Board of Historic Preservation

Wednesday, July 10, 2019
4:00 pm
City Center, Room 110
231 North Dakota Avenue
Sioux Falls, SD

MEETING ASSISTANCE. Upon request, accommodations for meetings will be provided for persons with disabilities. Please contact the Human Relations office, located on first floor of City Hall, 224 West Ninth Street, Sioux Falls, SD, at 367-8745 (voice) or 367-7039 (TDD) 48 hours in advance of the meeting.

AGENDA

Facilitators: Rachael Meyerink, Board Chair
Rob Collins, Vice Chair

Staff Liaison: Diane de Koeyer, Neighborhood Planner

1. CALL TO ORDER & QUORUM DETERMINATION Chair
2. WELCOME & INTRODUCTIONS Chair
3. APPROVAL OF REGULAR AGENDA Chair
4. APPROVAL OF JUNE 12, 2019 MEETING MINUTES Chair
5. PUBLIC INPUT ON NON-AGENDA ITEMS Chair (5-minute comment period per individual)

5. NEW BUSINESS
   A. Bechtold Jewelry Building, 325 S. Phillips Ave. Lenae Schwartz, Lenae Design Downtown Historic District & Thomas Faini, Faini Jewelry (board action required)
   B. Central Fire Station, 100 S. Minnesota Ave. Robbie Veurink, Midwest Eng.
      Downtown & Individual listing on National Register (board action required)
   C. 8th Street Bridge Reconstruction Vanessa Victor, Infrastructure Individual listing on the National Register (board action required)

6. OTHER BUSINESS
   A. (Re)Election of Officers Diane

7. ADJOURNMENT
Regular Meeting Minutes for June 12, 2019

Members Present:  Rob Collins  
                  Alex Halbach  
                  Pam Cole  
                  Jennifer Dumke  
                  Shelly Sjovold  
                  Lura Roti  
                  Lynn Remmers  
                  Thomas Keller 4:20

Members Absent:  Rachael Meyerink

Staff Present:  Diane deKoeyer, Neighborhood Planner, BoHP Staff Liaison

Public in Attendance:  Jacque and Jessica McNamara, Property Owner  
                        Jarrod Smart, Jarrod Smart Construction  
                        Kathy Renken, Jarrod Smart Construction  
                        Lloyd and Mona Schrader, McKennan Park HD Property Owner  
                        Aaron Bakker, Property Owner  @ 1719 S. 5th Ave.  
                        Nathan Wieber, Property Owner  @ 1102 S. Main Ave.

1. Call to Order and Quorum Determination
   Vice Chairperson Rob Collins called the meeting to order at 4:00 p.m.

2. Welcome and Introductions
   Vice Chairperson Rob Collins welcomed Board members and guests and gave introductory comments.

3. Approval of Regular Agenda
   Vice Chairperson Rob Collins requested a motion to approve the regular agenda. Member Pam Cole made the motion to approve the regular agenda. Member Shelly Sjovold seconded the motion. The motion to approve the regular agenda passed unanimously.

4. Approval of the May 29, 2019, Meeting Minutes
   Vice Chairperson Rob Collins requested a motion to approve the May 29, 2019, meeting minutes. Member Pam Cole made the motion to approve the minutes as presented. Member Alex Halbach seconded the motion. The motion to approve the May 29, 2019, meeting minutes passed unanimously.

5. Public Input on Non-Agenda Items (five-minute period)
   There was no public input received.
6. **New Business**

A. 1710 S. 4th Avenue
   McKennan Park Historic District
   (Board action required)

   The parcel at 1710 S. 4th Ave. is currently vacant. The board will apply the Secretary of Interior Standards for New Construction for review of this project.

Jarrod introduced the property owner, Jacque McNamara and her daughter Jessica. Jarrod provided a program description as to the space needs and architectural elements the owner requested with the house. Jessica uses a wheelchair; therefore requiring accessibility to all areas on one level in the design of the new home is a priority. Paratransit also provides transportation in this area for Jessica. The property has a sanitary sewer easement running diagonally through the southeast corner of the yard, which creates a challenge to the layout of the house and garage.

Jarrod presented the compliance of the Secretary of Interior Standards (SOIS) in his submission with examples of properties in the neighborhood and detailed explanation for the application. Jarrod provided an addendum since the last meeting of varying architectural elements that exist in new residential construction. The design style of the McNamara home is eclectic. Based on a general review of the standards and examples of other properties in the neighborhood, the proposed house design appears to comply with the SOIS as presented.

Square footage of the proposed house is 3,889 SF. The garage is 1,908 SF. Average size of a home, per occupant is 1,058 (2015 census bureau). This does not take into account a handicap accessible home.

Jarrod provided product samples for construction of the house. Modern materials allow for more durability and less maintenance. Material information as discussed at the May 29, 2019 meeting are:

- GAF Sienna Asphalt Shingles – Roof Shingles
  Diamond shape shingle at tower
- Marvin NexGen Windows – 4-Pane Double Hung Clad Windows
- Artisan Series Siding – Lap Siding 4"
- Mira Tec – Columns, trim, etc.
- Metal Corners – in lieu of mitering lap siding corners
- Brick – Classic brick, color has not been selected
- Limestone – Columns caps
- Bead board – underside of barreled entry
- Gutters – half round, aluminum
- Garage Doors – 8'-6" tall due to height of van/suv for accessibility. West facing garage is a singlewide door.

Jarrod reviewed the National Register of Historic Places description of McKennan Park noting that eclectic and substantial houses typify the district. "Eclecticism is the key to this period of construction for the architects often freely combined many different architectural vocabularies, materials and textures to create visually exciting, often playful, and always interesting houses." Jarrod noted that the proposed design of this home is not religious to any one style.
Member Roti confirmed with Jarrod that the front yard setback of the proposed house aligns with the adjacent home to the north.

Member Collins reviewed the use of the three dormers on the front façade of the home. As Jarrod mentioned at the last meeting, the dormers are “false”. They do not function to bring daylight into the home. Additional highlights from the previous discussion that Rob reviewed were the ramp/sidewalk that does not require handrails. Finials are proposed to cap the turret and gable ends. Member Cole noted that the footprint of the home is large, but because the garage is setback further than the house and at the corner, it appears smaller.

Member Halbach noted his appreciation for materials with brick, higher end double-hung clad windows, finials, the turret, and diamond shaped shingles. Alex also noted that the materials and design of the new home creates a “gateway” property to the neighborhood, and entrance to the park.

