The overall width of each movable leaf was also 60 feet, although the wood deck within its trusses was only 42-feet wide. The balance was made up by two nine-foot-wide metal brackets cantilevered from the bottom chords of the outside trusses. The brackets carried eight-foot-wide plank sidewalks, each flanking an 18-foot-wide roadway separated by the center truss. Each roadway carried streetcar tracks.

The bridge's stone-capped concrete substructure consisted of an abutment on the canal bank, a pier at the water line, and a second pier in the waterway itself. Resting on wood piling, the two piers carried the entire weight of the movable leaf, which was counterbalanced by cast-iron blocks attached, at the bottom chord, to the tail end of each of the three trusses. The counterweight arrangement was calculated to place the leaf's center of gravity near the center of the arc formed by trusses' curved rear members. This point was at the same level as the trusses' bottom chords. At the center of gravity, the bottom chords of each truss were rigidly connected

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There are no as-built drawings or shop drawings for the bridge. Nor are there detailed descriptions or close-up photographs of the original construction. The design drawings, therefore, are the major source for the structure's original detailing.

[6] See, for example, C.B. McCullough and Phil A. Franklin, "Bascule Bridges," *Movable and Long-Span Steel Bridges*, ed. George A. Hool and W.S. Kinne (New York: McGraw-Hill Book Company, 1923), vol. I, 20.

to a transverse, 15-inch-diameter, cast-steel trunnion, designed to serve as a rotating axle for lifting and lowering the movable leaf. As measured over the waterway from leaf-to-leaf, the trunnions stood 149 feet apart. Bearings enclosed each end of the trunnions, and these fixtures rested on 33.5-foot-long, riveted, steel, triangular trusses that spanned the two piers. The triangular trusses also held built-up steel columns carrying transverse steel girders supporting the front part of the bridge's fixed approach section. The approach section joined the movable-leaf roadway on the water side of the trunnions. The location of this joint was one of the bridge's significant design features. It ensured that highway traffic entered the movable leaf in front of the center of the gravity, so that there was no danger of the live load opening the leaf.

Since the movable leaves were counterbalanced, relatively little power was required to open and close the bridge. For each leaf, the motive force was a single, direct-current, 75-horsepower motor mounted, along with the rest of the lifting machinery, on an inclined steel platform spanning the abutment and first pier beneath the approach roadway.[7] The drive train employed two transverse shafts with open gearing. Mounted on the main drive shaft were three pinions, each engaging an open rack bolted to the curved tail end of one of the movable-leaf trusses. To open the leaf, the drive chain powered the racks downward causing the trusses to rotate on their trunnions, thereby lifting the front of the leaf away from the waterway. As the tail ends of the trusses moved downward, each descended into a concrete-and-steel-lined pit that had been individually excavated in the floor of the machinery area. In fully open position, the bridge provided a clear channel of 80 feet. Closing the leaf was simply a matter of reversing the motor.

To cushion the leaf's movement at each end of travel, the tail ends' of the trusses were provided with a pair of piston-like pneumatic buffers, one mounted on the underside of the fixed approach section and the other positioned directly below on the first pier. The upper buffer was activated by a metal bumper located on the upper part of the truss, just above the curved rack. As the tail end of the truss descended into the substructure during the leaf's opening cycle, the bumper eventually came into contact with the upper buffer's piston, pushing it downward until compressed air in the piston chamber brought the movement to a halt. The lower buffer retarded the movement of the leaf during the closing cycle. In its case, as the tail end of the truss moved upward, a steel pin protruding from the counterweight engaged a looped eye bar that was an extension of the lower buffer's piston. The piston ascended with the counterweight pin, compressing the air against the top of the piston chamber, thereby arresting the motion. The two buffers were vertically connected by a pinion-and-rack arrangement that helped reset their respective pistons. Additional equipment for the bridge's operation included drive-train emergency breaks and electric-powered, bolt-type center locks, which tied together the truss ends of the two movable leafs in order to ensure rigidity of the bascule span under live load. For governing the movement of the center locks and drive train, each leaf had its own electric-powered control equipment, sheltered in a wood-framed, hip-roofed operator's house standing adjacent to the fixed approach section on a steel framework supported directly by the

[7] The machinery area between the abutment and the first pier is currently enclosed by siding. Although the design drawings are silent on the matter, the original construction, in the interest of public safety, probably contained a similar feature.

substructure. The west-leaf house stood on the north side of the bridge; the east-leaf house on the south side.

