

United States Department of the Interior  
Heritage Conservation and Recreation Service

National Register of Historic Places  
Inventory—Nomination Form

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received OCT 28 1981

date entered NOV 30 1981

Continuation sheet

Item number

Page

DESCRIPTION

7

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this period; advances were not made until after 1910. Blakeman Bridge well represents this experimental period in bridge construction. It is an unusual example of steel reinforcement in a conservative era when pure Roman concrete bridges were popular.

### Airtight Bridge

Airtight Bridge is the newest of the bridges being nominated, built in 1914 by the Decatur Bridge Company and designed by Claude L. James. The bridge is located in a beautiful setting, with a large hill on the east side of the river and a forested area on the west. The bridge is located at what was once known as Willow Pond Ford and is the only crossing of the river in the northern half of the county.

Airtight Bridge is a Pratt through-truss, constructed with steel chords and a concrete floor. The bridge is constructed with eight panels, and is pinned and riveted. As is characteristic of the Pratt truss, vertical members and the top chord act in compression, and the lower chord and diagonals act in tension. The two center panels on either side have double diagonals.

Airtight Bridge is 188 feet long with a deck width of 15 feet 7 inches and a minimum clearance of 13 feet 7 inches. The span is comprised of the large through-truss, one pony truss on the west side of the river, and a steel beam on the east.

According to local folklore, there are two explanations as to why the bridge is referred to as Airtight. One explanation is that the crossing is located in a valley surrounded by hills. Air tends to settle and stagnate in this basin. Others say that in trying to climb the steep hill on the east side of the bridge, old automobiles would become "air-tight" because of the position of their gasoline tanks and would have to back up the hill to make the grade.

The bridge is in fair condition, with a load limit of eight tons.

Significance Airtight Bridge is significant as the only river crossing in Coles County between Quarry Bridge and the north county line, a distance of approximately 12 miles. Airtight has linked the east river area with the prairie to the north and west for 67 years.

Airtight Bridge is an example of a simple Pratt truss. It is representative of the improvement and sophistication of trusses in the years following their invention in the 1840s. The Pratt truss as developed in 1844 by Thomas and Caleb Pratt was a rather simple structure with vertical members in compression and diagonals in tension. As the Pratt was put to greater use, as loads increased, and as length requirements increased, engineers designed larger and more complex structures. Not fully understanding the science of bridge engineering, bridge builders thought that to be stronger a bridge needed additional members. Thus, bridges such as Quarry Bridge (double intersection Pratt) and Harrison Street (Camelback Parker) were common in the period 1865-1890. As knowledge increased and as steel replaced iron as the principal building material, engineers realized that additional members were redundant, at best just stabilizing factors. The improved steel version of the through-truss — of which the Airtight Bridge is a fine example — returned to the simple Pratt design as conceived by Thomas and Caleb. By the 1920s and 1930s,

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DESCRIPTION

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the improved steel trusses and reinforced concrete spans supplanted the small yet complex iron and steel truss as the predominant bridge type.

SIGNIFICANCE

8

2

widely built between 1865 and 1885, many with a combination of iron and a new material — steel. The Quarry Bridge (1883) is a fine example of the late use of this type of through-truss in Coles County.

Another common means of strengthening and improving the truss was to replace the straight top chord with a polygonal chord. By making the top chord members uniform in size, it was now possible to prefabricate this type of bridge and to quickly and inexpensively construct it on site. The Camelback Parker, with its five slopes, is the most common type of Camelback truss. The Harrison Street Bridge (built 1898) is a good example of this type. The Camelback design was used well into the 1900s in all-steel bridges.

While trusses were being perfected in the late 1800s, some engineers were beginning to construct concrete bridges as an alternative to iron and steel. The first concrete bridge in the United States was constructed in 1871. As concrete bridges became longer, reinforcement became necessary. The first iron and steel reinforced bridges were built in the early 1890s. The major impetus to building reinforced concrete bridges came in 1894, with the patenting of the Melan system, which was characterized by steel I beams bent to the shape of the arch and laid in parallel series near the undersurface of the arch. Despite this breakthrough most concrete bridges built from 1890 to 1910 were pure concrete, lacking metal reinforcement but often having stone facings for support. Whereas Europeans were widely building the reinforced concrete bridges, Americans were rather conservative before 1910 and continued to build pure concrete structures. Blakeman Bridge (1907) was one of the experimental concrete reinforced bridges built before 1910 in the United States. Having withstood 75 years of use, Blakeman Bridge stands as a rare testimony to American daring and ingenuity in bridgemaking during the early 1900s.

After 1910, reinforced concrete and all-steel trusses were perfected and became more common. Most post-1920 bridges were designed very scientifically, with the underlying structural system well understood. The simple Pratt truss was recognized as the most durable of the trusses built in the 1800s; engineers now realized that extensive use of eyebars and secondary counterties was redundant. In short, designers were not recognizing and designing simple forms. Airtight Bridge is representative of this era of construction. The newest structure in the thematic group, Airtight Bridge is the simplest in form.

BRIDGE INVENTORY FORM

81000211

Bridge Name Airtight Bridge Number 3165\*

OCT 23 1981

Location NW<sup>1</sup>/<sub>4</sub> SE<sup>1</sup>/<sub>4</sub> Section 21 Township 13 North Range 10 East

NOV 30 1981

Verbal Location 8 miles northeast of Charleston on township road 275 over Embarras River, spanning Ashmore and Morgan townships

Town Charleston Vicinity of X NE of Charleston

County Coles

Owner Ashmore Township Board Morgan Township Board  
% Supervisor Wm. Strader % Supervisor Bruce Swango  
R.R. #1

Ashmore, IL 61912 Oakland, IL 61943

Acreage less than 1 acre

UTM Coordinates

Number of Spans 1

Oakland, IL Quad

1:62500

Construction Date 1914

Zone 16

E 406 035

Engineer C.L. James

N 4378 075

Manufacturer Decatur Bridge Company, Decatur, IL

Materials steel, concrete, iron Type Pratt through-truss

Truss: Through X Pony X Deck \_\_\_\_\_

Truss Dimensions: See attached dimensions

Comments Bridge has one through-truss, one pony-truss approach, and one steel beam approach;  
length 188' 4"; pinned and riveted; 13' 7" minimum clearance; 15' 7" wide

