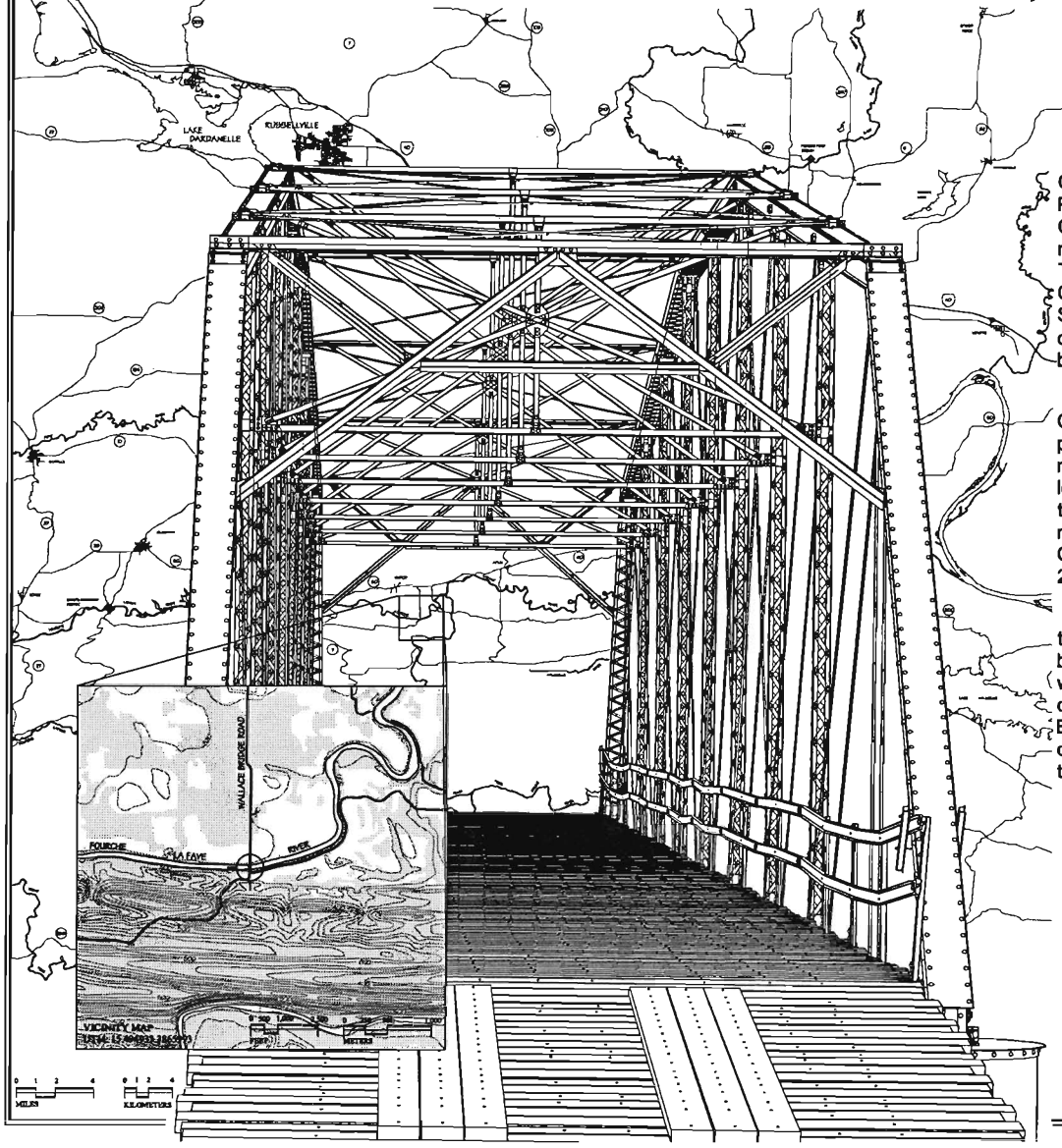
NIMROD BRIDGE, 1908



PERRY COUNTY, ARKANSAS

The Fourche LaFave River, which runs east-west through the center of Perry County, was critical to the settlement of this region in the mid-19th century. Settlers in Perry County used ferries to cross the river until the first bridge was constructed at Cates Ferry south of Perryville in 1902. In 1906, the County contracted for four more metal truss bridges over the Fourche LaFave at Houston, Aplin, Nimrod and Fourche. The contracts for all four bridges were originally let to the Virginia Bridge & Iron Company of Roanoke, Virginia, but that company later reassigned the contracts to the South Western Bridge Company of Joplin, Missouri. The Nimrod Bridge was completed in 1908 at a cost of approximately $10,000. It is the only one of the five bridges mentioned that survives.

the Nimrod Bridge is an excellent example of a Camelback through truss. The Camelback truss has the same geometry as the more common Pratt truss, but with a polygonal upper chord of exactly five slopes, that being the minimum number necessary to achieve the benefits of the polygonal shape. The polygonal chord made longer metal truss spans lighter and more economical by increasing the depth of the truss at the center of the span where the greatest bending moments occur, and reducing the truss depth at the ends of the truss where it isn't necessary. The Camelback truss was popular well into the twentieth century for spans of about 150 to 200 feet.

This is an excellent example of early 20th century metal truss bridge building technology and one of only a few surviving metal truss bridges from the period of bridge building prior to the development of the Arkansas State Highway Commission, when counties built and maintained hundreds of metal truss bridges that have all but disappeared in recent decades. The Nimrod Bridge, commonly known as the Wallace Bridge, was named for Dr. Charles T. Wallace (1869-1964), Nimrod's community doctor for 50 years, who lived adjacent to the bridge site and served as a member of the county bridge committee that arranged for its construction.

