

United States Department of the Interior
National Park Service

National Register of Historic Places
Inventory—Nomination Form

For NPS use only

received NOV 29 1982
date entered

See instructions in *How to Complete National Register Forms*
Type all entries—complete applicable sections

1. Name

historic Kelso Bowstring Arch Truss Bridge

and/or common Cowley Bridge

2. Location

N of Kelso Ky

street & number Stephens Creek Road,

N/A not for publication

city, town Kelso vic. vicinity of

state Tennessee code 047 county Lincoln code 103

3. Classification

Category	Ownership	Status	Present Use
<input type="checkbox"/> district	<input checked="" type="checkbox"/> public	<input checked="" type="checkbox"/> occupied	<input type="checkbox"/> agriculture
<input type="checkbox"/> building(s)	<input type="checkbox"/> private	N/A <input type="checkbox"/> unoccupied	<input type="checkbox"/> commercial
<input checked="" type="checkbox"/> structure	<input type="checkbox"/> both	<input type="checkbox"/> work in progress	<input type="checkbox"/> educational
<input type="checkbox"/> site	Public Acquisition	Accessible	<input type="checkbox"/> entertainment
<input type="checkbox"/> object	N/A in process	<input type="checkbox"/> yes: restricted	<input type="checkbox"/> government
	<input type="checkbox"/> being considered	<input checked="" type="checkbox"/> yes: unrestricted	<input type="checkbox"/> industrial
		<input type="checkbox"/> no	<input type="checkbox"/> military
			<input type="checkbox"/> museum
			<input type="checkbox"/> park
			<input type="checkbox"/> private residence
			<input type="checkbox"/> religious
			<input type="checkbox"/> scientific
			<input checked="" type="checkbox"/> transportation
			<input type="checkbox"/> other:

4. Owner of Property

name Lincoln County

street & number P.O. Box 10

city, town Fayetteville N/A vicinity of state Tennessee 37334

5. Location of Legal Description

courthouse, registry of deeds, etc. Lincoln County Courthouse

street & number Public Square

city, town Fayetteville state Tennessee

6. Representation in Existing Surveys

title Tennessee Bridge Inventory has this property been determined eligible? yes no

date 1981 federal state county local

depository for survey records Tennessee Historical Commission

city, town Nashville state Tennessee

7. Description

Condition		Check one	Check one
<input checked="" type="checkbox"/> excellent	<input type="checkbox"/> deteriorated	<input checked="" type="checkbox"/> unaltered	<input checked="" type="checkbox"/> original site
<input type="checkbox"/> good	<input type="checkbox"/> ruins	<input type="checkbox"/> altered	<input type="checkbox"/> moved date _____
<input type="checkbox"/> fair	<input type="checkbox"/> unexposed		

Describe the present and original (if known) physical appearance

Summary Paragraph

Erected over the Elk River in Lincoln County, Tennessee in 1878, the Kelso Bridge is a patented bowstring tubular arch through truss manufactured by the King Iron Bridge and Manufacturing Company of Cleveland, Ohio. A long bridge even by 1878 standards, it is 170.5 feet in length and 14.5 feet wide; the arch is 19.3 feet high at the top. Constructed of wrought iron which is more corrosion resistant than steel, it is generally in good condition.

Location

Historically known as the Kelso Bridge and also as the Cowley Bridge, it crosses the Elk River at river mile 104.3 on Stephen Creek Road, a partially improved one lane road between the Kelso and Mulberry communities in Lincoln County. Lincoln County is in south central Tennessee at the Alabama line. The land is rolling hills dissected by numerous small streams and by the Elk River, a meandering tributary of the Tennessee River. The Elk River presented a significant obstacle to transportation in the county and thus resulted in the county developing an extensive bridge construction program.

A committee, appointed by the County Court in 1877, selected the crossing point and after contacting a number of bridge companies recommended "... an iron structure [due to] its cheapness..." They also specified that the bridge should be at least 168 feet long and 14 feet wide.

The bridge which was built is a single span, 170.5 feet long, wrought iron bowstring tubular arch through truss constructed by the King Iron Bridge and Manufacturing Company of Cleveland, Ohio.

Substructure

The bridge is constructed with abutments on both banks; the north bank is higher than the south bank, thus no approach fill was required. The north abutment is limestone masonry carrying the fixed bearing. The south abutment is also limestone masonry and carries the expansion roller bearing. Both abutments are dry laid in a dressed, rock face, coursed ashlar pattern. The south abutment is inscribed: Erected 1878/W.H. Robertson, D.M. Eslick, W.D. Moorhead Joiners/Lewis Peach, Builder.

