Structure # 049-0080 IL HAER No. L-1997-1
Carrying Sheridan Road
Over an unnamed ravine
Lake Forest
Shields Township
Lake County

COVER SHEET
IL HAER DESCRIPTIVE DATA
USGS 7.5' LOCATION MAP
SITE PLAN
REPRODUCED COPIES OF ENGINEERING BRIDGE PLANS
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ILLINOIS HISTORIC ENGINEERING RECORD
ILLINOIS HISTORIC PRESERVATION AGENCY
SPRINGFIELD, ILLINOIS 62701

PREPARED BY ARCHAEOLOGICAL RESEARCH INCORPORATED in partial conjunction with the ILLINOIS TRANSPORTATION RESEARCH PROGRAM
KAREN POULSON, PRINCIPAL INVESTIGATOR AND PROJECT MANAGER

ILLINOIS HISTORIC AMERICAN ENGINEERING RECORD

STRUCTURE #049-0080
ILLINOIS HAER NO. L-1997-1

Location: Sheridan Road approximately at Deerpath Road Bridge carries over an unnamed creek and ravine approximately 0.10 mile south of Deerpath Road and in line with the northern limits of Lake Forest College

U.S.G.S. Waukegan 7.5 minute quadrangle
UTM Coordinates: 16/431420E/4677940N
SW, NW, NE, NE of Section 33, T44N, R12E

Illinois Department of Transportation
Inventory: Illinois Structure 049-0080

Owner, Custodian: City of Lake Forest

Present Status: Vehicular bridge programmed for replacement in 2000.

Significance: This three-span concrete tee-beam with arched facia panels and cut stone railing is located within the limits of the Lake Forest Historic District. The bridge is included within the district nomination because of its architectural characteristics. The architectural design reflects trends on a national, state and local level with cooperative funding ventures between state, municipalities and civic clubs. The philosophy behind such ventures may be summed up by the John Stuart Mill's "the greatest good to the greatest number" and the doctrine of "highest use". The involvement of the Lake Forest Garden Club exemplifies the extension of women out of the domestic sphere into the civic sphere. This may reflect the national trend of the women's suffrage movement, national conservation policies, and the professional development of city planning. In particular, examination of the bridge, explores the seemingly diametrically opposed thoughts on women- restricting women to the private sphere of the home and family and promoting a wide range of women’s rights and reform issues. The cooperative venture also

illustrates the continued debate within the engineering community on the role of aesthetics and mechanics.

PART I. Historical Information:

A. Physical History:

1. Date of Erection: 1928.

2. Civil Engineers: Neil M. Campbell, Civil Engineer, Lake Forest, executed the drawings for the overall site plan and the spandrel and retaining walls for the bridge.

Wm. Schroeder, G.J. Zuchman, ?? Hansen, P. Michener, V.M. Romine appear to be the civil engineers who executed the plans for the bridge with the exception of the railing and lighting system. These plans were approved by G.F. Burch, Engineer of Bridges, H.E. Surman, Engineer of Design, Frank T. Sheets, Chief Highway Engineer and Acting Superintendent of Highways. The final drawings were submitted and examined by G.N. Lamb, passed by H.E. Surman, approved by Frank T. Sheets, and approved by Cornelius R. Miller, Director of The Department of Public Works and Buildings.

3. Original and subsequent owner: This bridge has always been under the jurisdiction of the Lake County Local Roads, Illinois Department of Transportation.

4. Architect: Bennett, Parsons and Frost, Consulting Architects contracted to the Lake Forest Garden Club. This firm executed plans for the railing of the bridge.

5. Builder, contractor and suppliers: The Widell Company. Letting date May 9, 1928, awarded May 25, 1928. Contract Price $21,161.07 with a time limit of September 1, 1928 and extended to September 15, 1928.

