

BRIDGE INSPECTION REPORT CITY OF GOSHEN, INDIANA

PHASE I - 2020

PROJECT No. 2020-0015

PREPARED FOR:
CITY OF GOSHEN
BOARD OF PUBLIC WORKS AND
SAFETY



2211 EAST JEFFERSON BLVD., SOUTH BEND, IN 46615
PHONE: 574-236-4400
FAX: 574-236-4471

DLZ JOB No. 2061-2721-70
OCTOBER 2020





INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

TRANSMITTAL LETTER

DATE: November 12, 2020
TO: Josh Corwin, P.E.
City of Goshen Engineering Department
204 East Jefferson Street, Goshen, IN 46528
RE: City of Goshen Bridge Inspections 2020-2022
PROJECT # 2061-2721-70

RECEIVED
RECEIVED
NOV 11 2020
NOV 11 2020
CITY OF GOSHEN
ENGINEERING DEPT
ENGINEERING DEPT

WE ARE TRANSMITTING HERewith THE FOLLOWING MATERIAL

Date	Copies	Description
11/12/20	2	Final 2020 City of Goshen Bridge Inspection Report

REMARKS

DLZ REPRESENTATIVE

Pedro A. Trana, P.E.
Project Manager

CC GKF, MAK, EAF

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BRIDGE INSPECTION REPORT
CITY OF GOSHEN
ELKHART COUNTY
INDIANA

October 2020

Board of Public Works and Safety



Mayor Jeremy Stutsman



Michael Landis



Mary Nichols

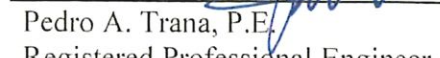
Certified By:



 11/22/2020

Michael A. Kummeth, P.E.
Registered Professional Engineer
State of Indiana No. 910382



 11-12-20
Pedro A. Trana, P.E.
Registered Professional Engineer
State of Indiana No. 1091097

DLZ INDIANA, LLC
Engineers/Architects/Scientists/Planners/Surveyors
2211 East Jefferson Boulevard
South Bend, Indiana 46615

CITY OF GOSHEN
BOARD OF PUBLIC WORKS AND SAFETY

JEREMY STUTSMAN, Mayor

MICHAEL LANDIS, Member

MARY NICHOLS, Member

Dustin Sailor, P.E., CPESC

Director of Public Works

Josh Corwin, P.E.

Civil City Engineer

David Gibbs

Street Commissioner

Tanya Heyde

Parks Superintendent

PREFACE

This Bridge Inspection Report continues the City of Goshen's Bridge Inspection Program, which is administered by the City of Goshen Engineering Department. This report was prepared in accordance with the National Bridge Inspection Standards developed under the 1968 Federal Aid Highway Act.

DLZ Indiana, LLC was authorized to conduct this inspection and prepare this report in accordance with an Agreement with the City of Goshen, Indiana, dated July 24, 2020. Authorization to proceed with Phase I was issued by the City of Goshen on July 28, 2020. The field inspections were performed on July 29, July 30, and August 5, 2020. As required per the agreement, and in compliance with FHWA requirements, a listing of the personnel involved in the inspections and their qualifications can be found on page 7.

This inspection report should prove to be helpful to City Officials in determining problem areas, in posting safe bridge load limits, in establishing a plan for bridge improvements, and in the selection of safe school bus routes. This report should also further demonstrate the need for preventative maintenance and reemphasize the benefits of a well coordinated bridge improvement program.

We wish to acknowledge the assistance and cooperation of all governmental offices involved in this study, including, but not necessarily limited to, the City of Goshen Engineer, the City of Goshen Board of Public Works and Safety, and the City of Goshen Parks Department.



BRIDGE INSPECTION REPORT

CITY OF GOSHEN

INDIANA

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INTRODUCTION AND SCOPE REPORT

The purpose of this inspection was to provide a current condition analysis and report of vehicular and pedestrian bridges under the jurisdiction of the City of Goshen. This inspection report includes a total of 16 structures. Since the last inspection, one (1) structure, Plymouth Avenue over Maple City Greenway, has been renamed from Bridge 306 to Bridge 401. In addition, two (2) structures have been added to the City's inventory: Millrace Canal Trail over the Millrace Canal at Goshen Dam (Bridge 306), and Norfolk Southern Railroad over Winona Trail at Goshen College (Bridge 402).

Several of the previously recommended repairs for various bridges have been completed; however, several bridges still require repairs and rehabilitation. This report should serve as a reminder of some of the undesirable conditions in existence.

