Bridge No. 008-4/5-2.95(01215) **BARS No.** 08A012

PFC Abraham G. Sams Memorial Bridge
over ELK RIVER
COUNTY ROUTE 4/5
0.01 MI S OF WV 4
Clay County
District 1
IS NOT on the NHS
ADT - 350 - 2010

BRIDGE INSPECTION REPORT

Type of Inspections Performed:

Fracture Critical, In-Depth Inspection and Report

FIELD INSPECTED BY: Paul Kelley

Paul Kelley

STRUCTURAL EVALUATION BY: Bob K. Shafii

Bob Shafii

REVIEWED AND APPROVED BY: Tracy W. Brown

Tracy Brown

THE WEST VIRGINIA DEPARTMENT OF TRANSPORTATION
DIVISION OF HIGHWAYS

Inspection Types

NBI 90 (Routine) Date: 07/18/2012 **Frequency:** 12
(LAST DAY)

Periodic ☐
In-Depth ☑
Interim-Condition ☐

Fracture Critical ☑	**Required:** Y	**Item 93A Date:** 07/18/2012	**Frequency:** 24
Underwater ☐	**Required:** N	**Item 93B Date:**	**Frequency:**
	Underwater Equipment:		
Other Special ☐		**Item 93C Date:**	**Frequency:**
	Special Code:		
Inventory ☐		**Inspection Date:** 05/01/1993	
Interim ☐		**Inspection Date:**	
Damage/Special ☐		**Inspection Date:**	
Closure ☐		**Inspection Date:**	**Frequency:**
UB Inspection Required ☐		**Inspection Date:**	**Frequency:**
	UB Inspection Vehicle:		

PROCEDURE

Information for this inspection report was obtained June 29, 30, July 3, 5, 6, 12, 18, 2012 The inspector in charge was P. Kelley assisted by: Don Burford on June 29, 30, July 3, 5, 6, 12, 18, Harry O'Conner on June 29, July 3, 5, 6, 12, 16, 18, 24, 25, Kaleb Acree on June 29, July 3, 5, 6, 13 William Gurley on June 30, and Carolyn Lewis on July 18.

The level of inspection forming the basis for this report was general visual observation, beginning with the substructure units at the ground and waterlines, ending with the upper chords of Span Two.

The underside was observed from the ground and by use of ladders and a swinging scaffold, providing all areas hands on inspection.

Orientation of the structure units is in compliance with the plans and straightline survey.

A Periodic Inspection, made June 12, 2010 by F. Miller, rated the general overall condition of the structure poor.

SUMMARY & RECOMMENDATIONS

The structure, in general, is in poor condition. The most serious deficiencies observed, along with our recommendations, are as follows:

1. Various truss members, floor system members, truss connections and laterals exhibit section loss which should be repaired.

2. The fractured lower chord pin nuts in Spans One and Three should be repaired or replaced.

3. Damaged and loose sections of the two line guardrail should be repaired.

4. Stringer Two at Abutment Two should be raised and the expansion seal at this location replaced.

5. Span Ones Downstream Truss should be monitored during each future inspection.

6. Replacement of the frozen roller nests over Pier One and any deteriorated bearing plates is recommended.

7. The cracked and spalled areas of the substructure units should be repaired.

8. All loose truss members should be tightened and the entire structure cleaned and painted.

9. Despite, effective retrofits and maintenance over the years. The structure is fracture critical and in a general state of decline. The structure has been in service for 85 years and soon will be requiring extensive repairs to items that were previously retrofitted; we recommend prompt replacement of the structure.

A WORK ORDER DATED 8/2/2012 WAS SUBMITTED FOLLOWING THIS INSPECTION.

ENGINEERS COMMENTS

Inspection Frequency has been reduced from 24 months to 12 months due to low ratings.

This structure is programmed to be replaced with construction currently scheduled to start in January 2015.

Due to the deteriorated condition of the floor system, we recommend reducing the Gross Load Posting from the current 13 Tons to **7 Tons**.

TRAFFIC CONDITIONS

The structure is posted for 13 tons in accordance with a Commissioner's Order dated December 24, 1987 currently on file **(see Photos 3 and 4)**. The posting, to the best of our knowledge, is being obeyed.

The intersection with WV 4 at Abutment Two occasionally causes traffic to back up on the structure.

The structures narrow width (15'-9") restricts traffic flow to one direction at a time.

WATERWAY - FEATURE INTERSECTED

Divers from Materials Control Soil and Testing have removed this structure from their inspection schedule due to the low water conditions usually found. The water was shallow and clear at each substructure during our inspection; we found no scour or undercutting around the piers. We did, however, find a moderate amount of debris accumulated at the upstream end of Pier Two, the only substructure in the water during our inspection **(see Photo 5)**.

The stream aligns well with the structure and the channel appears capable of handling periods of high water. No high water marks were visible during our inspection.

Previous reports have noted minor scour at both piers; with no significant changes over the years. A Scour Evaluation Summary (DS-34) dated June 24, 2010 lists the structure as having scour potential and in the low risk category with a recommended code 8. The bridge will be inspected for scour problems during routine inspections and after any flow event producing water surface elevations greater than Q10 discharge.

No substructure plans exist.

Soundings were taken along the structures upstream side referenced to the center line of the lower chord pins at panel point intervals with a 19.8' maximum water depth located near mid span of Span Two.

Our soundings were plotted in comparison to the initial Inventory Report. However, we found no significant change since last plotted in 2008 **(see CD Sketch 1)**.

ENVIRONMENTAL CONDITIONS

The structure is subjected to deicing agents.

SUBSTRUCTURE CONDITIONS

ABUTMENT ONE

This full height reinforced concrete abutment with extended wing walls is in fair condition.

We observed normal weathering, a few vertical cracks in the seat, backwall and breast wall.

·Light to moderate spalling to the edge of the bridge seat, especially around the sight of previous core holes and on the upstream side beneath Stringer One **(see Photo 6).**

·The seat and top of the upstream wingwall which was previously repaired exhibits hairline map cracking.

·The top of the downstream wingwall at the backwall union is broken out and has fallen away; someone has shoveled blacktop to fill the gap, no repair is needed at this time.

This unit has no visible weep drains

The unprotected soil slope is in good condition and no problems such as tipping or settlement were found.

ABUTMENT TWO

This full height reinforced concrete abutment with extended wing walls is in poor condition and features a recessed breast wall/backwall creating the appearance of columns beneath the truss bearings **(see Photo 7)**.

·The underside of the seat exhibits large rebar exposing spalls, delamination and general disintegration/failure of the paste **(see Photo 8)**.

·Moderate to heavy spalling of the concrete exists along a cold joint in the upstream and downstream columns respectively **(see Photo 9)**.

·The seat face displays hairline to 1/8" wide map cracks and efflorescent stains.

·All exposed concrete surfaces are weather worn and exhibit random hairline cracks and efflorescent stains **(see Photo 10).**

·The backwall edges are chipped away exposing the aggregates.

This unit has no visible weep drains

The unprotected soil slope is in good condition and no problems such as tipping or settlement were found with this unit.

PIER ONE

This reinforced concrete square column pier with web wall is in fair condition.

·All surfaces exhibit a weather worn, aged appearance with small delaminations, hairline cracks and efflorescence stains.

·The columns and connecting web wall exhibit scarring at and around the mean waterline, especially on the forward side**.**

· Column One has an area of delamination with exposed vertical rebar on its rear face **(see Photo 71).**

PIER TWO

This unit, of the same design as Pier One, is in fair condition.

·The exposed surfaces are weather worn and exhibit random hairline cracks and efflorescence stains.

·The columns and connecting web wall exhibit moderately spalled areas around its circumference, above and below the waterline; with considerable scarring of the surfaces up to 4'-0"+ above the present water line.

·A few areas of minor spalling and cracking exist in the web wall just below the cap.

·A horizontal crack up to 5/16”in width extends nearly the full length of the seat on both the rear and forward side of the pier. It should be noted that the crack runs along the edge of a previous repair to the cap and the concrete is fairly solid **(see Photo 11).**

·A small area of the seat has failed beneath the bearing plate of Stringer One on the rear side, having no effect on the bearing at this time **(see Photo 12)**.

SUPERSTRUCTURE CONDITIONS

FRACTURE CRITICAL

This structure has fracture critical members consisting of the Floor Beams,Pins and the tension members of each truss (**Span Two** Lower Chords L0 thru L8 , U1-L1, U1-L2, U2-L3,U3-L4 **Spans One and Three** the Lower Chords L0 thru L5 ,U1-L1, U1-L2 . These members remain in fair condition with varying degrees of section loss to be documented later in this report.

Overall the pin connected truss superstructures is in poor condition.

BEARINGS

The various bearing devices are in poor condition.

We found the bearings of Stringer Two at Abutment Two below grade and not supporting the grid deck properly. We believe this condition is due to Stringer Two being plated after a partial failure. A work order was submitted to correct his situation.

All of the bearings on the entire structure are corroded and show no indications of movement during expansion and contraction **(see Photo 13)**. The bearing shoes of Span Two (Main Span) are heavily rusted over Pier Two and the roller nests over Pier One are corroded and frozen.

We found both the upstream and downstream trusses at Abutment One in contact with the backwall and the

anchor bolts of the downstream truss failed at this location.

It is further noted that the bearings are in the fully expanded position at Pier One end of Span One and the expansion ends of Spans Two and Three.

We also found the stringers over the piers appearing to be floating slightly above their respective masonry plates, suspended from the grid deck. However, we did not observe any excessive movement under load. Previous reports have stated that this gap was 1/8"to 5/16". It appears that the failure and subsequent repairs of the grid decking at each pier has actually helped this situation, allowing the stringers to settle on to the bearing plates, somewhat, as the gap is now about 1/16" **(see Photo 14)**.

Previous reports have indicated that a possible problem was created during the renovation work performed in 1978 by bolting the stringer ends to Abutment One, thereby preventing normal expansion and contraction. We agree that both ends of Spans One were originally expansion. However, with the stringers attached to each floor beam and the trusses now against the backwall it is no longer an issue.

FLOORBEAMS

The floor beams are in fair condition.

All of the fracture critical floor beams on the structure were retrofitted in 1978 with cover pates to the top and bottom flanges and full length web plates. Although, the floor beams now display minor deterioration, primarily to the top flanges directly under each stringer, the members have substantially more section now than when new. The downstream end of Floor Beam Two in Span Two is the exception with moderate deterioration near the interior vertical gusset **(see Photo 15) also (refer to Photo 72)** .

STRINGERS

The stringers are deteriorated throughout the structure **(see Location Sketch Sheets, SL 1 thru 3)**. **(DT SKETCHES 4 THRU 9)**

It should be noted that his structure has only three stringers supporting the grid deck, spanning 15' in Spans One and Three and 18' in Span Two.

The stringers are continuous over the floor beams and spliced at those points with web plates as indicated in the Inventory Inspection and Report. The majority of these splice plates are now heavily deteriorated. It should be noted that the stringers do not function as continuous members.

Span One

Stringer Ones Web has been plated in the bearing area at Abutment One and displays sporadic areas of deterioration to the web for the entire length of the span estimated at up to 40% Web Loss; requiring no repair at this time.

Stringer Twos Web has been plated for the full length of Panels One, Two and Three in this Span. However, we found the bottom flange at the middle of Panel One to have a calculated deterioration of 63% Loss **(Work Order)**.

Stringer Twos Web is now failing (81% Web Loss) in Panel Four and most of Panel Five **(see Photo 16) (Work Order).**

Stringer Three now displays a 71% Web Loss and 46% Total Loss at Abutment One **(see Photo 17) (Work Order)**.

Stringer Three also displays random areas of deterioration **(see Photo 18)** primarily to the upstream side of the web, requiring no repair at his time.

Span Two

Stringer Twos Web has moderate to heavy deterioration primarily to the upstream side ranging from 35% to 50% Loss and extending for the full length of all panels with the exception of Panels Five and Seven which have no significant loss. Total Losses for Stringer Two in this Span is 26% or less **(see Photo 19)** as both of the flanges are good for nearly the entire span.