The Arkansas Historic Bridges Recording Project is part of the Historic American Engineering Record (HAER), a long-range program that documents and interprets historically significant engineering, industrial and maritime sites and structures throughout the United States. This project was cosponsored in the summer of 2005 by the Arkansas State Highway and Transportation Department (AHTD), Dan Flowers, Director of Highways and Robert W. Scoggin, Historic Resources Coordinator, Environmental Division.

The summer field team was under the direction of Thomas M. Behrens, HAER Architect. The recording team included Brian Carnahan, Field Team Leader (University of Arkansas, Fayetteville), Amy James, Architect (University of Arkansas, Fayetteville), Tiziana Di Franscesco, Architect (US ICOMOS, Italy), Lola Bennett, HAER Historian (Stow, Massachusetts), and Jet Lowe, HAER Photographer.

DELINEATED BY: BRIAN CARNAHAN, SUMMER 2005

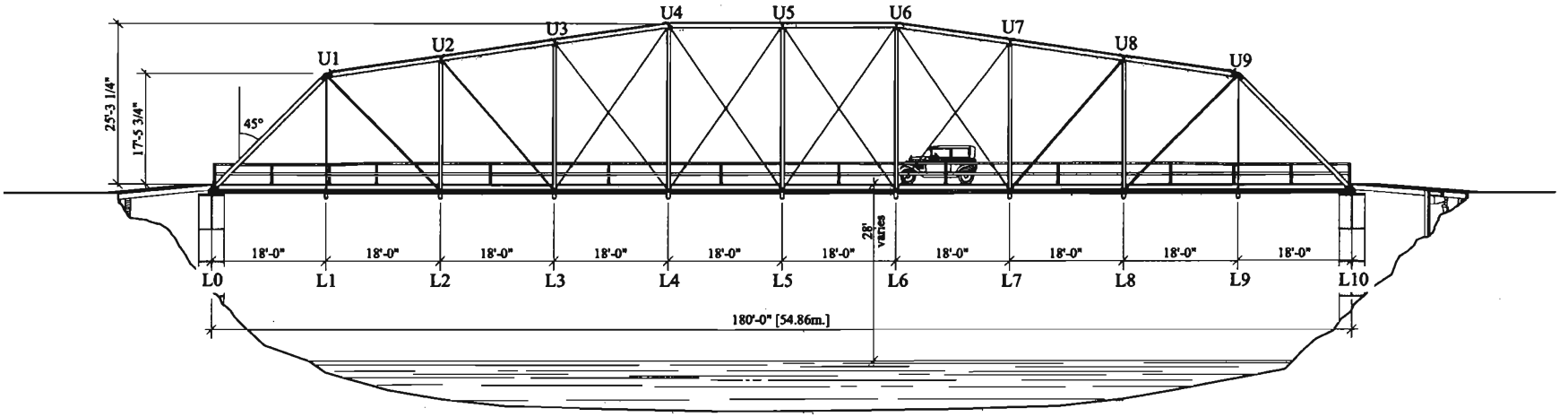
ARKANSAS HISTORIC BRIDGES RECORDING PROJECT HISTORIC AMERICAN ENGINEERING RECORD UNITED STATES DEPARTMENT OF THE INTERIOR