Member Sjovold stated she still has trouble with the tower. She feels that the style of it is “too early” for rest of the neighborhood. The use of the tower pre-dates 1910, 1890s specifically and is not something found in McKennan Park. Member Cole noted that Jarrod provided images in the updated packet of modern towers that creates interest to the house with some vintage flair. She cited the SOIS “contemporary design should not directly mimic historic buildings.” Jarrod stated that the tower provides a panoramic view of the park from the homes interior. Member Collins stated that he does not feel the proposed design violates the standards.

Member Remmers stated that there is simplicity of other homes in the neighborhood and this design has more complexity to which may challenge how it fits into the neighborhood. Lynn referenced 1600 S. 4th Ave. that successfully blends various features of the house that are simpler. Member Collins noted that if the dormers were removed, it might simplify the “busyness” of the design. Member Halbach commented that it might simplify the design too much and the dormers are necessary to create balance, and provides the appearance of a story and a half or two-story structure. Member Dumke and Cole agreed that keeping the dormers help to give an appearance of a taller structure.

Member Sjovold questioned the use of the doublewide garage doors and asked if they could be modified to two single doors. Jarrod responded that for the van to park in either garage, the doublewide doors provide better flexibility and function than single doors.

Member Halbach noted that the proposed design contributes to the eclectic look in the district as noted in the National Register. He also reminded board members that based on the description, it took 40-50 years to develop the district and there is a mix of styles that include; craftsman, Mediterranean, and ranch all within a couple blocks. The proposed house design contributes to the eclecticism, flair and dynamics of other homes around the park.

Member Cole made the motion that the new construction of the property at 1710 S. 4th complies with the SOIS of new construction and does not create an adverse effect on the McKennan Park Historic District. Member Halbach seconded the motion. The vote was in favor of with six Yeses and 1 No.

Kathy Renken with Jarrod Smart Construction was introduced as a new board member starting in July.
B. 1102 S. Main Ave. Sherman Historic District (Board action required)

Nathan Wieber, Homeowner

Nathan reviewed his request to demolish the existing single car garage for a new garage. The concrete slab of the existing garage is cracking.

Member Halbach asked about materials. Nathan is proposing to use LP smart siding and with Jarrod Smart’s input from the previous meeting, Nathan would like to use Marvin NexGen windows with a mullion pattern to compliment the house. Nathan stated that vinyl siding exists on the house with original wood siding underneath. Existing corbels on the house are wrapped with vinyl, with vinyl soffits. Historic images provided by the Siouxland Heritage Museum indicate the corbels were originally wood with an open design. The wood siding on the house indicated in the photos was 3”-4” wide.

Member Roti asked about the garage door and if two-single doors could be used in place of one double. To modify the width to accommodate two single doors would require increasing the garage by 3’ to 4’. The homeowner said he would use a doublewide garage door that appears as two single, and not increase the square footage of the structure.

Member Cole asked what the square footage of the house is compared to the proposed garage and second story. The homeowner reported that the square footage of the two structures are approximately the same size. Member Cole asked about “like materials for like materials” as noted in the standards (for rehabilitation) and asked if the applicant would consider changing the siding to wood. Member Collins reminded the board that the LP smart siding is an acceptable replacement material for new construction.

Homeowner will investigate the dimension of the existing wood siding is under the vinyl, and match the new garage siding to that dimension. The historic photo shows a very narrow siding on the house. Nathan agreed that he would match the new garage to what was original on the house.

Member Sjovold asked how much taller the garage was going to be than the house. Diane noted that there are steps to the first floor of the house with a basement below, which increases the height of the house. Nathan responded that there are four steps from the sidewalk to the first floor.

Member Halbach noted that the style of the house is craftsman and that the band board on the existing house should be incorporated into the garage. Alex asked Nathan to consider adding open corbels that are also deeper to match the original corbels on the house. Members Sjovold and Halbach also suggested moving the banding above the garage doors to minimize the scale of the structure.

Diane noted that any modifications made to the design would have to be finalized based on the motion of the board. Nathan could continue working with 4D Design before coming back in for a building permit. If the design is different from what the board approves, Nathan will be required to come back to the board, for another review.

Member Roti reviewed the proposed modifications for another board member to include in a motion for approval.
Member Collins added that the clip gable on the front of the garage should also be used at the rear elevation.

Member Halbach made the motion that the proposed project would not have an adverse effect on the Sherman Historic District with the following modifications:
- Doublewide garage door should look like two single garages doors.
- Band board should be located above the garage doors.
- Reveal of the siding on the new garage should be comparable to the reveal of the siding on the house.
- Corbels on the garage should match the original corbels on the house.
- Remove the proposed shutters; and consider the window scale at the clipped gable. Member Remmers seconded the motion. Member Remmers asked what the bearing height of the trusses are for the garage and made a “friendly amendment” to the motion to drop them down if it improves the scale and height of the garage.

The remaining board members voted unanimously in favor of the motion with the noted modifications.

Adjournment
The Board of Historic Preservation meeting adjourned at approximately 5:15 p.m.
24:52:07:04. Standards for new construction and additions in historic districts. New construction or additions within a historic district must comply with The Secretary of the Interior's Standards for the Treatment of Historic Properties as incorporated by reference in § 24:52:07:02. In addition the following standards apply:

(1) Compatibility of design. Massing, size, and scale of new construction must be compatible with surrounding historic buildings. Overall architectural features of new construction must be of contemporary design which does not directly mimic historic buildings. Architectural elements such as windows, doors, and cornices must be similar in rhythm, pattern, and scale to comparable elements in adjacent historic buildings. The overall visual appearance of new construction may not dominate or be distracting to the surrounding historic landscape;

(2) Height. The height of new buildings or additions to existing buildings may not exceed a standard variance of ten percent of the average height of historic buildings on both sides of the street where proposed new construction is to be located;

(3) Width. The width of new buildings or additions to existing buildings must be similar to adjacent historic buildings;

(4) Proportion. The relationship between the height and width of new buildings or additions to existing buildings must be similar in proportion to existing historic buildings. The proportion of openings in the facades of new construction or additions must be compatible with similar openings in adjacent historic buildings;

(5) Rhythm and scale. The rhythm, placement, and scale of openings, prominent vertical and horizontal members, and separation of buildings which are present in adjacent historic buildings must be incorporated into the design of new buildings or additions to existing buildings;