Despite major rebuilding over the years, the East Division Street Bridge still retains the original configuration of its substructure and superstructure.[8] The bridge's drive trains, minus their motors, are also still in place beneath the approach sections, as are the lower buffers, although their design has been modified.[9] The upper buffers have been removed. Bolt-type center locks still keep the movable leaves rigid under live load. The bridge has been redecked on several occasions. It now carries a bituminous-covered concrete slab on its approaches and an open-grid steel roadway on its movable leaves.[10] The bridge's control equipment has been removed and the upper portions of the operator's houses demolished, leaving behind wood-sided remnants capped with plywood at roadway level. Although Division Street Bridge continues to carry pedestrian and highway traffic, it no longer serves as a movable span.

History

In the late nineteenth century, the City of Chicago followed a pay-as-you-go policy for municipal improvements. One result was a chronic shortage of funds for public works, especially in the area of bridge maintenance.[11] The severity of the problem became apparent in the summer of 1898, when the Chicago Department of Public Works completed a systematic inspection of municipal highway spans. As City Engineer John E. Ericson informed the City Council in September of that year, the inspection revealed "a condition that is simply deplorable." Remedial action was essential: "Some of the structures are veritable relics . . . and will shortly become a menace to public safety unless attended to without delay."[12]

In Despite Ericson's pleas, money was not immediately forthcoming for bridge repairs.

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[8] The bridge received its first major overhaul in the early 1930s, when the movable-leaf trusses were reinforced and the counterweights, trunnion trusses, and floor systems rebuilt. Similar work was undertaken in 1969, followed by an extensive rehabilitation of structural steel in the movable-leaf trusses in the early 1980s. See drawings dated 1932, 1969, and 1982 in CDT Plan Archives.

[9] The lower buffers currently in place resemble those installed on the West Division Street Bridge in 1904. Although the new design was somewhat different in detailing, its operating principle was the same. For a drawing of the West Division Street Bridge's lower-buffer design, see Jeffrey A. Hess, "West Division Street Bridge," HAER No. IL-148, 1999, HABS/HAER Collection, Library of Congress, Washington, D.C.

[10] The bridge's first steel-grid roadways were installed in the mid-1950s; see drawings dated 1954 in CDT Plan Archives.

[11] City of Chicago, City Council, Proceedings, 14 October 1899, 1336, in Public Documents Division, Harold Washington Municipal Library, Chicago; *Mayor's Annual Message and Twenty-Third Annual Report of the Department of Public Works . . . 1898* (Chicago: Pettibone and Co., 1899), 46-47. Hereafter, the yearly statements of the Department of Public Works will be cited as *DPW Annual Report*, with the appropriate year.

[12] City Council, Proceedings, 12 September 1898, 587.

A year passed, and Ericson again called the bridge problem to the City Council's attention. Highway crossings had already been closed at Ninety-Fifth Street (Calumet River), Clybourn Place (North Branch of the Chicago River), and Weed Street (North Branch Canal). Further closures, Ericson warned, could soon be expected at Goose Island, where almost all the bridges were unsafe. The situation was particularly bleak at the East Division Street Bridge, a center-pier swing plan constructed in 1870. "[Its] wooden members, " reported Ericson, " are rotten in most cases. Center diagonals [have] sprung out of line and the iron work is very bad, besides being very light in the first place. Machinery breaks at intervals and center pier is giving way."[13] Finally responding to the emergency, the City Council authorized the replacement of the Clybourn Place and Ninety-Fifth Street bridges, and provided funds for preparing plans for several other unsafe spans. As if to underscore the continuing urgency of the situation, the Department of Public Works almost immediately closed the East Division Street Bridge. In January 1900, the City Council approved its replacement as well, with the stipulation that the street railway company using the crossing should be responsible for half the construction cost.[14]

