ADDENDUM TO: HAER NO. IL-144
CHICAGO AVENUE BRIDGE
Spanning N. Branch of Chicago River at W. Chicago Ave.
Chicago
Cook County
Illinois

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

HISTORIC AMERICAN ENGINEERING RECORD
National Park Service
U.S. Department of the Interior
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HISTORIC AMERICAN ENGINEERING RECORD

CHICAGO AVENUE BRIDGE

This report is an addendum to a ten-page report previously transmitted to the Library of Congress in 1999.

Location: Spanning North Branch of the Chicago River at Chicago Avenue (800 North; 640 West), Chicago, Cook County, Illinois

USGS Quadrangle: Chicago Loop Quadrangle, Illinois – Cook County
7.5 Minute Series

Present Owner: City of Chicago

Present Use: Vehicular Bridge

Significance: The Chicago Avenue Bridge represents the "second-generation" of the Chicago type trunnion bascule bridge with improvements executed in the design of the counterweights and a new rack-and-pinion assembly patented by bridge engineer Alexander von Babo in 1911 (namely, the use of an internal rack, instead of an external rack that extended along the truss superstructure's upper chords). The use of more aesthetically-pleasing pony trusses in its superstructure, which was novel at the time, quickly became preferable to the higher and more industrial-looking through trusses used on previous "first generation" bridges. It is visually similar to the Grand Avenue, Washington Street, and Ewing Street Bridges, all built within a year of each other. It features an intact oval-shaped Classically-styled bridge tender house of reinforced concrete that was designed by the architects George W. Maher and E.C. Jensen, members of the Municipal Art Commission of the Illinois Chapter of the American Institute of Architects, reflecting the new focus on civic beauty for bridges in accord with City Beautiful ideals.

Project Team: Anne Sullivan, Sullivan | Preservation, project manager
Jean L. Guarino, Ph.D., historian
Leslie Schwartz, photographer
September 2018

## PART I. HISTORICAL INFORMATION

### A. Physical History

1. **Dates of construction**: 1913-14 (opened October 15, 1914)

2. **Engineers**: John Ericson, City of Chicago Engineer; Thomas G. Pihlfeldt and Alexander von Babo, City of Chicago Bridge Engineers; architects George W. Maher and E.C. Jensen

3. **Builders**: Ketler and Elliott Company, Chicago (superstructure); Byrne Brothers Dredging & Engineering Company, Chicago (substructure)

4. **Steel Fabricators**: Toledo Bridge and Crane Company, Toledo, Ohio

5. **Original plans and construction**: The Chicago Avenue Bridge over the North Branch of the Chicago River was built as a double-leaf counter-balanced trunnion bascule span. The bridge had a clear span of 161'-3" inches between piers at datum, and a length of 188'-9" from center to center of trunnions. The overall length was 291'-3". The bridge provided a clear channel of 155' in width for the passage of vessels. Its 60' width included a 36' wide roadway with creosoted wood block pavement. The roadway had tracks for the Chicago Avenue streetcar and supports for the overhead electric trolley wires.

   The superstructure had two riveted steel pony trusses that were a distance of 39'-6" center to center. Each leaf had a depth at the free end of 11'-6" and a depth over the river piers of 27'-3", center to center of chords. The wood plank sidewalks were 8'-6" wide and carried outside of the trusses on cantilever brackets, which extended 10'-3" beyond the center lines of the chords. Affixed to the south truss of the west leaf was a cast iron nameplate that read:

CARTER H. HARRISON-MAYOR
L.E. MCGANN
COMMISSIONER OF PUBLIC WORKS
JOS. O. KOSTNER
DEPUTY COMMISSIONER OF PUBLIC WORKS
JOHN ERICSON, CITY ENGINEER
THOS. G. PIHLFELDT
ENGINEER OF BRIDGES AND HARBOR
A. VON BABO, ENGR. OF BRIDGE DESIGN

Each leaf was originally operated by two fifty horsepower electric motors. As it raised or lowered, the movable leaf rotated on two fixed axles or trunnion bearings. Reinforced concrete shafts 40' apart straddled an existing sewer tunnel that crossed the river at Chicago Avenue. Atop the counterweight pit, two longitudinal girders extended from the front wall (river pier) to the back wall (anchor pier) of the pit and provided support for the outside trunnion bearings. The entire weight of each leaf concentrated on the two bearings as it opened and the supports allowed space for the path of the large counterweight rigidly fixed to the rear end of the truss.

The weight of each movable leaf of the bridge and its operating machinery was carried on four concrete piers resting on bedrock, which was about 83' below city datum. The abutments of the short approach spans and the enclosing walls of the structure were supported on pile foundations. The west anchor piers were spaced 40' on centers, while the west river piers were spaced 1'-2" on centers, the center to center distance of the river and anchor piers being 38'-3". The spacing of the east river and anchor piers was the same as for the west piers. Below elevation –45.0 the piers were circular, the diameter being 7'. The west abutment had a total height of 22', a length of 70', and a width of footing of 13'. The east abutment was of similar construction. [1]

Operation of the Chicago Avenue Bridge was controlled from two operators' houses located at the northeast and southwest sides of the structure. From a vantage point in the upper gear room of each house, the bridge tenders controlled the electric motor, center-lock mechanism, and mechanical and pneumatic brakes that slowed the speed of the movable leaf on his side of the bridge as it reached the fully open or fully closed position. The identical bridge houses had oval-shaped footprints and were constructed with concrete that featured the same rough, granite-like finish used on the enclosure walls and sidewalk railings. The upper (control room) portion of the bridge houses was sheathed with copper and surrounded by a total of twenty-two one-over-one wood-sash windows arranged in groups that alternated with Classical pilasters. Each had a peaked roof covered with ceramic tiles. Entrance was through a wood

[1] The dimensions provided in this description were obtained from the following sources: Chicago Department of Public Works, *Annual Reports of the Board of Public Works* (Chicago, 1914) 154-155; "Design, Construction and Detailed Labor Costs of the Substructure of the Double-Leaf Trunnion Bascule Bridge at Chicago Ave., Chicago, Ill.," *Engineering and Contracting*, Vol. 42, No. 17 (October 21, 1914) 388-390; City of Chicago, Department of Public Works, Bureau of Engineering, Division of Bridges and Harbor, "West Chicago Avenue Bridge, Substructure and Superstructure – General Plan," Drawing No. 125, September 1912.

paneled door. The bridge houses had concrete spiral stairways and the control rooms were finished in wood.

6. **Alterations and additions**: Repairs to the superstructure's structural steel and machinery were undertaken in 1928. The bridge was rehabilitated in 1933. At that time, new steel rail stringers were installed as well and a new floor consisting of 6"x12' solid subplanking, with 3"x6' intermediate planks, and a 1'-5" asphalt plank surface was placed. The roadway lumber consisted of salt treated fir. The sidewalks were re-planked with 2"x8' salt treated yellow pine. The old pavement on the approaches was removed, asphalt membrane waterproofing placed, and a sandstone paving block surface was laid. The increased weight of the new bridge deck required an addition to each counterweight of approximately fifty tons of composite concrete. The total cost of this work was $23,014.[2]

   A major rehabilitation was undertaken in 1968, during which time the roadway floor framing and grating were replaced, as were the hand railings. The streetcar lines and supports for the overhead electric trolley wires were removed at this time. Additional re-decking and repairs were undertaken in 1992.[3] The exterior of the southwest bridge house appears to have remained intact until at least 1969, evidenced by a photo of the Chicago Avenue Bridge taken in that year that can be found in the James Parker Collection in the University Archives, University of Illinois at Chicago. All movable bridges in Chicago switched to one-man operation after that date and exterior alterations to the southwest bridge house were undertaken at an unknown date. Most notable was the drastic alteration of its upper control room: the copper sheathing was removed/covered with wood boards and all of its original windows were removed, as was its original roof. The clay tiles that once covered the peaked roof of the northeast bridge house were removed at an unknown date. The bridge has not been operational for at least the past twenty years and most of the controls in the upper floors of both bridge houses have been removed. Earlier sidewalk coverings have been replaced with concrete-infilled steel grating. The original cast iron nameplate has been removed from the superstructure.

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[2] DPW Annual Report, 1933: 204.

[3] Information on alterations obtained from site inspection and the following materials: Chicago Department of Public Works, "Historic Bridges Master Plan," 1985; Matthew Sneddon, "Chicago Avenue Bridge," HAER No. IL-144, Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, 1999.

## B. Historical Context

Chicago's Early Movable Bridges

Chicago's first movable bridge was built in 1834 over the main branch of the Chicago River at Dearborn Street. This wooden drawbridge was operated by chains and provided a 60' opening for the passage of vessels. In 1840, a pontoon swing bridge was erected at Clark Street. This early bridge type had a movable span that rested on a pontoon in the water and then swung to one side to provide passage. During the 1840s, variations of the pontoon bridge were erected at Wells, Randolph, and Kinzie Streets. All of these early bridges were destroyed during devastating winter floods that swept Chicago in 1849.[4]

Chicago's first iron swing bridge was built at Rush Street in 1856, marking the start of a new era in bridge construction in the city.[5] The swing bridge quickly became Chicago's predominant type of movable bridge during the second half of the nineteenth-century. This type of bridge was supported on a permanent pier located in the center of the waterway. When open, the structure rotated horizontally around the center pier and was aligned parallel to the river banks, creating a channel on each side of the pier for passage.

Although swing bridges represented an advance over earlier ferries and pontoon bridges, they were far from ideal—especially when the Chicago River was used more extensively for shipping. Chicago's waterways were increasingly plied with ever-larger lake vessels that were unable to pass the swing bridges' obstructionist mid-channel piers, and collisions between boats and bridges were commonplace. Even after the bridges changed from hand to steam power operation, they were slow to operate. Moreover, since swing bridges offered minimal barriers to approaching vehicles other than roadway gates, horse-drawn teams were in danger of falling into the water whenever they opened.

The City of Chicago experimented with a variety of movable bridge types during the 1890s in a quest to find alternatives to the swing bridge. The first attempt was made in 1891 with construction of the so-called "jack-knife" or folding bridge at Weed Street, which was a movable bridge without center pier.[6] Each leaf of the bridge was hinged at two places and in the raised position, the hinged leaves folded against the supporting towers on each bank. A second jack-knife bridge was installed at Canal Street in 1893. However, the jack-knife design was never widely used and eventually abandoned since the numerous joints required for its operation necessitated frequent and expensive maintenance.

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4 Chicago Department of Public Works Annual Report, 1901: 86.

5 Ibid., 87.

6 DPW Annual Report, 1891: 162. The jack-knife bridge design used at Weed and Canal Streets was patented by a Captain Harmon.

In 1894, another type of movable bridge—the vertical-lift—was built over the South Branch of the Chicago River at Halsted Street and designed by Kansas City-based engineer John Alexander Low (J.A.L.) Waddell. Operated on the same theory as an elevator, the bridge had a 130' long steel truss span weighing 280 tons, which was lifted vertically between two towers that rose 155' above the river level.[7] It was operated by steam hoisting machinery located on top of the lift span at its center. However, its $237,000 cost was enormous in comparison to other bridges and it required constant repairs. As a result, the vertical-lift, like the jack-knife design, was never a popular bridge design in Chicago and only one other such bridge was constructed along the Chicago River.[8]

Chicago was at the cutting edge of bascule bridge technology during the 1890s, as engineers experimented with and patented a number of different types. Bascule bridges operated on the same principal as medieval drawbridges. The modern bascule bridge is constructed of steel, machine-driven, and defined by a movable span, or leaf, balanced by a counterweight on the other side of the axis. The axis can be stationary, where the leaf rotates about a fixed trunnion (trunnion bascule), or moving, where the leaf rocks or rolls along a track (rolling-lift bascule).

Bascule bridges represented a great improvement over swing bridges. They were rapidly operated, allowed for a clear channel of navigation, and could be built close together since they swung vertically rather than horizontally. Bascule spans were also safer than swing bridges since the open leaf served as its own barrier to approaching vehicles. Bridges of this type may be either single-leaf, where the entire leaf over the waterway is raised on one side of the waterway, or double-leaf, where leaves on either side of the waterway are raised simultaneously.

Chicago's first bascule bridge was a Scherzer rolling-lift design, built near Van Buren Street in 1895 for the Metropolitan Elevated Railroad. Invented by William Scherzer, this type of bridge was raised by gears that engaged a drive rack at the rear of the span, forcing this section downward. As the forward end rose, the span rolled back (similar to the runners on a rocking chair) on a tread plate instead of rotating around a fixed axis. The Scherzer Rolling Lift Bridge Company—located in Chicago's Monadnock Building—designed thirteen vehicular bridges for the City of Chicago between 1895 and

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7 "The Halsted St. Lift Bridge over the Chicago River," *Engineering News* (19 April 1894): 320-321.

8 The vertical lift proved considerably more popular for railroad use, especially after Waddell and his new partner, John L. Harrington, brought the design to maturity with a series of refinements after 1907. The South Halsted Street vertical lift bridge was replaced by the current bridge at this location in 1932-24. The vertical lift bridge built by the Pennsylvania Railroad in 1914 along the South Branch of the Chicago River near 18th Street is extant.

1907 as well as several railroad bridges. The City paid an average of $18,000 to purchase the design and plans for each of these structures, which added a considerable sum to the total cost.[9] Another major objection to the Scherzer rolling-lift bridge design was that its rolling mechanisms necessitated massive foundations that not only lessened the width of the river channel but also proved incompatible to some river banks.[10]

Despite the introduction of three new movable bridge types—the jack-knife, Waddell vertical-lift, and Scherzer rolling-lift—as of 1895, all but five of Chicago's fifty movable bridges were still swing bridges.[11] Although some of these swing bridges were operated by steam, the majority relied upon hand power. In 1897, the U.S. Army Corps of Engineers conducted a survey of the Chicago River, which illustrated how swing bridges served as obstacles to navigation and prevented the latest 432' vessels from continuing along the waterway.[12] The survey's findings were presented to the Western Society of Engineers in June 1898 by G.A.M. Liljencrantz, District Engineer of the Army Corps of Engineers' Chicago District, an arm of the U.S. War Department that had recently become the powerful federal ally of industries shipping on the Chicago River. In Liljencrantz's report, "Obstructive Bridges and Docks in the Chicago River," he strongly argued against the further construction of swing bridges with mid-channel piers.[13]

Toward the end of the nineteenth century, declining water-borne trade highlighted the Chicago River's problems. In 1900, the City's Bridge Commissioner reported that, "There has been a decrease in the number of vessels entering the Chicago River during the year of 6.5 per cent as compared with the year 1899, and of 17.3 per cent as compared with the year 1898. The cause of this falling off in navigation is no doubt to be found in the fact that the large boats that rapidly take the place of older ones cannot successfully navigate the river owing to the obstructions met with transportation tunnels and center-pier bridges."[14]

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[9] The 1908 DPW Annual Report includes a table listing all Chicago bridges, along with the cost paid for royalties (if any) and the total cost of each structure. Other Scherzer bascule bridges were erected at Van Buren Street (1895), North Halsted Street (River, 1897), Taylor Street (1900), and Cermak Road (1906). Today there are only two extant Scherzer rolling-lift bridges in Chicago: the Cermak Road Bridge a railroad bridge built for the Pennsylvania Lines over the Sanitary and Ship Canal (1901; expanded 1909-10).

[10] Thomas G. Pihlfeldt, Assistant Engineer for the City of Chicago, voiced this objection in the 1895 *DPW Annual Report*, p. 88.

[11] DPW Annual Report, 1895: 48.

[12] G.A.M. Liljencrantz, "Obstructive Bridges and Docks in the Chicago River," *Journal of the Western Society of Engineers* (June 1898): 3.

[13] Liljencrantz, 27.

[14] DPW Annual Report, 1900: 34.

This situation finally forced government officials, industries, and navigation interests, such as the Lake Carriers Association, to demand the removal of swing bridges from the narrow, winding Chicago River. The River and Harbor Act of 1899 gave the Secretary of War authority to order bridges removed, and imposed his approval as a necessary step in constructing bridges over navigable waterways. The stage was set for the Army Corps to clear swing bridges from the river. When presented with petitions from navigation interests concerning the removal of obstructions along the waterway, the Army Corps held public hearings, which typically resulted in the Secretary of War's order that a bridge be removed.

"First Generation" Chicago-type Trunnion Bascule Bridge Design: 1900-10

Faced with the need to replace the vast majority of its swing bridges in the coming years, Chicago's bridge engineers decided to develop their own bascule bridge design. The decision was attractive as it allowed the City to avoid royalty payments on patented designs, as noted by the City's Bridge Commissioner in 1900: "The most important work done in this Division is the development and preparation of plans for bascule bridges of a new design. By this action the city is saved large sums of money which otherwise would have to be paid for royalties on patented bridges, and I am safe in saying that the city will have better and cheaper bridges."[15] The predominant patented design used by the City for vehicular bridges at that time was the Scherzer rolling-lift, with thirteen erected between 1895 and 1907.

In 1899, the City's Bridge Division undertook an extensive study of the most advanced movable bridge designs in the United States and Europe to determine which type was most suitable to the conditions of the Chicago River and its branches. Under the leadership of City Engineer John Ernst Ericson, a distinguished civil engineer, four classes of movable bridges were studied: swing bridges, vertical-lift, rolling-lift, and trunnion bascule. After an extended investigation, the trunnion bascule type was selected as the one that could most fully meet Chicago requirements, both from a practical and an economical point of view. Ericson, together with Assistant City Engineer Thomas G. Pihlfeldt and their colleagues in the Bridge Division, then developed three complete bascule bridge designs, differing in appearance, method of mounting, etc., but all involving the main feature—that of revolving on a fixed trunnion.[16]

These designs were submitted to an independent Board of Consulting Engineers, which was appointed by the Commissioner of Public Works and consisted of three well-known

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15 Ibid.

