

## Stringer Deteriorations

- Indicates what an area that would have been repaired with last job

### Span 10

Stringer 4 - heavy section loss  
 L6 - Stringer 5 - 3" hole at cope  
 Stringer 1 - Advanced Section Loss & 1" hole  
 L6 - Stringer 1 - 2" hole at cope  
 L8 - Stringer 5 - 5" long hole  
 L8 - Stringer 5 - 1" hole in web near FB  
 L12 - Stringer 1 - two 2" holes at cope  
 L12 - Stringer 2 - hole at cope  
 L12 - Stringer 4 - 2" hole at cope  
 L12 - Stringer 5 - 6" hole at cope  
 L14 - Stringer 4 and 5 - SL North Side  
 L16 - Stringer 3 - 1/8" SL  
 L16 - Stringer 3 - 3/16" SL  
 L16 - Stringer 4 - 3/16" SL  
 L16 - Stringer 1 & 2 - 3/16" SL  
 L16 - Stringer 3 - Min. SL in web  
 L18 - Stringer 5 - 3 x 2 hole in bottom of web ( 3 Photos)  
 L18 - Stringer 5 - Med. SL in web along Clip angle  
 L18 - Stringer 5 - 1" hole top of web ( 2 Photos)  
 L18 - Stringer 1 - w/ SL  
 L18 - Stringer 1 - SL at BTM of web and 2" hole at Top of web (2 Photos)  
 L18 - Stringer 3 - SL at BTM of web  
 L18 - Stringer 5 - Hole at Top of web  
 L18 - Stringer 4 - Hole at Top of web  
 L18 - Stringer 3 - Hole at Top of web  
 L18 - Stringer 1 - Hole at top of web  
 L18 - Stringer 5 - 1" x 3" hole thru web above saddle bearing  
 L18 - Stringer 1 - 1" hole in web above saddle bearing

### Span 11

L19' - Stringer 5 - 1/4" SL in web of FB  
 L19' - Stringer 5 - SL to web stringer and web FB  
 L18' - Stringer 2 - 1 1/2" hole and 1" hole in web  
 L18' - Stringer 2 - 1" hole and 1 1/2" hole in web  
 L18' - Stringer 5 - 3" hole at cope  
 L18' - Stringer 1 - 2" hole at cope  
 L18' - Stringer 1 - 1/4" SL on web and 3/8 on BTM Flange  
 L18' - Stringer 4 - Two holes in web w/ SL (2 Photos)  
 L18' - Stringer 5 - SL in Web and Flange (2 Photo)  
 L12' - Stringer 4 - 2" x 4" inch hole at cope  
 L12' - Stringer 1 - 2" x 8" hole thru top web  
 L12' - Stringer 3 - 2" x 4" hole in web at top flange  
 L12' - Stringer 4 - 2" x 4" hole in web at top flange  
 L12' - Stringer 5 - 2" x 10" hole in web at top flange  
 L12' - Stringer 5 - SL with hole at cope  
 L12' - Stringer 5 - SL w/ hole at cope  
 L12' - Stringer 4 - SL at cope  
 L12' - Stringer 3 - 3" hole cope  
 L12' - Stringer 2 - SL w/ hole at cope  
 L12' - Stringer 1 - SL w/ hole at cope  
 L12' - Stringer 4 - hole at cope w/ hvy SL on web of FB and Stringer  
 L12' Stringer 4 - hole at cope w/ hvy SL on web of FB and Stringer  
 L12' - Stringer 3 - Hole at cope w/ SL at BTM of Stringer  
 L12' - Stinger 2 - Repairs completed (2 Photos)  
 L9' - Stringer 1 - 1/4"SL at Clip angle  
 L8' - Stringer 3 - FB web SL  
 L7' - Stringer 1 - SL in FB web  
 L7' - Stinger 2 - SL in FB web  
 L7' - Stringer 1 - SL in FB and Stringer  
 L7' - Stringer 2 - SL up to 1/4" in web  
 L7' - Stinger 1 - 7" hole at cope  
 L6' - Stringer 2 - 3/8" SL at cope  
 L6' - Stringer 3 - 1" hole at cope  
 L6' - Stringer 4 - 1" hole and 3/8 SL  
 L6' - Stringer 5 - 5" hole and 5/8 SL  
 L6' - Stringer 4 - 3/8" SL  
 L6' - Stringer 5 - 3/16" SL  
 L6' - Stringer 5 - FB w/ 3/16" SL at Clip angle  
 L3' - Stringer 5 - SL in web of FB  
 L3' - Stringer 3 - 1/4" SL in both sides of web  
 L3' - Stringer 5 - hvy SL in web  
 L1' - Stringer 5 - hole and SL