(6) Materials. Materials which make up new buildings or additions to existing buildings must complement materials present in nearby historic properties. New materials must be of similar color, texture, reflective qualities, and scale as historical materials present in the historic district;

(7) Color. The colors of materials, trim, ornament, and details used in new construction must be similar to those colors on existing historic buildings or must match colors used in previous historical periods for identical features within the historic district;

(8) Details and ornament. The details and ornament on new buildings or additions to existing buildings must be of contemporary design that is complementary to those features of similar physical or decorative function on adjacent historic buildings;

(9) Roof shape and skyline. The roof shape and skyline of new construction must be similar to that of existing historic buildings;

(10) Setting. The relationship of new buildings or additions to existing buildings must maintain the traditional placement of historic buildings in relation to streets, sidewalks, natural topography, and lot lines; and

(11) Landscaping and ground cover. Retaining walls, fences, plants, and other landscaping elements that are part of new construction may not introduce elements which are out of character with the setting of the historic district.

Secretary of the Interior’s Standards for Rehabilitation

The Standards for Rehabilitation, a section of the Secretary’s Standards for Historic Preservation Projects, address the most prevalent preservation treatment today, rehabilitation. Rehabilitation is defined as the process of returning a property to state of utility, through repair or alteration which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural and cultural values.

The Standards that follow were originally published in 1977 and revised in 1990 as part of the Department of the Interior regulations (36 CFR Part 67, Historic Preservation Certifications). They pertain to historic buildings of all materials, construction types, sizes, and occupancy and encompass the exterior and the interior of historic buildings. The Standards also encompass related landscape features and the building’s site and environment as well as attached, adjacent or related new construction.

The Standards are to be applied to specific rehabilitation projects in a reasonable manner, taking into consideration economic and technical feasibility.

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historic development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.
<table>
<thead>
<tr>
<th><strong>Project Review</strong></th>
<th>July 10th, 2019</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Property Address</strong></td>
<td>325 S. Phillips Ave.</td>
</tr>
<tr>
<td><strong>Property Owner</strong></td>
<td>Steve Bechtold as Diamond Properties</td>
</tr>
<tr>
<td><strong>Historic District</strong></td>
<td>Downtown Historic District</td>
</tr>
<tr>
<td><strong>Year Built</strong></td>
<td>Early 1900s</td>
</tr>
<tr>
<td><strong>Category</strong></td>
<td>“C” grade structure</td>
</tr>
<tr>
<td><strong>Project</strong></td>
<td>Update the exterior east façade of the existing Bechtold Jewelry building by removing the existing brick infill and small display windows, and replace with large storefront windows, as historic images show.</td>
</tr>
<tr>
<td><strong>National Register Description</strong></td>
<td>This building is significant as an example of early 1900s commercial expansion in downtown Sioux Falls. The east façade is a three bay with marble facing.</td>
</tr>
<tr>
<td><strong>Project Representative</strong></td>
<td>Thomas Faini, Faini Design Jewelry Studio, and Lenae Schwartz, Lenae Design</td>
</tr>
<tr>
<td><strong>Neighbor Notification</strong></td>
<td>No</td>
</tr>
<tr>
<td><strong>Staff Comments</strong></td>
<td>The applicant is proposing two options for the updated storefront. Option 1 indicates a narrow transom above the storefront. Option 2 indicates storefront without a transom except above entrance door.</td>
</tr>
<tr>
<td><strong>Board Action</strong></td>
<td>Required</td>
</tr>
<tr>
<td><strong>Photos</strong></td>
<td>See attached</td>
</tr>
</tbody>
</table>
Images of existing façade at 325 S. Phillips Ave.
Image of existing façade at 325 S. Phillips Ave.
Historic images 325 S. Phillips Ave.
Central Fire Station is a rectangular, two-story building ninety feet long by sixty feet wide built of broken cut quartzite construction. It has a one-story dependent wing ten feet wide approximately fifty-seven feet long, of similar construction located on the north of the main block of the building. The design includes a tower against the rear of the dependency, which rises approximately sixty-five feet. The tower is marked by narrow windows with plain sills and lintels arranged in a vertical line; a concrete-enclosed oculus trims each of the four sides under the open belfry and low, metal hipped roof. The dependent wing and main building have flat parapet roofs with cornices of white concrete decorated with dentilation.

The principal façade on the west features a concrete plaque inscribed “Central Fire Station;” this is flanked by raised urns or white concrete. The façade is marked into three bays by “quoin pilasters.” Three large doors with multi-paned overlights on the ground floor accommodate fire engines; openings are arched and deeply cut, and topped by concrete arches with simple keystones. On the second story, paired rectangular windows with overlights and canted sills correspond to the doors below. The east façade is broken into four vertical sections, three correspond to the scale of those on the west and a fourth farthest north is filled by rectangular windows on the first and second stories. The fire bay on the south side is distinguished by a cut quartzite, interior chimney.

The building is set on a gentle hill which exposes the basement on the north and east facades. The windows on the north façade and dependent wing are rectangular with plain lintels and sills of white concrete and trimmed with quoin of white concrete.
The main floor included a large apparatus area and stalls for the horses. The second floor provides quarters for the men as well as a gymnasium for recreation. The hayloft and oats bin were placed above the stalls and designed to provide efficiency in the feeding of the horses. The tower provided ample room for storage and maintenance of hoses. It also housed the town’s fire bell and a red globe, which was lighted at night when the department was answering a call. By 1917, motorized equipment replaced the horse drawn equipment and in time, the interior was remodeled to accommodate change. The exterior remained unaltered until 1957, when structural weakness in the tower led to the removal of the bell, which was replaced by a four-sided metal roof.

Despite some interior alterations, much of the original wood trim and materials are visible. The basement is constructed of stone with a concrete floor. The main building floor is also concrete. Although portions of the second floor have been completely remodeled, the division of area remains intact.