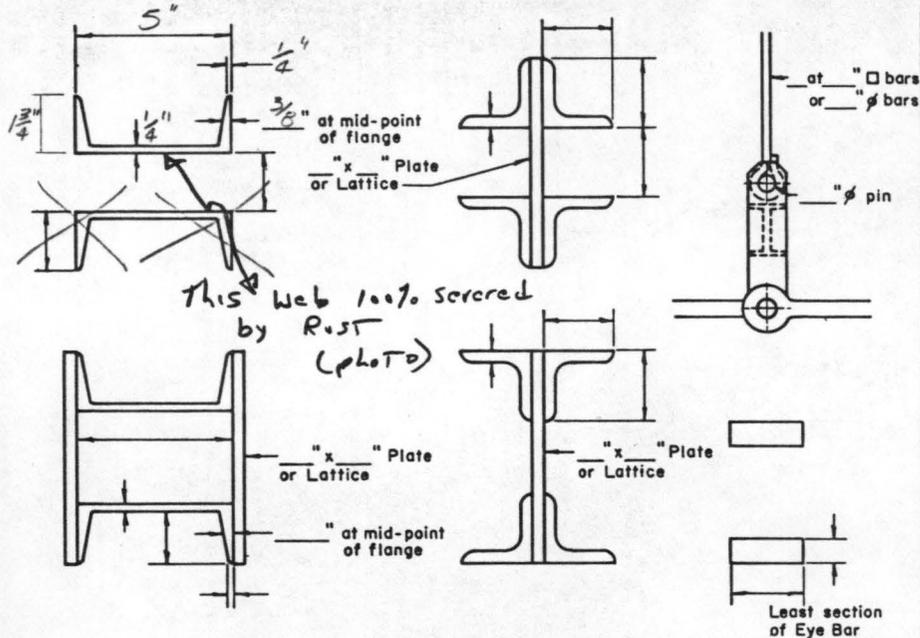
Significance Only Pratt truss in thematic group; represents improvement and simplification  
of bridge form

\* number 1711 on the Illinois Historic Sites Rural Survey

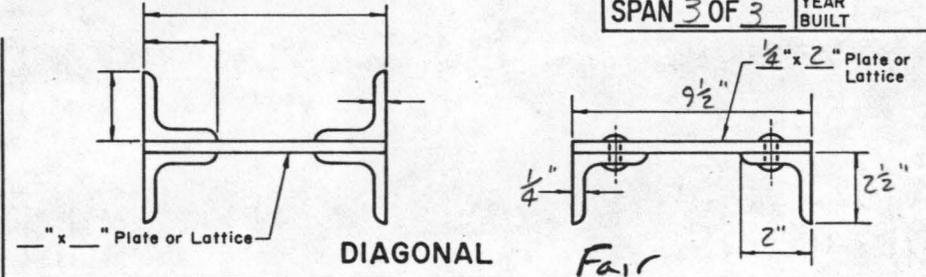
# RATING SHEET - TRUSS - Verticals, Diagonals, and Chords

BRIDGE NO. 015-3165

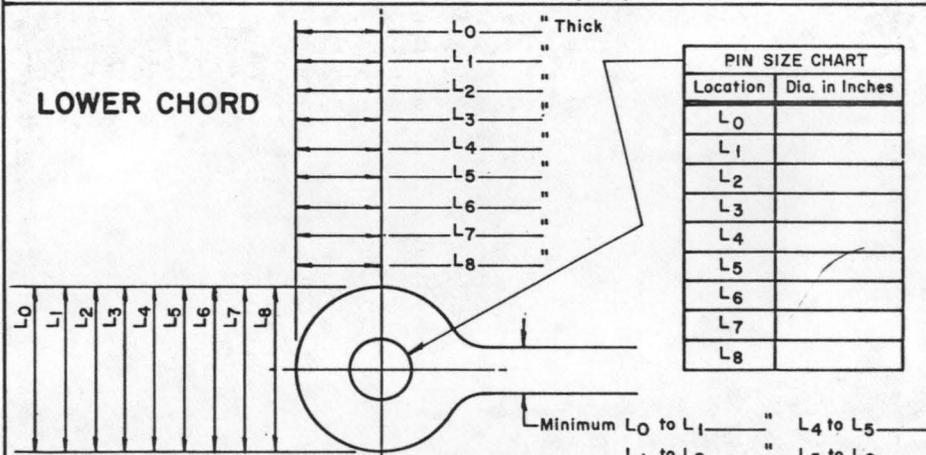
SPAN 3 OF 3 YEAR BUILT



VERTICAL

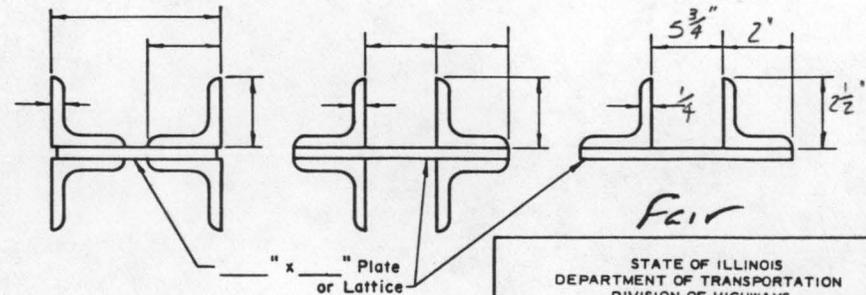
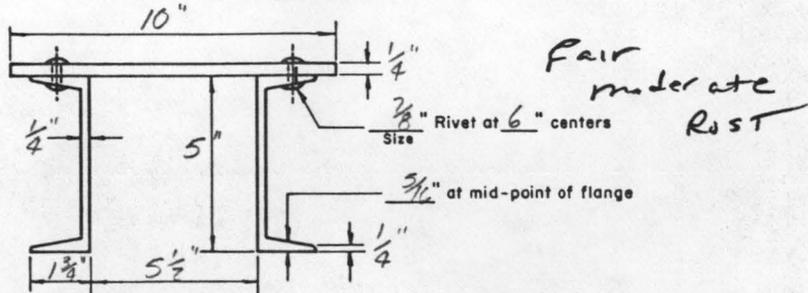


