Report of Findings (As-built Information)

Toboyne Township, Perry County
Schaeffer Run
Back Hollow Bridge TBT-3 Inspection
Bridge Key: 29744

Project #212IC-BF-00037
January 11, 2018

PREPARED FOR

Sunoco Pipeline L.P.
535 Fritztown Road
Sinking Spring, PA 19608

PRESENTED BY

Tetra Tech, Inc.
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Pittsburgh, PA 15220

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Authorized by:

Joseph L. Micikas

1/11/18

Joseph L. Micikas, P.E.
PA Registered Engineer No. PE040663E
Structural Department Manager

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1.0 INTRODUCTION

On October 10, 2017 Certified Bridge Safety Inspectors from Herbert, Rowland & Grubic, Inc. (HRG) conducted a periodic (routine) bridge inspection of Toboyne Township Bridge TBT-3 (Structure ID No. 50 7217 0300 4003, Category: A1, Bridge Key: 29744) and determined that the bridge needed to be closed to all traffic due to inadequate bearing of the end of bridge beam No. 4 (upstream beam at northwestern end). Closure of the bridge created up to a 22 mile round trip detour for vehicles and approximately 11 residences who used the bridge, and dramatically lengthen the time for emergency vehicles to reach these residences.

Sunoco Logistics, L.P. ("Sunoco") field staff coordinated with Perry County, through its Commissioners, Toboyne Township, through its Supervisors, and Dan Long, Bridge Inspector, to develop a workable solution to the failed bridge (No. 29744) to enable the contractor to use this route during construction activities. By doing so the local residences and emergency vehicles would also once again be able to use the bridge as well as the construction vehicles.

On or about October 28, 2017, Sunoco's contractor (Michel's Corporation) installed an "Air Bridge" over the existing Black Hollow Bridge. The new bridge installed over the existing Black Hollow Bridge was originally designed by E&M Engineers and Surveyors, P.C. in April of 2012, and fabricated by ADM Welding and Fabrication, LLC (fabrication date is unknown). Sunoco / Michel's Corporation failed to notify The State of Pennsylvania of the new bridge installation, nor had they obtained a Chapter 105 permit for the work.

On December 5, 2017, Felicia Lamphere of the Department of Environmental Protection (DEP) responded to a complaint alleging that an unauthorized bridge replacement over Schaeffer Run had occurred. Ms. Lamphere investigated the allegation and confirmed that this activity had occurred, and that a written permit had not been obtained from DEP prior to encroaching in a watercourse, floodway, body of water, or wetland.

Tetra Tech was tasked to assist in obtaining the necessary permitting for this bridge replacement, and part of that work involved performing an on-site inspection of the new and existing bridges, preparing an inspection report, preparing as-built drawings, and preparing Recommend Repair Drawings as required.

Tetra Tech's report is based on the information available at the current time, as described in the Basis of Report (Section III of this document). Should additional information become available, Tetra Tech reserves the right to determine what impact, if any, the new information may have on any opinions and conclusions and to revise any opinions and conclusions if necessary and warranted.

2.0 INSPECTION & CLOSURE OF BACK HOLLOW BRIDGE TBT-3

HRG Bridge Inspection and Report

On October 10, 2017, Mr. Greggory P. Rubinic, C.B.S.I. and Mr. Taylor A. Abel, E.I.T., C.B.S.I. of Herbert, Rowland & Grubic, Inc. conducted a periodic / routine inspection of the Toboyne Township Bridge TBT-3 (T-300 Back Hollow Road Over Schaeffer Run, Toboyne Township, Perry County, Pennsylvania, Structure ID No. 50 7217 0300 4003, Category: A1, Bridge Key: 29744). During their inspection they determined that the bridge was in critical condition overall, and immediately shutdown the use of the bridge until the necessary repairs could be made. Below is a summary of their inspection findings:

- The primary reason for immediately shutting down the bridge was due to a loss of bearing area / material under beam 4 (upstream most beam at the northwestern end). Claimed that beam No. 4 visibly deflected under live load and that the deflection caused movement of the remaining bearing material.
- The substructures were also a concern because the beams did not appear to rest on any formal substructure (foundation, pier, abutment, etc.) and appeared to rest on compacted shale.

- Traffic safety features at the bridge were damaged and did not provide proper vehicular safety to travelers. Recommended considerable speed reduction.
- Issues with bridge railings.
- Minor issues with Approach Roadways.
- Minor damage to the top deck.
- Cracked welds in connections attaching the diaphragm steel X-bracing to the girder webs.
- Minor scour / undermining of abutment.

A copy of the HRG Inspection Report for Bridge TBT-3 is attached (see Attachment E).

3.0 DISCUSSION

3.1 BACKGROUND INFORMATION

Mr. Joseph L. Micikas, P.E. (Tetra Tech Structural Department Manager) traveled to the Back Hollow Bridge on Saturday, January 6, 2017 and performed an inspection of the existing bridge as well as the new "Air Bridge". The purpose of this inspection was to determine and document the "As-Built" condition of both bridges.

The temperature was 8º F and the day ranged from partly overcast to sunny. Two (2) survey crew members were present for the beginning of the inspection.

E&M Engineers and Surveyors, P.C. were the designers of the "Air Bridge", for ADM Welding and Fabrication, LLC. A copy of the original design calculations (dated 5/2/2012) and a cover letter are attached to this report. The cover letter and calculation sheet indicate that the "Air Bridge" was designed for HS25-44 (45 ton) loading, that the design was based on the 2002 AASHTO Standard Specification for Highway Bridges (17th Edition), the standard deflection criteria (L/800) was not followed, impact to the bridge had been estimated at 10% maximum based on the restriction that the bridge will have a 10 MPH maximum speed limit, the design was based on a center to center bearing length of 37'-0"maximum (designed as a simply supported beam), and that the deck system consists of 3 ½" x 6" wide white oak planks.

A copy of the ADM Welding and Fabrication 40'-0" portable (13' W x 40' L x 45 ton, 5 axle combination vehicle load capacity, subject to a 10 MPH maximum speed restriction) bridge drawings are attached to this report, and were utilized in the field to verify that the as erected "Air Bridge" matched the drawings.

3.2 OBSERVATIONS

The descriptions provided and photographs attached were representative and were not intended to document all conditions present. The following relevant conditions were observed.

1. The Back Hollow Bridge is oriented in a Northwest to Southeast direction, and spans Schaeffer Run Creek (See Tt Dwg. S-001 and Photographs 1 to 4).
2. The recently installed "Air Bridge" matched the ADM Welding and Fabrication drawings, and was in good condition. The bridge consisted of six (6) 40'-0" long W18x50 longitudinal beams spaced at 2'-6" on center. The running surface consisted of two (2) sections 3 ½" H x 6" W x 5'-0" white oak planks positioned on the outer 5'-0" on each side of the bridge. The center 2'-6" section of the bridge is cover by ¼" checkered plates. The guide rails on each side consisted of 3 ½" O.D. pipe. See ADM drawings (Sheets 1 of 2 and 2 of 2) and Sections A-A, B-B and Detail No. 3 on Tt Dwg. S-002.
3. The "Air Bridge" was placed directly above the existing bridge. The new "Air Bridge" sits above the grating deck of the existing bridge, with a 2" gap between the top of existing bridge grating and the bottom of the "Air Bridge" beams bottom flanges (See Detail No. 3 on Tt Dwg. S-002). The deck of the "Air

Bridge" was 1'-11 ½" above the deck of the existing bridge (See Section B-B on Tt Dwg. S-002 and Photograph 5).

4. The "Air Bridge" was supported on the existing bridge at each end by two (2) 7" W x 2" H white oak planks (See Section A-A and Detail 1 on Tt Dwg. S-002). These planks spanned across the width of the bridges as described next. On the upstream and downstream sides on the northwestern end of the bridge the oak planks extend to the centerlines of the outermost W18x50's of the "Air Bridge" (See Section A-A and Detail 1 on Tt Dwg. S-002, Section C-C on Tt Dwg. S-003 and Photograph 6). On the downstream side on the southeastern end of the bridge the oak planks did not extend to the outermost W18x50 of the "Air Bridge" (See Section A-A and Detail 2 on Tt Dwg. S-002, Section D-D on Tt Dwg. S-003 and Photographs 7 and 8), leaving the downstream, southeastern outermost W18x15 unsupported. The interior four (4) W18x50 beams appear to be supported by the oak planks. It could not be determined if the oak planks support the outermost upstream side W18x50 as that section was buried.
5. It did not appear that the new "Air Bridge" was anchored or had any lateral restraint.
6. It could not be determined whether or not new bearing area material had been placed under Beam No. 4 (upstream side at Northwestern end) of the existing bridge (TBT-3). However, no movement of this beam was observed during our inspection. Approximately 10 to 12 vehicles had crossed the bridge during the time of the inspection. It is assumed the repairs were made and the bridge is suitable for use pending verification of the repair.
7. Soil and gravel put in place for the new roadway approach at the northwestern end of the bridge have begun to sluff under the bridge in three (3) locations (See Section E-E on Tt Dwgs. S-002 and S-003 and Photograph 9).
8. The W18 girders for the existing bridge are not supported on the concrete baffle wall on the southeastern end (See Photographs 10 and 11), nor on the stone wall on the northwestern end (See Photographs 12 and 13).
9. A single 10 MPH speed limit sign was observed before the approach to the southeastern end of the bridge. No speed limit signage was observed on the northwestern side.
10. Concrete barriers were placed on the upstream side of the approach on the southeastern end to act as a retaining wall for when the approach was built-up (0'-0" to 1'-11 ½" max.). These barriers are leaning outward as though they are being pushed over by the soil (See Photograph 14). It is possible that these barriers were installed with the observed slant, and not being pushed over.
11. The concrete barrier placed on the downstream side of the approach on the southeastern end is undermined and without full support on the northwestern end of the northwestern most barrier (See Photographs 2 and 14).
12. A wood plank retaining wall on the upstream side at the northwestern end appears to be twisting / bowing (See Photographs 15 and 17). However, it is my opinion that there has been no movement and the planks are in the shape they are in because they were installed between two (2) existing posts. Photograph 16 shows the concrete barrier on the downstream side of the northwestern end of the bridge.
13. A piece of stone approximately 3'-10" L x 1'-10" W x 1'-6" H has fallen into the stream bed (southeastern side of stream – See Photograph 18).
14. A bridge weight limit sign on the southeastern end states that the bridge has a 13 tons weight limit, except combinations 28 tons (See Photograph 19).

3.3 ANALYSIS

Based on the method used to support the new "Air Bridge" on the existing bridge, the existing bridge girders will be subjected to shear loads (calculated to be 12.7 kips) and bending moments (calculated to be 122.5 K-Ft). The resulting shear stress is 1.02 ksi and resulting bending moment is 16.6 ksi. Both stresses are acceptable and the existing bridge is capable of supporting the new "Air Bridge".

3.4 RECOMMENDED MODIFICATIONS & REPAIRS

1. "Air Bridge" Supports: Currently 7"x2" oak planks are utilized to support the new "Air Bridge" on the existing bridge. On the northwestern end, these planks extend to the centerline of the outermost (upstream and downstream) W18x50 bridge girder beams, providing full support of the interior girders and partial support of the outer girders. On the southeastern end, the planks support the interior girders, but provide no support to the downstream girder. Furthermore, it is unknown if the planks support the outer girder (area covered with dirt and gravel). Overtime the wood planks will deteriorate due to impact loads and weather related rotting. Therefore, it is our recommendation that the 7" x 2" oak planks used for supporting the new "Air Bridge" on the existing bridge grating be removed and replaced with W8x58 beams as shown on Tt Dwg. S-004. This modification will also provide anchorage and lateral restraint to the new "Air Bridge".
2. Since the placement of additional bearing material under Beam No. 4 (upstream side, Northwestern end) of the existing bridge could not be established it is recommended that the end of this beam be exposed to verify that sufficient bearing material is present. Prior to exposing the end of the beam a live load test can be conducted by running a construction vehicle across the bridge from the southeast end to the northwest end. The vehicle would drive at 10 MPH and as close to the upstream side of the bridge as possible. If no deflection is observed that would indicate the repair was made and no additional action regarding this issue would be required.
3. To prevent soil from sluffing under the bridge at each approach, it is our recommendation to add two (2) 3/8" plates across the full width of the "Air Bridge" as shown in the Modification at Approaches Detail on Tt Dwg. S-004.
4. The 3'-10" L x 1'-10" W x 1'-6" H piece of stone which has fallen into the upstream river bed should be removed from the waterway.
5. The concrete barriers and oak retaining wall along the approaches should be monitored for movement. If after 6 to 9 months pass and no movement has occurred, no modification or repairs will be required. If movement occurs, an engineering solution will need to be devised to prevent further movement.
6. It is recommended that a Speed Limit – 10 MPH sign be posted on the northwestern side of the "Air Bridge". The reason for this action is the "Air Bridge" design was based on a 10 MPH limit on the bridge. NOTE: Toboyne Township has been contacted and asked to install a 10 MPH Speed Limit Sign on the Northwestern end of the bridge and they agreed to add the speed limit sign.

4.0 BASIS OF REPORT

1. An on-site inspection of the Back Hollow Bridge was conducted by Joseph L. Micikas P.E., on January 6, 2018. Measurements, field notes, and photographs were obtained during the site inspection of the bridge.
2. E&M Engineers and Surveyors PC bridge criteria, calculations, clarifications, and exceptions for the "Air Bridge".
3. ADM Welding and Fabrication, LLC 40'-0" portable (13' W x 40' L x 45 ton, 5 axle combination vehicle load capacity, subject to a 10 MPH maximum speed restriction) bridge drawings.

5.0 ATTACHMENTS

Attachment A

E&M Engineers and Surveyors PC Bridge Calculations

E&M Engineers and Surveyors PC

24 Derrick Road
Bradford, PA 16701-3350
814-362-5546
Fax 814-362-3023
www.emengineers.com

Glenn D. Cooley, PE
Roy R. Pedersen, PE
Christopher M. Ernst, PE
Frederick J. Moricca III, PLS
Allan R. Vanderpoel, PE
Garrett M. Hacker, PE

April 27, 2012

Re: Bridge Submittals

To Whom It May Concern:

This is certification that the attached bridge drawings (File HS25-40, dated 9/19/05) with specifications as listed below will have an HS25 (45-ton) load capacity.

1. The bridge is designed in accordance with the 2002 AASHTO Standard Specification for Highway Bridges, 17th Edition with the following load criteria and exceptions.

2. The bridge stringer design will be able to handle HS25-44 (45-ton) loads, based on bending moment and shear stress requirements. Deflection limitations recommended by AASHTO have not been taken into account, resulting in some deflection under loads larger than allowed by AASHTO (length in inches/800). Impact to the bridge has been estimated at 10% maximum based on the restriction that the bridge will have a 10 MPH maximum speed limit.

3. 40' total length, center of tow bar to center of tow bar, with center to center bearing length of 37' maximum.

4. Deck System - 3 ½ " by 6" white oak: This material has been tested and field proven to be acceptable although horizontal shear stress is larger than recommended in the National Design Specifications for wood construction by the National Forest Products Association.

Very truly yours,
E & M ENGINEERS AND SURVEYORS, P.C.

Allan R. Vanderpoel, P.E.
Project Engineer

ARV/bap

INSTRUMENT NAME/ S/N

WEATHER

SURVEY NAMES

BOOK NO.