The deck is supported by plate and channel built up transverse floor beams with wrought iron rod lateral bracing. Although the original deck was probably wood, the present deck is poured concrete on corrugated metal on longitudinal "I" beams.

Superstructure

The Kelso Bridge superstructure is a Zenas King patented tubular bowstring arch through truss design manufactured by the King Iron Bridge and Manufacturing Company of Cleveland, Ohio. A cast iron plaque attached to the arch gives the patent date as July 30, 1867.

The bridge is 170.5 feet long, 14.5 feet wide and 19.3 feet high at the top of the arch. The tubular arch top chord member is made from two 9 by 13.4 inch wrought iron channels rivetted to two continuous 10.5 by 3/8 inch wrought iron plates. The result is an arched hollow tube with 5.5 by 13.4 inches inside dimensions that supports vertical hangers.

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
Kelso Bowstring Arch

Continuation sheet Truss Bridge

Item number 7

Page 2

The hangers, which connect the arch to the floor beams, consist of two  shaped cross-section wrought iron bars bolted through the top chord with cast iron fittings at both the top and bottom of the tube. The second vertical bar is splayed to the outside and laced to the vertical hanger. The outside bar of the pair bolts directly to the floor beam rather than the cast iron fitting.

Wrought iron rods (3/4 to 1 1/8 inch dia.) diagonal tension members cross each panel and are bolted through the top chord and to the floor beam cast iron fitting. The top lateral bracing is also 3/4 inch diameter rod and  cross-section bar.

The bottom chord or "bowstring" which carries tension stresses is a wrought iron bar (6 x 7/8 inch) with a forged threaded end bolted to the arch ends at the bearing plates.

The only change made to the structure is the addition of a 4 inch thick concrete deck which substantially increases the dead load.

The boundary selected is a rectangular area enclosing the bridge and abutments; measuring 30 feet by 180 feet.

8. Significance

Period	Areas of Significance—Check and justify below			
<input type="checkbox"/> prehistoric	<input type="checkbox"/> archeology-prehistoric	<input type="checkbox"/> community planning	<input type="checkbox"/> landscape architecture	<input type="checkbox"/> religion
<input type="checkbox"/> 1400-1499	<input type="checkbox"/> archeology-historic	<input type="checkbox"/> conservation	<input type="checkbox"/> law	<input type="checkbox"/> science
<input type="checkbox"/> 1500-1599	<input type="checkbox"/> agriculture	<input type="checkbox"/> economics	<input type="checkbox"/> literature	<input type="checkbox"/> sculpture
<input type="checkbox"/> 1600-1699	<input type="checkbox"/> architecture	<input type="checkbox"/> education	<input type="checkbox"/> military	<input type="checkbox"/> social/ humanitarian
<input type="checkbox"/> 1700-1799	<input type="checkbox"/> art	<input checked="" type="checkbox"/> engineering	<input type="checkbox"/> music	<input type="checkbox"/> theater
<input checked="" type="checkbox"/> 1800-1899	<input type="checkbox"/> commerce	<input type="checkbox"/> exploration/settlement	<input type="checkbox"/> philosophy	<input checked="" type="checkbox"/> transportation
<input type="checkbox"/> 1900-	<input type="checkbox"/> communications	<input type="checkbox"/> industry	<input type="checkbox"/> politics/government	<input type="checkbox"/> other (specify)
		<input type="checkbox"/> invention		

Specific dates 1878

Builder/Architect King Iron Bridge and Manufacturing Company

Statement of Significance (in one paragraph)

Summary Paragraph

The Kelso Bowstring Arch through truss bridge, erected in 1878 and manufactured by the King Iron Bridge and Manufacturing Company of Cleveland, Ohio is significant as the only remaining bowstring arch through truss in the state and for its representation of Zenas King's patented bridge design. Its primary significance is in the field of bridge engineering under National Register criterion C as an example of a type of construction and design. Located in Lincoln County, Tennessee over the Elk River near the Kelso community, this bridge represents an important phase of the county's development of its transportation network.

Significance

The Kelso Bridge is the only remaining example of a bowstring arch bridge in the state. The 1878 date of erection is well established by an inscription on a stone abutment and county court records.