DIAGONAL

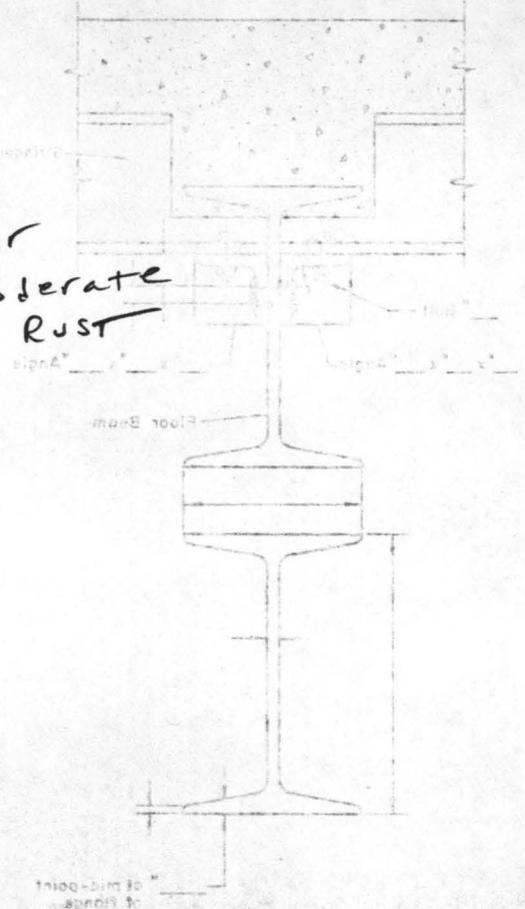
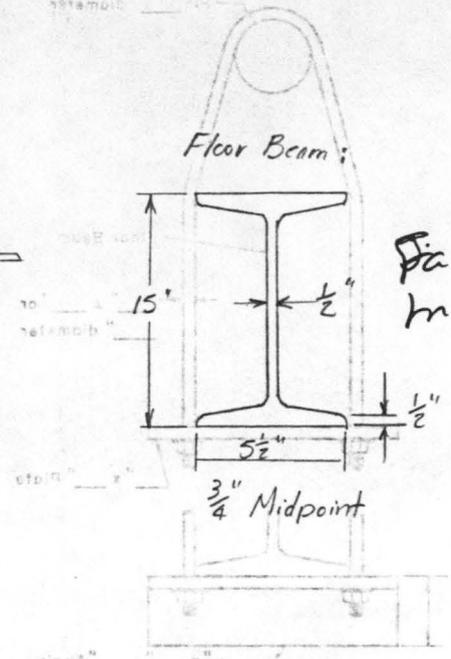
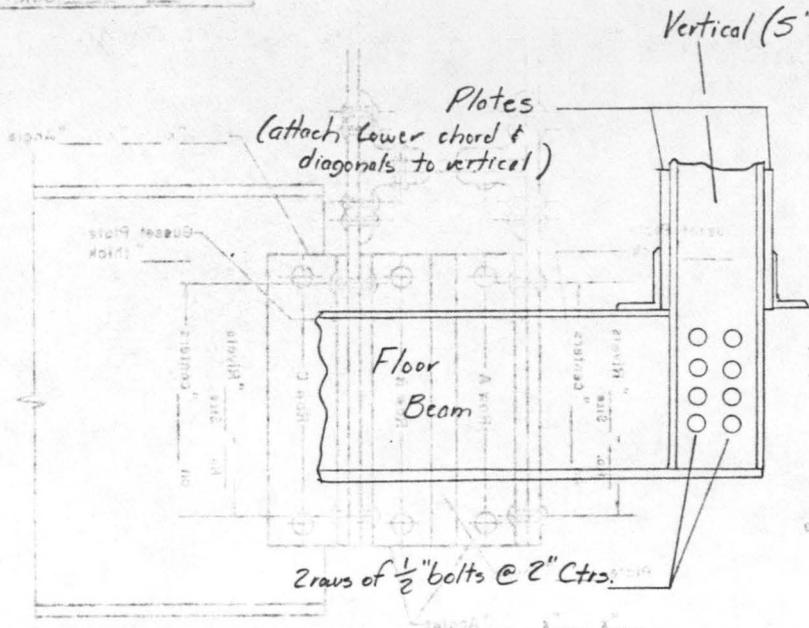


LOWER CHORD

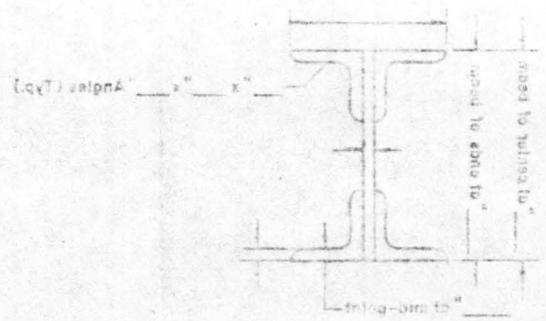
## TOP CHORD and END POST



STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS



Row A	1/2"	Rivets (Bolts) on	center
Row B	1/2"	Rivets (Bolts) on	center
Row C	1/2"	Rivets (Bolts) on	center

