Minnesota Department of Transportation (MnDOT)
Local Historic Bridge Report

Executive Summary

Bridge L6322, or Frank’s Ford Bridge, is located in rural Olmsted County, approximately 2 miles downstream from the city of Oronoco. The bridge formerly carried County Road 121 over the South Fork of the Zumbro River, but has since been closed to traffic. Bridge L6322 was constructed in 1895 and is currently owned by Olmsted County. The bridge is listed in the National Register of Historic Places (National Register) under Criterion A under the area of Transportation and Criterion C in the area of Engineering for its association with important bridge builder Horace E. Horton. In addition, Bridge L6322 is significant for its early use of steel to construct the bridge.

Bridge L6322 is a four-span structure, 148 feet long overall. The main span is a steel Pratt through truss with a span length of 72 feet. The timber deck is 16 feet wide overall. The east abutment is cast-in-place concrete and was built just behind the original stone masonry abutment, a portion of which still remains. The west abutment is stone masonry with a cast-in-place concrete cap.

Bridge L6322 is in fair condition overall. Loss of section was detected in the bottom chord and verticals at the lower chord connections of the truss. The steel floor system has widespread corrosion and loss of section. The stone masonry west abutment has loose and missing mortar and signs of settlement. The two main piers supporting the truss have settled. Due to its abandonment and deterioration, Bridge L6322 is recommended for relocation and rehabilitation for a new use. The recommendations outline a process to stabilize the bridge in the near term and preserve the truss once relocated to a new site.

Any work on Bridge L6322 should proceed according to the Secretary of the Interior’s Standards for the Treatment of Historic Properties (Standards) [36 CFR part 67] and The Secretary’s Standards with Regard to Repair, Rehabilitation, and Replacement Situations, as adapted by the Virginia Transportation Research Council (Guidelines).
Minneapolis Department of Transportation (MnDOT)
Local Historic Bridge Report

Bridge Location

Bridge Location

PROJECT LOCATION
OLMSTED COUNTY
SEC. 26, TO 108NN, R 14W
UTM ZONE: 15 NAD: 27
USGS QUAD NAME: ZUMBRO LAKE
EASTING: 1781470 ft.
NORTHING: 16031510 ft.

Bridge L6322 – CR 121 over SOUTH FORK ZUMBRO RIVER
Executive Summary

Bridge Location

I. Project Introduction
II. Historic Data
III. Bridge Data
IV. Existing Conditions/Recommendations
V. Projected Costs

Appendices

A. Glossary
B. Guidelines for Bridge Maintenance and Rehabilitation based on the Secretary of the Interior’s Standards
C. Documents
This Bridge Report is a product of a comprehensive study performed for approximately 140 historic bridges owned by county, city, township, private and other state agencies besides MnDOT. The study is the second phase of a multi-phased process developed and executed in partnership with representatives from the Federal Highway Administration (FHWA); State Historic Preservation Office (SHPO); MnDOT State Aid; MnDOT Cultural Resources Unit (CRU); the US Army Corps of Engineers (USACE); local public works and county highway departments; county and township boards and city councils; the preservation community and the general public. To perform the study, MnDOT retained the consultant team of LHB Inc., Mead & Hunt Inc., and The 106 Group.

The general goals of the study include:

- Gathering and compiling the existing historic and bridge condition data and other relevant information on the bridges in the study group into bridge reports.
- National Register nominations for a select number of bridges within the study group which the bridge owner may request a nomination to be prepared.
- Updating MnDOT’s Management Plan for Historic Bridges in Minnesota based on the study’s findings.
- Producing a narrative for the MnDOT Historic Bridge Website to disseminate information regarding locally owned historic bridges in Minnesota.
- Investigating and preparing a summary regarding how other states have funded historic bridge programs and structured Programmatic Agreements when multiple non-state entities are the owners of historic bridges.

The Bridge Reports compile and summarize the historic and engineering information concerning the structures. It is important to note that this report indicates if a bridge is located within a known historic district, but it does not identify all known or potential historic properties. Potential impacts to adjacent or surrounding historic properties, such as archaeological sites or other structures must be considered. Contact MnDOT CRU early in the project planning process in order to identify other potential historic properties. The reports also document the existing use and condition of the bridges along with assessments of the maintenance, stabilization and preservation needs of each structure, including cost estimates. The maintenance activities, along with regular structural inspections and anticipated bridge component replacement activities are routine practices directed toward continued structure serviceability. Stabilization activities address immediate needs identified as necessary to maintain a bridge’s structural and historic integrity and serviceability. Preservation activities are near term or long term steps that need to be taken to preserve and in some cases restore a bridge’s structural and historic integrity and serviceability. In assessing preservation activities, a design life of 20 years or longer is typically considered. In addition to general restoration activities and dependent on the severity of deterioration, preservation activities may include spot repair, disassembly and reassembly or replacement of specific bridge components.

Recommendations within the Bridge Reports are consistent with the Secretary of the Interior’s Standards for the Treatment of Historic Properties (Standards). The Standards are basic principles created to help preserve the distinct character of a historic property and its site, while allowing for reasonable change to meet new engineering standards and codes. The Standards recommend repairing, rather than replacing...
deteriorated features whenever possible. The Standards apply to historic properties of all periods, styles, types, materials and sizes and encompass the property’s location and surrounding environment.

The Standards were developed with historic buildings in mind and cannot be easily applied to historic bridges. The Virginia Transportation Research Council (Council) adapted the Standards to address the special requirements of historic bridges. They were published in the Council’s 2001 Final Report: A Management Plan for Historic Bridges in Virginia, *The Secretary’s Standards with Regard to Repair, Rehabilitation, and Replacement Situations*, provide useful direction for undertaking maintenance, repair, rehabilitation, and replacement of historic bridges and are included in the Appendix to this plan.

