April 22, 2015

A Brief History of the Concrete Footbridge Spanning Ravine Road in Lake Park

by

Steven R. Duback

A unique feature of Lake Park is the series of ravines running though the Park from the bluff down to the Lake. Attached as part of Appendix A hereto is a topographical map taken from Laurie Albano's book Milwaukee County Parks, p.23. Note that the widest of the many ravines is the one beginning on top of the bluff just east of the Newberry Boulevard entrance to the Park and running down to the beach. This is the ravine now occupied by "Ravine Road" completed during the first decade of the 20th Century under the supervision of the City of Milwaukee Park Commission. Ravine Road is spanned by what is now commonly called the "Lake Park Concrete Footbridge" built in 1905-06.

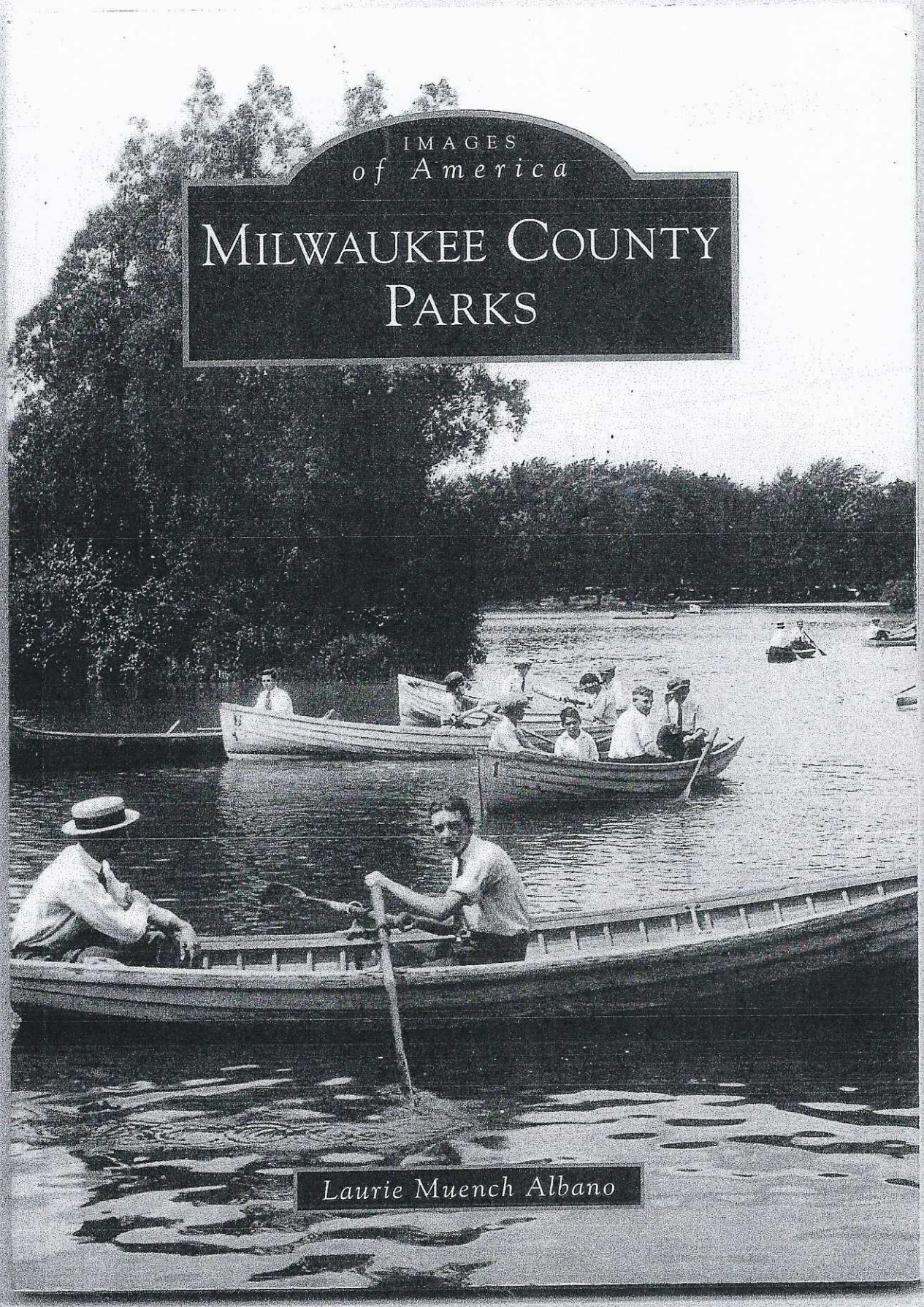
Olmsted's 1895 General Plan for Lake Park envisioned one main road along the lakeshore below the bluffs, another along the top of the bluff along city streets, and finally a connecting road from the base of the bluffs up through the ravine in which Ravine Road is now located ("Olmsted's Lake Park" by Diane M. Buck, published in The Magazine of the Milwaukee County Historical Society, Autumn 1982).

A early as 1899, Christian Wahl, then President of the City Park Commission, was concerned about the need to unite the north and south portions of the Park, so that people would not have to make a circuit west around the top end of this giant ravine. The problem became particularly acute as both the north and south portions of the Park were quite quickly developed for use by the public in the mid and late 1890s and early 1900s. The new pavilion just to the south of the Ravine and the new bandstand directly to its west were opened in 1903. The new pavilion was described by the Park commissioners in its 1902 Annual Report as able to "easily accommodate five thousand people." And, the streetcar station

at the east end of Locust (then Folsum) Street had been completed and was serving the ever increasing press of Park visitors from all over the City.The north portion of the Park (i.e. the portion north of what is today "Ravine Road" and what was then called "South Ravine") was being used increasingly as a picnic area.

A primary question therefore was how to bridge the South Ravine so that people could easily move from the Pavilion and Concert Grove areas back and forth across the South Ravine to the picnic area. The answer was the 1905-1906 Concrete Footbridge designed by one of the then Park Commissioners and well known architect Alfred C. Clas, who along with his partner George Bowman Ferry designed numerous now famous Milwaukee landmarks including the Central Library, the First Unitarian Church, the Frederick Pabst House. See Appendix B.