The inspections were limited to monitoring the problem areas identified in the previous reports and checking for relatively evident deficiencies, which have occurred since the last inspection. Although the inspections and the report have been completed under the direction of a Registered Professional Engineer and every effort has been made to maintain a high level of professional judgment, no guarantees can be made that all deficiencies were noted.

The Structure Inventory and Appraisal (SI&A) Reports have been prepared with respect to the Federal Highway Administration's (FHWA) guidelines established in December of 1995 and Indiana Department of Transportation's (INDOT) direction and interpretation. Because this inventory is not part of the National Bridge Inventory (NBI) and some inventory items are not applicable to pedestrian bridges, some data entries of the coding guidelines were modified so that they would be applicable to pedestrian bridges. This was done to report the existing conditions for each structure in a clear and concise manner.

In accordance with the FHWA's *Recording and Coding Guide for the Structural Inventory and Appraisal of the Nations Bridges*, hereafter referred to as the coding guide, the SI&A sheets shall include and keep updated (within 5 years) the ADT and the percentage of trucks at the structure for those carrying vehicular traffic. For any proposed design work at the vehicular structures, the City should obtain traffic counts prior to proceeding with any design. The traffic counts for all vehicular bridges are up to date.

All field notes, computations, reference data and other materials used in the preparation of this report are on file at the office of DLZ Indiana, LLC. Copies of relevant data for individual bridges will be furnished upon request.

NARRATIVE

BRIDGE REPLACEMENT AND MAINTENANCE

At this time there are twelve (12) bridges recommended for rehabilitation and/or repairs, and one bridge, Bridge 302, recommended for replacement. There are also a few bridges in the City that have load capacities and roadway widths which are adequate for local and/or pedestrian traffic, but do not conform to current standards. These bridges could be replaced or widened; however, at this time they appear to be functioning adequately. Thus, they have not been recommended for major improvements.

The estimated total cost for all the improvements is \$1,387,250. A priority schedule for these improvements is included on Table 2. This cost is based on a narrow scope of work focused on repairing structures with noted major deficiencies and does not include structures requiring only routine maintenance tasks or safety feature upgrades.

Routine maintenance costs are not included in the Coding Guide of FHWA and have therefore been separated out. Routine maintenance will be required on fourteen (14) bridges to prevent future problems from occurring. This includes, but is not limited to, clearing vegetation overgrowth, installing load posting signs, fixing fences, installing gates, repairing holes in decks, removing debris, and placement of riprap to help prevent scour and erosion. The estimated total cost for all these maintenance needs is \$89,400. These estimates were based on the inspecting engineer's visual evaluation at the time of inspection. It should be realized that this type of cost is very hard to estimate on a general basis, and the costs shown should be considered as a guide to the magnitude and assumed complexity of maintenance needs rather than a firm dollar estimate. It is recommended that all maintenance work be done in a timely fashion, either to improve safety or to prevent further deterioration. Some routine maintenance may need to be performed annually or semi-annually, such as clearing vegetation from the bridge. The minor repairs made now will reduce later maintenance and repair costs and will extend the useful life of these bridges. See Table 3 for a summary of maintenance costs per bridge.

In addition to these comments, the following general conditions are worthy of noting:

1. A few of the steel bridges were found to have dirt and debris accumulating around their bearings. This condition leads to severe corrosion problems, which could be greatly reduced by periodically cleaning the bearing areas and painting the steel portions of the structure in these areas. Bridges 101, 103, 104, 302, 303 and 305 were found to have debris accumulating at the bearings.
2. A few of the steel bridges have paint that is in poor to very poor condition. This condition leaves the steel unprotected and susceptible to rust and can drastically reduce the structural integrity of the bridge, depending upon its extent. A plan to sandblast and paint steel bridges could slow down the rate of deterioration of older structures and prevent the premature deterioration of newer structures. A properly performed painting will last approximately twenty years. Bridges 103, 104, 201, 302, 303, and 304 were found to have the paint in poor to fair condition.