Existing bridge data sources typically available for Minnesota bridges were gathered for the study. These sources include:

- PONTIS, a bridge management system formerly used by MnDOT to manage its inventory of bridges statewide, and its replacement system, SIMS (Structure Information Management System)

- The current MnDOT Structure Inventory Report and MnDOT Bridge Inspection Report. Reports are available for the majority of the bridges (not available for bridges in private ownership)

- Database and inventory forms resulting from the 2012 Minnesota Local Historic Bridge Study and other prior historic bridge studies as incorporated into the database

- Existing Minnesota historic contexts studies for bridges in Minnesota, including *Reinforced-Concrete Highway Bridges in Minnesota, 1900-1945*, *Minnesota Masonry-Arch Highway Bridges, 1870-1945*, *Iron and Steel Bridges in Minnesota, 1873-1945* and *Minnesota Bridges 1955-1970*

- Field investigations documenting the general structural condition and determining character-defining features

Additional data sources researched and gathered for some of the bridges as available also included:

- Files and records at MnDOT offices

- Original bridge construction plans, rehabilitation plans, and maintenance records of local owners

- Files and documents available at the SHPO office, including previous inventory forms, determinations of eligibility, studies, and compliance documents

- Existing historic and documentary material related to the National Register-eligible bridges

The Appendix contains the following: a Glossary explaining structural and historic preservation terms used in the report, the Guidelines for Bridge Maintenance and Rehabilitation based on the Secretary of the Interior’s Standards, a list of engineering and historic documents available for this bridge, and copies of the MnDOT Structure Inventory and Bridge Inspection Reports current at the time of the report preparation.

The Bridge Report will provide the bridge owner and other interested parties with a comprehensive summary of the bridge condition and detailed information related to the historic nature of the bridge. This information will enable historic bridge owners to make informed decisions when planning for their historic properties.
This narrative is drawn from previous documents, as available for the subject bridge, which may include determination of eligibility (also known as Phase II evaluation), Minnesota Architecture/History Inventory Form, National Register nomination, Multiple Property Documentation Form, and/or applicable historic contexts. See Sources for details on which documents were used in compiling this Historic Data section.

Contractor: Unknown

Designer/Engineer: Chicago Bridge & Iron Company (Horace E. Horton)

Description
Bridge L6322, or Frank’s Ford Bridge, is located 1.4 miles east of Olmsted County Road 112 in a rural location approximately 2 miles downstream from the city of Oronoco. The bridge formerly carried County Road 121 over the South Fork of the Zumbro River, but has since been closed to traffic.

The single main span is a steel, five-panel, pin-connected Pratt through truss, with three approach spans. The truss is 72 feet long with a 16-foot wood deck, mounted on four concrete-filled metal plate caissons. The portal bracing members are elevated above the portal struts. The upper chord consists of paired channels with continuous cover plates riveted on top and lacing underneath. The lower chord and diagonals in the second and fourth panels are paired punched eye-bars. Diagonals in the third panel are paired turnbuckles. Hip verticals are paired forged eye-bars; main verticals consist of two sets of lacing perpendicular to each other and intertwined, riveted to two angle sections. The floor is comprised of wood planks on I-beam stringers (with channels on the outside edges). The stringers rest on the upper flanges of the I-beam floorbeams, which in turn are riveted to plate extensions of the verticals. Portal bracing, comprised of angle sections, peaks above the level of the main truss. Sway bracing is paired angles. Top and bottom lateral bracing is round rods.

The main span rests on two piers each consisting of two concrete-filled metal caissons with turnbuckle cross-braces. The railing is comprised of angle sections. The approach span at the west end is an I-beam stringer span. The two spans at the east end are of recent pile-bent construction with I-beam stringers. This wood pile trestle approach replaced a four-span approach sometime in the 1970s. The bridge abutments are comprised of random-coursed rough-cut limestone, with poured concrete added in places.

Significance
Research revealed little in the construction history of Bridge L6322. In 1895 the Minnesota state legislature appropriated $600 to aid in the rebuilding of “a bridge across the Zumbro River in the town of Oronoco in the county of Olmsted, at a point at or near Frank’s Ford...” However, the legislation did not indicate if the money was appropriated to the county or township. Ultimately, Oronoco Township contracted with the Chicago Bridge & Iron Company and bridge builder Horace E. Horton to build the bridge at Frank’s Ford in 1895. In 1908, the bridge was washed downstream in a flood, then repaired and elevated, with work being done by the original builder.

Horace E. Horton was an important bridge engineer according to the Multiple Property Documentation Form “Historic Iron and Steel Bridges in Minnesota, 1873-1945.” Horton was born in New York State in 1843 but moved to Rochester, Olmsted County, Minnesota, about 1859. He returned to New York in
1863 to attend Fairfield Seminary for Civil Engineering, and moved back to Rochester in 1866. In 1867 he became county surveyor and also built his first bridge in the city of Oronoco after the previous bridge collapsed. Horton also was the architect of Rochester city hall and Northrop school house. While in Rochester, Horton formed the H.E. Horton Bridge Company and constructed many bridges in Minnesota and neighboring states, including the Fort Snelling Bridge. In 1889, in order to expand his business and increase his market area, Horton moved to Chicago where he formed the Chicago Bridge & Iron Company.

The late-nineteenth-century depression brought difficult times for the Chicago Bridge & Iron Company. Business recovered in the spring of 1895 with increased building and construction activity. Railroads began improving right of way structures, bringing more work to the bridge building business. Steel prices rose as bridges, railways, skyscrapers, farming implements and other structures were built. Horton had an office in St. Paul during this time, and continued to build bridges in Minnesota. In order to keep up business and recover from the depression, the Chicago Bridge & Iron Company bid on many contracts for small, combination wood and iron bridges in the Midwest. This includes design and construction of Bridge L6322.

This bridge is one of 10 extant Pratt through trusses in Minnesota constructed between 1875 and 1922. Bridge L6322 is the oldest extant metal truss bridge in Olmsted County and is the third oldest Pratt through truss in the state. Constructed in 1895, only Bridge 4842 (Le Sueur County; 1875) and Bridge 92366 (Wright County; 1885), are older. Its configuration with the portal struts extending above the portal is unique among the extant examples. Additionally, Bridge L6322 is representative of the early use of steel. Beginning in the 1890s, steel replaced wrought iron as the preferred metal to construct bridges. Under the “Historic Iron and Steel Highway Bridges in Minnesota” Multiple Property Documentation Form, bridges constructed in the 1890s represent the early use of steel in bridge construction in Minnesota. Constructed in 1895, Bridge L6322 meets this criterion.

The bridge has had minor modifications, including coating the original limestone foundations with concrete and replacement of the original approach spans. The repairs and modifications undertaken in 1908 by the Chicago Bridge & Iron Company following flooding were done by the original fabricator. As such, any alterations made at this time do not diminish the historic integrity of the bridge. Later alterations to the approach spans result in minor integrity loss of design; however the bridge continues to retain integrity of design, workmanship, and materials overall. Bridge L6322, though closed to traffic, continues to span the South Fork of the Zumbro River in rural Olmsted County. As such the bridge retains integrity of setting, location, feeling, and association. The period of significance for Bridge L6322 is 1895, which corresponds with the date of its construction.