The footbridge also has historic significance from an engineering standpoint. In Historic Highway Bridges in Wisconsin, Vol. 1, Stone and Concrete - Arch Bridges, 1986, Wisconsin Department of Transportation, the authors at pp.233-235, 259 and 280-286 describe in some detail the historical engineering significance of the Lake Park Concrete Foot Bridge. See attached Appendix C which includes a detailed description of the bridge and some interesting photos of it from various angles. At p.234 the authors describe the footbridge as "an advanced and innovative work of reinforced-concrete bridge engineering." They go on to say that the bridge "not only is one of the earliest extant reinforced-concrete arches in Wisconsin, but it employs the Kahn Truss Bar system in a semi-open, rib-arch design, one of the earliest major rib-arch bridges in the nation." An interesting photo of the just completed footbridge and road under it was part of the 1905 Annual Report of the City Park Commissioners and is attached hereto as Appendix D.


IMAGES
of America
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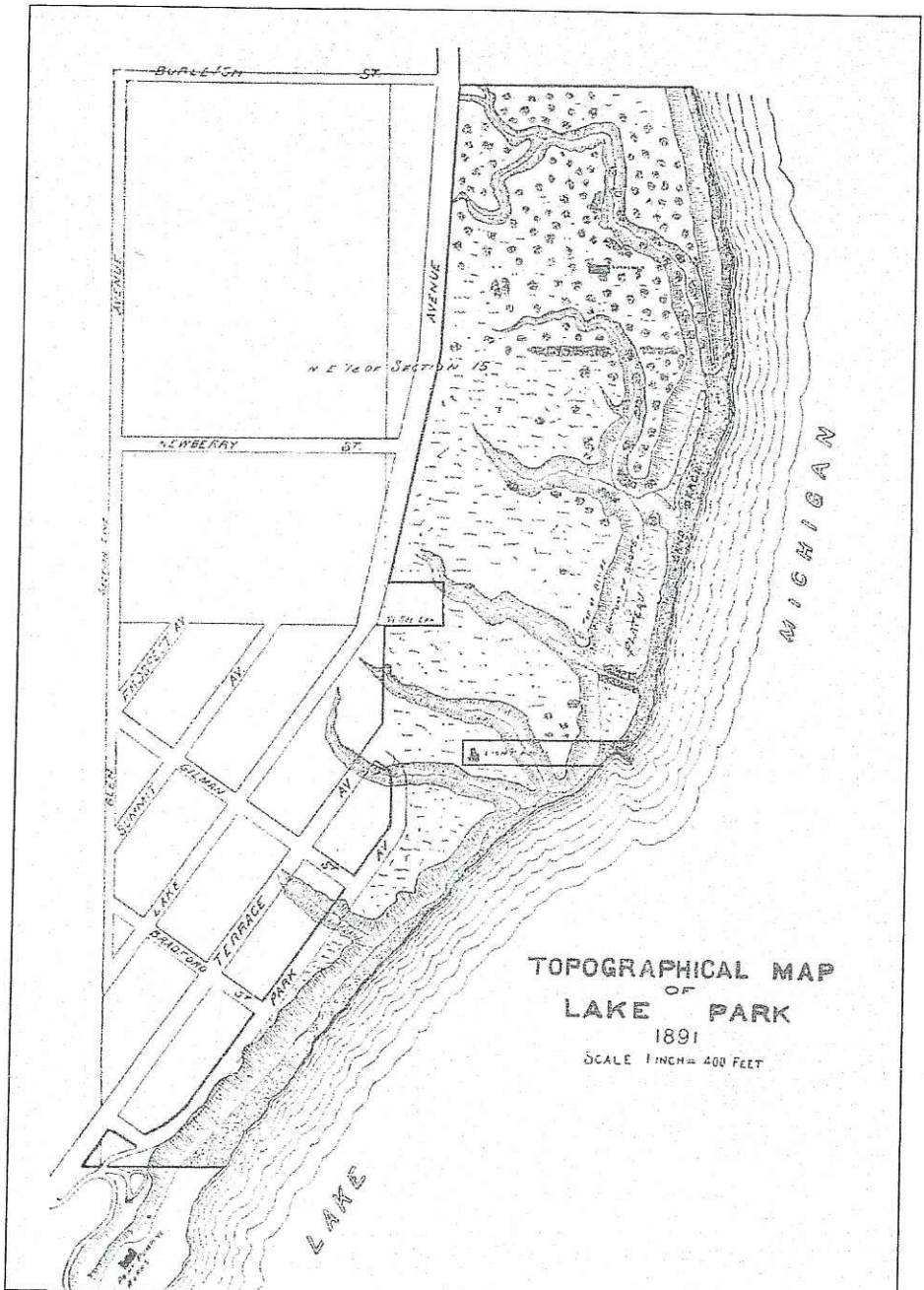
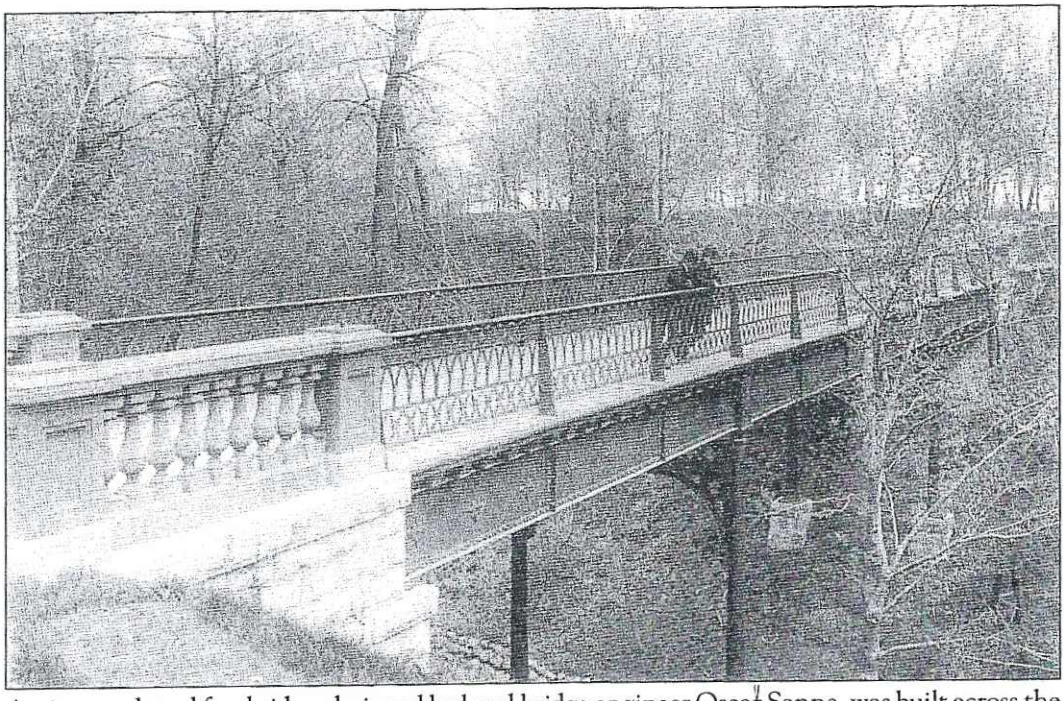
PARKS
Laurie Muench Albano