40' BRIDGE OVERALL LENGTH
38' C TO C BEARING LENGTH
2x4 DECKING ON EDGE
NO DEFLECTION REQUIREMENTS
IMPACT LIMITED TO 110 BY 10 MPH SPEED RESTRICTION
LOAD HS25-44
GRADE 50 STEEL

MOMENT - DEAD LOAD

GIRDERS W18x50	50 LBS/FT
DIAPHRAGMS	4 LB/FT
WOOD DECK	37 LB/FT
	91 LB/FT

$M_{DL} = wL^2/8 = (.091)(38')^2/8 = 164$ K-FT

MOMENT - LIVE LOAD

LINE FROM HS25: (414.3 K-FT)(1.25) = 517.9 K-FT
IMPACT: 110
DISTRIBUTION FACTOR: S/4.5: 2.5/4.5 = 0.56
WHEEL LINES = 1/2 = 0.5

M_{LL} (FACTORED) = (517.9 K-FT)(1.10)(0.56)(0.5) = 159.5 K-FT

TOTAL MOMENT

$M_{LL} + M_{DL} = 159.5 + 16.4 = 175.9$ K-FT

REQUIRED SECTION

$S_{REQ} = \frac{(175.9 \text{ K-FT})(12 \text{ IN/FT})}{27 \text{ KSI}} = 782 \text{ IN}^3$

USE W18x50 $S_{XX} = 859 \text{ IN}^3$ OK

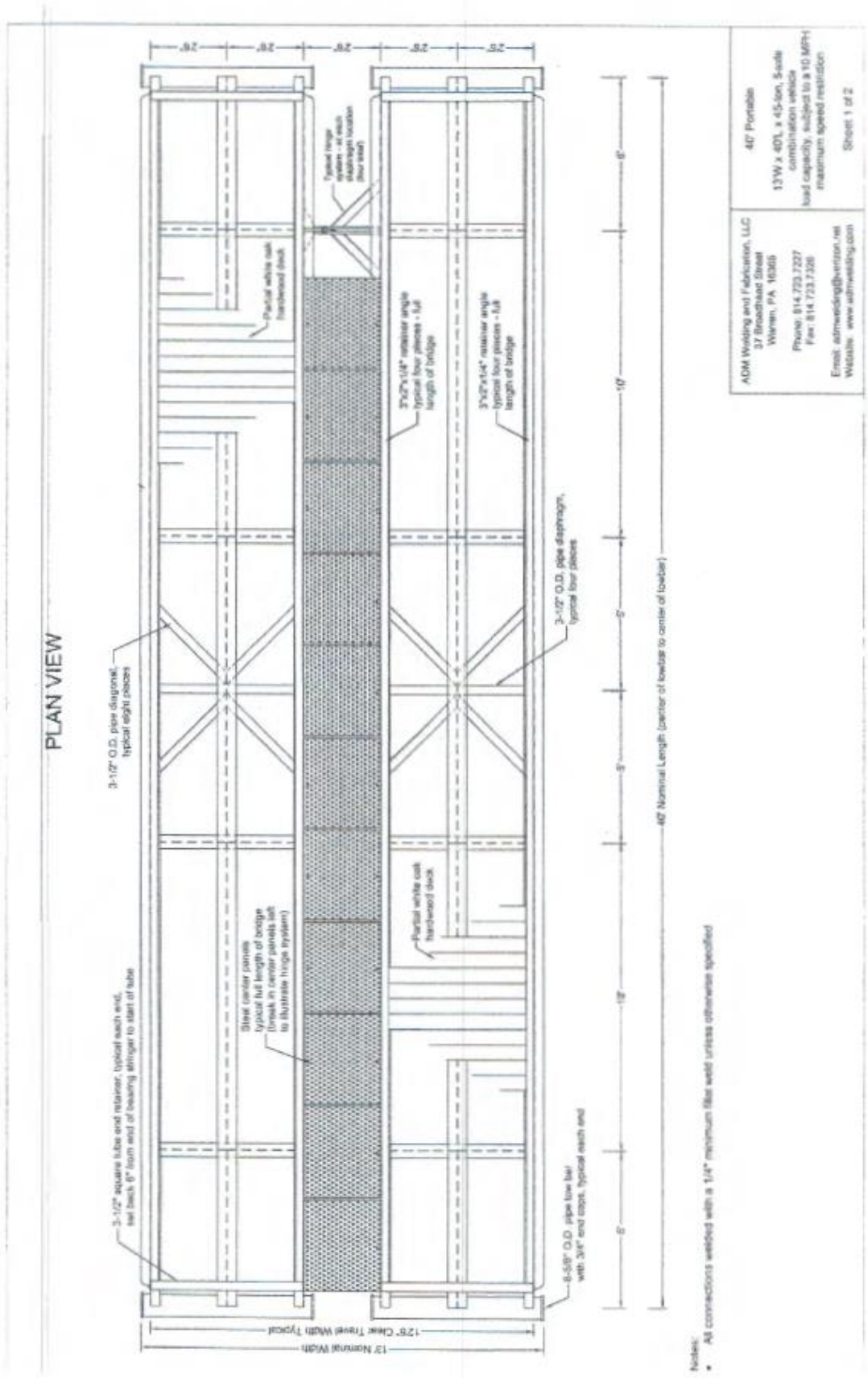
COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
ALLAN R. WINDENPOEL
ENGINEER

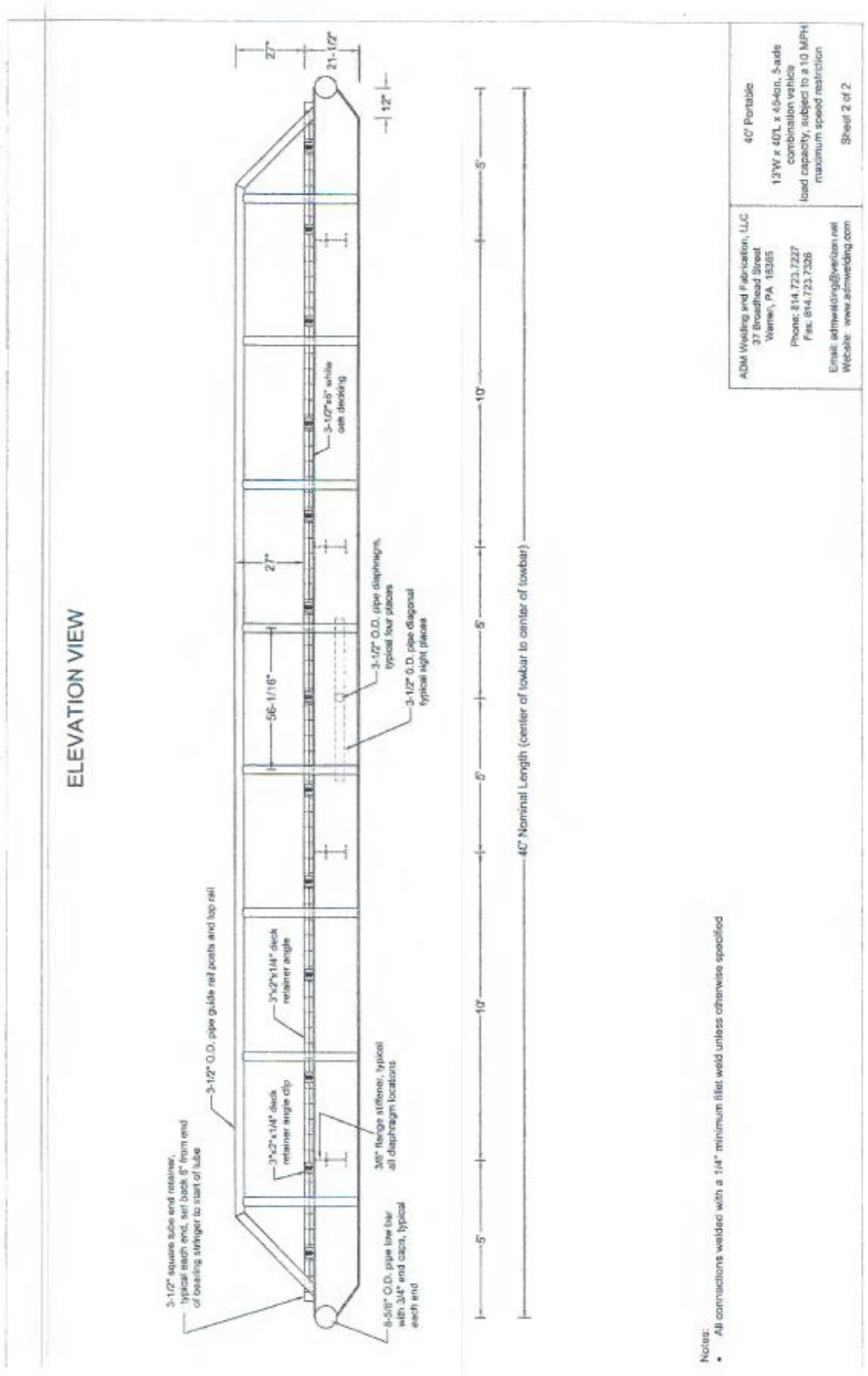
E&M
ENGINEERS AND SURVEYORS PC
SPRINGVILLE, NEW YORK
BRADFORD, PENNSYLVANIA

PROJECT ADM WELDING SHEET NO 1 OF 1
SUBJECT HS25-40 BRIDGES
ORIGINAL BY ARW DATE 05/22/2015 CHK BY DATE
REVISED AFTER 9/16/2005 CALCULATIONS

Attachment B

ADM Welding and Fabrication, LLC 40’-0” Bridge Drawings (Portable - 13’ W x 40’ L x 45 Ton, 5 Axle Combination Vehicle Load Capacity, Subject to a 10 MPH Maximum Speed Restriction)


PLAN VIEW
40' Portable
13'W x 40'L x 45-ton, 5-axle combination vehicle load capacity, subject to a 10 MPH maximum speed restriction
Sheet 1 of 2
ADM Welding and Fabrication, LLC
37 Broadhead Street
Warren, PA 16365
Phone: 814.723.7227
Fax: 814.723.7326
Email: admweldingl@verizon.net
Website: www.admwelding.com
3-1/2" O.D. pipe diagonal, typical eight pieces
3-1/2" square tube end retainer, typical each end, set back 6" from end of bearing stringer to start of tube
Steel carrier panels (typical full length of bridge (break in center panels set to illustrate hinge system))
Partial white oak hardwood deck
3"x2"x1/4" retainer angle typical four pieces - full length of bridge
3-1/2" O.D. pipe diaphragm, typical four places
8-5/8" O.D. pipe tow bar with 3/4" end stock, typical each end
47' Nominal Length (center of towbar to center of towbar)
13' Nominal Width
12'6" Clear Travel Width Typical
Notes:
All connections welded with a 1/4" minimum fillet weld unless otherwise specified

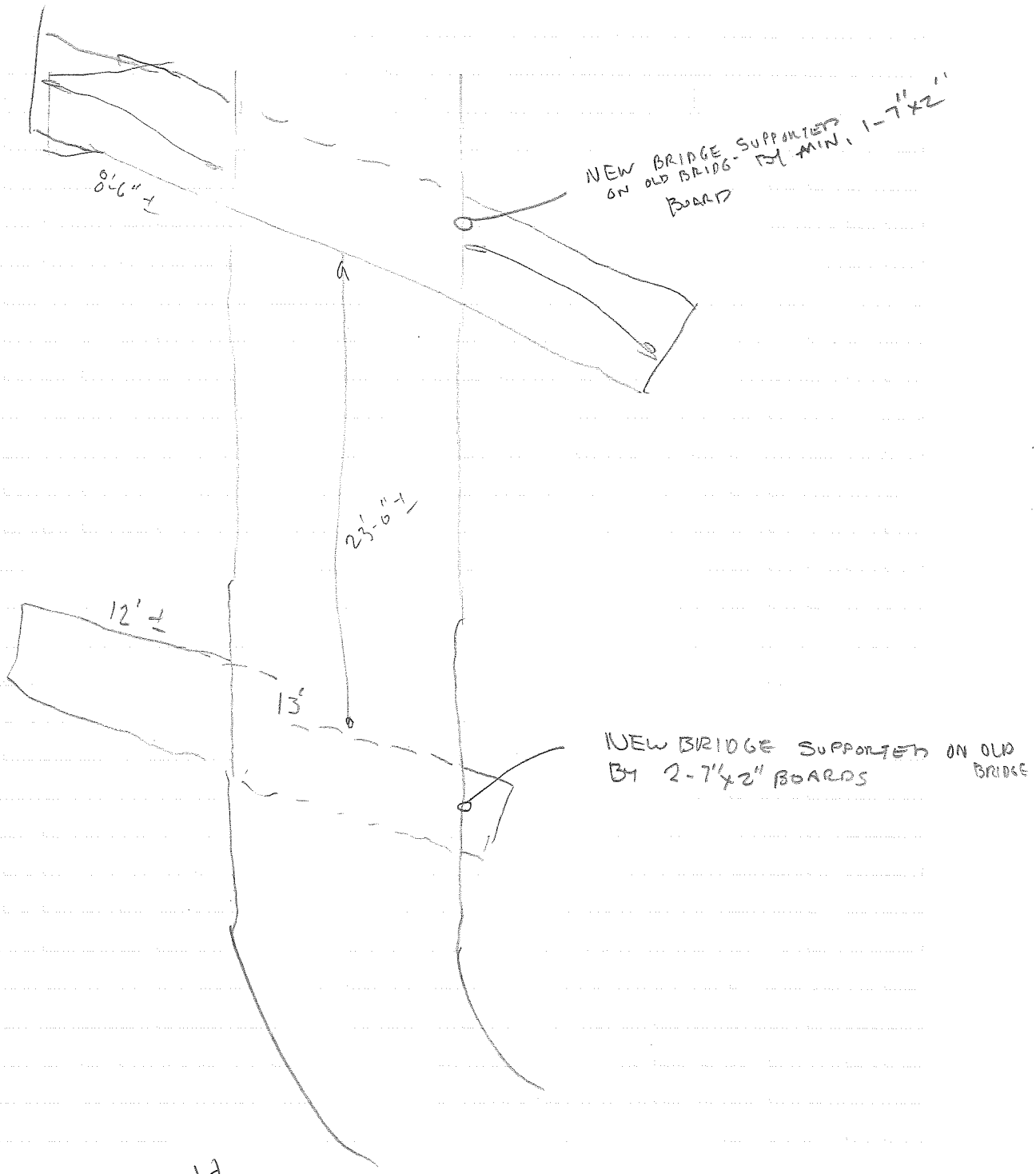

ELEVATION VIEW
27"
21-1/2"
12"
3-1/2"x6" white oak decking
3-1/2" O.D. pipe diaphragm, typical four places
3-1/2" O.D. pipe diagonal typical eight places
5/8- 1/16"
27"
3"x2"x1/4" deck retainer angle
3"x2"x1/4" deck retainer angle clip
3/8" flange stiffener, typical all diaphragm locations
3-1/2" square tube end retainer, typical each end, set back 6" from end of bearing stringer to start of tube
3-1/2" O.D. pipe guide rail posts and top rail
8-5/16" O.D. pipe tow bar with 3/4" end caps, typical each end
5'
10'
5'
10'
5'
40' Nominal Length (center of towbar to center of towbar)
ADM Welding and Fabrication, LLC
37 Broadhead Street
Warren, PA 16365
Phone: 814.723.7227
Fax: 814.723.7326
Email: admwelding@verizon.net
Website: www.admwelding.com
40' Portable
13'W x 40'L x 48-ton, 3-axle combination vehicle load capacity, subject to a 10 MPH maximum speed restriction
Sheet 2 of 2
Notes:
All connections welded with a 1/4" minimum fillet weld unless otherwise specified

Attachment C

January 6, 2018 Tetra Tech Inspection - Field Notes

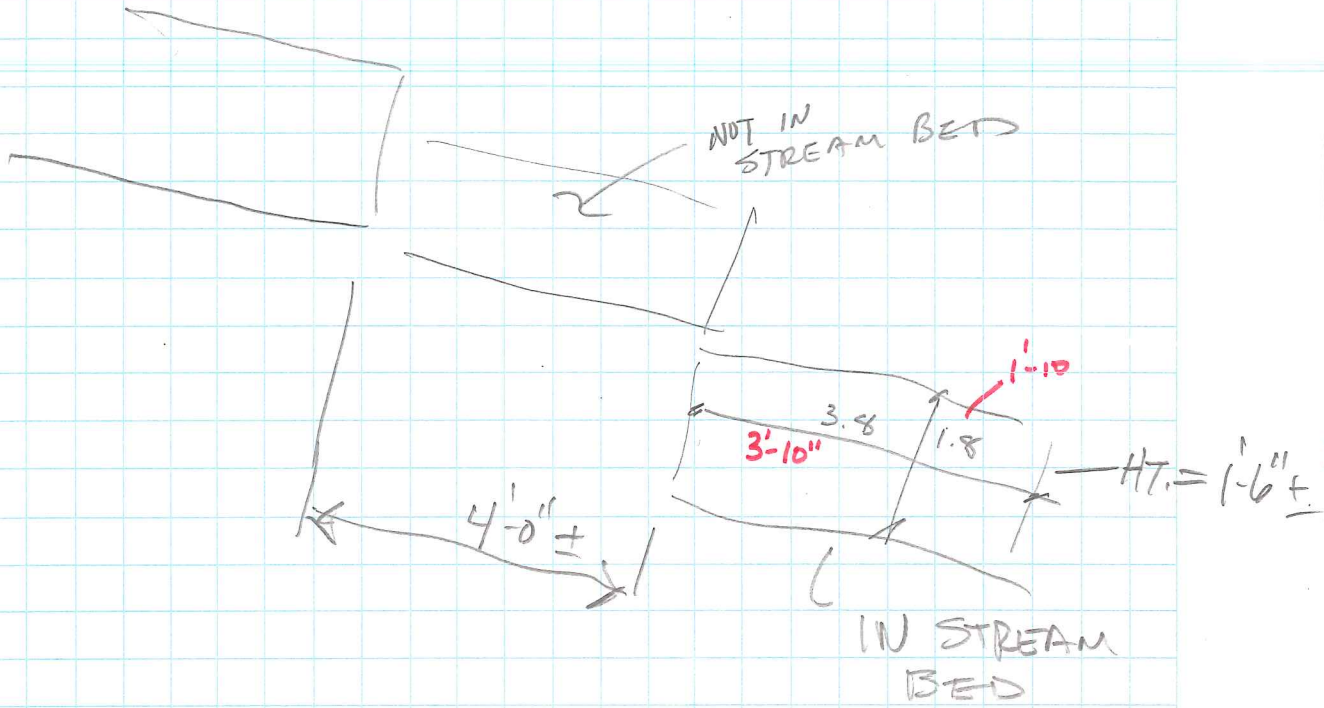
TETRA TECH **CALCULATION WORKSHEET** PAGE 1 OF