<table>
<thead>
<tr>
<th>Project Representative</th>
<th>Consultant</th>
</tr>
</thead>
<tbody>
<tr>
<td>Neighbor Notification</td>
<td>No</td>
</tr>
<tr>
<td>Staff Comments</td>
<td>Due to structural and life safety concerns to the fire station, staff recommends approval.</td>
</tr>
<tr>
<td>Board action</td>
<td>Required</td>
</tr>
<tr>
<td>Photos</td>
<td>See attached</td>
</tr>
</tbody>
</table>
Grading process following the ‘A Grading Protocol for Structural Lumber and Timber in Historic Structures” by U.S. Department of the Interior National Park Service

Wood beam requiring reinforcement. Cracking is not the primary concern on the beam, but the angle of the slope of grain.
STEEL CHANNEL TO BE PAINTED BLACK, ALONG WITH EXPOSED BOLTS.
<table>
<thead>
<tr>
<th><strong>SIoux Falls Board of Historic Preservation</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Project Review</strong></td>
</tr>
<tr>
<td><strong>Property Address</strong></td>
</tr>
<tr>
<td><strong>Property Owner</strong></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Applicant</strong></td>
</tr>
<tr>
<td><strong>Historic District</strong></td>
</tr>
<tr>
<td><strong>Project Representative</strong></td>
</tr>
<tr>
<td><strong>Neighbor Notification</strong></td>
</tr>
<tr>
<td><strong>Staff Comments</strong></td>
</tr>
<tr>
<td><strong>Board Action</strong></td>
</tr>
<tr>
<td><strong>Photos &amp; Drawings</strong></td>
</tr>
</tbody>
</table>
SUPPORTING DOCUMENTATION

A- ORIGINAL PLANS

B- ARCHEOLOGICAL REPORT

C- 1970’s REHABILITATION PLANS

D- REHABILITATION ANALYSIS INFORMATIONAL HandOUT

E- PROFILE PHOTOGRAPHS

F- PROPOSED REHABILITATION ELEMENTS
A

ORIGINAL PLANS
B

ARCHEOLOGICAL REPORT
Kogel Archaeological Consulting Services, LLC.  
100 South Spring Avenue  
Suite 110  
Sioux Falls, South Dakota 57104  

Infrastructure Design Group, Inc.  
18 East Kemp Avenue  
Watertown, South Dakota 57201  

Historical Documentation of the Eighth Street Bridge, Sioux Falls, South Dakota.

Dear Ms. Victor,

Kogel Archaeological Consulting Services (KACS) conducted historical research of the Eighth Street Bridge in Sioux Falls, South Dakota ahead of a planned bridge rehabilitation project. This research was conducted in order to identify the architectural and historical traits of the bridge which have it to be considered historically significant and listed on the National Register of Historic Places (NRHP). The bridge was listed on the NRHP in 1993 as the Eighth Street Bridge, but the structure is also known as South Dakota Department of Transportation (SDDOT) Bridge Number 50-203-206 and as Structure MH00001372 by the South Dakota State Historic Preservation Office (SHPO). The bridge is located in the SW1/4 of the NE1/4 of the SW1/4 in Section 16, T101N, R49W in Sioux Falls, Minnehaha County, South Dakota. The location of the bridge is depicted on the United States Geological Survey’s (USGS) 7.5' Sioux Falls East 1962 (photorevised 1971 and 1976) quadrangle in Figure 1. Overview photographs of the bridge can be found in Figures 2 through 4.

A records search of the bridge and surrounding area was conducted by Jane Watts, Records Manager of the Archaeological Research Center in Rapid City, South Dakota, on February 9, 2017. The records search revealed that no other structures or archaeological sites have been recorded within the immediate vicinity of the bridge. The bridge has been included in one previous cultural resources survey (Buhta and Kruse 2009a). Eight cultural resources surveys (Buhta 2007, Buhta and Kruse 2009b, Donohue 1991, Dorrance 2008, Hanson 2004, Kogel 2005, Lueck 2010a and 2010b) have been conducted within one mile of the bridge. Three archaeological sites, 10 bridges, and hundreds of structures are recorded within one mile of the bridge. Six of the historic districts of Sioux Falls are also within one mile of the bridge, but the bridge itself is not within a designated historic district. A series of historic atlases and platmaps (Getty and Wagner 1913, Ogle 1903, Webb 1917 and 1929) were examined at Historic MapWorks (2017) for details about the bridge and its surroundings. Each of the examined maps revealed that from its earliest days, a bridge crossing over the Big Sioux River was a part of Eighth Street and not part of any of the railroad networks that once passed through Sioux Falls.
When discussing the important structural aspects of the bridge, it is necessary to understand the history of the structure itself. Firstly, it is important to note that the current Eighth Street Bridge is not the only bridge to have been constructed in this location. At least two other structures were previously constructed to allow passage over the Big Sioux River in this location. The first of these structures was a single span, steel truss bridge built in 1876 (Figure 5; Hufstetler 2014: 15). A plaque on the modern bridge notes that this was the first bridge to cross the Big Sioux River in Sioux Falls. This structure quickly proved to be insufficient, as it was washed out by a flood shortly after its construction (Bragstad 1967: 138). The original bridge was replaced by a more substantial metal through truss bridge in 1882 (Figures 6 and 7, Hufstetler 2014:15). This bridge was not only wide enough to allow for two lanes of horse drawn carriage traffic, but also had a pedestrian footpath. The decision to construct the current Eighth Street Bridge was made in 1911, when the Minnehaha County Board resolved to replace the existing bridge with a concrete bridge (Traeger and Hess 1993: 7). A call for construction bids on the project went out in trade publications throughout the Midwest, with one such publication referring to the project as “the greatest and most costly concrete bridge in South Dakota” (Western Contractor 1911: 11). N.M. Stark and Company of Des Moines, Iowa submitted the only proposal for the project, and the new concrete arch span bridge was in place by April 1912 (Figures 8 and 9; Traeger and Hess 1993: 7). Over time, the bridge was adapted to the changing transportation needs of the city (Figures 10 through 12).

Concrete was a relatively new material for bridge construction in the United States in the early 1900s. Reinforced concrete began to be widely touted for bridge construction due to its tensile strength, minimal maintenance, and the fact that such bridges were easier to construct than other common bridge forms of the time, such as stone arch and metal truss bridges (Hufstetler 2014: 36, Spero et al. 1995: 138). The first documented concrete bridge construction in South Dakota occurred in Yankton in 1908 (Hufstetler 2014: 36). While this bridge contained design flaws that inevitably lead to its demolition, its initial success lead to the construction of several additional concrete bridges in and around Yankton in the following years (Hufstetler 2014: 36-37). N.M. Stark and Company was one of the companies involved in the construction of concrete bridges in Yankton. And the success of their bridge projects there may have been part of the reason why they were awarded the contract for the Eighth Street Bridge in Sioux Falls, despite offering a proposal that was $5,000 over the projected budget for the project (Traeger and Hess 1993: 7, Western Contractor 1911: 11).