APPENDIX A

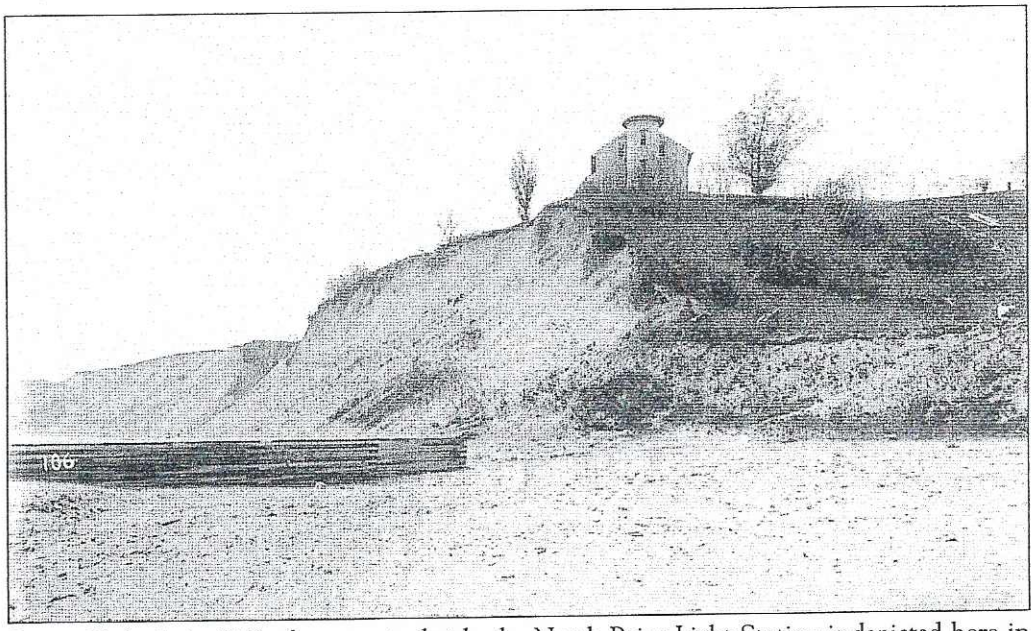


One of the first purchases made for the new park system was 123.6 acres located along the Lake Michigan shoreline, extending from the Water Works Park at Terrace Avenue north to Burleigh Street. The property was cut by several ravines, which extended to the lake. The northern 40 acres of the park were heavily wooded, consisting primarily of oaks. The commissioners saw this as the only chance left to provide the citizens of Milwaukee with an opportunity to reach the lake without having to cross railroad tracks as "private landholders and corporations had ownership of the lakeshore from St. Francis on the south to the Water Works on the north."

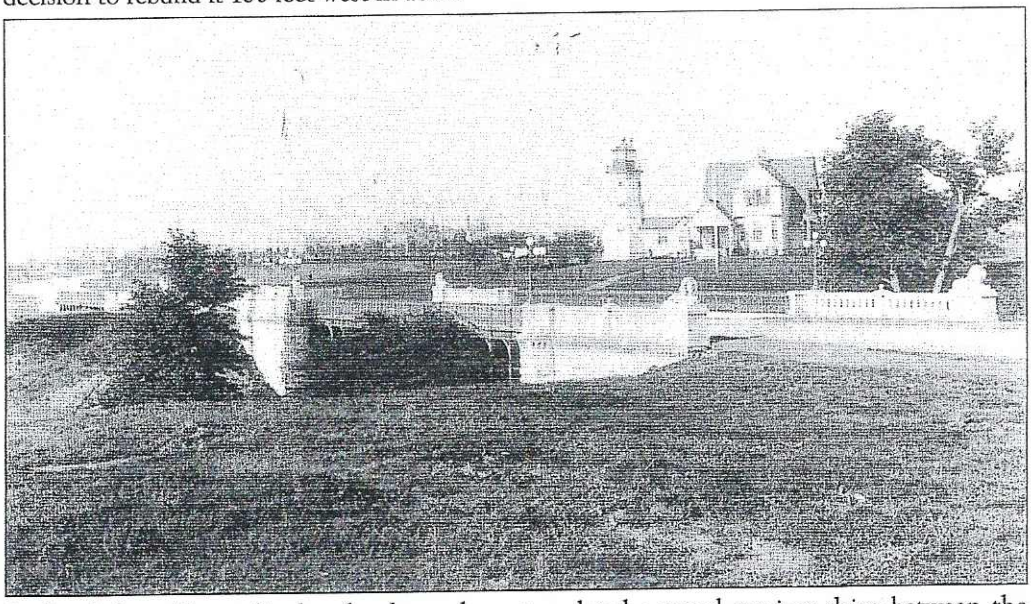


An iron and steel footbridge, designed by local bridge engineer Oscar Sanne, was built across the North Ravine in 1892. The bridge was 110 feet long and 12 feet wide. The terra-cotta railing on the abutments was completed in 1893.

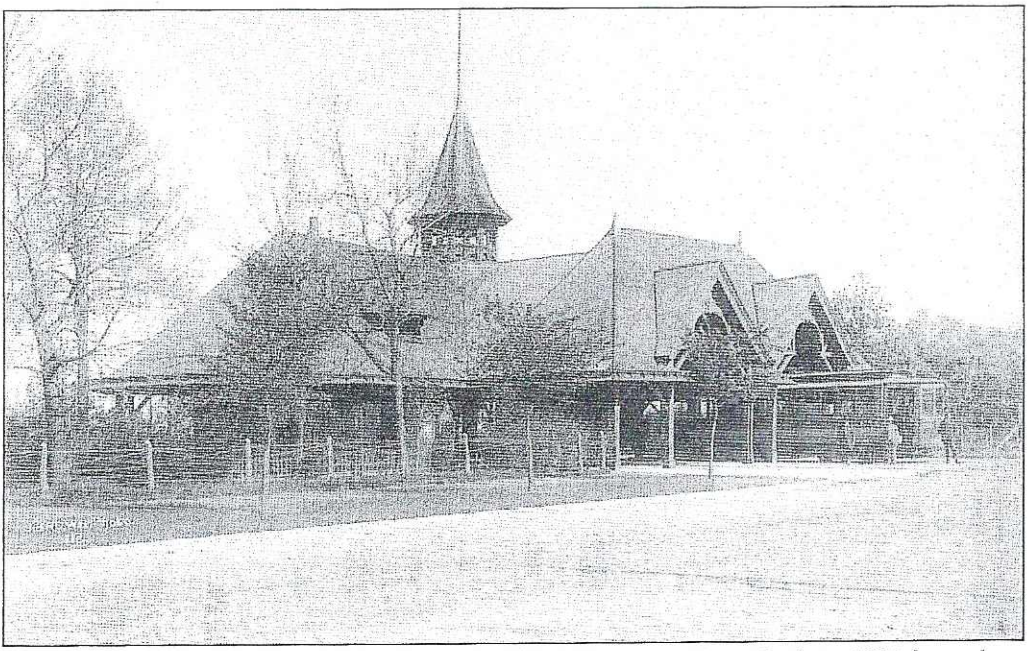
This rustic footbridge was built across the South Ravine in 1895. It was planned by park board president Christian Wahl. Additional rustic bridges were built across the brooks in the bottom of the ravines under Wahl's direction, providing pedestrian access down to the lakefront.