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Only five months elapsed between the city's authorization of the new East Division Street Bridge and the awarding of the construction contract. A good two years, however, had gone into planning for the bridge's general design. During the 1890s, the Department of Public Works had experimented with several types of movable bridges in an attempt to find a substitute for the common center-pier swing span, which had become a navigational hazard on Chicago's narrow waterways for the ever-larger vessels of the late nineteenth century. The city's first alternative to the swing span was a folding-leaf "jackknife" bridge, constructed over the North Branch Canal at Weed Street in 1891. This was followed by two other movable-bridge designs, both constructed over the South Branch of the Chicago River, a vertical-leaf span at South Halsted Street in 1894, and a rolling-lift span at West Van Buren Street in 1895.[16] All three of these bridges employed newly patented designs that required the city to pay royalties for their use. Despite this expense, none of the designs was free from structural or mechanical defects, a situation that seems to have

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[13] City Council, Proceedings, 18 September 1898, 1060, 14 October 1898, 1336.

[14] City Council, Proceedings, 18 September 1899 (1148, 1173), 14 October 1899 (1336), 22 January 1900 (2244).

[15] City Council, Proceedings, 18 September 1899 (1148, 1173), 14 October 1899 (1336), 22 January 1900 (2244).

[16] Thomas G. Pihlfeldt, "Designing," *DPW Annual Report, 1900*, 87-88.

particularly irked Ericson, a Swedish-born-and-trained engineer who had considerable experience in designing water-related structures. In 1897, Ericson became head of municipal engineering in Chicago, and, by his own account, he "very soon after recommended that the city take up the question of investigating movable bridges for the purpose of designing their own bridges." To assist with the study, Ericson called on Thomas G. Pihlfeldt (1858-1941), a Norwegian immigrant with German engineering training who had been with the city's bridge division since 1894.[17]

According to Pihlfeldt, Ericson wanted "a critical analysis of the literature on movable bridges built in the United States and Europe, with the view of selecting a type of bridge suitable to the requirements of the Chicago river and its branches." By 1899, Ericson and Pihlfeldt had decided that the best model for the city could be found in the Tower Bridge of London, England. Completed in 1894, this structure was a counterweighted, double-leaf, fixed-trunnion bascule with below-deck operating machinery.[18] The counterbalanced-lever principal of the Tower Bridge was appealing for three main reasons. First, it relied on relatively simple operating machinery that was fairly easy to manufacture and install. Second, it was patent-free, so that its use entailed no royalty payments. Third, it dictated a bridge with a fixed center of gravity, reducing the possibility that the action of the movable span might rock the bridge's substructure. This last consideration was especially important in an area such as Chicago, where unyielding foundations were extremely difficult to achieve. Again according to Pihlfeldt, "This type was ... discussed in detail and three complete designs were made, differing in appearance, method of mounting, etc., but all involving the main feature, that of revolving on a fixed trunnion."[19] To test its new designs on the open market, the city made them available for public inspection and announced a competition to design and build the Ninety-Fifth Street Bridge and the East Division Street Bridge. The specifications gave the following details:

The bridge shall be a movable structure without center pier and shall leave a channel with a clear opening of 120 feet for Ninety-fifth street and 80 feet for Division street. The bridge shall have two roadways 18 feet in the clear between wheel guards and two sidewalks 8 feet in the clear, or one roadway 38 feet in the clear between wheel guards and two sidewalks 8 feet in the clear, and shall have an overhead clearance of 16 feet. There must be under the bridge a clear

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[17] "Testimony of John Ericson," *The Scherzer Rolling Lift Bridge Company vs. City of Chicago and Great Lakes and Dock Company*, 63, U.S. Court of Appeals, Seventh Circuit, Records and Briefs, October 1924, Case No. 3606, in Record Group 276, National Archives, Chicago. For Ericson's biography, see John W. Leonard, ed., *The Book of Chicagoans* (Chicago: A.N. Marquis and Company, 1905), 191; *Prominent Citizens and Industries of Chicago* (Chicago: W.P. Dunn Co. for German Press Club of Chicago, 1901), 115-116. On Pihlfeldt, see Kenneth Bjork, *Saga in Steel and Concrete: Norwegian Engineers in America* (Northfield, MN: Norwegian-American Historical Association, 1947), 121; "Pihlfeldt Dies at 82," *Chicago Daily News*, 23 January 1941, 14.