CLIENT Sunoco		JOB NUMBER 2121C-BF-00037	
SUBJECT Back Hollow Bridge Insp.		TASK 500	
BASED ON		DRAWING NUMBER	
BY JLM	CHECKED BY	APPROVED BY	DATE 1/6/17



TETRA TECH **CALCULATION WORKSHEET** PAGE 2 OF

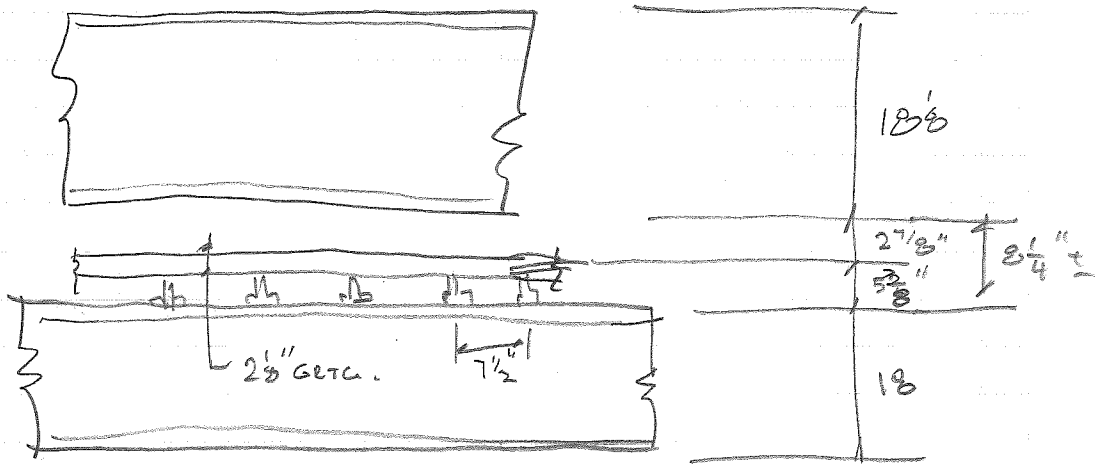
CLIENT SUNOCO		JOB NUMBER 212IC-BF-00037	
SUBJECT BLACK HOLLOW BRIDGE INSPECTION			
BASED ON		DRAWING NUMBER	
BY JLM	CHECKED BY	APPROVED BY	DATE 1/6/17

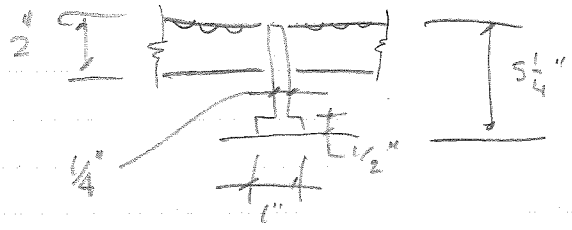


Face/Pier To Face/Pier @ ℄ = 23'-0

TETRA TECH **CALCULATION WORKSHEET** PAGE 3 OF

CLIENT SUNOCO		JOB NUMBER 212IC-BF-00037	
SUBJECT BLACK HOLLOW BRIDGE INSP.			
BASED ON		DRAWING NUMBER	
BY JLM	CHECKED BY	APPROVED BY	DATE 1/6/17



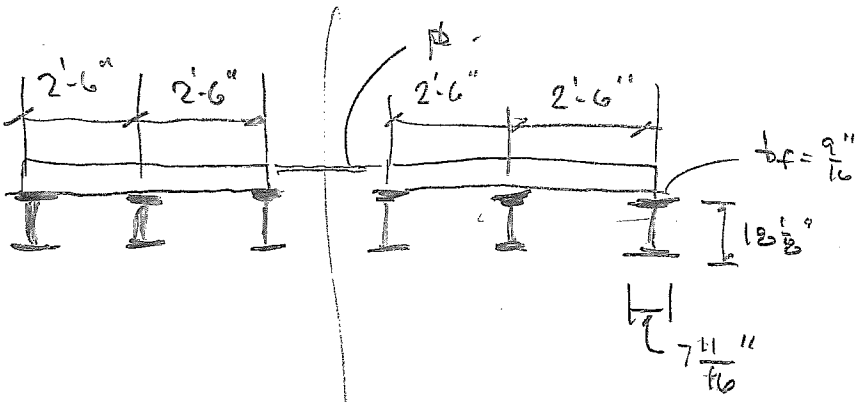


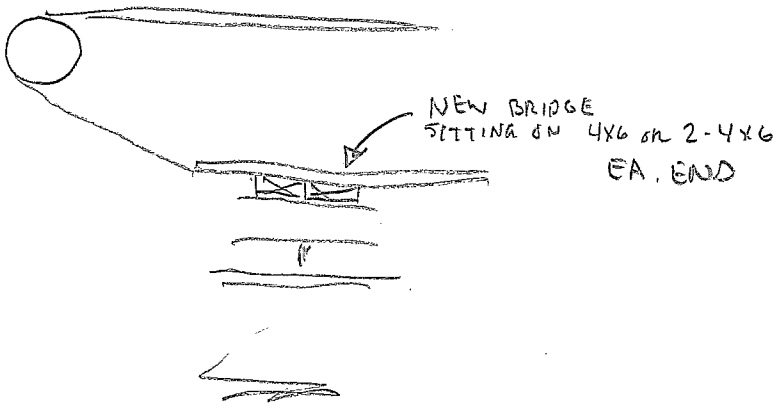
OLD BRIDGE
WEIGHT LIMIT
13 TONS
EXCEPT COMBINATIONS
28 TONS

212IC-BF-00037

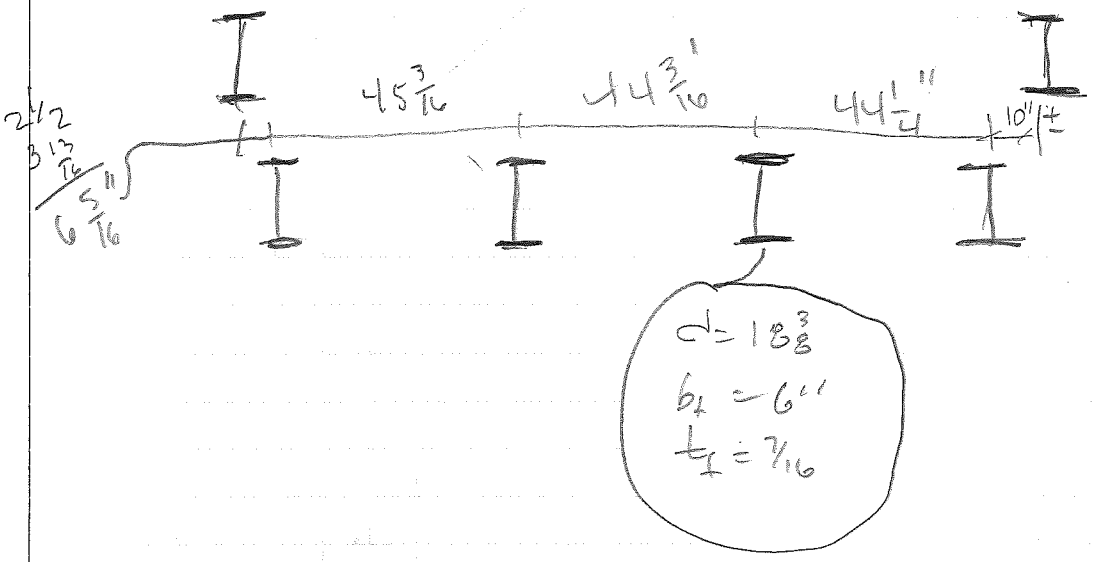
4/

Joshua Lane — TRICO SURVEYING & MAPPING
906-364-1704
joshualane84@yahoo.com





CLIENT SUNOCO		JOB NUMBER 212IC-BF-00037	
SUBJECT BACK HOLLOW BRIDGE INSP.			
BASED ON		DRAWING NUMBER	
BY JLM	CHECKED BY	APPROVED BY	DATE 1/6/17



LOOKING TOWARD HOUSE

45 3/16 = 3'-9 3/16
44 3/16 = 3'-8 3/16
7'-5 3/8
44 1/4 = 3'-8 1/4
11'-1 5/8

12'-6
11'-1 3/8
1'-4 3/8
10
6 3/8

Attachment D

January 6, 2018 Tetra Tech Inspection – Photographs

Photograph 1.

Photograph 2.

Photograph 3

Photograph 4.

Photograph 5.

Photograph 6.

Photograph 7.

Photograph 8.

Photograph 9.

Photograph 10.

Photograph 11.

Photograph 12.

Photograph 13.

Photograph 14.

Photograph 15.

Photograph 16.

Photograph 17.

Photograph 18.

Photograph 19.

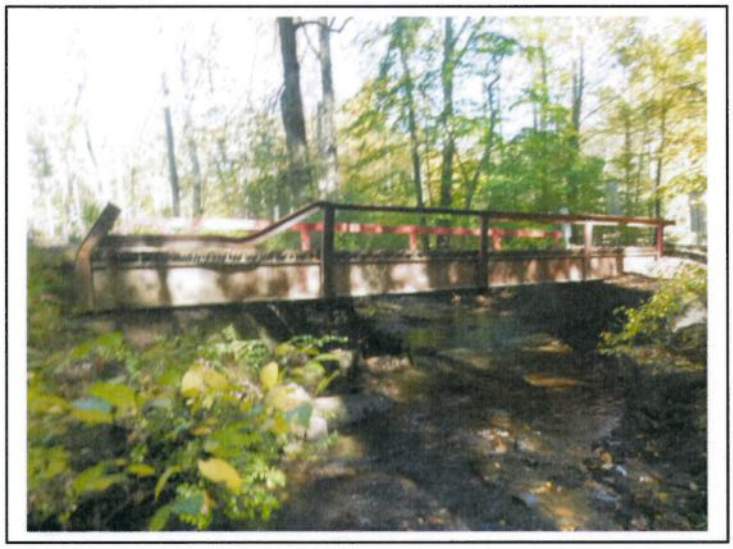
Attachment E

HRG 2017 Periodic (Routine) Bridge Inspection Report - Toboyne Township Bridge TBT-3, T-300 Back Hollow Road Over Schaeffer Run, Toboyne Township, Perry County, Pennsylvania, Structure ID No. 50 7217 0300 4003, Category: A1, Bridge Key: 29744

2017

PERIODIC (ROUTINE) BRIDGE INSPECTION REPORT
TOBOYNE TOWNSHIP BRIDGE TBT-3
T-300 BACK HOLLOW ROAD OVER SHAEFFER RUN
TOBOYNE TOWNSHIP
PERRY COUNTY, PENNSYLVANIA
STRUCTURE ID NO. 50 7217 0300 4003
CATEGORY: A1 BRIDGE KEY: 29744

POSTED
CLOSED DURING INSPECTION



Inspected October 10, 2017
for
Perry County Board of Commissioners
By Herbert, Rowland & Grubic, Inc.
Harrisburg, Pennsylvania

Inspected by:
Greggory P. Rubinic, C.B.S.I.
Taylor A. Abel, E.I.T., C.B.S.I.

Previously Inspected: October 18, 2016

COMMONWEALTH OF PENNSYLVANIA
REGISTERED PROFESSIONAL
FRANK P. HUTTE
ENGINEER
No. 32143-E

11-09-17

HRG
Herbert, Rowland & Grubic, Inc.
Engineering & Related Services

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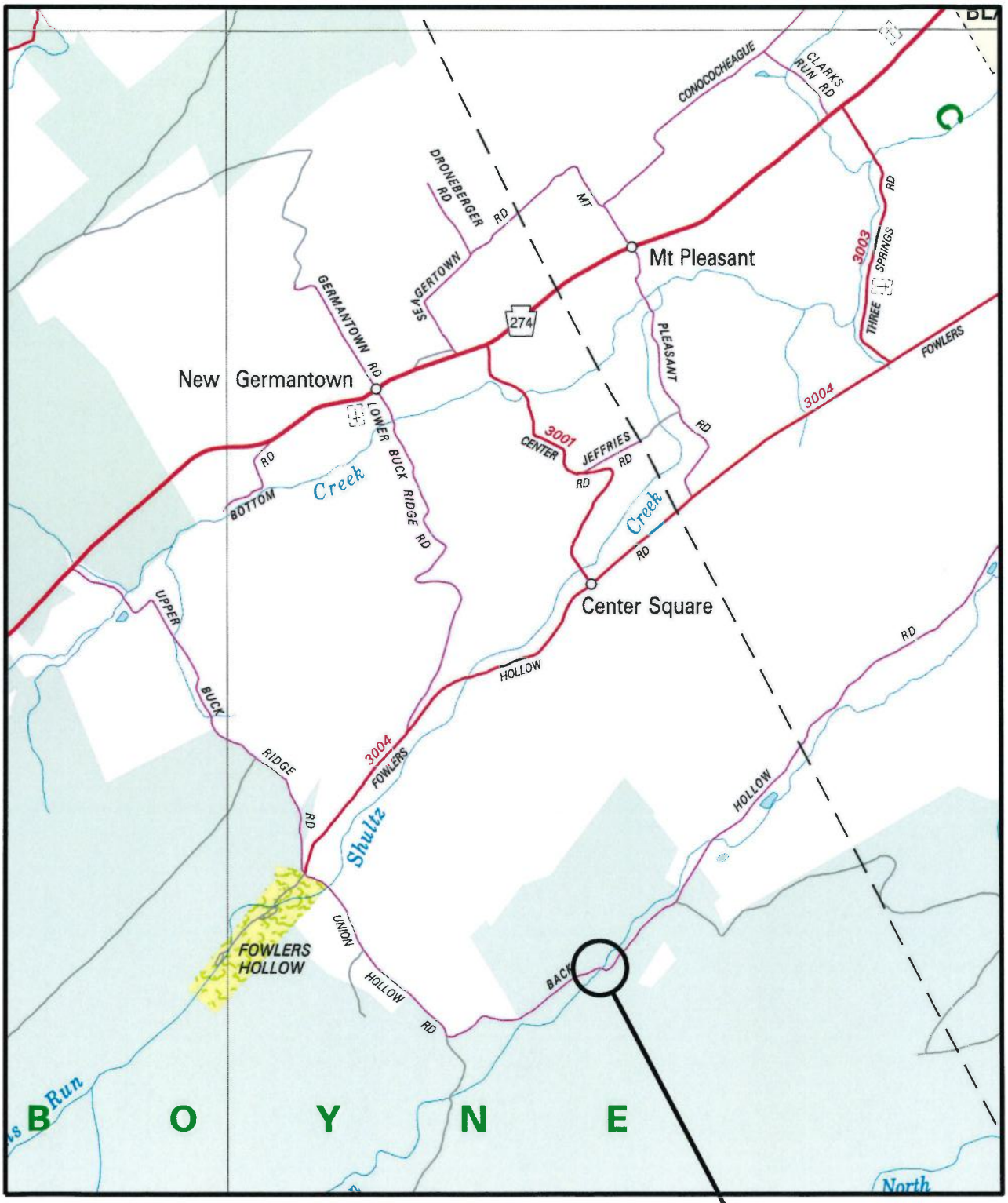
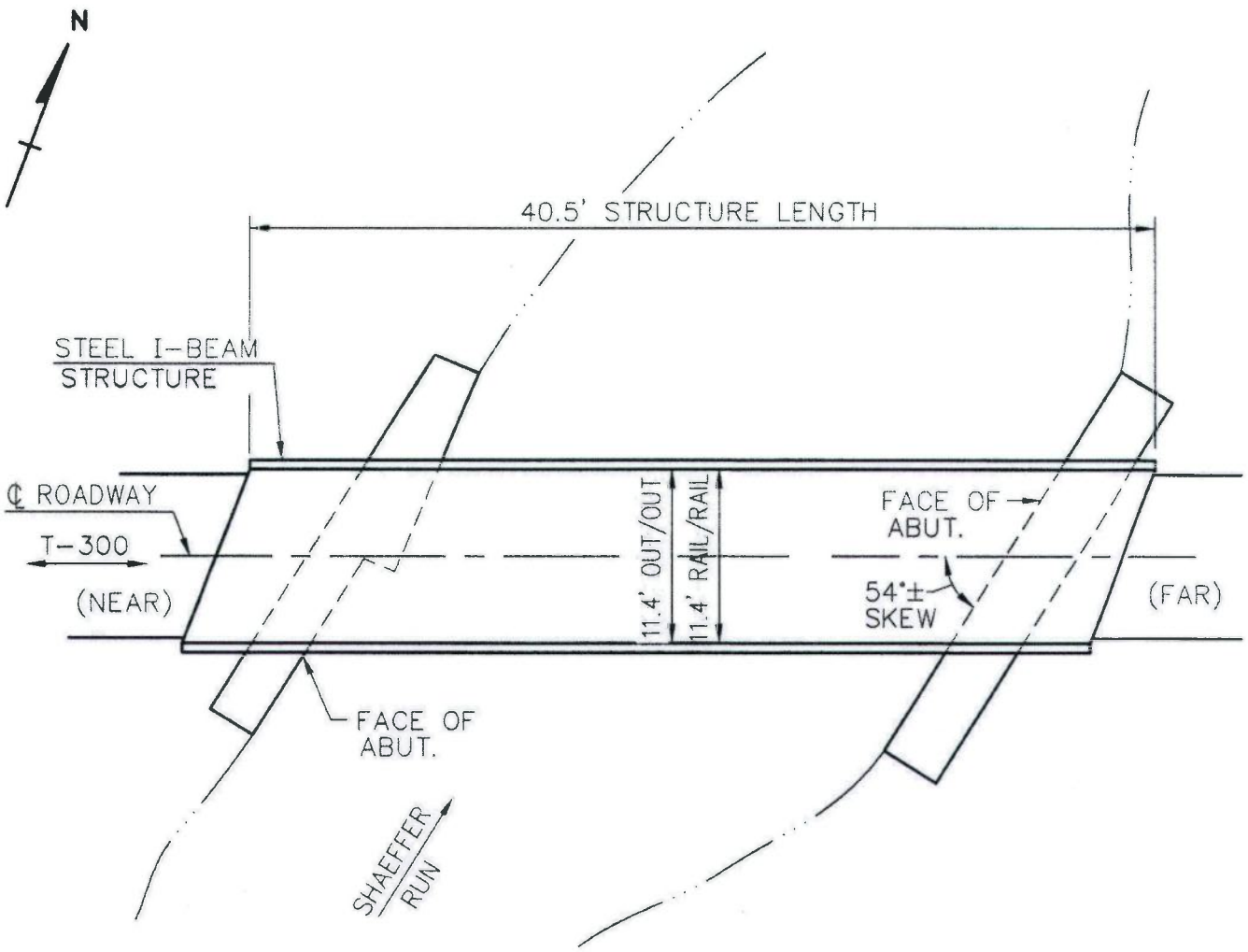
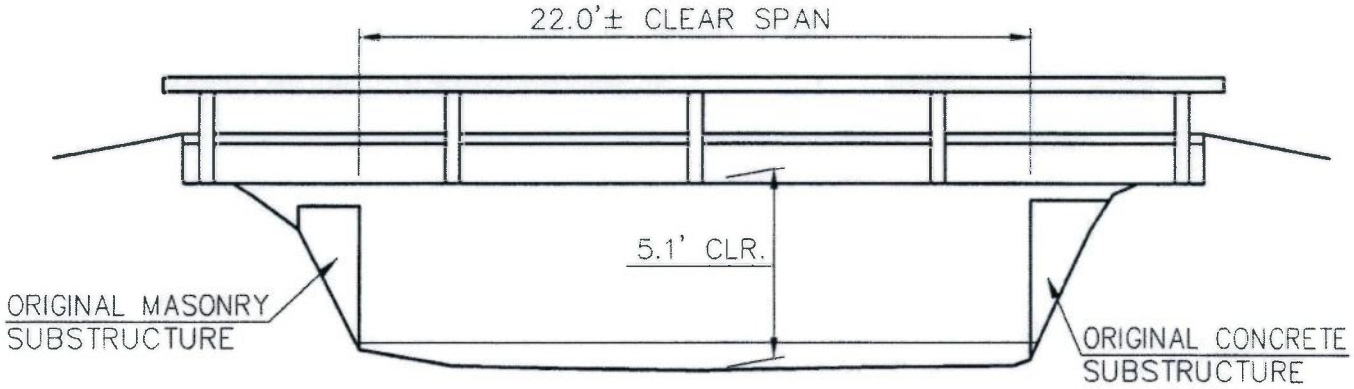