Stringers One and Three have random areas of deterioration to their webs of up to **25 %** in this span. However, their top and bottom flanges have nearly no deterioration, resulting in Total Losses of less than 10%.

No work order is being submitted for span twos floor system at this time.

Span Three

Stringer Twos Bottom Flange displays a 60% Loss at mid panel, Panel Five **(Work Order)**.

Stringer Two Web is failing for the entire length of Panel Four and part of Panel Five **(see Photos 20 and 21) (Work Order).**

Stringer One displays Total Losses in the 40% range in and around the bearing area of Abutment Two, requiring no repair at this time.

· Stringer Three has loss to the web in the bearing area in excess of 50% **(Work Order).**

SPANS ONE AND THREE (PONY TRUSS SPANS)

These members remain in fair condition, and exhibit several significant deficiencies despite the renovation in 1978 and other repairs subsequent to that time **(SEE LOCATION SKETCHES 8 THRU 11) (SEE DT SKETCHES 12 THRU 17).**

LOWER CHORDS

The lower chords in these two spans are in fair condition displaying mild to moderate amounts of bowing and alignment distortions. We attribute this to a lack of proper tension in some members and/or inadequate room for expansion.

All lower chord eye bar members in these spans have been retrofitted by the addition of loop bars; adding significant section and redundancy to these members. Several of the original eye bars are severely deteriorated at the sides and end of the loops. Span Ones Upstream Truss, L3 – L4 @ L4 interior eye bar

(main) has 61% Loss (38.6 % remaining section) and Span Threes Upstream Truss, L1 – L2 @ L2 exterior eye bar has 28% Loss (71.6 remaining section). L4 – L5 @ L4 interior eye bar also of Span Threes upstream truss has similar effective loss as those at L2 **(see Photos 22 thru 25).**

We found spot welds on several of the original eye bars and retrofit loop bars **(see Photo 26).**

DIAGONALS

All diagonals in these spans have been replaced and or retrofitted with loop bars which are in good condition; the only deficiency of these members being heavy surface rust on the threads.

VERTICALS

Vertical members in these spans are in fair condition; with losses primarily to the hip verticals U1-L1 and U4 – L4, which are in tension. The worst of these being the U1 – L1 of the Downstream Truss in Span One **(see Photo 27)** However, this member has been previously retrofitted; with the addition of steel plates on both the upstream and downstream sides of the member and needs no attention at this time.

The U1 – L1 vertical of the Upstream Truss in Span One displays a 21% Loss and the U4 – L4 of the same truss in Span One displays a 15% Loss **(see Photo 28 and Sketch 8 & 9)**.

The U4 – L4 vertical member in Span Threes Downstream Truss has collision damage which should have little effect on function **(see Photo 29)**

The other vertical members of these two spans have no significant deterioration with the exception of moderate loss to a few of the batten Plates **(see Photo 30)**

PINS

The Pins are in fair condition being moderately deteriorated; with documented loss up to 19% at L1 of Span Ones Downstream Truss **(see Photo 31 and Sketch 10).** The pin at L1 of the Span Ones Downstream Truss displays a similar loss as does the pin at L4 of the Span Threes Upstream Truss.

It should be noted that some areas on the pins cannot be accessed for visual inspection.

UPPER CHORDS & END POST

The Upper chords and end post are in fair condition in these spans; having been previously retrofitted along their entire length; adding angle on both sides of the chord and replacing the lower portion of the end post at each abutment both upstream and down.

We found some deterioration to the interior of the end post in Span One at U5 upstream and what may have been intentional cuts performed during maintenance to the U5 end post of the downstream truss **(see Photos 32 and 33)** each of these areas are backed up by retrofits and cause no concern at this time.

We also found a misalignment in the form a swag to Span Ones Downstream Truss **(see Photo 34)** we recommend monitoring this situation during future inspections **(see CD Sketch 4)** .

Previous reports have noted collision damage to both end post at Abutment Two and it is obvious by the damage to the handrail that these elements have been struck in the past. However, on examination we feel that the misalignment of the end post is consistent with what is generally found when major renovations have

been done on a truss and no attempts at repair are warranted.

We found pack rust under the top connection plate; now failing rivets in Span Ones Upstream Truss with 40% loss to the top cover plate at the edge of the connection plate **(see Photo 35) (Work Order)** Span Ones Downstream Truss has similar loss to the cover plate at its connection, but the rivets have been replaced with bolts.

Several of the pin retainer nuts in these spans are cracked **(see Photo 36)** and several more have been retrofitted by welding a plate washer to them.

We found the pin nuts failed at L1 of Span Ones Downstream Truss and L4 of Span Threes Downstream Truss **(see Photo 37) (Work Order).**

Spans One and Three both have U-Bolt hangers at each floor beam connection; these members display varying degrees of deterioration with the worst being in Span One **(see Photo 38).** However, the floor beams are supported by vertical gusset plates with riveted and bolted connections; the U-Bolt hangers were installed during a renovation to hold the members in place and are not needed in these spans.

The lower lateral bracing and connections in these spans are in poor condition; with connections at each substructure failing or near failure and heavy deterioration to the lateral members themselves **(see Photo 39 and 40)**

SPANS TWO (THRU TRUSS SPAN)

The primary members in this span, in general, are in fair condition **(SEE LOCATION SKETCHES 18 AND 94)**.

NOTE: INSPECTECH ONLY TAKES 18 SECTION LOSS ATTACHMENTS , SKETCHES 19 THRU 24 ARE LISTED AS PHOTOS 79 THRU 83

LOWER CHORDS

The lower chords in this span are in fair condition displaying mild to moderate amounts of bowing and alignment distortions. As in Spans One and Three we attribute this to a lack of proper tension in some members and/or inadequate room for expansion.

Some of the lower chord eye bar members in this span have been retrofitted by the addition of loop bars; adding significant section and redundancy to these members. Several of the eye bars display moderate section loss, primarily near the connections. However, none display any significant effective loss; therefore, the deterioration should have no effect on the structures load capacity **(see Photos 40).**

As in Spans One and Three we found spot welds on several of the original eye bars and retrofit loop bars**.**

DIAGONALS

The diagonal members in this span are in fair condition displaying no effective loss.

VERTICALS

Vertical members in this span are in fair condition; with the hip verticals which are in tension being retrofitted with loop bars. The remaining verticals display minor deterioration around several of the lower connections and holes that have previously been retrofitted on the opposite side at nearly all of the knee brace connections for the upper struts **(see Photo 41)** we could not obtain a good photo of the holes behind each of these plates. These deficiencies should have no effect on load capacity at this time.

PINS

The pins in this span are in fair condition being moderately deteriorated. However, several of the connections in this span have pack rust and clearances which are too tight to allow visual inspection. Based on our limited inspection of these members we feel the deterioration is similar or less than the 19% Loss documented in the other two spans.

The pins at L4 downstream and L2 upstream are protruding with the nuts not completely installed **(see Photos 42 and 43)** requiring no repair**.**

VERTICAL GUSSET PLATES

The upper and lower vertical gusset plates are in fair and poor condition respectively.

The vertical gusset plates at the top display no significant loss.

The gusset plates at the lower connections have all been retrofitted, but three different retrofits were employed.

The connections at L3, L4 and L5 of both the upstream truss and downstream truss were completely renovated by replacing both interior and exterior gussets with 3/4” plate and in addition now have a u-bolt also supporting the floor beam.

The connection at L2 upstream has a replaced 1/2’ plate interior gusset with original (deteriorated) exterior gusset and 3/4” square bar retrofit.

The connection at L2 downstream has a replaced 1/2’ plate exterior gusset with original (deteriorated) interior gusset and 3/4” square bar retrofit.

The vertical gussets at L1 and L6 both up and downstream have only the original heavily deteriorated gussets and the 3/4” square bar retrofits.

The vertical gussets at L6 downstream is the controlling member as the interior and exterior gusset both have 100% loss below the pin and deterioration to the square bar retrofits **(see Photo 40)** we recommend considering additional retrofits at the L6 and L1 connections in Span Two. We also found heavy loss to a few of these same connections above the pin. However, this should not be a safety concern.

UPPER CHORDS & END POST

The upper chords and end post are in fair condition in these spans; having been previously retrofitted along

their entire length; adding angle on both sides of the chord.

The top chord of the Downstream Truss is damaged in a couple of places with a noticeable sweep in the chord between U2 and U3 **(see Photos 44 and 45)** this misalignment is likely due to construction or renovation damage

We found the top cover plate deteriorated at the edge of each connection plate up to 90% loss, due to pack rust (at upper connections and portal bracing) **(see Photos 46 thru 48)**. However, the extent is only 1/2 to 3/4 of an inch for each.

LOWER LATERALS AND UPPER LATERALS

Both the upper and lower laterals and lateral connections in this span are in critical condition; with the lateral connections near failure and several of the connections already failed **(see Photos 46 and 47)** and **(Photos 48 thru 53)**. In addition, the area of the laterals which runs through the floor beams or connections in some cases cannot be visually inspected.

PORTAL BRACING

The portal bracing is in fair condition; with no significant section loss. The only noteworthy deficiency being the top gusset plates which are bent from pack rust at the connection to each end post **(see Photo 54)**.

SWAY STRUTS AND KNEE BRACES

The sway struts are in fair condition overall, with moderate loss at the connections to the top chord and to the knee braces **(see Photos 55 and 56)** we found the underside of sway strut top angles deteriorated up to 50% with pinholes, from the pack rust at the connection to the top chord cover plate**.**

The knee braces are in fair condition; also displaying only moderate losses at the connections.

FASTENERS RIVETS & BOLTS

Fasteners in all of the spans truss members are in general in good condition; with the exception of the failed rivets in Span Ones Upstream Truss splice connection (failed due to pack rust) **(see Photo 25)**.

EXPANSION JOINT OPENINGS

The neoprene sealed expansion dams are in poor condition.

Areas of the expansion dams have been removed at the piers during deck repairs.

The dam over Pier Two has an hourglass shape, narrow at the roadway centerline and markedly wider at the ends.

The seals are extruded and torn at Abutment One and each Pier and Abutment Twos expansion seal is hanging under the expansion dam.

The deck side of the expansion dam at Abutment Two is vertically offset is weak and 1 1/4” +/- at the center making for an abrupt transition **(see Photos 57 thru 61)**.

No expansion measurements were recorded during this inspection as it is clear that the superstructure is bound and not functioning as designed.

DECK

The 5 3/16" open steel grid deck is in fair condition and provides full lateral support. However, areas near each substructure are now either failed or have been repaired by removing the grid deck and replacing sections with steel plate running between stringers, covered with either HLBC wearing coarse or some form of other concrete

Areas of the grid deck away from the substructures are in good condition with little loss to the bearing bars or other elements **(see Photos 62 thru 66)** also **(see Photo 60).** In addition, state forces performed additional deck repairs in areas near PierOne and Pier Two following this inspection.

The grid deck surface is smooth and an acceptably smooth ride is provided.

The channel beam wheel guards remain in fair condition.

We found a section of the wheel guard loose from the grid deck at Pier Two, upstream **(see Photo 67).**

Deck drains are not needed in an open grid deck.

SIDEWALKS

This structure has no sidewalks.

RAILINGS

The two-line angle railing is in fair condition. The downstream railing has collision damage, but is still fairly solid **(see Photo 68)**. The upstream top support railing, which the inspection crews and maintenance crews use to support the scaffold hangers, is not secure **(see Photo 69 and 70) (Work Order)** Other areas exhibit only random minor collision damage and surface rust with light pitting.

The flex-beam approach guardrail at Abutment Two remains in good condition, but stops well short of the structure.

The two line rail appears incapable of restraining an out of control vehicle at any speed.