### Span 12

U8 - Stringer 4 - 50% SL in web

### Unknown

3/16" SL in FB web and 7/16" SL in Stringer Flange

## Saddle Bearing Locations

### Span 8

U9 - Pk rust on W. side saddle bearings

### Span 9

U5 - Conn. Pl at BTM Clip angle NW side Pk rust at saddle Bearing

### Span 10

(UNKNOWN)

Stringer 5 - Lifting due to Pk rust

Stringer 5 - SL at saddle bearing

Stringer 5 - Lifting due to Pk rust

### Span 10

L6 - Stringer 1 - SL ( 2 Photos)

L6 - Stringer 4 - SL

L6 - Stringer 5 - SL

L6 - Stringer 3 - SL and Pk rust

L6 - Stringer 5 - SL 30% remain in 4" x 12" area

L6 - Stringer 5 - hvy SL in FB web in 4" x 2" area ( 2 Photos)

L10 - Stringer 4 - SL with 40% remain

L12 - Stringer 5 - Advanced SL in Bearing support (2 Photos)

L12 - Stringer 5 - Pk rust and SL

L18 - Stringer 1 - SL in FB web

### Span 11

L18' - Stringer 1 - SL on web of stringer

L12' - Stringer 1 - holes thru saddle bearing supports and hole/SL at web of FB (3 photos)

L12' - Stringer 3 - hole at cope and SL web of FB

L12' - Stringer 4 - hole at cope w/ hvy SL on web of FB and Stringer (2 photos)

L12' - Stringer 5 - saddle bearing w/ hvy SL (2 photos)

L12' - Stringer 1 - 3" x 1/2" hole rusted thru hvy SL

L6' - Stringer 5 - 6" hole in Stiffener + 3/16" SL at BTM web/clip angle

L6' - Stringer 1 - SL Saddle Bearing supports

L6' - Stringer 5 - hvy Pk rust under curved flat plate

### Span 12

U9 - Stringer 1 - Advanced Bearing Channel SL

U9 - Stringer 2 - FB U9 50% BTM Flange SL

U9 - Stringer 2 - Advanced web and bearing support SL in FB

U9 - Stringer 3 - FB U9 50% BTM Flange SL

U9 - Stringer 4 - Advanced web and bearing support SL in FB ( 4 photos)

U9 - Stringer 2 - BTM Flange of FB with 50% SL and 1" x 1" hole rusted thru

U9 - Stringer 3 - BTM flange of FB 50% Remain under saddle & 40% remain in Vert Stiff

U9 - Stringer 5 - Hvy pack rust

U9 - Stringer 3 - Hvy pack rust

### Span 13

U9' - Stringer 4 - Hvy pack rust

U9' - Stringer 2 - Hvy pack rust

U9' - Stringer 3 - Hvy pack rust

U9' - Stringer 4 - 80% SL in web and BTM Flange ( 2 Photos)

U9' - Stringer 1 - Hvy pack rust

## Floorbeam Locations

### Span 8

U0 - Deteriorations and Section Loss (5 Photos)  
U1 - Deteriorations and Section Loss (3 Photos)  
U4 - Deteriorations and Section Loss (1 Photo)  
U5 - Deteriorations and Section Loss (1 Photo)  
U6 - Deteriorations and Section Loss (1 Photo)  
U9 - Deteriorations and Section Loss (4 Photos)  
U10 - Deteriorations and Section Loss (1 Photo)  
U13 - Deteriorations and Section Loss (1 Photo)

### Span 9

U11 - Deteriorations and Section Loss (1 Photo)  
U14 - Deteriorations and Section Loss (1 Photo)  
U12' - Deteriorations and Section Loss (1 Photo)  
U10' - Deteriorations and Section Loss (1 Photo)  
U9' - Deteriorations and Section Loss (1 Photo)  
U4' - Deteriorations and Section Loss (1 Photo)  
U1' - Deteriorations and Section Loss (2 Photos)