3. Many bridges have interior bents or piers, which tend to catch debris. These structures should be checked periodically, and the debris removed. Bridges 101 and 104 were found to have accumulated debris under the bridge.
4. Many bridges have problems with erosion, undermining, or scour to varying degrees at the substructure elements. Although these problems may not appear to be very serious initially, if they are not corrected, they can lead to serious problems. When these problems are detected, they should be repaired. A variety of means exist to repair and prevent future problems such as placing riprap around the substructure. Bridges 101, 102, 103, 104, 202, 203, 301, 305, and 306 were found to have erosion, undermining, or scour depressions.
5. Many bridges have a heavy amount of vegetation growing on, around and under them. This vegetation reduces the visibility of the bridge and can shorten the life expectancy of the structure. The vegetation tends to hold water around the bridge and reduces air circulation. These two factors will cause the bridge to deteriorate at a faster rate. A plan to keep the vegetation away from the bridge will reduce the hazard of obscuring the bridge and at the same time allow more air circulation to keep the bridge dry. Bridges 102, 104, 201, 202, 203, 303, 304, and 305 were found to have vegetation encroaching the bridge

It should be noted that continuous maintenance costs beyond these immediate requirements will be needed. However, estimating costs of such future maintenance is not within the scope of this report. In using the cost estimating sections of this report, readers are cautioned that preliminary estimates are very general and that substantial refinements can be obtained when an in-depth scope of work and detailed plans are prepared for a project.

BRIDGE SIGNING AND MARKING

The field inspection showed that a few signs and markers are being used by the City. Local Agencies traditionally have been reluctant to engage in extensive signing, probably due to the assumption that most persons traveling local roads are familiar with these roads. Signs are also subject to vandalism and can be a major expense for highly limited budgets. However, recent changes in legal decisions governing liability in accidents and increases in traffic are forcing Local Agencies to be conscious of signing and marking problems. As a minimum, signs warning of one lane or narrow bridges and low load limits are essential. In addition to these signs, reflectorized delineators warning of narrow shoulders or reflectorized warning signs at the ends of narrow bridges provide a highly visible means of warning the traveling public of hazardous situations. Weed and brush control should be exercised to maintain the visibility of such warning devices.

The location of load limit signs deserves attention. Load limit signs should be located within a few feet of the structure. However, it would be advantageous to both the motorists and the City to also locate these signs at intersections nearest the bridge, thereby warning the

motorists at a point where they can change their route, if necessary. It would also be to the City's benefit to keep updated and well documented records of the posting of all load limit signs. For a summary of bridge load postings, see Table 4. In accordance with the INDOT Bridge Inspection Manual, a notice should be sent by the City to the school districts advising them of the location of all bridges with a 12 Ton or less capacity. This notice should be sent annually or when a bridge's posting status changes.

The criteria for posting bridge end markers for vehicular bridges is called out in the Federal Manual on *Uniform Traffic Control Devices*; and the Indiana Manual on *Uniform Traffic Control Devices*. These manuals only require bridge end markers for "One Lane Bridge" and "Narrow Bridge" structures or where "objects not actually in the roadway may be so close to the edge of the road that they need a marker". It is this latter criterion that governs our judgment when recommending posting of markers for certain structures wider than a "Narrow Bridge". However, the final use of the markers at locations other than at a "One Lane Bridge" or a "Narrow Bridge" will remain at the discretion of the City.

Table 5 and Table 6 list those safety items that are currently on the bridge and those that are recommended for use at the bridge designated, respectively. The recommended signing set out in these tables is intended as a minimum and should be evaluated in the field for possible expansion, especially if features such as intersections, curves, or other hazards are near the bridge.

BRIDGE INVENTORY AND APPRAISAL CRITERIA

The condition of each bridge has been assessed by the inspecting engineer and ratings have been assigned to the features as listed in accordance with the guidelines referenced herein. In general, a rating "6" or "7" indicates a potential for minor maintenance. A rating of "5" indicates a potential for major maintenance and ratings of "4" or less indicate a potential for major rehabilitation or replacement.

The appraisal of each structure with the deficiencies as noted, was based on the judgment of the inspecting engineer. Ratings were then assigned based again on the referenced guidelines. Ratings "6" and above indicate that conditions are equal to or better than present minimum criteria. Ratings "4" and "5" indicate conditions meeting minimum tolerable limits to be left in place as is. Ratings "3" and lower indicate intolerable conditions requiring repair or replacement with high priority.

The capacity of each structure was determined by calculations where possible. Where enough data is unavailable, assumptions were made to arrive at a rating. The calculations were based on field dimensions, on the condition of the superstructure and on the judgment of the engineer. They are by no means intended to completely analyze the entire structure or to guarantee the capacity ratings. This is clearly beyond the scope of this project and would be impossible without complete plans and a more detailed inspection and investigation. They are intended to be a "best estimate" for these ratings and serve as the basis for determining the safe live load capacity. The summary of the load ratings can be found in Table 4.