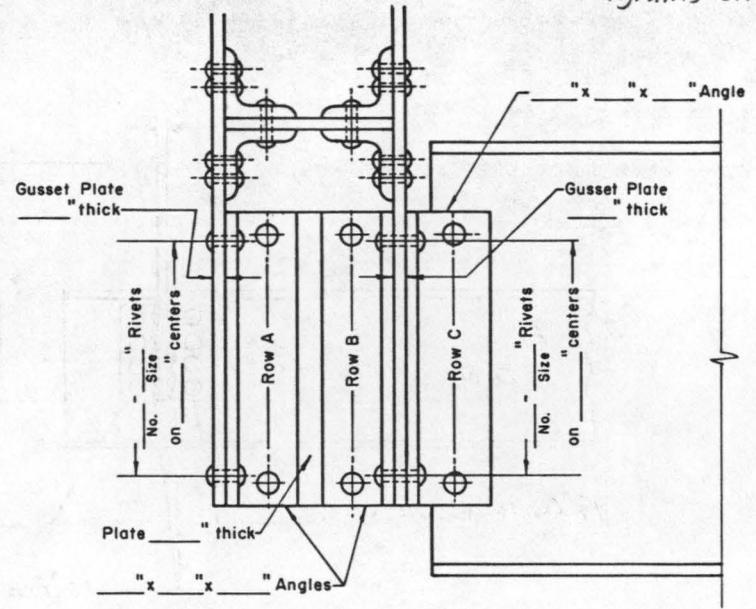
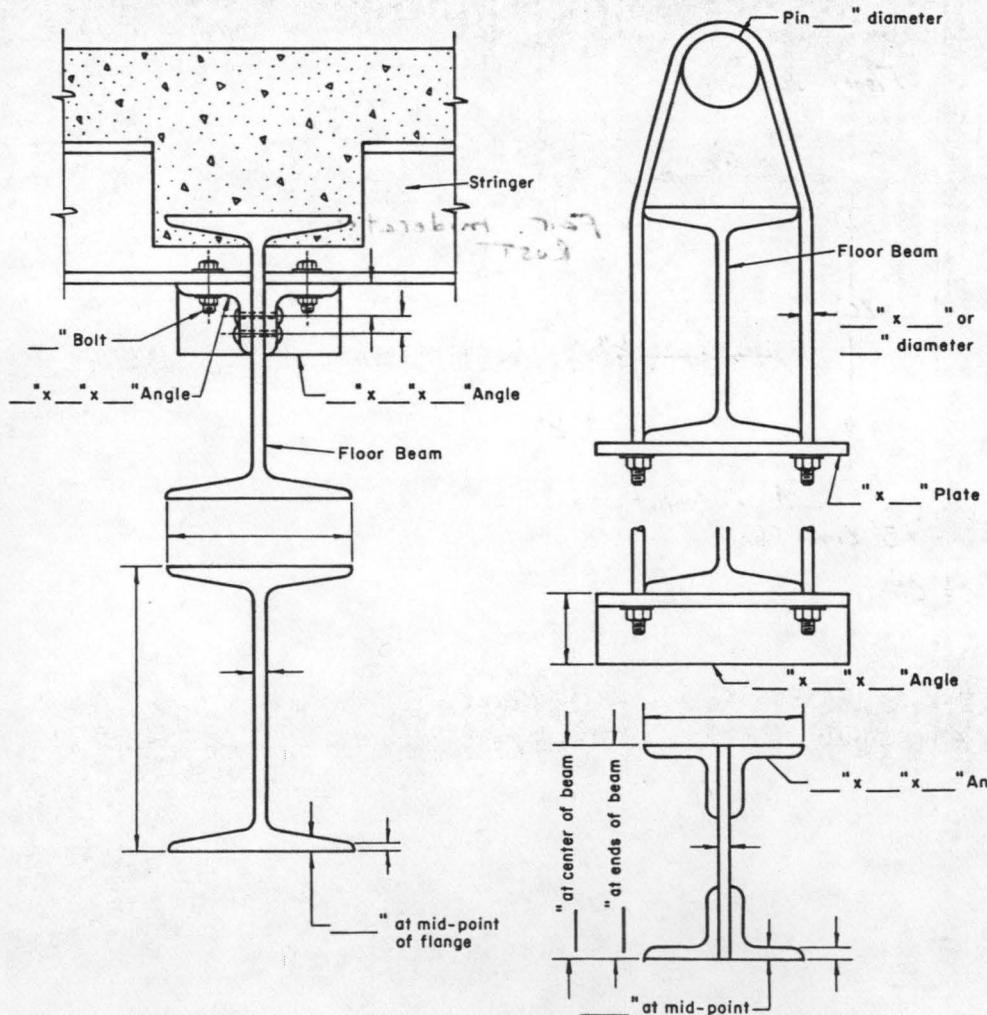


FLOOR BEAMS

# RATING SHEET - TRUSS - Floor Beams

BRIDGE NO. 015-3165  
 SPAN 2 OF 3 YEAR BUILT

*See diagrams on back!*



- Row A - " Rivets (Bolts) on " centers  
No. Size
- Row B - " Rivets (Bolts) on " centers  
No. Size
- Row C - " Rivets (Bolts) on " centers  
No. Size