In December of 1877 a group of citizens petitioned the Lincoln County Court to appoint a committee to study the construction of a bridge across the Elk River near the Kelso Depot. They were to determine the precise location and to contact bridge companies for information (Court Minutes January 6, 1878). The three man committee reported back on July 6, 1878 that the bridge should be 165 feet long and should have a clear width of 14 feet. They recommended that an iron structure be selected due to its known durability, adaptability and cheapness. Also in the matter of economy, they noted that a single span would relieve the necessity and expense of pier construction. They found that "a magnificent iron bridge can be built complete in all respects... at a cost of \$8,000. The bridge nicely painted and ready for travel..." (Court Minutes July 6, 1878). The Court approved their request for \$8,000 on a vote of 13 to 12.

The Kelso Bridge is also significant as an example of the bridge design patented by Zenas King in 1868. Without formal engineering training, King had worked for the Moseley Iron Bridge Company in the 1850's, a company which also produced tubular wrought iron arch bridges. King improved upon the design by making his tube rectangular in cross-section and went on to found the highly successful King Iron Bridge and Manufacturing Company which became renowned for its tubular arch bridges.

Although the bridge is currently condemned, it is not scheduled for replacement. The County intends to close the bridge to traffic as soon as a nearby new bridge now under construction is completed.

9. Major Bibliographical References

Lincoln County Court Minutes, January 7, 1878 Book A-1 p.61-64, (Roll 106) and July 6, 1878 Book A-1 p. 246-248, (Roll 106).
 Bridge inspection report, 1980 Hazelet and Erdal Engrs. on file TN. Dept. of Transportation #52-A183-5 54
 Simmons, D.A.; King Iron Bridge & Mfg Co.; Soc. for Industrial Archaeology Newsletter Vol. 8 Nos. 1, 2, Jan-Mar. 1979.

10. Geographical Data

Acreeage of nominated property 0.12 acre
 Quadrangle name Mulberry, Tennessee

Quadrangle scale 1:24000

UTM References

A

1	6	5	4	8	4	2	0	3	8	8	8	2	9	0
Zone		Easting						Northing						

B

Zone		Easting						Northing					

C

Zone		Easting						Northing					

D

Zone		Easting						Northing					

E

Zone		Easting						Northing					

F

Zone		Easting						Northing					

G

Zone		Easting						Northing					

H

Zone		Easting						Northing					

Verbal boundary description and justification Boundary is a rectangle centered on the bridge centerline and extending 15 feet to each side and including the north and south abutments; 30' x 180'.

List all states and counties for properties overlapping state or county boundaries

state N/A code N/A county N/A code N/A

state N/A code N/A county N/A code N/A

11. Form Prepared By

name/title George F. Fielder, Jr.

organization Tennessee Historical Commission

date September, 1982

street & number 701 Broadway

telephone 615/742-6716

city or town Nashville,

state Tennessee 37203

12. State Historic Preservation Officer Certification

The evaluated significance of this property within the state is:

national state local

As the designated State Historic Preservation Officer for the National Historic Preservation Act of 1966 (Public Law 89-665), I hereby nominate this property for inclusion in the National Register and certify that it has been evaluated according to the criteria and procedures set forth by the National Park Service.