Certain criteria were established as a practical method for arriving at a rating for each of the structure types. The procedures used, in accordance with guidelines of this study, were as follows:

General: The supporting bridge floor members in all cases were assumed to be the limiting component and subject of analysis. Members were assumed to be less than fully effective where portions of members were lost due to corrosion or spalling.

Steel: Member sized and spacings were measured. Superstructure dead loads were approximated based on field measurements. Distribution of wheel loads was determined in accordance with current AASHTO requirements. ASTM A36 steel (36 ksi yield stress) was assumed for bridges built since 1963 and A7 steel (33 ksi yield stress) was assumed for construction between 1936 and 1963. Steel with 30 ksi yield stress was assumed for steel construction between 1905 and 1936. For construction prior to 1905 steel with 26 ksi yield stress was assumed. Inventory ratings were based on 55 percent of yield stress; while the operating rating was based on 75 percent of yield stress.

Cast-in-Place Concrete Flat Slabs, Arches & Girders: Member sizes and spacing were measured. Where plans were available the specified concrete compressive strength, reinforcement yield strength and size and location of reinforcement was used in the strength calculations. Where this data was not available the guidelines outlined in the AASHTO Manual for Condition Evaluation of Bridges were followed. For structures built prior to 1954 the inventory rating was based on an allowable steel stress of 18 ksi, the operating rating was based on an allowable steel stress of 25 ksi and a yield strength of 33 ksi. For structures built after 1954 the inventory rating was based on an allowable steel stress of 20 ksi, the operating rating was based on an allowable steel stress of 28 ksi and a yield strength of 40 ksi. The concrete compressive strength for structures built prior to 1959 was assumed to be 2500 psi and 3000 psi after 1959. For a concrete compressive strength of 2500 psi, the allowable stress for the inventory rating was 1000 psi and 1500 psi for the operating rating. For a concrete compressive strength of 3000 psi, the allowable stress for the inventory rating was 1200 psi and 1900 psi for the operating rating.

Prestressed Concrete Box Beams and I-Beams: Member capacities were determined with the aid of load tables and the 1960's Prestressed Beam Standard Drawings published by the Indiana Department of Transportation. When the number of prestressing strands was not known, a conservative estimate was made. When plans were not available, an initial concrete strength of 4,000 psi and a final concrete strength of 5,000 psi were assumed. In addition, strands were eliminated at crack locations or where spalls were evident.

Timber Slabs: Member sizes and spacings were measured. Superstructure dead loads were approximated based on the field measurements. The distribution of wheel loads was determined in accordance with current AASHTO requirements. In accordance with INDOT specifications, timber slabs were assumed to be Douglas Fir-Larch, No. 1 or better with a bending strength of 1150 psi. The actual allowable stress for the operating and inventory ratings was based on the bending strength multiplied by various adjustment factors. For both the

inventory and operating rating, a repetitive member factor of 1.15 and a size factor (which depends on thickness and depth) of 1.0 to 1.2 were used. For the inventory rating a load duration factor of 1.15 was used while 1.33 was used for the operating rating duration factor. In addition to the adjustment factors, the allowable operating rating stress was increased by 33%, in accordance with AASHTO.

A listing of all personnel involved with the project and their qualifications is listed in Table 1. A summary of bridges historic significance can be found in Table 7. In order to further facilitate and clarify interpretation of the various items contained on the Structure Inventory and Appraisal Sheets, a brief explanation of each item is listed in Appendix B.

It is hoped that the format of this report will provide a convenient means of reference for anyone using it and assist in achieving an improved, adequate and safe bridge system within the City of Goshen.

TABLE 1

**LISTING OF PERSONNEL AND QUALIFICATIONS AND
SIGNATURE OF ALL TEAM LEADERS**

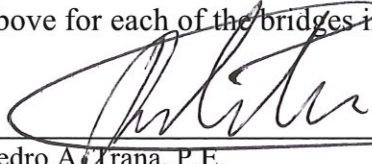
Inspection	Load Rating	Name	Qualifications	Duties
X	X	Michael A. Kummeth, P.E.	BSCE, NHI 1990, 31 years insp. & design, INDOT Bridge Inspector Number IN000149-2020	Project Manager/ QC-QM
X	X	Pedro A. Trana, P.E.	MSCE, BSCE, NHI 2005, 16 years insp. & design, INDOT Bridge Inspector Number IN000255-2021	Team Leader
X		Ethan A. Flook	BSCE, 2 years inspection & design experience	Team Member
X		Quinten C. Prieur	Bridge Dept. Intern, 2 Summers of Bridge Inspection Experience	Team Member
<p>At least one Team Leader was present and actively involved at each of the individual inspections listed above for each of the bridges in the City of Goshen, Indiana for the 2020 Inspections.</p>  <hr/> <p>Pedro A. Trana, P.E.</p>				