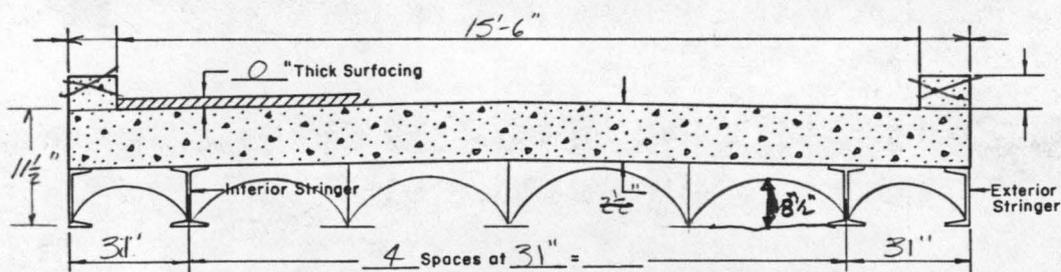
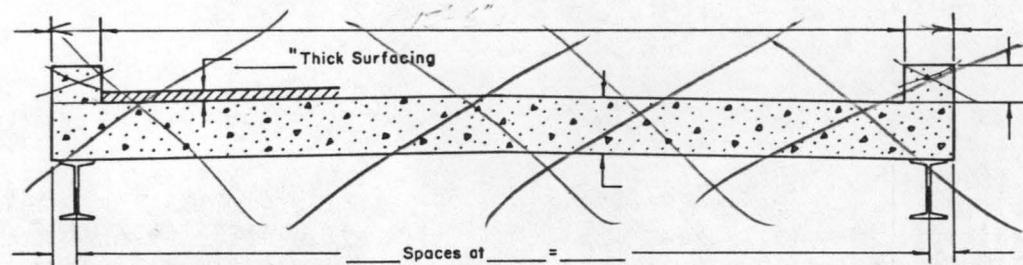
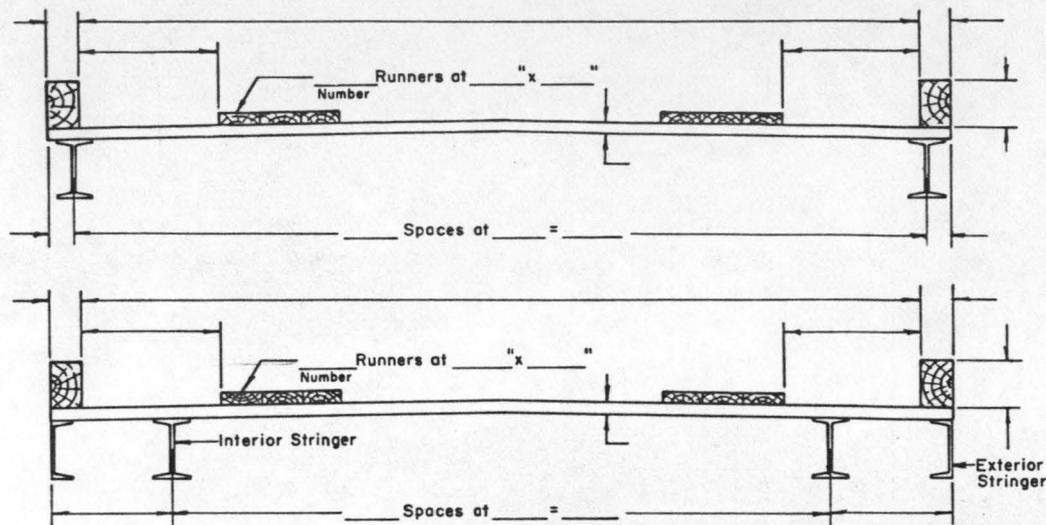
## FLOOR BEAMS

STATE OF ILLINOIS  
 DEPARTMENT OF TRANSPORTATION  
 DIVISION OF HIGHWAYS

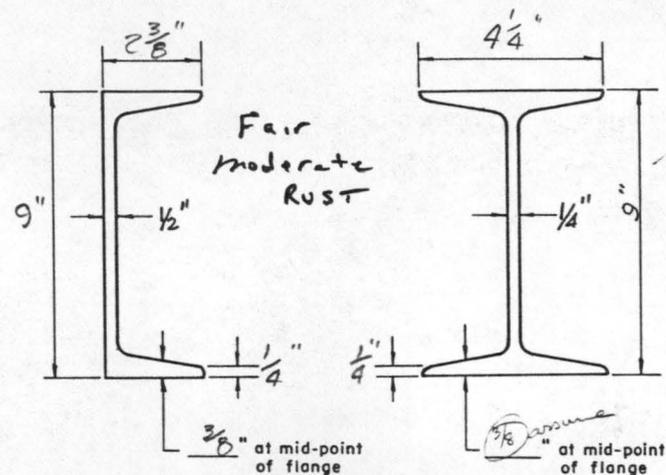
RATING SHEET - TRUSS - Floor

BRIDGE NO. 015-3165

SPAN 2 OF 3 YEAR BUILT



CROSS SECTION of ROADWAY



Stringers

Deck thickness = 2 1/2" min.

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

# RATING SHEET - TRUSS

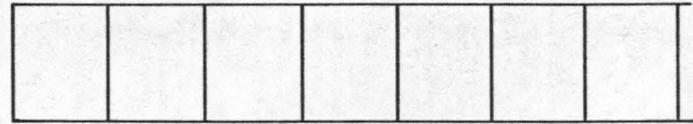
Span 2 = 140'

BRIDGE NO. 015-3165  
SPAN 2 OF 3 YEAR BUILT 1900es

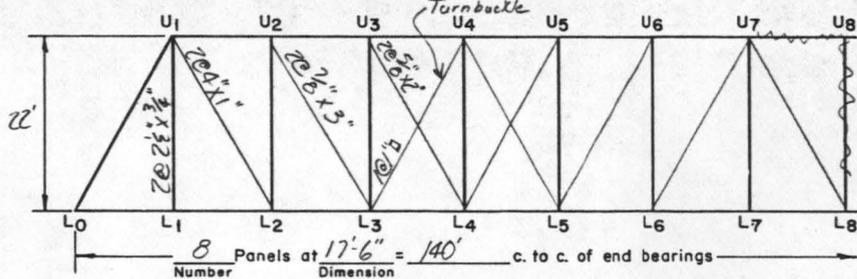
## THROUGH TRUSS



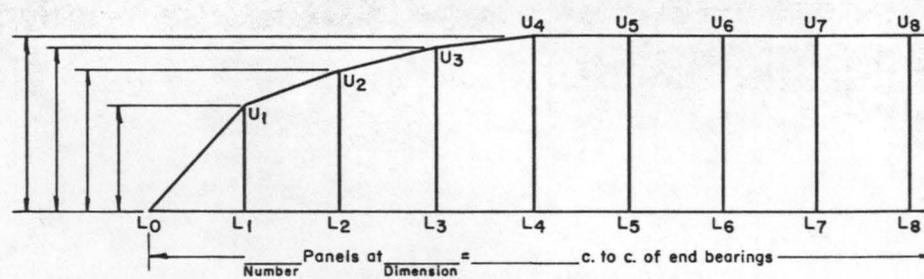
TOP VIEW (Show Diagonals)



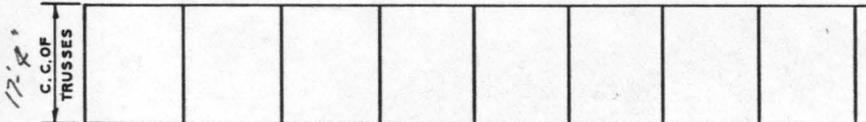
TOP VIEW (Show Diagonals)