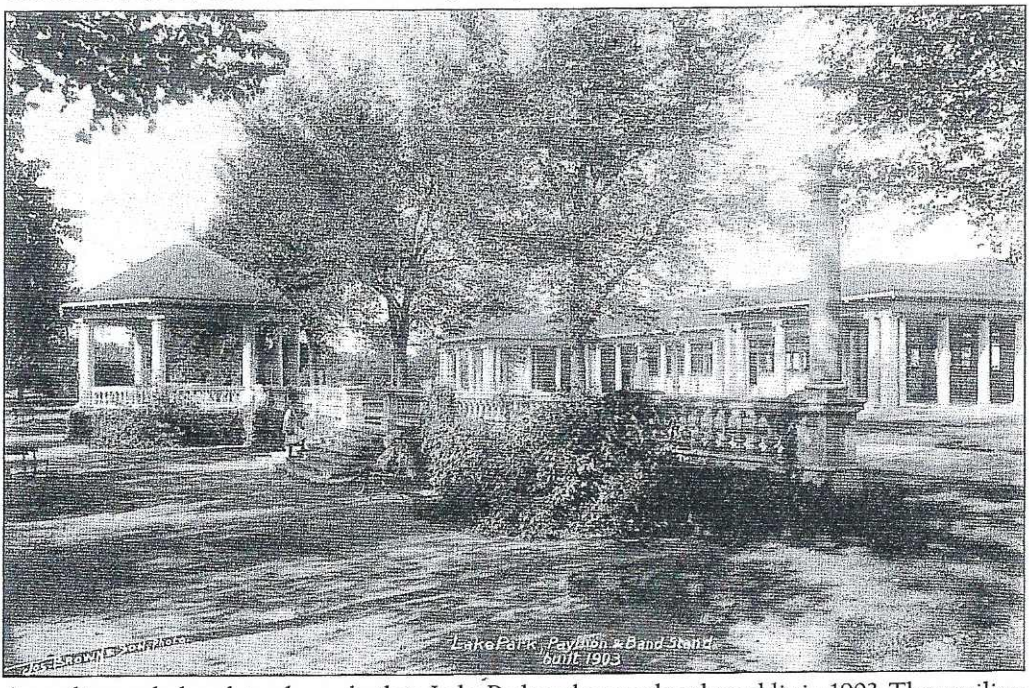
Originally built in 1855 of cream city brick, the North Point Light Station is depicted here in 1890. The tower was 28 feet tall and was situated on a bluff that made it, at 107 feet above the water, the highest lighthouse elevation on the Great Lakes. Several decades of erosion brought the light station perilously close to the bluff edge, and the U.S. Lighthouse Service made a decision to rebuild it 100 feet west in 1888.



Frederick Law Olmsted's plan for the park contemplated a grand carriage drive between the lakeshore and the new lighthouse, taking advantage of the vista along the lakefront. The commissioners successfully negotiated with the federal government and were allowed to improve the lighthouse parcel, which essentially cut the park in half. In 1897, two steel arch bridges spanning the ravines north and south of the lighthouse were completed and adorned with eight sculpted stone lions.



A railcar station, with a large waiting room and "retiring rooms," was built in 1894 from plans made by architect Howland Russel. The structure was located at the Folsum (Locust) Street entrance, which allowed visitors to easily visit the park using "the electric road." This station cost about $7,000, one half of which was paid by the Milwaukee Street Railway Company.

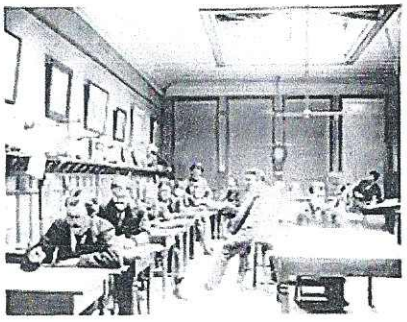


A pavilion and a bandstand were built in Lake Park and opened to the public in 1903. The pavilion was described as having a floor space of 140 feet by 50 feet with two porches that measured 26 feet by 26 feet at the west end. The basement was outfitted with all sanitary conveniences.

Ferry & Clas

From Wikipedia, the free encyclopedia

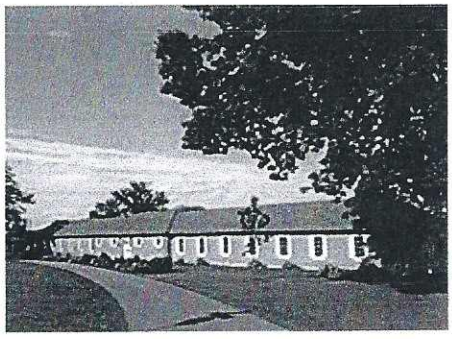
Ferry & Clas was an architectural firm in Wisconsin. It designed many buildings that are listed on the National Register of Historic Places.[1] George Bowman Ferry and **Alfred Charles Clas** were partners.