TABLE 2

PRIORITY SCHEDULE FOR BRIDGE IMPROVEMENTS

Priority No.	Bridge No.	Year Needed	Work Description	*Estimated Project Cost
1	301	2021	REPAIR EROSION HOLE AND SETTLEMENT OF WEST APPROACH. INSTALL PEDESTRIAN ONLY SIGNS IN EAST APPROACH. REPAIR EROSION AT SOUTHEAST EMBANKMENT	\$20,000
2	101	2021	REPLACE MISSING PORTIONS OF RUBBER MAT	\$8,000
3	201	2021	INSTALL NEW JOINTS. INSTALL CHECKERED PLATES. CLEAN AND PAINT STEEL SUBSTRUCTURES. CLEAN RUST OFF OF DECK ANGLES. REPLACE DECK.	\$50,000
4	102	2021	INSTALL APPROACHES LEADING TO BRIDGE. CLEAN & PAINT RUST AREAS. REMOVE GRAFFITTI AND PAINT STEEL.	\$23,000
5	203	2021	REPLACE DETERIORATED BOARDS. RESET EXISTING BOARDS TO REDUCE 1" GAPS.	\$5,500
6	303	2021	CLEAN AND PAINT STRUCTURAL STEEL. INSTALL CHECKERED PLATES AT EACH END OF BRIDGE DECK.	\$13,750
7	304	2022	CLEAN AND PAINT STRUCTURAL STEEL. REPLACE TIMBER CURBS.	\$105,000
8	103	2023	REPAIR SUBSTRUCTURE WITH EPOXY CRACK INJECTION AND CONCRETE PATCHING. REPAIR THROUGH GIRDERS NEAR BEARINGS, CLEAN AND PAINT GIRDERS, FLOOR BEAMS, AND STRINGERS.	\$120,000
9	202	2025	REPLACE EXPANSION JOINTS. REPLACE BRIDGE RAILING	\$50,000
10	402	2025	REPLACE CRACKED SIDEWALK AT WEST STAIRS APPROACH.	\$7,000
11	302	2026	CONSIDER REPLACING STRUCTURE WITH NEW VEHICULAR BRIDGE.	\$610,000
12	104	2028	CLEAN AND PAINT STRUCTURAL STEEL. REPLACE DECK.	\$75,000
13	306	2030	REMOVE AND REPAIR UNSOUND CONCRETE. EPOXY INJECT CRACKS. MILL AND OVERLAY CONCRETE DECK.	\$300,000
Total Cost =				\$1,387,250

* Estimated Project Cost does not include maintenance costs.

TABLE 3

SCHEDULE FOR BRIDGE MAINTENANCE

Priority No.	Bridge No.	Description	Year Needed	*Estimated Cost
1	201	UNTIL DECK IS REPLACED, REPLACE DETERIORATED TIMBER BOARDS AS NEEDED.	2021	\$3,000
2	302	INSTALL GATE AT EAST APPROACH. INSTALL LOAD POSTING SIGNS.	2021	\$5,400
3	101	REMOVE HEAVY DEBRIS BUILD-UP UNDER BRIDGE.	2021	\$5,000
4	104	CLEAR DEBRIS FROM CHANNEL. REFASTEN LOOSE DECK PLANKS WITH GALVANIZED SCREWS.	2021	\$5,000
5	102	CLEAR TREES & HEAVY BRUSH GROWING UNDER AND ALONG BRIDGE.	2021	\$5,000
6	203	REMOVE VEGETATION AT WEST END, NEXT TO NORTH TRUSS. FIX UNDERMINING AT EAST APPROACH.	2021	\$5,000
7	103	PERIODICALLY CLEAN DEBRIS AND LEAVES FROM BRIDGE DECK AND BEARINGS. CLEAR HOMELESS ACTIVITY.	2021	\$2,000
8	301	INSTALL RIPRAP AT WEST BANK. CLEAR VEGETATION.	2021	\$5,000
9	303	SECURE FENCE ALONG TOP OF BRIDGE RAILING AND EAST APPROACH RAILING. REPAIR LOOSE BOTTOM TIMBER KICK BOARD ALONG THE SOUTH BRIDGE RAILING. REPAIR BENT RAILING ALONG NORTHWEST APPROACH RAIL & CONCRETE SPALL AT SOUTHEAST BEARING.	2021	\$9,000
10	304	CLEAR VEGETATION AROUND BRIDGE.	2021	\$5,000
11	305	CLEAR VEGETATION. PLACE RIPRAP AT PIERS.	2021	\$10,000
12	401	SEAL CRACKS IN TOP SURFACE OF SLAB.	2025	\$10,000
13	202	INSTALL RIPRAP AT SPILL SLOPES.	2025	\$5,000
14	306	FILL VOIDS IN GROUTED RIPRAP. FIX EROSION BEHIND NORTHWEST AND NORTHEAST WINGWALLS. REPLACE PAVED SIDE DITCH.	2025	\$15,000
Total Cost:				\$89,400