TOBOYNE TOWNSHIP BRIDGE TBT-3

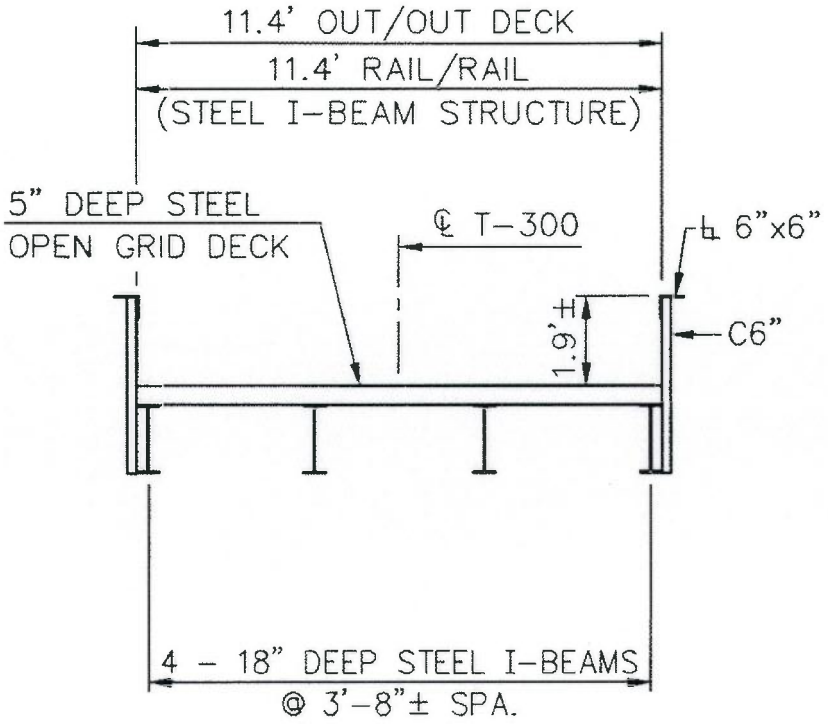
LOCATION MAP



PLAN
NOT TO SCALE



ELEVATION – LOOKING DOWNSTREAM
NOT TO SCALE



TYPICAL SECTION

SCALE: 1/4" = 1'-0"

GENERAL DESCRIPTION

STRUCTURE TYPE: ..... Single Span Steel I-Beam Bridge

YEAR BUILT: ..... Original: 1936; Reconstructed: 1998

SPAN(S): ..... 1 @ 38.0' (Clear)

SKEW: ..... 54°

DECK TYPE: ..... Open Grid Steel Deck

ABUTMENT TYPE: ..... Stone Masonry and Concrete

PIER TYPE: ..... N/A

HORIZONTAL CLEARANCE RAIL TO RAIL: ..... 11.4'

VERTICAL CLEARANCE: ..... Unlimited

UNDERCLEARANCE: ..... 5.1'(+/-)

APPROACH PAVEMENT WIDTH: ..... 11.4'

APPROACH ROADWAY WIDTH W/SHOULDERS: ..... 11.4'

POSTED WEIGHT LIMIT: ..... 13 Tons, Except Combinations 28 Tons

(Closed During Inspection)

ESTIMATED AVERAGE DAILY TRAFFIC 50 (2017)

SUMMARY OF FINDINGS

Signing Notes

The bridge is posted for 13 Tons, Except Combinations 28 Tons. The approach weight posting signs are >25' from bridge but provide visibility across structure due to road alignment. All weight posting signs are in satisfactory condition. Weathering noted on several of the advance sign panels (See Photo Nos. 9 & 10). The far advanced supplemental weight posting sign at the township line is missing due to construction of a pipeline, however this sign is not required, the far advanced sign is in place. One lane bridge signs are in place, the far post is slightly loose, stable. Both one lane bridge signs are dirty, the far sign is very dirty (See Photo Nos. 13 & 14). Additionally, there are hazard clearance signs present, the near left post and panel are bent with scrapes, stable, need repaired. The post at the near right is very loose and leans (See Photo No. 15). All four are placed at improper height.

Approach Alignment

Limited sight distance, considerable speed reduction required.

Traffic Safety Features

Current Rating: 3 2 2 2
Prior Rating: 3 2 2 2

Bridge Railing: Steel angles with channel posts, 2' height. The railing extends just past the structure and turns down into the ground.

- Moderate damage at far left, three bent posts, end post bent out 5", all secure.
- Painted on top and inside face with freckled corrosion, remainder exhibits corrosion and minor pitting. A few scrape marks and minor isolated paint peel on inside face.
- Right railing exhibits outward lean at top (outward lean 2" max. to 1/4" min., old condition)
- Severe impact damage at the near right. The top channel is no longer connected to the first post and the turndown is no longer present. The post is no longer connected to the beam at the top and is barely attached at the bottom of the beam. (See Photo No. 17)

Transition: None.

Guiderail: None.

Approach Rail Ends: None.

Approach Roadway

Current Cond. Rating: 6
Prior Cond. Rating: 6

Pavement: Gravel/shale with minor unevenness, minor wheel rut, two 1 s.f. shallow potholes at near in wheel lines, three 1 s.f. shallow potholes in right wheel line at far, no settlement.

Drainage: Natural, appears adequate.

Shoulders: Narrow, gravel, shale and vegetated, steep embankment beyond, mostly stable.

Deck **Current Cond. Rating:** 6
Prior Cond. Rating: 6

Top: Steel open grid deck (5") repurposed condition.
- No cracked welds detected at beam connections.
- No loose panels.
- 2' long portion of end plate at far left corner previously loose with broken weld not present, grid deck below ok.
- A few bent secondary bars, minor damage.
- A few short diagonal secondary bars broken at a weld at end of bar.
- Steel plate at far left end missing, no problems to exposed deck.
- Beams/deck measured for levelness:
  - Near end drops from left to right 1 1/2" in 4' perpendicular to beams.
  - Far end is level perpendicular to beams.
  - Left edge drops from near to far 1 1/2" in 4' parallel to beams.
  - Right edge drops from near to far 1" in 4' parallel to beams.

Underside: See "Top".

Expansion Joints: N/A

Superstructure **Current Cond. Rating:** 2
Prior Cond. Rating: 5

Girders/Beams: Steel I-beams - repurposed condition.
- Moderate to heavy paint peel, surface corrosion with pitting, some moderate pitting on top flanges.
- No significant section loss noted.
- One minor gouge and two moderate gouges noted on downstream (left) fascia web, 1/8" deep +/-.
- Upstream (right) fascia bent laterally at far end 6' (old condition, deck welded to top flange no cracks) with minor gouges along bottom flange.
- Heavy accumulation of gravel and dirt on top flanges, minor on bottom.
- Beam 4 at the near end exhibits extensive bearing loss/deterioration (over 80%). Beam 4 visibly deflected under live load, this deflection also caused movement of the remaining bearing material. This deficiency warranted immediate closure of the structure. (See Photo Nos. 25-27)

Diaphragm: Steel X-Bracing - angles similar condition as beams.
- Four cracked welds noted at connection to beam web locations.
  - Beam 1 bottom angle connection, 3/8" long fine crack in weld (right face of web) (See Photo No. 28).
  - Beam 2 (center bay) bottom angle connection of beam 2 web 4" long (full height) crack in weld on near side (right face of web) (See Photo No. 29).
  - Beam 3 bottom angle connection, 3/8" long fine crack in weld (left face of web).
  - Beam 4 (upstream. fascia) top & bottom angle connection 11/16" gap at bottom connection, 1/8" gap at top with slight misalignment (left face of web) (See Photo No. 30).

- Far end - shallow end diaphragms present, narrow steel plate and fill visible, some spill through evident, approach above stable.
- Near end similar, less spill through than far, approach above stable.

Bearings: Not visible except beam 4 at the near abutment. Beams appear to bear on compacted shale. Significant loss (over 80%) to the bearing of beam 4 at the near abutment, see "beams" for more information.

Drainage System: None.

Substructure

Current Cond. Rating: 2
Prior Cond. Rating: 4

Near Abutment:

Backwall: No backwall, vertical steel plate along top beams from deck connection, noted between beams, some timber evident, shale from approach roadway visible with spill thru evident, somewhat stable, no settlement in roadway above.

Bridge Seat: N/A.
- Steel superstructure does not appear to bear on old masonry abutment. No formal beam seat visible.
- Distance between bottom flange of beams and top of stone masonry:
  - Beam 1 - 9"
  - Beam 2 - 9"
  - Beam 3 - 8 3/4"
  - Beam 4 - 8 1/2"

Cheekwalls: N/A

Stem: Stone Masonry
- Old masonry abutment no longer provides support for superstructure and retains fill where beams bear.
- No formal substructure visible to support beams.
- Parget and joints mostly sound at center.
- Movement & separation of stones 3' long x 3' high area with voids probed to 3' penetration, 3' long x 0.5' vertical x 0.5' under void at base below 3' long x 1.5" wide crack above. (See Photo No. 32)
- Somewhat stable.
- 1 1/2" to 2 1/2" wide x 2' long diagonal crack between stone and abutment corner at near right end of masonry, 1 s.f. deterioration above.
- Loose stones in fill below beam 1, end 3'. Beam supported beyond.
- Loss of bearing stones under beam 4 at the near abutment, see superstructure for more information.

Wings: Stone Masonry
- Most joints appear sound.
- Locations of moderate cracking & deterioration mostly at near left end.
- Moderate vegetation on top.

Footing: Not detected. Large rocks along old abutment & wings, appears stable. Previous scour or undermining repaired.

Scour/Undermine: Medium to large rocks along abutment some migration possible, no scour or undermining.

Settlement: Minor settlement (Old condition) at middle of abutment.

Embank-Slope-Wall: N/A

Wall Drainage: None.

Far Abutment:

Backwall: No backwall, vertical steel plate along top beams from deck connection, noted between beams, some timber evident, shale from approach roadway visible with spill thru evident, somewhat stable, no settlement in roadway above.

Bridge Seat: N/A

- No formal beam seat detected.
- Heavy accumulation of gravel between beams and on beam flanges & webs.
- Old concrete abutment may provide some support, no apparent distress or settlement.
- Distance between bottom flange of beams and top of concrete:
    - Beam 1 - 3/4"
    - Beam 2 - 1"
    - Beam 3 - 1 5/8"
    - Beam 4 - 2 1/4".

Cheekwalls: N/A

Stem: Concrete

- Abutment may provide some support for superstructure, no apparent distress.
- A few chips & scrapes.
- Portions of previous undermining covered except under each fascia beam see "Footing for more information.

Wings: Concrete and Stone Masonry

- Far left masonry some minor deterioration at end 1' long x 0.5' vertical x 2' under void (See Photo No. 37).
- Joints mostly sound.
- Concrete sound, similar to abutment.

Footing: Not detected.

- Bottom of concrete abut. & wings visible.
- Far Right 5' long x 1.0' vertical x 1.0' under, no increase.
- Far Left 1.0' long x 0.5' vertical x 1.0' under, no increase.

Scour/Undermine: 0.9' scour depth = 0.9' of infill (probed vertically).

- Undermining at far left, 1.0' long x 0.5' vertical x 1.0' under.
- Undermining at far right, 5' long x 1.0' vertical x 1.0' under.
- Several medium to large rocks along abutment

Settlement: None apparent.

Embank-Slope-Wall: N/A

Wall Drainage: None.

Channel

Current Cond. Rating: 5
Prior Cond. Rating: 5

Channel: Channel alignment is fair to good.
- Minor scour noted under the bridge, and just downstream of the structure, scour up to 0.4' in depth.

Banks:
- Severe erosion at near right which is undercutting bank at wing.
- Far left tree roots exposed & undermined (>100' long x 3' high to 4' high)
- Minor at near left, far right, some sloughing.

Streambed Movements: Minor toward near right, far left, no significant change.

Debris, Vegetation: None.

River Control Devices: None.

Embankment/Streambed Controls: Large rocks/rubble from old pier placed along old abutments and wings, some migration, stable.

Drift, Other: Minor.

Paint

Current Cond. Rating: 5
Prior Cond. Rating: 5

Interior Beam/Girder: Steel beams exhibit moderate paint peel, surface corrosion with some pitting. No significant section loss noted.

Fascias: Similar to interior beams.

Bearings: Not visible, except at beam 4, paint is in similar condition to rest of beam.

Other: Steel open grid deck (5") repurposed condition, worn, moderate surface corrosion and paint peel throughout. Steel X-Brace - angles similar condition as beams.