16 Thomas G. Pihlfeldt (1858-1941) was a Norwegian immigrant with German engineering training who had been with the City of Chicago's bridge division since 1894. For information on Philfeldt see: Kenneth Bjork. *Saga in Steel and Concrete: Norwegian Engineers in America* (Northfield, Minnesota: Norwegian-American Historical Association, 1947), 121; "Pihlfeldt Dies at 82," *Chicago Daily News*, January 23, 1941.

engineers: E.L. Cooley, Ralph Modjeski and Byron B. Carter. The Board selected and recommended the design designated as No. 3, with some modifications, which were subsequently carried out.[17]

The *Annual Report of the Department of Public Works* for 1900, which includes a detailed account of the process involved in developing the new Chicago-type trunnion bascule bridge, does not identify its designers by name. However, an article in the July 21, 1900 issue of *Engineering Record* noted that City Engineer John Ericson credited Edward Wilmann, City Bridge Engineer, along with Karl Lehman, Alexander von Babo and Thomas Pihlfeldt, Assistant City Engineer, for providing valuable assistance in developing the three initial designs. An article on the Chicago-type bascule bridge published in the July 28, 1900 issue of *Engineering Record* stated that, "The plans were prepared by Mr. John Ericson, city engineer,…"[18]

The Chicago type bascule bridge, as developed by City engineers from 1899 to 1900, rotated around a fixed trunnion located at the design center of gravity of the movable span or leaf. Bridges could have one or two leaves. In opening, the bridge rotated about this shaft and raised its leaves to a nearly vertical position, giving a completely clear and unobstructed passage for river vessels. Such a bridge was raised or lowered by the operation of curved racks attached to the tail ends of each truss arching above the roadway. The pinions that engaged the racks were operated by an electric motor and machinery, generally located below the roadway and controlled by an operator located in a small house near the river bank. This gearing action was aided by massive fixed counterweights at the rear of the bridge that descend into watertight pits along the river bank. When the bridge was open or opening, the trunnions in each leaf supported the entire dead weight of the structure.[19]

The selected trunnion bascule design No. 3 became the model for nearly every subsequent movable bridge constructed in Chicago. The trunnion bascule had many advantages. Its fixed center of gravity required less massive foundations than the Scherzer rolling-lift, it had a minimum of moving parts, and because its leaves were almost perfectly balanced, and the bridge could be opened and closed quickly. The trunnion style also featured a locking mechanism to prevent tipping upward when in the closed position.

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[17] DPW Annual Report, 1900: 88. The final report of the Board of Consulting Engineers was published in: "The Chicago Type of Bascule Bridge," *Engineering Record* 42 (July 21, 1900): 50-52.

[18] "The Chicago Type of Bascule Bridge," *Engineering Record* (July 21, 1900); "The Lift or Bascule Type of Movable Bridges." *Engineering Record* (July 28, 1900): 73.

[19] A detailed description of the City's Design No. 3 for a trunnion bascule bridge is included in the *DPW Annual Report* for 1900: 88-89.

A total of eight "first generation" trunnion bascule bridges were built in Chicago between 1902 and 1909 according to the design developed by City Engineers. They included the bridges at Cortland Street (formerly Clybourn Place; North Branch), 1902; East Division Street (North Branch Canal), 1903; Ninety-Fifth Street (Calumet River), 1903; West Division Street (North Branch), 1904; North Western Avenue (North Branch), 1904; Archer Avenue (South Branch), 1906; North Avenue (North Branch), 1907; North Halsted Street (North Branch), 1908; and Kinzie Street (North Branch), 1909.[20] All of these bridges had tall through-trusses braced over the roadway as well as modest, wood frame operator houses. The construction of the earliest of these "first generation" bridges was made possible by the City of Chicago's authorization in April 1900 of $850,000 for new bridges.[21]

"Second Generation" Chicago-type Trunnion Bascule Bridge Design: 1911-30

Despite the spurt of new bridge construction in the early 1900s, as of 1908 twenty-nine of Chicago's fifty-one vehicular bridges remained swing bridges, with many still operated by hand power.[22] In that year, city bridge engineer Thomas G. Pihlfeldt highlighted the dilapidated condition of swing bridges along the Chicago River's north and south branches, noting that their removal should take precedence over swing bridges along the main channel, many of which were comparatively new structures and in fairly good shape.[23]

It was not until a $4.6 million bond issue passed in the fall of 1911 that funds were made available for twenty-six new bridges.[24] This next group of "second generation" bascule bridges, completed between 1913 and 1930, incorporated a number of design improvements that distinguished them in appearance from "first generation" bridges. The later bridges featured the use of pony trusses, rail-height trusses, or deck trusses, all of which were lower in height than the more industrial looking through trusses used on "first generation" bridges. Post-1910 bridges also featured the use of two, rather than three, trusses.

These aesthetic improvements were made possible by new engineering features for moveable bridges that were outlined in a set of "General Specifications" prepared by the Bridge Division in 1912, which were discussed in the DPW Annual Report of that year:

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[20] The Archer Avenue and Kinzie Street bridges were single-leaf bridges, while the others were all double-leaf. Today, only three bridges remain from this initial group of first generation Chicago-designed trunnion bascule bridges. They are to be found at Cortland Street, West Division Street (River), and Kinzie Street.

[21] DPW Annual Report, 1900: 21; "Mayor's Veto Is Upheld," *Chicago Tribune*, April 5, 1900.

[22] Donald N. Becker, "Development of the Chicago type Bascule Bridge," *American Society of Civil Engineers* Transactions, Vol. 109 (1945); 1008.

[23] DPW Annual Report, 1908: 210.

[24] DPW Annual Report, 1912: 238. "Bonds Win; Court Acts Lose," *Chicago Tribune*, November 8, 1911.

"Since the adoption of the City type as a standard design, constant effort has been made to perfect the details structurally, mechanically and artistically…During July, after a full discussion of the specifications in use for designing our bascule bridges, new General Specifications were prepared and approved. These became effective in August and were published for the use of the bridge division. They cover the design and detailing of the structural parts and machinery of movable city bridges, and also for plate girders….The type of roadway floor has been changed to creosoted wood blocks so as to provide a more permanent flooring." [25]

One of the most significant aspects of the new design exhibited by "second generation" bridges was the internal rack patented in 1911 by Alexander von Babo, the city's Engineer of Bridge Design, which differed from the external rack that previously extended along the truss superstructure's upper chords.[26] Von Babo explained in his patent application that a rack contained internally within the trusses, used in conjunction with a transverse trunnion girder to support the trunnions, allowed space for a larger dimension counterweight of a less costly material and allowed placement of the operating machinery and gear trains directly alongside the movable truss. In addition, it "avoided use of unsightly circular racks above the top chords or beneath the bottom chords."[27]

Von Babo's patented design, which changed the location of the rack and pinion, eliminated the need for three trusses to support each leaf. After 1910, all bridges built by the city featured the use of two trusses, which made a striking difference in their appearance.

Another feature of bridge design standardized with the group of second generation bridges completed between 1911 and 1930 was the positioning of the center of gravity in the movable leaves. Ideally, the front and rear portions of a bascule leaf balanced perfectly around the trunnion, and required only the motive force needed to overcome friction to open and close. In early practice, City Engineer John Ericson feared that a perfectly balanced bridge might become unbalanced on hot days when the timber decking dried out and would rise unexpectedly. To avoid this possibility, the first bascules had their center of gravity just ahead of the trunnions and had to be raised 14" before they became balanced. Since this required heavier motors and more substantial front piers for the trusses, Thomas G. Pihlfeldt, Engineer in Charge of Bridges, convinced Ericson that the structure could be exactly balanced by building pockets into the counterweight into which cast iron or lead plates could be placed to account for weight changes caused by the weather.[28] Bridges built after 1910 incorporated Pihlfeldt's counterweight pockets,

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25 DPW Annual Report, 1912: 240.
26 Becker, 1010.
27 U.S. Patent No. 1,001,800, received August 29, 1911, Alexander F.L. von Babo, 1.
28 *Chicago Daily News*, October 15, 1936

which also served as a means to re-balance bridges in later years, when more durable concrete and steel grid decks replaced the original wood ones.[29]

Significantly, the 1912 DPW Annual Report also noted that, "Special attention has been given to the architectural treatment of the new bridges and the architects of the Chicago Plan Commission have collaborated with the Bridge Division in this work.[30] This was a reference to the efforts of Edward H. Bennett through his work as consulting architect to the Chicago Plan Commission. This quasi-public agency was established by Mayor Fred A. Busse following the publication of the 1909 *Plan of Chicago*, a document that Bennett co-authored with Daniel H. Burnham and which famously ignited interest in downtown beauty in cities nationwide.

The Illinois Chapter of the American Institute of Architects and the Chicago Municipal Art League also submitted designs to municipal officials for the artistic treatment of city bridges.[31] As plans were readied in 1911 to replace numerous downtown swing bridges with new bascule spans, these and other arts groups announced their intention to weigh-in on their designs, as reported by the *Chicago Tribune*:

"An active campaign for architecturally beautiful bridges in place of the dilapidated structures soon to be replaced by the city was inaugurated yesterday. James Wilson Pattison, secretary of the Municipal Art League, and W.M.R. French, director of the Art Institute, struck the first blows on behalf of several organizations who will interest themselves in the matter…

"The whole trouble with Chicago bridges," said Mr. Pattison yesterday, "is that they are all stock pieces of engineering. It never seemed to occur to anybody to ornament them. A bridge which is at once sturdy and stanch and beautiful to boot is what we want here—something graceful in shape and form and which is as strong and useful as if built in the old methodical way. There ought to be some art deliberately thrust upon Chicago."[32]

George W. Maher was the chairman of the Municipal Art Committee of the Illinois Chapter of the AIA, which developed a policy pertaining to all matters of municipal beautification, including bridge design. Other prominent architects on this committee included Hubert Burnham, Elmer C. Jensen, Earl H. Reed, Jr., Leon E. Stanhope, and M.J. Schiavoni. *The Economist,* Chicago's weekly business magazine, reported in 1916

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29 Matthew Sneddon, "Chicago Avenue Bridge," HAER No. IL-144, Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, 1999.

30 DPW Annual Report, 1912: 241.

31 The DPW Annual Report for 1912 noted on p. 240: "For the Chicago Avenue Bridge, the Illinois Chapter of the American Institute of Architects submitted designs for its architectural treatment and these plans were adopted."

32 "Want Grace in New Bridges," *Chicago Tribune*, May 7, 1911.

that due to this Committee's urging, "the bridge department will recommend terra cotta for the construction of all future bridge tower houses. This is a considerable step in advance, as these tower houses, heretofore constructed of wood, galvanized iron or metal, have for the most part been unsightly, so that matte glazed terra cotta as material for them will be a distinct artistic improvement."[33]

Persistent efforts by these various art and architectural organizations resulted in extensive revisions to the type and shape of trusses, the configuration and façade of operator houses and pit walls, and the ornamental detailing of sidewalk railings, light fixtures and other ornamental metal elements.[34] For example, the Washington Street and Grand Avenue Bridges, both completed 1913, were the first bridges in Chicago's central business district to feature curving pony trusses, which quickly became preferable to the higher and more industrial-looking through trusses used on previous "first generation" bridges. Pony trusses continued to be used on bridges well into the 1940s.

However, Bennett and other civic arts groups considered the use of both deck trusses and rail-height trusses aesthetically preferable to pony trusses since they were located beneath the roadway, allowing the ornamental handrails of each bridge to be easily seen. In fact, such bridges were depicted in the 1909 *Plan of Chicago*. The Jackson Boulevard Bridge was Chicago's first vehicular bridge to feature deck trusses, thereby conforming to Bennett's design criteria, which also included the design of Beaux Arts style limestone or terra cotta-clad bridge houses with octagonal plans, classical detailing, and mansard roofs. Such artfully-designed bridges were intended to enhance civic beauty while playing a pivotal role in facilitating traffic circulation, both important goals of the *Plan of Chicago*. The most visually impressive of the "second generation" trunnion bascule type is the classically-styled Michigan Avenue Bridge (1920), which was based on the contemporary Alexander III Bridge in Paris. It features gracefully arched deck trusses, integrated embankments, and four monumental Beaux Arts style bridge houses, each embellished with sculptural reliefs highlighting moments in Chicago's history.

History of the Chicago Avenue Bridge

The present-day Chicago Avenue Bridge was preceded by two hand-operated wood and iron swing spans, both of which were designed by Fox and Howard and measured 175' in length and 32' in width. The first, built 1867, was burned by the 1871 Chicago Fire and was replaced in the following year by another swing bridge that cost $20,850.[35]
In 1884, a *Chicago Tribune* article titled, "Useless Bridges," reported on how numerous swing bridges that spanned the Chicago River's North Branch—including the one at

33 "West Madison Street," *The Economist*, January 29, 1916.
34 Joan Draper, *Chicago Bridges* (Chicago: City of Chicago, 1984), 8.
35 Table titled, "Chicago Bridges, 1908," contained in the DPW Annual Report for 1908.

Chicago Avenue—were constantly out of service due to repairs. In response to complaints about the state of these bridges, the City Engineer stated that:

"The fact is, most of the bridges now in use were built at a time when Chicago was a village in comparison with its present dimensions and population, and very few of them were ever expected to accommodate anything like the traffic in which they have been subjected, and many of them should be replaced or repaired right away. This would have been done long ago but for the want of money. The city has never had enough to meet its demands."[36]

The Chicago Avenue swing bridge was subject to the same problems encountered by other bridges of this type. Once example occurred in November 1888 when a ship became stuck in the narrow passage adjacent to its center pier and the efforts of four tugs were unable to budge it after hours of work. Swing bridges also posed a danger to vehicles on the roadway, which could plunge into the river when the span was open. This occurred in September 1906 when a wagon pulled by a blind horse whose driver had dozed off fell into the river at Chicago Avenue when the bridge was open; both were drowned.[37]

On August 4, 1910, the *Chicago Tribune* reported that the U.S. Secretary of War proposed to replace the swing bridge at Chicago Avenue with a bascule bridge, with work to begin within a year.[38] Hearings were subsequently held and Secretary of War Robert Shaw Oliver sent City of Chicago an official order on January 25, 1911 to replace this bridge with either a bascule or a vertical lift bridge on or before May 31, 1914.[39] At that time the area surrounding the bridge site was heavily industrial. The sprawling 1.25-million square foot Montgomery & Ward Company catalog house had recently been completed in 1908 to the northeast, hugging the river's east bank for about 600'. Large wood sheds, a woodworking company factory, and a lumber yard were located to the southeast. Southwest of the bridge site was an iron rolling mill, warehouses for an ice company, coal sheds, and tracks of the Chicago and Northwestern Railway. Northwest of the bridge site was a large vacant parcel, an adjacent lumber yard, and a round house of the Chicago and Northwestern Railway.

The commitment to artistic bridge design was carried out at Chicago Avenue despite the industrial character of the surrounding area. An undated drawing of the bridge houses at Chicago Avenue, on file in the Chicago Department of Transportation Archives, is labeled as "Submitted by the American Institute of Architects." Engineer of Bridge

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36 "Useless Bridges: They are Generally Swung for Repairs," *Chicago Tribune*, August 29, 1884.

37 "Blind; Asleep; Both Drown," *Chicago Tribune*, September 1, 1906.

38 "Lift Bridge, Chicago Avenue," *Chicago Tribune*, August 4, 1910.

39 *Journal of the Proceedings of the City Council of Chicago*, Issue 2, (January 30, 1911): 3508.

Design Alexander von Babo reported in 1912 on the status of the bridge's design and construction:

"During the year 1912, the plans for a new bridge over the North Branch of the Chicago River at Chicago avenue, which were started in the preceding year, were continued and completed. The movable parts of this bridge will be similar to those of Indiana street bridge, now under contract; the abutments and stationary parts, however, will be given a monumental appearance by the free use of concrete for the operating houses, enclosure walls and sidewalk railings, etc., and by adding heavily built ornamental concrete pylons with elaborate light brackets, one in front of each of the main bridge trusses, and by further adding one or two pairs of light standards on heavy concrete bases to be located on the curb lines a little distance away from the bridge proper. These ornamental features of Chicago avenue bridge were designed by Messrs. G.W. Maher and E.C. Jensen of the Illinois Chapter of Architects.

"The subfoundations for the piers of this bridge consist of heavy concrete shafts spaced 40 feet apart in the clear, so that a double subway tunnel may be constructed in the line of Chicago avenue underneath the river, without interfering with or affecting the safety of the piers and pits of the bridge.

"The bridge is a double leaf trunnion bascule bridge with one roadway 36 feet in the clear between wheelguard and two sidewalks each 9 feet in the clear. When the leaves are raised, the clear opening for navigation will be 161 feet and 3 inches between river piers."[40]

The Byrne Brothers Dredging and Engineering Company began work on the substructure on March 17, 1912. The substructure work was well advanced by the end of 1913 and was completed March 23, 1914. Construction of the superstructure began February 16, 1914. The west leaf was completed May 9 and the east leaf was completed May 15, 1914. Both leaves were lowered simultaneously on August 13, 1914. The street car tracks on Chicago Avenue were connected on both approaches and the first street car crossed the new bridge on October 4, 1914. The concrete steps, sidewalks, curbs on the east approach were completed October 9th and the new bridge opened to all traffic on October 15, 1914.[41]

Upon completion, the Chicago Avenue Bridge was similar in appearance to the Washington Street, Ewing Avenue (95th Street), Webster Street, and Grand Avenue (formerly Indiana Avenue) bridges, all of which were built 1913-14 with two riveted pony trusses. These "second generation" Chicago-type trunnion bascule bridges incorporated improvements in the design of their counterweights and a new rack-and-pinion assembly patented by bridge engineer Alexander von Babo in 1911 (namely, the

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40 DPW Annual Report, 1912: 245.

41 DPW Annual Report, 1913: 275; DPW Annual Report, 1914: 154.

use of an internal rack, instead of an external rack that extended along the truss superstructure's upper chords).

Artistic treatment of the identical bridge houses at Chicago Avenue was also indicative of "second generation" bridges. Those at Chicago Avenue were situated at the northeast and southwest corners of the span. They featured graceful oval-shaped footprints, use of copper cladding, Classical detailing, and peaked roofs covered with ceramic tiles. In addition, the concrete used on the base of each bridge house featured a textured surface that emulated the appearance of granite. The Chicago Avenue Bridge was one of the first to integrate the operator's houses into the abutment masonry, where it blended more cohesively into the approaches and foundations. This was in contrast to the design of bridge houses on "first generation" bridges which had appeared as appendages suspended from the side of the fixed part of the bridge.