Deputy

State Historic Preservation Officer signature

Herbert E. Hagen

title Executive Director, Tennessee Historical Commission

date 11/22/82

For NPS use only

I hereby certify that this property is included in the National Register

Entered in the
National Register

date

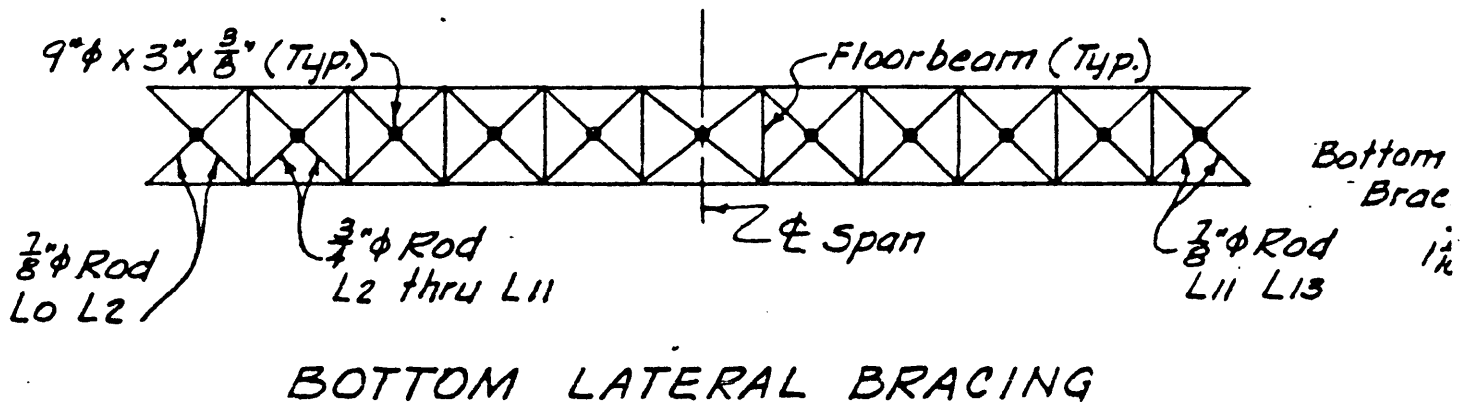
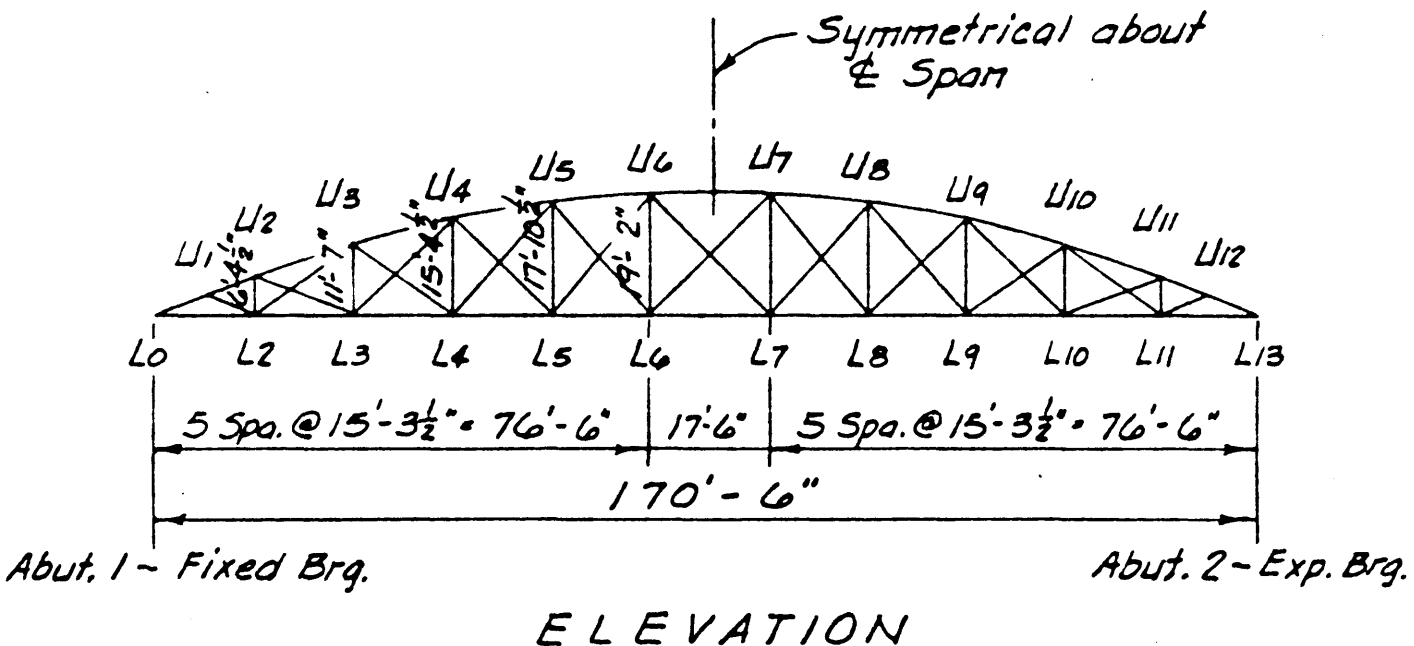
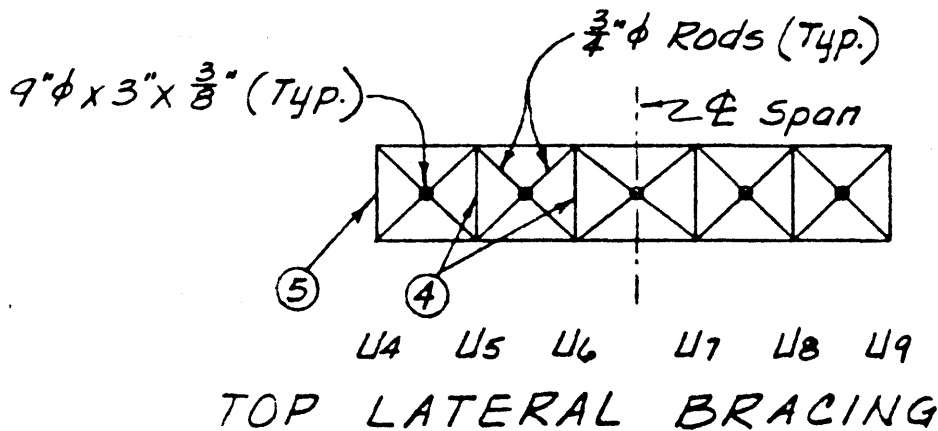
4/4/83