In 1980, Bridge L6322 was listed in the National Register under Criterion A in the area of Transportation and Criterion C in the area of Engineering for its association with important bridge builder Horace E. Horton. In addition to its association with H.E. Horton, Bridge L6322 is significant as an early representative example of a Pratt through truss in Minnesota and as an early example of the use of steel in bridge construction.
**Historic Context**

Historic Minnesota Iron and Steel Highway Bridges, 1873-1945

**National Register Status**

Listed (Individually)

**Criterion A Significance**

Transportation

**Criterion C Significance**

Engineering: Variation of type; Work of a master

**Historic District**

N/A

**SHPO inventory number**

OL-ORT-008

**Sources Used to Compile Section II – Historic Data**

National Register of Historic Places. Frank Ford’s Bridge (Bridge L6322), Olmsted County, Minnesota. National Register #800004534


Field inspection by LHB, Inc. and Mead & Hunt, 28 April 2014.
Character-Defining Features
Character-defining features are prominent or distinctive aspects, qualities, or characteristics of a historic property that contribute significantly to its physical character. Features may include materials, engineering design, and structural and decorative details. Often, the character-defining features include important historic fabric. However, historic fabric can also be found on other elements of a bridge that have not been noted as character-defining. For this reason, it is important to consider both character-defining features and the bridge’s historic fabric when planning any work.

Feature 1: Design and construction of a single-span, pin-connected, steel Pratt through truss, an early example of the type in the state and constructed by the Chicago Bridge & Iron Company, notably Horace Horton, who was an important Minnesota bridge builder.
Feature 2: Steel structural members, including the steel caisson substructure, representing the early use of steel in bridge construction in Minnesota.
Feature 3. Portal struts, comprised of angle sections, which extends above the portal. This feature is unique among extant Pratt through truss examples.
**Minnesota Department of Transportation (MnDOT)**

**Local Historic Bridge Report**

### Bridge Data

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<td>Common Name (if any)</td>
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**Location**

- Feature Carried: CR 121
- Feature Crossed: South Fork Zumbro River
- County: Olmsted
- Ownership: Olmsted County

**MnDOT Structure Data**

- Main Span Type: 303 STEEL HIGH TRUSS
- Main Span detail: PRATT
- Substructure Type - Foundation Type:
  - Abutment: 7-Differ - 1-Spread/Soil
  - Piers: 7-Differ - 4-Pile Bent
- Total Length: 149.5 ft
- Main Span Length: 72 ft
- Total Number of Span(s): 6
- Skew (degrees): 0
- Structure Flared: No Flare
- Roadway Function: Rural, Local
- Custodian/Maintenance Type: County

**Reported Owner Inspection Date**

- 12/05/2013

**Sufficiency Rating**

- 18.3

**Operating Rating**

- HS 4.1

**Inventory Rating**

- HS 2.9

**Structure Status**

- K - Bridge closed

**Posting**

- VEH: SEMI: DBL:

**Design Load**

**Current Condition Code**

- Deck: 7
- Superstructure: 1
- Substructure: 1
- Channel and Protection: 8
- Culvert: N

**Current Appraisal Rating**

- Structural Evaluation: 0
- Deck Geometry: 0
- Underclearances: N
- Waterway Adequacy: 4
- Approach Alignment: 3

**Fracture Critical**

- Yes

**Deficient Status**

- S.D.

**Roadway Clearances**

- Roadway Width: 15 ft
- Vert. Clearance Over Rdwy: 13.4 ft
- Vert. Clearance Under Rdwy: N/A
- Lat. Clearance Right: 0 ft
- Lat. Clearance Left: 0 ft

**Roadway Data**

- ADT Total: 70 (2002)
- Truck ADT Percentage: Not given
- Bypass Detour length: 4 miles
- Number of Lanes: 1

**Waterway Data**

- Scour Code: C-CLSD;NON SCR

**Non-MnDOT Data**

**Approach Roadway Characteristics**

- Lane Widths: Road Closed
- Shoulder Width: Road Closed
- Shoulders Paved or Unpaved: Road Closed
- Roadway Surfacing: Road Closed

**Location of Plans**

- N/A

**Plans Available**

- No Plan Available

---

* Non-MnDOT data collected during field survey. All other fields of data collected from MnDOT April of 2014. See Appendix C for MnDOT inventory and inspection report data.

**Unless a significant number of crashes are noted on or near a bridge, the accident data is not detailed in this report.
Existing Conditions
Available information, as detailed in the Project Introduction section, concerning Bridge L6322 was reviewed prior to visiting the bridge site. The site visit was conducted to establish the following:

1. General condition of structure
2. Conformation to available extant plans
3. Current use of structure
4. Roadway/pedestrian trail geometry and alignment (as applicable)
5. Bridge geometry, clearances and notable site issues

General Bridge Description
Bridge L6322 is a four-span structure, 148 feet long overall. The main span is a steel Pratt through truss (pin and eye bar construction) with a span length of 72 feet. There are two 31-foot-3-inch approach spans on the east side and one 13-foot-6-inch approach span on the west side. The truss bottom chord is made up of pairs of steel bars and the top chord is a pair of channels, cover-plated on top and laced on the bottom. The verticals are pairs of rods and pairs of angle sections (laced in an inter-woven pattern) and the diagonals are pairs of bars and pairs of rods with turnbuckles. The two east approach spans are comprised of 15-inch steel I-beams with a timber plank deck and the west approach span is supported by 7-inch steel I-beams with a timber plank deck. The timber deck is 16 feet wide overall and 15 feet wide measured between the two timber curbs. The east abutment is of relatively short height and is cast-in-place concrete. It was built just behind the original stone masonry abutment, a portion of which still remains. The west abutment is tall and made of stone masonry with a cast-in-place concrete cap.

Bridge L6322 is in fair condition. The truss members are mostly in fair condition; loss of section was detected in the bottom chord and verticals at the lower chord connections. While high water conditions prevented close access to the underside of the arch, the Bridge Inspection Report notes through corrosion in several stringers and floorbeams. The concrete east abutment is in good condition and the stone masonry west abutment is in poor condition with loose and missing mortar. The top of the west abutment leans to the east. The two pile bent piers on the east side are in fair condition. The two main piers consist of steel caissons made of riveted steel plate and filled with concrete. There is one caisson under each truss bearing. These piers are in poor condition, mainly due to settlement.

Serviceability Observations
The bridge is currently barricaded and closed to vehicle traffic. This closure is likely the result of the bridge’s deteriorated condition, including the substructures. Plate beam guard rail has been erected at each end of the bridge, with gaps in the guard rail to accommodate pedestrian and ATV use.