SIGNS

13-Ton Weight Limitsigns in good condition exist at each end of the structure **(see Traffic)**. Additional signing includes **Hazard Paddles** present at Abutment One downstream and Abutment Two upstream, and an advance **One Lane Bridge** sign on Abutment Ones approach. A **Stop Sign** in good condition is present on the opposite side of Rt 4 @ Abutment Two as well**.**

PAINT

Paint, limited to a red primer coat, is in critical condition due to overall rusting, section losses, and lack of any finish coat **(refer to Superstructure Photos).**

APPROACH SLABS & APPROACH PAVEMENT

The asphalt approach roadways are in good condition. However with the approach to Abutment One being slightly settled and Abutment Twos approach being inclined and slightly settled, results in abrupt transitions.

No loss of vehicular control is anticipated.

MISCELLANEOUS

State forces completed repairs to the worst areas of the deck (@ each pier) following our inspection.

INSPECTION HISTORY

Checklist:	September 20, 1971
Original Periodic Inspection:	September 6, 1973
Second Original Periodic Inspection:	July 8, 1980
Revised periodic Inspection:	September 20, 1983
Revised Periodic Inspection:	October 2, 1985
Third Original Periodic Inspection:	October 1, 1987
Materials Underwater Inspection:	September 1, 1988
Revised Periodic Inspection:	May 1, 1989
Periodic Inspection:	May 1, 1991
Inventory Inspection and Report:	May 12, 1993
In Depth Periodic Inspection:	May 20, 1993
Periodic Inspection:	May 9, 1995
Periodic Inspection:	June 21, 1997
In Depth Periodic Inspection:	May 19, 1999
Periodic Inspection:	May 1, 2001
Interim Inspection:	May 1, 2002
Periodic Inspection:	June 6, 2003
Interim Inspection:	May 18, 2004
In Depth Periodic Inspection:	June 8, 2006
Periodic Inspection:	June 12, 2008
Periodic Inspection:	June 24, 2010

BARS No. : 08A012 **Date :** 07/18/2012

PHOTO 1 - ELEVATION VIEW LOOKING DOWNSTREAM L-R

PHOTO 2 - END VIEW LOOKING NORTH ALONG INCREASING MILEPOST

PHOTO 3 - POSTING SIGN @ ABUTMENT ONE APPROACH

PHOTO 4 - POSTING SIGN @ ABUTMENT TWO APPROACH

PHOTO 5 - MODERATE AMOUNT OF DEBRIS AGAINST PIER TWO

PHOTO 6 - SPALLING TO SEAT FACE OF ABUTMENT ONE UNDER STRINGER ONE (18"IN LENGTH, NOT AFFECTING THE BEARING)

PHOTO 7 - OVERALL OF ABUTMENT TWO

PHOTO 8 - SEVERE DETERIORATION OF CONCRETE & EXPOSED REBAR, ABUTMENT TWO

PHOTO 9 - SPALLING ALONG COLD JOINT IN COLUMN ONE OF ABUTMENT TWO

PHOTO 10 - MAP CRACKING WITH EFFLORESCENCE, REAR SIDE, COLUMN TWO OF ABUTMENT TWO

PHOTO 11 - UP TO 5/16" CRACK ALONG REAR OF PIER TWOS CAP (SEAM OF FORMER REPAIR) TYPICAL OF FORWARD SIDE AS WELL

PHOTO 12 - SPALLING UNDER BEARING AREA, SPAN TWO UNDER STRINGER ONE (BEARING REMAINS SUPPORTED)

PHOTO 13 - TYPICAL CONDITION OF BEARINGS

PHOTO 14 - STRINGERS @ PIER TWO NOT RESTING ON SOLE PLATE

PHOTO 15 - MODERATE LOSS TO FLOORBEAM TWO, SPAN TWO

PHOTO 16 - FAILED WEB STRINGER TWO, PANEL 4, SPAN ONE

PHOTO 17 - DETERIORATION TO STRINGER THREE @ ABUTMENT ONE

PHOTO 18 - DETERIORATION STRINGER THREE, PANEL TWO, SPAN ONE

PHOTO 19 - STRINGER TWO, SPAN TWO, PANEL TWO SECTION LOSS

PHOTO 20 - FAILED WEB, STRINGER TWO PANEL FOUR, SPAN THREE

PHOTO 21 - FAILED WEB, STRINGER TWO PANEL FIVE, SPAN THREE

PHOTO 22 - L3 -L4 @ L4 EYE BAR, SPAN ONES UPSTREAM TRUSS (61% LOSS TO MAIN) RETROFITTED

PHOTO 23 - L3 -L4 @ L4 EYE BAR, SPAN ONES UPSTREAM TRUSS (SAME AS PHOTO 13 FOR LOCATION PURPOSES)

PHOTO 24- L1 - L2 @ L1 EYE BAR, SPAN THREES UPSTREAM TRUSS (61% LOSS TO MAIN) RETROFITTED

PHOTO 25 - L0 -L1 @ L1 EYE BAR, SPAN THREES UPSTREAM TRUSS (L1 - L2 @L1 SIMILAR EFFECTIVE LOSS)

PHOTO 26 - EXAMPLE OF WELDS TO LOOP BARS AND ORIGINAL EYE BARS TYPICAL OF ALL SPANS

PHOTO 27 - DETERIORATED ANGLES U1 - L1 VERTICAL, SPAN ONES DOWNSTREAM TRUSS (RETROFITTED)

PHOTO 28 - U1 - L1 VERTICAL, SPAN ONES UPSTREAM TRUSS 21% TOTAL LOSS (U4 - L4 VERTICAL, SAME TRUSS SIMILAR APPEARANCE 15% TOTAL LOSS)

PHOTO 29 - COLLISION DAMAGED INTERIOR ANGLE OF U4 - L4 VERTICAL, SPAN THREE

PHOTO 30 - HOLE IN BATTEN PLATE U3-L3 VERTICAL OF SPAN ONES UPSTREAM TRUSS APPROXIMATELY 30% LOSS (WORSE EXAMPLE IN THESE SPANS)

PHOTO 31 - 19 % SECTION LOSS TO PIN SPAN ONE DOWNSTREAM TRUSS L1

PHOTO 32 - LOSS TO INT. CHANNEL OF END POST @ L5, SPAN ONES UPSTREAM TRUSS (HAS CRUDE RETROFIT ON OPPOSITE SIDE OF CHANNEL AND A PLATE ON TOP OF

PHOTO 33 - RETROFIT THAT APPEARS TO HAVE BEEN CUT (INTERIOR OF CHANNEL HAS HEAVY PLATE)

PHOTO 34 - MEASUREMENT OF HORIZONTAL MISALIGNMENT IN SPAN ONES DOWNSTREAM TRUSS (SEE SKETCH)

PHOTO 35 - PACK RUST UNDER THE EDGE OF CONNECTION PLATE AND FAILED RIVETS

PHOTO 36 - EXAMPLE OF CRACKED NUTS AT PIN CONNECTIONS ON THE STRUCTURE

PHOTO 37 - FAILED PIN RETAINER NUTS(TAKEN @ L1, SPAN ONE UPSTREAM L4, SPAN THREE DOWNSTREAM SIMILAR)

PHOTO 38 - DETERIORATED HANGER BOLT @ FLOORBEAM FOUR, SPAN ONE, UPSTREAM

PHOTO 39 - DETERIORATED LATERAL BRACING

PHOTO 40 - 100% LOSS OF ORIGINAL GUSSET PLATES AND MOST SIGNIFICANT LOSS TO EYE BAR IN SPAN TWO

PHOTO 41 - RETROFITTED VERTICALS @ KNEE BRACE CONNECTION, 100% LOSS TO INTERIOR VERTICAL BEHIND THIS RETROFIT (TYPICAL)

PHOTO 42 - PROTRUDING PIN ON EXTERIOR OF LOWER CONNECTION @ L4 DOWNSTREAM SPAN TWO

PHOTO 43 - EXPOSED THREADS OF NUT, LOWER CONNECTION @ L2 UPSTREAM SPAN TWO

PHOTO 44 - UPPER CHORD OF DOWNSTREAM TRUSS SPAN TWO BENT ABOUT 4' FORWARD OF U3

PHOTO 45 - UPPER CHORD OF DOWNSTREAM TRUSS SPAN TWO BENT ON THE EXTERIOR CAUSING A UPSTREAM SWEEP BETWEEN U2 & U3

PHOTO 46 - UPPER CHORD COVER PLATE 90% DETERIORATION @ U3 OF UPSTREAM TRUSS SPAN TWO & FAILED UPPER LATERAL BRACING

PHOTO 47 - UPPER CHORD COVER PLATE 90% DETERIORATION DOWNSTREAM TRUSS SPAN TWO @ U7. & FAILED LATERAL BRACING CONNECTION

PHOTO 48 - UPPER CHORD COVER PLATE 90% DETERIORATION DOWNSTREAM TRUSS SPAN TWO

PHOTO 49 - FAILED UPPER LATERAL BRACING @ U7 UPSTREAM SPAN TWO

PHOTO 50 - CONDITION OF UPPER LATERALS INSIDE OF CONNECTIONS

PHOTO 52 - FAILED LOWER LATERAL PANEL ONE SPAN TWO

PHOTO 53 - FAILED LOWER LATERAL PANEL ONE, SPAN TWO (AFTER WE GOT IT OFF THE SCAFFOLD)

PHOTO 54 - PORTAL BRACING GUSSET PLATE (TYPICAL) PHOTO TAKEN FROM THE TOP

PHOTO 55 - SWAY STRUTS DETERIORATION AND BENDING FROM PACK RUST @ CONNECTIONS TO TOP CHORD (TYPICAL)

PHOTO 56 - SWAY STRUTS DETERIORATION @ KNEE BRACE CONNECTION (TYPICAL)

PHOTO 57 - EXPANSION DAM @ ABUTMENT ONE, WEAK AND SEAL TORN AND LEAKING

PHOTO 58 - EXPANSION DAM @ ABUTMENT TWO AND SEAL HANGING UNDERNEATH

PHOTO 59 - EXPANSION DAM @ ABUTMENT TWO SETTLED 1 1/4'

PHOTO 60 - TYPICAL OF FAILING DECK & EXPANSIONS @ PIERS (PIER TWO)

PHOTO 61 - SECTION OF EXPANSION DAM THAT HAS BEEN REMOVED @ PIER ONE

PHOTO 62 - SEVERELY DETERIORATED BEARING BARS IN AREAS NEAR THE SUBSTRUCTURES WHICH HAVE NOT BEEN REPAIRED

PHOTO 63 - TEMPORARY REPAIRS TO GRID DECK @ PIER ONE

PHOTO 64 - PREVIOUS REPAIR @ ABUTMENT TWO (DETERIORATING BLACKTOP)