6. Original plans: Included as part of this HAER submittal.

7. Alterations and Additions: Comparison of architectural and engineering plans to existing structure indicate that no major alterations have been made to the substructure or superstructure. However,

repairs were made to the damage on the west railings, four posts and a section of the top rail were replaced with formed cement. Periodic resurfacing to the superstructure and patching to the substructure has been undertaken.

B. Historical Background:

Lake County, Illinois

Historic research of plats and atlases dating from 1876, 1885, 1907, 1960 and 1970 indicate that substantial methodic development was undertaken in Lake County during this time period. Comparison of topographic maps from the 1960s, 1970s to 1990s dramatically demonstrate the decline in open lands, farm land and wetlands in Lake County. Dense urban development increased the need for changes in the infrastructure. The call for infrastructure on a local level for lane widening and road improvement is apparent in the environmental requests for survey from District 1 and local roads in Lake County.

Lake Forest, Illinois

The development of Lake Forest as a suburb of Chicago reflects the development of the Country Life Movement. Lake Forest was settled in 1835 and laid out in 1856. Although, building began prior to 1900, the period between 1900 through 1909 was an active building period in Lake Forest[1]. Lake Forest had become famous as an ideal location for homes of Chicago businessmen. The demise of the Country Place Era coincided with the 1929 Wall Street Crash. The 1933 economic revolution brought revision of tax policies and as a result of new taxation, the size and number of large domestic establishments in town and country waned[2].

The National Register Nomination form attributes the street scape to one akin to a park like appearance[3]. The park like appearance is attributable to the street pattern laid out by Jed Hotchkiss in 1857. The streets are all winding, relatively narrow and in keeping with the environment. Ravines are spanned by bridges thus avoiding steep grades.

Nelson[4] divided Illinois into eleven major geological regions. There are three basic topographic features in northeastern Illinois. These are: the Chicago Lake Plain formed by Glacial Lake Chicago, the morainic system formed by the advances and retreats of glacial

ice during the Wisconsin glacial epoch, and the rivers and streams that drain these areas.

Lake Forest lies within the Chicago Lake Plain region of northeastern Illinois. The Chicago Lake Plain is characterized by two topographic features. Beach ridges and remnants of moraines that stand as "islands" above the former lake bottom.

Specifically, Lake Forest lies within the Lake Border Morainic System[5]. The ravine system of the North Shore District is a consequence of the lake bluff which was cut by the waves of Lake Michigan after the ridge of drift was built (the Highland Park moraine)[6]. Bretz discusses the north shore ravines as the most and longest ravines in the Chicago area. He stipulates that the ravines lie along a long ridge of constructional topography (i.e. glacial drift deposit) that runs parallel to the lake shore. A graph by Bretz dramatically illustrates that the original eastward slope on the lake bluff near Lake Forest Academy was approximately 60 feet higher and that the Academy was 120 feet higher[7]. Sheridan Road south of Lake Forest transverses no less than twenty ravines. Presently, the built environment diminishes the dramatic impact of the ravines on the natural environment.

The Chicago and North Western Railroad runs along the divide summit[8]. Conspicuous relief features are railroad embankments and manmade features[9]. The expansion of Lake Forest to a further western boundary subsequently was to the Chicago, Milwaukee, St. Paul and Pacific Railroad (the Skokie). The Skokie was an attractive travel alternative to the Chicago and Northwestern Railroad to the east.

The progressiveness of the times and subsequent social reform movement was influential on the details of estate planning. Architects were aware of the social implications of design. For instance, Holly discusses the impact of the railroad on estate planning:

> The prejudices of railroads is that the poorest part of town is seen. An axiom in political economy that the construction of railways from large cities through rural districts, not only increases the population and industry of such

> districts, but also must act as the most effective agents of social reform. The natural overflow from the city into the country necessarily carries with it an element of refinement and culture[10].

The automobile also provided easy access from Chicago to the northern suburbs. The establishment of the sewer system in Chicago was an early initiative to provide for solid streets instead of mud and plank roads. Sheridan Road is attributed as a secondary arterial and state highway.