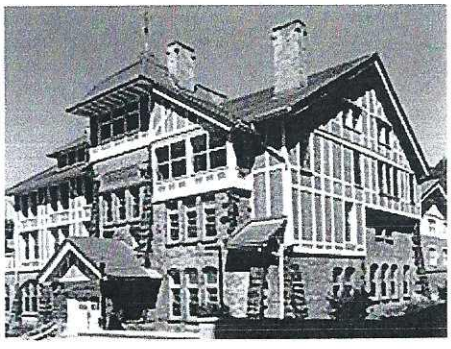
Ferry & Clas architects at work

Works (and credits) include:

- Emanuel D. Adler House, 1681 N. Prospect Ave., Milwaukee, WI (Clas,Alfred C.) NRHP-listed[1]
- Brittingham Park Boathouse, N. Shore Dr., Madison, WI (Ferry & Clas) NRHP-listed[1]
- Cass-Wells Street Historic District, 712, 718, and 724 E. Wells St. and 801, 809, 815, 819, and 823 N. Cass St., Milwaukee, WI (Ferry & Clas) NRHP-listed[1]
- Central Library, 814 W. Wisconsin Ave., Milwaukee, WI (Ferry & Clas) NRHP-listed[1]
- Columbus Fireman's Park Complex, 1049 Park Ave., Columbus, WI (Clas, Alfred C.) NRHP-listed[1]
- Crisp Building, 1970 Main St., Sarasota, FL (Clas & Shepard) NRHP-listed[1]
- Earle House, 4521 Bayshore Rd., Sarasota, FL (Clas, Alfred C.) NRHP-listed[1]
- L. D. Fargo Public Library, 120 E. Madison St., Lake Mills, WI (Ferry & Clas) NRHP-listed[1]
- First Unitarian Church, 1009 E. Ogden Ave., Milwaukee, WI (Ferry & Clas) NRHP-listed[1]



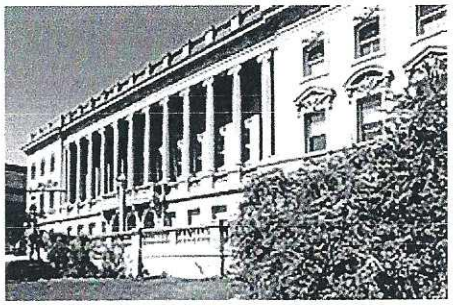
Brittingham Park Boathouse



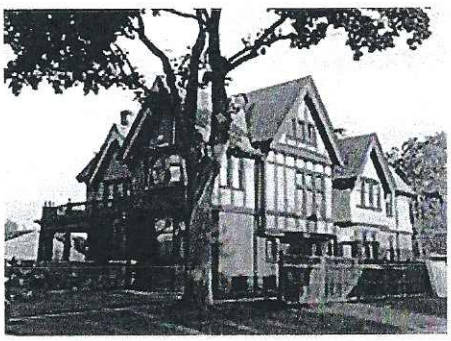
Hiram Smith Hall and Annex

APPENDIX B

- Freethinkers` Hall, 309 Polk St., Sauk City, WI (Clas,Alfred Charles) NRHP-listed[1]
- Hiram Smith Hall and Annex, 1545 Observatory Dr., Univ. of WI, Madison, WI (Ferry & Clas) NRHP-listed[1]
- Hotel Whiting, 1408 Strongs Ave., Stevens Point, WI (Clas,Alfred C.) NRHP-listed[1]
- Hutchinson Memorial Library, 228 N. High St., Randolph, WI (Clas & Clas,Inc.) NRHP-listed[1]
- Jackson District Library, 244 W. Michigan St., Jackson, MI (Ferry & Clas) NRHP-listed[1]
- Knapp-Astor House, 930 E. Knapp St. and 1301 N. Astor St., Milwaukee, WI (Ferry & Clas) NRHP-listed[1]
- Lake Park, 2900 N. Lake Dr. and 2800 E. Kenwood Blvd., Milwaukee, WI (Clas, Alfred C.) NRHP-listed[1]



Wisconsin Historical Society



Jacob Van Orden House

- Milwaukee Hospital, 2200 W. Kilbourn Ave., Milwaukee, WI (Clas, Shepartd & Clas, et al.) NRHP-listed[1]
- Nye House, 1643 N. Nye Ave., Fremont, NE (Ferry & Class) NRHP-listed[1]
- Pabst, Frederick, House, 2000 W. Wisconsin Ave., Milwaukee, WI (Ferry & Class) NRHP-listed[1]
- Saint James Court Apartments, 831 West Wisconsin Ave, Milwaukee, WI (Ferry and Clas) NRHP-listed[1]
- Sauk City High School, 713 Madison St., Sauk City, WI (Clas,Alfred C.) NRHP-listed[1]
- Sauk County Courthouse, 515 Oak St., Baraboo, WI (Ferry & Clas) NRHP-listed[1]
- Franklyn C. Shattuck House, 547 E. Wisconsin Ave., Neenah, WI (Ferry & Clas) NRHP-listed[1]
- Cathedral of St. John the Evangelist, 812 N. Jackson St., Milwaukee, WI (Ferry & Clas) NRHP-listed[1]

- State Bank of Wisconsin, 210 E. Michigan St., Milwaukee WI (Ferry & Clas) NRHP-listed
- State Historical Society of Wisconsin, 816 State St., Madison, WI (Ferry & Clas) NRHP-listed[1]
- Tripoli Temple, 3000 W. Wisconsin Ave., Milwaukee, WI (Clas,Shepard & Clas) NRHP-listed[1]
- Tripp Memorial Library and Hall, 565 Water St., Prairie du Sac, WI (Ferry & Clas) NRHP-listed[1]
- Jacob Van Orden House, 531 4th Ave., Baraboo, WI (Ferry & Clas) NRHP-listed[1]
- Joseph Vilas, Jr. House, 610-616 N. 8th St., Manitowoc, WI (Ferry & Clas) NRHP-listed[1]
- Wisconsin State Reformatory, SE corner of Riverside Dr. and SR 172, Allouez, WI (Ferry & Clas) NRHP-listed[1]

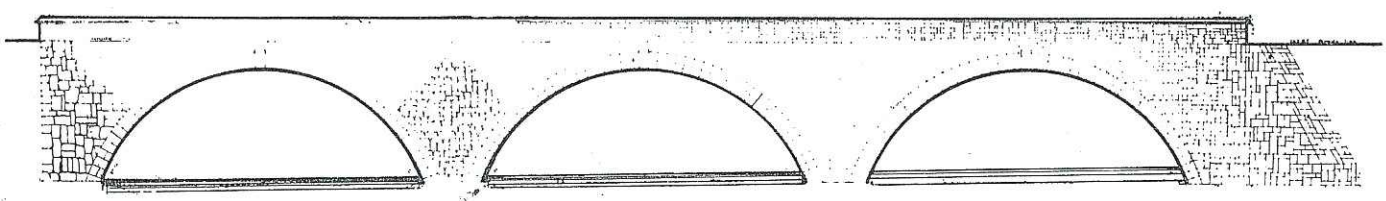
References

1. "National Register Information System" (http://nrhp.focus.nps.gov/natreg/docs/All_Data.html). *National Register of Historic Places*. National Park Service. 2009-03-13.