Condition Observations

Superstructure
Steel truss-primary members
The steel truss primary members are in fair condition. Section loss was noted in bottom chord members as well as verticals and diagonals mainly at or near the pin connections. The bottom chord is bent or misaligned in at least two locations and a similar condition exists for two of the diagonals.
Steel truss portal and top plane cross bracing
The steel portal frames and associated bracing members are in good condition.

Truss floorbeams and stringers
The existing floorbeams and stringers are in poor condition according to the Olmsted County Bridge Inspectors. Heavy corrosion and loss of section of 15 percent was reported for the floorbeams. Through corrosion was reported on the stringers with loss of section between 40 and 100 percent.

Truss bottom in-plane cross bracing
The in-plane cross-bracing for the floor system consists of round bars with threaded ends. The bracing appeared to be slightly loose but no disconnected or hanging members were noted.

Truss Bearings
The truss bearings appear to be in fair condition. Bearings are rusty but appear to be effective in transmitting vertical loads.

Timber Deck & Curbs
The timber plank deck appears to be in good condition, as do the timber curbs.

Bridge Railings
The existing two line steel angle railings are in fair condition. Various pieces of the railing are bent or otherwise misaligned, likely due to bridge settlement.

Paint System
The current paint system on the truss and floor system is failed and should be replaced.
Substructures
Abutments
The cast-in-place concrete abutment that has been placed behind the original stone masonry abutment on the east end is in good condition. The stone masonry west abutment is in poor condition. The stone is loose, cracked and missing in some areas. Mortar joints are in need of repointing and the top 4 feet of the abutment leans towards the east 4 inches.

Piers
The two main piers supporting the truss are in poor condition, mainly due to the apparent settlement of the caissons. The top sections of the caissons lean toward the east, at least 4 inches in 4 feet. The pile bent approach piers are in fair condition with significant decay noted in the south end of the timber cap beam on the pile bent near the east end of the truss.

Approach/Waterway Observations
The bridge approaches have been removed and plate beam guard rail has been erected off each end of the bridge with an opening for pedestrians and ATV traffic. The waterway appears adequate and scour protection is in place where appropriate. A large amount of wood and debris has accumulated at the east approach spans. Slope protection is deficient at the east and west slopes.

Date of Engineering Site Visit by LHB
April 28, 2014
Condition 1: South elevation looking north

Condition 2: North elevation, looking south
Condition 3: Bridge approach, looking west

Condition 4: Bridge approach, looking east
Condition 5: Typical bottom chord configuration

Condition 6: Lower chord connection (note section loss in eye bars)
Condition 7: Truss underside/floor system

Condition 8: Truss bearings
Condition 9: Bridge top side view showing timber deck

Condition 10: Bridge two-line steel angle section railing
Condition 11: Uniquely laced truss vertical

Condition 12: Tumbuckles on diagonals
**Condition 13:** Concrete east abutment behind original stone abutment

**Condition 14:** West abutment
Condition 15: Caisson pier supporting truss span, west pier

Condition 16: East truss pier (note lean of pier and decay in adjacent timber cap)
Condition 17: Waterway showing debris on east side of channel

Condition 18: Remnants of original pier on east end of bridge
Overall Recommendations
Bridge L6322 is currently closed to vehicular traffic as a result of its condition, deficient geometry and closure of the county road the bridge was formerly located on. The bridge owner has indicated that there are no plans to officially reopen the bridge to vehicular or pedestrian traffic. The age and original design of the bridge make it unlikely it would possess the capacity to carry modern highway loads without significant alterations to its original character.

The size and construction of the bridge make it a good candidate for relocation, therefore the recommendations that follow assume the bridge (truss span only) will likely be dismantled and reassembled at a different location and used for recreational purposes. Should this course of action be considered, the historic impacts (adverse effect of relocation) of such a move would have to be weighed with potential outcomes if the bridge were not to be moved and cannot be preserved or maintained in place.

Recommended Stabilization Activities
1. Survey and periodically monitor the settlement of the west abutment and piers.
2. Erect substructure shoring if settlement is continuing.
3. Slope protection at east and west abutments.
4. Perform an initial inspection and analysis of the floor system to determine if it can safely carry current live loadings (pedestrian and ATV). If analysis shows the existing floor system is not capable of supporting the current live loading the bridge should be securely closed to all users. Costs for this analysis have been included in the Preliminary Design and Assessment estimate.

Recommended Preservation Activities
Truss Primary, Secondary and Bridge Railing Members
Perform an assessment of the bridge members and complete an analysis based on the bridge’s future intended use. By using intended loading, members that exhibit minor to moderate section loss may be returned to service instead of being replaced if the proposed recreational live load demands are low compared to the original design live loads. In preparation for its relocation the bridge should be dismantled on site and shipped to a steel fabrication/paint shop for straightening, testing, blasting/painting and reassembly. The nature of the truss construction should permit complete disassembly without having to separate the individual components of the built up members such as the truss verticals with the unique lacing details. Prior to disassembly all truss members must be carefully match marked to ensure reassembly exactly matches the original. Prior to reassembly the pins at the upper and lower chord connections should be tested to ensure integrity. For the purposes of this report it is assumed the new bridge location will be within the boundaries of Olmsted County. Consideration of how the bridge will be utilized and what it will cross over at its potential new location should be carefully weighed, since it can affect the height and type of the required railing. For example, it may be best to have the bridge just carry pedestrians and only require a pedestrian-height rail, but not bicycle or horses, which require a higher rail. Also, placement over a roadway or railroad, which may require higher rails and smaller openings to avoid objects being thrown off the bridge, should be avoided if possible.
IV – Existing Conditions/Recommendations

**Bridge Number:** L6322

### Deck and Floor System
The deck system would need to be removed in order to dismantle the truss. Once removed, the steel floorbeams and stringers should be assessed and replaced, if necessary, based on the intended use design live load requirements. For the purpose of this report it is assumed that 50 percent of the floorbeams and 50 percent of the stringers would need replacement. When replacement is determined to be necessary, replacement should be made with components of like material and geometry.

### Paint System
The current paint system on the trusses and remaining bridge superstructure is failed and should be replaced. It is recommended the in-place paint system and surface rust be entirely removed to bare metal through abrasive blasting (which through testing is determined will not degrade portions of the steel structure which are to remain). The structure should be painted with a zinc-rich primer and a protective overcoat system with color and sheen to be selected based on a study of the historic requirements of the structure. The in-place system will require testing to determine the presence of lead. Due to the toxicity of lead, the removal of lead paint system requires approved shop containment methods. For purposes of cost estimating a lead based system has been presumed.