PHOTO 65 - UNDERSIDE SPAN TWO

PHOTO 66 - TYPICAL OF TOP OF GRID DECK BETWEEN SUBSTRUCTURES

PHOTO 67 - LOOSE CURB GUARD @ PIER TWO UPSTREAM

PHOTO 68 - COLLISION DAMAGED RAILING AT ABUTMENT TWO DOWNSTREAM

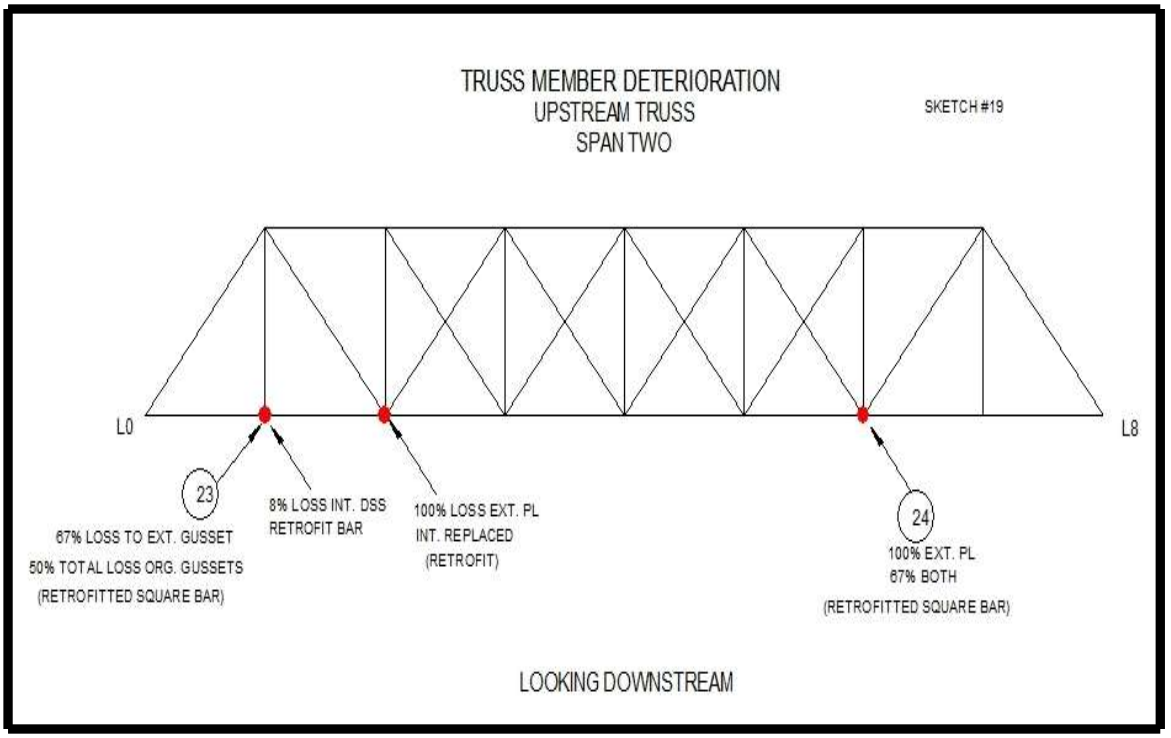
PHOTO 69 - MISSING FASTENERS TO RAIL SYSTEM @ L2 U2 VERTICAL SPAN THREE

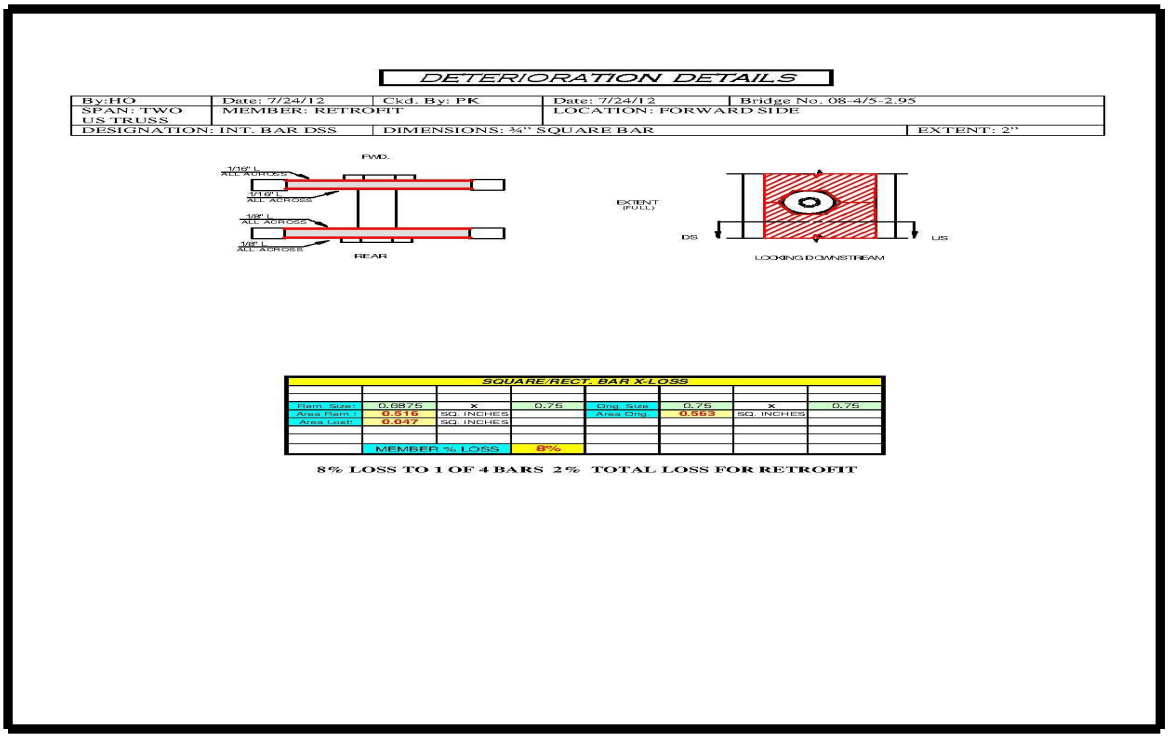
PHOTO 70 - FAILING FASTENERS IN TOP RAILING, SPAN TWO

PHOTO 71 - REBAR EXPOSED SPALLING TO REAR SIDE COLUMN ONE PIER ONE

PHOTO 72 - TYPICAL OF RETROFITTED FLOOR BEAMS

CRUDE RETROFIT TO INTERIOR OF L6 @ PIER 1


TRUSS MEMBER DETERIORATION
UPSTREAM TRUSS
SPAN TWO
SKETCH #19
L0
L8
23
67% LOSS TO EXT. GUSSET
50% TOTAL LOSS ORG. GUSSETS
(RETROFITTED SQUARE BAR)
8% LOSS INT. DSS
RETROFIT BAR
100% LOSS EXT. PL
INT. REPLACED
(RETROFIT)
24
100% EXT. PL
67% BOTH
(RETROFITTED SQUARE BAR)
LOOKING DOWNSTREAM


DETERIORATION DETAILS
By:HO | Date: 7/24/12 | Ckd. By: PK | Date: 7/24/12 | Bridge No. 08-4/5-2.95
SPAN: TWO US TRUSS | MEMBER: RETROFIT | LOCATION: FORWARD SIDE
DESIGNATION: INT. BAR DSS | DIMENSIONS: ¾" SQUARE BAR | EXTENT: 2"
FWD.
REAR
EXTENT (FULL)
DS
US
LOOKING DOWNSTREAM
SQUARE/RECT. BAR X-LOSS
Rem. Size: 0.6875 x 0.75 Orig. Size 0.75 x 0.75
Area Rem.: 0.516 SQ. INCHES Area Orig. 0.563 SQ. INCHES
Area Lost: 0.047 SQ. INCHES
MEMBER % LOSS 8%
8% LOSS TO 1 OF 4 BARS 2% TOTAL LOSS FOR RETROFIT

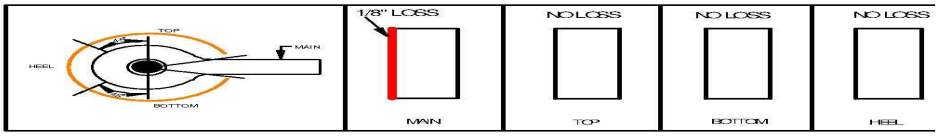
STRUCTURES DIVISION

EYEBAR DETERIORATION DETAILS

SKETCH #

By:	HO	Date:	7/24/2012	Ckd. By:	PK	Date:	7/24/2012	Bridge No.:	08-4/5-2.95	Sheet
Span	Member @ End			US/DS	INT./EXT.	End Type	Rect./Sq.	Distance	Location When Not @ Pin	
TWO	L1L2 @ L2			USS	INT.	RND.	Rect.		From	Extent
									END OF MAIN	

	Orig. Size:	2" X 7/8"		Area Remaining:		2.125	X	0.75	1.59375	
MAIN	Orig. Area:	1.75	Orig. Area Main:		1.75					
	Section Remaining	91.1%	Effective Section Remaining		91.1%					
	Orig. Size:			Area Remaining:			X		0	
TOP	Orig. Area:		Orig. Area Main:							
	Section Remaining	#DIV/0!	Effective Section Remaining		#DIV/0!					
	Orig. Size:			Area Remaining:			X		0	
BOTTOM	Orig. Area:		Orig. Area Main:							
	Section Remaining	#DIV/0!	Effective Section Remaining		#DIV/0!					
	Orig. Size:			Area Remaining:			X		0	
HEEL	Orig. Area:		Orig. Area Main:							
	Section Remaining	#DIV/0!	Effective Section Remaining		#DIV/0!					
	Controlling Section Loss =		smallest section above		91.1			8.90	%	
	Controlling Effective % Loss =		smallest effective remaining		91.1			8.90	%	



DETERIORATION DETAILS

By: HO	Date: 7/24/12	Ckd. By: PK	Date: 7/24/12	Bridge No. 08-4/5-2.95
SPAN: TWO	MEMBER: GUSSET PLATE		LOCATION: 2 ¾" FROM CL OF PIN @ L1	
DESIGNATION: EXT. PL. @ L1	DIMENSIONS: 3/8" PLATE x 7"			EXTENT: FULL

INTERIOR PLATE	Ext Lngth Remaining		0.00	Int Lngth Remaining		0.00
Hole(s)	Loss	Length	Loss	Length	Loss	Length
Exterior Side	0.125	7.000				
Interior Side	0.125	7.000				
Edge Loss "A"	0.375		AREA LOST		% LOSS	
Edge Loss "B"	0.375		1.750		67%	

EXTERIOR PLATE	Ext Lngth Remaining		0.00	Int Lngth Remaining		0.00
Hole(s)	Loss	Length	Loss	Length	Loss	Length
Exterior Side	0.063	7.000				
Interior Side	0.063	7.000				
Edge Loss "A"	0.375		AREA LOST		% LOSS	
Edge Loss "B"	0.375		0.875		33%	

AO	2.625
ACT	5.250
PL Length	7.000
PL Thk	0.375
# of Plates	2.000
Total Area Lost	2.63
Total Member Loss	50%

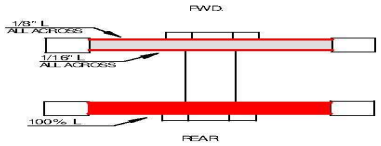
West Virginia Division of Highways

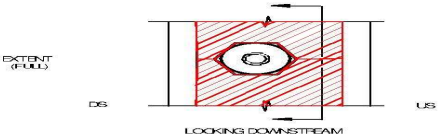
Photos

BARS No. : 08A012 **Date :** 07/18/2012

DETERIORATION DETAILS

By: HO	Date: 7/24/12	Ckd. By: PK	Date: 7/24/12	Bridge No. 08-4/5-2.95
SPAN: TWO	MEMBER: GUSSET PLATE		LOCATION:2 ¾'' FROM CL OF PIN @ L6	
DESIGNATION:EXT. PL. @ L6	DIMENSIONS:3/8'' PLATE x 7''			EXTENT: FULL





INTERIOR PLATE	Ext Lngth Remaining		0.00	Int Lngth Remaining		0.00
Hole(s)	Loss	Length	Loss	Length	Loss	Length
Exterior Side	0.188	7.000				
Interior Side	0.188	7.000				
Edge Loss "A"	0.375		AREA LOST		% LOSS	
Edge Loss "B"	0.375		2.625		100%	

EXTERIOR PLATE	Ext Lngth Remaining		0.00	Int Lngth Remaining		0.00
Hole(s)	Loss	Length	Loss	Length	Loss	Length
Exterior Side	0.063	7.000				
Interior Side	0.063	7.000				
Edge Loss "A"	0.375		AREA LOST		% LOSS	
Edge Loss "B"	0.375		0.875		33%	

AO	2.625
AOT	5.250
PL Length	7.000
PL Thk.	0.375
# of Plates	2.000
Total Area Lost	3.50
Total Member Loss	67%

CHANNEL PROFILE

LOOKING DOWNSTREAM

	A1	14.6	29.2	43.8	58.4	73.0	87.6	102.2	116.8	131.4	146.0	160.6	175.2	189.8	204.4	219.1	233.7	248.3	262.9	277.5	A2
1993	10.2	14.0	17.0	19.7	25.6	29.5	29.5	31.8	35.7	36.7	37.8	38.8	38.5	35.5	30.7	30.5	28.7	26.0	24.0	15.5	10.3
2012	10.0	13.9	16.8	18.6	24.0	29.4	30.1	31.5	35.6	36.8	38.0	38.6	38.2	35.5	30.8	30.4	28.5	26.2	23.7	14.1	9.2