Country Life Movement

The architect Emilio Levy wrote "The yearning of the city man to become a country gentleman seems to be increasing more and more every year"[11]. The Country Place type of the Midwest site was selected because of some magnificent view of the lake, river, valley or open prairie, and was located as to make the principal landscape feature on the general plan of arrangement[12]. The dominant note becomes the relationship of the house to the selected natural view. The philosophical purpose of the movement was to extol the virtues of rural living as inherently superior to urban living. Liberty Hyde Bailey, the leader of the movement, envisioned a symbiotic relationship between man and environment[13]. The main result of the movement, however, appeared to be a glamorization of rural living. This resulted in a return to the country for those who could afford large estates. In fact, in spite of the idealism as the movement, it became equated with the "gentleman farmer" image[14]. Country places ere thus developed adjacent to the cities.

Gifford Pinchot

Concurrent with the Country Life movement was the genesis of a conservation movement headed by Gifford Pinchot. Gifford Pinchot is perhaps renowned in the conservation community for his adaptation of John Stuart Mill's maxim, The greatest good to the greatest number. His particular doctrine was in addition of "highest use"[15]. The opposing arguments to the establishment of the National Forest Policy was that the forests would remain a wilderness. Pinchot's reply was that on the contrary the wilderness would open up and be developed as producing forests. He invoked the doctrine of "highest use" and its criterion "the greatest good to the greatest number" to support the

National Forest Policy. Aldo Leopold further stipulated that this doctrine "...must remain the guiding principle by which democracies handle their natural resources[16].

In 1913, Clifford Pinchot, chief forester in President Theodore Roosevelt's administration, and his wife were guests at Walden in Lake Forest, to consult with Mr. and Mrs. Cyrus McCormick on matters of the national conservation program which had begun during the first Roosevelt administration and then neglected. The new president, Woodrow Wilson, along time friend of the McCormick family, was able to reactivate the conservation program as a result of conferences and studies made at Walden during this visit. Mrs. Pinchot became one of the founders of the Garden Club of America in 1913 and the Lake Forest Garden Club served as one of the pilot organizations of the country wide movement[17].

The impact of Romanticism on the debate about technology and industrialization was reflected also as Pinchot was fond of saying "...efficient management of natural resources"[18]. Underlying the efficiency movement was the thought that if work were more efficient, if more households were more efficient than true democracy would be realized[19]. The underpinning of this philosophy is the cult of domesticity. Women were theoretically restricted to home and family, however, diametrically opposed was the national right to vote.

This diametric was played out as Mrs. Pinchot and McCormick moved out of the domestic sphere and into the civic sphere by participating in the exemplification of Walden for the national conservation program. The doctrine of "highest use" and the criterion "the greatest good to the greatest number" were integrated into the Garden Club of America.

Garden Club of America

Mrs. Pinchot was one of the founding members of The Garden Club of America in 1913. The Garden Club of Lake Forest, with Mrs. McCormick as a founding member, in 1912 served as one of the pilot organizations of the country wide movement. The purpose of The Garden Club of America was and is still "to stimulate the knowledge and love of gardening, to share the advantages of

association by means of educational meetings, conferences and correspondence and publications, and to restore, improve and protect the quality of environment through educational programs and action in the fields of conservation and civic improvement.

Supporting this tenet at a local level, the mission statement of the Chicago Women's Club succinctly states that "[Women} have learned to assume responsibility outside of home interests, and to consider the study of conditions in city and state as an extension of their concern-constituting as they do the larger home.[20]"

Theory of Engineering and Aesthetics on Bridge Design

Scottish engineer Thomas Telford wrote on the elegance or aesthetics of modern bridge design in the early 19th century. The bridge engineer as an artist was a continuing theme in the 1920s and 1930s. This is exemplified in the following quote:

> Increasing study and consideration are being given by bridge engineers and their associated architects to the artistic essentials of design, including harmony with environment, beauty of form, grace of proportions, gradation and rhythm of composition, interest of details, light and shade, color and illumination. Moreover, recognition by the public of the importance of making bridges beautiful, as well as useful, is helping to bring about this new era of beauty in bridges.[21]

Professional bridge designers follow three historical positions. First, that the structure of the bridge is the province of the engineer and that beauty is fully achieved only by the addition of architecture. Second, that bridges from an engineering standpoint make efficient use of materials are by definition beautiful. Third, architecture is not needed but that engineers must think about how to make the structure beautiful (assumes that engineers have many possible choices of equal efficiency and economy and can express their own aesthetics ideas without adding significantly to materials and costs).