[18] "Testimony of Thomas G. Pihlfeldt," *Scherzer vs. Chicago*, 93. Pihlfeldt identified the Tower Bridge as the model in Dan Fogle, "Modest Man is Pihlfeldt," *Chicago Daily New*, 15 October 1936, 21. For a description of the Tower Bridge, see Ottis Ellis Hovey, *Movable Bridges* (New York: John Wiley and Sons, 1926), vol 1, 83-88.

[19] Pihlfeldt, "Designing," *DPW Annual Report, 1900*, 88.

height of 16 ½ feet above Chicago datum for a space of at least 40 feet at right angles to the center of the channel. The general appearance of the bridge shall be as graceful and artistic as the nature of the structure will permit.[20]

Bids for the Ninety-Fifth Street Bridge and the Division Street Bridge were opened within two weeks of each other, on 15 May and 1 June 1900, respectively. The Chicago firm of Roemheld and Gallery was the low bidder in both cases and secured both contracts, which were in the amount of $152,00 for Ninety-Fifth Street and $133,000 for Division Street. The competition results vindicated the municipal engineers' efforts, as Roemheld and Gallery had based their winning bids on one of the city's designs.[21]

In July 1900, Roemheld and Gallery began work at the Division Street bridge site by removing the old swing span. Construction on the new bridge commenced a month later, with the erection of curb walls for the approaches, followed soon afterwards by the placement of coffer dams in the canal channel, preparatory to building the bridge's substructure. By the close of 1900, the contractors had completed the coffer dams and driven wood piling for the bridge's concrete foundations. The city bridge division's annual report for the year announced that "on the substructure 46 percent of the work has been completed, the substructure by estimated cost being 45 per cent of the completed structure."[22] Although work had proceeded apace, it now ran into a serious obstacle. The coffer dams obstinately leaked, a problem that also delayed Roemheld and Gallery's progress on the Ninety-Fifth Street Bridge, which they were building at the same time. At the East Division Street Bridge, the contractor's solution was to rebuild the coffer dams as double-walled structures, but in excavating for this work, the construction crew encountered still more leakage from a city water tunnel under the canal. Further delays resulted while the tunnel was bulkheaded. Roemheld and Gallery did not begin placing concrete for the bridge's piers until August 1901, and the full substructure was not completed until December.[23] Although the contractors made good time on their superstructure work, it was still more than a year before the East Division Street Bridge finally opened to traffic in February 1903. Largely

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[20] Pihlfeldt, "Designing," *DPW Annual Report, 1900*, 90.

[21] Pihlfeldt, "Designing," *DPW Annual Report, 1900*, 91. The fact that Roemheld and Gallery selected the city's design is perhaps not surprising; partner Jules E. Roemheld ((1865-1947), a graduate in civil engineering of Rensselaer Polytechnic Institute, had served as chief engineer of the city's bridge division from 1896 to 1898. After leaving the municipal payroll, Roemheld went into the contracting business with John J. Gallery, about whom little is known. The two men stayed together until 1907, when Roemheld organized his own firm, Roemheld Construction Company. In 1914, this enterprise was absorbed by Great Lakes Dredge and Dock Company. Roemheld remained with the amalgamated firm until his retirement in 1939. His obituary credits him with serving as a "consultant in the construction of the Golden Gate bridge in California." See John William Leonard, *Who's Who in Engineering, 1922-1923* (New York: John W. Leonard Corporation, 1922), 1073; "[Obituary of] of Jules Eugene Roemheld," *Chicago Tribune*, 18 February 1947, 25.

[22] Walter Cahill, "East Division Street Bridge," *DPW Annual Report, 1901*, 100.