DATUM: ℄ OF PIN AT EACH PANEL POINT

The Loose Truss Members Spans One and Three (2012)

SPAN ONE

UPSTREAM	DOWNSTREAM
L0-L1 Loop Bar & Int. Eye Bar	L0-L1 Loop Bar
L3-U4 Int. Eye Bar	L1-L2 Int. Eye Bar
U1-L2 Ext. Eye Bar	L3-U4 Int. Eye Bar

SPAN THREE

UPSTREAM	DOWNSTREAM
L1-L2 Int. Eye Bar	L2-L3 Loop Bar
L3-U4 Int. Eye Bar	L3-U4 Loop Bar
L4-L5 Int. Eye Bar	L3-U4 Int. Eye Bar
	L4-L5 Ext. Eye Bar

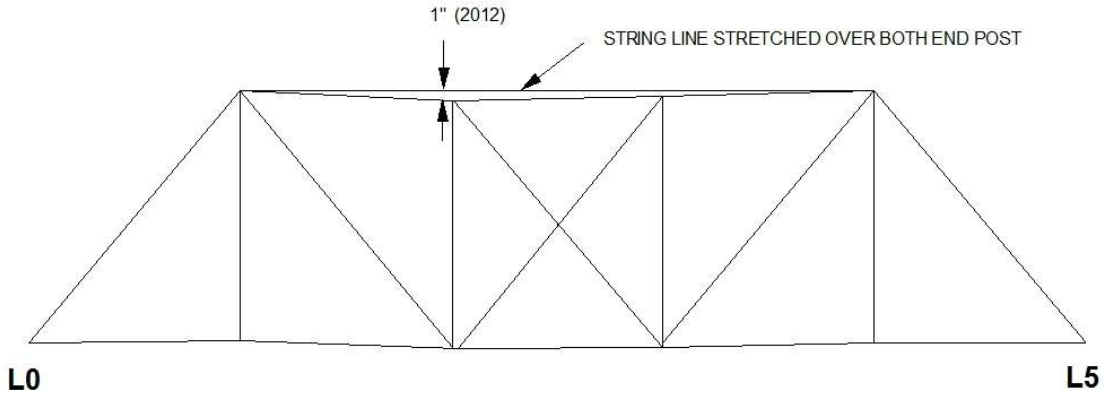
Loose Truss Members Span Two (2012)

UPSTREAM	DOWNSTREAM
U1-L2 Int. Eye Bar	L2-U3 Loop Bar Counter
L2-U3 Loop Bars Counter	U3-L4 Int. Eye Bar
U3-L4 Int. Eye Bar	L4-U5 Ext. Eye Bar
L3-U4 Loop Bar	L5-U6 Ext. Eye Bar
L4-U5 Int. Eye Bars	
L5-U6 Eye Bars & Int. Loop Bar	
L7-U7 Loop Bar	

SPAN ONE

DOWNSTREAM TRUSS

(LOOKING DOWNSTREAM)



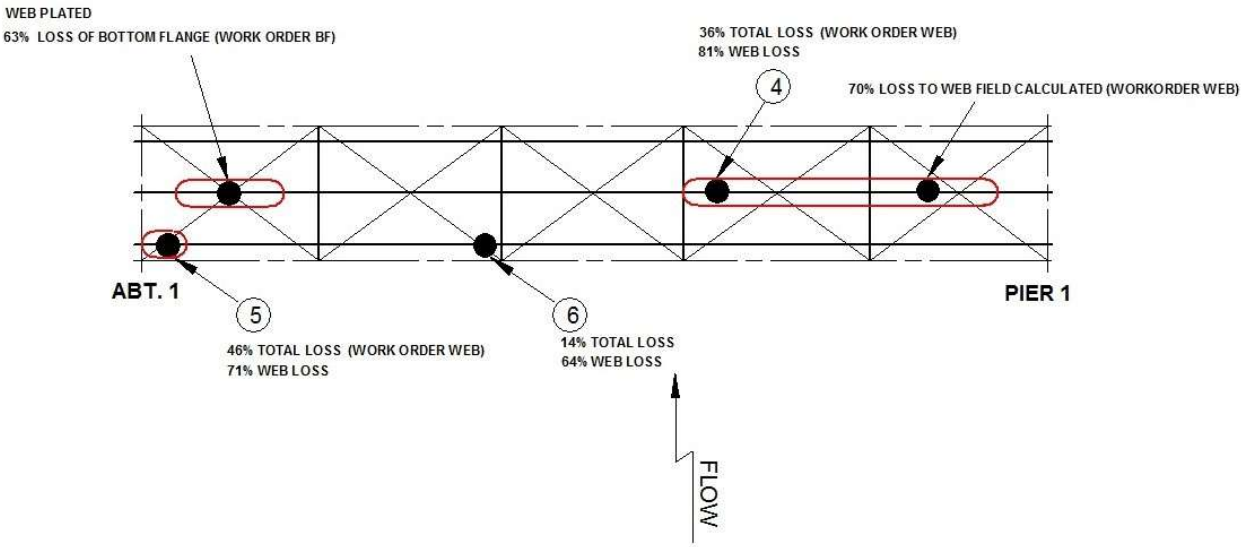
NOTE: TOP OF TRUSS MARKED WITH BLUE PAINT @ MEASUREMENT LOCATION & POINTS ON END POST

2012	XXXX	XXXX	XXXX	XXXX
1"	XX	XX	XX	XX

LOCATION of FLOORSYSTEM DETERIORATION

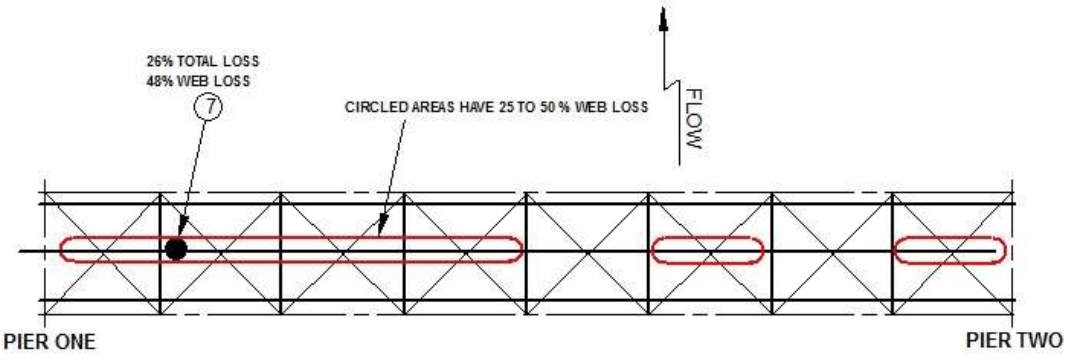
SKETCH #1

SPAN ONE



LOCATION of FLOORSYSTEM DETERIORATION SKETCH #2

SPAN TWO

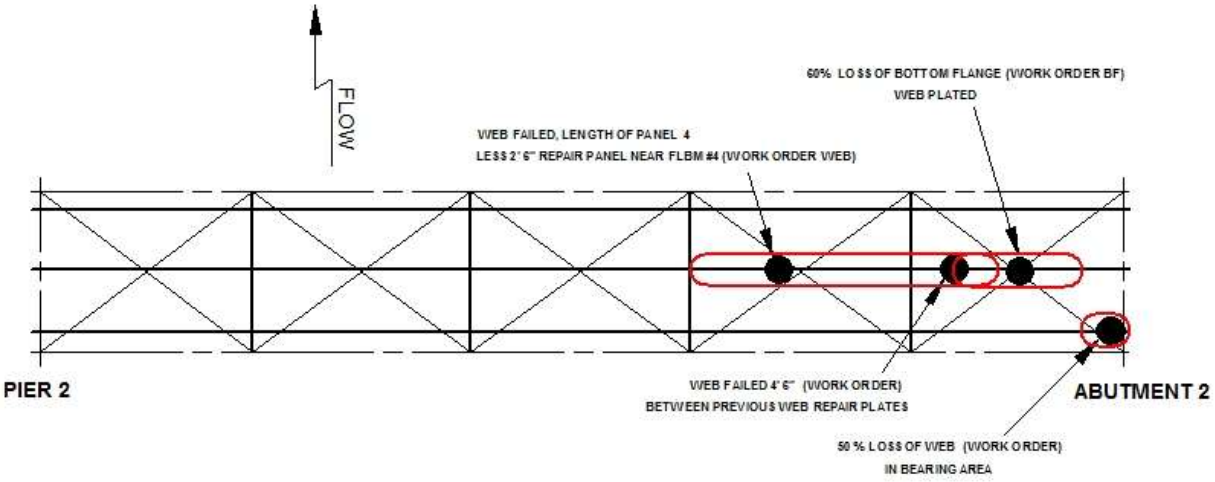


STRINGER #2 HAS WEB LOSS (PRIMARILY TO THE UPSTREAM SIDE) RANGING FROM 35% TO 50% FOR ALL PANELS IN SPAN TWO WITH THE EXCEPTION OF PANELS 5 & 7
BOTH THE TOP AND BOTTOM FLANGES HAVE VERY LITTLE DETERIORATION (TOTAL LOSS OF MEMBER IS IN THE 10% RANGE) NO WORK ORDER IS BEING SUBMITTED AT HIS TIME
STRINGERS ONE & THREE HAVE A RANDOM AREAS OF DETERIORATION UP TO 25% OF THE WEB, BUT NEARLY NO LOSS TO FLANGES (TOTAL LOSS IN THE 5% RANGE)

LOCATION of FLOORSYSTEM DETERIORATION

SKETCH # 3

SPAN THREE



West Virginia Division of Highways

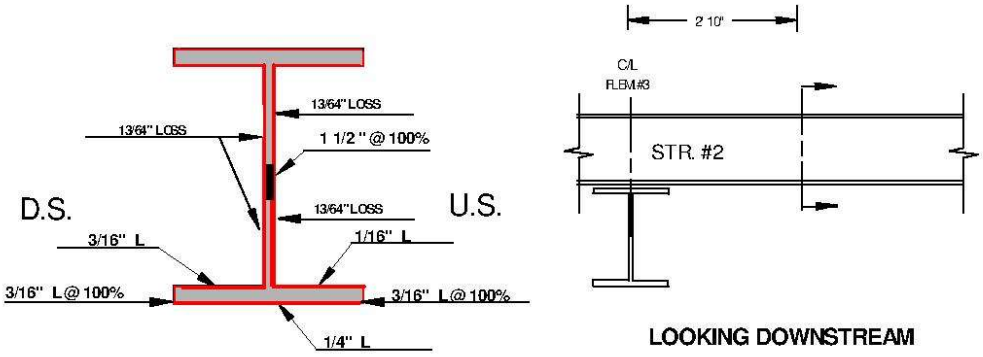
Section Loss

BARS No. : 08A012 **Date :** 07/18/2012

Form DS-28 1-1-90	STRUCTURES DIVISION GENERAL DETERIORATION DETAILS				SKETCH # 4
By: PK	Date:7/7/12	Ckd. by: DRB	Date:7/9/12	Bridge No.: 08-4/5-2.95	

Span	Member	US / DS	Not For Reg. Member Side	Not For Reg. Member Piece	Stringer Panel No:	Stringer No. From L.	Location
							2' 10" FWD. OF FLBM. #3
ONE	STR.#2		---	---	-------- FOUR----	----------	

Member Designation:	Member Dimensions:	Extent of Deterioration:
W8 X 58	8 3/4" X 8 1/4" X 13/16" X (1/2")	26' (PANEL #4 & 11' OF PANEL #5)