### Bearings
The bearings are presently fairly deteriorated and likely non-functioning. It is likely replacement will be necessary though this will need to be further determined through more detailed inspection and cleanup. If replacement is determined to be necessary, replacement components should be of like material and geometry as they are a visual element of the structure. For purposes of the preservation cost estimate replacement has been assumed.

### Substructure
#### Abutments
New abutments will be required and for the purposes of this report it is assumed that the new abutments will be cast-in-place concrete with a level of architectural treatment to allow them to appropriately exist with the historic structure. Use of a stone veneer element could also be considered though has not been incorporated in the estimate. Final determination of abutment materials and aesthetics will involve a detailed study of the new location setting for the bridge, the bridge’s historic features and incorporation of the Preservation Standards.

The existing abutments, caisson piers and pile bents for the approach spans should be removed as they would create a hazard if left in place. Due to their construction type, they could not be salvaged for reuse.

### Recommended Annual Maintenance Activities
1. Clear brush and vegetation from the bridge area.
2. Remove accumulated wood and debris from the channel.
Summarized Maintenance, Stabilization and Preservation Construction Cost Estimates

It is important to recognize that the work scope and cost estimates presented herein are based on a limited level assessment of the existing structure. In moving forward with future project planning, it will be essential to undertake a detailed structure assessment addressing the proposed work for the structure. It is also important that any future preservation work follow applicable preservation standards with emphasis to rehabilitate and repair in-place structure elements in lieu of replacement. This includes elements which are preliminarily estimated for replacement within the work scope of this report. Only through a thorough review of rehabilitation and repair options and comprehensive structural and historic assessment can a definitive conclusion for replacement of historic fabric be formed.

The opinions of probable construction and administrative costs provided below are presented in 2013 dollars. These costs were developed without benefit of a detailed, thorough bridge inspection, bridge survey or completion of preliminary design for the estimated improvements. The estimated costs represent an opinion based on background knowledge of historic unit prices and comparable work performed on other structures. The opinions of cost are intended to provide a programming level of estimated cost. These costs will require refinement and may require significant adjustments as further analysis is completed in determining the course of action for future structure improvements. A 20 percent contingency and 7 percent mobilization allowance has been included in the construction cost estimates.

Administrative and engineering costs are also presented below. Engineering and administrative costs are also to be interpreted as programming level only. Costs can be highly variable and are dependent on structure condition, intended work scope, project size and level of investigative, testing and documentation work necessary. Additional studies, evaluation, and historic consultation costs not exclusively called out may also be incurred on a case-by-case basis.

Maintenance, Stabilization, and Preservation Costs (refer to the work item breakdown on the next page)

- Opinion of Annual Cost- Maintenance Activities: $4,800
- Opinion of Construction Cost- Stabilization Activities: $51,600
- Opinion of Construction Cost- Preservation Activities: $602,480

Estimated Preliminary Design, Final Design, Construction Administration Costs

- Preliminary Design and Assessment: $31,500
- Final Design and Plans: $60,000
- Construction Administration: $90,000
## Maintenance, Stabilization & Preservation Cost Estimate (2013 Dollars)

### Bridge No. L6322

**August 15, 2014**

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<th>Item No.</th>
<th>Item Description</th>
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<td>Clear Earth and Brush and Vines from Bridge Area</td>
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Appendices

Appendix A. Glossary
Glossary

**Abutment** – Component of bridge substructure at either end of bridge that transfers load from superstructure to foundation and provides lateral support for the approach roadway embankment.

**Appraisal ratings** – Five National Bridge Inventory (NBI) appraisal ratings (structural evaluation, deck geometry, under-clearances, waterway adequacy, and approach alignment, as defined below), collectively called appraisal ratings, are used to evaluate a bridge’s overall structural condition and load-carrying capacity. The evaluated bridge is compared with a new bridge built to current design standards. Ratings range from a low of 0 (closed bridge) to a high of 9 (superior). Any appraisal item not applicable to a specific bridge is coded N.

**Approach alignment** – One of five NBI inspection ratings. This rating appraises a bridge’s functionality based on the alignment of its approaches. It incorporates a typical motorist’s speed reduction because of the horizontal or vertical alignment of the approach.

**Character-defining features** – Prominent or distinctive aspects, qualities, or characteristics of a historic property that contribute significantly to its physical character. Features may include structural or decorative details and materials.

**Condition, fair** – A bridge or bridge component of which all primary structural elements are sound, but may have minor deterioration, section loss, cracking, spalling, or scour.

**Condition, good** – A bridge or bridge component which may have some minor deficiencies, but all primary structural elements are sound.

**Condition, poor** – A bridge or bridge component that displays advanced section loss, deterioration, cracking, spalling, or scour.

**Condition rating** – Level of deterioration of bridge components and elements expressed on a numerical scale according to the NBI system. Components include the substructure, superstructure, deck, channel, and culvert. Elements are subsets of components, e.g., piers and abutments are elements of the component substructure. The evaluated bridge is compared with a new bridge built to current design standards. Component ratings range from 0 (failure) to 9 (new) or N for (not applicable); elements are rated on a scale of 1-3, 1-4 or 1-5 (depending on the element type and material). In all cases condition state 1 is the best condition with condition state 3, 4 or 5 being the worst condition. In rating a bridge’s condition, MnDOT pairs the NBI system with the newer and more sophisticated Pontis element inspection information, which quantifies bridge elements in different condition states and is the basis for subsequent economic analysis.

**Corrosion** – The general disentegration of metal through oxidation.

**Cutwater** – The wedge-shaped end of a bridge pier, designed to divide the current and break up ice.
Decay – Deterioration of wood as a result of fungi feeding on its cell walls.

Delamination – Surface separation of concrete, steel, glue laminated timber plies etc. into layers.

Deck geometry – One of five NBI appraisal ratings. This rating appraises the functionality of a bridge’s roadway width and vertical clearance, taking into account the type of roadway, number of lanes, and ADT.

Deficiency – The inadequacy of a bridge in terms of structure, serviceability, and/or function. Structural deficiency is determined through periodic inspections and is reflected in the ratings that are assigned to a bridge. Service deficiency is determined by comparing the facilities a bridge provides for vehicular, bicycle, and pedestrian traffic with those that are desired. Functional deficiency is another term for functionally obsolete (see below). Remedial activities may be needed to address any or all of these deficiencies.