The Chicago Avenue Bridge had been used as a vehicular bridge and a pedestrian bridge across the Chicago River throughout its history.

"Third Generation" Chicago-type Trunnion Bascule Bridge Design: 1932-49
In 1930, the *Chicago Tribune* announced that a movement "to keep the city's new bridges in harmony architecturally with the Michigan Avenue Bridge and the new Wabash Avenue structure gained ground in the city hall yesterday as officials considered means to prevent the construction in the future of unsightly spans across the river." The announcement was spurred by a 1930 proposal by Richard W. Wolfe, the Commissioner of Public Works, to construct five new downtown bridges, including one at State Street. Interest in the artistic design of bridges remained evident at this time as the Tribune also reported that, "Under a state statute, works of art in public places and designs of all city buildings, bridges, lamps and other public structures must be approved by the Municipal Art Commission as to their design and location." Members of this quasi-public Commission in 1930 had been appointed by the late Mayor William Dever and included real estate developer Potter Potter Jr., meatpacking scion Cyrus McCormick Jr., architect Jarvis Hunt, landscape designer Jens Jensen, and artist Thomas A. O'Shaughnessy."[42]

From an architectural point of view, the period between the Great Depression and World War II constitutes the "third generation" in bridge design. Movable bridges built in the 1930s and 1940s followed established structural and architectural models, but featured simpler ornamental details. These bridges reflect the desire of design engineers to project a more contemporary image as well as the dire state of the economy, which encouraged streamlining.[43] The use of pony trusses on some bridges followed long-established

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42 "Officials Seek to Prevent Building of Ugly Bridges," *Chicago Tribune*, September 13, 1930.

43 Draper, 20.

models. The more prominent downtown bridges, such as the one at State Street, featured the use of gracefully arched rail-height trusses partially located beneath the roadway, a design long advocated by civic art groups. The bridge houses of this period feature stripped-down silhouettes, flattened rooflines, and no ornamental references to the classical past. Especially notable are the monumental bridge houses at Lake Shore Drive and North Ashland Avenue, the latter of which features distinctive Art Deco style bas-reliefs with allegorical figures representing the Chicago River.

"Fourth Generation" Chicago-type Trunnion Bascule Bridge Design: 1952-67

The "fourth generation" trunnion bascule bridges erected in Chicago during the 1950s and 1960s were sleeker and technically more sophisticated than their predecessors. For example, they featured automated control from a single bridge house, as well as railings that were primarily functional, rather than ornamental. Downtown bridges of this period were typically designed with gracefully arched deck or rail-height trusses. Bridge houses of this era exhibit the influence of International style modernism with their cubic form, banded windows, flat roofs, and smooth, unadorned wall planes clad in smooth limestone or granite. Examples include bridges at Congress Parkway, 1956; Van Buren Street, 1956; 95th Street, 1958; Harrison Street, 1960; and Dearborn Street, 1963.

"Fifth Generation" Chicago-type Trunnion Bascule Bridge Design: 1976-84

Chicago's "fifth generation" trunnion bascule bridges featured all-welded box girders that extended above-deck to railing height. This was innovative as previous vehicular bridges in Chicago used riveted trusses. Fifth generation examples include the bridges at Loomis Street (1977), Columbus Drive (1982) and Randolph Street (1984). The Loomis and Randolph Street Bridges replaced Scherzer rolling-lift designs. The Columbus Street Bridge was the first at its site, which was half-way in-between the Michigan Avenue and Outer Drive Bridges. It was a vital link in a larger improvement project to extend Columbus Drive, which then dead-ended at Monroe Street, northward from Monroe to Grand Avenue. This massive structure was the largest in Chicago upon completion, measuring 269' long and 111' wide between trunnions. Its trunnions were set back from the river, allowing pedestrians to walk beneath it at river level. The Columbus Drive and Randolph Street bridges were both granted a design award by the American Institute of Steel Construction shortly after their completion.

Bridge Engineers associated with the Chicago Avenue Bridge

**John Ernst Ericson** (1858-1927), a native of Sweden, graduated from the Royal Polytechnic Institute in Stockholm in 1880 with a degree of Civil Engineer. His professional career began as assistant in construction work on the Vasa Bridge, Stockholm. He immigrated to the United States in 1881, initially working as resident

engineer of the Toledo, Cincinnati & St. Louis Railroad, and in 1882 he accepted a position as a bridge designer with Hopkins & Company, St. Louis. Ericson was hired by the City of Chicago as a draftsman for the water department in 1884, subsequently working as an Assistant Engineer with the City of Seattle, in connection with the design of the new water works for that city. In 1890 he returned to Chicago and was employed for two years as an Assistant Engineer with the Sanitary District. Ericson re-entered the employ of the City of Chicago in 1893 when he was hired as Assistant City Engineer. In 1897 he was appointed by Mayor Carter H. Harrison Jr. as City Engineer, a position he held until his death, except for a four-year period, 1919 to 1923, when he was employed as consulting engineer to the Department of Public Works.

As City Engineer, Ericson was credited as the designer of the Chicago-type trunnion bascule bridge in 1900 and was in charge of the design and construction of all the city's vehicular bridges. An obituary written by Arthur Gorman for the *American Water Works Association Journal* noted: "As City Engineer Mr. Ericson had charge of the design and construction of many bridges for the City of Chicago during the last three decades. He designed a type of bascule bridge in 1898 that enabled the city to build its bridges without paying royalties."[44] Likewise, the *Chicago Tribune* reported upon Ericson's death that he "was known also for the development of a unique type of bascule bridge which enabled the city to build according to its own design without infringing on patented devices."[45]

Ericson was known internationally as an authority on municipal engineering problems. His term of service embraced the period of greatest growth of the city's water supply. Most of the city's pumping stations and miles of water tunnels and mains were laid under his direction. In 1909 Ericson submitted a report on investigations of underground conditions affecting future subway construction. In the same year he was decorated by the King of Sweden with the Royal Order of Vasa. From 1911 to 1914 he served as Chairman of Chicago's Harbor and Subway Commission, which gathered other transportation information and made preliminary plans for the Municipal Pier (today's Navy Pier).[46]

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[44] Arthur E. Gorman, "John Ericson: Died April 16, 1927," *American Water Works Association*, Vol. 18, No. 1 (July 1927): 137.

[45] "John E. Ericson, City Engineer for Years, Dies," *Chicago Tribune*, April 17, 1927.

[46] The following sources were reviewed for this biography on John Ericson: Clark J. Herringshaw, *Clark J. Herringshaw's City Blue Book of Current Biography: Chicago men of 1913* (Chicago: American Publishers Association, 1913); *Notable Men of Chicago and Their City* (Chicago: Chicago Daily Journal, 1910), 119; *Prominent Democrats of Illinois* (Chicago: Democrat Publishing Company, 1899), 172-73; "John E. Ericson, City Engineer for Years, Dies," *Chicago Tribune,* April 17, 1927; Arthur E. Gorman, "John Ericson: Died April 16, 1927," *American Water Works Association*, Vol. 18, No. 1 (July 1927): 136-138; *National Cyclopaedia of American Biography*, Vol. 16, 1918.

**Thomas G. Pihlfeldt** (1858-1941) was born in Vadso, Norway and received his technical training in the polytechnic schools at Dresden and Hanover in Germany. After completing his studies he immigrated to the United States and arrived in Chicago in 1879. For several years he worked as draftsman and designer with private firms. In 1889 he entered the Bureau of Maps in Chicago's Public Works Department. In 1894 he was transferred to the Bridge Division of the Engineering Bureau and in 1896 he was made principal assistant to the city bridge engineer. His rapid climb culminated with his appointment in 1901 to the position of Chief Engineer of Bridges, which he held until his death in 1941. Pihlfeldt lived through the entire period of the development of the Chicago bascule bridge during his forty-year tenure as bridge engineer of Chicago. During this period, several dozen movable bridges, fixed bridges and viaducts were built under his supervision. In 1932 he was made a knight of St. Olav by King Haakon of Norway.[47]

Although his reputation rested on his work with the bascule bridge, Pihlfeldt was modest when asked in 1936 about the assessment of his role in its creation:

"The first [bascule bridge] built here was in Cortland street. We have designed and constructed forty-nine river bridges in Chicago and maintain them in daily operation. I say we because I could do nothing without the loyal and efficient staff of 100 men in the division, engineers, draftsmen, mechanics, electricians and operators and without the readiness of city engineers and commissioners above me to accept new ideas.

"All that I claim credit for is being constantly on the alert, traveling around the country when need be, to watch every improvement in bridge building in every city and apply that new thing, bettering it, usually, on the next bridge built by the city of Chicago."[48]

Philfeldt's obituary in the *Chicago Tribune* referred to him as "an authority on the lift type of bridge used in Chicago."[49] Loran D. Gayton, City Engineer of Chicago, paid tribute to Pihlfeldt at the time of his death:

"While the fundamental principal of bascule bridges is centuries old, the application thereof to modern bridge structures, capable of successfully serving the needs of a metropolitan area, involves the application of engineering science and ingenuity requiring the greatest skill. It was in this application and the stage of perfection to which it has been carried in the modern bascule bridge which made Mr. Pihlfeldt a master in his field. The adoption of many of these

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47 Kenneth Bjork. *Saga in Steel and Concrete: Norwegian Engineers in America* (Northfield, Minnesota: Norwegian-American Historical Association, 1947), 121; "Pihlfeldt Dies at 82," *Chicago Daily News*, January 23, 1941.

48 *Chicago Daily News*, October 15, 1936.

49 "T.G. Pihlfeldt, Bridge Engineer, is Dead at 82," *Chicago Tribune*, January 24, 1941.

developments by various engineers throughout this and other countries is the finest testimony to his high standing in his profession."[50]

## PART II. ENGINEERING INFORMATION

### A. Current Description:

The Chicago Avenue Bridge over the North Branch of the Chicago River is a double-leaf counter-balanced trunnion bascule span. The bridge has a clear span of 161'-3" between piers at datum, and a length of 188'-9" from center to center of trunnions. The overall length is 291'-3". Its 60' width includes a 36' wide roadway with open steel grating on the movable sections and concrete-infilled steel grating on the remainder.

The superstructure has two riveted steel pony trusses that slope inward and are a distance of 39'-6" center to center. Each leaf has a depth at the free end of 11'-6" and a depth over the river piers of 27'-3", center to center of chords. The sidewalks are 8'-6" wide and consist of concrete-infilled steel grating, although a short stretch of wood planking exists on the west leaf's south sidewalk. The sidewalks are carried outside of the trusses on cantilever brackets, which extend 10'-3" beyond the center lines of the chords.

The weight of each movable leaf of the bridge is carried on four concrete piers resting on bedrock, which is about 83' below city datum. The abutments of the short approach spans and the enclosing walls of the structure are supported on pile foundations. The west anchor piers are spaced 40' on centers, while the west river piers are spaced 1'-2" on centers, the center to center distance of the river and anchor piers being 38'-3". The spacing of the east river and anchor piers is the same as for the west piers. The west abutment has a total height of 22', a length of 70', and a width of footing of 13'. The east abutment is of similar construction.

Two operators' houses are located at the northeast and southwest sides of the structure. Their oval-shaped lower portions are constructed with concrete that has a rough, granite-like finish. Both have internal concrete spiral stairways. The upper portion (control room) of the southwest bridge house has been heavily altered with wood siding and its original windows and roof have been removed. It is accessed via an original wood panel door. The northwest bridge house has good exterior integrity. Its control roof retains original copper sheathing, fenestration and peaked roof, although the original clay tiles covering the roof have been removed. It is accessed via a non-original metal door and has original interior wood paneled doors. Most of the controls in both bridge houses have

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[50] "Thomas George Pihlfelt, 1858-1941," in Municipal Employees Society, *Monthly Bulletin*, Vol. 21 (February 1941): 17.

been removed, although their hand brakes are extant. The northeast control room retains its original wood wall and ceiling finishes. Most of the operating machinery in the control rooms of both bridge houses have been removed and the bridge has probably not been raised since the 1990s.

**B. Site**

1. **General Setting and Orientation**: The Chicago Avenue Bridge is located about 1.5 miles northwest of the Loop. The area surrounding the bridge, once defined by industrial uses, has been gentrified. The sprawling Montgomery and Ward Company catalog warehouse and office buildings (now occupied by offices and condominiums) flank the Chicago Avenue Bridge to the east. The Chicago Tribune plant is located on the southwest side of the bridge. A parking lot is located on the northwest side of the bridge. Former loft warehouse and manufacturing buildings in the area east of the bridge have been converted to condominiums. The swanky North Michigan Avenue shopping thoroughfare is located about six blocks east of the bridge and is directly accessible by Chicago Avenue.

## PART III. SOURCES OF INFORMATION

**A. Architectural Drawings:**

City of Chicago, Department of Public Works, Bureau of Engineering, Division of Bridges and Harbor, "West Chicago Avenue Bridge, Substructure and Superstructure – General Plan," Drawing No. 125, September 1912. Chicago Department of Transportation (CDOT) Plan Archives.

City of Chicago, Department of Public Works, Bureau of Engineering, Division of Bridges and Harbor, "West Chicago Avenue Bridge, Superstructure, Movable Part," Drawing No. 132, September 1912. Chicago Department of Transportation (CDOT) Plan Archives.

American Institute of Architects, "Details for Chicago Avenue Bridge," undated drawing. Chicago Department of Transportation (CDOT) Plan Archives.

Chicago Bureau of Engineering, "West Chicago Avenue Bridge Re-decking and Repairs – General Plan," Drawing no. 30601, October 4, 1968.

A series of drawings of the Chicago Avenue Bridge accompany an article in the journal Engineering and Contracting, Vol 42, No. 17 (October 21, 1914) 388-390. They include: side elevation and longitudinal Section; Foundation Plan; Cross Section of Pit

and Elevation of East Anchor Pier; Front Elevation of East River Pier; Longitudinal Section of West Piers and Pit; Cross Section of Pit and Elevation of Anchor Pier; Cross Section of West Abutment.

**B. Bibliography:**

**1. Primary and unpublished sources:**

Becker, Donald N., "Development of the Chicago type Bascule Bridge." *American Society of Civil Engineers Transactions*, Volume 109, 1945: 995-1046.

Bjork, Kenneth. *Saga in Steel and Concrete: Norwegian Engineers in America*. Northfield, Minnesota: Norwegian-American Historical Association, 1947: 121.

"Blind; Asleep; Both Drown." *Chicago Tribune*, September 1, 1906.

"Bonds Win; Court Acts Lose." *Chicago Tribune*, Nov. 8, 1911.

*Chicago Daily News*, October 15, 1936.

Chicago Department of Public Works. *Annual Reports of the Board of Public Works.* Chicago, varying publishers, 1891 to 1967.

Chicago Department of Public Works. "Historic Bridges Master Plan," 1985.

"The Chicago Type of Bascule Bridge." *Engineering Record*, July 21, 1900.

"Design, Construction and Detailed Labor Costs of the Substructure of the Double-Leaf Trunnion Bascule Bridge at Chicago Ave., Chicago, Ill.," *Engineering and Contracting*, Vol. 42, No. 17, October 21, 1914: 388-390.

Gorman, Arthur E., "John Ericson: Died April 16, 1927." *American Water Works Association*, Vol. 18, No. 1, July 1927: 136-138.

"The Halsted St. Lift Bridge over the Chicago River." *Engineering News*, April 19, 1894: 320-321.

Herringshaw, Clark J. *Clark J. Herringshaw's City Blue Book of Current Biography: Chicago men of 1913*. Chicago: American Publishers Association, 1913.

"John E. Ericson, City Engineer for Years, Dies." *Chicago Tribune*, April 17, 1927.

*Journal of the Proceedings of the City Council of Chicago*, Issue 2, (January 30, 1911): 3508.

"The Lift or Bascule Type of Movable Bridges." *Engineering Record*, July 28, 1900: 73.

"Lift Bridge, Chicago Avenue." *Chicago Tribune*, August 4, 1910.

Liljencrantz, G.A.M., "Obstructive Bridges and Docks in the Chicago River." *Journal of the Western Society of Engineers*, June 1898: 3.

"Mayor's Veto Is Upheld." *Chicago Tribune*, April 5, 1900.

*Notable Men of Chicago and Their City*. Chicago: Chicago Daily Journal, 1910: 119.

"Officials Seek to Prevent the Building of Ugly Bridges." *Chicago Tribune*, September 13, 1930.

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

*Prominent Democrats of Illinois*. Chicago: Democrat Publishing Company, 1899: 172-73.

Sanborn Fire Insurance Map, Vol. 1 North. New York: Sanborn Fire Insurance Company, 1906; Revised 1950.

Sanborn Fire Insurance Map, Vol. 2 South. New York: Sanborn Fire Insurance Company, 1906; Revised 1950.

Sneddon, Matthew. "Chicago Avenue Bridge." HAER No. IL-144, Historic American Engineering Record (HAER), National Park Service, U.S. Department of the Interior, 1999.

"T.G. Pihlfeldt, Bridge Engineer, is Dead at 82." *Chicago Tribune*, January 24, 1941.

"Thomas George Pihlfelt, 1858-1941." in Municipal Employees Society, *Monthly Bulletin*, Vol. 21, February 1941: 17.

U.S. Patent No. 1,001,800, received August 29, 1911, Alexander F.L. von Babo, 1.

"Useless Bridges: They are Generally Swung for Repairs." *Chicago Tribune*, August 29, 1884.
"Want Grace in New Bridges." *Chicago Tribune*, May 7, 1911.

"West Madison Street." *The Economist*, January 29, 1916.

2. **Secondary and published sources:**

Draper, Joan. *Chicago Bridges*. Chicago: City of Chicago, 1984.

**C. Likely Sources Not Yet Investigated:**

The construction permit for this bridge and additional drawings related to its alterations may be on file at either CDOT or the U.S. Army Corps of Engineers' Chicago office. Additional historic views of the bridge could likely be obtained by researching historic photographs of the Montgomery Ward & Company's catalog building.