NIMROD VICINITY

NIMROD BRIDGE (WALLACE BRIDGE), 1908
SPANNING FOURCHE LAFAVE RIVER ON WALLACE BRIDGE ROAD (CR 18)
PERRY COUNTY ARKANSAS

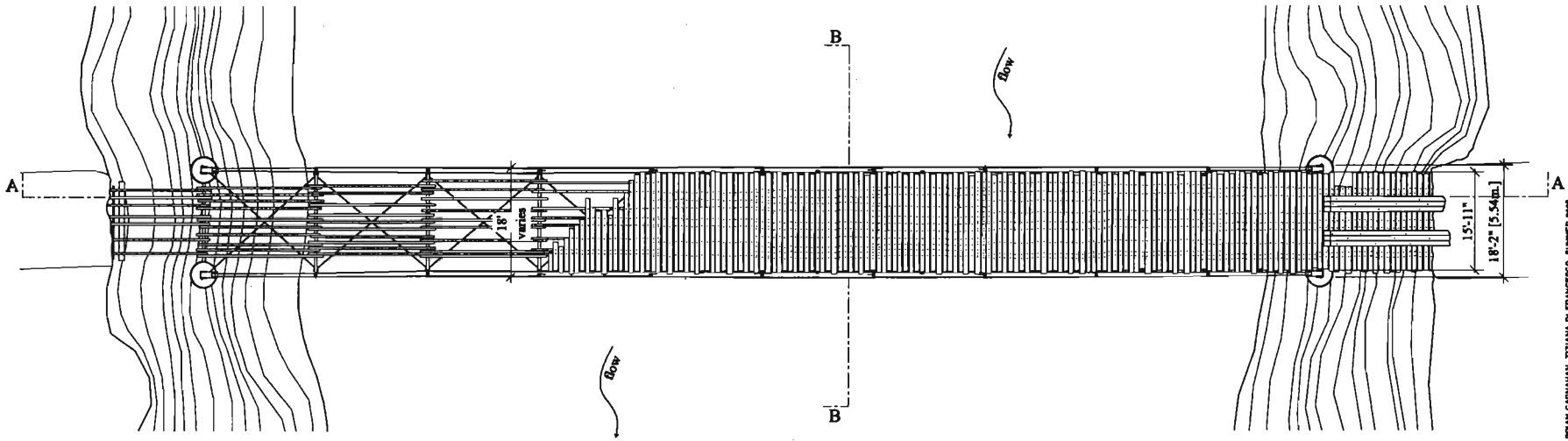
SHEET 1 OF 8

HISTORIC AMERICAN ENGINEERING RECORD
AR-66



EAST ELEVATION

SCALE 1/16" = 1' 1 : 96



PLAN

SCALE 1/16" = 1' 1 : 96

N

0 5 10 20 FEET

0 1 2 4 METERS

DELINEATED BY: BRIAN CARNAHAN, TIZIANA DI FRANCESCO, SUMMER 2005

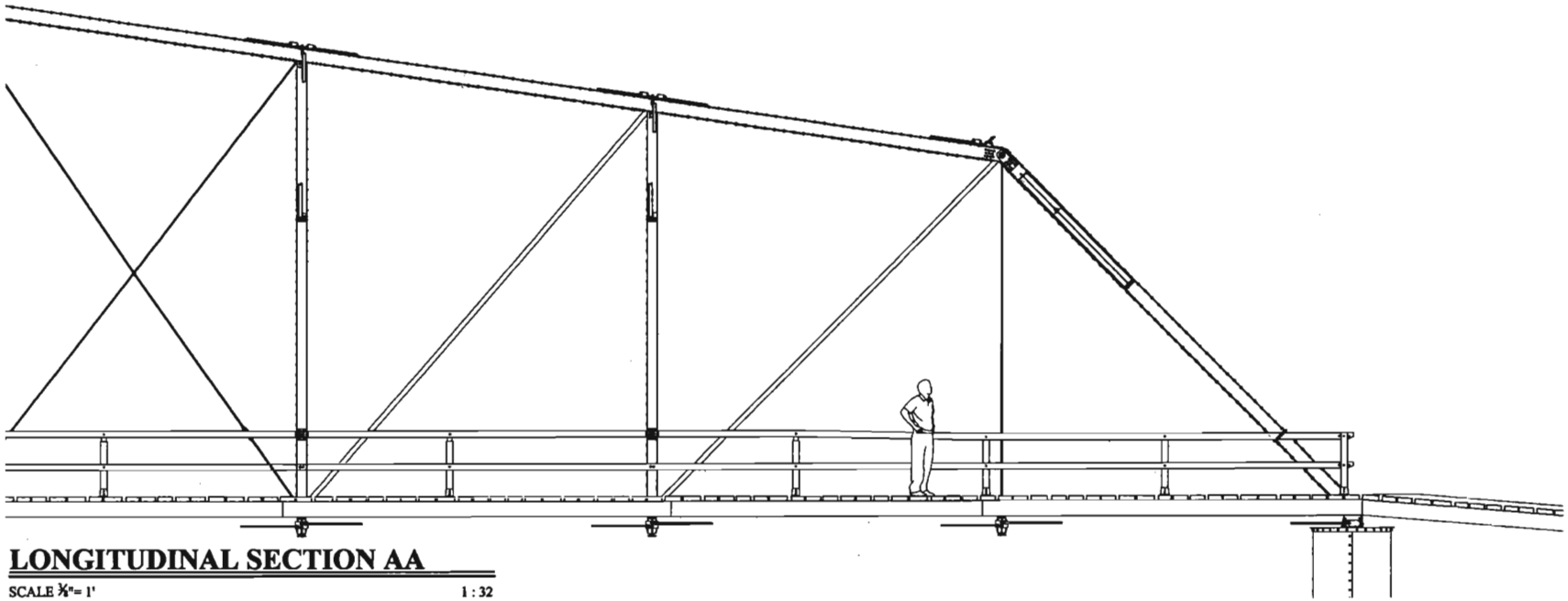
ARKANSAS HISTORIC BRIDGES
RECORDING PROJECT
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