TABLE 4

LOAD RATING SUMMARY AND LOAD POSTING

Bridge No.	Design Load	Load Rating (H inventory for Veh. Bridges)	Open, Posted, or Closed	*Year Rated
101	PEDESTRIAN	40 PSF	OPEN	2008
102	PEDESTRIAN	65 PSF / 10,000 LB TRUCK	OPEN	2012
103	PEDESTRIAN	85 PSF	OPEN	2008
104	PEDESTRIAN	85 PSF	OPEN	2008
201	PEDESTRIAN	80 PSF	OPEN	2008
202	PEDESTRIAN	85 PSF	OPEN	2008
203	PEDESTRIAN	60 PSF/10,000 LB TRUCK	OPEN	2012
300	H-20/HS-20	20 TON	OPEN	2012
301	UNKNOWN	1 TON	POSTED – PEDESTRIANS ONLY	2008
302	H-20/HS-20	12 TON	B – OPEN, POSTING REQUIRED	2020
303	PEDESTRIAN	80 PSF	OPEN	2008
304	PEDESTRIAN	85 PSF	OPEN	2012
305	H-20/HS-20	20 TON	OPEN	2012
306	UNKNOWN	16 TON	OPEN	2020
401	HS-25	20 TON	OPEN	2009
402	E-80 COOPER TRAIN	40 TON	OPEN	2020

* All previous load ratings have been verified in 2020.

TABLE 5

SAFETY IMPROVEMENTS CURRENTLY AT BRIDGE

Bridge No.	One Lane	Narrow Bridge	Bridge Railing	Approach Railing	Bridge End Markers	Speed Limit	Curve Signs	Other
101			X	X			X	
102			X					
103			X	X				
104			X	X				
201			X					
202			S					
203			X					5
300			X	X				
301			X	X				1
302			S					2
303			X	S				3
304			X					1
305	X		S		X	X		3
306			X					3
401			X	X				4
402			X					

X = In Place and Adequate

S = In Place and Substandard

Other:

- 1 – Bollard in place to prevent vehicular traffic.
- 2 – Additional signs in place: “Pedestrian Crossing (Symbol)” and City of Goshen Trail signs. In addition, gates restricting bridge are placed at the west approach.
- 3 – Additional signs in place: STOP Sign and/or City of Goshen Trail sign.
- 4 – Additional signs in place: “SR 119”, City of Goshen Trail, and “Bikeway Narrows” signs.
- 5 – Elkhart River sign

TABLE 6

SAFETY IMPROVEMENTS NEEDED AT BRIDGE

Bridge No.	One Lane	Narrow Bridge	Bridge Railing	Approach Railing	Bridge End Markers	Speed Limit	Curve Signs	Other
101								
102				X				
103								
104								
201								
202			X					
203								
300								
301								
302			X	X				1
303				X				
304								
305			X	X				
306								
401								
402								

Other:

1 – Install Load Posting signs. Install gate at east approach. Lock gate at west approach.