TOP FLANGE LOSS			T OF T FLG.REM.		8.220	ORG. HALF FLG.		3.855
	LOSS	LENGTH	LOSS	LENGTH	LOSS	LENGTH	AREA ORIG	17.100
Top of Top							AREA FLG	6.658
DS Btm.							AREA WEB	3.784
US Btm.							FLG. THK.	0.810
DS Tip	0.810		Hole(s)	Top of Top-All Across			FLG. WIDTH	8.220
US Tip	0.810			Btm of Top-Both Sides			WEB THK.	0.510
Top Flange Area Lost			0.000	Top Flange % Lost		0%	DEPTH	8.750

WEB LOSS								
	Hole(s)	USS	USS	USS	DSS	DSS	DSS	US REM
Length	1.500	5.630			5.630			0
Loss	0.510	0.203			0.203			DS REM
Web Area Lost			3.052	Web % Lost		81%		0

BOTTOM FLANGE LOSS			B OF B FLG. REM.		7.845		Total Area Lost
	LOSS	LENGTH	LOSS	LENGTH	LOSS	LENGTH	6.234
Bot of Bot							
DS Btm.	0.188	3.668					Total Member Loss
US Btm.	0.063	3.668					36%
DS Tip	0.810	0.188	Hole(s)	Bott of Bott-All Across		0.250	
US Tip	0.810	0.188		Top of Bott-Both Sides			
Bottom Flange Area Lost			3.182	Bott. Flange % Lost		48%	

West Virginia Division of Highways

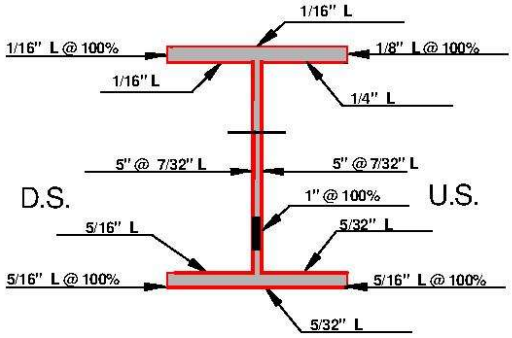
Section Loss

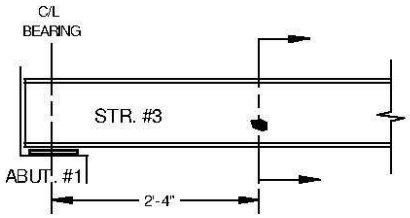
BARS No. : 08A012 **Date :** 07/18/2012

Form DS-28 1-1-90	STRUCTURES DIVISION GENERAL DETERIORATION DETAILS					SKETCH # 5
By: PK	Date:7/7/12	Ckd. by: DRB	Date:7/9/12	Bridge No.: 08-4/5-2.95		

Span	Member	US / DS	Not For Reg. Member		Stringer Panel No:	Stringer No. From L.	Location
			Side	Piece			NEAR ABUT. 1
ONE	STR.#3		---	---	----ONE	---	

Member Designation:	Member Dimensions:	Extent of Deterioration:
W8 X 58	8 3/4" X 8 1/4" X 13/16" X (1/2")	5' 6" (END BEAM TO REPAIR PLATE)





LOOKING DOWNSTREAM

TOP FLANGE LOSS			T OF T FLG.REM.		8.033	ORG. HALF FLG.		3.855
	LOSS	LENGTH	LOSS	LENGTH	LOSS	LENGTH	AREA ORIG	17.100
Top of Top							AREA FLG	6.658
DS Btm.	0.063	3.730					AREA WEB	3.784
US Btm.	0.250	3.792					FLG. THK.	0.810
DS Tip	0.810	0.063	Hole(s)	Top of Top-All Across		0.063	FLG. WIDTH	8.220
US Tip	0.810	0.125		Btm of Top-Both Sides			WEB THK.	0.510
Top Flange Area Lost			1.835	Top Flange % Lost		28%	DEPTH	8.750
WEB LOSS								
	Hole(s)	USS	USS	USS	DSS	DSS	DSS	US REM
Length	1.000	5.000	1.130		5.000	1.130		0
Loss	0.510	0.219	0.000		0.219	0.000		DS REM
Web Area Lost			2.698	Web % Lost		71%		0
BOTTOM FLANGE LOSS			B OF B FLG. REM.		7.595		Total Area Lost	
	LOSS	LENGTH	LOSS	LENGTH	LOSS	LENGTH	7.886	
Bot of Bot								
DS Btm.	0.313	3.542					Total Member Loss	
US Btm.	0.156	3.542					46%	
DS Tip	0.810	0.313	Hole(s)	Bott of Bott-All Across		0.156		
US Tip	0.810	0.313		Top of Bott-Both Sides				
Bottom Flange Area Lost			3.353	Bott. Flange % Lost		50%		

West Virginia Division of Highways

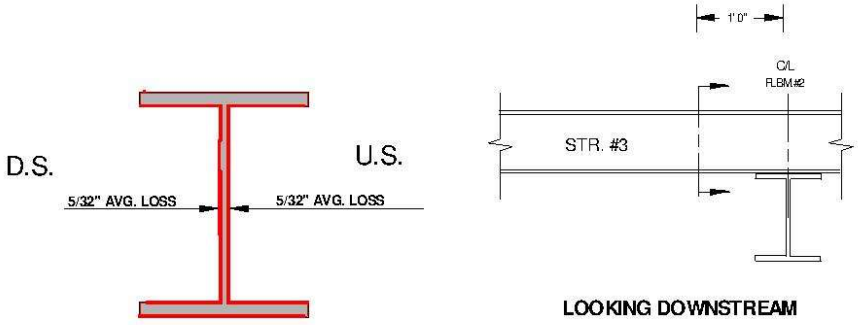
Section Loss

BARS No. : 08A012 **Date :** 07/18/2012

Form DS-28 1-1-90	STRUCTURES DIVISION GENERAL DETERIORATION DETAILS					SKETCH # 6
By: PK	Date:7/7/12	Ckd. by: DRB	Date:7/9/12	Bridge No.: 08-4/5-2.95		

Span	Member	US / DS	Not For Reg. Member		Stringer Panel No:	Stringer No. From L.	Location
			Side	Piece			1' REAR OF FLBM. #2
ONE	STR.#3		---	---	--- TWO---	---	

Member Designation:	Member Dimensions:	Extent of Deterioration:
W8 X 58	8 3/4" X 8 1/4" X 13/16" X (1/2")	2' (TYP. OF SEVERAL LOCATIONS ON STR. 1&3 IN SPAN ONE)



LOOKING DOWNSTREAM

TOP FLANGE LOSS			T OF T FLG.REM.		8.220	ORG. HALF FLG.		3.855
	LOSS	LENGTH	LOSS	LENGTH	LOSS	LENGTH	AREA ORIG	17.100
Top of Top							AREA FLG	6.658
DS Btm.							AREA WEB	3.784
US Btm.							FLG. THK.	0.810
DS Tip	0.810		Hole(s)	Top of Top-All Across			FLG. WIDTH	8.220
US Tip	0.810			Btm of Top-Both Sides			WEB THK.	0.510
Top Flange Area Lost			0.000	Top Flange % Lost		0%	DEPTH	8.750

WEB LOSS								
	Hole(s)	USS	USS	USS	DSS	DSS	DSS	US REM
Length	1.000	6.130			6.130			0
Loss	0.510	0.156			0.156			DS REM
Web Area Lost			2.426	Web % Lost		64%		0

BOTTOM FLANGE LOSS			B OF B FLG. REM.		8.220		Total Area Lost
	LOSS	LENGTH	LOSS	LENGTH	LOSS	LENGTH	2.426
Bot of Bot							
DS Btm.							Total Member Loss
US Btm.							14%
DS Tip	0.810		Hole(s)	Bott of Bott-All Across			
US Tip	0.810			Top of Bott-Both Sides			
Bottom Flange Area Lost			0.000	Bott. Flange % Lost		0%	

West Virginia Division of Highways

Section Loss

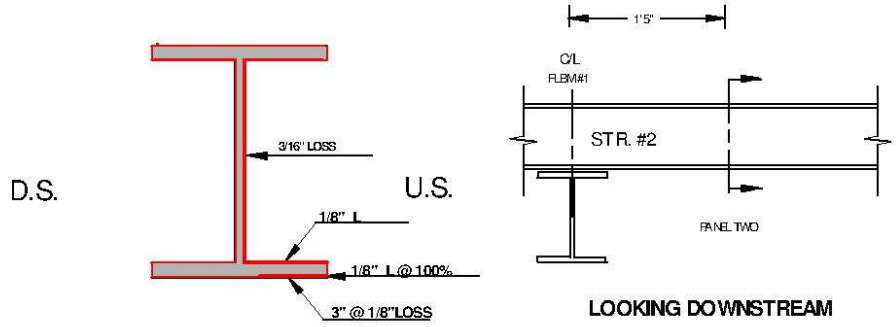
BARS No. : 08A012 **Date :** 07/18/2012

Form DS-28 1-1-90	STRUCTURES DIVISION GENERAL DETERIORATION DETAILS	SKETCH #7

By: PK	Date:7/7/12	Ckd. by: DRB	Date:7/9/12	Bridge No.: 08-4/5-2.95		

Span	Member	US / DS	Not For Reg. Member		Stringer Panel No:	Stringer No. From L.	Location
			Side	Piece			1' 5" FWD. OF FLBM. #1
TWO	STR.#2		---	---	------- TWO	----------	

Member Designation:	Member Dimensions:	Extent of Deterioration:
W8 X 58	8 3/4" X 8 1/4" X 13/16" X (1/2")	WEB LOSS FULL FOR PANEL



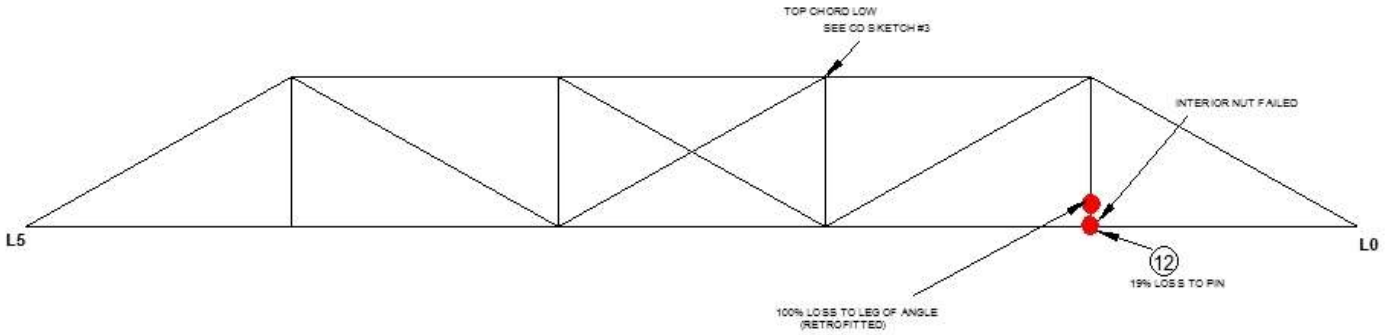
TOP FLANGE LOSS			T OF T FLG.REM.		8.220	ORG. HALF FLG.		3.855
	LOSS	LENGTH	LOSS	LENGTH	LOSS	LENGTH	AREA ORIG	17.100
Top of Top							AREA FLG	6.658
DS Btm.							AREA WEB	3.784
US Btm.							FLG. THK.	0.810
DS Tip	0.810		Hole(s)	Top of Top-All Across			FLG. WIDTH	8.220
US Tip	0.810			Btm of Top-Both Sides			WEB THK.	0.510
Top Flange Area Lost			0.000	Top Flange % Lost		0%	DEPTH	8.750

WEB LOSS								
	Hole(s)	USS	USS	USS	DSS	DSS	DSS	US REM
Length	1.500	5.630			5.630			0
Loss	0.510	0.188			0.000			DS REM
Web Area Lost			1.821	Web % Lost		48%		0