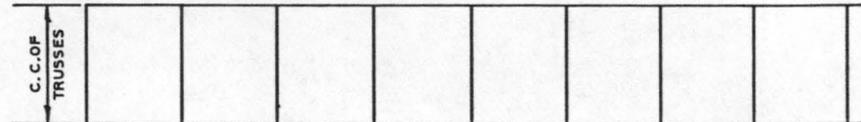
ELEVATION (Show Diagonals)



ELEVATION (Show Diagonals)

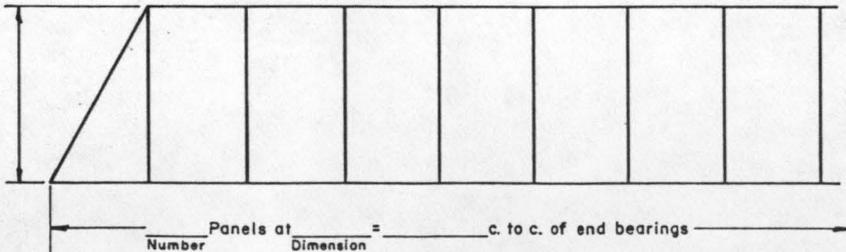


BOTTOM VIEW (Show Diagonals)

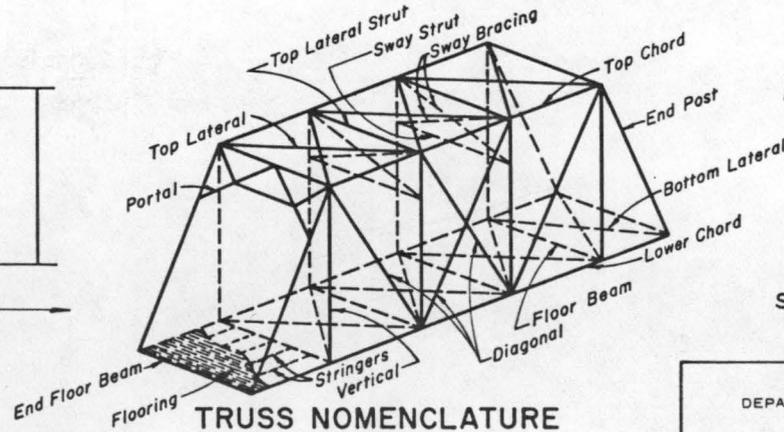


BOTTOM VIEW (Show Diagonals)

## PONY TRUSS



ELEVATION (Show Diagonals)



### TRUSS NOMENCLATURE

Hor. Clearance - 15'-7"  
Deck Length - 190'  
Face to Face - 185'-8"  
Vert. Clearance - 13'-7"

SKEW 0°

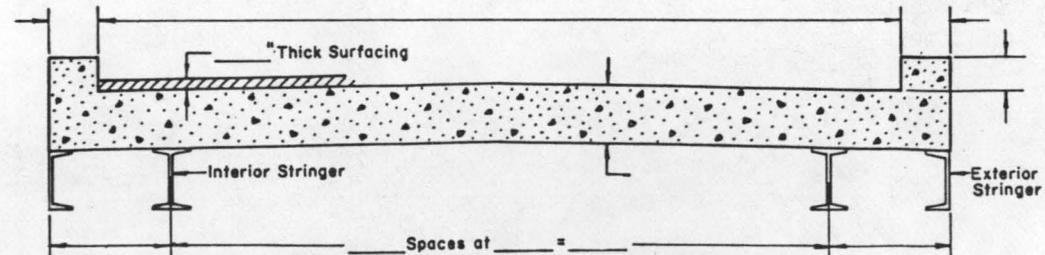
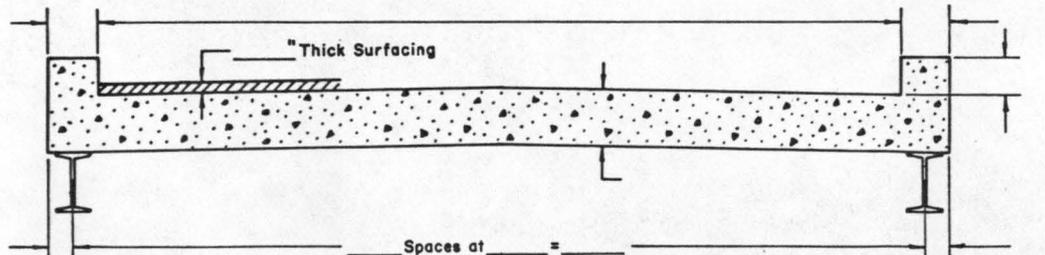
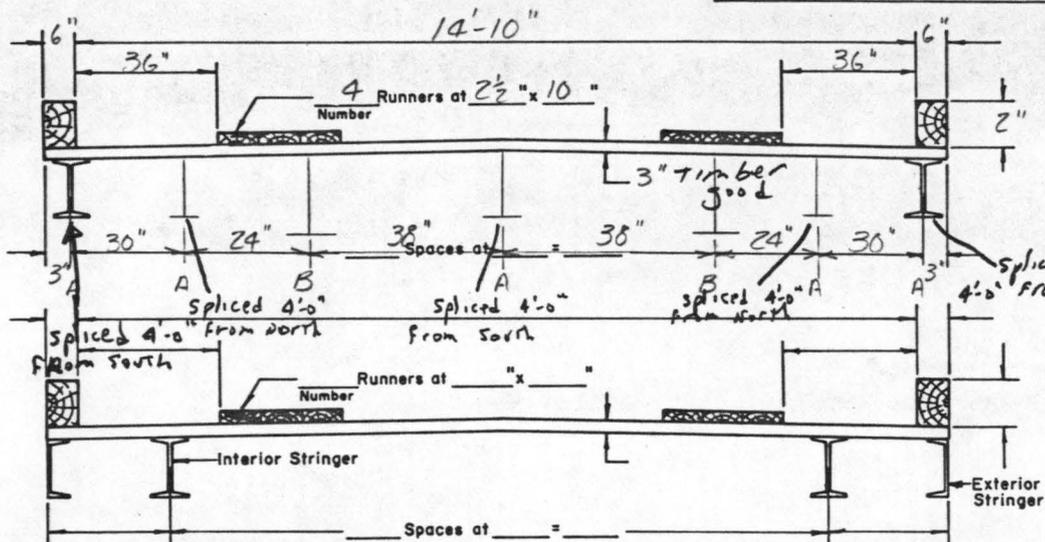
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