This position is also illustrated by Clement Williams, a professor of civil engineering at the University of Kansas, who states that,

> Masonry structures are especially well adapted to aesthetic treatment in their design... Therefore, while there are no fixed canons of taste and beauty, those designs are generally most pleasing that are harmony with Nature's outline [22].

Bridging the Gap between Architecture and Engineering: Civic Improvement

Mrs. McCormick felt that landscape gardening was considered to be an expressive, harmonious and refined imitation of beauty[23]. Walden, the McCormick estate, utilized this in their Country Place Estate and was published in a book discussing the tenets of the Country Life and conservation movement. As such, the Garden Club of Lake Forest in 1928 extended this tenet to civic improvement. They opposed the city's plan to fill in one of the ravines that distinctively line the north shore. The Garden Club sponsored a the design by Bennett, Parsons and Frost to design the balustrades and balusters of the Sheridan Road bridge. Thus, women bridged the gap between architecture and engineering.

Bennett, Parsons & Frost

Edward Bennett was an assistant of the famed Daniel Burnham. In 1906, they began work on a master plan for the city of Chicago. His firm, Bennett, Parsons and Frost, is attributed as the architectural firm that designed Buckingham Fountain[24]. Bennett was the seminal architect who designed the majority of the downtown Chicago movable bridges. After World War II, Bennett devised a formal plan based on French Prototypes. He worked to produce a standard design for fixed bridges in downtown Chicago as well. These bridges have simple abutments of exposed aggregate concrete and decorative railings[25]. A renderings of a balustrade of the Pont de la Concorde by F. de Darien is illuminating in its similarity to Bennett's designs. Architectural elements such as pylons and balustrades were utilized to enliven the overall Beaux Arts design. Bennett preferred granite, limestone or terra cotta rather than concrete for the downtown bridges.

Bennett, Parsons and Frost corporate records are housed at the Art Institute of Chicago. The computer index was consulted to determine whether any correspondence or renderings were available regarding the Sheridan Road bridge. Additionally, access was granted to

peruse the correspondence box for the year 1928 to determine whether appropriate uncatalogued material was available. No material was identified to illuminate the relationship of Bennett to the ladies of the Garden Club.

Although, a direct correspondence connection between Mrs. McCormick or Mrs. Pinchot and Bennett was not identified, a relationship between the Garden Club of Lake Forest and Bennett is identified (Title Block: Bridge on Sheridan Rd. near Deerpath). One goal of the Garden Club was to foster civic beautification. The business relationship between the Garden Club and Bennett is discussed fully under the specifics of the Sheridan Road bridge.

Overview of Illinois Bridge History:
It is probable that non-permanent bridges were utilized as early as the Paleoindian temporal period in Illinois, 10,000[26]. It should be noted that no archaeological evidence exists to support this contention. However, the earliest documented instances of civil engineering is probably the establishment of irrigation systems. The following is John Nolan's development of Illinois bridge history.

["The earliest permanent bridges in Illinois are a few masonry structures built in 1832 when the National Road was extended from Cumberland Maryland into Illinois as far as Vandalia. In the same era a few were built on the Galena Road. Early accounts mention ferries operated by Indians and Europeans to cross larger streams, planks on ice in winter months and timber structures, presumably pile trestles, which were prone to being washed away by high water."]