Deficiency rating – A nonnumeric code indicating a bridge’s status as structurally deficient (SD) or functionally obsolete (FO). See below for the definitions of SD and FO. The deficiency rating status may be used as a basis for establishing a bridge’s eligibility and priority for replacement or rehabilitation.

Design exception – A deviation from federal design and geometric standards that takes into account environmental, scenic, aesthetic, historic, and community factors that may have bearing upon a transportation project. A design exception is used for federally funded projects where federal standards are not met. Approval requires appropriate justification and documentation that concerns for safety, durability, and economy of maintenance have been met.

Design load – The usable live-load capacity that a bridge was designed to carry, expressed in tons according to the AASHTO allowable stress, load factor, or load resistance factor rating methods. An additional code was recently added to assess design load by a rating factor instead of tons. This code is used to determine if a bridge has sufficient strength to accommodate traffic load demands. A bridge that is posted for load restrictions is not adequate to accommodate present or expected legal truck traffic.

Deterioration – Decline in condition of surfaces or structure over a period of time due to chemical or physical degradation.

Efflorescence – A deposit on concrete or brick caused by crystallization of carbonates brought to the surface by moisture in the masonry or concrete.

Extant – Currently or actually existing.

Extrados – The upper or outer surfaces of the voussoirs which compose the arch ring. Often contrasted with intrados.
**Footing** – The enlarged, lower portion of a substructure which distributes the structure load either to the earth or to supporting piles.

**Fracture Critical Members** – Tension members or tension components of bending members (including those subject to reversal of stress) whose failure would be expected to result in collapse of the bridge.

**Functionally obsolete** – The Federal Highway Administration (FHWA) classification of a bridge that does not meet current or projected traffic needs because of inadequate horizontal or vertical clearance, inadequate load-carrying capacity, and/or insufficient opening to accommodate water flow under the bridge. An appraisal rating of 3 or less for deck geometry, underclearance, approach alignment, structural evaluation or waterway adequacy will designate a bridge as functionally obsolete.

**Gusset plate** – A plate that connects the horizontal and vertical members of a truss structure and holds them in correct position at a joint.

**Helicoidal** – Arranged in or having the approximate shape of a flattened coil or spiral.

**Historic fabric** – The material in a bridge that was part of original construction or a subsequent alteration within the historic period of the bridge (i.e., more than 50 years old). Historic fabric is an important part of the character of the historic bridge and the removal, concealment, or alteration of any historic material or distinctive engineering or architectural feature should be avoided if possible. Often, the character-defining features include important historic fabric. However, historic fabric can also be found on other elements of a bridge that have not been noted as character-defining.

**Historic bridge** – A bridge that is listed in, or eligible for listing in, the National Register of Historic Places.

**Historic integrity** – The authenticity of a bridge’s historic identity, evidenced by the survival and/or restoration of physical characteristics that existed during the bridge’s historic period. A bridge may have integrity of location, design, setting, materials, workmanship, feeling, and association.

**Inspections** – Periodic field assessments and subsequent consideration of the fitness of a structure and the associated approaches and amenities to continue to function safely.

**Intrados** – The inner or lower surface of an arch. Often contrasted with extrados.

**Inventory rating** – The load level a bridge can safely carry for an indefinite amount of time expressed in tons or by the rating factor described in design load (see above). Inventory rating values typically correspond to the original design load for a bridge without deterioration.

**Keystone** – Wedge-shaped stone, or voussoir, at the crown of an arch.
**Load Rating** – The determination of the live load carrying capacity of a bridge using bridge plans and supplemented by field inspection.

**Maintenance** – Work of a routine nature to prevent or control the process of deterioration of a bridge.

**Minnesota Historical Property Record** – A documentary record of an important architectural, engineering, or industrial site, maintained by the Minnesota Historical Society as part of the state’s commitment to historic preservation. MHPR typically includes large-format photographs and written history, and may also include historic photographs, drawings, and/or plans. This state-level documentation program is modeled after a federal program known as the Historic American Buildings Survey/Historic American Engineering Record (HABS/HAER).

**National Bridge Inventory** – Bridge inventory and appraisal data collected by the FHWA to fulfill the requirements of the National Bridge Inspection Standards (NBIS). Each state maintains an inventory of its bridges subject to NBIS and sends an annual update to the FHWA.

**National Bridge Inspection Standards** – Federal requirements for procedures and frequency of inspections, qualifications of personnel, inspection reports, and preparation and maintenance of state bridge inventories. NBIS applies to bridges located on public roads.

**National Register of Historic Places** – The official inventory of districts, sites, buildings, structures, and objects significant in American history, architecture, archaeology, and culture, which is maintained by the Secretary of the Interior under the authority of the National Historic Preservation Act of 1966 (as amended).

**Non-vehicular traffic** – Pedestrians, non-motorized recreational vehicles, and small motorized recreational vehicles moving along a transportation route that does not serve automobiles and trucks. Includes bicycles and snowmobiles.

**Operating rating** – Maximum permissible load level to which a bridge may be subjected based on a specific truck type, expressed in tons or by the rating factor described in design load (see above).

**Pack rust** – Rust forming between adjacent steel surfaces in contact which tends to force the surfaces apart due to the increase in steel volume.

**Pier** – A substructure unit that supports the spans of a multi-span superstructure at an intermediate location between its abutments.

**Pointing** – The compaction of mortar into the outermost portion of a joint and the troweling of its exposed surface to secure water tightness and/or desired architectural effect (when replacing deteriorated mortar).
**Pony truss** – A through bridge with parallel chords and having no top lateral bracing over the deck between the top chords.

**Posted load** – Legal live-load capacity for a bridge which is associated with the operating rating. A bridge posted for load restrictions is inadequate for legal truck traffic.

**Pontis** – Computer-based bridge management system to store inventory and inspection data and assist in other bridge data management tasks.

**Preservation** – Preservation, as used in this report, refers to historic preservation that is consistent with the Secretary of the Interior’s *Standards for the Treatment of Historic Properties*. Historic preservation means saving from destruction or deterioration old and historic buildings, sites, structures, and objects, and providing for their continued use by means of restoration, rehabilitation, or adaptive reuse. It is the act or process of applying measures to sustain the existing form, integrity, and material of a historic building or structure, and its site and setting. MnDOT’s *Bridge Preservation, Improvement and Replacement Guidelines* describe preservation differently, focusing on repairing or delaying the deterioration of a bridge without significantly improving its function and without considerations for its historic integrity.

**Preventive maintenance** – The planned strategy of cost-effective treatments that preserve a bridge, slow future deterioration, and maintain or improve its functional condition without increasing structural capacity.