N.M. Stark and Company was known for their construction of a particular type of concrete arch bridge that used a patented design known as the Luten arch. The Luten arch was designed and patented by a civil engineer named Daniel Luten from Indianapolis, Indiana. The hallmark of the Luten arch included
reinforcement of the concrete in strategic locations in order to counteract the weight-bearing stress placed upon the concrete (Spero et al. 1995: 141-143). Luten designed a number of concrete arches using this principal, and eventually held over 30 patents ranging from variations of his original patent to concrete reinforcement systems to construction methodologies (Spero et al. 1995: 142). Luten arch bridges were widely popular in the United States in the early 20th century, and by the 1920s, examples of his designs could be found in all but three states (Spero et al. 1995: 143). Because of the resilience of the Luten arch, it was popular with local governments who were funding bridge projects, but the Luten arch was popular with construction companies for a different reason. Use of the design was strictly controlled by Luten and his business, the National Bridge Company, and companies who wished to use the Luten arch (or any of its numerous variations) needed to first have a licensing agreement with the National Bridge Company. This arrangement was popular with savvy construction companies, as the licensing process allowed regional building companies, such as N.M. Stark and Company, to effectively have a local monopoly on the growing concrete bridge construction market (Iowa Department of Transportation 2017). It is not currently known which version of the Luten arch was used to construct the Eighth Street bridge, as the construction plans for the project have not been able to be located.

The Eighth Street concrete arch bridge measures approximately 241 feet (73.5 meters) long and 66 feet (20.1 meters) wide. The size of the bridge allows for two lanes of traffic, two lanes for parking, one central turning lane, and a pedestrian sidewalk along each side of the road (Figure 4). The bridge is wider than the average bridge built in the early 1900s, which has led to speculation that it once carried a trolley line across the Big Sioux River (Jorgensen 2013). Attempts to locate evidence of the trolley line during previous restoration work in 1977 were unsuccessful, and no records of such a line were able to be located during the current historical research (Jorgensen 2013). The bridge is composed of three reinforced arch segments, with each segment measuring approximately 80 feet (24.4 meters). The arches themselves are filled spandrels, with the only decorative details being lines incised in the exterior concrete panels (Figure 13). The concrete piers of the bridge are conical, with the piers on the south side of the bridge possessing pointed cutwaters that have been reinforced with metal strips (Figures 14 and 15). A plaque on the northwestern corner of the bridge notes that the bridge is "earth filled" and was "considered an engineering masterpiece at the time of its construction."

Various repairs and improvements have been made to the bridge and the roadway passing over it, with the most notable being those done in 1977. These repairs included replacing the decorative concrete railing which runs along each side of the bridge. This is noted on the bridge by a plaque embedded in the southwestern corner of the southern railing. Both the original railing and the more modern replacement consist of a neoclassical balustrade topped with decorative
metal street lamps (Figures 8, 9, and 16). Like the railing, the original cast-iron street lamps have also been replaced with more modern equivalents (Figure 17). Other repairs and alterations that have occurred to the bridge over time include patching of the concrete arches and piers (Figures 13 and 18), installation of light fixtures underneath the arches of the bridge that coincide with modern pedestrian pathways, and the installation of a utility corridor along one side of the exterior deck of the bridge. This corridor is encased in concrete and can be seen as a bulge on the north side of the bridge between the balustrade and the arches of the bridge (Figure 19). The utilities within the concrete corridor no longer appear to be in use, though one modern, unmarked utility line currently crosses the bridge outside of the contained corridor. It is not known when this utility corridor and the concrete encasement were installed.

The bridge was evaluated in 1990 for possible inclusion on the National Register of Historic Places (NRHP), and was officially listed on the register in 1993 (Traeger and Hess 1993). The NRHP uses a defined set of criteria in order to evaluate the historical significance of locations, structures, and archaeological sites. In order to be listed on the NRHP, at least one of four criteria must be met (Townsend et al. 1993). Criterion A is used to identify historic properties that are significant based on their relation to historic events or patterns of history. Criterion B is used to identify historic properties with ties to historically significant individuals, while Criterion C qualifies historic properties due to unique elements of design, construction, or association with a master craftsperson. The final criteria, Criterion D, is used to identify archaeological sites or historic districts which possess information generating potential.

The Eighth Street Bridge was listed on the NRHP under Criterion C, as a structure that typifies early concrete bridge construction in South Dakota, particularly due to the presence of the concrete deck arch (Buhta and Kruse 2009a). Concrete deck arch bridges are bridges where the deck is located completely above the arches which comprise the base of the bridge. This structure is also representative of a concrete bridge built before widespread standardization of reinforced concrete bridge construction methods and materials (Traeger and Hess 1993: 7). During this time, experimental bridge forms were common, though not all of these experimental bridges were structurally sound. Some of N.M. Stark and Company’s Luten arch bridges—such as the Squaw Creek Bridge in Ames, Iowa—collapsed not long after their completion (Fraser 1992: 6). Despite these occasional failures, the proprietor of N.M. Stark and Company, Nathanial M. Stark, was still considered a master bridge builder of the time, and examples of his concrete arch bridges can be found listed on the NRHP throughout Minnesota, Iowa, and South Dakota (Fraser 1992: 3). His prolific career drastically altered and improved transportation systems throughout the upper Midwest in the early 1900s, until a combination of governmental bridge standardizations and the invalidation of his exclusive licensing of the Luten arch patent forced the company out of business (Fraser 1992: 6-7). Given this, if the
Eighth Street Bridge were ever to be re-evaluated for the NRHP, the argument could be made that the structure should also be listed under additional criteria. For example, the bridge could be listed under Criterion A for association with a pattern of history, in that it typifies a form of early, local government-funded transportation improvements in southeastern South Dakota. The bridge could also justifiably be listed under Criterion B, for close association with a regionally, historically significant individual (Nathanial M. Stark). However, the bridge currently remains listed only under Criterion C, as an example of an early reinforced concrete arch bridge.