NIMROD VICINITY

NIMROD BRIDGE (WALLACE BRIDGE), 1908
SPANNING FOURCHE LAFAVE RIVER AT WALLACE BRIDGE ROAD (CR 16)
PERRY COUNTY
ARKANSAS

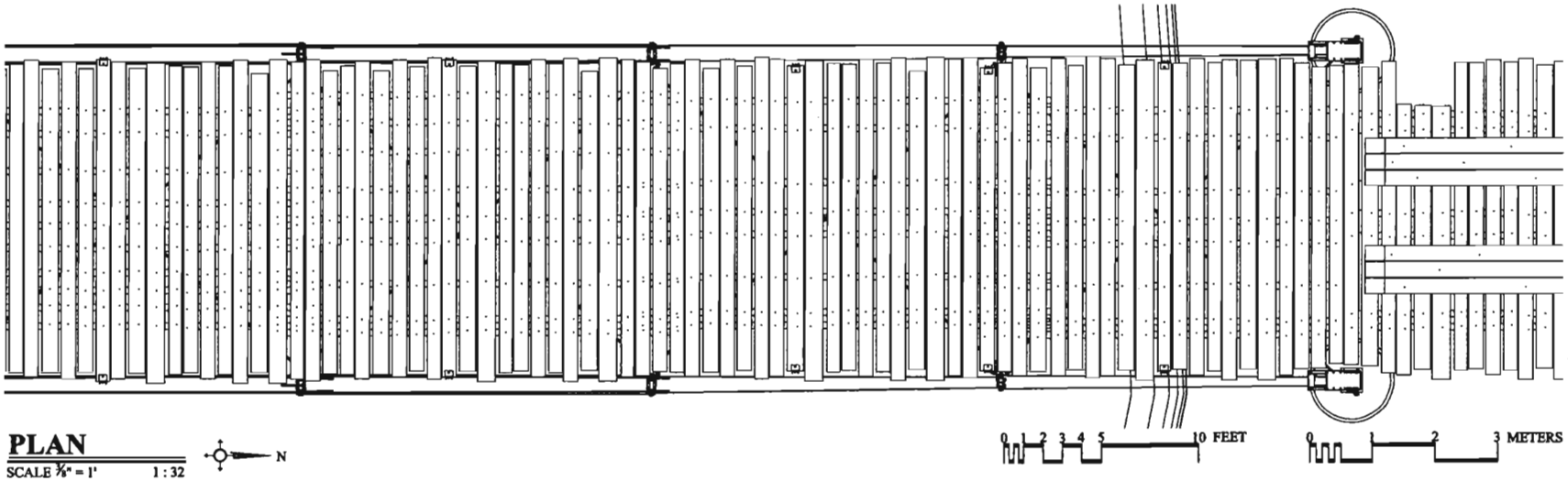
SHEET 2 OF 8

HISTORIC AMERICAN ENGINEERING RECORD
AR-66



LONGITUDINAL SECTION AA

SCALE ⅛"= 1' 1 : 32



PLAN

SCALE ⅛" = 1' 1 : 32

N

0 1 2 3 4 5 10 FEET

0 1 2 3 METERS

DELINEATED BY: BRIAN CARNAHAN, TIZIANA DI FRANCESCO, SUMMER 2005

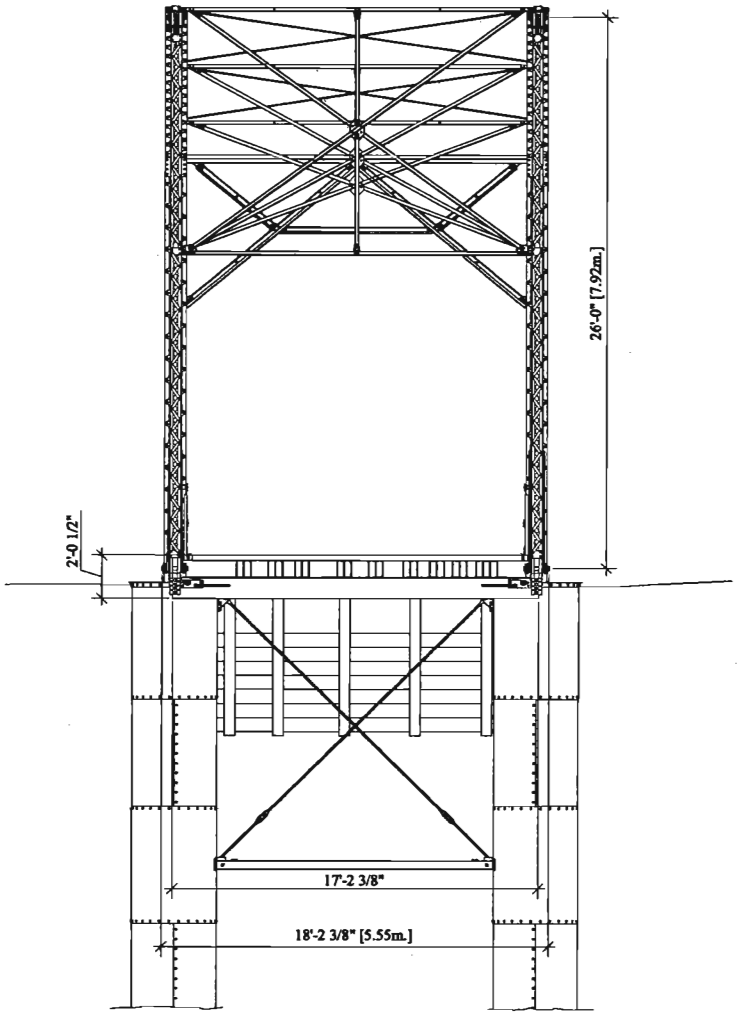
ARKANSAS HISTORIC BRIDGES
RECORDING PROJECT
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