**Reconstruction** – The act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location. Activities should be consistent with the Secretary of the Interior’s *Standards for the Treatment of Historic Properties*.

**Rehabilitation** – The act or process of returning a historic property to a state of utility through repair or alteration which makes possible an efficient contemporary use, while preserving those portions or features of the property that are significant to its historical, architectural, and cultural values. Historic rehabilitation, as used in this report, refers to implementing activities that are consistent with the Secretary of the Interior’s *Standards for the Treatment of Historic Properties*. As such, rehabilitation retains historic fabric and is different from replacement. MnDOT’s *Bridge Preservation, Improvement and Replacement Guidelines* describe rehabilitation and replacement in similar terms.

**Restoration** – The act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time. Activities should be consistent with the Secretary of the Interior’s *Standards for the Treatment of Historic Properties*.

**Ring stone** – One of the separate stones of an arch that shows on the face of the headwall, or end of the arch. Also known as a voussoir.
Scaling – The gradual distentegration of a concrete surface due to the failure of the cement surface caused by chemical attack or freeze-thaw cycles or rebar too close to the surface and oxidizing from exposure to chlorides.

Scour – Removal of material from a river’s bed or bank by flowing water, compromising the strength, stability, and serviceability of a bridge.

Scour critical rating – A measure of a bridge’s vulnerability to scour (see above). MnDOT utilizes letter designations to represent specific descriptions of a bridge’s susceptibility and/or present condition in regards to scour. Range in condition and scour susceptibility does not necessarily correlate alpha numerically to the MnDOT scour code letters so it is important to understand the specific scour description for each MnDOT scour code. The scour codes and descriptions can be found in the “MNDOT Bridge Inspection Field Manual”.

Section loss – Loss of a member’s cross sectional area and resulting strength usually by corrosion or decay.

Serviceability – Level of facilities a bridge provides for vehicular, bicycle, and pedestrian traffic, compared with current design standards.

Smart flag – Special Pontis inspection element used to report the condition assessment of a deficiency that cannot be modeled, such as cracks, section loss, and steel fatigue.

Spall – Depression in concrete caused by a separation of a portion of the surface concrete, revealing a fracture parallel with or slightly inclined to the surface.

Spring line – The imaginary horizontal line at which an arch or vault begins to curve. As example, the point of transition from the vertical face of an abutment to the start of arch curvature extending from abutment face.

Stabilization – The act or process of stopping or slowing further deterioration of a bridge by means of making minor repairs until a more permanent repair or rehabilitation can be completed.

Stringcourse – A horizontal band of masonry, generally narrower than other courses and sometimes projecting, that extends across the structure’s horizontal face as an architectural accent. Also known as belt course.

Structural evaluation – Condition rating of a bridge designed to carry vehicular loads, expressed as a numeric value and based on the condition of the superstructure and substructure, the inventory load rating, and the ADT.
**Structurally deficient** – Classification indicating NBI condition rating of 4 or less for any of the following: deck condition, superstructure condition, substructure condition, or culvert condition. A bridge is also classified as structurally deficient if it has an appraisal rating of 2 or less for its structural evaluation or waterway adequacy. A structurally deficient bridge is restricted to lightweight vehicles; requires immediate rehabilitation to remain open to traffic; or requires maintenance, rehabilitation, or replacement.

**Sufficiency rating** – Rating of a bridge’s structural adequacy and safety for public use, and its serviceability and function, expressed on a numeric scale ranging from a low of 0 to a high of 100. It is a relative measure of a bridge’s deterioration, load capacity deficiency, or functional obsolescence. MnDOT may use the rating as a basis for establishing eligibility and priority for replacement or rehabilitation. Typically, bridges which are structurally deficient and have sufficiency ratings between 50 and 80 are eligible for federal rehabilitation funds and those which are structurally deficient with sufficiency ratings of 50 and below are eligible for replacement.

**Through truss** – A bridge with parallel top and bottom chords and top lateral bracing with the deck generally near the bottom chord.

**Under-clearances** – One of five NBI appraisal ratings. This rating appraises the suitability of the horizontal and vertical clearances of a grade-separation structure, taking into account whether traffic beneath the structure is one- or two-way.

**Variance** – A deviation from State Aid Operations Statute Rules that takes into account environmental, scenic, aesthetic, historic, and community factors that may have bearing upon a transportation project. A design variance is used for projects using state aid funds. Approval requires appropriate justification and documentation that concerns for safety, durability and economy of maintenance have been met.

**Vehicular traffic** – The passage of automobiles and trucks along a transportation route.

**Voussoir** – One of the separate stones forming an arch ring; also known as a ring stone.

**Waterway adequacy** – One of five NBI appraisal ratings. This rating appraises a bridge’s waterway opening and passage of flow under or through the bridge, frequency of roadway overtopping, and typical duration of an overtopping event.
Appendix B. Guidelines for Bridge Maintenance and Rehabilitation based on the Secretary of the Interior’s Standards
The Secretary’s Standards with Regard to Repair, Rehabilitation, and Replacement Situations

Adapted from:

The Secretary of the Interior's Standards for the Treatment of Historic Properties, first codified in 1979 and revised in 1992, have been interpreted and applied largely to buildings rather than engineering structures. In this document, the differences between buildings and structures are recognized and the language of the Standards has been adapted to the special requirements of historic bridges.

1. Every reasonable effort shall be made to continue an historic bridge in useful transportation service. Primary consideration shall be given to rehabilitation of the bridge on site. Only when this option has been fully exhausted shall other alternatives be explored.

2. The original character-defining qualities or elements of a bridge, its site, and its environment should be respected. The removal, concealment, or alteration of any historic material or distinctive engineering or architectural feature should be avoided.

3. All bridges shall be recognized as products of their own time. Alterations that have no historic basis and that seek to create a false historic appearance 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 engineering and stylistic features, finishes, and construction techniques or examples of craftsmanship that characterize an historic property shall be preserved.