Restoration work that has previously been conducted on the bridge, such as the replacement of the balustrade and streetlights, has been done in such a way as to maintain the historic integrity of the bridge. Repairs that have been made to the bridge over the years, such as concrete patching, have not significantly altered the form or function of the Eighth Street Bridge. As such, the bridge currently retains the characteristics necessary to remain on the NRHP, despite the numerous repairs and improvements the structure has undergone. Future improvements to the bridge should also be undertaken in such a manner as to not disturb the historic integrity of the bridge; the overall appearance of the filled spandrel concrete deck arch in particular should be maintained. Given that the older utilities located along the northern exterior of the bridge appear to be no longer in use, removal of the concrete-encased utility corridor may be feasible. If possible, removal of this corridor would allow restoration of the original façade of the bridge, including the incised concrete panels that were altered by the installation of the encased utility corridor. That being said, although the Eighth Street Bridge is 105 years old, it remains a viable historic symbol and transportation corridor from the early days of Sioux Falls. With the proper restoration, maintenance, and management, the structure could feasibly continue to be adapted to the needs of the community while still retaining its historic integrity.

Thank you for the opportunity to conduct the historical documentation of the Eighth Street Bridge for the planned improvement project.

Sincerely,

Suzanne Reece  
Principal Investigator
Figure 1. The Eighth Street Bridge shown in relation to surrounding topography on the USGS 7.5' Sioux Falls East (1962, photorevised 1971 and 1976) quadrangle.
Figure 2. Overview of the Eighth Street Bridge, view to the north. Photograph taken by Suzanne Reece on February 14, 2017.

Figure 3. Overview of the Eighth Street Bridge, view to the south. Photograph taken by Suzanne Reece on February 21, 2017.
Figure 4. Overview of the Eighth Street Bridge at street level, view to the west. Photograph taken by Suzanne Reece on February 14, 2017.

Figure 5. Overview of the original Eighth Street bridge, photographed in 1876. Image courtesy of the Siouxland Heritage Museums, Sioux Falls, South Dakota (2017).
Figure 6. Overview of Eighth Street and the predecessor of the current Eighth Street Bridge west (Bragstad 1967).
Figure 7. Overview of Eighth Street and the predecessor of the current Eighth Street Bridge southwest (Fox 1908).
Figure 8. Postcard from 1913 showing the bridge shortly after its construction in 1912 (Fisher 2017).

Figure 9. Artistic postcard showing the concrete bridge shortly after its construction in 1913 (Fisher 2017).
Figure 10. Photograph from the 1930s of traffic and spectators on the bridge observing the removal of an ice jam, view to the north (Odland 2007: 81).

Figure 11. Photograph of the bridge taken in 1989, view to the north (South Dakota State Historical Society 1989a).
Figure 12. Photograph of the bridge taken in 1989, view to the south (South Dakota State Historical Society 1989b).

Figure 13. Overview of the incised concrete panels on the bridge, view to the north. Photograph taken by Suzanne Reece on February 14, 2017.
Figure 14. Overview of the conical piers on the north side of the bridge, view to the west. Photograph taken by Suzanne Reece on February 14, 2017.

Figure 15. Overview of the cutwaters on the south side of the bridge, view to the east. Photograph taken by Suzanne Reece on February 14, 2017.
Figure 16. Overview of the modern balustrade and streetlamps along the north side of the bridge, view to the west. Photograph taken by Suzanne Reece on February 14, 2017.

Figure 17. Appearance of the streetlights on the bridge in 1989 (left; South Dakota State Historical Society 1989c) and in 2017 (right).
Figure 18. Concrete repairs made to the eastern arch of the bridge, view to the northeast. Photograph taken by Suzanne Reece on February 14, 2017.

Figure 19. Overview of the utility corridor on the north side of the bridge, view to the west. Photograph taken by Suzanne Reece on February 14, 2017.
References Cited

Bragstad, R.E. 1967  
*Sioux Falls in Retrospect.* R.E. Bragstad, Sioux Falls, South Dakota.

Buhta, Austin A. 2007  
*A Level III Cultural Resources Evaluation of Areas Associated with Five Drainage and Storm Sewer Projects Included in the City of Sioux Falls Proposed 2007 Facilities Plan, Sioux Falls, Lincoln and Minnehaha Counties, South Dakota.* Archaeological Research Center Library Archive Number: ESD-0395.

Buhta, Austin A., and Jason M. Kruse 2009a  
*A Level III Cultural Resources Evaluation of Segments 2, 3, and 4 of the City of Sioux Falls Proposed Central Main Phase III Sewer Project, Section 16, T101N, R49W, Sioux Falls.* Archaeological Research Center Library Archive Number: AMH-0332.

2009b  
*A Level III Cultural Resources Evaluation of Segment 5 of the City of Sioux Falls Proposed Central Main Phase III Sewer Project, Sioux Falls, Minnehaha County, South Dakota.* Archaeological Research Center Library Archive Number: AMH-0336.

Donohue, James 1991  

Dorrance, Brett 2008  
Fisher, Joy
2017
*Penny Postcards from Minnehaha County, South Dakota.*
USGenWeb Archive, Boca Raton, Florida.

Fox, G.W.
1908
*Sioux Falls, S. Dak., business centre looking west c.a. 1908.*

Fraser, Clayton B.
1992

Getty and Wagner
1913
*Atlas and Plat Book of Minnehaha County, South Dakota.*
Getty and Wagner, Sioux Falls, South Dakota.

Hanson, Rick
2004

Historic MapWorks
2017
The Historic MapWorks website is available at:

Hufstettler, Mark
2014
*Prairie Crossings: South Dakota’s Historic Roadway Bridges.*
South Dakota Department of Transportation, Pierre, South Dakota.

Iowa Department of Transportation
2017
*Historic Bridges of Iowa.* Iowa Department of Transportation, Ames, Iowa.

Jorgensen, Don
2013
*Mystery & History of 8th Street Bridge.* Keloland News, Sioux Falls, South Dakota.
Kogel, Troy
2005

A Cultural Resources Survey for the Sherman Avenue to East Reservoir Water Main in Sioux Falls, T101N, R50W, Section 15, Minnehaha County, South Dakota. Archaeological Research Center Library Archive Number: AMH-0178.

Lueck, Edward
2010a


2010b


Odland, Rick D.
2007


Ogle, Geo. A., and Company
1903


Siouxland Heritage Museums
2017

8th Street Bridge. Siouxland Heritage Museums Catalog Number 1962.019.00002. Siouxland Heritage Museums, Sioux Falls, South Dakota.