NIMROD, VICINITY

NIMROD BRIDGE (WALLACE BRIDGE)
SPANNING FOURCHE LAFAVE AT WALLACE BRIDGE ROAD (CR 97)
CONWAY COUNTY
ARKANSAS

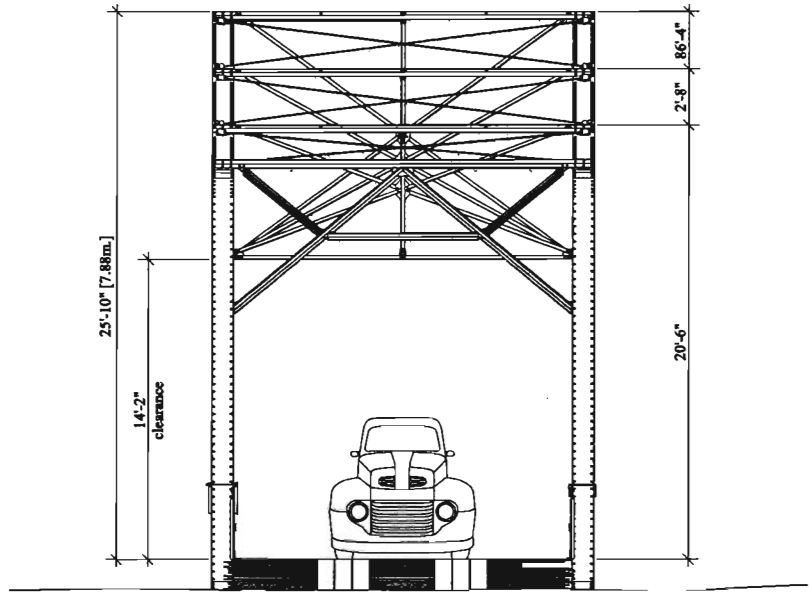
SHEET 3 OF 8

HISTORIC AMERICAN ENGINEERING RECORD
AR-64



TRANSVERSE SECTION BB

SCALE 3/8"= 1' 1 : 32



NORTH ELEVATION

SCALE 3/8"= 1' 1 : 32

0 1 2 3 4 5 10 FEET

0 1 2 3 METERS

DELINEATED BY: BRIAN CARNAHAN, TICIANA DI FRANCESCO, AMY JAMES, SUMMER 2005

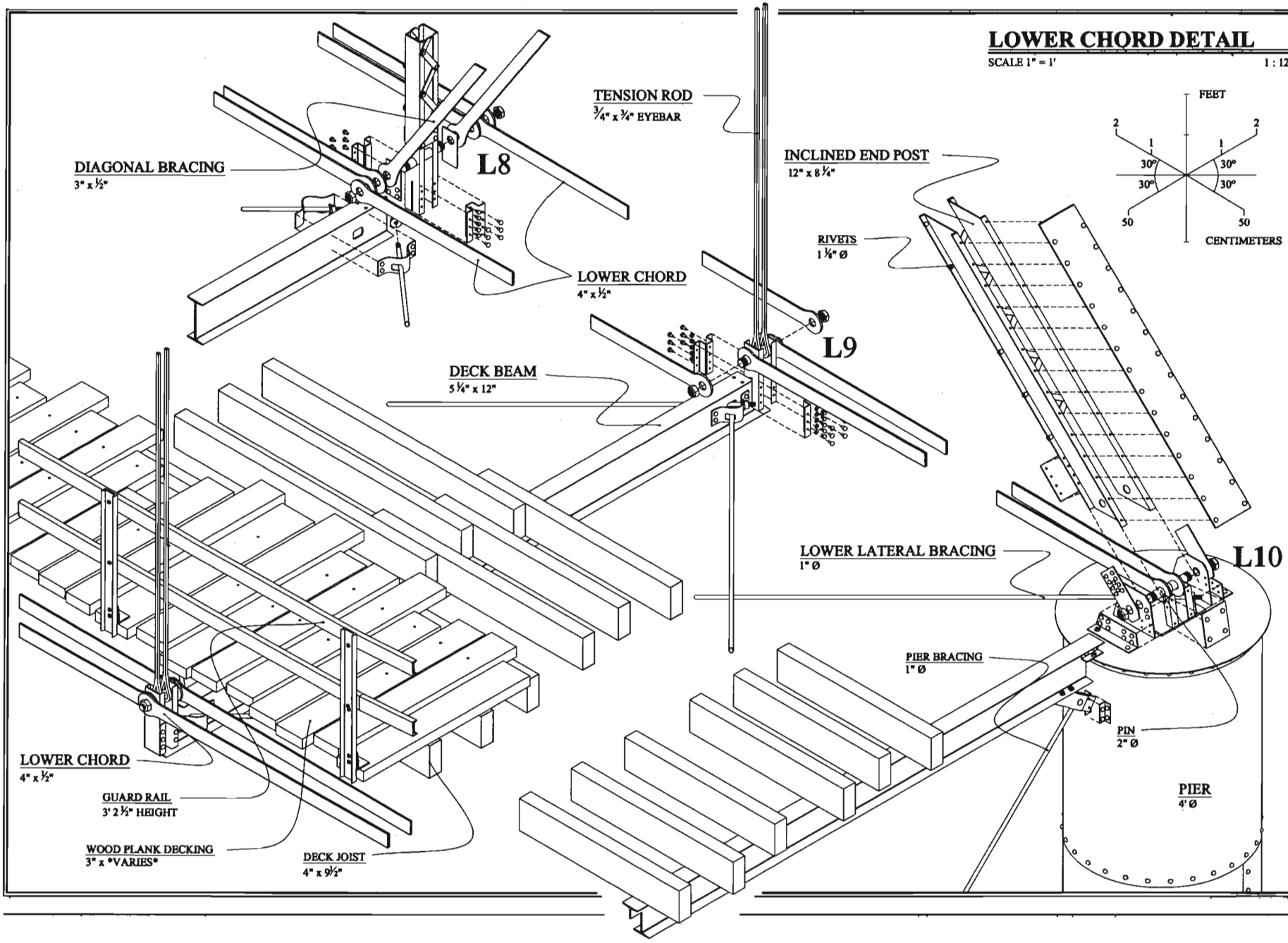
ARKANSAS HISTORIC BRIDGES
RECORDING PROJECT
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