[23] George F. Samuel, "Construction," *DPW Annual Report, 1902*, 101-103.

because of the unforseen difficulties with the city's water tunnel, the bridge's total cost, at $194,150, was nearly fifty percent over the bid price. The Ninety-Fifth Street Bridge, even more over budget, opened two months later.[24]

The delays in constructing the Ninety-Five Street and East Division Street bridges introduced a curious anachronism into the history of Chicago bridge building. Although these two structures embodied the earliest version of the city's bascule design, neither was the first of the city's bascule bridges to be completed. That honor belonged to the 1902 Clybourn Street (later renamed Cortland Street) Bridge, which incorporated a significant design modification.[25] After the city had called for bids for designing and building the Ninety-Fifth Street and East Division Street bridges, the Commissioner of Public Works, at Ericson's request, submitted the city's prototype bascule designs to a review panel of independent engineers. Two months later, in July 1900, the consultants issued their report, which approved the overall fixed-trunnion concept, but suggested certain structural modifications. The recommendations included: (1) lowering the river end of the abutment so that its base would be at the same level as that of the river pier; (2) reinforcing the substructure concrete with a steel framework; and (3) laterally connecting the tail ends of the three bascule trusses for the sake of rigidity and excavating a single tail pit to receive them during the bridge's opening cycle.[26] The city incorporated the first recommendation into the design of the East Division Street and Ninety-Fifth Street bridges, and perhaps the second recommendation as well, the final cost accounting for the East Division Street Bridge included a charge for "extra medium steel," which may have been for substructure reinforcing.[27] The consultants' third recommendation apparently was not considered to be economically feasible for the East Division Street and Ninety-Fifth Street bridges, probably because it would have entailed a major reworking of the contractor's designs upon which the construction bids were based. These two bridges, therefore, were built according to the city's original design as adopted by the contractor, with three separate tail pits for each movable leaf. The single tail-pit design, however, was applied to the Cortland Street bridge, and it became a standard feature in all subsequent bascules constructed by the city.

Ericson and his colleagues in the city's bridge division had developed their fixed-trunnion bascule design to keep the Chicago River navigable for the city's commercial and industrial interests. During the first decades of the twentieth century, however, Chicago shipping patterns significantly changed, as the largest carriers increasingly bypassed the Chicago River's entrance on Lake Michigan near the downtown district in order to serve new manufacturing

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[24] George F. Samuel, "New Bridge Construction," *DPW Annual Report, 1903*, 109; "[Cost of] East Division Street Bridge," n.d., Drawing No. 2032A, in CDT Plan Archives.

[25] "Bascule Bridge Over the Chicago River at Clybourn Place, Chicago," *Engineering News* 45 (31 January 1901):75-79; *DPW Annual Report, 1904*, 134.

[26] "The Chicago Type of Bascule Bridge," *Engineering Record* 42 (21 July 1900):50-52.

[27] Becker, 274; "[Cost of] East Division Street Bridge."

plants located near a deeper harbor at the mouth of the Calumet River in south Chicago. By the mid-1920s, Chicago River shipping tonnage had fallen off to such an extent that the Department of Public Works even suggested the adoption of "a fixed bridge policy" that "could be established beginning 1925, by converting or replacing the 41 existing [movable] bridges, starting in the outlying districts and gradually approaching the river mouth within ten years."[28] If such a policy were to be implemented, the city engineers projected an annual savings of almost $3 million, as movable bridges were much more expensive than fixed bridges to maintain and rebuild. At least partly because of opposition by the Army Corps of Engineers, which held to the belief that the Chicago River should be maintained as a navigable waterway, the city's movable bridges remained in operation.

Chicago's movable bridges proved to be a national asset during World War II, when commercial shipping on the Chicago River markedly increased. But the upsurge in traffic was a wartime anomaly rather than a revitalization. In the post-war period, shipping once again declined, and bridge openings increasingly served the needs of pleasure craft. In 1971, the city administration under Mayor Richard B. Daley once again called for closing many of the river spans, especially on the northern parts of the waterway. As the mayor's office reported, "The bridges are seldom lifted and permanent closing would mean a considerable saving on upkeep of the costly lift machinery . . . . Practically all the river traffic, including barges and tugs, have clearance to pass under the bridges without elevating them."[29] The Army Corps of Engineers eventually agreed, and by the 1990s, all of the North Branch and North Branch Canal bascules, including the East Division Street Bridge, were functioning as fixed highway spans.