TABLE 7

LISTING OF HISTORICAL STRUCTURES

Category: (1) On National Register of Historic Places
(2) Eligible for National Register of Historic Places
(3) Possibly eligible for National Register of Historic Places

Category	Bridge No.	Structure Type	Location
2 - ELIGIBLE	301	EARTH FILLED MASONRY ARCH	350' W. OF 3RD STREET
2 - ELIGIBLE	304	RIVETED STEEL PONY TRUSS	475' W. OF WILSON AVENUE

STRUCTURE INVENTORY AND APPRAISALS

CITY OF GOSHEN BRIDGE NO. 101

**MAPLE CITY GREENWAY
OVER
ROCK RUN CREEK**



SOUTH ELEVATION



NORTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 101

Facility Carried: MAPLE CITY GREENWAY
Feature(s) Intersected: ROCK RUN CREEK

IDENTIFICATION

State: **INDIANA**
 District: **FORT WAYNE**
 County: **ELKHART**
 City/Town: **GOSHEN**
 Feature Int'd: **ROCK RUN CREEK**
 Facility Carried: **MAPLE CITY GREENWAY**
 Location: **425' W. OF 1ST STREET**
 Latitude: **41° 35' 42.72"**
 Longitude: **85° 50' 30.55"**

GEOMETRIC DATA

Structure Length:
 Max. Span Length:
 Deck Width (O-O):
 Br. Rdwy Width:
 Approach Width:
 Total Hor. Clearance – Over:
 Bridge Skew:
 Stream Skew:

REMAINING LIFE

Estimated Remaining Life:
 Wearing Surface:
 Deck:
 Joints:
 Superstructure:
 Substructure:
 Approach:
 Channel:
 Culvert:

STRUCTURE DATA

Str. Type-Main: **RIVETED STEEL PONY TRUSS**
 Str. Type-Appr: **NA**
 Deck Str. Type: **WELDED STEEL GRATE**
 Wearing Surface: **RUBBER MAT**
 Thickness of Asphalt: **0** Inches
 No. of Spans – Main: **1**
 No. of Spans – Approach: **0**

CLASSIFICATION

Historical Significance:
 Maintenance Responsibility:
 Owner:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed: **2021**
 City Type Work: **REPAIR - LOCAL FORCES**
 City **REPLACE RUBBER MAT**

LOAD RATING AND POSTING

Design Load:
 Operating Rating:
 Inventory Rating:
 Gross Tons or H Rating:

PEDESTRIAN
NA
40 PSF
40 PSF

AGE OF SERVICE

Year Built: **1928 (TRUSS)**
 Reconstructed: **2003 (ON SITE)**
 Repaired: **2011**
 Type of Service: **PED./BIKE over WATERWAY**
 Lanes on Structure: **TRAIL**
 ADT – Over: **NA VPD**
 ADT Year Over: **NA**
 Paint Date: **2011**
 Paint Rating: **6 - SATISFACTORY**
 Detour: **NA**

Posting:
 Date Posted/Closed:
 Open, Posted, or Closed:
 Tons Posted:
 Year of Rating:

NA Bridge Imp. Costs: **\$8,000**
NA Roadway Imp. Costs: **\$0,000**
OPEN Total Project Costs: **\$8,000**
2008 Yr. of Cost Estimate: **2020**

MAINTENANCE NEEDS

Year Needed: **2021**
 Describe Work:
7/29/2020 **REMOVE HEAVY DEBRIS BUILD-UP UNDER BRIDGE**
48 Months **3/7/2018**

Total Maintenance Costs: **\$5,000**

CONDITION

CONDITION
 Deck: **SATISFACTORY - PAINT PEEL/ RUST AT EDGES.**
 Wearing Surface: **POOR - MISSING PIECES/ TEARING**
 Superstr: **FAIR - PACK RUST @ FLR BM/LOW CHORD & STRINGER/FLR BM CONN.**
 Substr: **GOOD**
 Channel: **POOR - HEAVY TREE DEBRIS UNDER BRIDGE**
 Culvert: **NA**
 Approach Roadway: **GOOD - TRAIL**

MATERIAL **RATING**
WELDED STEEL GRATE **6**
RUBBER MAT **4**
STEEL **5**
CONCRETE END BENTS **7**
RIPRAP **4**
NA **NA**
CONCRETE **7**

APPRAISAL

APPRAISAL **RATING**
 Structural: **FAIR - PACK RUST AT FLOORBEAM/LOW CHORD AND FLOORBEAM/STRINGER CONNECTIONS. HEAVY RUST AT FASCIA STRINGERS** **5**
 Geometry: **VERY GOOD - TRAIL** **8**
 Bridge Railing: **GOOD - STEEL TUBE** **7**
 Waterway Adequacy: **SLIGHT CHANCE OF OVERTOPPING BRIDGE** **7**
 Roadway Alignment: **VERY GOOD - TRAIL/ HORIZONTAL CURVE AT APPROACHES** **8**
 Scour: **STABLE** **8**
 Foundation: **STEEL H-PILES**