South Dakota State Historical Society
1989a


1989b


1989c

Spero, Paula, Michael Reis, James DuSel, Kate Elliot, Laura Landenfeld, and Deborah Scherkoske
1995  

Townsend, Jan, John H. Sprinkle, Jr., and John Knoerl
1993  

Traeger, Jennifer, and Jeffery A. Hess
1993  

United States Geological Survey (USGS)
1962  

Webb Publishing Company
1917  

1929  

Western Contractor
1911  
“Construction News for the Central West and Southwest.”  
1970’s REHABILITATION PLANS
NOTE: All sections to be painted.

C 3 x 5 Channel
2" x 2" x No. 12 x No. 12 Wire Mesh

1/4" x 1/2" Metal Stud

5/8" o.d. Kwik Nut 4" Min. Embedment

Conduit Support Spacing 10" O.C.

TYPICAL TYPE I JUNCTION BOX LOCATION

SIDE VIEW

NOTE: NMB-1211 finish & install the conduit support system. The Contractor shall be responsible for furnishing & installing the wire mesh and少年iew for this work.

SIDE VIEW

EXPANSION HOOK BOLTS

FRONT VIEW

DETAIL FOR COVERING EXPOSED CONDUIT
TYPICAL ROADWAY SECTION - STATION 0+39.79 TO STATION 1+69.50

TYPICAL ROADWAY SECTION - STATION 1+69.50 TO STATION 4+20.50

TYPICAL ROADWAY SECTION - STATION 4+20.50 TO STATION 7+31.00
### REMOVAL OF PARKING METERS

<table>
<thead>
<tr>
<th>Station</th>
<th>Station</th>
</tr>
</thead>
<tbody>
<tr>
<td>0+44.00</td>
<td>27.61 Lt.</td>
</tr>
<tr>
<td>0+62.00</td>
<td>27.61 Lt.</td>
</tr>
<tr>
<td>0+65.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>1+01.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>1+40.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>1+71.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>1+72.50</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>1+74.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>2+15.50</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>2+32.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>2+34.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>2+44.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>2+55.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>2+67.50</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>2+92.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>3+15.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>3+22.50</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>3+35.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>3+37.50</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>3+59.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>3+65.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>3+82.00</td>
<td>28.00 Lt.</td>
</tr>
<tr>
<td>3+89.00</td>
<td>28.00 Lt.</td>
</tr>
</tbody>
</table>

### Curb & Gutter Summary

<table>
<thead>
<tr>
<th>Station</th>
<th>to</th>
<th>Station</th>
<th>Str. G.R.S.</th>
<th>Str. TYPE 'p'</th>
<th>Curved</th>
</tr>
</thead>
<tbody>
<tr>
<td>0+23.79</td>
<td>27.99 Lt.</td>
<td>0+39.79</td>
<td>27.99 Lt.</td>
<td>50.00</td>
<td>25</td>
</tr>
<tr>
<td>0+62.50</td>
<td>27.99 Lt.</td>
<td>1+16.50</td>
<td>27.99 Lt.</td>
<td>71.00</td>
<td>25</td>
</tr>
<tr>
<td>1+49.50</td>
<td>28.00 Lt.</td>
<td>1+49.50</td>
<td>28.00 Lt.</td>
<td>92.00</td>
<td>25</td>
</tr>
<tr>
<td>2+01.50</td>
<td>28.00 Lt.</td>
<td>2+01.50</td>
<td>28.00 Lt.</td>
<td>37.00</td>
<td>25</td>
</tr>
<tr>
<td>3+01.50</td>
<td>28.00 Lt.</td>
<td>3+01.50</td>
<td>28.00 Lt.</td>
<td>23.00</td>
<td>25</td>
</tr>
<tr>
<td>3+45.00</td>
<td>28.00 Lt.</td>
<td>3+45.00</td>
<td>28.00 Lt.</td>
<td>79.00</td>
<td>25</td>
</tr>
<tr>
<td>3+45.00</td>
<td>28.00 Lt.</td>
<td>3+45.00</td>
<td>28.00 Lt.</td>
<td>117.50</td>
<td>25</td>
</tr>
<tr>
<td>3+45.00</td>
<td>28.00 Lt.</td>
<td>3+45.00</td>
<td>28.00 Lt.</td>
<td>117.50</td>
<td>25</td>
</tr>
</tbody>
</table>

**TOTALS**

| 1068.11 LF | 67.25 LF | 25 LF |

### INSTALLATION OF CONCRETE SIDEWALK

<table>
<thead>
<tr>
<th>Station</th>
<th>to</th>
<th>Station</th>
<th>S.Y.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0+23.79</td>
<td>Lt.</td>
<td>1+16.00</td>
<td>Lt.</td>
</tr>
<tr>
<td>1+16.00</td>
<td>Lt.</td>
<td>2+00.00</td>
<td>Lt.</td>
</tr>
<tr>
<td>2+00.00</td>
<td>Lt.</td>
<td>2+46.00</td>
<td>Lt.</td>
</tr>
<tr>
<td>2+46.00</td>
<td>Lt.</td>
<td>3+65.00</td>
<td>Lt.</td>
</tr>
</tbody>
</table>

* Denotes Lt. will be run in the standard

### INSTALLATION OF CONCRETE PAVEMENT

<table>
<thead>
<tr>
<th>Station</th>
<th>to</th>
<th>S.Y.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0+23.79</td>
<td>Lt.</td>
<td>148.0 S.Y.</td>
</tr>
</tbody>
</table>

### INSTALLATION OF CONC. APPROACH PAVEMENT

<table>
<thead>
<tr>
<th>Station</th>
<th>to</th>
<th>S.Y.</th>
</tr>
</thead>
<tbody>
<tr>
<td>0+23.79</td>
<td>Lt.</td>
<td>148.0 S.Y.</td>
</tr>
</tbody>
</table>

### INSTALL.

<table>
<thead>
<tr>
<th>Station</th>
<th>0+23.79</th>
<th>0+47.00</th>
</tr>
</thead>
<tbody>
<tr>
<td>1+71.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>1+72.50</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>1+80.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>1+98.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>2+05.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>2+22.50</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>2+35.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>2+45.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>3+15.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>3+22.50</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>3+35.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>3+45.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>3+59.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>3+65.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>3+82.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
<tr>
<td>3+89.00</td>
<td>28.00 Lt.</td>
<td></td>
</tr>
</tbody>
</table>