["As settlers, established permanent communities, experienced "mechanics," self taught or from New England shipyards, were attracted to the frontier to erect covered bridges. Between 1820 and 1900 an estimated 200 and 300 covered bridges were built in Illinois, of which five survived in 1996"].

["By the late 1850s the need to strengthen bridges on the expanding railroads encouraged the development of iron bridges, to be followed after the 1870s by steel. The price of steel had become affordable after Henry Bessemer's invention of the Bessemer converter,

followed by the open hearth process"].

Ambitious cities, first established on the rivers, also recognized the commercial advantages of building permanent iron bridges. Before the establishment of the Division of Highway's authority, bridges were often built as joint ventures by cities or towns {townships} and counties. Prior to the introduction of marked routes in 1925, promoter cooperatives had established a network of named routes through the state connected with border states.]

At the present time in Illinois there are 26,256 bridges in Illinois, of which 669 are steel trusses. With the exception of a limited number of major river crossings, the older steel trusses on primary routes have been replaced by multi-beam structures or bridges utilizing sophisticated design and the improved materials now available."][27]

Overview of Lake County Bridge History:
In Lake County, Illinois there are 263 bridges listed on the Planning Services Section list. The Planning Services Section list only references bridges under the jurisdiction of the Illinois Department of Transportation. Very little is known or documented on bridges located on private property. It is notable that the McCormick's Walden-Bluff' Edge Bridge, a concrete and steel bridge was rehabilitated after it was placed on the Landmark Preservation Council of Illinois (LPCI) Ten Most Endangered Historic Places List. This bridge was built by J.H. Gray, an engineer who worked on early Chicago skyscrapers. He constructed the bridge from 1897 to 1901. The subdivision of Walden in 1957 did not deter Lake Forest residents from continuing to utilize the bridge. The bridge was in continued use by pedestrians and bikes until 1997. Wiss, Janney, Elstner Associates prepared a structural engineering study and recommended that high wire fencing on both sides of the deck with a caged walkway underneath the bridge be put in place. The Lake Forest Preservation Foundation decided to undertake the saving of the bridge, however, there was opposition to spending public funds. The City pledged a cap of $201,000 to be spent on the bridge (the cost of demolition) and the remaining was to be privately funded. In March 1996, LPCI placed the bridge on its Ten Most Endangered List. By April 1997, Lake Forest

Preservation Foundation was able to present the City with a check to preserve the bridge. The rehabilitation work was completed by Wiss, Janney, Elstner by May 1998[28].

The J.O. Armour Estate in Lake Forest also contains a privately owned small concrete bridge that was rehabilitated to the Secretary of Interior's Standards. Remnants of the railroad bridge in the estate was recorded as an industrial archaeological site in 1999. This railroad bridge rails match the small concrete bridge previously rehabilitated.

A summary by of bridges under IDOT jurisdiction by bridge type, total number of bridge type and spans of years built is summarized in the table below.

Bridge Type	**Years Built**	**Number of bridge type**
Reinforced Concrete Slab	1900-1961	12
Reinforced Concrete Stringer/Multi-beam	1974-1987	3
Reinforced Concrete Tee Beam	1928-1977	8
Reinforced Concrete Rigid Frame	1900-1935	2
Reinforced Concrete deck arched, filled spandrel	1900-1935	5
Reinforced Concrete undefined secondary (119)	1932-1990	9

Reinforced Concrete through girder w/o floor beam	1930	1
Reinforced Concrete deck arch, open spandrel	1913	1
Reinforced Concrete undefined secondary (129)	1928	1
Continuous Reinforced Concrete, slab	1926-1996	12
Continuous Reinforced Concrete, tee beam	1925-1968	5
Continuous Reinforced Concrete undefined secondary (219)	1929-1991	11
Steel	1936	1
Steel Slab	1987	1
Steel, stringer/multi beam	1923-1989	26
Steel, girder & floor beam system	1900-1984	11
Steel, deck truss	1928	1
Steel, unspecified through truss	1905	1
Steel, deck arch, filled spandrel	1962	1