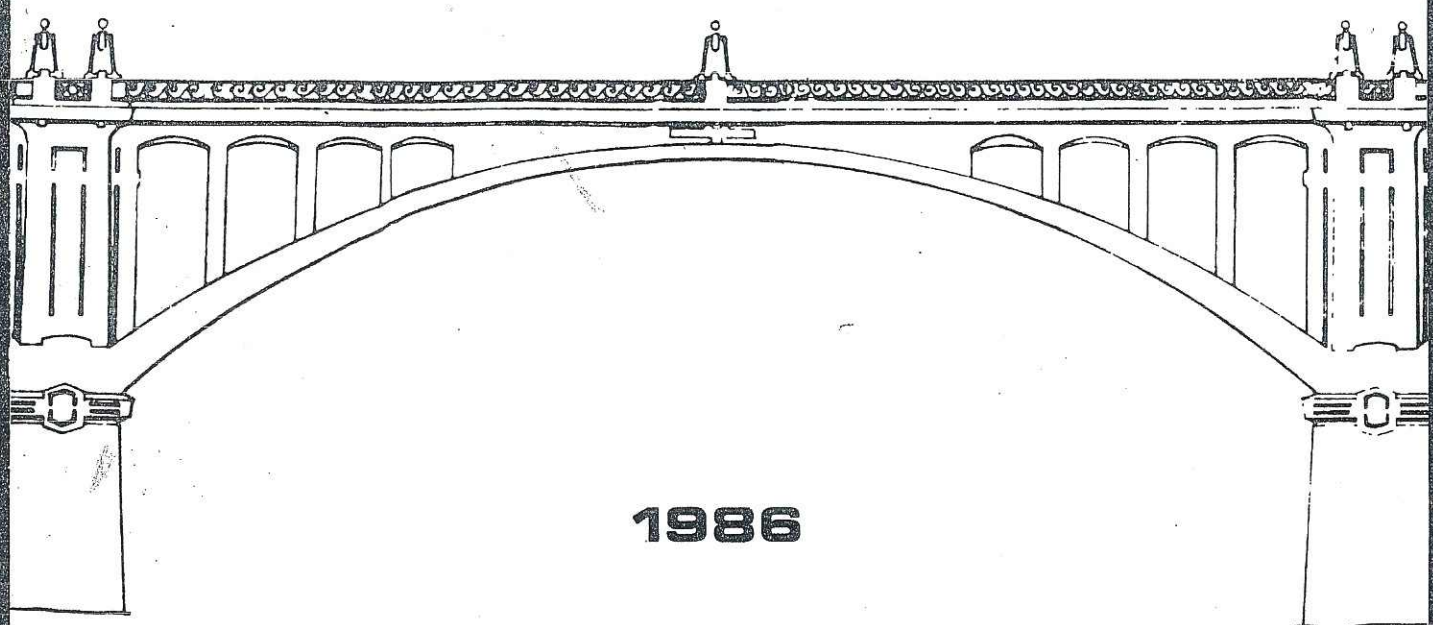
Categories: Architecture firms based in Wisconsin

HISTORIC HIGHWAY BRIDGES IN WISCONSIN

Volume 1



STONE AND CONCRETE-ARCH BRIDGES



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APPENDIX C

HISTORIC HIGHWAY BRIDGES IN WISCONSIN

VOLUME I

STONE AND CONCRETE ARCH BRIDGES

PREPARED BY

Jeffrey A. Hess and Robert M. Fráme III

WISCONSIN DEPARTMENT OF TRANSPORTATION
1986

maintain the allowable stress." In addition, Condit has noted the higher United States labor costs relative to complicated formwork, along with extreme geographical factors in North America, such as hurricanes, blizzards, wind and snow loads, and earthquakes, as well as heavy railroad loadings.[79]

-- Park Bridges: A Special Case in Aesthetics

Along with the chronological coincidence of urban expansion, the growth of city and state road systems, and the introduction of reinforced concrete, came the rise of the urban park. As social historian Alan Tractenberg has observed, noting particularly the ideas of park architect Frederick Law Olmsted, the park was meant to be a refuge from, and thus a contrast with, both the commercial and industrial center and the immigrant-crowded neighborhoods of worker housing. With its curvilinear streets, green open space, all carefully landscaped, the urban park was "all pastoral picture, composed views, nature artfully framed as spectacle."[80]

Within the park, the bridge was not merely an expected necessity, but emerged as an opportunity. Here the city park commission and landscape architect could request special bridge designs, in harmony with the grand park scheme. Bridge engineer and aesthetic critic Henry G. Tyrrell declared in 1901, "In the matter of ornamental park-bridges the engineer has opportunity to display more or less artistic taste, and create, not only useful works, but architectural ornaments as well." He indicated also that

> It can not...be expected to put up ornamental structures in any of the rural districts, or to any great extent for the use of railroads.

> The opportunity in the line of ornamental bridge-construction lies chiefly in and around our large cities and park systems and it is greatly to be hoped that, as old wooden bridges decay and are removed, our progressive American people will see their opportunity to replace these with suitable ones of iron and stone, made not simply to carry loads, but to be prominent architectural ornaments.[81]

For Tyrrell, particularly appropriate park styles would be based on the arch or suspension bridge, with rustic treatment desirable.[82] The park further provided an ideal opportunity to explore the possibilities of the new concrete, and a great variety of forms emerged (with notable early examples illustrated in Tyrrell's and Whitney's works). Today, since parks seldom have undergone the heavy usage and expansions of all other road systems, many of the original park bridges survive. Parks now provide us with significant extant examples of some of the earliest and most ornate reinforced-concrete bridges.[83]

The most important park represented in this study is Milwaukee's Lake Park, the plans for which were first prepared by the office of Frederick Law Olmsted in 1892. The final designs were submitted in 1895.[84] Interestingly enough, however, is the fact that the reinforced-concrete arch in Lake Park is notable not because it is a representative park type in the Tyrrell or Whitney mode, but because it is an advanced and innovative work of reinforced-concrete bridge engineering. The 1906 Lake Park Bridge (P-40-576) not only is one of the earliest extant reinforced-concrete arches in Wisconsin, but it employs the Kahn Truss Bar system in a semi-open, rib-arch design, one of the earliest major rib-arch bridges in the nation. While the other Lake Park bridges, all described in contemporary bridge literature, are in the conventional, ornamental, park

style, the concrete example is given only a slight neoclassical treatment. A more "representative" reinforced-concrete ornamental park bridge is the Kinzie Avenue/Horlick Park Bridge (see Figure 102), known today as Island Park Bridge (P-51-712). Not only is this a park bridge in the archetypal neoclassical -- "city beautiful" -- mode, but it also is one of Wisconsin's earliest reinforced-concrete arch bridges, built in 1908 (a second 1908 bridge in the park, likely a twin when built, now has been altered). Significantly, this bridge was designed for the recently opened (ca. 1906-07) Horlick Park by an architect, A.A. Guilbert.