### Span 10

L6 - Deteriorations and Section Loss (1 Photo)  
L10 - Deteriorations and Section Loss (1 Photo)  
L19 - Deteriorations and Section Loss (1 Photo)

### Span 11

L18' - Deteriorations and Section Loss (4 Photos)  
L15' - Deteriorations and Section Loss (1 Photo)  
L14' - Deteriorations and Section Loss (1 Photo)  
L13' - Deteriorations and Section Loss (1 Photo)  
L12' - Deteriorations and Section Loss (3 Photos)  
L7' - Deteriorations and Section Loss (1 Photo)  
L0' - Deteriorations and Section Loss (3 Photos)

### Span 12

L0 - Deteriorations and Section Loss (4 Photos)  
U1 - Deteriorations and Section Loss (3 Photos)  
U3 - Deteriorations and Section Loss (1 Photo)  
U4 - Deteriorations and Section Loss (1 Photo)  
U8 - Deteriorations and Section Loss (2 Photos)  
U9 - Deteriorations and Section Loss (6 Photos)  
U10 - Deteriorations and Section Loss (1 Photo)  
U12 - Deteriorations and Section Loss (1 Photo)  
U13 - Deteriorations and Section Loss (2 Photos)  
U14 - Deteriorations and Section Loss (1 Photo)

### Span 13

U10 - Deteriorations and Section Loss (2 Photos)  
U14 - Deteriorations and Section Loss (1 Photo)  
U13' - Deteriorations and Section Loss (2 Photos)  
U12' - Deteriorations and Section Loss (1 Photo)  
U11' - Deteriorations and Section Loss (2 Photos)  
U9' - Deteriorations and Section Loss (3 Photos)  
U8' - Deteriorations and Section Loss (2 Photos)



## Gusset Locations

### Unknown

U0 - Lower Gusset with 3" hole

### Span 8

U0 - L - Inner gusset with severe SL above retrofit 20% remain (2 photos)  
U0 - R - Inner gusset with severe SL above retrofit 5% remain (2 photos)  
L0 - L - Lower gusset with hvy pack rust, distorting and many holes  
L0 - R - Outside cantilever gusset with hvy Pk rust and severe SL under beam cap  
L0 - R - Side lower gusset with advanced SL  
L4 - R - 4' area of mod SL on Outside gusset along L, 12" area 40% remain  
U9 - L - Top gusset w/ 4" x 16" area hvy SL w/ many holes rusted thru  
U13 - R - Top gusset w/ hvy pk rust at gusset conn.

### Span 9

L4 - L - Inside gusset w/ distortion on N side of diag.  
L4 - L - Outside gusset w/ distortion on N side of diag.

### Span 10

L0 - Inside gusset 1/4" out of plane, east side  
L0 - Outside gusset 3/11" out of plane, east side (2 photos)  
L0 - FB East end SL  
L2 - East side minor Pk rust, visually distorted ( 2 photos)  
L2 - R - Inner gusset SL  
L10 - East side gusset bulging 5/11"  
L18 - L - Inner gusset with SL along secondary plate  
L18 - R - Inner gusset with SL along secondary plate

### Span 11

L24 - West side, distortion at gusset conn.  
M5' - L - outer gusset with mod distortion  
L13' - R - outer gusset SL  
L10' - R - Inner gusset SL  
L10' - R - Inner gusset diagonal SL  
L10' - SL on Inner and Outer gusset w/ SL  
L9' - R - Inner and Outer gusset w/ SL ( 2 photos)  
L9' - R - Lower gusset several holes and SL w/ 70% remain  
L7' - R - Outer gusset SL  
L7' - R - Inner and Outer gusset SL  
L3' - R - Inner gusset SL

### Span 12

L6 to L8 - Inside and Outside gussets distorted w/ concrete debris inside LC  
L6 to L8 - Inside and Outside gussets distorted w/ concrete debris inside LC  
L10 - R - Inside Gusset Distorted at vertical  
L12 - R - Outside gusset Distorted and Pk rust at corner of Vertical conn (2 photos)