Keeper of the National Register

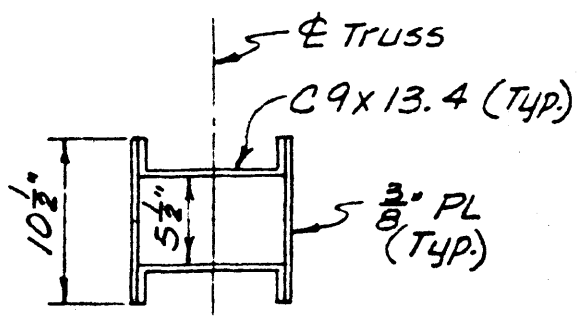
Attest:

date

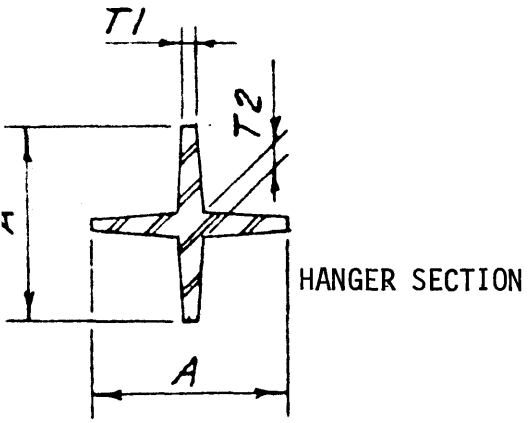
Chief of Registration



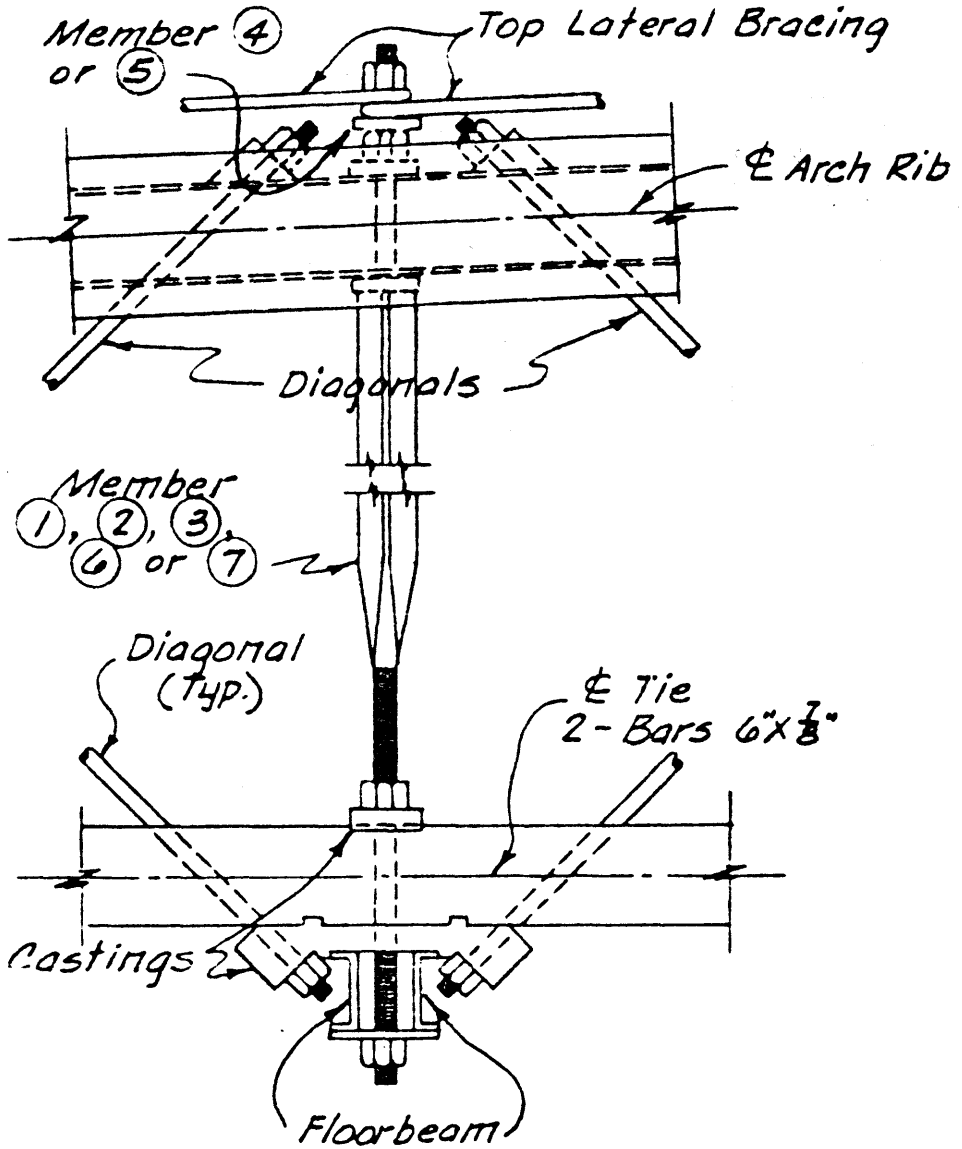
Kelso Bowstring Arch Bridge, Kelso vicinity, Lincoln Co. Tennessee