**D. Supplemental Material:**

The Chicago History Museum has three photos of the closed Chicago Avenue Bridge with views looking east, west, and north, all dated November 9, 1914. They can be found in its Chicago Bridges Collection, call no. 1009.038.1 PPL. Three additional photos of the bridge are located in the James Parker Collection, Special Collections and University Archives, University of Illinois at Chicago. They include an image of the bridge with both leaves raised looking south, dated November 9, 1914; an image of the raised east leaf looking northeast, taken ca. 1914; and an image of the bridge looking north dated October 30, 1969.

## PART IV. METHODOLOGY OF RESEARCH

**A. Research Strategy:**

The research strategy focused on identifying detailed information about the Chicago Avenue Bridge and its context from primary source materials, such as the City of Chicago Department of Public Works Annual Reports, the *Chicago Tribune*, historic photographs, original drawings, contemporary engineering articles, as well as published books and reports.

**B. Actual Research Process:**

Research focused on reviewing City of Chicago Department of Public Works Annual Reports from varying years, which are on file at the Harold Washington Library's Municipal Reference Department. Research also relied upon contemporary *Chicago Tribune* and engineering articles found via proquest and internet searches, as well as a

review of original drawings in the CDOT Archive. Online catalogs of various repositories were reviewed to identify other print and photographic materials related to this bridge, its engineers, and its context.

**C. Archives and Repositories Used:**
Burnham and Ryerson Libraries and its Historic Architecture and Landscape Image Collection; Harold Washington Library's Municipal Reference Collection; James Parker Collection, Special Collections and University Archives, University of Illinois at Chicago; Chicago History Museum and its Chicago Bridges Collection and Department of Public Works Photo Collection; Chicago Department of Transportation Archives.

## PART V. PROJECT INFORMATION

This addendum to the 1999 Chicago Avenue Bridge HAER report was undertaken in August-September 2018 to mitigate the effects of the structure's planned demolition and replacement. In 2018, the Chicago Department of Transportation determined that the Chicago Avenue River Bridge existed in a highly deteriorated condition and was beyond cost-effective repairs, despite efforts over the past decade to maintain the structure in a safe condition and keep it operational. The roadway and sidewalk steel framing are severely deteriorated and require replacement. Moreover the floorbeams and trusses are also in urgent need of repairs. CDOT has identified demolition and replacement with a temporary three span fixed bridge as the only remaining cost-effective alternative to restore both public safety and ensure vehicular access until permanent replacement takes place. Local funds (TIFs) will be used for this project.

In order to memorialize the bridge, CDOT will ensure that its machinery is retained in place and made available for public viewing. They will produce interpretative signage to be installed on the pedestrian river walk that will commemorate and interpret the original bridge and its machinery. They will make information about this bridge available to the public by placing on a city website the HIER and HAER recordation documents and the Movable Bridges Preservation Plan.

HISTORIC AMERICAN ENGINEERING RECORD

INDEX TO PHOTOGRAPHS

ADDENDUM TO:
CHICAGO AVENUE BRIDGE HAER NO. IL-144
Spanning the N. Branch of Chicago River at W. Chicago Ave
Chicago
Cook County
Illinois

Photographs IL-144-01 through IL-144-05 were previously transmitted to the Library of Congress.

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Leslie Schwartz, Photographer, September, 2018

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| IL-144-08 | Overall view from the southeast |
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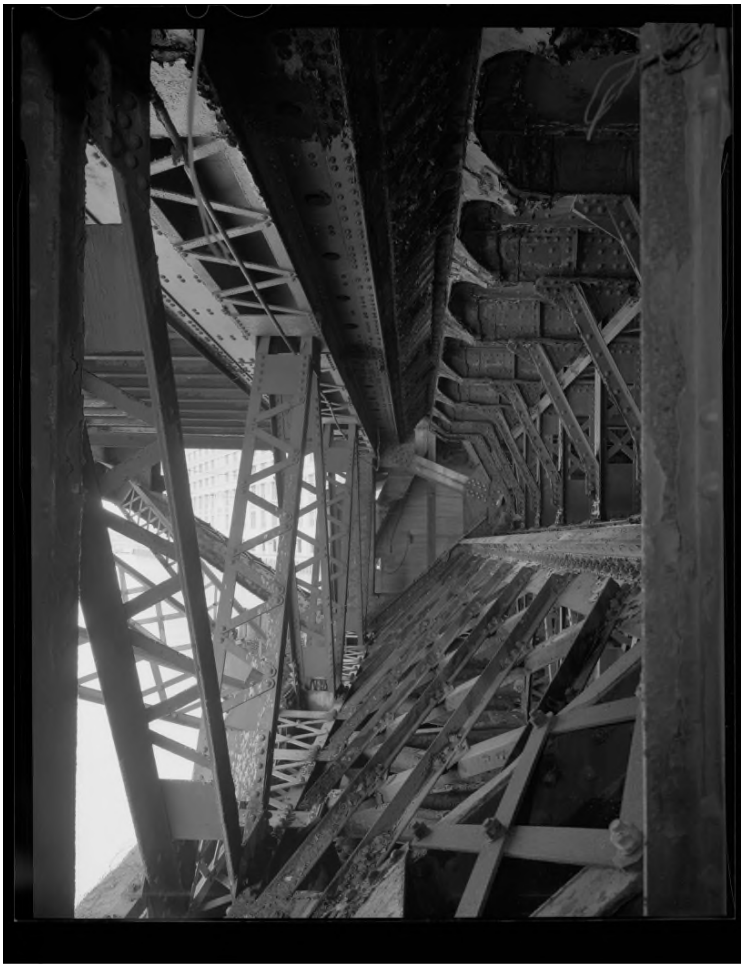
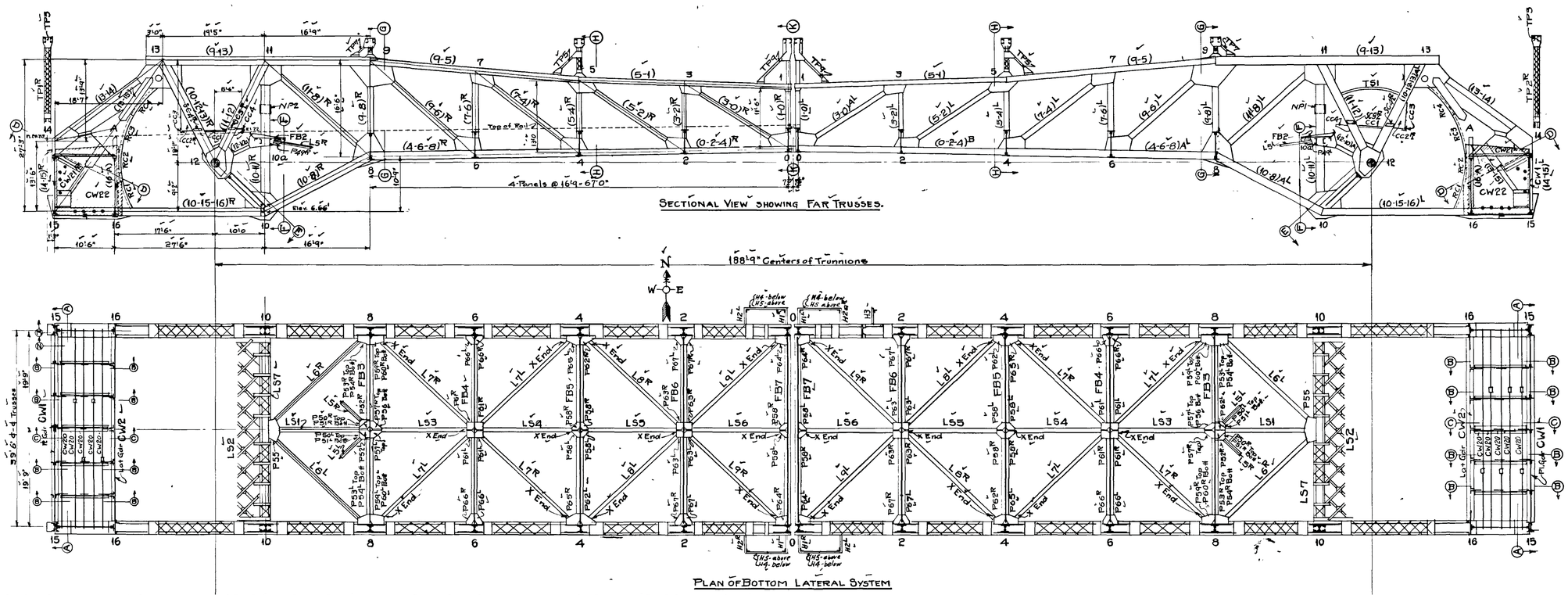
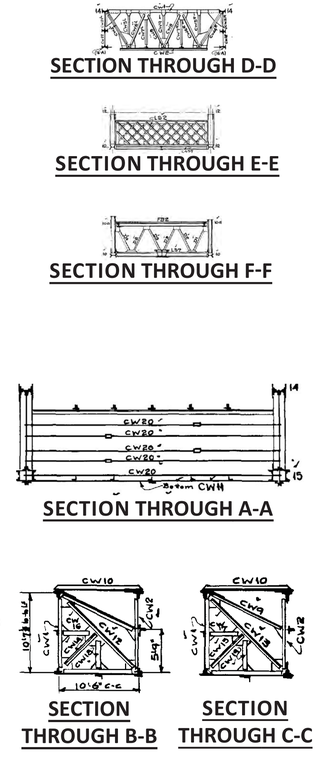


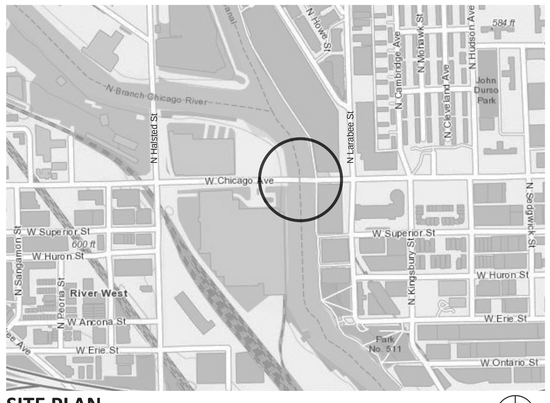



SECTIONAL VIEW OF FAR TRUSSES (FIRST ROW), PLAN OF BOTTOM LATERAL SYSTEM (SECOND ROW)




# CHICAGO AVENUE BRIDGE, 1913–1914

## (CHICAGO AVENUE CANAL BRIDGE) CHICAGO, ILLINOIS




SITE PLAN

THE CHICAGO AVENUE BRIDGE REPRESENTS THE "SECOND-GENERATION" OF THE CHICAGO TYPE TRUNNION BASCULE BRIDGE WITH IMPROVEMENTS EXECUTED IN THE DESIGN OF THE COUNTERWEIGHTS AND A NEW RACK-AND-PINION ASSEMBLY PATENTED BY BRIDGE ENGINEER ALEXANDER VON BABO IN 1911 (NAMELY, THE USE OF AN INTERNAL RACK, INSTEAD OF AN EXTERNAL RACK THAT EXTENDED ALONG THE TRUSS SUPERSTRUCTURE'S UPPER CHORDS). THE USE OF MORE AESTHETICALLY-PLEASING PONY TRUSSES IN ITS SUPERSTRUCTURE, WHICH WAS NOVEL AT THE TIME, QUICKLY BECAME PREFERABLE TO THE HIGHER AND MORE INDUSTRIAL-LOOKING THROUGH TRUSSES USED ON PREVIOUS "FIRST GENERATION" BRIDGES. IT IS VISUALLY SIMILAR TO THE GRAND AVENUE, WASHINGTON STREET, AND EWING STREET BRIDGES, ALL BUILT WITHIN A YEAR OF EACH OTHER. IT FEATURES ORIGINAL OVAL-SHAPED CLASSICALLY-STYLED BRIDGE TENDER HOUSE OF REINFORCED CONCRETE THAT WERE DESIGNED BY THE ARCHITECTS GEORGE W. MAHER AND E.C. JENSEN, MEMBERS OF THE MUNICIPAL ART COMMISSION OF THE ILLINOIS CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS, REFLECTING THE NEW FOCUS ON CIVIC BEAUTY FOR BRIDGES IN ACCORD WITH CITY BEAUTIFUL IDEALS.

DRAWING SOURCE: (TOP) VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NO. 4337, 1914, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES; (BOTTOM LEFT) SITE PLAN, AUGUST 2018, CITY OF CHICAGO, ESRI CANADA, ESRI, HERE, GARMIN, INCREMENT P, INTERMAP, USGS, METI/NASA, EPA, USDA. TEXT BY JEAN L. GUARINO.

DELINEATED BY: ALYSSA FRYSTAK, 2018
ANNE SULLIVAN, FAIA
SULLIVAN PRESERVATION
ILLINOIS HISTORIC PRESERVATION AGENCY

CHICAGO AVENUE BRIDGE (CHICAGO AVENUE CANAL BRIDGE)
SPANNING NORTH BRANCH CANAL OF THE CHICAGO RIVER
COOK COUNTY
CHICAGO
ILLINOIS

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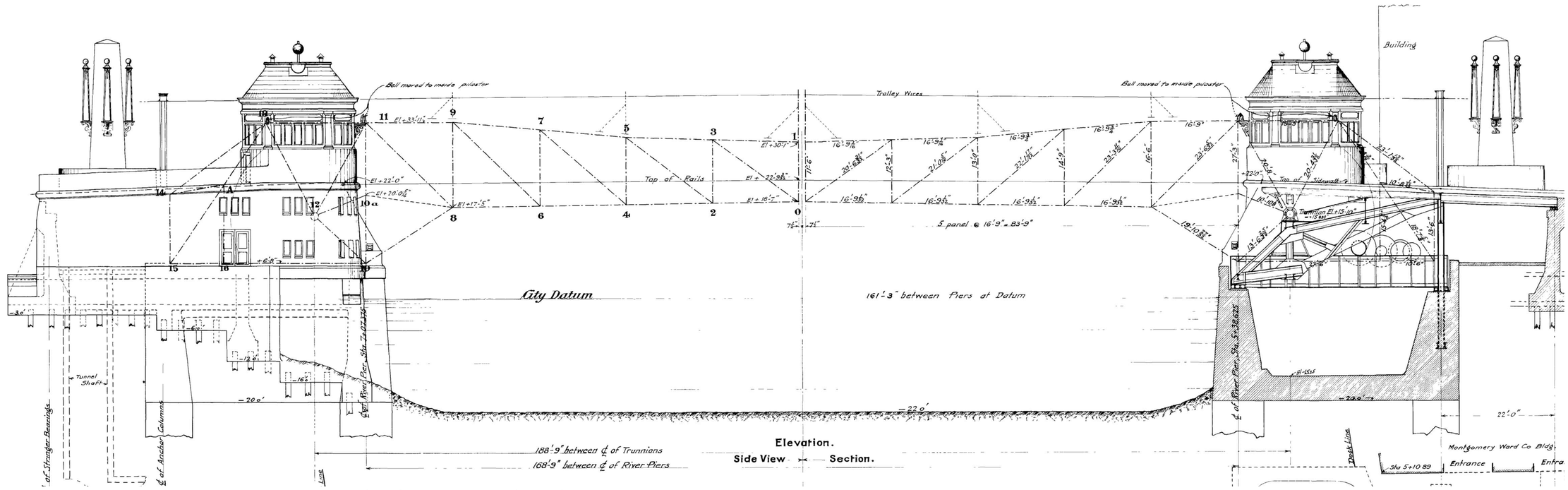
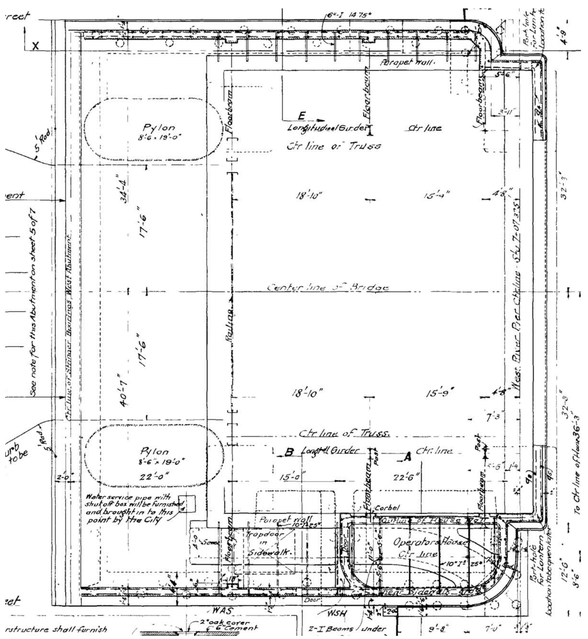
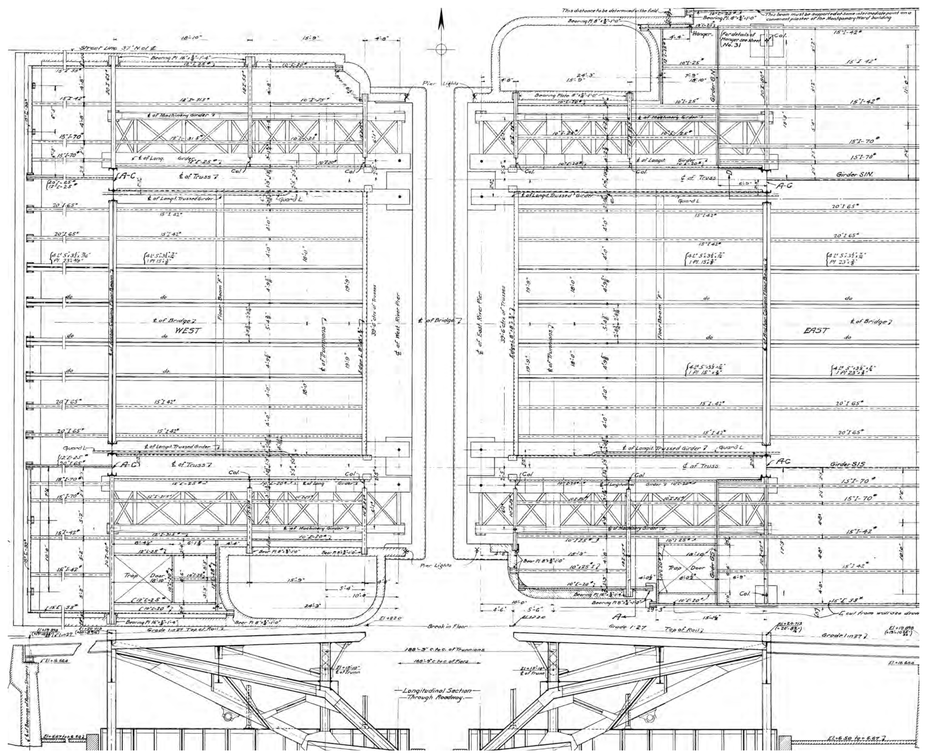


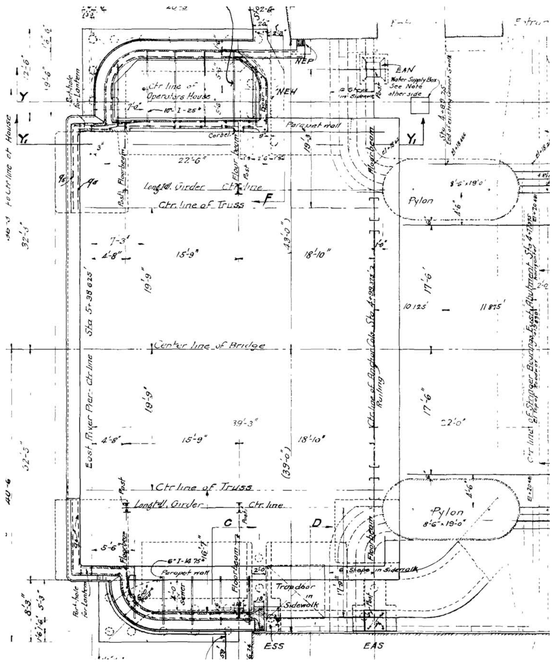

**ELEVATION OF CHICAGO AVENUE BRIDGE–SIDE VIEW (LEFT), SECTION VIEW (RIGHT)**




**WEST APPROACH SECTIONAL PLAN OF PYLONS**




**PLAN (TOP), LONGITUDINAL SECTION THROUGH ROADWAY (BOTTOM)**




**EAST APPROACH SECTIONAL PLAN OF PYLONS**

DRAWING SOURCE: VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NOS. 125 (TOP), 128 (BOTTOM LEFT AND RIGHT), AND 143 (BOTTOM MIDDLE), 1912, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.