### Span 13

U6' - R - Upper gusset with hvy SL 20% remain

## Lower Chord in Deck Truss Locations

### Span 10

L5 to L4 - R - Minor SL along vert edge of outside gusset  
L16 to L17 - R - Many rusted holes in top of LC (3 photos)  
L17 to L18 - L - Many rusted holes in top of LC (3 photos)  
L17 to L18 - R - Many rusted holes in top of LC (2 photos)  
L18 to L19 - R - Many rusted holes in top of LC

### Span 11

L19' to L18' - ? - Many rusted holes in top of LC  
L18' to L17' - L - Many rusted holes in top of LC  
L18' to L17' - R - Many rusted holes in top of LC (2 photos)  
L18' to L16' - R - Many rusted holes in top of LC  
L18' to L17' - L - Many rusted holes in top flange and pack rust  
L17' to L16' - R - Many rusted holes in top of LC (2 photos)

## Random Structure Section loss and Deterioration Locations

### Span 7

Web of FB NW side 7" x 32" area of SL and 1" hole (2 photos)  
Web of FB NE side 4" x 24" area of SL and 4" x 11" in BF (2 photos)

### Span 8

East Tower at bent 8 (15 photos)  
U9 - Web of FB area of SL and 1/2" hole  
U10 - R - Profile of SL and Holes Inner and Outer LC (4 photos)

### Span 9

U9' - FB - view of 5" x 31" area of SL ( 2 photos/views)

### Span 10

L14 - FB - view of 7" x 36" area of SL ( 2 photos/views)

### Span 11

L6' to U7' diag - SL near gusset  
L3' to U4' diag - SL near gusset  
L2' - R - SL to LC near Gusset

### Span 12

L0 - FB - hvy Pk rust and SL at stiffener  
U9 - FB - hvy SL in web center of beam with 1" x 2" hole 50% remain (2 photos)  
U0 - FB - web with Advanced SL

### Span 13

U8' to U9' inner channel Advanced SL

### Bent 14

U0' and Bent 14 deteriorations (9 photos)

### Span 14

Girder 2 at pier 14 with Hvy Pk rust and SL

## Misc. Deteriorations

Tie Plates at Top of Steel Beam Cap

Bent 8 - U0 R & L  
Bent 14 - U0' R & L

Missing Rivets Throughout Structure

Span 10 - L7 to L8 - Stringer 3 - Diaphragm missing 4 rivets  
Span 10 - L8 to L9 - Stringer 2 to 3 - Diaphragm missing 2 rivets  
Span 10 - L14 to L15 - Stringer 4 - Diaphragm missing 4 rivets  
Span 10 - L17 to L18 - Stringer 2 - Diaphragm missing 1 rivet  
Span 10 - L18 to L19 - Stringer 3 - Diaphragm missing 1 rivet

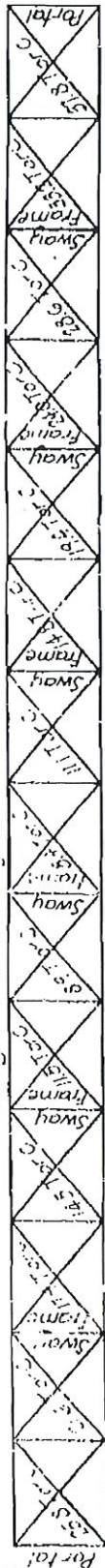
Span 8 - U0 Floorbeam with Heavy Section Loss at Fingerplate - 50% Remaining

Pier 10 Under the secondary bearing step bent cap spalling off with rebar exposed