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[28] City of Chicago, Department of Public Works, Bureau of Engineering, Division of Bridges, "Preliminary Report on Movable Bridges vs. Fixed Bridges," 16 April 1923, 1-2, in Government Documents Division, Harold Washington Municipal Library. The shift in shipping patterns can be traced in the comparative tonnage statistics for the Chicago River and Calumet Harbor that were presented each year by the Department of Public Works in its annual reports.

[29] "Plan to End Operation of 6 Lift Bridges," *Chicago Sun-Times*, 16 November 1971.

Sources Consulted

Published

"Bascule Bridge over the Chicago River at Clybourn Place, Chicago." *Engineering News* 45 (31 January 1901): 75-79.

Becker, Donald N. "Development of the Chicago Type Bascule Bridge." *American Society of Civil Engineers Transactions* (February 1943):263-293.

Bjork, Kenneth. *Saga in Steel and Concrete: Norwegian Engineers in America.* Northfield, MN: Norwegian-American Historical Association, 1947.

"The Chicago Type Bascule Bridge." *Engineering Record* 42 (21 July 1900): 50-52.

Duis, Perry R. And Holt, Glen E. "Chicago's Only Island." *Chicago History* (February 1979):170-172.

Fogle, Dan. "Modest Man is Pihlfeldt." *Chicago Daily News*, 15 October 1936, 21.

Hovey, Albert Ellis. *Movable Bridges.* 2 vols. New York: John Wiley and Sons, 1926.

Leonard, John William. *Who's Who in Engineering, 1922-1923.* New York: John Leonard Corporation, 1922.

Marquis, Albert Nelson, ed. *The Book of Chicago.* Chicago: A.N. Marquis and Company, 1905.

Mayor's Annual Message and the Twenty-Third Annual Report of the Department of Public Works. . . 1898. Chicago: P.F. Pettibone and Co., 1899.

Mayor's Annual Message and the Twenty-Fifth Annual Report of the Department of Public Works. . . 1900. Chicago: P.F. Pettibone and Co., 1901.

Mayor's Annual Message and the Twenty-Sixth Annual Report of the Department of Public Works . . .1901. Chicago: Allied Printing, n.d.

Mayor's Annual Message and the Twenty-Seventh Annual Report of the Department of Public Works . . . 1902. Chicago: Allied Printing, n.d.

Mayor's Annual Message and the Twenty-Eighth Annual Report of the Department of Public Works. . . 1903. Chicago: Allied Printing, n.d.

McCullough, C.B. and Franklin, Phil A. "Bascule Bridges." *Movable and Long-Span Steel Bridges*, ed. George A. Hool and W.S. Kinne. Vol. 1. New York: McGraw-Hill Book Company, 1923.

"[Obituary of] Jules Eugene Roemheld." *Chicago Tribune*, 18 February 1947, 25.

"Pihlfeldt Dies at 82." *Chicago Daily News*, 23 January 1941, 14.

"Plan to End Operation of 6 Lift Bridges." *Chicago Sun-Times*, 16 November 1971.

Prominent Citizens and Industries of Chicago. Chicago: W.P. Dunne Co. for German Press Club of Chicago, 1901.

Archival

City of Chicago. City Council. Proceedings. Harold Washington Municipal Library, Chicago, IL.

City of Chicago. Department of Transportation. Plan File Archives. Chicago, IL (30 North LaSalle Street).

City of Chicago. Department of Public Works. "Preliminary Report on Movable Bridges vs. Fixed Bridges." 16 April 1923. Government Documents Division, Harold Washington Municipal Library, Chicago, IL.

Hess, Jeffrey A. "West Division Street Bridge." HAER No. IL-148, 1999. HABS/HAER Collection. Library of Congress, Washington, D.C.

U.S. Court of Appeals. Seventh Circuit. Records and Briefs. *The Scherzer Rolling Lift Bridge Company vs. City of Chicago and Great lakes Dredge and Dock Company.* Case No. 3606. October 1924. Record Group 276, National Archives, Chicago, IL.