NIMROD VICINITY

NIMROD BRIDGE (WALLACE BRIDGE), 1908
SPANNING FOURCHE LAFAVE RIVER AT WALLACE BRIDGE ROAD (CR 18)
PERRY COUNTY
ARKANSAS

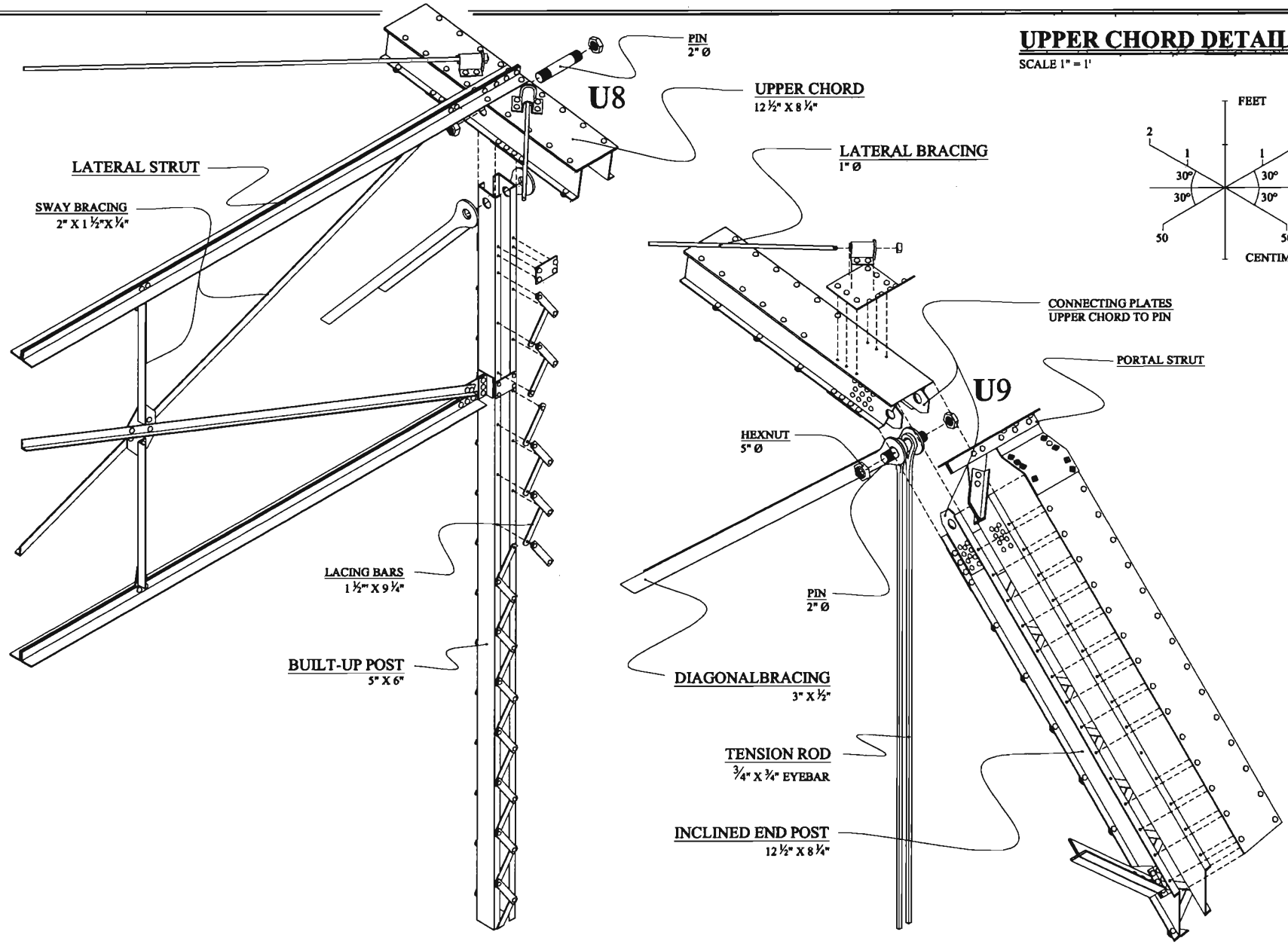
SHEET 4 OF 8

HISTORIC AMERICAN ENGINEERING RECORD
AR-66


LOWER CHORD DETAIL
SCALE 1" = 1'
1 : 12
FEET
2
1
30°
30°
50
CENTIMETERS
TENSION ROD
¾" x ¾" EYEBAR
DIAGONAL BRACING
3" x ½"
L8
INCLINED END POST
12" x 8 ¼"
RIVETS
1 ⅛" Ø
LOWER CHORD
4" x ½"
L9
DECK BEAM
5 ¼" x 12"
LOWER LATERAL BRACING
1" Ø
L10
PIER BRACING
1" Ø
PIN
2" Ø
PIER
4' Ø
LOWER CHORD
4" x ½"
GUARD RAIL
3' 2 ½" HEIGHT
WOOD PLANK DECKING
3" x *VARIES*
DECK JOIST
4" x 9½"
NIMROD BRIDGE (WALLACE BRIDGE), 1908
SPANNING FOURCHE LAFAVE RIVER AT WALLACE BRIDGE ROAD (CR 98)
PERRY COUNTY
ARKANSAS
NIMROD VICINITY
HISTORIC AMERICAN ENGINEERING RECORD
AR-66
SHEET 5 OF 8
DELINEATED BY: BRIAN CARNAHAN, SUMMER 2008
ARKANSAS HISTORIC BRIDGES
HAER RECORDING PROJECT
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