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CHICAGO AVENUE BRIDGE (CHICAGO AVENUE CANAL BRIDGE)
SPANNING NORTH BRANCH CANAL OF THE CHICAGO RIVER
COOK COUNTY

CHICAGO



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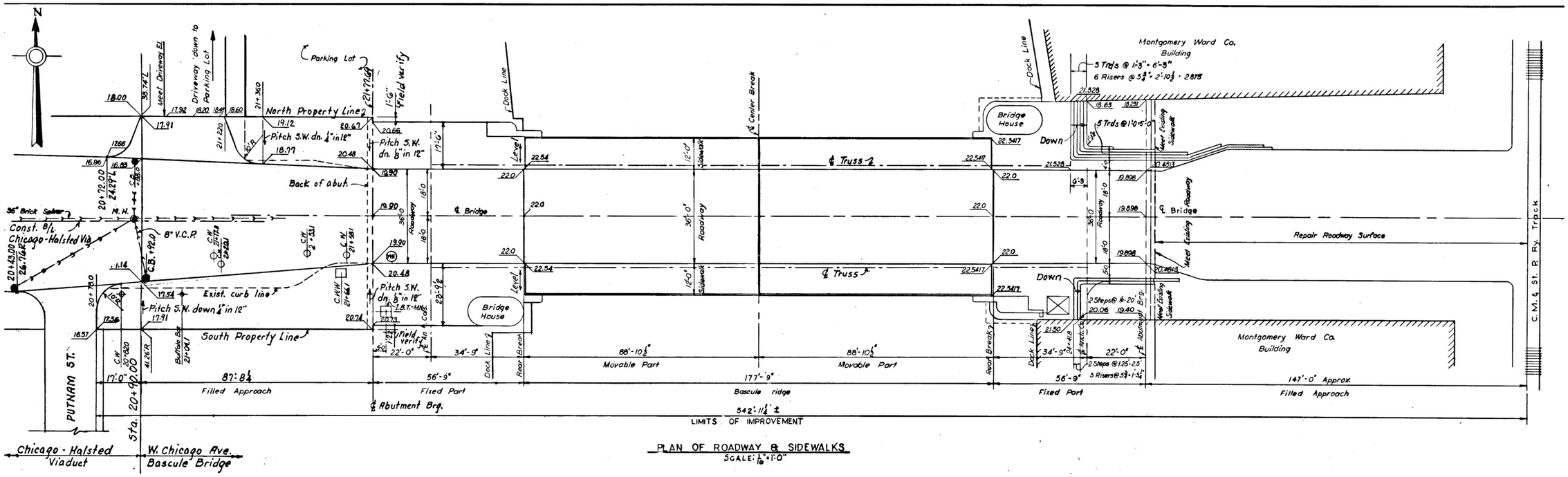
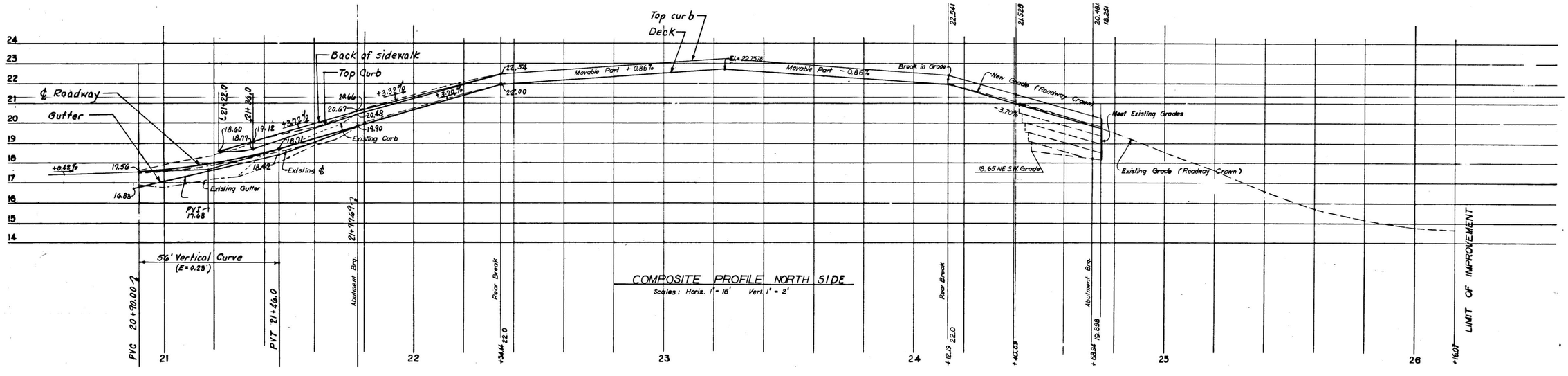



PLAN OF ROADWAY & SIDEWALKS
SCALE: 1" = 1'-0"

## PLAN OF ROADWAY AND SIDEWALKS




COMPOSITE PROFILE NORTH SIDE
Scales: Horiz. 1" = 16' Vert. 1" = 2'

## PROFILE OF NORTH SIDE

DRAWING SOURCE: CHICAGO AVENUE BRIDGE REDECKING & REPAIRS, DRAWING NO. 30611, 1968, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.

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ILLINOIS

CHICAGO AVENUE BRIDGE (CHICAGO AVENUE CANAL BRIDGE)
SPANNING NORTH BRANCH CANAL OF THE CHICAGO RIVER
COOK COUNTY

CHICAGO



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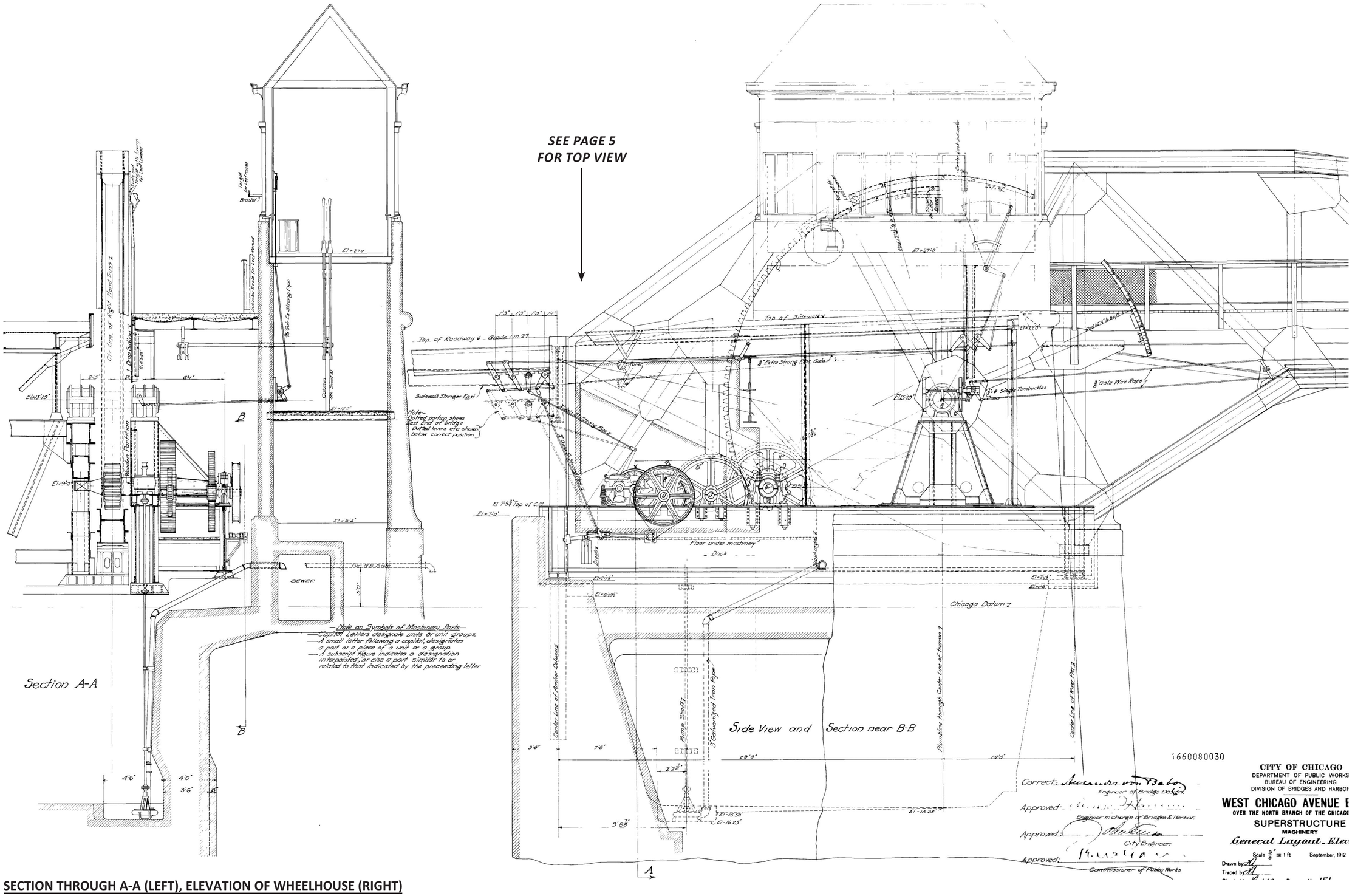
ILLINOIS HISTORIC PRESERVATION AGENCY

SEE PAGE 5
FOR TOP VIEW




**SECTION THROUGH A-A (LEFT), ELEVATION OF WHEELHOUSE (RIGHT)**

DRAWING SOURCE: VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NO. 151, 1912, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.

1660080030

CITY OF CHICAGO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
DIVISION OF BRIDGES AND HARBOR

**WEST CHICAGO AVENUE B**
OVER THE NORTH BRANCH OF THE CHICAGO
SUPERSTRUCTURE
MACHINERY
*General Layout - Elev*

Scale 3/8" = 1 ft September, 1912

Drawn by
Traced by

Correct: Sullivan von Babo
Engineer of Bridge Design

Approved:
Engineer in charge of Bridges & Harbors

Approved:
City Engineer

Approved:
Commissioner of Public Works

DELINEATED BY: ALYSSA FRYSTAK, 2018

ANNE SULLIVAN, FAIA
SULLIVAN PRESERVATION
ILLINOIS HISTORIC PRESERVATION AGENCY

CHICAGO

CHICAGO AVENUE BRIDGE (CHICAGO AVENUE CANAL BRIDGE)
SPANNING NORTH BRANCH CANAL OF THE CHICAGO RIVER
COOK COUNTY

ILLINOIS

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HISTORIC AMERICAN ENGINEERING RECORD
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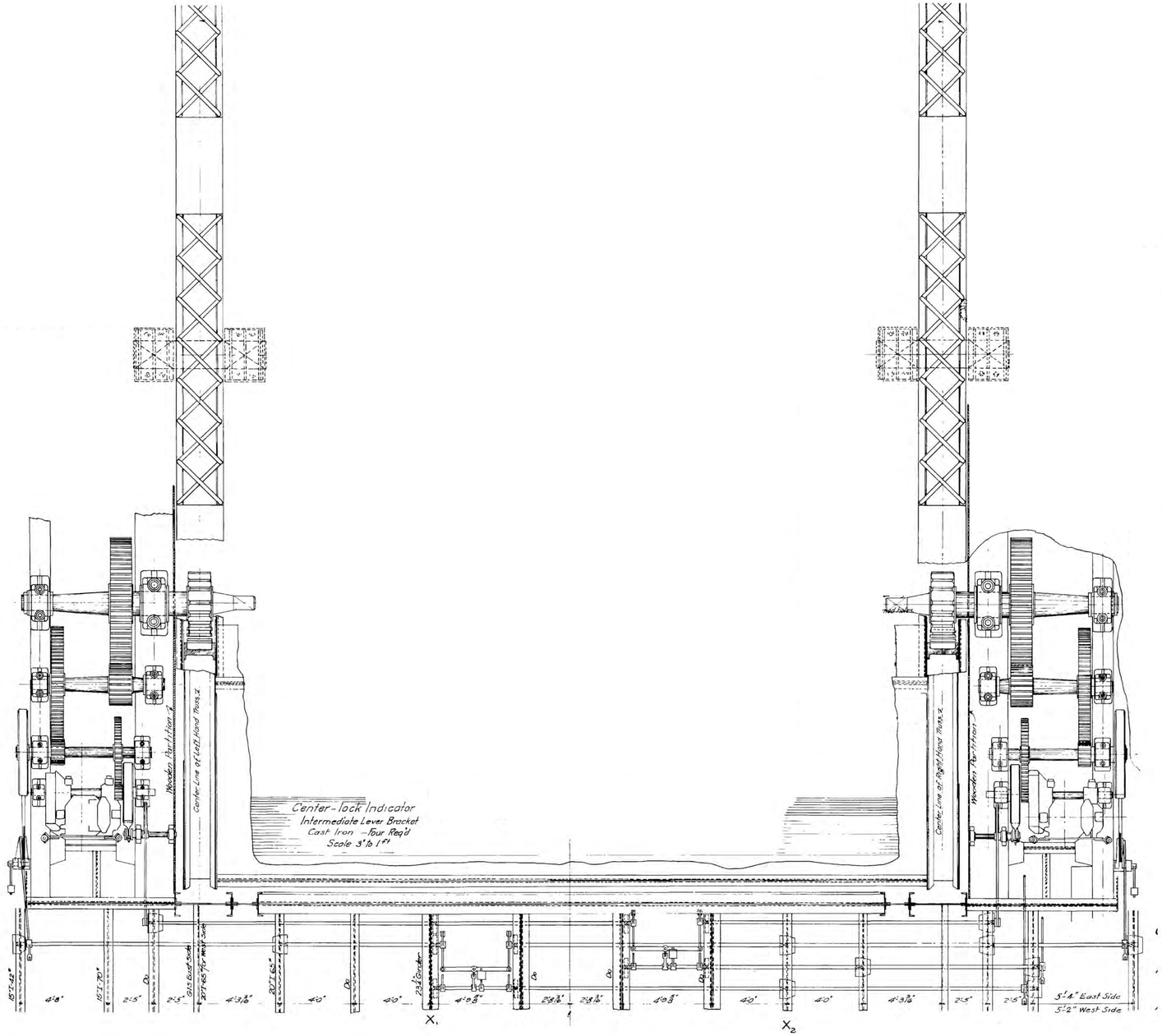
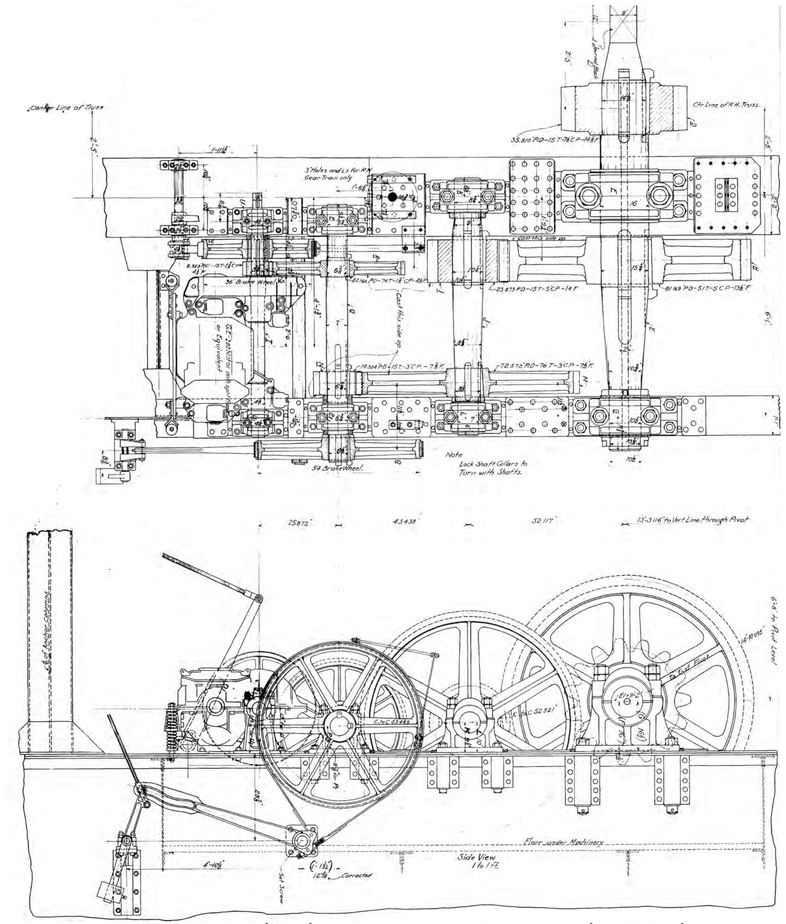



**SECTION VIEW OF BRAKES**




**PLAN VIEW OF GEAR TRAIN (TOP), SIDE VIEW OF GEAR TRAIN (BOTTOM)**

DRAWING SOURCE: VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NOS. 152 (LEFT) AND 153 (RIGHT), 1912, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.