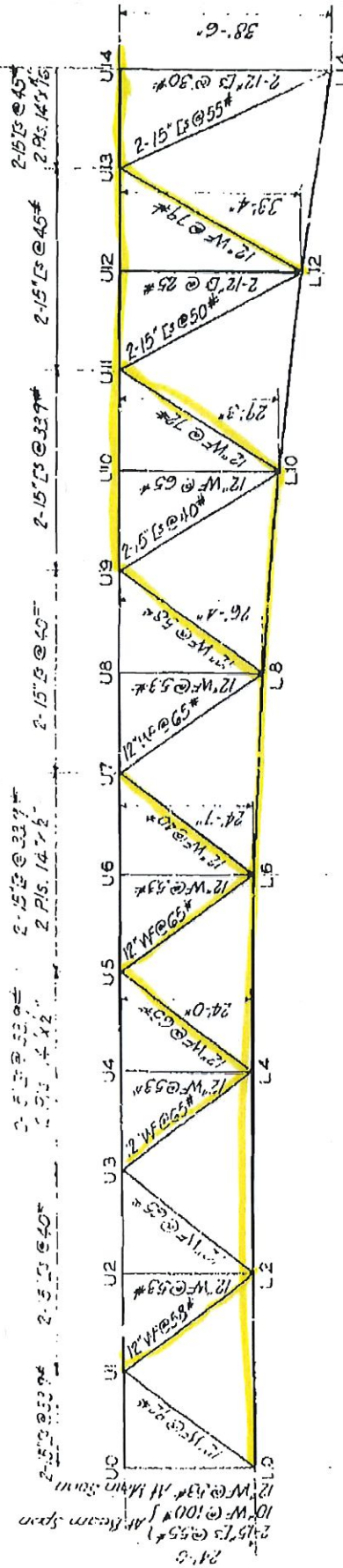
Connect each diagonal to each interior  
stringer with a gusset



Diagonals - 2 1/2" x 3/4" x 1/2"

### PLAN OF TOP LATERALS

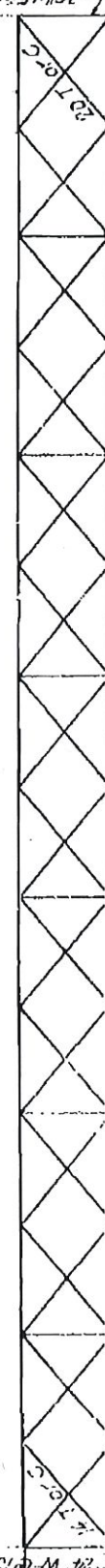
14 Panels @ 17'-10" = 249'-8"



### CONTINUOUS TRUSS

Symmetrical about &  
except as shown & noted

Struts - 2 1/2" x 3/4" x 1/2"



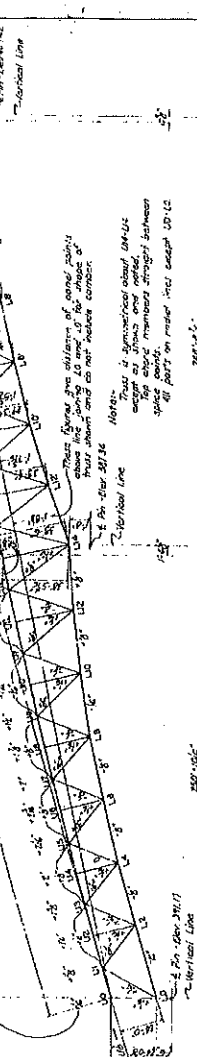
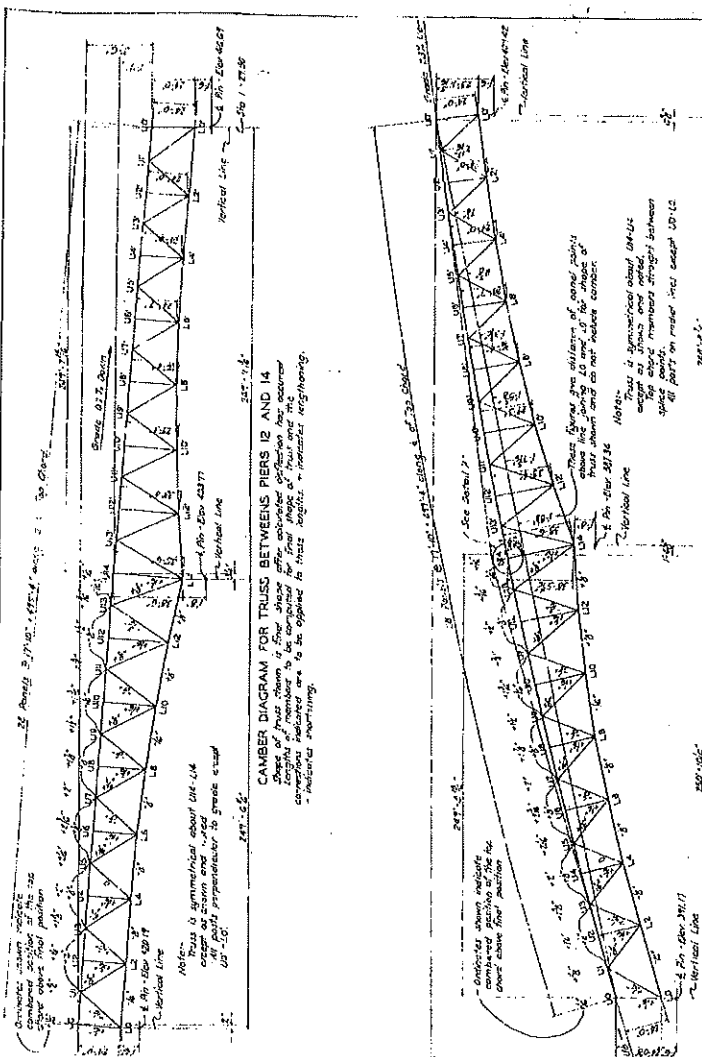
Diagonals - 1 1/2" x 1/2" x 1/2"