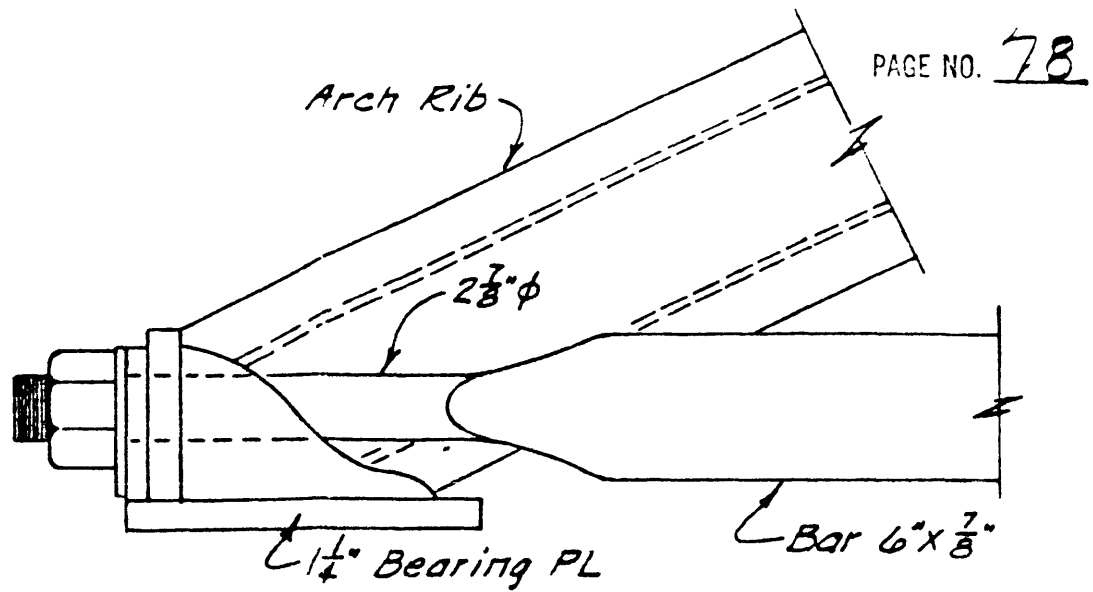
ARCH RIB



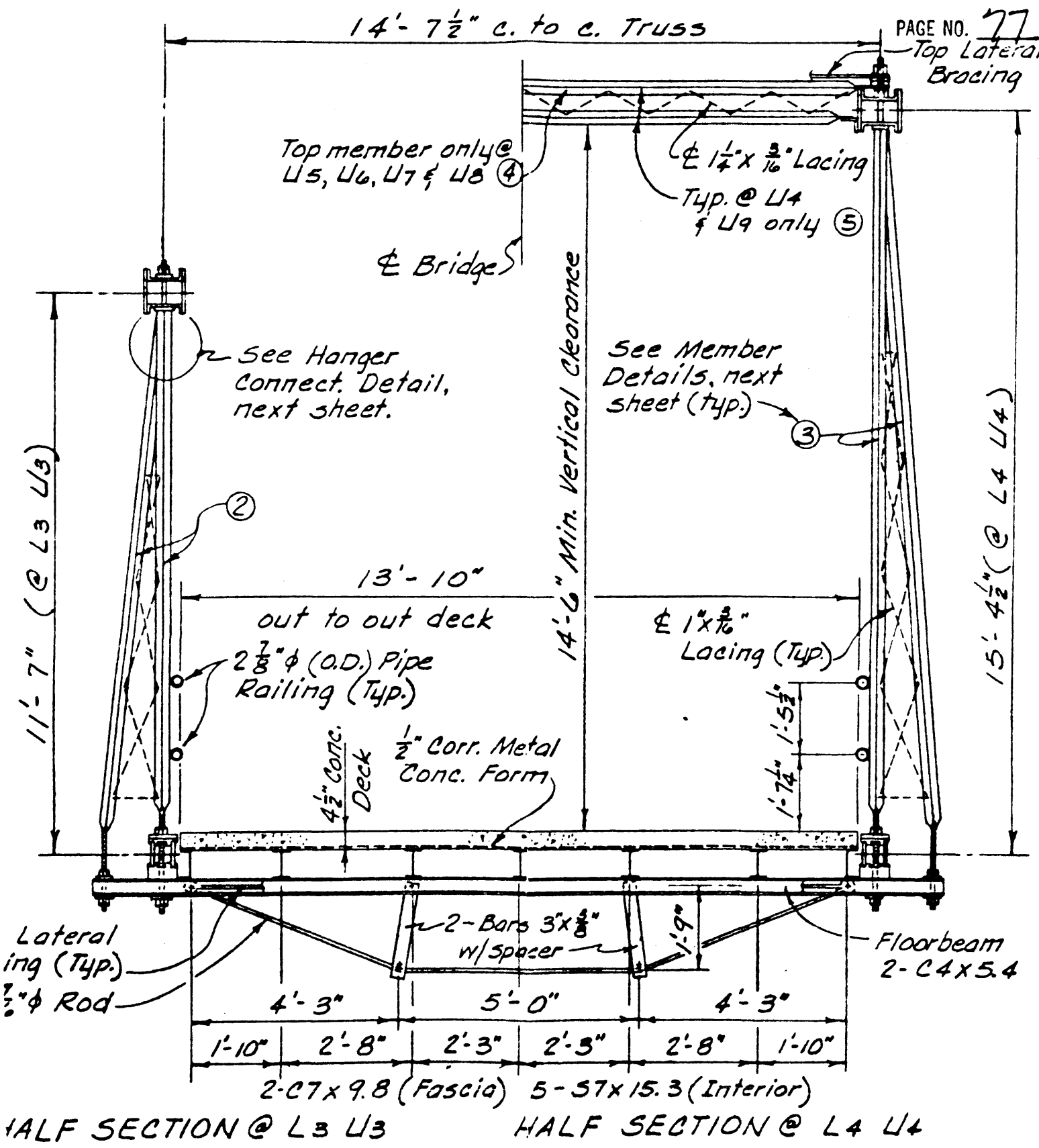
Kelso Bowstring Arch Bridge
 Kelso vicinity
 Lincoln Co. Tennessee