BOTTOM FLANGE LOSS			B OF B FLG. REM.		8.095		Total Area Lost
	LOSS	LENGTH	LOSS	LENGTH	LOSS	LENGTH	4.408
Bot of Bot							
DS Btm.							Total Member Loss
US Btm.	0.125	3.700					26%
DS Tip	0.810		Hole(s)	Bott of Bott-All Across		0.250	
US Tip	0.810	0.125		Top of Bott-Both Sides			
Bottom Flange Area Lost			2.588	Bott. Flange % Lost		39%	

TRUSS MEMBER DETERIORATION
DOWNSTREAM TRUSS
SPAN ONE

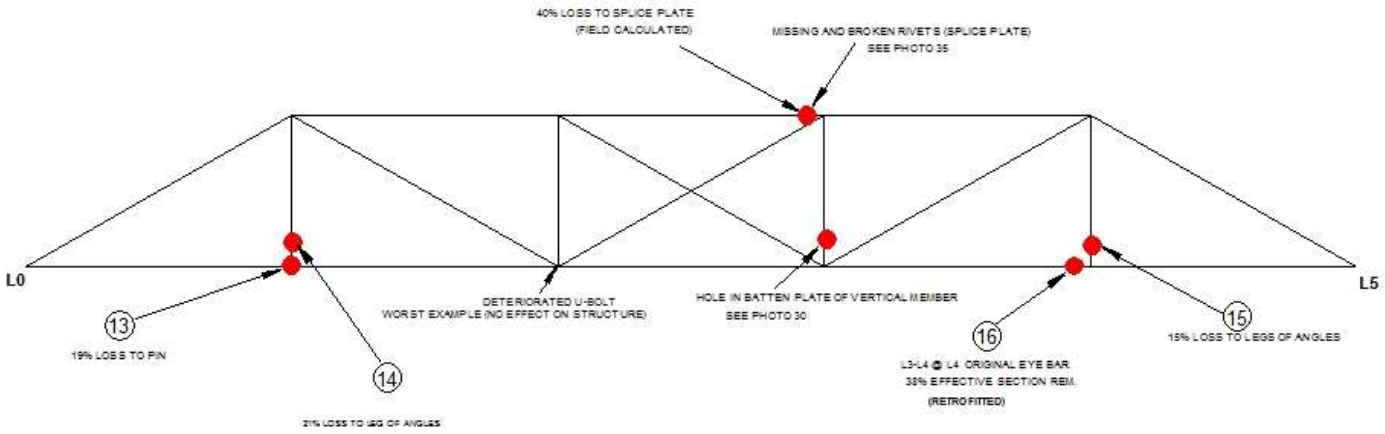
SKETCH# 8



LOOKING UPSTREAM

TRUSS MEMBER DETERIORATION
UPSTREAM TRUSS
SPAN ONE

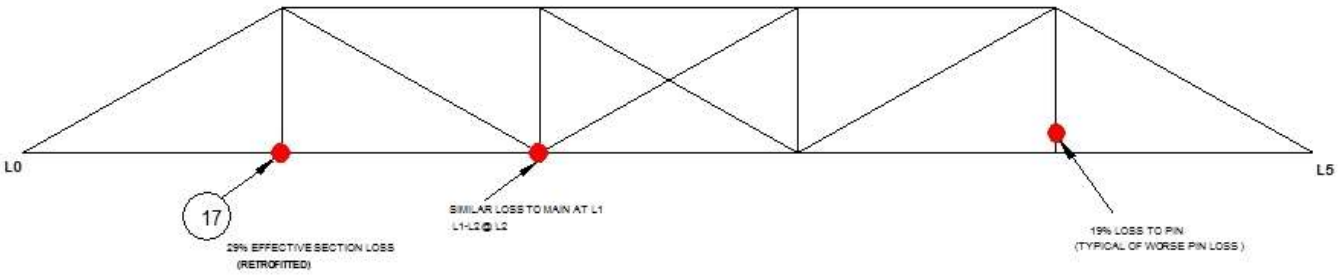
SKETCH# 9



LOOKING DOWNSTREAM

TRUSS MEMBER DETERIORATION
UPSTREAM TRUSS
SPAN THREE

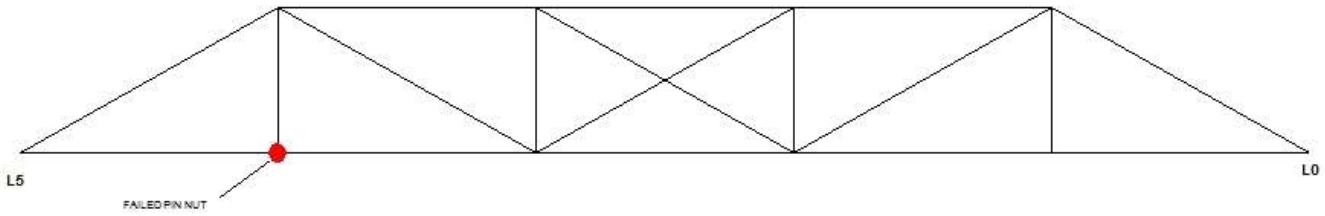
SKETCH # 10



LOOKING DOWNSTREAM

TRUSS MEMBER DETERIORATION
DOWNSTREAM TRUSS
SPAN THREE

SKETCH # 11



LOOKING UPSTREAM

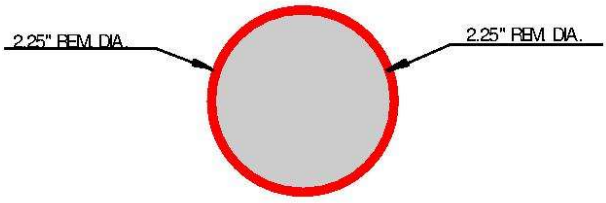
West Virginia Division of Highways

Section Loss

BARS No. : 08A012 **Date :** 07/18/2012

DETERIORATION DETAILS

By: FMjr	Date: 6/7/06	Ckd. By: H.O	Date: 7/12/12	Bridge No. 08-4/5-2.95
SPAN: ONE	MEMBER: PIN @L1 DSS		LOCATION: @L1 USS OF PIN	
DESIGNATION: LOWER CHORD PIN	DIMENSIONS: 2 ½" DIA.			EXTENT: ¾"



PIN @ L1 ON DS TRUSS
SPAN ONE

UNIFORM LOSS CALCULATOR

ORIG. DIAMETER -	2.5	REM. DIAMETER -	2.25
RADIUS -	1.25	RADIUS-	1.13
AREA LOST =		0.93	
% LOSS =		19.00%	

SEGMENT LOSS CALCULATOR

DIAMETER -		HEIGHT	
RADIUS -	0.00		
SEGMENT AREA LOST =		#DIV/0!	
% LOSS =		#DIV/0!	

UNIFORM & SEGMENT AREA LOSSES	#DIV/0!
TOTAL COMBINED % LOSS	#DIV/0!

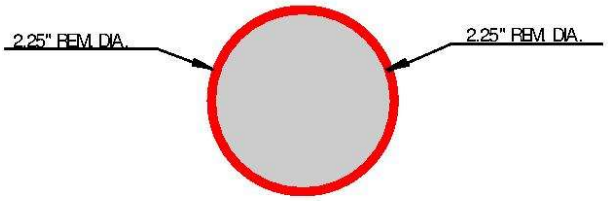
West Virginia Division of Highways

Section Loss

BARS No. : 08A012 **Date :** 07/18/2012

DETERIORATION DETAILS

By: H.O	Date: 7/12/12	Ckd. By: P.K	Date: 7/12/12	Bridge No. 08-4/5-2.95
SPAN: ONE	MEMBER: PIN@L1 US		LOCATION: @ L1	
DESIGNATION: LOWER CHORD PIN	DIMENSIONS: 2 ½" DIA.			EXTENT: ¾"



PIN @ L1 ON US TRUSS
SPAN ONE

UNIFORM LOSS CALCULATOR

ORIG. DIAMETER -	2.5	REM. DIAMETER -	2.25
RADIUS -	1.25	RADIUS-	1.13
AREA LOST =		0.93	
% LOSS =		19.00%	

SEGMENT LOSS CALCULATOR

DIAMETER -		HEIGHT	
RADIUS -	0.00		
SEGMENT AREA LOST =		#DIV/0!	
% LOSS =		#DIV/0!	

UNIFORM & SEGMENT AREA LOSSES	#DIV/0!
TOTAL COMBINED % LOSS	#DIV/0!

West Virginia Division of Highways

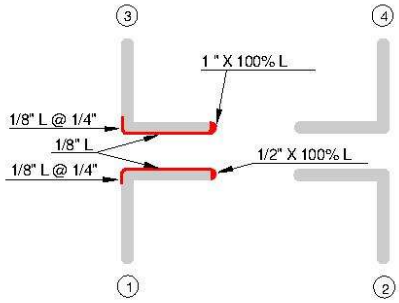
V 1.2

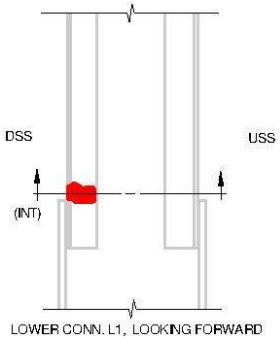
Section Loss

BARS No. : 08A012 **Date :** 07/18/2012

DETERIORATION DETAILS

By: H.O	Date: 7/12/12	Ckd. By: P.K	Date: 7/12/12	Bridge No. 08-4/5-2.95
SPAN: ONE	MEMBER: L1/U1 USS		LOCATION: 1' FROM BOTTOM OF MEMBER	
DESIGNATION: L 2 ½" X 3.62#	DIMENSIONS: 4 ANGLES 2 ½" x 2" x ¼"			EXTENT: 3"





ANGLES 1 & 4 SECTION LOSS								
Angle 1	Loss	Length	Loss	Length	Loss	Length	AO Total	2.13
45%	0.125	0.250	0.125	1.500	0.260	1.000	AO Per L	1.06
							V-LEG	2.500
							H-LEG	2.000
Angle 4	Loss	Length	Loss	Length	Loss	Length	Thickness	0.250
0%							# Angles	2.000
							for Angles 1 & 4	
ANGLES 2 & 3 SECTION LOSS							AL Total	0.48
Angle 2	Loss	Length	Loss	Length	Loss	Loss	% Loss	23%
0%								
							AO Total	2.13
Angle 3	Loss	Length	Loss	Length	Loss	Length	AO Per L	1.06
38%	0.125	0.250	0.125	2.000	0.250	0.500	V-LEG	2.500
							H-LEG	2.000
							Thickness	0.250
TOTAL MEMBER LOSS (all angles combined)							# Angles	2.000
			21%				for Angles 2 & 3	
							AL Total	0.41
							% Loss	19%

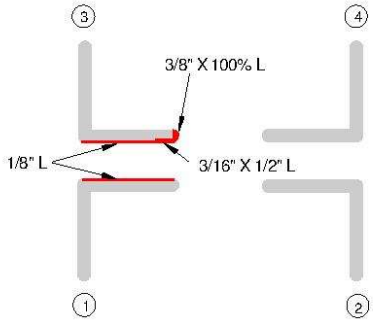
West Virginia Division of Highways

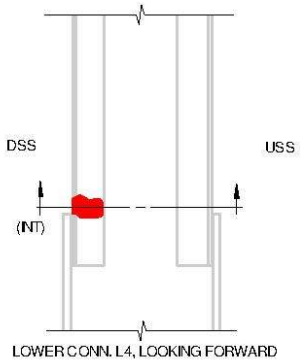
Section Loss

BARS No. : 08A012 **Date :** 07/18/2012

DETERIORATION DETAILS

By: FMjr	Date: 6/8/06	Ckd. By: H.O	Date: 7/12/12	Bridge No. 08-4/5-2.95
SPAN: ONE	MEMBER: U4L4 USS		LOCATION: 6" FROM BOTTOM OF MEMBER	
DESIGNATION: L 2 ½" x 3.62#	DIMENSIONS: 4 ANGLES 2 ½" x 2" x ¼"			EXTENT: 3"