### PLAN OF BOTTOM LATERALS

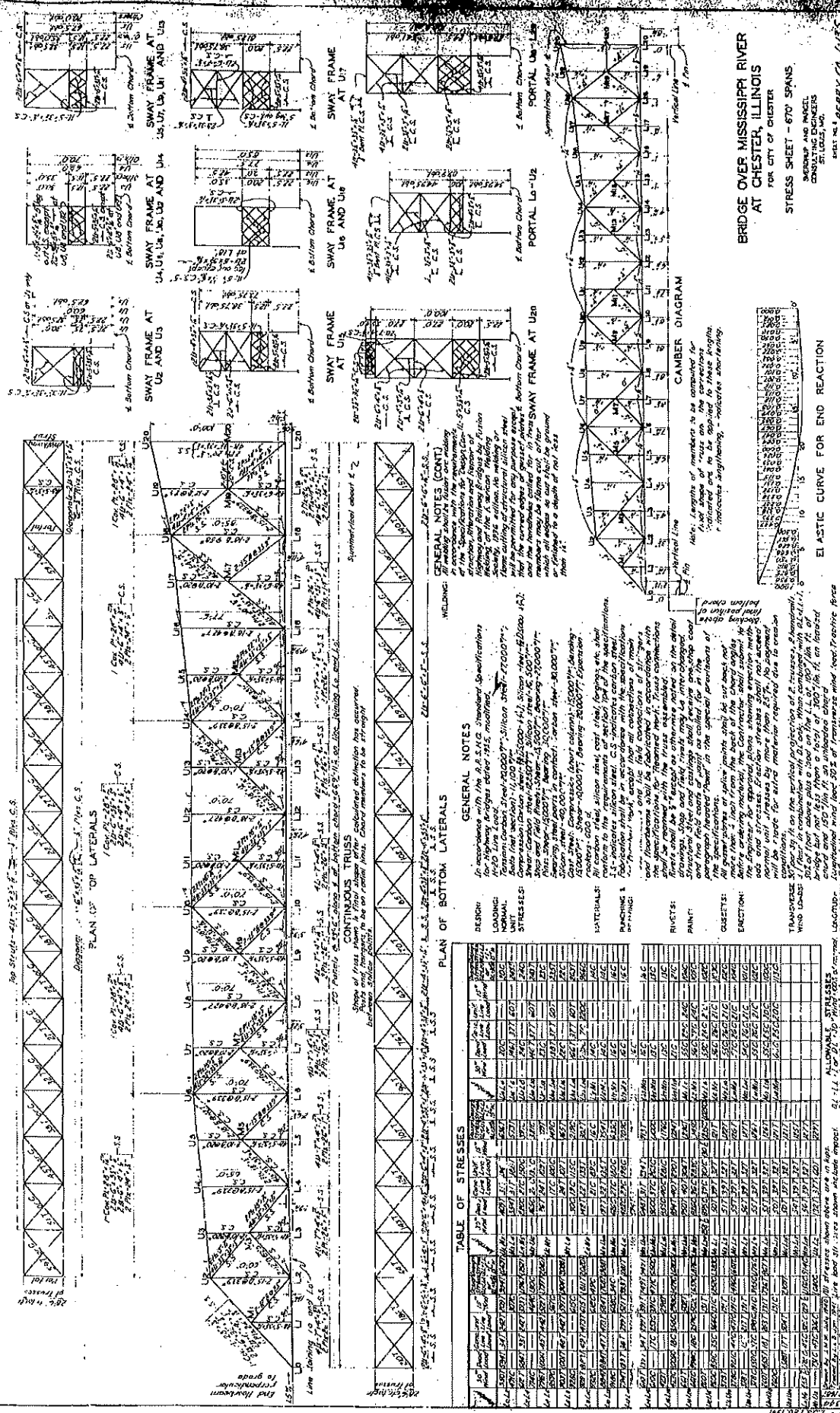






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2021 08 25





## Bridge Memorandum

**Job No.:** J9P3585

**Bridge No.:** L01355

**County:** Perry

**Route:** 51 (Minor) over Mississippi River & UPRR

**Final Layout:** U.I.P. and Rehabilitate Existing (7@60') Simple Wide Flange Beam Spans, (250'-250') Continuous Deck Truss Spans, (670'-670') Continuous Through Truss Spans, (250'-250') Continuous Deck Truss Spans, (60') Simple Wide Flange Beam Span

**Roadway:** 22'-0"±

**Alignment:** Tangent

**Skew:** Square

**Grade:** Match existing minus 3/8" ±

**Loading:** H20 (1935) (Existing), HS20-44 (New Construction)

**Beg. Station:** 28+95.32± (match existing) at abut. #1

**Traffic Handling:** Maintain traffic on structure during construction, see roadway plans for traffic control.

**Existing Bridge:** Rehabilitate existing L01354 and use in place.

**Existing Load Posting:** No Posting Required

### GENERAL NOTES:

Condition Ratings: Deck = 4, Superstructure = 4, Substructure = 4

AADT = 6886 (2018), ADTT = 23.6% = 1625

AADT = 9296 (2038), ADTT = 23.6% = 2194

Remove existing 3/4"± asphalt wearing surface using fine tooth scarification or similar method from Sta. 16+45.32± to the end of the bridge Sta. 0+68.60± at abut. #15.

Remove existing expansion joint seal or sealant at abut #15.

Install 3/8" (min.) emulsified asphalt, seal coat and seal coat aggregate grade A1 from Sta. 16+45.32± to Sta. 0+68.60±.

Estimated 5250 sq. ft. of modified deck repair.

Estimated 3500 sq. ft. of full depth repair.

▷ Repair floor beam in span #8 - U1, span #12 - U0, U1, U3, U4, U6, U8, U9 & U13, span #13 - U0', U5', U8', U11', U12' & U13'.