Two excellent examples of rustic stone ornamental park bridges are the 1927 Lakeside Park Bridge (P-20-720) in Fond du Lac -- an urban example (see Figure 103), and the 1927 Eau Clair Dells Bridge (B-37-568) in Eau Clair Dells County Park, Marathon County -- a rural example (see Figure 104).

Historical Analysis

The Role of the State in Concrete Bridge Building

The official role and ever increasing intervention of the State of Wisconsin in road and bridge construction was intertwined historically with the development and standardization of the use of concrete. This was due to several factors, notably the advent and widespread use of the automobile. Concrete, particularly reinforced concrete, emerged as a viable bridge and road material at about the same time that autos were introduced, circa 1900. By World War I, the automobile was becoming a major transportation concern, the state had formed the Wisconsin State

necessary to receive Special Bridge funding. To accommodate the Wisconsin Rapids project, State Senator Isaac P. Witter in 1917 obtained an amendment (Section 1325k) reducing the minimum length to 475 feet, with the cost to paid one third by the state and two thirds by the county or counties. Completed in 1922, the new Grand Avenue Bridge on the Wisconsin River (B-71-753; see Figure 107) not only had precipitated the reduced-length amendment, but also was the first reinforced-concrete arch bridge built under the Special Bridge Law.[133]

Between 1921 and 1931 the Special Bridge Statutes were revised and amended several times, although in no particular way affecting the bridges in this study. In 1929 the statutes were consolidated. Very little was changed between 1931 and 1945, the end date of this study.[134]

Significant Bridges

Of the 44 reinforced-concrete arch bridges and viaducts reviewed in this study, 14 have sufficient engineering, historical, and/or architectural significance to merit National Register designation as a thematic group. This determination does not mean that all of the other structures are entirely lacking in significance. The selection process was largely contextual, which means that some structures were not recommended for eligibility because their virtues are better documented by other bridges. If, for whatever reason, the future witnesses a marked attrition of Wisconsin reinforced-concrete arches, we recommend that the surviving sample be re-evaluated for significance. The 14 eligible structures are discussed in detail below, in order by WisDOT bridge number.

6. WisDOT Designation: P-40-576

Historic Name: Lake Park Foot Bridge

Common Name: Lake Park Footbridge

Location: Pedestrian Walkway over Lake Park Drive, Lake Park, City of Milwaukee, Milwaukee County

Construction Date: 1906

Engineer: Ferry and Clas, Architects; F.E. Turneaure

Contractor: Newton Engineering Company

Architectural & Engineering Significance: This structure is a pierced-spandrel, reinforced-concrete, rib-arch bridge. Overall length is 216.5 ft. Overall width is 10 ft. and carries the pedestrian walkway. The span is 118 ft. with an 18-ft. rise. There are two reinforced-concrete ribs, 12 in. wide and 54 in. deep, placed 12 ft. apart. They are reinforced with Kahn-patent trussed bars. Each rib supports a spandrel wall pierced with large openings. The ribs are connected with cross walls, struts, and lateral bracing of truscon bars.[150] The overall effect is designed to reduce structure weight. F.E. Turneaure (1866-1951) assisted Ferry & Clas, an architectural firm, with the design, and engineer R.E. Newton may also have been involved. This is among the earliest American rib-arch bridges (a rib-arch park bridge built in 1905 in Illinois was declared, at that time, to be the first known such structure),[151] and possibly the first concrete-arch bridge to use the Kahn trussed-bar system of reinforcement.[152] Detailing is neoclassical. The bridge retains excellent integrity in engineering and aesthetics.[153] (See Figures 94, 95, 118, 119, 120, and 121.)

FIGURE 118: Lake Park Foot Bridge (P-40-576), Lake Park, Milwaukee. Built 1906; Ferry and Clas, Newton Engineering Company, and F.E. Turneaure, engineers. East elevation. (Source: Robert M. Frame III, 1985.)

FIGURE 119: Lake Park Foot Bridge (P-40-576), Lake Park, Milwaukee. South abutment. (Source: Robert M. Frame III, 1985.)

FIGURE 120: Lake Park Foot Bridge (P-40-576), Lake Park, Milwaukee. South abutment. (Source: Robert M. Frame III, 1985.)