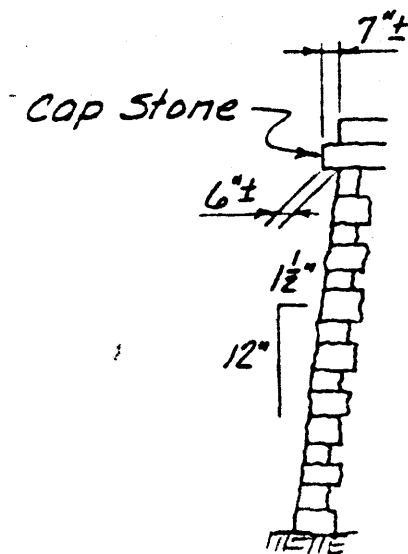
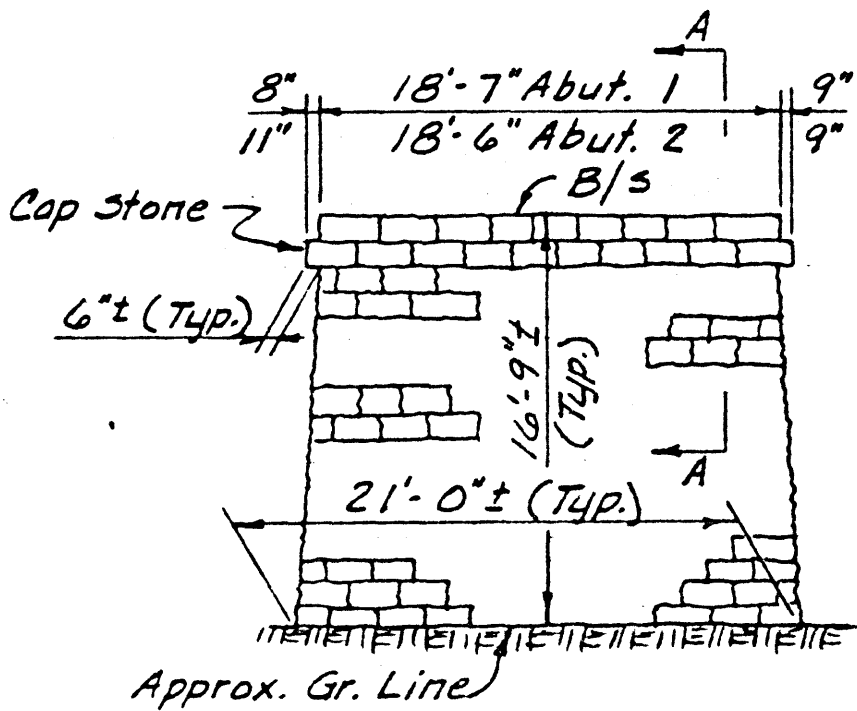
HANGER DETAILS



BEARING & TIE DETAIL @ L0 & L13

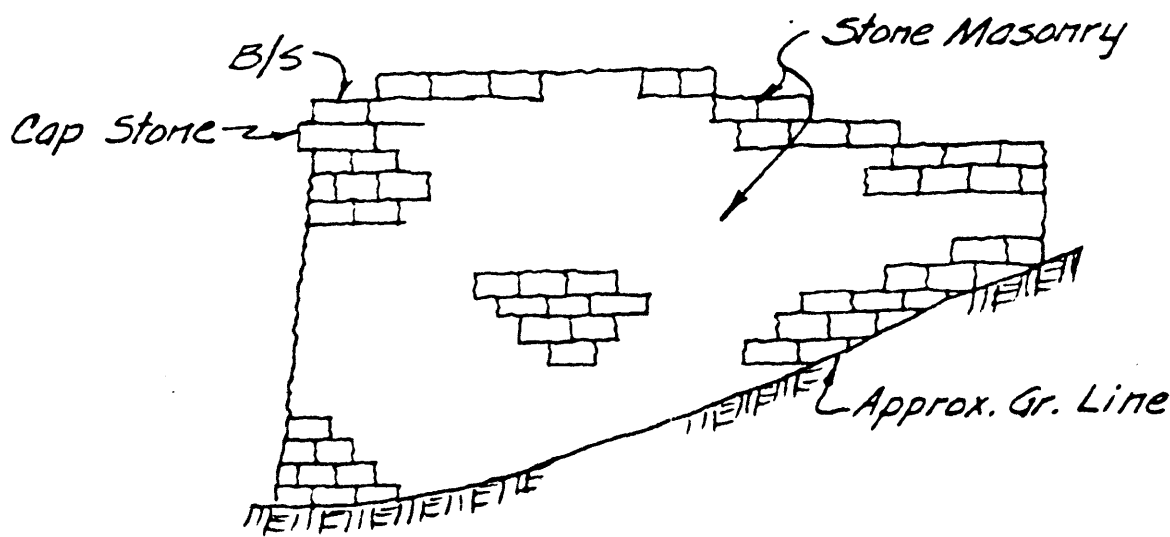


Kelso Bowstring Arch Bridge, Kelso vicinity, Lincoln Co. Tennessee



SECTION A-A

ELEVATION - ABUTMENTS 1 & 2



TYPICAL WINGWALL ELEVATION
(Stone Masonry)

Kelso Bowstring Arch Bridge, Kelso vicinity, Lincoln Co. Tennessee