Steel, unspecified secondary (319)	1900-1983	4
Steel, unspecified secondary (323)	1982-1988	3
Steel, deck arch, open spandrel	1896-1914	3
Steel, Pony Pratt Truss	1925	1
Continuous Steel, stringer/multi beam	1923-1990	46
Continuous Steel, deck beam	1966-1979	2
Precast prestressed concrete	1962-1965	2
Precast prestressed concrete, slab	1955	1
Precast prestressed concrete, stringer/multi beam	1958-1997	37
Precast prestressed concrete, deck beam	1900-1990	25
Unknown material, stringer/multi beam	1958-1989	8
Timber	1900	1

Of the 263, eight are reinforced concrete tee beam bridges (type 104). One of the eight was reconstructed in 1978, two others are located on Sheridan Road over

Boyington and Middleton Ravines in Highland Park. The Lake Forest bridge is also one of the above mentioned eight. A chart below lists the year built and the feature crossed for the eight bridge type 104 throughout Lake County, Illinois:

Year Built	**Feature Crossed**
1928	Small Stream
1929	Boyington Ravine
1929	Middleton Ravine
1929	Squaw Creek
1937	Chicago River
1938	Skokie Ditch
1945	North Mill Creek
1977	Spinney Run Creek

Fifteen of the bridges on the Planning Services list are located over the heavily dissected ravines between Lake Forest, Illinois and Highland Park, Illinois. Only three are bridge type 104.

E. Overview of Structure SN #049-0080

Structure SN #049-0080 is a concrete tee beam bridge, bridge type 104. The bridge carries Sheridan Road over an unnamed creek.

Donald C. Jackson, engineering bridge historian in a publication for the National Trust, stated that "...many people consider reinforced-concrete arch bridges visually more attractive than comparable steel trusses" and were often selected for sites in picturesque locations.[29]".

The bridge is not a particularly awe-inspiring structure. It is not particularly significant in and of itself as an example of technological innovation. Rather, it derives its significance due to its

association with the village of Lake Forest and in particular due to its contribution to the beautification of the ravines.

The current structure replaced a two deck truss and 2 I-beam approaches on concrete abutments (Sheet No. 2). The prior bridge was to be removed by the bridge contractor. A note on this sheet indicates that the "...contract does not include the cut stone railing and the lighting system. The City of Lake Forest is to furnish plans for the railing and lighting system and receive bids at the same time as bids are received for by the State for this bridge." (Sheet No. 2)

The duties of the Bridge section of the Bureau of Design in 1928 are described in the Eleventh Annual Report of the Division of Highways. The Division of Highways was a part of the Department of Public Works and Buildings. The Division of Highways maintained immediate control over the location, construction and maintenance of State Highways. According to the annual report,

> "It is charged with the administration of the provisions of the $60,000,000 Bond Issue Act of 1918, the $100,000,000 Bond Issue Act of 1924, and with the general supervision of work constructed on the State aid system by the counties under Section 15d of the State Aid Act. It also acts in an advisory capacity to the counties and townships in connection with the improvement of the roads under their jurisdiction[30].

Sheridan Road is listed on the design plans as S.B.I. (State Bond Issue) Rte. 42 Sec. 113B-1 (Sheet 2). G.N. Lamb was the District 1 engineer in 1928. It appears that he submitted the plans of the bridge

A summary of quantities was included for the bridge design. A total of 390 square yards of 4" p.c.c. (Portland Cement Concrete) pavement, 732.9 cubic yards of class A concrete, 93,860 pounds of reinforcing steel, 5,330 pounds of rockers and plates, 1,850 pounds of structural steel and 1 name plate were required.