DELINEATED BY: ALYSSA FRYSTAK, 2018

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SULLIVAN PRESERVATION
ILLINOIS HISTORIC PRESERVATION AGENCY

CHICAGO AVENUE BRIDGE (CHICAGO AVENUE CANAL BRIDGE)
SPANNING NORTH BRANCH CANAL OF THE CHICAGO RIVER
COOK COUNTY
ILLINOIS

CHICAGO

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Sectional View AtAA
For Bottom Casting see Sheet

Castings at point 10.
See Sheet #3 of 32.

Section m-m

Top View of Top Plate.

Top View of Bottom Plate.

Metal: Cast Steel for both plates.

Section p-p

Section D-D.

Hand-hole Cover.
Cast Iron - ¼" Metal.

**SHOP NOTES:**

All radial members to be milled to exact length and ends neatly finished. Particular care shall be taken in assembling the Tail End of Trusses, all members must be bolted together to exact center distances before the reaming of rivet holes, the drilling of holes for Rack bolts and the boring for the Trunnion is started. It is important that all through holes be bored exactly perpendicular to plane of Trusses and parallel to each other, so that after the bridge leaves are erected a true alignment of struts and trusses can be obtained.
—The separate members and Rack castings must be carefully match marked to facilitate erection in field.

Material:
Structural Steel as per Specifications.
Rivet " " " .
Cast " " " .
Cast iron " " " .

Rivets and Rivet Holes:
All Rivets ⅞" diameter.
All Rivet Holes ¹⅞₆" diameter.
All holes reamed except in the lattice bars ⅜" thick and under, which may be punched full size.

Section thro Rack.

Horizontal Line through Pivot

Section C-C.

Section through Member 14-A.

Section through Member 14-15.

Section through Member 16-A at this point.

Section through Member 15-A.

Sectional Elevation B-B
showing End Connections of C.W. Box.
Front Part removed.

Material for Bumper Bracket:
sides (1 Pl. 20⅞" - 3'-8"
2 L⁶ 6 x 3½ x ½ - 1'-8"
2 Fills. 6 x ⅞ - 1'-2"
2 L⁴ 3½ x ½ - 3'-11"
2 Fills. 4⅛ x ⅞ - 3'-5"
2 Fills 4 x ⅞ - 3'-11"

Correct. Alexander von Babo
Engineer of Bridge Design.
Approved Alexis Frieden
Engineer in Charge of Bridges & Harbor.
Approved John Ericson
City Engineer.
Approved Fred A. Busse
Mayor.

1660080009

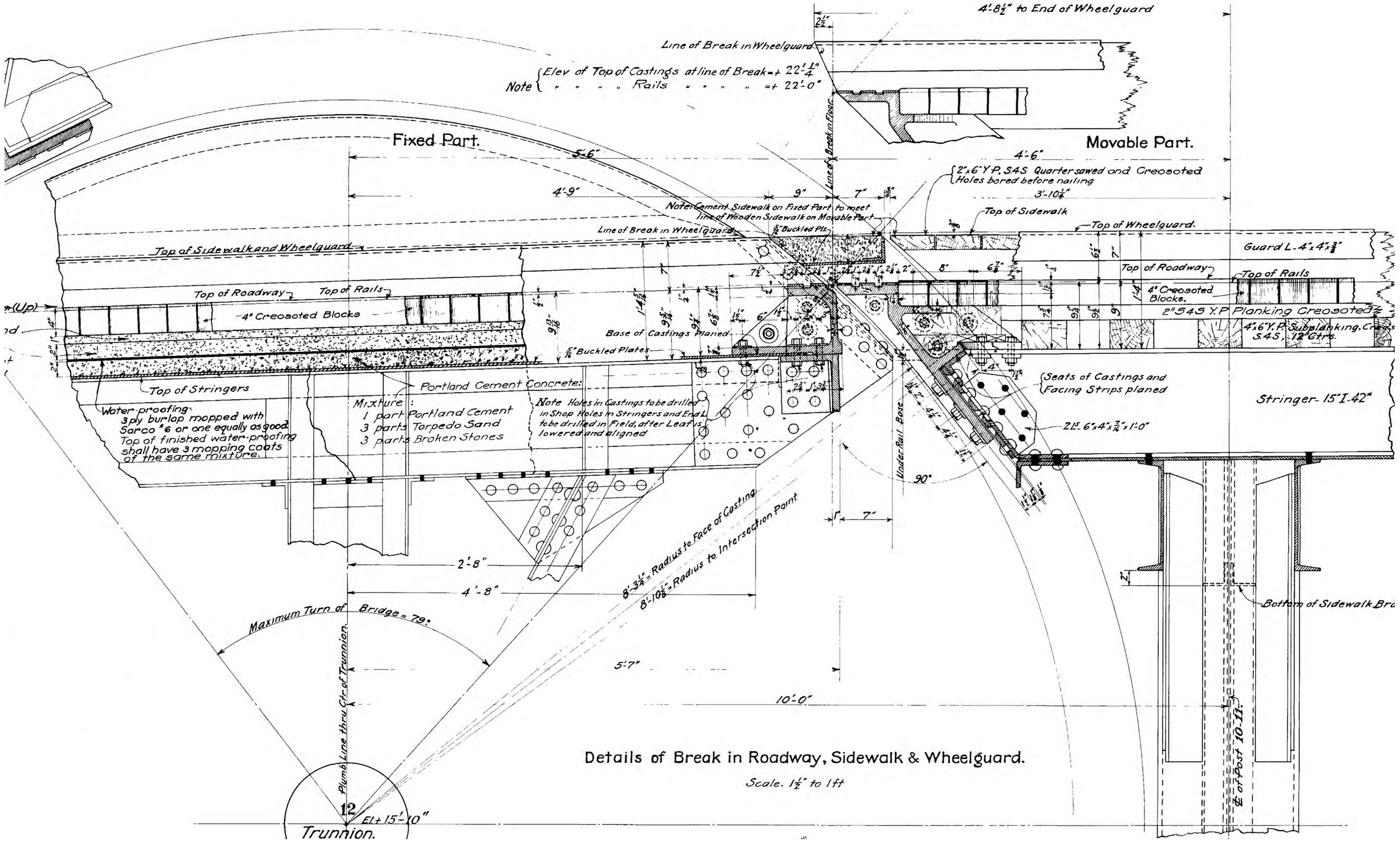
CITY OF CHICAGO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
DIVISION OF BRIDGES AND HARBOR

# WEST CHICAGO AVENUE BRIDGE
OVER THE NORTH BRANCH OF THE CHICAGO RIVER
SUPERSTRUCTURE
MOVABLE PART
*Tail End of Trusses.*

Scale. ¾" = 1 ft September, 1912
Drawn by J. A.
Traced by H.P.C.
Checked by J. A.
Drawing No 132 (2) OF (32)
File No. 11-5F-9

## ELEVATION OF TRUSS AT TAIL END

DRAWING SOURCE: VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NO. 132, 1912, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.




Details of Break in Roadway, Sidewalk & Wheelguard.

Scale. 1½" to 1ft

**DETAILS OF BREAKS IN ROADWAY, SIDEWALK, & WHEELGUARD**

DRAWING SOURCE: VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NO. 141, 1912, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.

DELINEATED BY: ALYSSA FRYSTAK, 2018

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ILLINOIS HISTORIC PRESERVATION AGENCY

CHICAGO AVENUE BRIDGE (CHICAGO AVENUE CANAL BRIDGE)
SPANNING NORTH BRANCH CANAL OF THE CHICAGO RIVER
CHICAGO
COOK COUNTY
ILLINOIS

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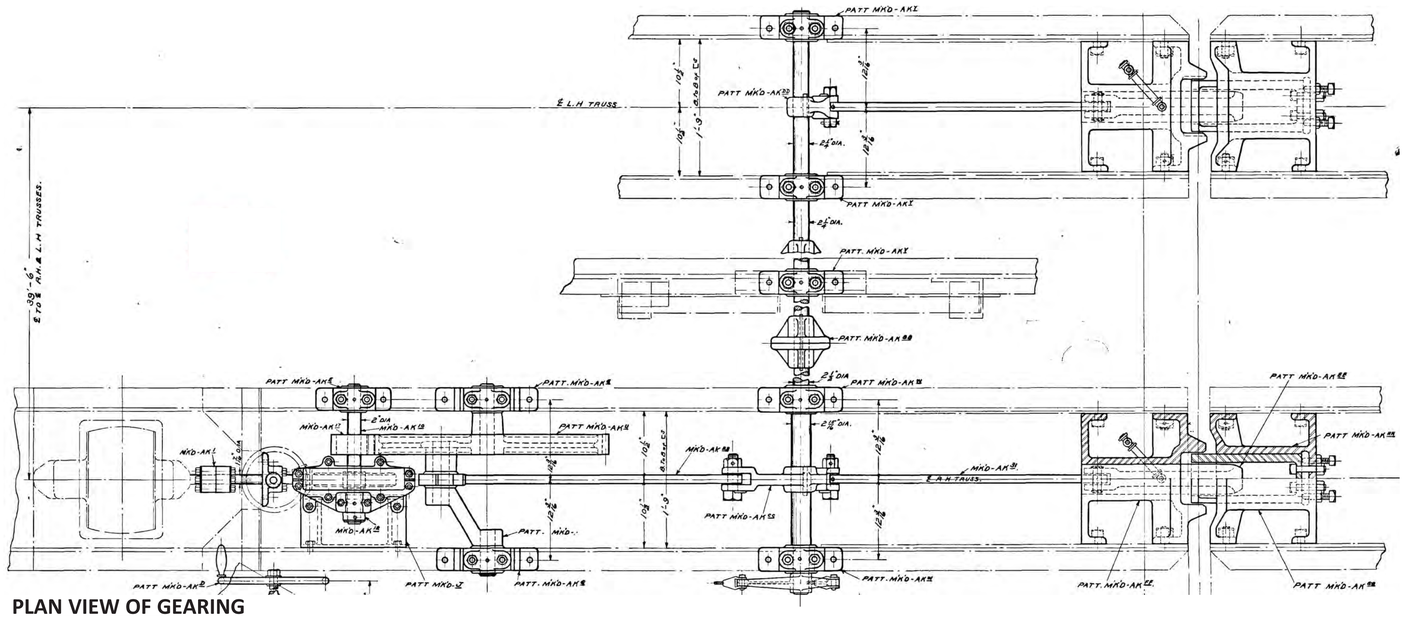
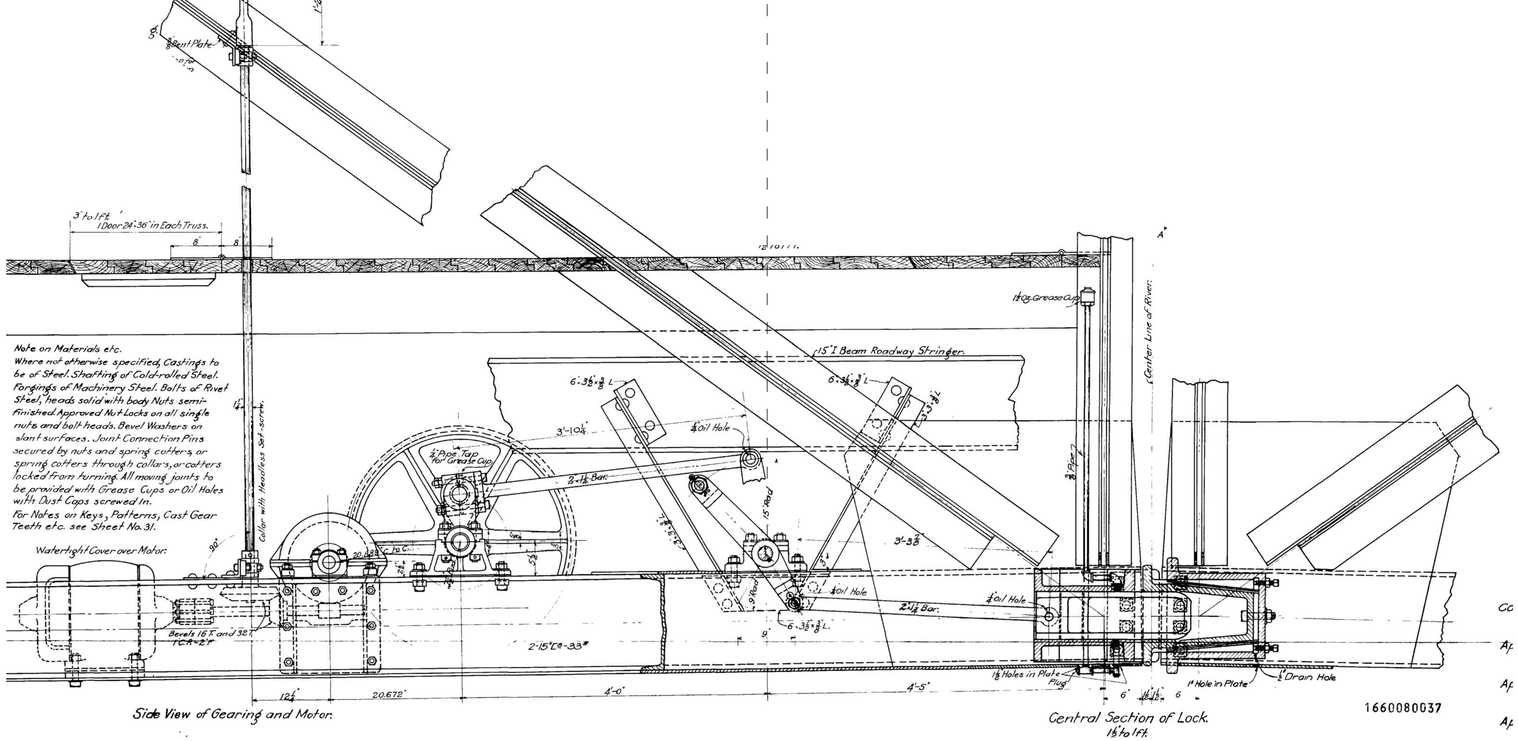



**PLAN VIEW OF GEARING**




**SIDE VIEW OF GEARING & MOTOR**

DRAWING SOURCE: PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NOS. 4439, 1913 (TOP) AND DRAWING NO. 158, 1912 (BOTTOM), CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.

DELINEATED BY: ALYSSA FRYSTAK, 2018

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ILLINOIS HISTORIC PRESERVATION AGENCY

CHICAGO AVENUE BRIDGE (CHICAGO AVENUE CANAL BRIDGE)
SPANNING NORTH BRANCH CANAL OF THE CHICAGO RIVER
COOK COUNTY

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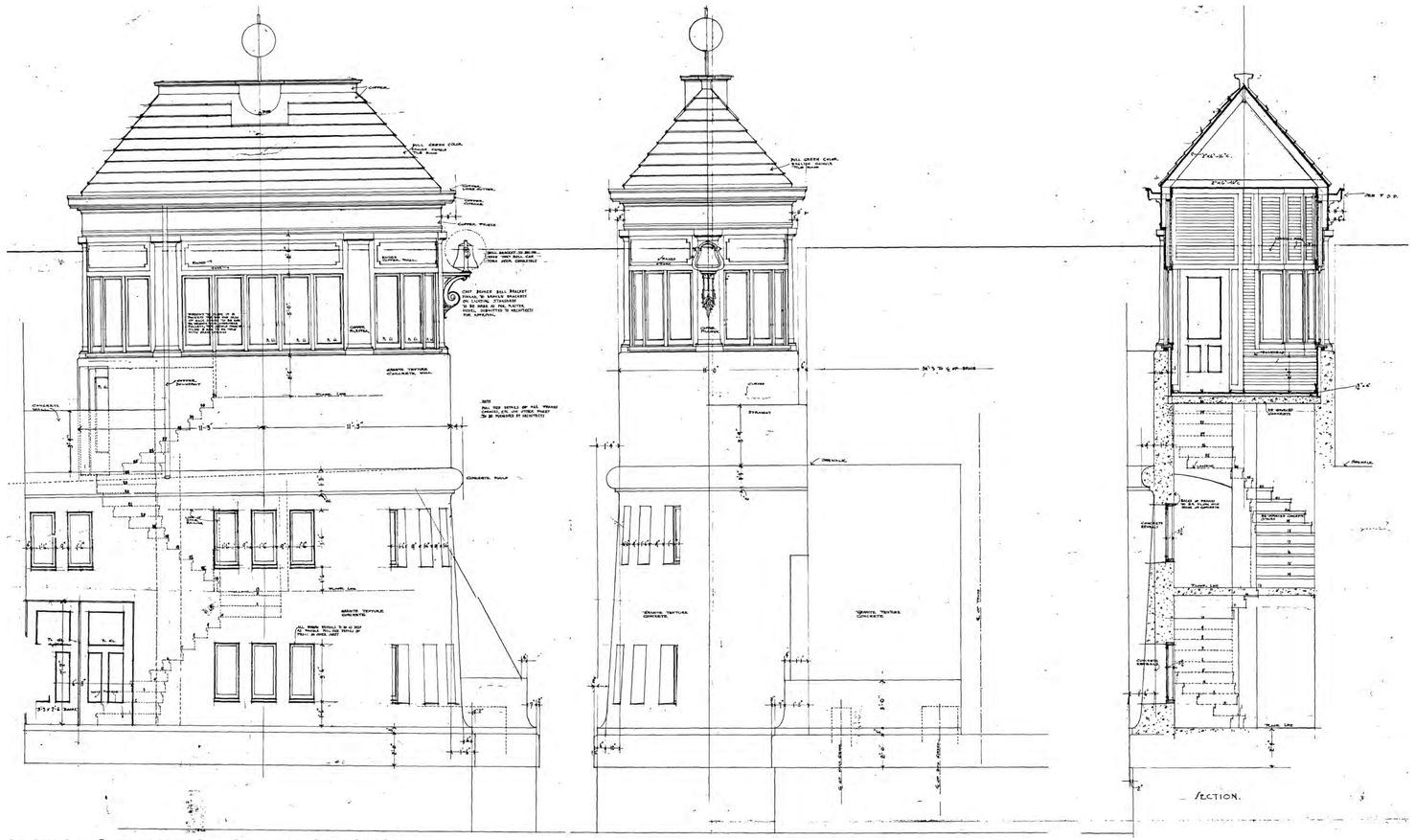
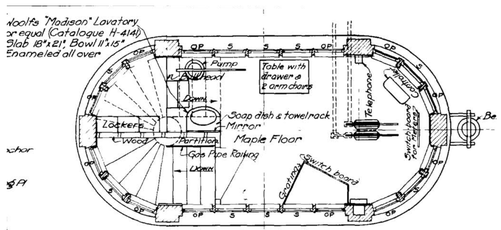
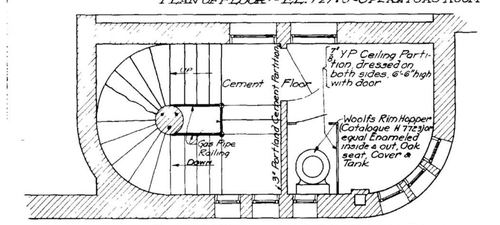
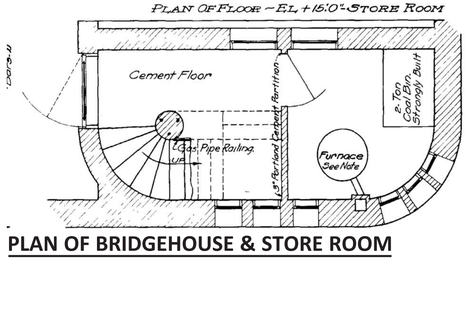