Photo No. 1: Near Approach

Photo No. 2: Far Approach

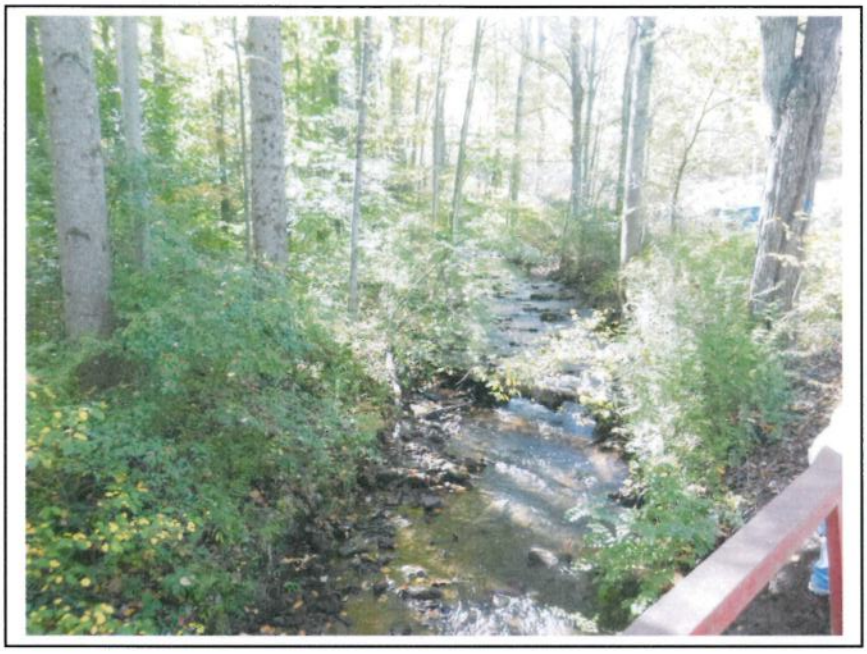


Photo No. 3: View Upstream

Photo No. 4: View Downstream

Photo No. 5: Upstream Elevation

Photo No. 6: Downstream Elevation

Photo No. 7: Near Road Closed Sign

Photo No. 8: Far Road Closed Sign

Photo No. 9: Near Advanced Weight Posting Sign

Photo No. 10: Far Advanced Weight Posting Sign

Photo No. 11: Near Weight Limit Sign

Photo No. 12: Far Weight Limit Sign

Photo No. 13: Near One Lane Bridge

Photo No. 14: Far One Lane Bridge

Photo No. 15: Near Right Leaning Hazard Clearance Sign

Photo No. 16: Far Right Hazard Clearance Sign

Photo No. 17: Near Right Railing Damage

Photo No. 18: Near Approach Condition

Photo No. 19: Near Joint

Photo No. 20: Typical Deck Condition

Photo No. 21: Typical Underside

Photo No. 22: Typical Railing Channel to Beam Connection

Photo No. 23: Beam 1 Fascia

Photo No. 24: Beam 2 Web

Photo No. 25: Beam 4 Loss of Bearing at Near Abutment

Photo No. 26: Beam 4 Loss of Bearing at Near Abutment

Photo No. 27: Beam 4 Loss of Bearing at Near Abutment

Photo No. 28: Bay 1 Intermediate Diaphragm Cracked Weld at Beam 1

Photo No. 29: Bay 2 Cracked Weld at Beam 2

Photo No. 30: Bay 3 Intermediate Diaphragm Gap in Connection

Photo No. 31: Near Abutment Elevation

Photo No. 32: Near Left Abutment Voids

Photo No. 33: Near Left Wing Elevation

Photo No. 34: Near Right Wing Elevation

Photo No. 35: Far Abutment Elevation

Photo No. 36: Far Left Wing Elevation

Photo No. 37: Far Left Wing Void

Photo No. 38: Far Right Wing Elevation

LOAD RATING SUMMARY

	Vehicle Rating (Tons)			
	H 20 (20)	**HS 20 (36)**	**ML 80 (37.7)**	**TK 527 (40)**
Inventory	**24**	**39**	**29**	**33**
Operating	**40**	**65**	**48**	**56**

Interior Steel I-Beam

(Controlling Member)

Load Posting Review:

The structure is currently posted for 13 Tons, Except Combinations 28 Tons. This is based on the poor condition of the substructures. The ratings in the table above were obtained from the 1998 load rating analysis, except for the TK527 vehicle. The load rating analysis for the TK527 vehicle was performed in 2003. The load ratings were calculated in accordance with the LFD methodology, utilizing PennDOT's Bridge Analysis and Rating program (BAR7 v7.8 except TK527 was performed on v7.10a). The controlling member was found to be the interior steel I-Beams.

A load rating analysis was not conducted as part of this bridge inspection, however the bridge was closed to all traffic, due to the loss of bearing under beam 4 at the near abutment, since the structure could not carry any live loads safely.

RECOMMENDATIONS

	Maintenance Items		Estimated Cost	Priority Code
1.	Scour Control – Rock Protection			
	2 CY	$50 per CY	$100	3
	Place additional rock protection along far abutment.			
2.	Clean/Flush – Steel – Horizontal Surfaces			
	1 EB	$1,000 per EB	$1,000	3
	Clean horizontal surfaces.			
3.	Steel – Diaphragm/Lateral Bracing			
	5 EA	$250 per EA	$1,250	3
	Repair welds at X-bracing diaphragm.			
4.	Abutment – Wing – Pier, etc. – Masonry (Repoint)			
	150 LF	$25 per LF	$3,750	4
	Repair open joints and cracks in masonry at near abutment.			
5.	Approach Roadway – Guide Rail			
	4 EA	$1,000 per EA	$4,000	2
	Install standard guide rail and end treatments.			
6.	Railing – Structure Mounted			
	73 LF	$150 per LF	$10,950	1
	Install standard structure mounted guide rail.			Deferred
7.	Approach Roadway – Clearance Signs			
	2 EA	$200 per EA	$400	2
	Reset loose hazard clearance sign post at near right. Reset near and far right hazard clearance signs to proper height.			
8.	Approach Roadway – Clearance Signs			
	2 EA	$200 per EA	$400	2
	Replace damaged post and sign panel at near left. Reset near and far left hazard clearance signs to proper height.			
9.	Bearings – Pedestal/Seat			
	1 EA	$2,500 per EA	$2,500	1
	Repair the bearing area under beam 4 at the near abutment.			Deferred

Total Cost of All Maintenance Items: **$ 24,350**

Maintenance Priority Codes:

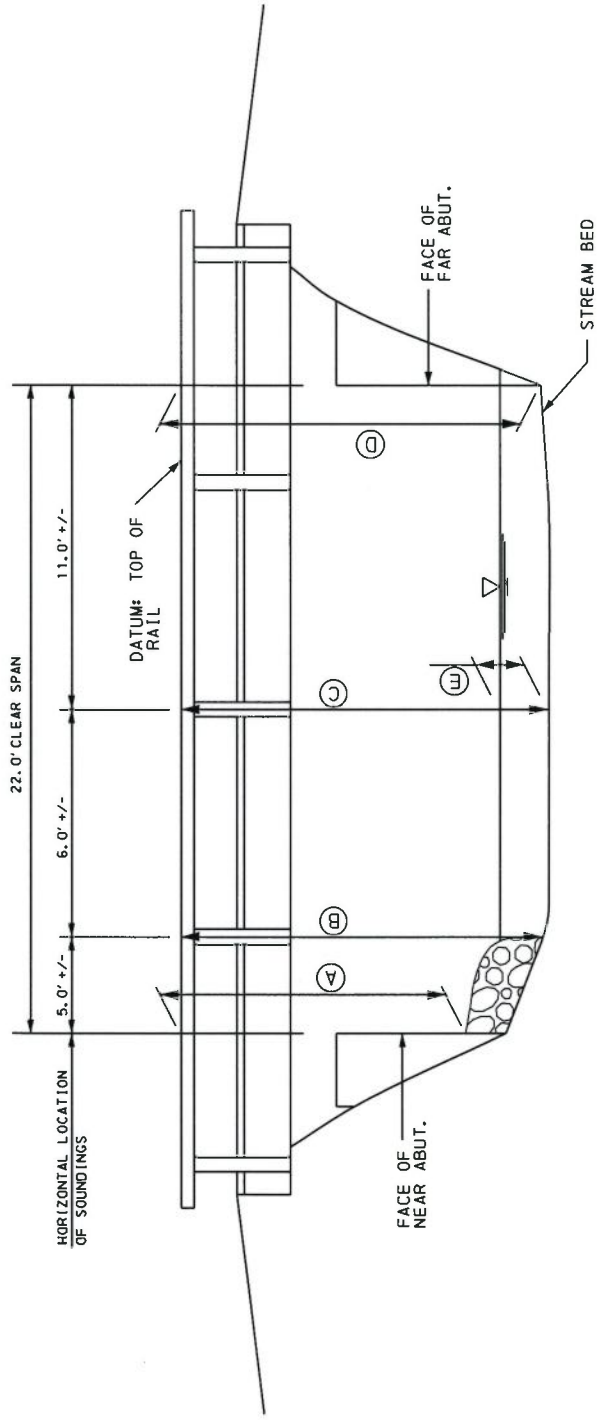
Coding		Short Definition	Action Timeframe
0	CRITICAL	Immediate response required	(within 7 days)
1	HIGH PRIORITY	Schedule work as soon as possible	(within 6 months)
2	PRIORITY	Adjust work plan	(re-prioritize schedule)
3	SCHEDULE	Add to scheduled work	(Add to schedule)
4	PROGRAM	Add to programmed work	(when funds are avail)
5	ROUTINE	As per existing maintenance sch.	(w/in next work cycle)

CONCLUSIONS

The bridge is in critical condition overall. This is primarily driven by the condition of the bearing area under beam 4 at the near abutment; the bridge was closed at the time of inspection due to this deficiency. The substructures are also a concern because the beams do not appear to rest on any formal substructure and appear to rest on compacted shale. Additionally the traffic safety features at this structure are damaged and do not provide proper vehicular safety to travelers. The recommended maintenance items outlined in this report should be implemented in a timely manner to abate further deterioration and to improve vehicular safety.

This bridge should be inspected again in 12 months by a qualified engineer.

APPENDIX



STREAM CROSS SECTION - U/S FACE OF BRIDGE

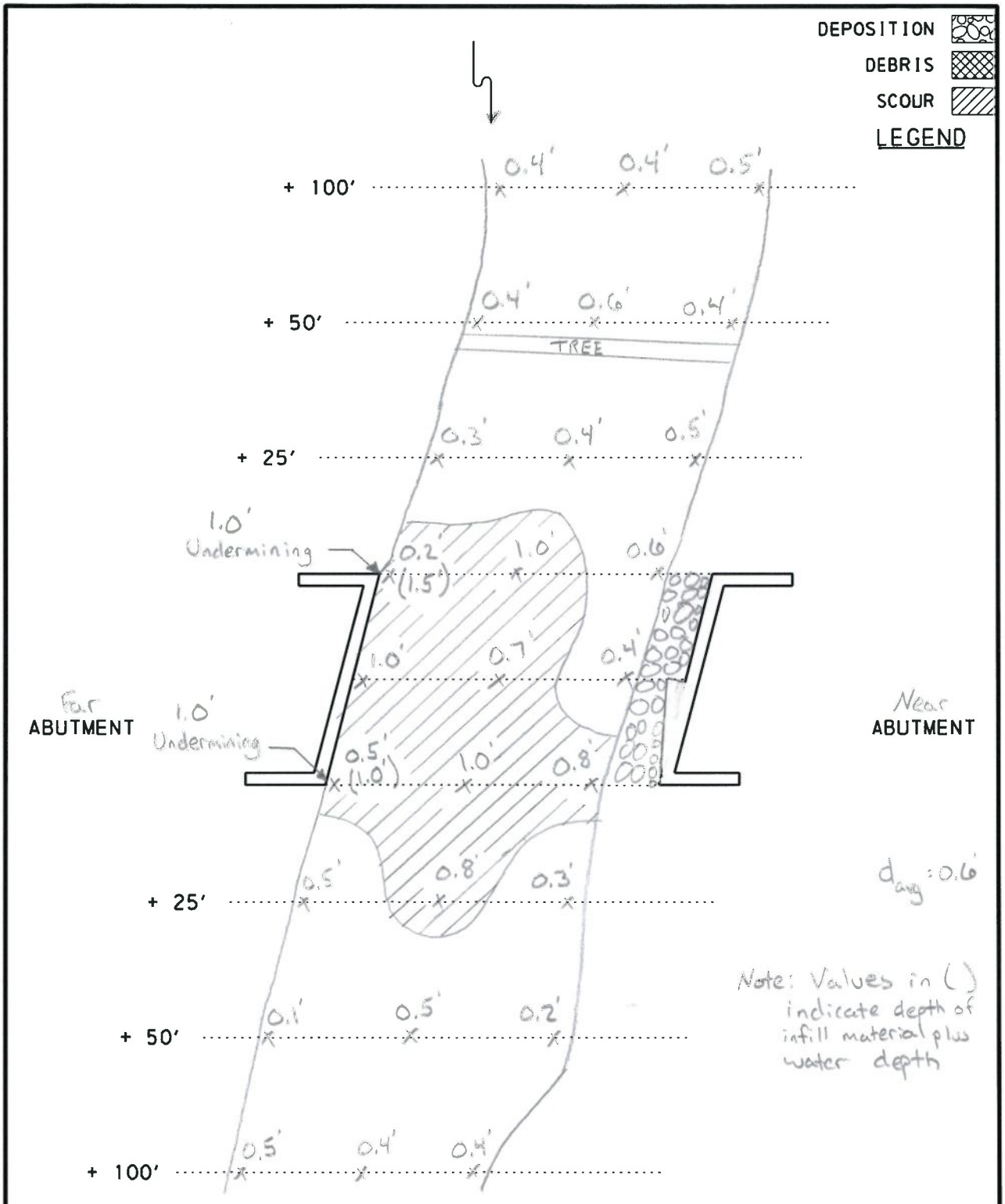
LOOKING DOWNSTREAM
NOT TO SCALE

DATE	A	B	C	D	E
10-14-2015	7.0'	8.8'	9.1'	8.3'	0.6'
10-10-2017	7.0'	8.8'	9.2'	8.5'	1.0'

Perry County

Br. Name: TBT-3

Date: 10-10-17



CHANNEL PLAN & SOUNDINGS

NOT TO SCALE

NOTE: VALUES INDICATE WATER DEPTH AT TIME OF INSPECTION.

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SITE DATA
Form A

Form D-450A

5A01	SR ID: 50721703004003	5A03	BR Key: 29744	7A01	Inspection Date: October 10, 2017

1A09	Inspection Status:	2 - Submitted
7A02	Team Leader:	2032 Herbert, Rowland & G Rubinic
7A03	Inspection Type:	R - Regular (routine)
7A05	Inspected By:	8 - Consulting Firm

Structure Description

5A08	FHWA Facility Carried:	BACK HOLLOW RD
5A07	Features Intersected:	SHAEFFER RUN
5A09	Location:	3 SE N GRMNTWN/SHAEFFER R
5C01	Roadway Name:	T-300
5A06	City / Borough Name:	50/217 - TOBOYNE
6B48	Combust. Mat. Under Bridge:	
	Combust. Mat. Under Bridge Note:	

Structure Type

Main			Approach		
6A26	Material Makeup:	1 - Steel	6A26	Material Makeup:	
6A27	Physical Makeup:	6 - Rolled sections	6A27	Physical Makeup:	
6A28	Span Interaction:	1 - Simple, non-comp	6A28	Span Interaction:	
6A29	Structural Config:	04 - I beams	6A29	Structural Config:	

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SITE DATA
Form A

Form D-450A

5A01 SR ID: 50721703004003 | 5A03 BR Key: 29744 | 7A01 Inspection Date: October 10, 2017

Sign Information

ID01 Type of Sign	ID02 Sign Needed	ID03 Sign Message	ID04 Near Adv	ID06 Bridge Site Near	ID07 Bridge Site Far	ID05 Far Adv	Comments
0 - Bridge	Yes	BRIDGE	G	G	G	G	NO PROBLEMS. APPROACH SIGNS >25' FROM BRIDGE BUT PROVIDE VISIBILITY ACROSS STRUCTURE DUE TO ROAD ALIGNMENT.
1 - Bridge Weight Limit	Yes	13 TONS	G	G	G	G	ALL SIGNS IN satisfactory CONDITION. WEATHERING NOTED ON SEVERAL of the ADVANCE SIGN PANELS.
2 - Except Combinations	Yes	28 TONS	G	G	G	G	THE FAR ADVANCED supplemental weight posting sign AT THE TOWNSHIP LINE IS MISSING DUE TO CONSTRUCTION OF A PIPELINE,
3 - One Truck at a Time	No						WEIGHT LIMIT POSTING SIGN PRESENT 3 MILES FROM FAR END OF BRIDGE.
4 - Vertical Clearance On	No						_
5 - Vertical Clearance Under	No	_					_
6 - One Lane Bridge	Yes		N	G	G	N	FAR POST SLIGHTLY LOOSE, STABLE. Both signs are dirty, far is very dirty.
7 - Narrow Bridge	No						_
8 - Hazardous Clearance	Yes		N	D	D	N	NL POST AND PANEL BENT WITH SCRAPES, STABLE, REPAIR. Very loose post at near right, leaning. All four are placed at improper height.
9 - Other	No						

Features Intersected

6C02 SR	6C02 Seg	5C03 On/ Under	5B09 Skew Angle	5C06 Dir	5C29 NHS	4A20 Min Lat Cl Left	4A19 Min Lat Cl Right	6C18 Tot Hor Cl Left	6C19 Tot Hor Cl Right	6C20 Min Vrt Cl Rdwys Left	6C21 Min Vrt Cl Rdwys Right	6C22 Vrt Cl Over 10ft Left	6C23 Vrt Cl Over 10ft Right	6C24 VT Sign	6B17 ADT
_	_	1	58	N/A	0 - Not on NHS	-1.0	-1.0	-1.0	11.4	99.9	99.9	99.9	99.9	0	50
		2	0	N/A	-1	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0	-1.0		-1

6B15 Design Exceptions:
6A50 Sup Latent Problem: _
6A51 Sub Latent Problem: _

Deck Geometry

Table Used for Appraisal: 1 - 2A/2B

Controlling Values

5C10 ADT: 50
5C27 Bridge Road Width: 11.4

4A10 Appraisal: 3 - Intolerable-Correct
Notes: ONE LANE, TWO WAY TRAFFIC.