In 1928, the Garden Club of Lake Forest opposed the City of Lake Forest’s plans to fill in the ravine. A ten thousand dollar ($10,000) financial contribution was donated toward the construction of a beautiful and

enduring bridge. The sponsorship of the bridge was to prevent the expedient and less expensive plan to fill in the ravine. The Garden Club sponsored a design contest for the look and feel of the proposed bridge. A committee of three, Mrs. Gardner, Reynolds and Dick were appointed to approve Mrs. Hamill's plan for the bridge. The plans were approved on March 9, 1928. The first plans for the bridge were not located. The bridge is listed as one of the major project of the Club under the theme of Civic Beautification. Architectural plans by Bennett, Parsons and Frost have a date of April 6, 1928 with revisions made on May 14, 1928. Regular meeting minutes, dated June 29, 1928 note that the plans for the bridge were completed. The plans approved appear to be the May 14, 1928 revisions. A motion was made, seconded and carried that a letter to the City Officials be drafted recommending that this plan be a model for future bridges[31]. Executive Meeting minutes note that the regular meeting minutes be accepted and that the Bridge Committee be authorized to complete financial arrangements for payment of the bridge[32].

PART II. ENGINEERING INFORMATION

A. Architectural Character: The bridge is an excellent example of a concrete bridge designed to the aesthetics of a particular setting, a ravine. The handrails and arched facia panels are of particular architectural significance and merit due to their design by Bennett, Parsons and Frost

B. Condition of Fabric: The bridge was constructed in 1928 with an estimated life span of fifty years. The bridge has been utilized for twenty two years beyond its life expectancy.

There are several commonly accepted chemical and physical processes that cause cement degradation. These all appear to have impacted the bridge cement integrity. The degradation processes include sulfate and chlorine attack, de-icing salts, sulfur and nitrogen pollutants, water leaching, freeze/thaw cycling and salt crystallization.

No major modifications appear to have been made to the superstructure or substructure. The Elgin Bridge Crew repaired damage to the west railings in 1993, according to a engineering report. Four posts and a section of the top rail are formed concrete not cut-stone. Additionally, it should be noted that bridge lighting is mentioned on the

Department of Highways renderings, however, no lighting designs are noted on the City of Lake Forest or Bennett, Parsons & Frost renderings nor are lights currently placed on the bridge.

C. Description of superstructure: The structure is a three span concrete tee beam bridge. The deck is poor very condition. The asphalt wearing surface is heavily cracked especially over the joints. The joints were filled with asphalt. The sidewalk on all four approaches have settled and in places the sidewalk is unsafe and not useable. The sidewalk and the hubguard on the bridge are spalling.

The entire span of the bridge is approximately 97 feet in length, abutment to abutment.

D. Description of Balusters and Balustrades: The firm of Bennett, Parsons and Frost is the consulting architectural firm who designed the east and west balustrades as well as the decorative elements of the balusters. The scale and design are so strikingly similar to the scale and design of the balustrade of the Pont de la Concorde, as drawn in "Etudes sur les Pont en Pierre" by F. de Dartien[33]. The design is so strikingly similar as to not be accidental. The "urn is approximately one foot in height,the top is 3/4" and the base is ½", the top tapers inward to

The height of each baluster is 3 feet and 2 inches. The top and bottom base of each baluster measures approximately 1/4 foot in height and in width identically measure 1' 1/8". The height of the baluster to the rail is 2' 5". Spacing between the balusters is regular, the square base and top separates each baluster by approximately three inches. The top and the bottom rail contain a hole approximately 5" to receive a portion of the baluster. These joints in the top and bottom rail appear to be adhered with Portland cement with small aggregate. The top rail thickness measures approximately 6 inches with the bottom thickness that measures slightly smaller at 5 1/4 inches. Each rail appears to be original material and is noted on the engineering plans as Bedford Stone. The west and east balustrades are 149' long and the sidewalks are 4" longer. The width of the sidewalk is approximately 2' wide. The sidewalk ends at the scroll design on the north and south approaches. The width of the sidewalk appears to have been modified as the original engineering plans note the width of the sidewalk as approximately 6'.