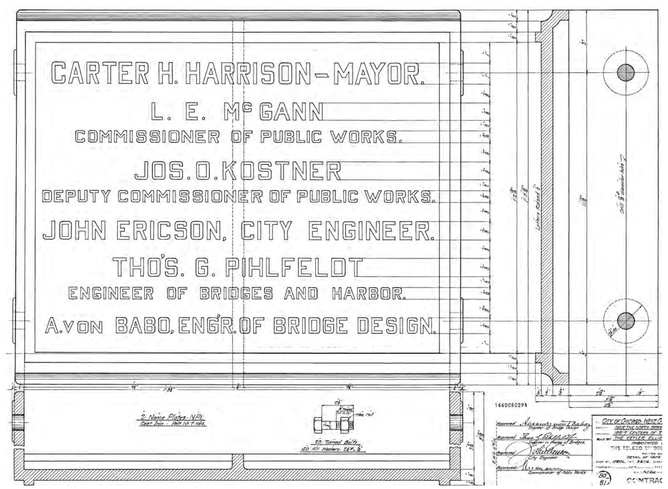

SECTION & ELEVATION OF BRIDGEHOUSE



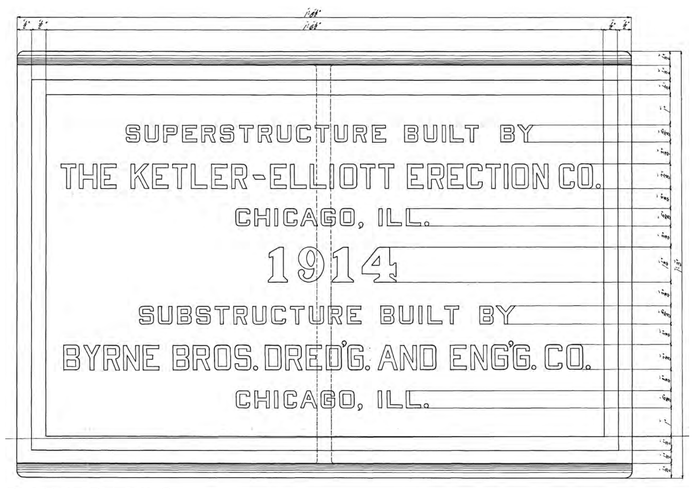



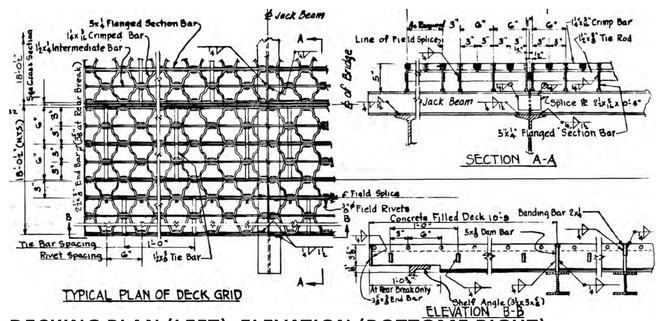

PLAN OF BRIDGEHOUSE & STORE ROOM



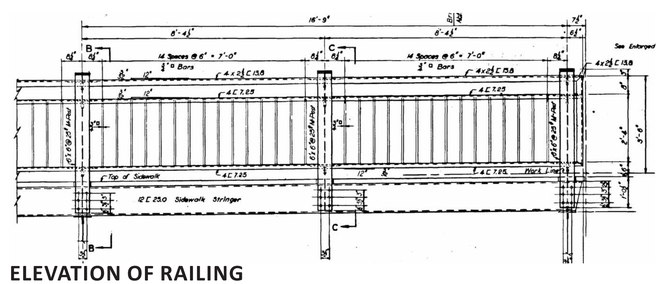

PLAQUE DETAIL 1




PLAQUE DETAIL 2




DECKING PLAN (LEFT), ELEVATION (BOTTOME RIGHT), SECTION (TOP RIGHT)




ELEVATION OF RAILING

(CLOCKWISE FROM TOP LEFT) ILLINOIS CHAPTER OF THE AMERICAN INSTITUTE OF ARCHITECTS, DETAILS FOR CHICAGO AVENUE BRIDGE, DRAWING NO. 2; VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NO. 159, 1912; CHICAGO AVENUE BRIDGE REDECKING AND REPAIRS, DRAWING NO. 30602, 1968; CHICAGO AVENUE BRIDGE REDEACKING AND REPAIRS, DRAWING NO. 30607, 1968; VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NOS. 4419 AND 4418, 1914 (CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES).

DELINEATED BY: ALYSSA FRYSTAK, 2018

ANNE SULLIVAN, FAIA
SULLIVAN PRESERVATION
ILLINOIS HISTORIC PRESERVATION AGENCY

CHICAGO

CHICAGO AVENUE BRIDGE (CHICAGO AVENUE CANAL BRIDGE)
SPANNING NORTH BRANCH CANAL OF THE CHICAGO RIVER
COOK COUNTY
ILLINOIS

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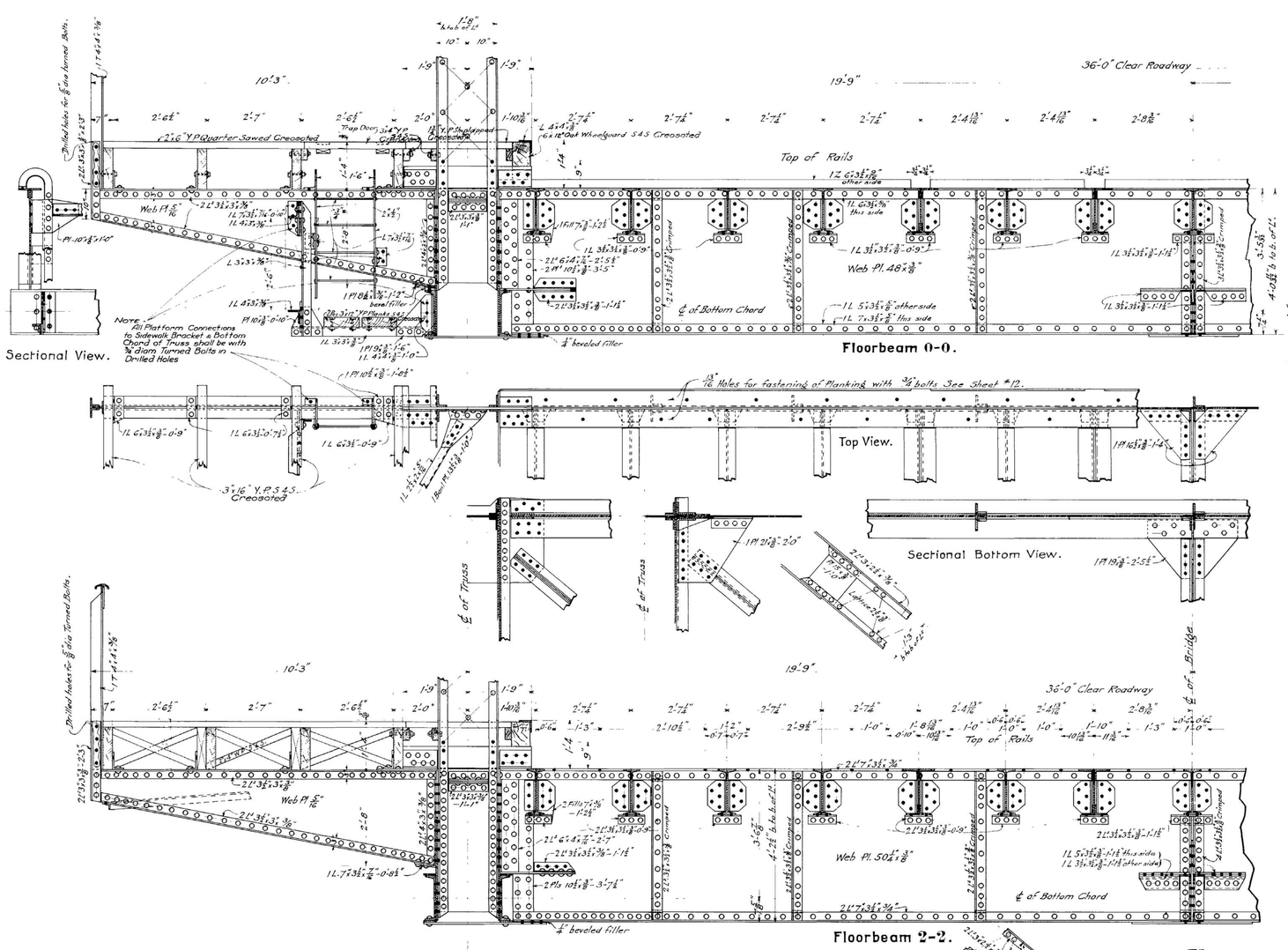


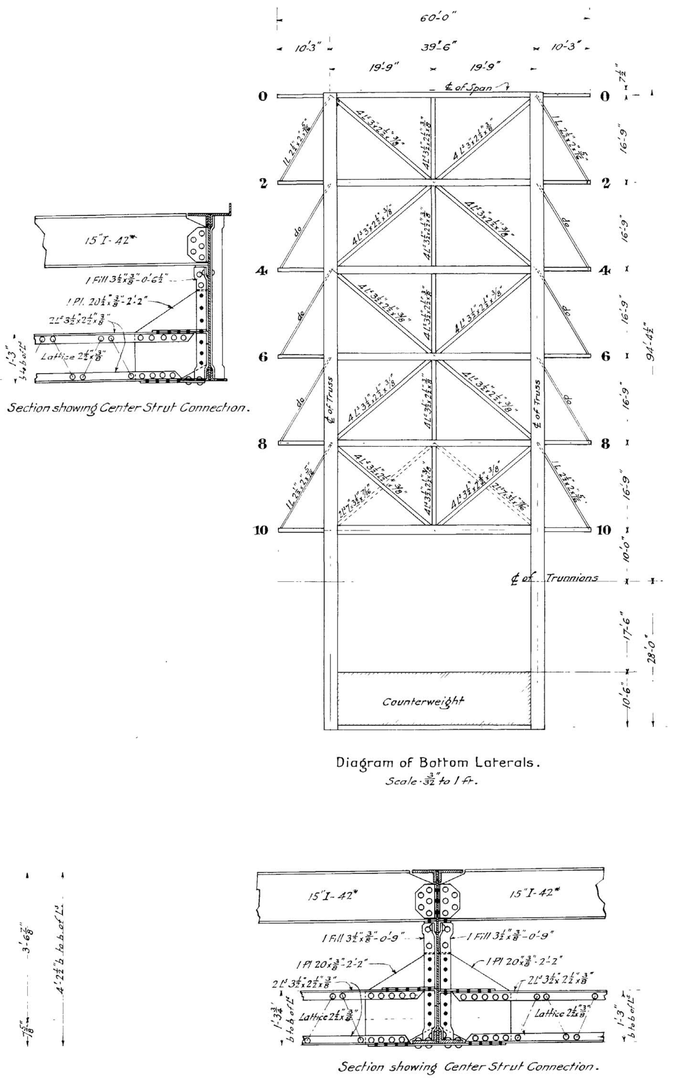


CITY OF CHICAGO
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DIVISION OF BRIDGES AND HARBOR

**WEST CHICAGO AVENUE BRIDGE**
OVER THE NORTH BRANCH OF THE CHICAGO RIVER
SUPERSTRUCTURE
MOVABLE PART

*Floorbeams 0-0, 2-2*

Scale 3/4" = 1 ft September, 1912

Drawn by L.A.
Traced by M.P.C.
Checked by J.A.
Drawing No. 137
File No. 11-5F-14

Correct Alexander von Babo Engineer of Bridge Design.
Approved: Engineer in charge of Bridges & Harbor
Approved City Engineer.
Approved Commissioner of Public Works.

1660080014

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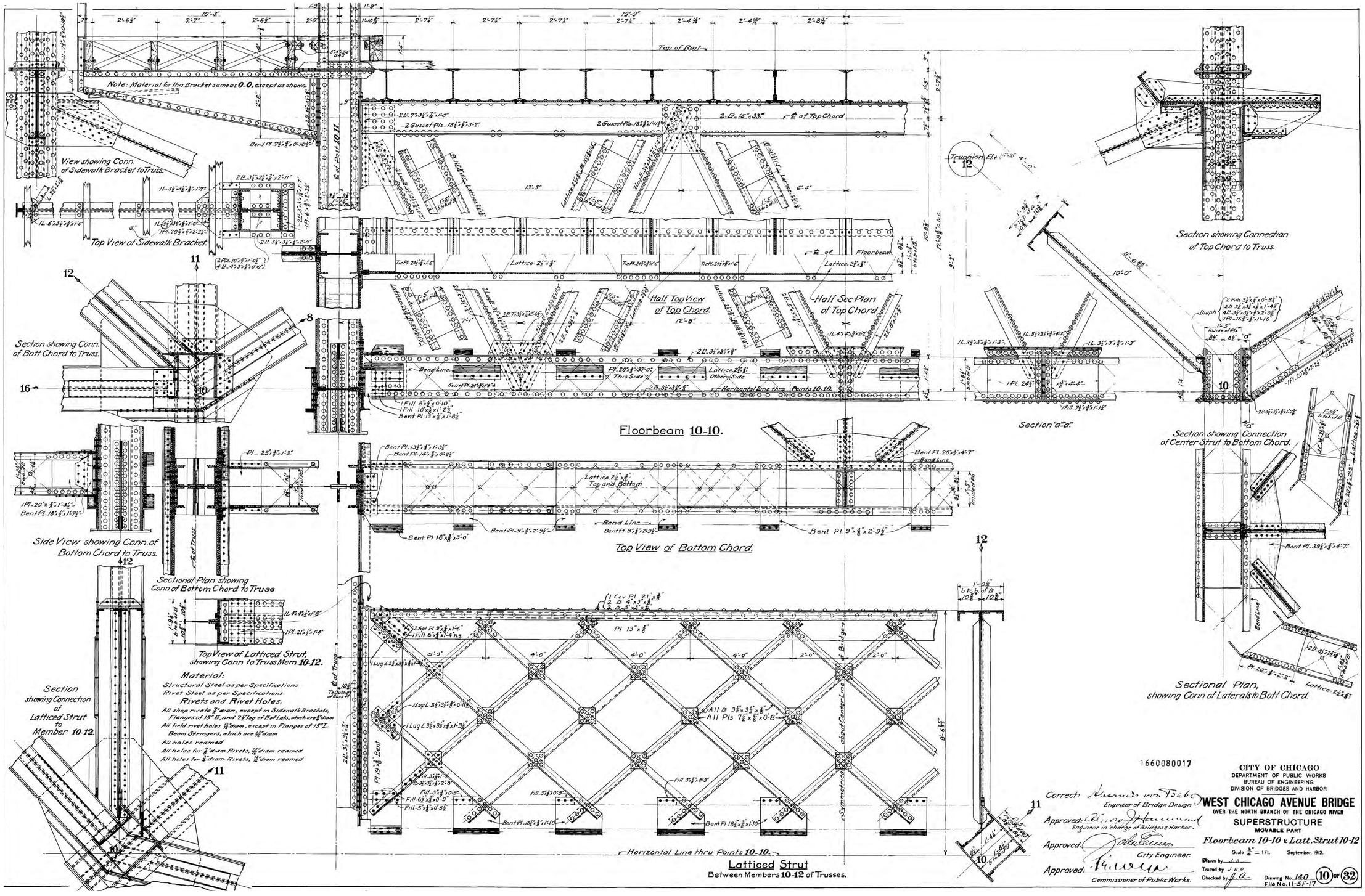
## FLOORBEAMS AT BASE OF BRIDGE

DRAWING SOURCE: VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NO. 137, 1912, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.