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SITE DATA
Form A

Form D-450A

5A01 **SR ID:** 50721703004003 | 5A03 **BR Key:** 29744 | 7A01 **Inspection Date:** October 10, 2017

4A11 **Underclr Appr:** N - Not applicable (NBI)
6B13 **Controlling Vertical:** -1.0 FT
Controlling Lateral:

Traffic Safety Features

Feature Type	IA01 Location	IA02 Adequacy Rating	IA03 Description	5C08 Posted Spd Lmt (mph)
1 - Railing		3 - inadeq for cond	STEEL ANGLES W/ CHANNEL POSTS @ 4' SPA., 2' H	-1

Comment: STEEL ANGLES WITH CHANNEL POSTS, 2' HEIGHT. The railing extends just past the structure and turns down into the ground.
-MODERATE DAMAGE at FL, THREE BENT POSTS, END POST BENT OUT 5", ALL SECURE.
-PAINTED ON TOP AND INSIDE FACE WITH FRECKLED CORROSION, REMAINDER exhibits CORROSION AND MINOR PITTING. A FEW SCRAPE MARKS and MINOR ISOLATED PAINT PEEL ON INSIDE FACE.
-RIGHT RAILING EXHIBITS OUTWARD LEAN AT TOP (OUTWARD LEAN 2" MAX. TO 1/4" MIN., OLD CONDITION)
-Severe IMPACT DAMAGE at the near right. The top channel is no longer connected to the first post and the turndown is no longer present. The post is no longer connected to the beam at the top and is barely attached at the bottom of the beam.

2 - Transition	2 - Req not provided	NONE	-1

Comment: NONE.

3 - Approach Guiderail	2 - Req not provided	NONE	-1

Comment: NONE.

4 - Approach railend	2 - Req not provided	NONE	-1

Comment: NONE.

Approach Alignment

4A02 **Code:** 4 - Minimum Tolerable
Comment: LIMITED SIGHT DISTANCE, CONSIDERABLE SPEED REDUCTION REQD.

Approach Roadway

6B39 **Code:** 6 - Satisfactory
Pavement: Gravel/shale with minor unevenness, minor wheel rut, two 1 s.f. shallow potholes at near in wheel lines, three 1 s.f. shallow potholes in right wheel line at far, no settlement.
Drainage: NATURAL, APPEARS ADEQUATE.
Shoulders: NARROW, GRAVEL, SHALE & VEGETATED, STEEP EMBANK. BEYOND, MOSTLY STABLE.

Approach Slab

6B38 **Code:** N - N/A
Pavement: NONE.
6B04 **Bump at Bridge:** No Bump NO SETTLEMENT.
6A39 **Relief Joints:** 0 - Joints not present 6A41 **Number of Joints:** 0
Comment: NONE.
6B02 **New Wearing Surface Under Bridge:** No

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DECK AND SUPER STRUCTURE DATA

Form B

Form D-450B

5A01 **SR ID:** 50721703004003 | 5A03 **BR Key:** 29744 | 7A01 **Inspection Date:** October 10, 2017

Deck Wearing Surface

Main

5B02 **Type of Wearing Surface:** 0 - None
5B03 **Type of Memb. Water-Proof:** 0 - None
5B04 **Deck Corrosion Protection:** 0 - None
6A33 **Thickness:** 0.0
6A34 **Date Recorded:** 01/01/1901

Approach

6A30 **Type of Wearing Surface:** _ - Unknown (NBI)
6A31 **Type of Memb. Water-Proof:** _ - Unknown (NBI)
6A32 **Deck Corrosion Protection:** _ - Unknown (NBI)
6A33 **Thickness:** 0.0
6A34 **Date Recorded:** 01/01/1901

6B40 **Condition Rating:** N - Not applicable
IC02 **Dk WS Notes:** STEEL OPEN GRID DECK (5") REPURPOSED CONDITION, SOME WEAR TO TRACTION GROOVES, MODERATE CORROSION AND PAINT PEEL THROUGHOUT. A FEW BENT SECONDARY BARS MOSTLY ALONG LEFT HALF AND A FEW SHORT DIAGONAL SECONDARY BARS BROKEN AT A WELD AT END OF BAR, A FEW AT NL/FL CORNER.

Expansion Joints

6A41 **Number of Expansion Joints:** 0

Joint Number	VD25 Joint Type	VD26 Movement Class	VD27 Manufacture Code	VD31 Bridge Seat Cleaning	VD32 Bridge Seat Cleaning Note	VD33 Scuppers w/ Downspout	VD34 Scuppers w/o Downspout
0				0		0	0

Deck

1A01 **Condition Rating:** 6 - Satisfactory condition - structual elements show some minor deterioration
6B07 **Est. Spall Delamination:** 0.0 %
6B08 **Date:** 01/01/1901
6B10 **Est. Chloride Content:** 0.0 %
6B11 **Date:** 01/01/1901
1A07 **Unrepaired Spalls:** 0.0 SF
6B47 **Deck Cracking Metric :** 0.00 YD/SY

Deck Top: STEEL OPEN GRID DECK (5") REPURPOSED CONDITION
-NO CRACKED WELDS DETECTED AT BEAM CONNECTIONS
-NO LOOSE PANELS.
-2' long PORTION OF END PLATE at FL CORNER PREVIOUSLY LOOSE WITH BROKEN WELD NOT PRESENT, GRID DECK BELOW OK.
-A FEW BENT SECONDARY BARS, MINOR DAMAGE.
-A FEW SHORT DIAGONAL SECONDARY BARS BROKEN AT A WELD AT END OF BAR.
-STEEL PLATE AT FL END MISSING, NO PROBLEMS TO EXPOSED DECK.

BEAMS/DECK MEASURED FOR LEVELNESS:
-NEAR END DROPS FROM LEFT TO RIGHT 1 1/2" IN 4' PERPENDICULAR TO BEAMS.
-FAR END IS LEVEL PERPENDICULAR TO BEAMS.
-LEFT EDGE DROPS FROM NEAR TO FAR 1 1/2" IN 4' PARALLEL TO BEAMS.
-RIGHT EDGE DROPS FROM NEAR TO FAR 1" IN 4' PARALLEL TO BEAMS.

Deck Underside: SEE "DECK TOP"
Deck Drainage: NONE.
Expansion Joints: N/A
Deck Notes:

Superstructure

1A04 **Condition Rating:** 2 - Critical-adv. deterioration of primary structural elements.
Narrative: CRITICAL ELEMENT REQUIRING INTERIM INSPECTION

FOUR STEEL I-BEAMS, REPURPOSED

5A01 **SR ID:** 50721703004003 5A03 **BR Key:** 29744 7A01 **Inspection Date:** October 10, 2017

Girders/Beams: STEEL I-BEAMS - REPURPOSED CONDITION.
-MODERATE TO HEAVY PAINT PEEL, SURFACE CORROSION WITH PITTING, SOME MODERATE PITTING ON TOP FLANGES.
-NO SIGNIFICANT SECTION LOSS NOTED.
-ONE MINOR GOUGE AND TWO MODERATE GOUGES NOTED ON DOWNSTREAM (LEFT) FASCIA WEB, 1/8" DEEP +/-.
-UPSTREAM (RIGHT) FASCIA BENT LATERALLY AT FAR END 6' (OLD CONDITION, DECK WELDED TO TOP FLANGE NO CRACKS) WITH MINOR GOUGES ALONG BOTTOM FLANGE.
-HEAVY ACCUMULATION OF GRAVEL AND DIRT ON TOP FLANGES, MINOR ON BOTTOM.
-Beam 4 at the near end exhibits extensive bearing loss/deterioration (over 80%). Beam 4 visibly deflected under live load, this deflection also caused movement of the remaining bearing material. This deficiency warranted immediate closure of the structure.

Floorbeams: N/A

Stringers: N/A

Diaphragms: STEEL X-BRACING - ANGLES SIMILAR CONDITION AS BEAMS.

FOUR CRACKED WELDS NOTED AT CONNECTION TO BEAM WEB LOCATIONS.
-BM1 BOTTOM ANGLE CONNECTION, 3/8"L FINE CRACK IN WELD (RIGHT FACE OF WEB).
-BM2 (CENTER BAY) BOTTOM ANGLE CONNECTION OF BM2 WEB 4"L (FULL HEIGHT) CRACK IN WELD ON NEAR SIDE (RIGHT FACE OF WEB).
-BM3 BOTTOM ANGLE CONNECTION, 3/8"L FINE CRACK IN WELD (LEFT FACE OF WEB).
-BM4 (UPSTRM. FASCIA) TOP & BOTTOM ANGLE CONNECTION 1 1/16" GAP AT BOTTOM CONNECTION, 1/8" GAP AT TOP WITH SLIGHT MISALIGNMENT (LEFT FACE OF WEB).

FAR END - SHALLOW END DIAPHRAGMS PRESENT, NARROW STEEL PLATE AND FILL VISIBLE, SOME SPILL THRU EVIDENT, APPROACH ABOVE STABLE.

NEAR END SIMILAR, LESS SPILL THRU THAN FAR, APPROACH ABOVE STABLE.

Truss Members: N/A

Portals/Bracings: N/A

Bearings: NOT VISIBLE except beam 4 at the near abutment. BEAMS APPEAR TO BEAR ON COMPACTED SHALE. Significant loss (over 80%) to the bearing of beam 4 at the near abutment, see "Beams" for more information.

Drainage System: NONE.

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ABUTMENT DATA
Form C

Form D-450C

5A01 **SR ID:** 50721703004003 | 5A03 **BR Key:** 29744 | 7A01 **Inspection Date:** October 10, 2017

1A02 **Substructure Condition Rating:** 2 - Critical-adv. deterioration of primary structural elements.

Notes:

Near Abutment

Backwall: NO BACKWALL, VERTICAL STEEL PLATE ALONG TOP BEAMS FROM DECK CONNECTION, NOTED BETWEEN BEAMS, SOME TIMBER EVIDENT, SHALE FROM APPROACH ROADWAY VISIBLE WITH SPILL THRU EVIDENT, SOMEWHAT STABLE, NO SETTLEMENT IN ROADWAY ABOVE.

Bridge Seats: N/A.

STEEL SUPERSTRUCTURE DOES NOT APPEAR TO BEAR ON OLD MASONRY ABUTMENT. NO FORMAL BEAM SEAT VISIBLE.

DISTANCE BETWEEN BOTTOM FLANGE OF BEAMS AND TOP OF STONE MASONRY:
BM1 - 9"
BM2 - 9"
BM3 - 8 3/4"
BM4 - 8 1/2"

Cheekwalls: N/A

Stem: STONE MASONRY
-OLD MASONRY ABUTMENT NO LONGER PROVIDES SUPPORT FOR SUPERSTRUCTURE AND RETAINS FILL WHERE BEAMS BEAR.
-NO FORMAL SUBSTRUCTURE VISIBLE TO SUPPORT BEAMS.
-PARGET AND JOINTS MOSTLY SOUND AT CENTER.
-MOVEMENT & SEPARATION OF STONES 3'Lx3'H AREA WITH VOIDS PROBED TO 3' PENETRATION, 3'L x0.5'Vx0.5'U VOID AT BASE BELOW 3'Lx1.5"W CRACK ABOVE.
-SOMEWHAT STABLE.
-1 1/2" TO 2 1/2" W x2'L DIAGONAL CRACK BETWEEN STONE AND ABUTMENT CORNER AT NR END OF MASONRY, 1SF DETERIORATION ABOVE.
-LOOSE STONES IN FILL BELOW BEAM 1, END 3'. BEAM SUPPORTED BEYOND.
-Loss of bearing stones under beam 4 at the near abutment, see superstructure for more information.

Wings: STONE MASONRY
-MOST JOINTS APPEAR SOUND
-LOCATIONS OF MODERATE CRACKING & DETERIORATION MOSTLY at NL END.
-MODERATE VEGETATION ON TOP.

Footing: NOT DETECTED. LARGE ROCKS ALONG OLD ABUTMENT & WINGS, APPEARS STABLE. PREVIOUS SCOUR OR UNDERMINING REPAIRED.

Piles: NONE DETECTED.

IN20 **Scour Undermine:** 0 - No

Settlement: MINOR SETTLEMENT (OLD CONDITION) at MID ABUT.

Embank Slope-wall: N/A

Wall Drainage: NONE.

Far Abutment

Backwall: NO BACKWALL, VERTICAL STEEL PLATE ALONG TOP BEAMS FROM DECK CONNECTION, NOTED BETWEEN BEAMS, SOME TIMBER EVIDENT, SHALE FROM APPROACH ROADWAY VISIBLE WITH SPILL THRU EVIDENT, SOMEWHAT STABLE, NO SETTLEMENT IN ROADWAY ABOVE.

Bridge Seats: N/A
-NO FORMAL BEAM SEAT DETECTED.
-HEAVY ACCUMULATION OF GRAVEL BETWEEN BEAMS AND ON BEAM FLANGES & WEBS.
-OLD CONCRETE ABUTMENT MAY PROVIDE SOME SUPPORT, NO APPARENT DISTRESS OR SETTLEMENT.
-DISTANCE BETWEEN BOTTOM FLANGE OF BEAMS AND TOP OF CONCRETE:
BM1 - 3/4"
BM2 - 1"
BM3 - 1 5/8"
BM4 - 2 1/4"

Cheekwalls: N/A

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DEPARTMENT OF TRANSPORTATION

ABUTMENT DATA

Form C

Form D-450C

5A01 **SR ID:** 50721703004003 5A03 **BR Key:** 29744 7A01 **Inspection Date:** October 10, 2017

Stem: CONCRETE
-ABUTMENT MAY PROVIDE SOME SUPPORT FOR SUPERSTRUCTURE, NO APPARENT DISTRESS.
-A FEW CHIPS & SCRAPES.
-Portions of previous undermining covered except under each fascia beam see "Footing for more information.

Wings: CONCRETE AND STONE MASONRY
-FL MASONRY SOME MINOR DETERIORATION AT END 1'Lx0.5'Vx2'U VOID.
-JOINTS MOSTLY SOUND.
-CONCRETE SOUND, SIMILAR TO ABUTMENT

Footing: NOT DETECTED.
BOTTOM OF CONCRETE ABUT. & WINGS VISIBLE.
FR 5'L x 1.0'V x 1.0'U, NO INCREASE.
FL 1.0'L x 0.5'V x 1.0'U, NO INCREASE.

Piles: NONE DETECTED.

IN20 **Scour Undermine:** 1 - Yes

Settlement: NONE APPARENT.

Embank Slope-wall: N/A

Wall Drainage: NONE.