▷ Rehabilitate saddle bearings in span #8 - U9, span #9 - U9', span #10 - L12, span #12 - U9 & span #13 - U9'.

▷ Repair bearing area of stringer #5 at the saddle bearing for span #10 - L12

Repair cantilever for girders in spans #7 & #14 at int. bents #8 & #14.

▷ Repair gusset plate in span #8 - U7.

Repair finger plate joint at pier #10.

▷ Repair end of girder #2 at int. bent #14.

Sandblast and repaint the lower chord of the through truss and 5' each side of centerline joint at int. bents #8 & #14 and piers #10 & #12.

Install open cell foam joint seal at abut. #15 (no armor).

### SPECIAL NOTES:

Roadway surfacing adjacent to the bridge ends to match top of bridge wearing surface (Roadway Item).

An asbestos and lead inspection has been performed on this structure (L0135). Results indicate that asbestos is present.

The District will need to include this report in the electronic deliverables folder when submitting contract documents to the Design Division for the Letting (Roadway item).

District contact is Benji Philpot, TPM (573) 421-5803.

Bridge Division contact is Dan Smith, SPM (573) 526-0838.

Estimated Working/Calendar Days: 60/90

Estimated Bridge Construction Cost for FY 2020: \$1,532,000

Does NOT include inflation from Planning (3% compounded annually).

STIP Program Bridge Estimate: \$1,323,000

Bridge: Keith Kliethermes

Date: 4/2/2019

Structural Analyst

Bridge: Daniel M. Smith

Date: 4/4/2019

Structural Project Manager

District: Jessie B. Philpot

Date: 4/17/2019

Transportation Project Manager

District: Edward G. Hess

Date: 4/4/2019

District Bridge Engineer