**RATING SHEET - TRUSS - Floor**

**BRIDGE NO. 015-3165**

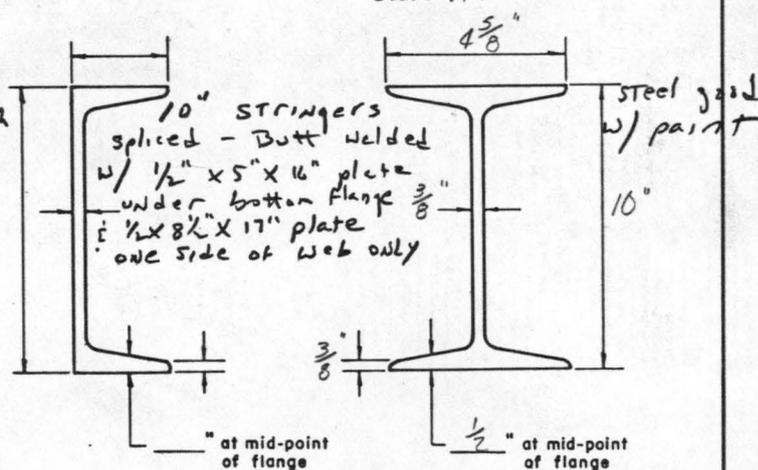
**SPAN 1 OF 3 YEAR BUILT 1900 est.**

Span Length = 22'-6"  
(C-C bearing)

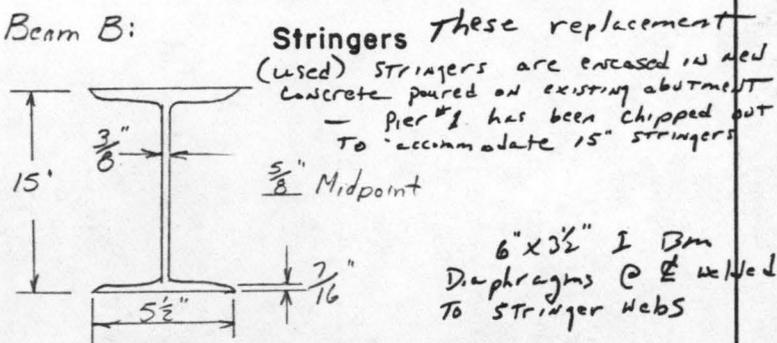


**CROSS SECTION of ROADWAY**

Beam A:



Beam B:



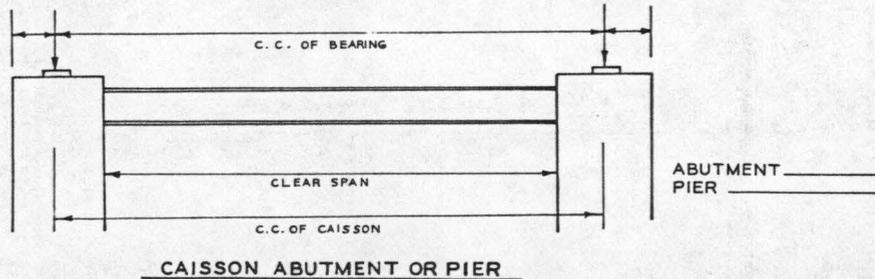
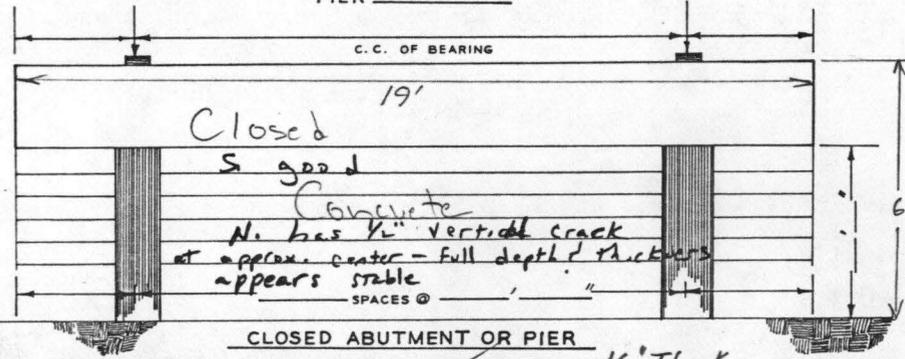
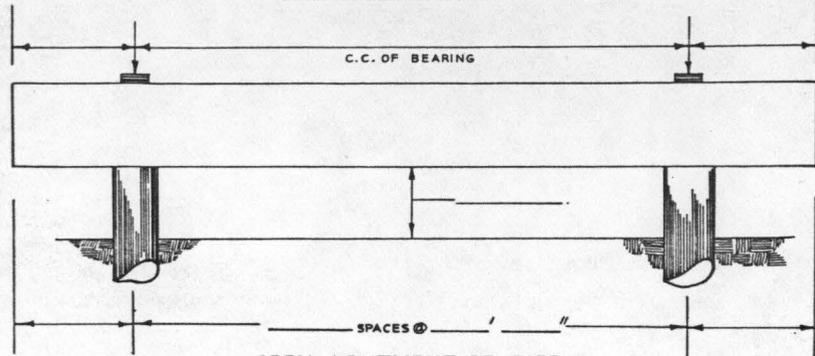
STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