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DEPARTMENT OF TRANSPORTATION

UNDERWATER INSPECTION

Form G

5A01 **SR ID:** 50721703004003 | 5A03 **BR Key:** 29744 | 7A01 **Inspection Date:** October 10, 2017

IU00a **UW Reviewer Action:**

IU00b **Reviewer Comments:**

IU02 **Number of Units:** 0

IU03 **SCBI Source:** O - observed

IU01 **Recalculate SCBI:** 0 - no recalc needed

4A08 **SCBI:** 5 - Stable w/in footing

IU04 **Overall SCBI:** 4

IU05 **SAR:** 86.0

IU06 **Streambed Material #1:** A5 - Stable nat alluvium

IU06 **Streambed Material #2:**

IU07 **Notes:** SMALL ROCK, COBBLES, GRAVEL

Current Countermeasures

CM Num	IU21 Type	IU22 Location	IU23 Condition	IU24 Subunit

Possible Countermeasures

PCM Num	IU25 Location	IU26 Work Candidate

SAR Calculation Data

IU08 **Debris Potential:** 1 - Medium

IU09 **Trapping Potential:** 1 - Medium

IU10 **Pressure Flow:** 0 - No

IU11 **NAB Location:** 1 - Left

IU12 **FAB Location:** 2 - Right

US Left Wingwall

IU13 **Presence:** 0 - No

IU14 **Condition:** N - not applicable

US Right Wingwall

IU15 **Presence:** 0 - No

IU16 **Condition:** N - not applicable

Horizontal Debris Blockage

IU17 **Start:** 0

IU18 **End:** 0

Vertical Debris Blockage

IU19 **Start:** 0

IU20 **End:** 0

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DEPARTMENT OF TRANSPORTATION

UNDERWATER INSPECTION

Form G

5A01 **SR ID:** 50721703004003 | 5A03 **BR Key:** 29744 | 7A01 **Inspection Date:** October 10, 2017

Sub Unit OSA Data

Observed Scour Rating Components

IN01 Sub Unit	IN12 Pier/ Abut Type	IN13 Inv. Found Type	IN14 Found Type	IN15 Strmbd Mat	IN19 Move Ind	IN04 Chg Since Last Insp	IN05 Scour Hole	IN06 Debris Potential	IN07 Scour-ability	IN08 Opening Adeq. / Channel	IN09 Sediment	IN10 Alignment	IN11 Velocity/ Stream Slope	IN03 Observed Scour Rating
NAB	6	L	2	A5	0	8	9	6	5	5	9	6	5	6
FAB	3	K	1	A5	0	7	6	6	7	5	9	6	5	6

Other Subunit Details

IN01 Sub Unit	IN16 UW Insp Type	IN18 Water Dept	IN17 Observed Scour Depth	IN20 Scour Undermine	IN21 Counter-measures	IN02 Info from Current Insp	IN22 100 yr Flood Calc Scour Depth	IN23 500 yr Flood Calc Scour Depth	IU27 SCBI Code
NAB	E	0.0	0.0	0	0	1	-1.0	-1.0	4

IN24 **Notes:** MEDIUM TO LARGE ROCKS ALONG ABUTMENT SOME MIGRATION POSSIBLE, NO SCOUR OR UNDERMINING.

FAB	E	1.0	0.9	1	0	1	-1.0	-1.0	8

IN24 **Notes:** 0.9' Scour Depth = 0.9' of infill (probed vertically). -UNDERMINING AT FL , 1.0'L x 0.5'V x 1.0'U. -UNDERMINING AT FR, 5'L x 1.0'V x 1.0'U. -SEVERAL MEDIUM TO LARGE ROCKS ALONG ABUTMENT

Underclearance

IL09 **Origin Description:**
IL10 **Horizontal:**
IL11 **Vertical:**
IL12 **Notes:**

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CHANNEL AND WATERWAY DATA

Form J

5A01 **SR ID:** 50721703004003 | 5A03 **BR Key:** 29744 | 7A01 **Inspection Date:** October 10, 2017

Channel

1A05 **Channel/ Channel Protection Cond. Rating:** 5

Channel: CHANNEL ALIGNMENT IS FAIR TO GOOD.
Minor scour noted under the bridge, and just downstream of the strucutre, scour up to 0.4' in depth

Banks: SEVERE EROSION AT NR which is undercutting bank at wing.
FL TREE ROOTS EXPOSED & UNDERMINED (>100'Lx3'H TO 4'H)
MINOR AT NL, FR, SOME SLOUGHING.

Streambed Movements: MINOR TOWARD NR, FL, NO SIGNIFICANT CHANGE.

Debris, Vegetation: NONE.

River Control Devices: NONE.

Embank/Strmbed Contr: LARGE ROCKS/RUBBLE FROM OLD PIER PLACED ALONG OLD ABUTS. & WINGS, SOME MIGRATION, STABLE

Drift Other: MINOR.

Waterway Adequacy

1A06 **Appraisal Code:** 6

Notes: OCCASIONAL OVERTOPPING.

IL02 **Overtop Risk:** O - Occasional

IL03 **Traffic Delay:** I - Insignificant

5C22 **Functional Class:** 09 - Rural Local

High Water Mark

IL05 **Elevation:** -1.0 | IL06 **Date:** January 01, 1901 | IL07 **New High Water Mark:** No

Notes:

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DEPARTMENT OF TRANSPORTATION

PAINT, STRUCTURE APPRAISAL AND LOAD RATINGS

Form K

5A01 SR ID: 50721703004003 | 5A03 BR Key: 29744 | 7A01 Inspection Date: October 10, 2017

Paint Condition

6B36 **Paint Cond Rating:** 5 - Poor to Fair
6B37 **Ext of Paint Cond:** 5 - Spot + >60% finish
6B35 **New Paint:** 0 - no new paint

Int Beam / Gird: STEEL BEAMS EXHIBIT MODERATE PAINT PEEL, SURFACE CORROSION WITH SOME PITTING. NO SIGNIFICANT SECTION LOSS NOTED.
Fascias: SIMILAR TO INTERIOR BEAMS.
Splsh Zone Truss Gird: N/A
Truss: N/A
Bearings: NOT VISIBLE, except at beam 4, paint is in similar condition to rest of beam.
Other: STEEL OPEN GRID DECK (5") REPURPOSED CONDITION, WORN, MODERATE SURFACE CORROSION AND PAINT PEEL THROUGHOUT. STEEL X-BRACE - ANGLES SIMILAR COND. AS BEAMS.

4B03 **Brdge Cap. Appraisal:** 9 - 31% or more above
6B19 **Controlling:** 5 - Eng. Judg.
4A09 **Struct Cond Appraisal:** 4

Structure Condition Appraisal Based on

The following Ratings:

1A04 **Superstructure Condition R** 2 - Critical-adv. deterioration of primary sti
1A02 **Substructure Condition Rating:** 2 - Critical-adv. deterioration of primary sti
1A03 **Culvert Rating:** N - Not applicable

Load Ratings

4B15 **Load Rating Review Recommended:** Recalc not required

Due To:

IR03 **Calculation Date:** October 14, 2005
IR02 **Rating Approval Date:** October 14, 2005

Load Rating Details

LOAD TYPE (IR10)	IR LOAD (IR11)	OR LOAD (IR05)	NBI IND (IR06)	RTNG ANAL METH (IR07)	CONT MEM TYPE (IR16)	ANALYSIS ENGINEER (IR14)	AASHTO MANUAL YEAR (IR15)	AASHTO SPEC YEAR (IR13)	OPR GOV CRITERIA (IR12)	INV GOV CRITERIA
1	24	40	0	2	1		1983	1996	M	M
Notes Description:										
2	39	65	1	2	1		1983	1996	M	M
Notes Description:										
8	29	48	0	2	1		1983	1996	M	M
Notes Description:										
0	33	56	0	2	1		1983	1996	M	M
Notes Description:										

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DEPARTMENT OF TRANSPORTATION

MAINTENANCE NEEDS DATA

Form M

5A01 **SR ID:** 50721703004003 | 5A03 **BR Key:** 29744 | 7A01 **Inspection Date:** October 10, 2017

IM01 Type of Work	IM03 Action	IM04 Est Qty	UOM	IM05 Priority	IM06 Date Rec	IM08 Target Year	IM11 Ass. WK
Flexible	13 - B745301-CONST.ROCK PROTECT	2	CY	3	10/21/2009	2014	No

IM07 **Status:** 0 - Work not planned IM15 **Notes:** PLACE ADDITIONAL ROCK PROTECTION ALONG FAR ABUTMENT.

IM09 **Location** F

Flexible	34 - D743102-CLN.STL.HOR.SURFACES	1	EB	3	10/15/2003	0	No

IM07 **Status:** 0 - Work not planned IM15 **Notes:** CLEAN HORIZONTAL SURFACES

IM09 **Location** 1

Flexible	54 - D744602-RPR/RPLSTLDIAPHRAM	5	EA	3	10/21/2009	2016	No

IM07 **Status:** 0 - Work not planned IM15 **Notes:** Repair welds at X-bracing diaphragm.

IM09 **Location** 1

Flexible	19 - F744804-REPOINT MASONRY	150	LF	4	10/14/2005	2015	No

IM07 **Status:** 0 - Work not planned IM15 **Notes:** REPAIR OPEN JOINTS & CRACKS IN MASONRY at NEAR ABUTMENT.

IM09 **Location** N

Flexible	27 - RDGDERL-CONNECT GDERAIL TO BR	4	EA	2	10/21/2009	2013	No

IM07 **Status:** 0 - Work not planned IM15 **Notes:** INSTALL STANDARD GUIDE RAIL and end treatments.

IM09 **Location** LNRLFR

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MAINTENANCE NEEDS DATA

Form M

5A01 **SR ID:** 50721703004003 **5A03** **BR Key:** 29744 **7A01** **Inspection Date:** October 10, 2017

Flexible	17 - RLGSTRM-RPR/RPL.STR.MTD.G.R.	73	LF	1	10/21/2009	2013	No

IM07 **Status:** D - Deferred Work

IM09 **Location** 1

IM15 **Notes:** #1 PRIORITY CHANGED FROM 2 TO 0 AT TIME OF INSPECTION DUE TO DAMAGE AT NEAR RIGHT. HOWEVER BRIDGE WAS CLOSED DUE TO BEARING DEFICIENCY THEREFORE THE ITEM HAS BEEN GIVEN A PRIORITY 1 AND DEFERRED.
#2 INSTALL STANDARD STRUCTURE MOUNTED GUIDE RAIL.

Flexible	51 - RDCLSGN-RPL.CLEARANCE SIGN	1	EA	2	10/16/2012	2013	No

IM07 **Status:** 0 - Work not planned

IM09 **Location** NRF

IM15 **Notes:** RESET LOOSE HAZARD CLEARANCE SIGN POST AT NEAR RIGHT. Reset near and far right hazard clearance signs to proper height.

Flexible	51 - RDCLSGN-RPL.CLEARANCE SIGN	1	EA	2	10/07/2014	2014	No

IM07 **Status:** 0 - Work not planned

IM09 **Location** NLF

IM15 **Notes:** REPLACE DAMAGED POST AND SIGN PANEL AT NEAR LEFT. Reset near and far left hazard clearance signs to proper height.

Flexible	45 - D744503-RPL.BRGPED/SEAT	1	EA	1	10/10/2017	2017	No

IM07 **Status:** D - Deferred Work

IM09 **Location** 1

IM15 **Notes:** #1 INITIALLY GIVEN 0 PRIORITY. HOWEVER BRIDGE WAS CLOSED DUE TO BEARING DEFICIENCY AT TIME OF INSPECTION THEREFORE THE ITEM HAS BEEN GIVEN A PRIORITY 1 AND DEFERRED.
#2 Repair the bearing area under beam 4 at the near abutment.

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DEPARTMENT OF TRANSPORTATION

INSPECTION ADMINISTRATION

Form P

5A01 **SR ID:** 50721703004003 5A03 **BR Key:** 29744 7A01 **Inspection Date:** October 10, 2017

Current Inspection

7A03 **Primary Type:** R - Regular (routine)

7A06 **Types of Inspections Performed:**

NBI	Underwater	Element	Fracture Critical	Other Special
Yes	No	No	No	Yes

Inspection Man Hours

6B26	NBI Crew:	-1.00	6B30	Underwater:	0.00
6B28	Fracture Critical:	0.00	6B29	Other 1:	-1.00
6B27	Crane:	0.00	6B31	Other 2:	-1.00

Inspection Costs (Entered to nearest dollar)

6B32	Engineering:	0	6B33	Rigging:	0
			6B34	Office:	0

Special Equip Used:

6B12 **Temperature:** 75.0 6B09 **Weather:** 3 - Cloudy

6B03 **Inventory Review Recommended:** No

Change Notes:

Inspection Team

7A05 **Inspected By:** 8 - Consulting Firm

7A02 **Team Leader:** Herbert, Rowland & G Rubinic

6B23 **Team Member:** Taylor Abel

6B24 **Hired By:** 2

6B25 **Insp Contract Num:** 089705

2A02 **Inspection Notes:** Bridge closed during 2017 inspection due to loss of bearing at beam 4 at the near abutment

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DEPARTMENT OF TRANSPORTATION

INSPECTION ADMINISTRATION
Form P

5A01 **SR ID:** 50721703004003 | 5A03 **BR Key:** 29744 | 7A01 **Inspection Date:** October 10, 2017

Next Inspection

7A14 **Next Inspection By:** 2 - County

6B20 **Next Insp Type:** I - Interim (special)

Schedule

Insp Types	7A07 Required	7A09 Frequency	7A10 Next Date
NBI	----	24	October 10, 2019
Fractical Critical	No	-1	January 01, 1901
Underwater	No	-1	January 01, 1901
Other Special	Yes	12	October 10, 2018
Element	----	-1	January 01, 1901
Crane	----		6B18 January 01, 1901

6B01 **Special InspType:** 4 - Problem areas only

Estimated Inspection Man Hours

7A12	NBI Crew:	0.0	7A17	Underwater:	0.0
7A15	Fracture Critical:	0.0	7A16	Other 1:	0.0
7A13	Crane:	0.0	7A18	Other 2:	0.0

APPENDIX IP – 04A
BRIDGE POSTING RECOMMENDATION DATA

SR ID# 50 7217 0300 4003 BMS Reference No. 29744

LOCATION

County Perry Municipality Tobyne Twp.

State Route _____ Segment _____ Offset _____ Traffic Route(s) T-300

Bridge Name: TBT-3 Detour Length 9 miles

Feature Carried T-300 Back Hollow Rd NHS _____

Feature Intersected Shaeffer Run PUC Jurisdiction _____

ADT 50 ADTT 1 School Bus Route No Public Transportation Route No

PREVIOUS BRIDGE POSTING (Year last posted 1998)

Weight Limit 13 Tons Except Combinations 28 Tons One Truck at a Time _____

RECOMMENDED POSTING under §4902(a) of the PA Vehicle Code

Weight Limit _____ Tons Except Combinations _____ Tons One Truck at a Time _____

Bridge Closed; X Yes ____ No Bridge Closed, Pedestrian Traffic Only Allowed; X Yes ____ No

Posting based on: Structural Analysis _____ and/or Structural Condition X

Controlling Member(s) Bearing of Beam 4 @ Near Abutment

Reason (as per Pub 238, Section IP 4.3.1.1) Temporary Closure due to loss of bearing of beam 4 @ the near abutment.

STRUCTURE DATA

Structure Type: Main Steel I Beams Approach _____

No. Spans 1 Structure Length 40 ft. and if applicable: Depth of Fill: _____ ft.

Bridge Roadway Width 11.4 ft. No. of Traffic Lanes 1 Sidewalk: _____ Lt. _____ Rt.

Year Built: 1936 Year Last Reconstructed/Rehab. 1998 Type Reconst. _____

BRIDGE CONDITION RATINGS

Date of Last Inspection 10-10-17 Sufficiency Rating 48.9 (before posting)

APPENDIX IP – 04A
BRIDGE POSTING RECOMMENDATION DATA

Deck 6 Superstructure 2 Substructure 2 Culvert _____

Deck Geometry Appraisal 3 Approach Alignment Appraisal 4

Comments _____

BRIDGE RATING ANALYSIS

Governing Members(s) Interior Beam (int./fascia) Governing Span(s) 1

Non-Redundant _____ Fatigue Sensitive _____ Interior/Fascia Girder _____(if multi-girder)

Inventory Ratings:	Full Lanes:	H 24 Tons	HS 39 Tons	ML80 29 Tons	TK527 33 Tons
	One Truck:	H ____ Tons	HS ____ Tons	ML80 ____ Tons	TK527 ____ Tons
Operating Ratings:	Full Lanes:	H 40 Tons	HS 65 Tons	ML80 48 Tons	TK527 56 Tons
	One Truck:	H ____ Tons	HS ____ Tons	ML80 ____ Tons	TK527 ____ Tons

Analysis Method: ____AASHTO Line Girder with Simplified (S-Over) LL Distribution Factors

____AASHTO Line Girder with NCHRP LL Distribution Factors

____2D/Grillage (_____) describe ____3D/FEM (_____) describe

____PDT Box Culvert Analysis Program ____Other (_____) describe

Rating Method: ____Working Stress __X__Load Factor ____Load & Resistance Factor Design

____Engineering Judgment ____Other (_____) describe

Special assumptions used for analysis: _____

Controlling member conditions:(i.e., % deterioration, location of deterioration, etc.) _____

Are traffic conditions for One Truck at a Time restriction valid according to Pub. 238? ____Yes ____No
(District Traffic Engineer Signoff Required, see Page 3 of 3)

PROGRAMMING DATA

PI No. _____ Scope of Work: ____Replace ____Rehab ____Repair

Program: ____12 Year Program ____I4R ____Betterment ____Department Force

APPENDIX IP – 04A
BRIDGE POSTING RECOMMENDATION DATA

Programming Status: ____On Bridge Bill ____Twelve Year Program (____Four Year Period)

Cost ($000)_____ Estimated Letting Date_____

ECONOMIC IMPACT OF RECOMMENDED POSTING

Will recommended posting adversely impact Industry/Business? _X_ Yes ____No

If yes, provide brief description. Oil/gas industry will be affected.