ANGLES 1 & 4 SECTION LOSS							AO Total	2.13
Angle 1	Loss	Length	Loss	Length	Loss	Length	AO Per L	1.06
24%							V-LEG	2.500
	0.125	2.000					H-LEG	2.000
Angle 4	Loss	Length	Loss	Length	Loss	Length	Thickness	0.250
0%							# Angles	2.000
							for Angles 1 & 4	
ANGLES 2 & 3 SECTION LOSS							AL Total	0.25
Angle 2	Loss	Length	Loss	Length	Loss	Loss	% Loss	12%
0%								
							AO Total	2.13
Angle 3	Loss	Length	Loss	Length	Loss	Length	AO Per L	1.06
35%	0.188	0.500	0.125	1.500	0.250	0.375	V-LEG	2.500
							H-LEG	2.000
							Thickness	0.250
TOTAL MEMBER LOSS (all angles combined)							# Angles	2.000
			15%				for Angles 2 & 3	
							AL Total	0.38
							% Loss	18%

West Virginia Division of Highways

Section Loss

BARS No. : 08A012 **Date :** 07/18/2012

STRUCTURES DIVISION

EYEBAR DETERIORATION DETAILS

SKETCH #

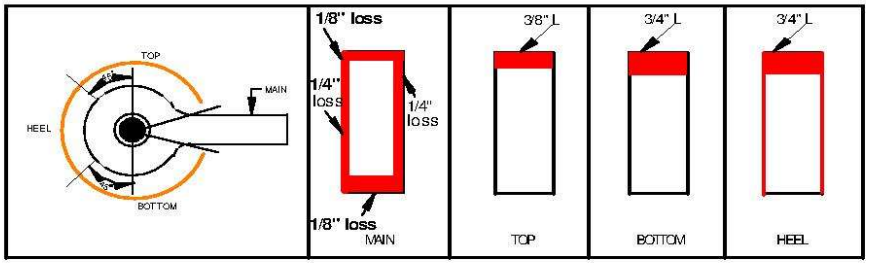
By:	P.K	Date:	7/16/2012	Ckd. By:	HC	Date:	7/16/2012	Bridge No.:	08-4/5-2.95		
Span	Member @ End			US/DS	INT./EXT.	End Type	Rect./Sq.	Location When Not @ Pin Distance			Extent
ONE	L3 L4 @ L4			US	EXT	RND	REC.				

	Orig. Size:	2 1/2" X 7/8"		Area Remaining:	0.375	X	2.25	0.84375		
MAIN	Orig. Area:	2.1875	Orig. Area Main:	2.1875						
	Section Remaining	38.6%		Effective Section Remaining	38.6%					
	Orig. Size:	1 3/4" X 1"		Area Remaining:	1.375	X	1	1.375		
TOP	Orig. Area:	1.75	Orig. Area Main:	1.75						
	Section Remaining	78.6%		Effective Section Remaining	116.3%					
	Orig. Size:	1 3/4" X 1"		Area Remaining:	1	X	1	1		
BOTTOM	Orig. Area:	1.75	Orig. Area Main:	1.75						
	Section Remaining	57.1%		Effective Section Remaining	84.6%					
	Orig. Size:	1 3/4" X 1"		Area Remaining:	1	X	1	1		
HEEL	Orig. Area:	1.75	Orig. Area Main:	1.75						
	Section Remaining	57.1%		Effective Section Remaining	76.0%					
	Controlling Section Loss =		smallest section above		20.9		79.10	%		
	Controlling Effective % Loss =		smallest effective remaining		20.9		79.10	%		

SPAN 1

UPSTREAM TRUSS (2012)

L3 L4 @ L4



West Virginia Division of Highways

V 1.2

Section Loss

BARS No. : 08A012 **Date :** 07/18/2012

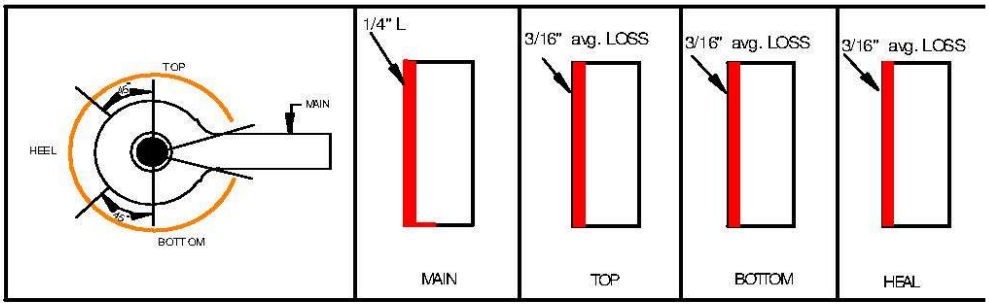
STRUCTURES DIVISION

EYEBAR DETERIORATION DETAILS

SKETCH #

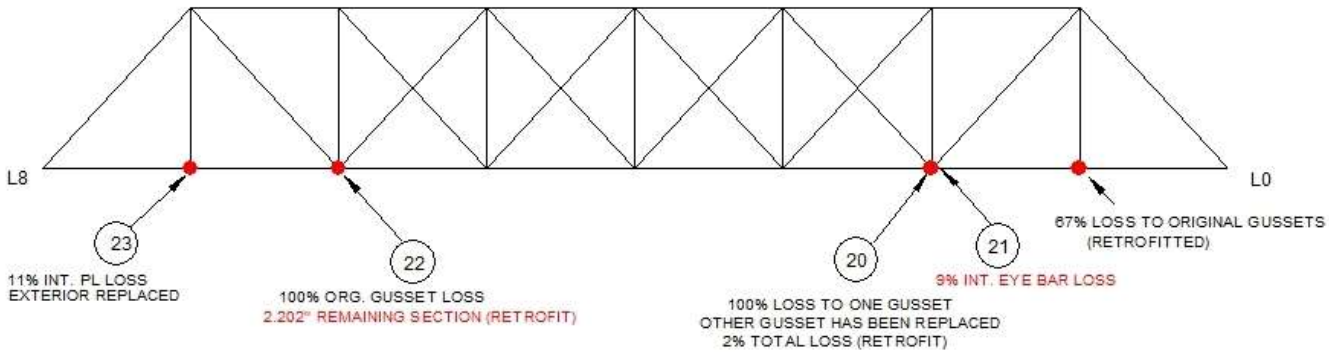
By:	PK	Date:	7/16/2012	Ckd. By:	PK	Date:	7/16/2012	Bridge No.:	08-4/5-2.95	
Span	Member @ End			US/DS	INT./EXT.	End Type	Rect./Sq.	Location When Not @ Pin Distance		Extent
THREE	L1 L2 @ L1			US	EXT	RND	REC.			

	Orig. Size:	2 1/2" X 7/8"	Area Remaining:	0.625	X	2.5	1.5625		
MAIN	Orig. Area:	2.1875	Orig. Area Main:	2.1875					
	Section Remaining	71.4%	Effective Section Remaining	71.4%					
	Orig. Size:	1 3/4" X 1"	Area Remaining:	1.5	X	0.8125	1.21875		
TOP	Orig. Area:	1.75	Orig. Area Main:	1.75					
	Section Remaining	69.6%	Effective Section Remaining	103.1%					
	Orig. Size:	1 3/4" X 1"	Area Remaining:	1.4375	X	0.8125	1.167969		
BOTTOM	Orig. Area:	1.75	Orig. Area Main:	1.75					
	Section Remaining	66.7%	Effective Section Remaining	98.8%					
	Orig. Size:	1 3/4" X 1"	Area Remaining:	1.6875	X	0.8125	1.371094		
HEEL	Orig. Area:	1.75	Orig. Area Main:	1.75					
	Section Remaining	78.3%	Effective Section Remaining	104.2%					
	Controlling Section Loss =		smallest section above	71.4		28.60	%		
	Controlling Effective % Loss =		smallest effective remaining	71.4		28.60	%		



TRUSS MEMBER DETERIORATION
DOWNSTREAM TRUSS
SPAN TWO

SKETCH #18

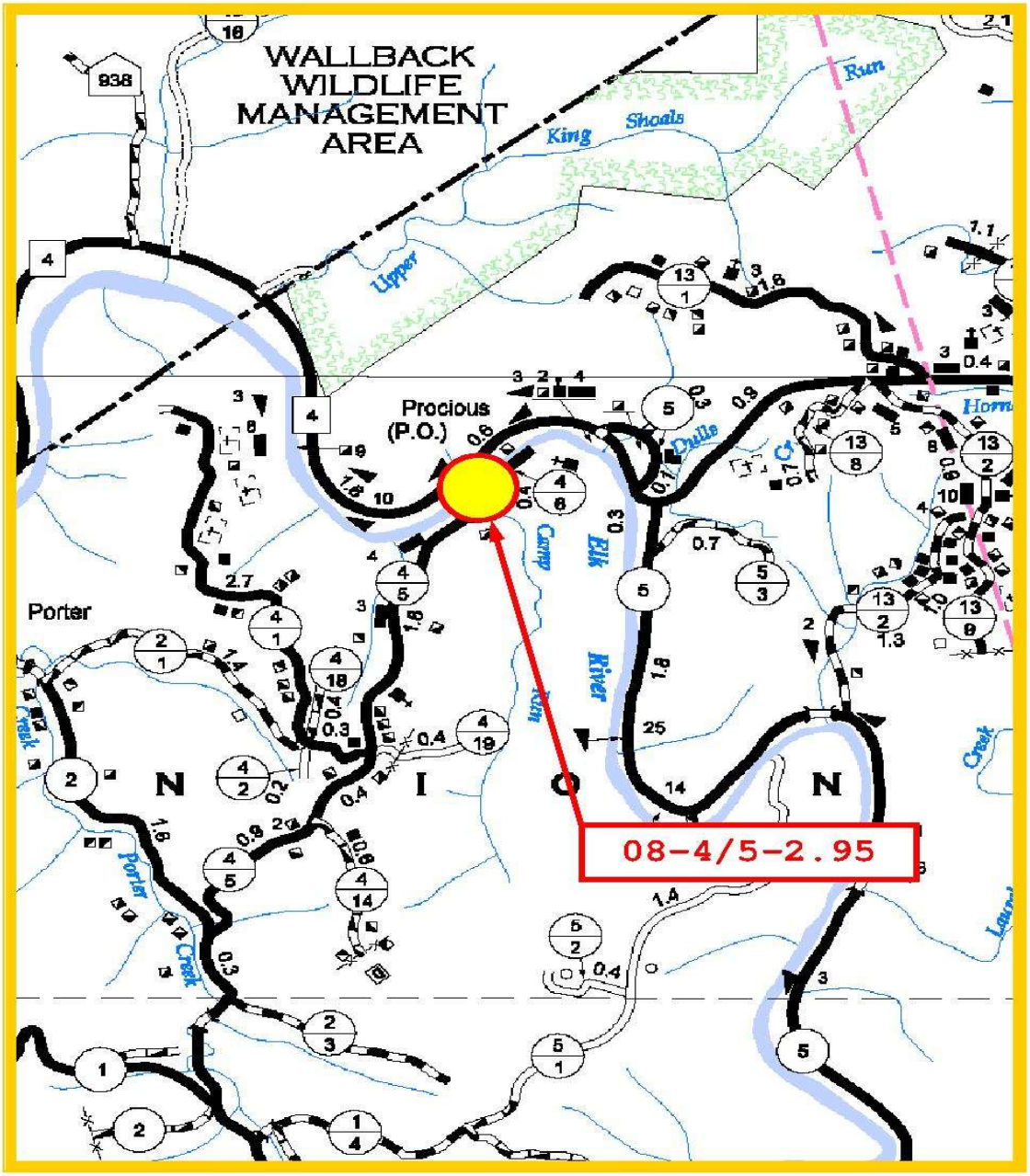


LOOKING UPSTREAM

BARS No. : 08A012 **Date :** 07/18/2012

Maintenance Items

There are no maintenance items for this asset.


WALLBACK
WILDLIFE
MANAGEMENT
AREA
King
Shoals
Upper
Procious
(P.O.)
Porter
Camp
Elk
River
Porter
Creek
08-4/5-2.95