RATING SHEET - SUBSTRUCTURE

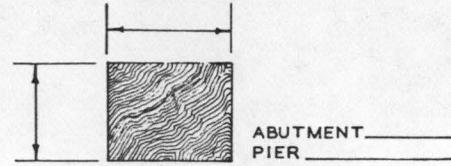
BRIDGE NO. 015-3165

YEAR BUILT \_\_\_\_\_

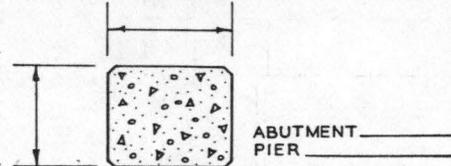
ELEVATIONS



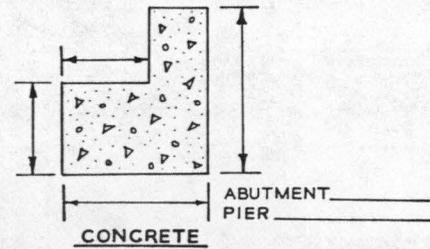
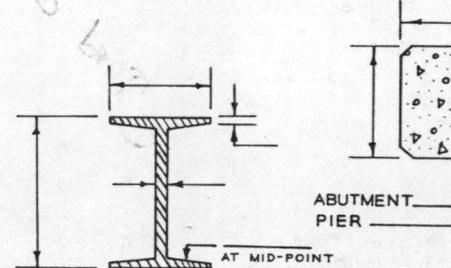
CAPS



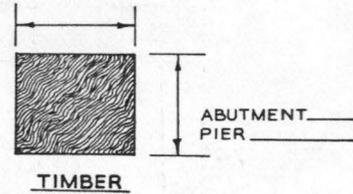
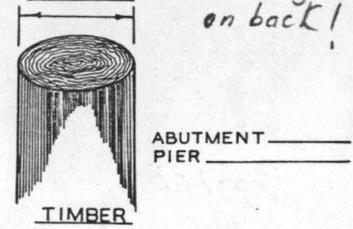
TIMBER



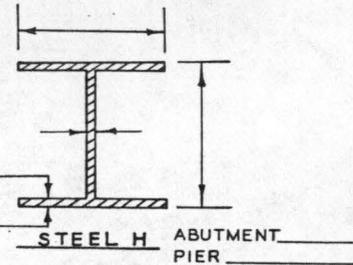
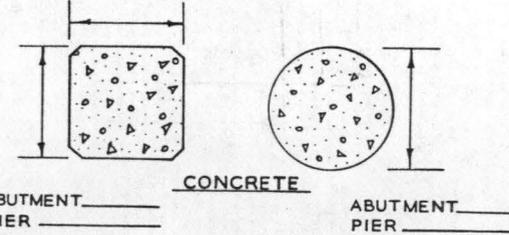
CONCRETE



PILES



TIMBER



Pier diagram on back!

STATE OF ILLINOIS  
DEPARTMENT OF TRANSPORTATION  
DIVISION OF HIGHWAYS

FORM BLR 1047

Multiple Resource Area  
Thematic Group

dnr-11

Name Coles County Highway Bridges Over The Embarras River Thematic Resources  
State Illinois

Nomination	Type of Review	Decision
1. Airtight Bridge	Entered in the - National Register	<u>Delores Byers 11/30/81</u>
2. Blakeman Bridge	Substantive Review Entered in the	<u>Accept - McCallister</u>
3. Harrison Street Bridge	- National Register	<u>Accept, Beth Grovena 11/30/81</u>
4. Stone Quarry Bridge	Entered in the - National Register	<u>Delores Byers 11/30/81</u>
5.	-	_____
6.	-	_____
7.	-	_____
8.	-	_____
9.	-	_____
10.	-	_____
11.	-	_____
12.	-	_____
13.	-	_____
14.	-	_____
15.	-	_____
16.	-	_____
17.	-	_____
18.	-	_____
19.	-	_____
20.	-	_____
21.	-	_____
22.	-	_____
23.	-	_____
24.	-	_____

DOE 11/19/81 - 12/7/81

Name Airtight Bridge (Coles County Highway Bridges over the Embarras River Thematic Resource) dnr-3 81000211  
State, County IL Coles Fed Nom or Request-Agency \_\_\_\_\_  
Working Number 10.23.81.367 Federal Register Date 2.7.83

Nomination  
 Determination of Eligibility  
 On Nomination Form

Bldg(s)  
 Site  
 Object  
 Structure  
 District

Within:  
 Multiple Resource Area  
 Thematic Group

Maps 4  
Photos 4

Nomination prepared by:  
 State Staff  
 Local  
 Other

Entered in the  
Action: **National Register** Check if Appropriate:  
 ACCEPT 11/30/81  
 RETURN \_\_\_\_\_  
 REJECT \_\_\_\_\_

State Request for Review  
 Keeper's Decision to Review  
 2nd Return

I. Evaluation of Resource (cont. on back if necessary)

II. Evaluation of Nomination

	Good	Adequate	Poor	Comments
1. Descriptive Statement Short Format <input type="checkbox"/> Yes <input type="checkbox"/> No				
2. Significance Statement Short Format <input type="checkbox"/> Yes <input type="checkbox"/> No				
3. Concepts/Integrity				
4. Concepts/Criteria				
5. Concepts/Boundaries				
6. Contextual Evaluation				

General Comments (cont. on back if necessary):

Reviewer/Date \_\_\_\_\_

See Attached \_\_\_\_\_

National Park Service

U.S. Department of the Interior



*Coles County Highway Bridges over the  
Embarasa River schematic drawings*

Airtight Bridge  
Coles County, Illinois

Dan Barringer

March 1, 1981

Department of Conservation, Spfld

#Facing northwest

#1 of 4

NOV 30 1981

OCT 23 1981



*Coles County Highway Bridges Over the  
Embarras River & Lematic Reservoir*

Airtight Bridge  
Coles County, Illinois  
Dan Barringer  
March 1, 1981  
Dept. Of Conservation, Spfld.  
Facing north  
#2 of 4

NOV 30 1981

OCT 23 1981



*Coles County Highway Bridges over  
the Embarras River & Embarras Reservoir*

Airtight Bridge  
Coles County, Illinois  
Dan Barringer  
March 1, 1981  
Dept. of Conservation, Spfld.  
Facing west  
#3 of 4

NOV 30 1981

OCT 23 1981



*Coles County Highway Bridges over  
the Embarras River schematic resources*

Airtight Bridge

Coles County, Illinois

Dan Barringer

March 1, 1981

Dept. of Conservation, Spfld.

Underneath facing northeast

#4 of 4

NOV 30 1981

OCT 23 1981

Please refer to the map in the  
Coles County Highway Bridges  
Over the Embarras River TR  
Cover Sheet for this property

Multiple Property Cover Sheet Reference Number: 64000174