There are a series of nine panels consisting of six balusters each that are interspersed with two raised panels and a raised panel at the north and south abutments. One identical raised panel is located on the two piers and is also located at the north and south approaches. The width of each raised panel is approximately 4' 5". A mirror image of the balustrade and baluster is located on the east elevation. Three arches have corresponding three panels of six balusters and two small raised panels, each arch consistently measures approximately 31 feet long (measuring from abutment to pier, pier to pier and pier to abutment). The north and south approaches have a larger raised panel each with an incised and raised circle in the center of the panel. Two scrolls are also located on the north and south approaches. The pattern is a mirror image on the east and west elevations.

E. Description of the substructure: The substructure consists of three arches made of reinforced concrete. A decorative coursework of square cut blocks runs along the top of each arch. Nineteen square cut blocks comprise the total square cut of each coursework. Exact field measurement size was not possible due to the height of the arches from the ground or lack of access from the top. The top of each pier is decoratively capped by the raised panel in the balustrades.

F. Description of piers: Two reinforced concrete piers are sunk into the unnamed creek. The north pier is slightly higher (due to the grade) and measures approximately 23 feet high and 7 feet wide. The south pier is approximately 20 feet high and 6 feet 5 inches wide. Each pier runs east to west in elevation with four through sections.

G. Description of abutments: Two reinforced concrete abutments are sunk into the north and south side of the unnamed creek. The north abutment measures approximately 2 feet wide and the south abutment measures approximately 2 feet and five inches wide. The height of each abutment measures approximately 18 feet.

H. Engineering approaches: The approaches are slightly off the north-south line. The approaches are approximately ten degrees the north-south line with the north approach ten degrees to the east. Both measure approximately 20 feet. The approaches are paved with a 2.5' thickness wearing surface. The asphalt is in good condition with some east-west cracking.

I. Site:
1. General Setting and orientation: The bridge is located within the Lake Forest Historic District. It is located on Sheridan Road approximately 20 feet south of Deerpath Road over a small stream. The stream is located in a steep ravine characteristic of the Lake Michigan dendritic systems located along the north shore.

1. National Register of Historic Places Inventory, Nomination Form for the Lake Forest Historic District (Chicago: Historic Preservation Services, 1976).

2. Norton T. Bateman, Design on the Land The Development of Landscape Architecture (Cambridge: The Belknap Press of Harvard University Press, 1971), 445.

3. National Register of Historic Places Inventory, Nomination Form for the Lake Forest Historic District, 1.

4. Ronald Nelson, Illinois Land and Life in the Prairie State,(Dubuque: Kendall Hunt Publishing Company, 1978), 55.

5. H.B. Willman, Summary of the Geology of the Chicago Area, (Urbana: State of Illinois Department of Registration and Education, 1971), plate insert.

6. Harlen J. Bretz, Geology of the Chicago Region Part I General,(Urbana: State of Illinois Division of the State Geological Survey, 1952), 26.

7. Ibid.

8. Ibid.

9. Nelson, Illinois Land and Life in the Prairie State, 63, 65.

10. H. Hudson Holly, Modern Dwellings in Town and Country, (New York: Harper & Brothers, 1878), 131.

11. Emilio Levy, "Country Home, Far Hills, New Jersey" in *Architecture The Professional Architectural Monthly*, Volume 39, No. 4 (1919), 93.

12. Ralph Rodney Root, "Country Place Types of the Middle West" in *The Architectural Record*, Volume 55, No. 1 (1924), 2.

13. Philip Preghill and Nancy Volkman, Landscapes in History Design and Planning in the Western Tradition,(New York: Van

Nostrand, 1993), 565.

14. Ibid.

15. Aldo Leopold, The River of the Mother of God and Other Essays by Aldo Leopold, Susan Flader and J. Baird Callicott, Editors, (Madison: The University of Wisconsin Press, 1991), 25.

16. Ibid., 78.

17. The Lake Forest College, Donnelly Library, The Garden Club of Lake Forest Papers, Special Collections.

18. Ruth Schwartz Cowen, A Social History of American Technology, (new York: Oxford University Press, 1997), 212.

19. Ibid.

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