1660080017

CITY OF CHICAGO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
DIVISION OF BRIDGES AND HARBOR

**WEST CHICAGO AVENUE BRIDGE**
OVER THE NORTH BRANCH OF THE CHICAGO RIVER
SUPERSTRUCTURE
MOVABLE PART
*Floorbeam 10-10 x Latt. Strut 10-12*

Correct: Alexander von Babo, Engineer of Bridge Design
Approved: [illegible], Engineer in Charge of Bridges & Harbor.
Approved: [illegible], City Engineer.
Approved: [illegible], Commissioner of Public Works.

Scale 3/4" = 1 ft. September, 1912.
Drawn by J.A.
Traced by J.E.O.
Checked by J.E.O.
Drawing No. 140 (10) of (32)
File No. 11-5F-17

## FLOORBEAMS AND LATTICE STRUTS

DRAWING SOURCE: VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NO. 140, 1912, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.

DELINEATED BY: ALYSSA FRYSTAK, 2018

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CHICAGO AVENUE BRIDGE (CHICAGO AVENUE CANAL BRIDGE)
SPANNING NORTH BRANCH CANAL OF THE CHICAGO RIVER
COOK COUNTY

CHICAGO

ILLINOIS

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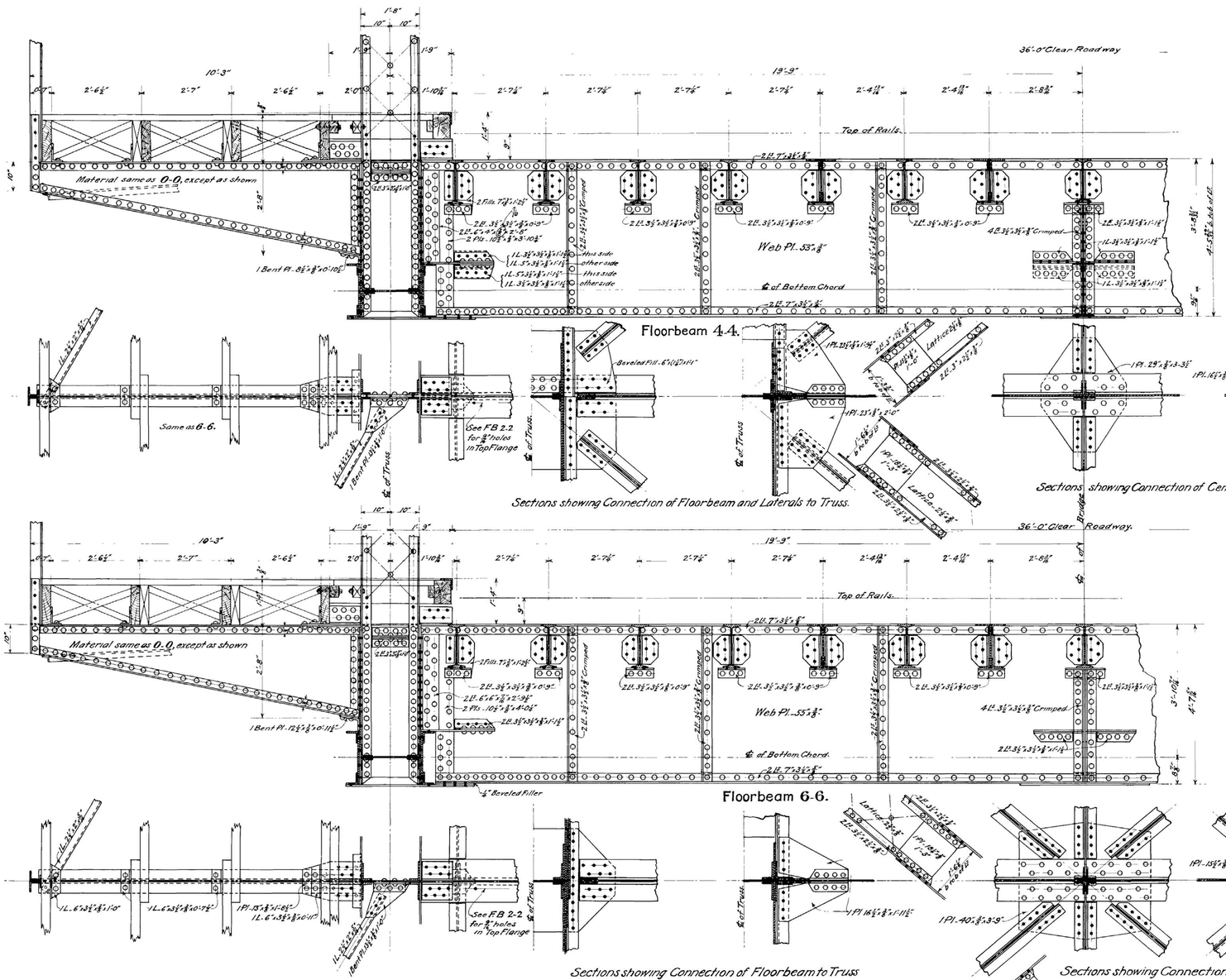


**Note:** For Material, Rivets and Rivet Holes, see Sheet "7.

Correct: Alexander von Babo
Engineer of Bridge Design.

Approved: _____
Engineer in charge of Bridges & Harbor.

Approved: _____
City Engineer.

Approved: _____
Commissioner of Public Works

CITY OF CHICAGO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
DIVISION OF BRIDGES AND HARBOR

**WEST CHICAGO AVENUE BRIDGE**
OVER THE NORTH BRANCH OF THE CHICAGO RIVER
SUPERSTRUCTURE
MOVABLE PART

1660080015 **Floorbeams 4-4, 6-6**

Scale: ¾" = 1 ft September, 1912
Drawn by J. A.
Traced by G. H. H.
Checked by J. A.
Drawing No. 138 File No. 11-5F-15 8 OF 32

## FLOORBEAM CONNECTION TO UPPER TRUSS

DRAWING SOURCE: VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NO. 138, 1912, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.

DELINEATED BY: ALYSSA FRYSTAK, 2018

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SULLIVAN PRESERVATION
ILLINOIS HISTORIC PRESERVATION AGENCY

CHICAGO

CHICAGO AVENUE BRIDGE (CHICAGO AVENUE CANAL BRIDGE)
SPANNING NORTH BRANCH CANAL OF THE CHICAGO RIVER
COOK COUNTY

ILLINOIS

SHEET 12 of 13

HISTORIC AMERICAN ENGINEERING RECORD
IL-144

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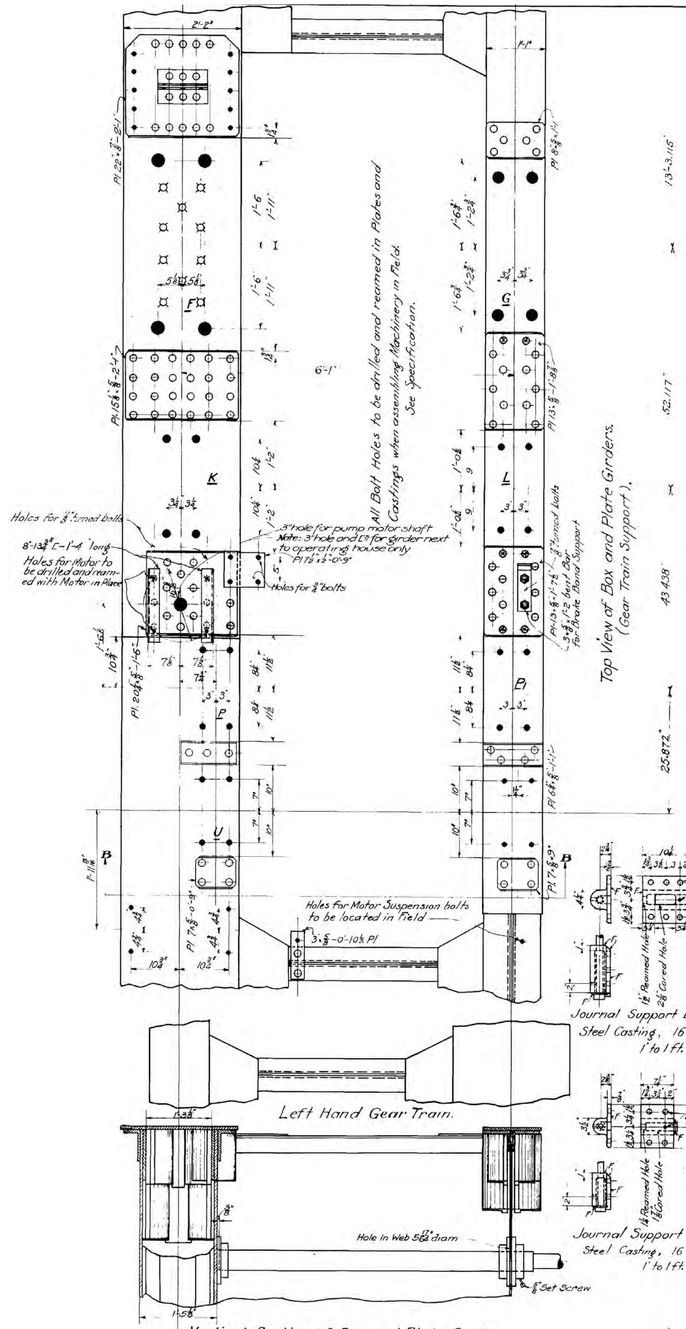
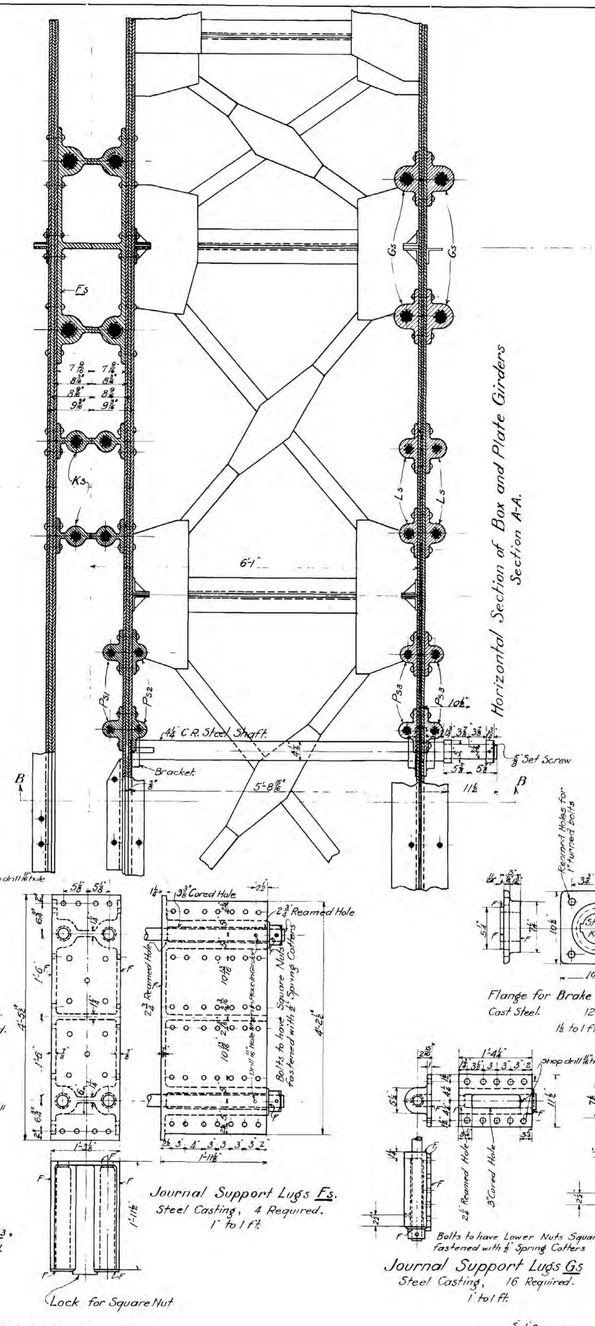


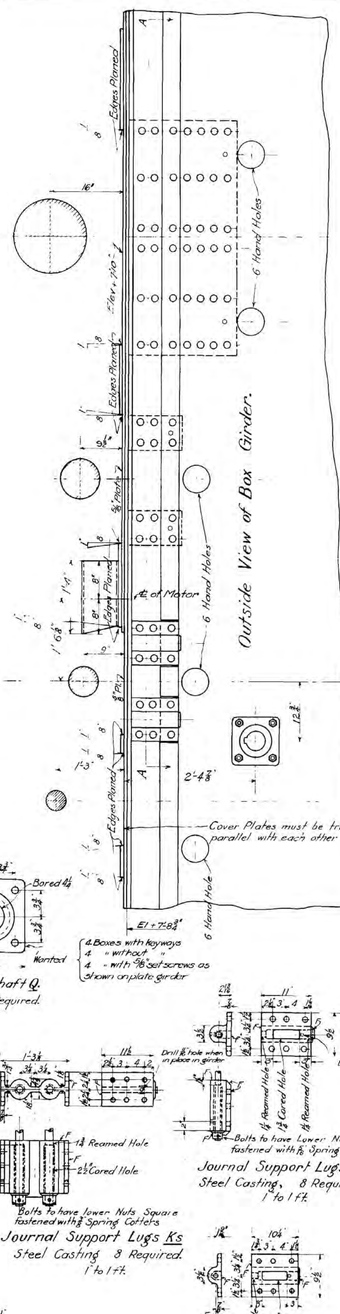



Top View of Box and Plate Girders.
(Gear Train Support).

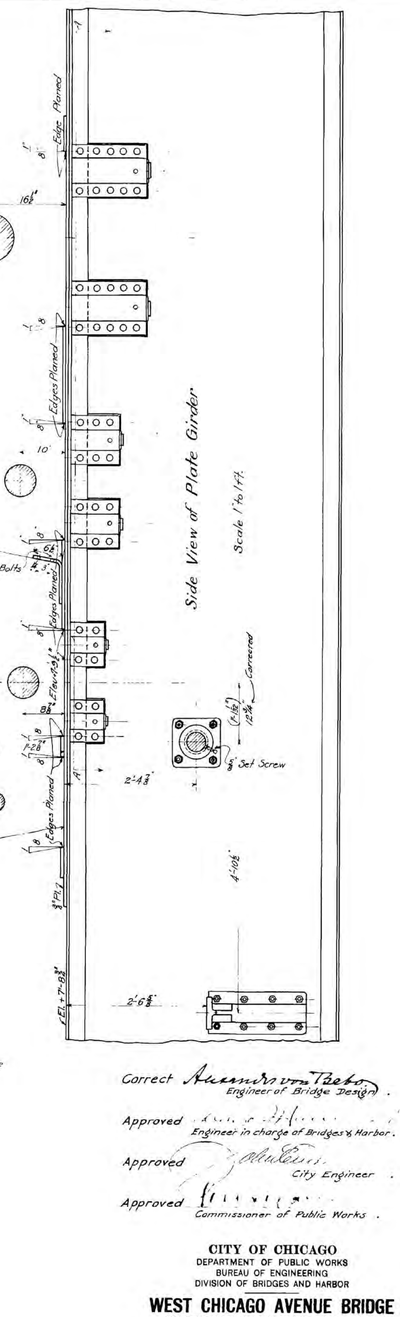
All Bolt Holes to be drilled and reamed in Plates and Castings when assembling Machinery in Place.
See Specification.




Horizontal Section of Box and Plate Girders
Section A-A.




Outside View of Box Girder.




Side View of Plate Girder.
Scale 1"=1 Ft.

Journal Support Lugs Ls.
Steel Casting, 16 Required.
1" to 1 Ft.

Journal Support Lugs Fs.
Steel Casting, 4 Required.
1" to 1 Ft.

Lock for Square Nut

Journal Support Lugs Ps3.
Steel Casting, 16 Required.
1" to 1 Ft.

Flange for Brake Shaft Q
Cast Steel. 12 Required.
1½ to 1 Ft.

4 Boxes with keyways
4 " without "
4 " with ⅝" set screws as shown on plate girder

Journal Support Lugs Gs
Steel Casting, 16 Required.
1" to 1 Ft.

Journal Support Lugs Ks
Steel Casting 8 Required.
1" to 1 Ft.

Journal Support Lugs Ps1.
Steel Casting, 8 Required.
1" to 1 Ft.

Journal Support Lug Ps2.
Steel Casting 8 Required.
1" to 1 Ft.

Journal Block Gibs.
6" to 1 Ft.

Note on Support Lug Castings Etc.
All rivet holes in castings which are placed within Box-Girder and those on one side of Plate-Girder, to be left blank until castings are assembled in place in shop.
Finished tops of castings to be close fit against cover plates or angles.
All bolt holes in cover plates, angles and lug castings, to be drilled to not more than ⅛ size, or left blank, in shop, and then drilled reaming size and reamed standard size after Journal-Blocks are assembled in place in field. The drills and reamers must be guided truly square to cover-plates.
Journal block holding down bolts to be tabbitted, to an easy driving fit, at lower end, after machinery is assembled at bridge site.

Correct Ausmus von Babo
Engineer of Bridge Design.
Approved
Engineer in charge of Bridges & Harbor.
Approved
City Engineer.
Approved
Commissioner of Public Works.

CITY OF CHICAGO
DEPARTMENT OF PUBLIC WORKS
BUREAU OF ENGINEERING
DIVISION OF BRIDGES AND HARBOR

# WEST CHICAGO AVENUE BRIDGE
OVER THE NORTH BRANCH OF THE CHICAGO RIVER

SUPERSTRUCTURE
MACHINERY
*Machy Supports & Castings.*

Scale as shown. September, 1912.
Drawn by AH
Traced by HA
Checked by [illegible]
Drawing No. 154

26 OF 32

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## DETAILS OF BOX AND PLATE GIRDERS

DRAWING SOURCE: VON BABO, PLANS FOR CHICAGO AVENUE BRIDGE, DRAWING NO. 154, 1912, CHICAGO DEPARTMENT OF TRANSPORTATION (CDOT) PLAN ARCHIVES.