UPPER CHORD DETAIL

SCALE 1" = 1' 1 : 12



DELINEATED BY: BRIAN CARNAHAN, SUMMER 2005

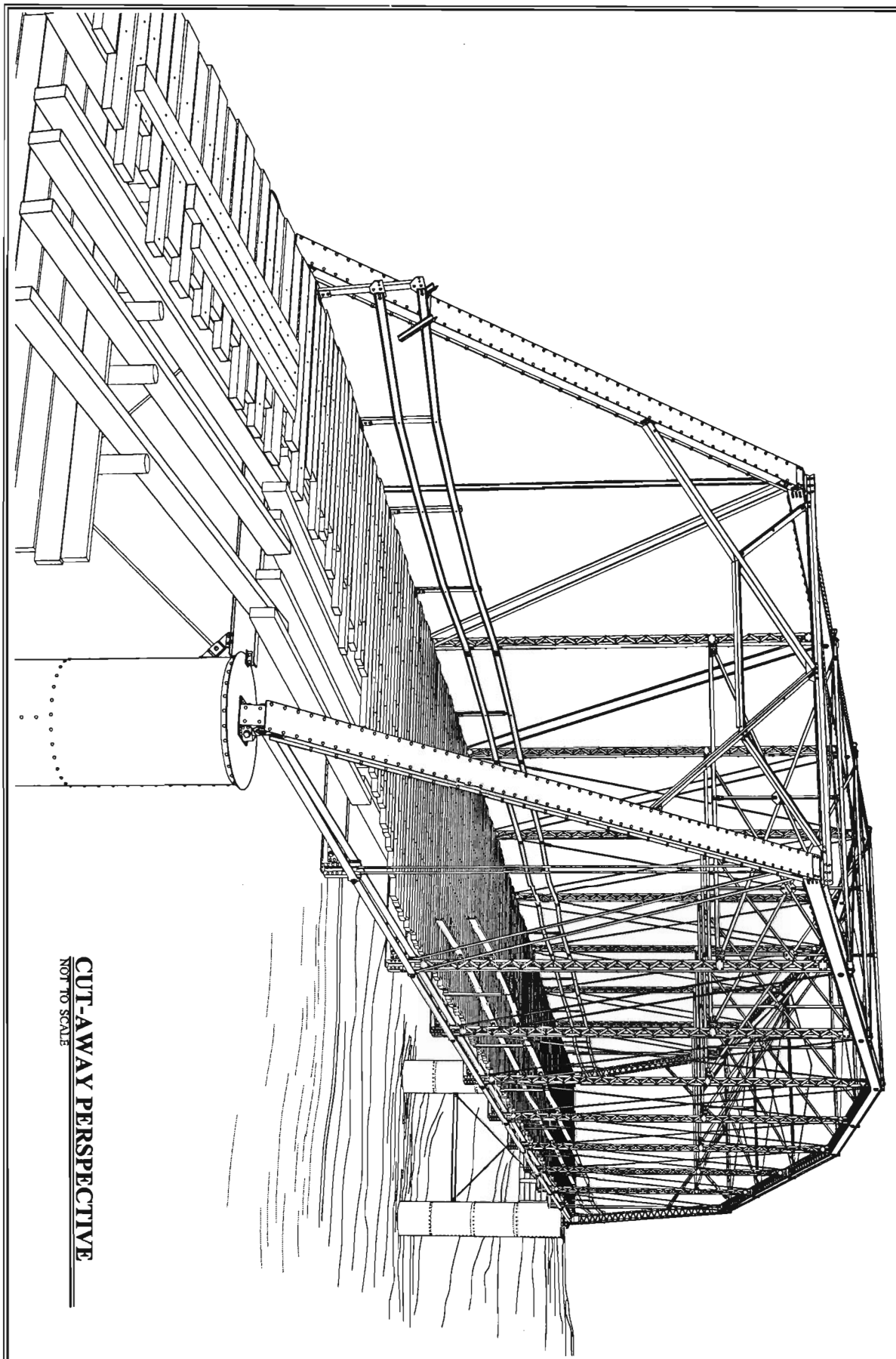
ARKANSAS HISTORIC BRIDGES
RECORDING PROJECT
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

NIMROD VICINITY

NIMROD BRIDGE (WALLACE BRIDGE), 1908
SPANNING FOURCHE LAFAYE RIVER AT WALLACE BRIDGE ROAD (CR) 18
PERRY COUNTY
ARKANSAS

SHEET 6 OF 8

HISTORIC AMERICAN ENGINEERING RECORD
AR-66



CUT-AWAY PERSPECTIVE

NOT TO SCALE

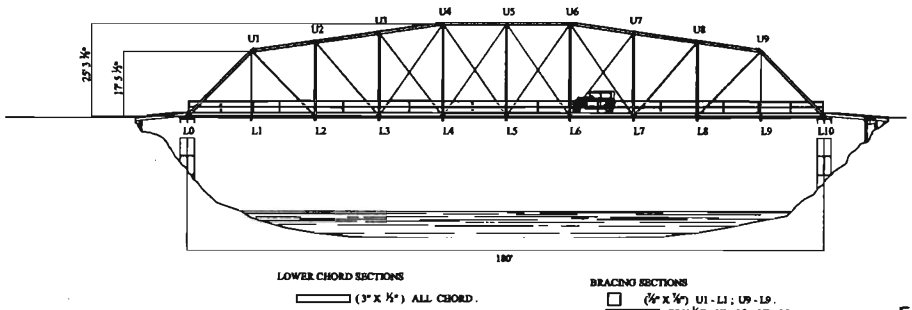
DELINEATED BY: BRIAN CARNAHAN, SUMMER 2006

ARKANSAS HISTORIC BRIDGES RECORDING PROJECT NATIONAL PARK SERVICE UNITED STATES DEPARTMENT OF THE INTERIOR	NIMROD, VICINITY	NIMROD BRIDGE (WALLACE BRIDGE), 1908 SPANNING FOURCHE LAFAVE RIVER AT WALLACE BRIDGE ROAD (CR 18) PERRY COUNTY ARKANSAS	SHEET 7 OF 8	HISTORIC AMERICAN ENGINEERING RECORD AR-66	

THREE BRIDGES

NIMROD BRIDGE: CAMELBACK THROUGH TRUSS

SCALE ⅛" = 1' 1:192



LOWER CHORD SECTIONS

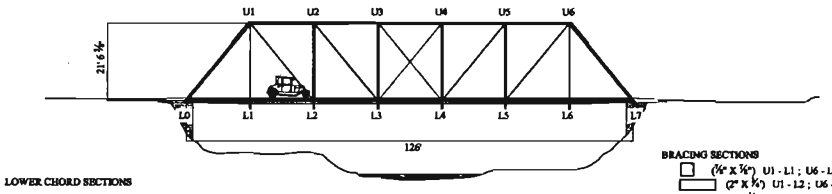
(3" X ½") ALL CHORD.

BRACING SECTIONS

(⅝" X ⅜") U1 - L1 ; U9 - L9.
(3" X ½") U1 - L2 ; U9 - L8.
(2" X ½") U2 - L3 ; U8 - L7.
(⅝" X ⅜") U3 - L4 ; U4 - L5 ; U5 - L4 ; U5 - L6 ; U6 - L5 ; U6 - L7 ; U7 - L6.