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

7. Chemical and physical treatments that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the most environmentally sensitive means possible.
8. Significant archaeological and cultural 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, structural reinforcements, 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.
Appendix C. Documents
Additional Electronic Data
Bridge L6322

Historic Data
- Research

Local Data
- Frank’s Ford Bridge Closing Documents
- Historic Bridge Report for Br L6322 on CR 121

MnDOT Reports
- Accident Report
- L6322 Condition Sheet 2010
- L6322 Inspection 12-5-13
- L6322 Inspection 12-06-11
- L6322 inventory 4-24-14
- L6322 Inventory 05-29-13
- L6322 Rating Report 1974

Photos
- L6322_2012
- Historic Photos
- L6322 LHB 04-28-14
- L6322_M&H_4-28-14
- Report Photos

Plans
- No data
# Mn/DOT Bridge Inspection Report

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**Location:** CR 121 Over South Fork Zumbrun River

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<td>[217. [2011-2013] West abutment is scaling, cracking and severely tipping in. Loss of limestone rock throughout.]</td>
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<td>[235. [2011-2013] Cracks, splitting and decay on all end caps for the first 2' of each.]</td>
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<td>[382. [2011-2013] Very rusty. West pier columns are severely tipped and bolts are popping due to pack rust.]</td>
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## Mn/DOT BRIDGE INSPECTION REPORT

**Inspected by:** OLMSTED COUNTY  
**BRIDGE L6322**  
**CR 121 OVER SOUTH FORK ZUMBRO RIVER**  
**INSP. DATE:** 12-05-2013

### STRUCTURE UNIT: B

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**Notes:**

- Highwater 3' above top of deck July 1978.
- Bridge closed to all traffic. Installed road closures, gates on West end and flex beam guardrail and reflectorized signs at both ends of bridge.

---

Inspector's Signature

Reviewer's Signature / Date
**Mn/DOT Structure Inventory Report**

**Bridge ID:** L6322  
**CR 121 over SOUTH FORK ZUMBRO RIVER**  
**Date:** 04/24/2014

### **General**
- **Agency Br. No.:**  
- **District:** 6  
- **Maint. Area:**  
- **County:** 55 - OLMSTED  
- **City:**  
- **Township:** OROXO  
- **Desc. Loc.:** 1.4 MI E OF JCT CR 112  
- **Sect., Twp., Range:** 26 - 108NN - 14W  
- **Latitude:** 44d 07' 46.77"  
- **Longitude:** 92d 27' 45.28"  
- **Custodian:** COUNTY  
- **Owner:** COUNTY  
- **Inspection By:** OLMSTED COUNTY  
- **BMU Agreement:**  
- **Year Built:** 1895  
- **Year Fed Rehab:**  
- **Year Remodeled:**  
- **Temp:**  
- **Plan Avail.:** NO PLAN  
- **Service On:** HIGHWAY  
- **Service Under:** STREAM  
- **Main Span Type:** STEEL HIGH TRUSS  
- **Main Span Detail:** PRATT  
- **Appr. Span Type:** STEEL BM SPAN  
- **Appr. Span Detail:**  
- **Skew:**  
- **Culvert Type:**  
- **Barrel Length:**  
- **Number of Spans:**  
  - MAIN: 1  
  - APPR: 5  
  - TOTAL: 6  
- **Main Span Length:** 72.0 ft  
- **Structure Length:** 149.5 ft  
- **Deck Width:** 16.0 ft  
- **Deck Material:** TIMBER  
- **Wear Surf Type:** TIMBER  
- **Wear Surf Install Year:**  
- **Wear Course/Fill Depth:**  
- **Deck Membrane:** NONE  
- **Deck Protect.:** N/A  
- **Deck Install Year:**  
- **Structure Area:** 2,392 sq ft  
- **Roadway Area:** 2,238 sq ft  
- **Sidewalk Width - L/R:**  
- **Curb Height - L/R:** 0.67 ft  
- **Rail Codes - L/R:** 32  
- **Bridge Match ID (TIS):** 1  
- **Roadway O/U Key:** 1-ON  
- **Route Sys/Nbr:** CNTY 121  
- **Roadway Name or Description:** CNTY 121  
- **Roadway Function:** MAINLINE  
- **Roadway Type:** 1 LN 2 WAY  
- **Control Section (TH Only):**  
- **Ref. Point (TH Only):** 001+00.330  
- **Date Opened to Traffic:** 01-01-1900  
- **Detour Length:** 4 mi.  
- **Lanes:** 1 Lane ON Bridge  
- **ADT (YEAR):** 70 (2002)  
- **HCADT:**  
- **Functional Class:** RURAL LOCAL  
- **Row Y DIMENSIONS:**  
  - If Divided  
    - NB-EB  
    - SB-WB  
  - Roadway Width: 15.0 ft  
  - Vertical Clearance: 13.4 ft  
  - Max. Vert. Clear.: 13.4 ft  
  - Horizontal Clear.:  
  - Lateral Clr. - L/R:  
  - Appr. Surface Width: 13.0 ft  
  - Roadway Width: 15.0 ft  
  - Median Width:  
- **MISC. BRIDGE DATA:**  
  - Structure Flared: NO  
  - Parallel Structure: NONE  
  - Field Conn. ID: PINNED  
  - Cantilever ID:  
  - Foundations:  
  - Abut. DIFF - SPRD SOILT  
  - Pier DIFF - PILE BENT  
  - Historic Status: ON REGISTER  
  - On - Off System: OFF  
- **PAINT:**  
  - Year Painted:  
  - Pct. Unsound: 99 %  
  - Painted Area:  
  - Primer Type:  
  - Finish Type:  
- **BRIDGE SIGNS:**  
  - Posted Load: BRIDGE CLOSED  
  - Traffic: NOT REQUIRED  
  - Horizontal: OBJECT MARKERS & WIDTH  
  - Vertical: NOT REQUIRED  
- **Deck:** 7 
- **Superstructure:** 1 
- **Substructure:** 1 
- **Channel:** 8 
- **Culvert:** N  
- **Structure Evaluation:** 0  
- **Deck Geometry:** 0  
- **Underclearances:** N  
- **Waterway Adequacy:** 4  
- **Approach Alignment:** 3  
- **Bridge Railing:** 0-SUBSTANDARD  
- **GR Transition:** 0-SUBSTANDARD  
- **Appr. Guardrail:** 0-SUBSTANDARD  
- **GR Termini:** 0-SUBSTANDARD  
- **Frac. Critical:** Y  
- **Waterway:**  
  - Drainage Area: 2210 sq ft  
  - Waterway Opening:  
  - Navigation Control: NO PRMT REQD  
  - Pier Protection: NOT APPL  
  - Nav. Vert./Horiz. Clr.:  
  - Nav. Vert. Lift Bridge Clear.:  
  - MN Scour Code: C-CLS:NON SCR  
  - Scour Evaluation Year: 1991  
- **CAPACITY RATINGS:**  
  - Design Load: UNKN  
  - Operating Rating: HS 4.10  
  - Inventory Rating: HS 2.90  
- **Mn/DOT Permit Codes:** A:N B:N C:N