IMPACT OF RECOMMENDED POSTING ON EMERGENCY SERVICES, ETC.

Provide brief description of impact on each public service (i.e., permit required, detour required) Some explanation as to how each item will be handled is required; especially on low posted bridges.

Snow Removal routes will have to be modified

Ambulance routes will have to be modified.

Fire Truck previously restricted.

Public Transportation N/A.

This bridge posting recommendation has been developed and accepted by the District and is accurate to the best of my knowledge.

Signed: Daniel Lang

Name: Daniel Lang
Title: ~~District Bridge Engineer~~ County Bridge Engineer

Date: 10-1-17

Required if "Bridge Limited To One Truck" posting is proposed

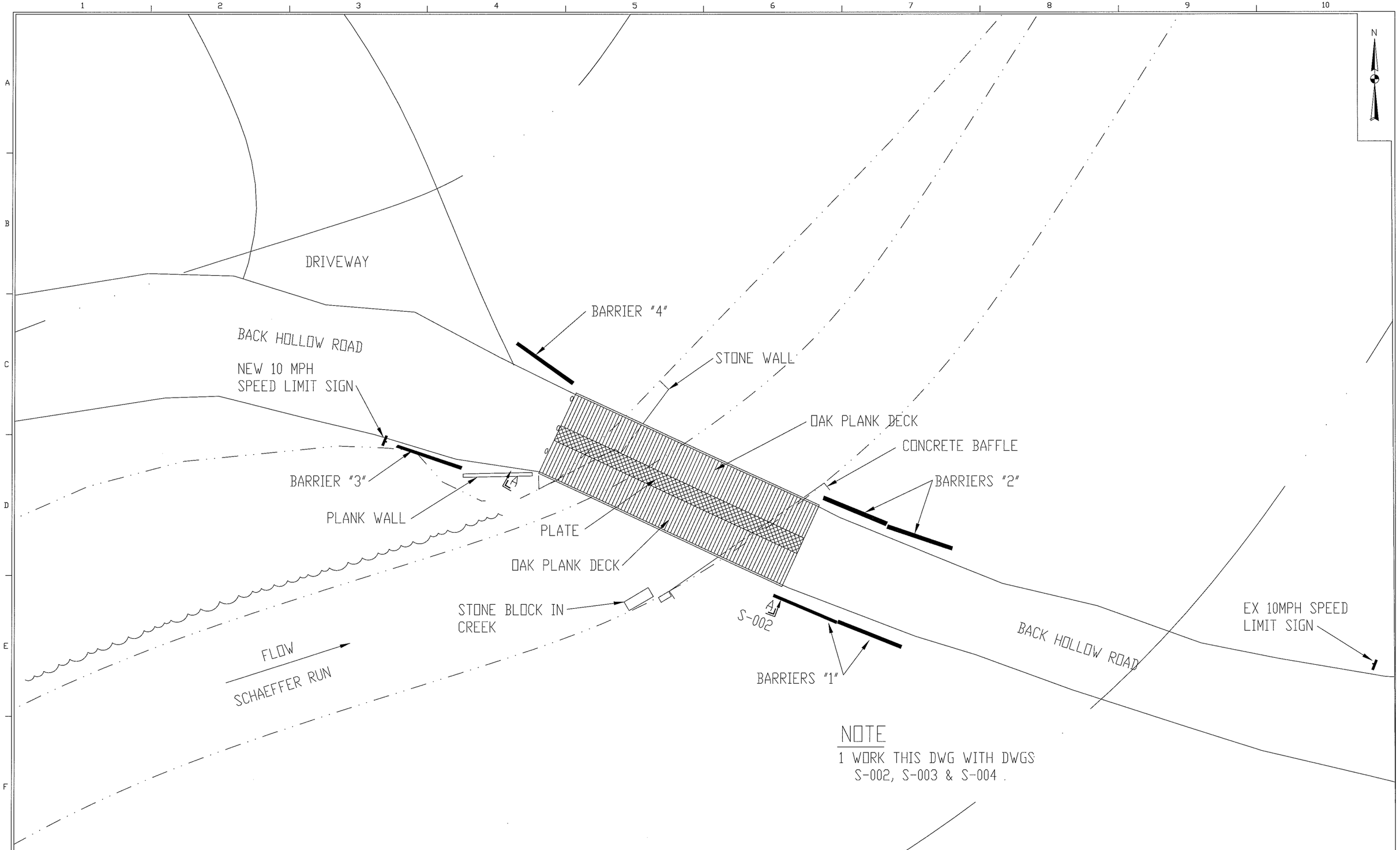
Signed: _____

Name: _____
Title: District Traffic Engineer

Date: _____

Attachment F

Tetra Tech As-Built and Modification Drawings (S-0012S-004)



NOTE

1 WORK THIS DWG WITH DWGS
S-002, S-003 & S-004 .

TETRA TECH
www.tetratech.com
661 ANDERSEN DRIVE - FOSTER PLAZA 7
PITTSBURGH, PA 15220
T: (412) 921-7090 | F: (412) 921-4040

REVISIONS			
NO.	BY	DATE	REMARKS
0	JRS	1/10/18	ISSUED FOR INSPECTION REPORT

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3
BACK HOLLOW ROAD BRIDGE

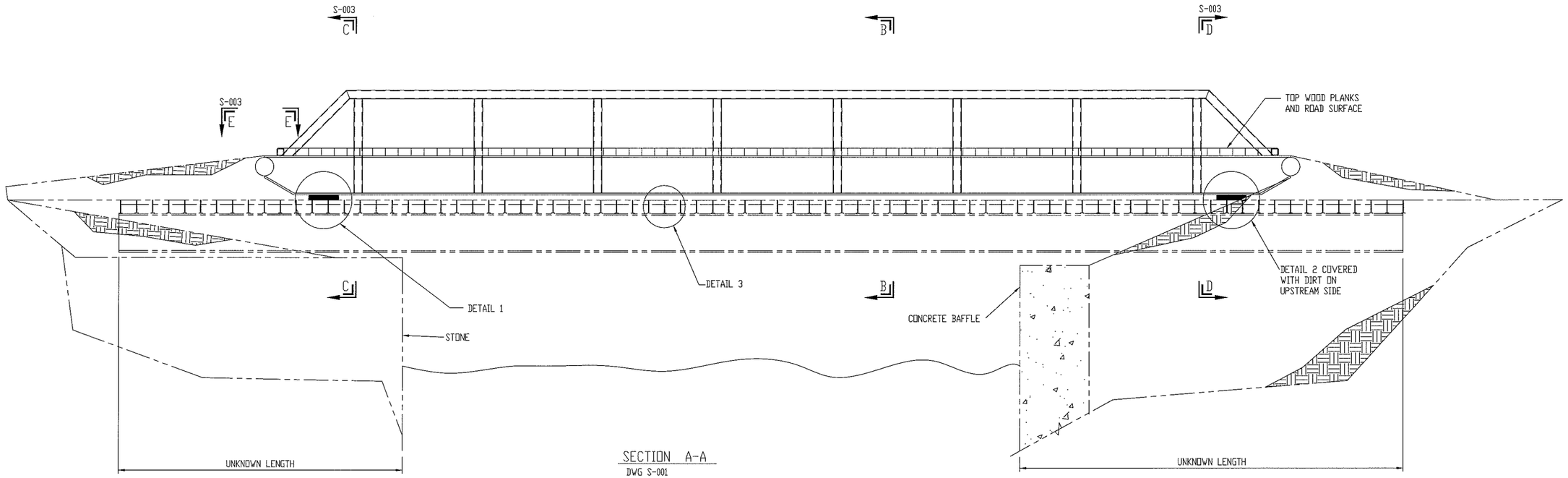
BACK HOLLOW BRIDGE BTB-3
AS BUILT SITE PLAN

DATE:	1/8/18
PROJECT NO.:	112IC05958
DESIGNED BY:	JLM
DRAWN BY:	JRS
CHECKED BY:	JLM

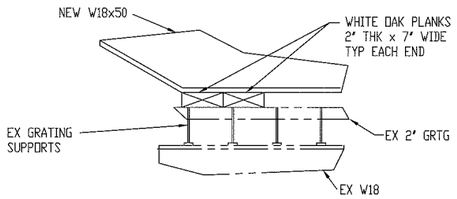
S-001

SHEET 1 OF 4

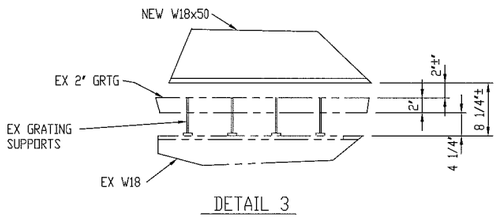
S:\Engineering Services Projects\Sunoco (Rooney)\2121C-BF-00037 Tobyone Bridge Issue\Drawings\59585-001 (2).dwg PIT JAMES.SOUKUP 1/11/2018 9:02:07 AM



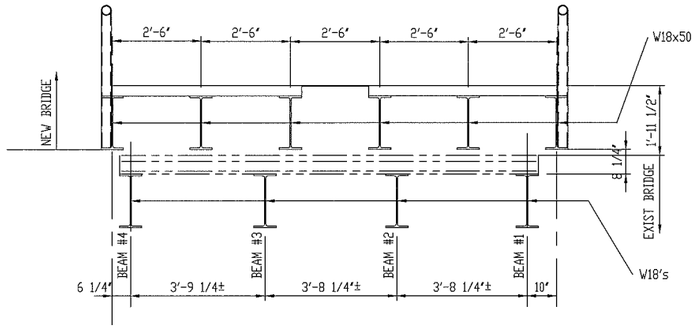
SECTION A-A
DWG S-001
LOOKING DOWNSTREAM



DETAIL 1 AS SHOWN
DETAIL 2 OPP HAND



DETAIL 3



SECTION B-B

NOTE
1 WORK THIS DWG WITH DWGS
S-001, S-003 & S-004

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REVISIONS

NO.	BY	DATE	REMARKS
0	JRS	1/10/18	ISSUED FOR INSPECTION REPORT

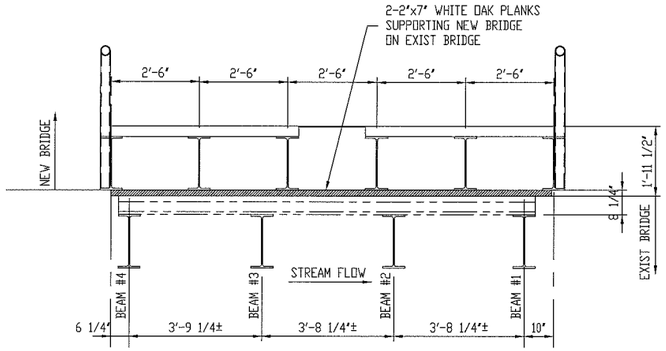
SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3
BACK HOLLOW ROAD BRIDGE

BACK HOLLOW BRIDGE BTB-3
AS BUILT DRAWING
SECTIONS & DETAILS

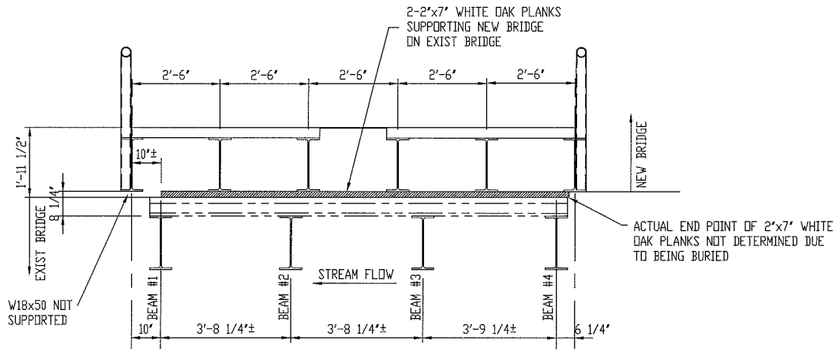
DATE:	1/8/18
PROJECT NO.:	112IC05958
DESIGNED BY:	JLM
DRAWN BY:	JRS
CHECKED BY:	JLM

S-002
SHEET 2 OF 4

S:\Engineering Services Projects\Sunoco (Rooney)\112IC-BF-00037 Tobyone Bridge Issue\Drawings\S903BS-002.dwg PIT JAMES.SOUSUP 1/11/2018 9:04:35 AM



SECTION C-C
DWG S-002



SECTION D-D
DWG S-002

DIRT AND GRAVEL SLUFFING DOWN
UNDER AIR BRIDGE ON NORTHWESTERN
APPROACH RAMP

SECTION E-E
DWG S-002

NOTE
1 WORK THIS DWG WITH DWG S-002

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REVISIONS

NO.	BY	DATE	REMARKS
0	JRS	1/10/18	ISSUED FOR INSPECTION REPORT

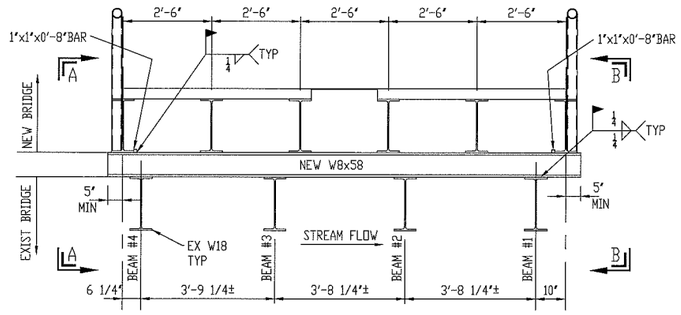
SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3
BACK HOLLOW ROAD BRIDGE

BACK HOLLOW BRIDGE BTB-3
AS BUILT DRAWING
SECTIONS

DATE:	1/9/18
PROJECT NO.:	112IC05958
DESIGNED BY:	JLM
DRAWN BY:	JRS
CHECKED BY:	JLM

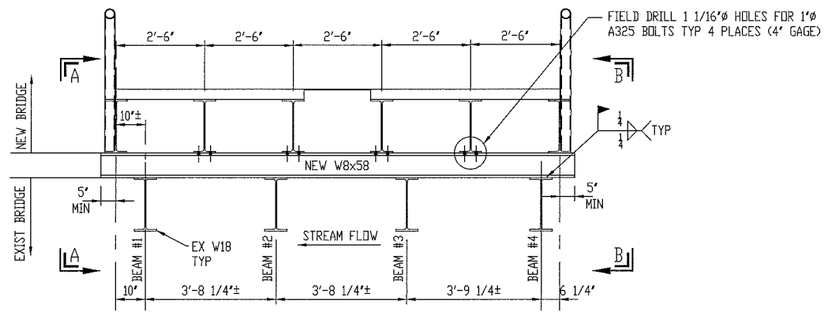
S-003
SHEET 3 OF 4

S:\Engineering Services Projects\Sunoco (Rooney)\2121C-BF-00037 Tobyone Bridge Issue\Drawings\59585-003.dwg PIT JAMES.SOUKUP 1/11/2018 9:07:53 AM

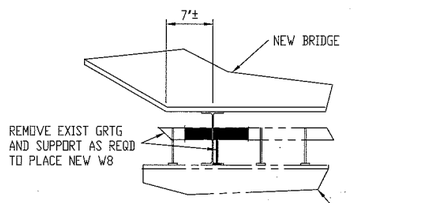


REPAIR AT NORTHWEST END

HOUSE SIDE

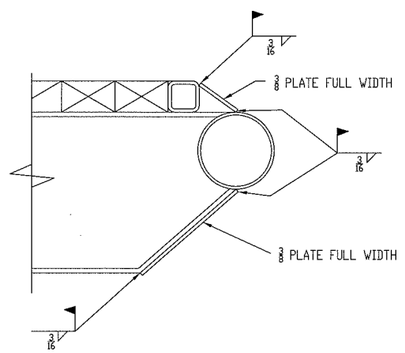


REPAIR AT SOUTHEAST END



SECTION A-A AS SHOWN

SECTION B-B OPP HAND



MODIFICATION AT APPROACHES

TYP EACH END

NOTE

1 WORK THIS DWG WITH DWGS S-001, & S-003

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REVISIONS			
NO.	BY	DATE	REMARKS
0	JRS	1/10/18	ISSUED FOR INSPECTION REPORT

SUNOCO PIPELINE L.P.
SINKING SPRING, PENNSYLVANIA
PENNSYLVANIA PIPELINE PROJECT
CONSTRUCTION SPREAD 3
BACK HOLLOW ROAD BRIDGE

BACK HOLLOW BRIDGE BTB-3
REQUIRED MODIFICATIONS
FOR AIR BRIDGE SUPPORT

DATE:	1/9/18
PROJECT NO.:	112IC05958
DESIGNED BY:	JLM
DRAWN BY:	JRS
CHECKED BY:	JLM

S-004

SHEET 4 OF 4

S:\Engineering Services Projects\Sunoco (Rooney)\2121C-BF-00037 Tobyne Bridge Issue\Drawings\S5958S-004.dwg PIT JAMES.SOUKUP 1/11/2018 9:10:29 AM