FRYER'S FORD BRIDGE: PRATT THROUGH TRUSS

SCALE ⅛" = 1' 1:192



LOWER CHORD SECTIONS

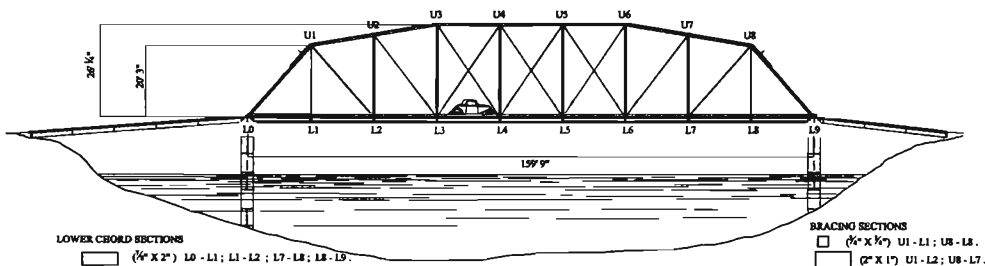
(⅝" X 1 ½") L0 - L1 ; L1 - L2 ; L5 - L6 ; L6 - L7.
(⅝" X 2 ½") L2 - L3 ; L4 - L5.
(⅝" X 3") L3 - L4.

BRACING SECTIONS

(⅝" X ⅜") U1 - L1 ; U6 - L6.
(2" X ½") U1 - L2 ; U6 - L5.
(2" X ½") U2 - L3 ; U3 - L4.
(⅝" Ø) U3 - L4 ; U4 - L3.

WARD'S CROSSING BRIDGE: CAMELBACK THROUGH TRUSS

SCALE ⅛" = 1' 1:192



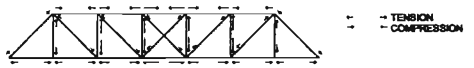
LOWER CHORD SECTIONS

(⅝" X 2") L0 - L1 ; L1 - L2 ; L7 - L8 ; L8 - L9.
(⅝" X 2 ½") L2 - L3 ; L6 - L7.
(⅝" X 3") L3 - L4 ; L4 - L5 ; L5 - L6 ; L6 - L7.

BRACING SECTIONS

(⅝" X ⅜") U1 - L1 ; U8 - L8.
(2" X 1") U1 - L2 ; U8 - L7.
(1" Ø) U2 - L3 ; U3 - L4 ; U4 - L5 ; U5 - L4 ; U6 - L5 ; U7 - L6.
(⅝" Ø) U4 - L3 ; U5 - L6.

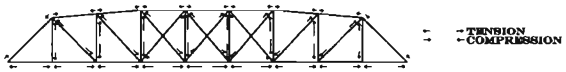
In 1844, Caleb Pratt and Thomas Willis Pratt received a patent for a timber and iron panel truss with vertical members in compression and diagonal members in tension. By keeping the compression members as short as possible (as opposed to a Howe truss, in which the diagonals are in compression), Pratt hoped to reduce lateral buckling. While not immediately popular in the combination wood and iron form, the Pratt truss became the seminal American truss type in the last quarter of the 19th century, when it was built in a simplified all-metal version. By the 1870's, the Pratt truss was the most popular type of truss for metal highway spans of up to about 150 feet. In the 20th century, the Pratt truss remained one of the two dominant metal truss types in America, the Warren truss being the other.



FORCE diagram: pratt truss

For longer spans, the truss needs to be deeper at the center, where the greatest bending moments occur. One of the most economical ways to accomplish this is to make the upper chord polygonal in shape. This idea was suggested, but not claimed, in Pratt's 1844 patent; it was later patented, in 1870, by Charles Henry Parker of Boston. The Parker truss was popular for long spans well into the twentieth century, but where it has an indefinite number of slopes in the upper chord, the Camelback truss is distinguished by a polygonal upper chord of exactly five slopes, the minimum number needed to obtain the benefits of the polygonal chord.

The Camelback truss was commonly used for bridges of 150 to 200 feet in length, and these longer spans required the introduction of a few components not generally seen in standard parallel chord Pratt truss bridges. For instance, the increased depth of the Camelback truss requires extensive overhead bracing to keep the structure rigid. In addition, counterbraces are required AT all but the end panels to accommodate reversal of tension/compression forces, which only occur at the very center of the parallel chord truss. Both the Nimrod Bridge and Ward's Crossing Bridge have these features, while the Fryer's Ford Bridge does not.



FORCE diagram: Camelback truss

Yet while these bridges have some differences, their similarities are also striking. Although built at different dates, by different companies, the three bridges shown here share many common characteristics, most notably built up compression members, wrought iron tension members, and pinned connections. In addition, there are marked similarities in truss dimensions, panel widths, and sizes of the individual metal components. These similarities clearly illustrate the trend toward standardization and mass-production that occurred in the latter half of the 19th century, as bridge fabricating firms adapted railroad technology for a mass market.

DELINEATED BY: TIZIANA DI FRANCESCO, AMY JAMES, BRIAN CARNAHAN, SUMMER 2005

ARKANSAS HISTORIC BRIDGES RECORDING PROJECT
NATIONAL PARK SERVICE
UNITED STATES DEPARTMENT OF THE INTERIOR

NIMROD VICINITY

NIMROD BRIDGE (WALLACE BRIDGE), 1908
SPANNING FOURCHE LAVE RIVER AT WALLACE BRIDGE ROAD (CR 10)
PERRY COUNTY
ARKANSAS

SHEET 8 OF 8

HISTORIC AMERICAN ENGINEERING RECORD
AR-66