### BID ITEM NO.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Removal of Concrete Sidewalk</td>
<td>2055</td>
<td>105</td>
<td>874</td>
<td>459</td>
<td>1</td>
<td>5</td>
<td>4260</td>
<td>52</td>
<td>5</td>
<td>3743</td>
<td>305</td>
<td>66</td>
<td>372</td>
<td>2</td>
</tr>
</tbody>
</table>

**TOTALS**

| 2055 | 105 | 874 | 459 | 1 | 5 | 4260 | 52 | 5 | 3743 | 305 | 66 | 372 | 2 |
NOTES:
1. Surface texture of the ramp shall be obtained by a coarse brooming, transverse to the slope of the ramp.
2. Care shall be taken to assure a uniform grade on the ramp, free of sags and sharp grade changes.
3. The normal gutter line profile shall be maintained through the area of the ramp.
4. There will be no separate payment for Curb Ramps. The sidewalk ramp will be measured and paid for at the unit price bid for sidewalk, and Ramp Opening will be measured and paid for at the unit bid price for Concrete C & G (L.F.)
SAWED TRANSVERSE CONSTRUCTION JOINT

TRANVERSE CONSTRUCTION JOINT WITH TIE BARS

SAWED LONGITUDINAL JOINT

NOTE:
For Transverse Construction Joint The No. 4 Deformed Tie Bar Shall Be Spaced 12" Center To Center And Approximately 6", From The Pavement Edges, Joint Shall Not Be Paced At The Normal Transverse Construction Joint.
Sioux Falls, SD Bridge Repair:
8th St. & Phillips Avenue

Repair Pedestals to Original Condition
Sioux Falls, SD Bridge Repair

Top: South View from a Distance
Bottom: North View
Sioux Falls, SD Bridge Repair

Chip to Sound Concrete and Replace to Original Lines With Shotcrete
Sioux Falls, SD Bridge Repair

South View
REHABILITATION ANALYSIS
INFORMATIONAL HANDOUT
The 8th Street Arch was constructed in 1912 at the advent of utilizing reinforced concrete in bridge construction. Recently the structure has been showing deterioration associated with its age. The crossing at 8th Street was the first bridge to cross the Big Sioux River in the City of Sioux Falls. The current arch bridge is actually the third structure constructed at this location. The first bridge was erected in 1876 and washed out from a flood. The second structure was constructed 6 years later in 1882 and proved to be insufficient. The current bridge is known to be a Luten arch and was constructed by N.M. Stark and Company.

8th Street Arch Bridge
REHABILITATION

Improving our existing infrastructure while preserving history.

The bridge was dubbed as “the greatest and most costly bridge in South Dakota.”

Western Contractor

The bridge was listed on the National Register of Historic Places in 1993. A plaque on the corner of the bridge denotes it as being an “Engineering Masterpiece” at the time of its construction.
SIS

A month of weeks in order to itemize deterioration and from the arches at specific locations to analyze the structure. Reinforcement size and spacing were verified to...

SING

STDS OVER THE STRUCTURE

- $496/SqFt

REPLACEMENT (PRESTRESSED GIRDER BRIDGE W/ PRECAST PANELS SIMULATING AN ARCH) - $12.5M

Feasibility of undertaking the rehabilitation was examined by researching similar past projects from around the country and consulting with contractors.

Both rehabilitation options provide for a smooth, uniform finish and address the needed concrete repairs.

The final design will incorporate extensive coordination with the State Historic Preservation Office.

Rehabilitation will provide a savings of nearly $9M in initial construction costs.

HISTORICAL SIGNIFICANCE OF THE BRIDGE

- Void
- Aggregat
- Void
PROFILE PHOTOGRAPHS
Existing Profile Photos

Southern Face of Bridge

Northern Face of Bridge
Existing Profile Photos

East Approach

West Approach
PROPOSED REHABILITATION ELEMENTS
Existing Surfacing –
Asphalt Roadway (up to 12” thick)
Concrete Sidewalk

Arch is filled with saturated
granular material

Replace roadway and
concrete structure
Remove existing granular material
with non-compromised
quality.
Existing Drain Outlet – (1) centered in middle span over each pier

Replace with new piping and Add (4) additional downspouts
8th Street Arch  

PieR NosIng Repairs

Existing Pier Nosing

PIER CAP TO BE REMOVED AND REPLACED (TYP.)—
8TH STREET ARCH

ARCH REPAIRS

Existing Arch

Concrete Repairs and Complete Shotcrete Coverage
8TH STREET ARCH

ARCH REPAIRS

Existing Arch

Shotcrete Stamping

Color match "Patchwork"
8th Street Arch

Spandrel Wall Repair – Precast

Existing Spandrel Walls

Removal of concrete to a specified depth

Installation of Precast Concrete Panels
8th Street Arch

Spandrel Wall Repairs – Shotcrete Option

Existing Spandrel Walls

Removal of concrete to a specified depth

Existing Arch Detail
8th Street Arch

Existing Railing –
Installed with 70’s Rehabilitation

Railings Improvements

Replace with precast balustrades and
Cast bottom toe kick section
The entire rail needs to be taller to coincide
with criteria and balustrades dimensions need alteration.
Integrate conduit for lighting into precast top rail sections.

Utilize pier pedestals and plaques for lighting junction boxes.
Utilize existing street lights with new LED fixtures.

These same pedestals are used throughout Downtown Greenway with both amber and white fixture colors.
8th Street Arch

Lighting Improvements

Ballustrade Strip Lighting – One Side

Highlights the railing and provides additional sidewalk lighting
Ballustrade Strip Lighting – Both Sides

Highlights the railing and provides additional sidewalk lighting

Mock up proved the outside lighting to be a distraction from the architectural railing when viewed from the Greenway elevation.
Arch Lighting
Highlights the arches and provides additional Greenway lighting under bridge

Existing Lighting

Proposed Arch Lighting (2 Fixtures)
Arch Lighting

Highlights the arches and provides additional Greenway lighting under bridge
Arch Lighting

Highlights the arches and provides additional Greenway lighting under bridge
8TH STREET ARCH  LIGHTING IMPROVEMENTS

Exposed Fixtures
Option 1 - Color match the fixtures themselves

Option 2 - Frame system with Dryvit strip along springline of arch