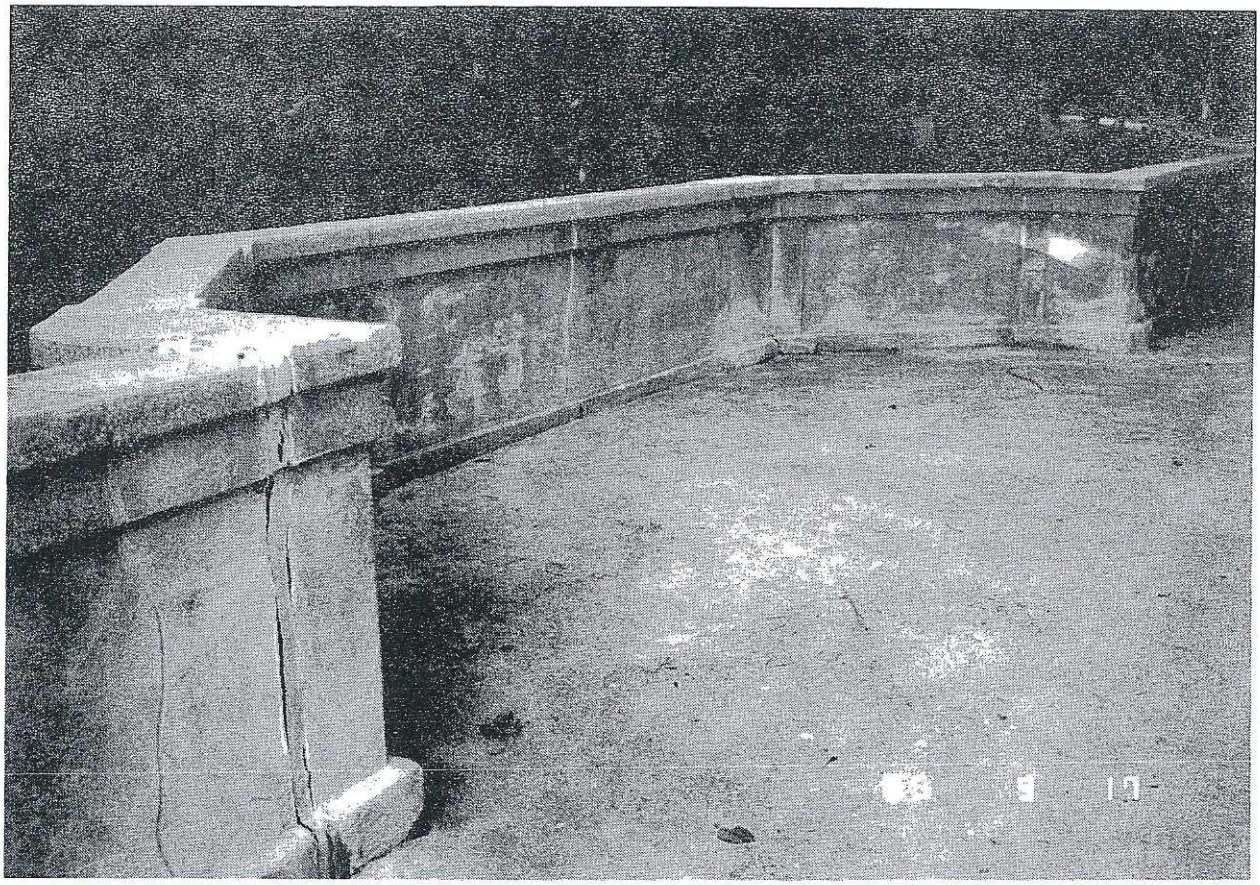
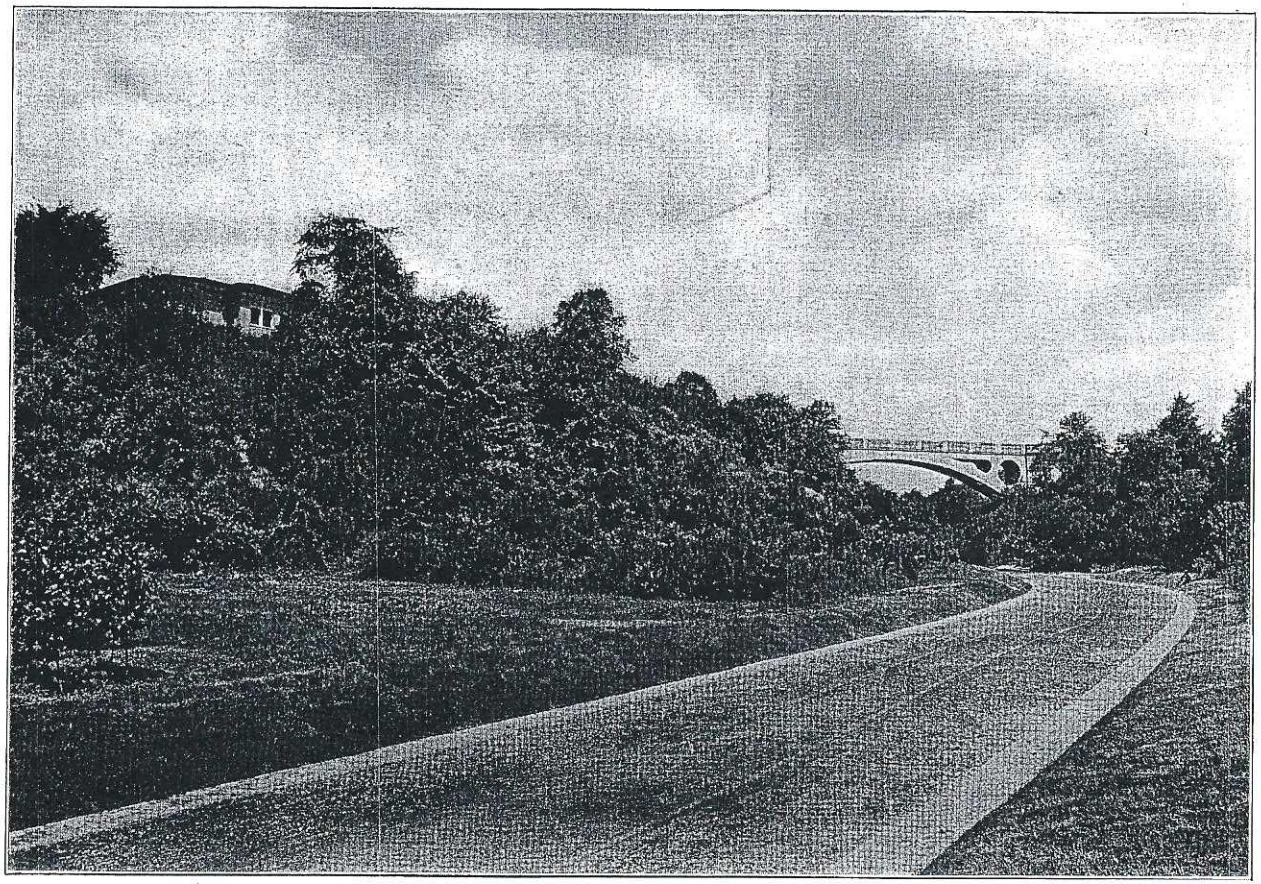


FIGURE 121: Lake Park Foot Bridge (P-40-576), Lake Park, Milwaukee. Detail of refuge bay and railing. (Source: Robert M. Frame III, 1985.)

Historical Significance: The footbridge in Lake Park was built in 1906 for the Milwaukee Park Commission, to span a 59-ft.-deep ravine and connect the park pavilion and concert grove with the picnic grounds. As was typical with urban park bridges, neoclassical aesthetics were preferred, and are visible largely in the railing. Sources do not indicate why such an advanced engineering design was selected, unless, perhaps, it was inspired by the 1905 rib-arch park bridge in Illinois. The Lake Park Bridge was considered a major park improvement at the time and is very visible in contemporary photographs. Now it is obscured by trees, but is readily accessible and a visitor can walk around and beneath the entire bridge.[154]



Beach Drive and Concrete Foot Bridge, Lake Park

APPENDIX D