REMARKS

THE BOTTOM CHORD OF THE BRIDGE COLLECTS SIGNIFICANT AMOUNTS OF DEBRIS DURING HIGH FLOWS. THEREFORE, THE CHANNEL SHOULD BE CLEARED OF DEBRIS FOLLOWING SIGNIFICANT STORM EVENTS. ISOLATED PACK RUST AT LOWER CHORD MEMBERS. PACK RUST TYPICAL AT FLOOR BEAM TO LOW CHORD CONNECTIONS AND STRINGER TO FLOOR BEAM CONNECTIONS. PITTING OF FLOOR BEAMS AND INTERIOR STRINGERS. HEAVY RUST AND SECTION LOSS AT FASCIA STRINGERS. THINNING OF TOP FLANGE OF EXTERIOR STRINGERS. SECTION LOSS OF STRINGER ENDS AT FLOOR BEAM CONNECTION. PACK RUST AT WELDED STEEL PLATE AND STRINGER CONNECTION. PAINT PEELING AND RUST AT STEEL GRATE DECK OUTSIDE OF LIMITS OF RUBBER MAT. RUBBER MAT WEARING SURFACE TORE AT VARIOUS LOCATIONS WITH MAT PRYING UP. RIPRAP BEING ERODED EXPOSING GEOTEXTILES.



CITY OF GOSHEN BRIDGE NO. 102

**MAPLE CITY GREENWAY
OVER
ROCK RUN CREEK**



WEST ELEVATION



EAST ELEVATION



SECTION LOOKING NORTH



SECTION LOOKING SOUTH

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 102

Facility Carried: MAPLE CITY GREENWAY
Feature(s) Intersected: ROCK RUN CREEK

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: ROCK RUN CREEK
Facility Carried: MAPLE CITY GREENWAY
Location: 625' E. OF 5TH STREET
Latitude: 41° 35' 23.88"
Longitude: 85° 49' 52.24"

GEOMETRIC DATA

Structure Length:
Max. Span Length:
Deck Width (O-O):
Br. Rdwy Width:
Approach Width:
Total Hor. Clearance – Over:
Bridge Skew:
Stream Skew:

REMAINING LIFE

86'-0" Estimated Remaining Life:
85'-4" Wearing Surface: 10 Years
10'-8" Deck: 10 Years
10'-0" Joints: NA Years
10'-8" Superstructure: 20 Years
10'-0" Substructure: 35 Years
0 Degree(s) Approach: NA Years
25 Degree(s) Channel: 20 Years
Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: WELDED STEEL PONY TRUSS
Str. Type-Appr: NA
Deck Str. Type: CONCRETE
Wearing Surface: MONOLITHIC CONCRETE
Thickness of Asphalt: 0 Inches
No. of Spans – Main: 1
No. of Spans – Approach: 0

CLASSIFICATION

Historical Significance:
Maintenance Responsibility:
Owner:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed: 2021
City Type Work: REPAIR - CONTRACT
City
INSTALL APPROACHES LEADING TO BRIDGE. CLEAN & PAINT RUST AREAS. PAINT OVER GRAFFITI.

LOAD RATING AND POSTING

Design Load: PEDESTRIAN
Operating Rating: NA
Inventory Rating: 65 PSF / 10,000 LB TRUCK
Gross Tons or H Rating: 65 PSF / 10,000 LB TRUCK

AGE OF SERVICE

Year Built: 1999
Reconstructed: 0000
Repaired: 0000
Type of Service: PED./BIKE over WATERWAY
Lanes on Structure: TRAIL
ADT – Over: NA VPD
ADT Year Over: NA
Paint Date: 1999
Paint Rating: 6 - SATISFACTORY
Detour: NA

Posting: NA
Date Posted/Closed: NA
Open, Posted, or Closed: OPEN
Tons Posted:
Year of Rating: 2012

Bridge Imp. Costs: \$12,000
Roadway Imp. Costs: \$11,000
Total Project Costs: \$23,000
Yr. of Cost Estimate: 2020

INSPECTIONS

Inspection Date:
Des. Inspection Frequency:
Prev. Inspection Date:

MAINTENANCE NEEDS

Year Needed: 2021
Describe Work:
7/30/2020 CLEAR TREES & HEAVY BRUSH GROWING UNDER AND
48 Months ALONG BRIDGE
3/7/2018

Total Maintenance Costs: \$5,000

CONDITION

CONDITION
Deck: GOOD - LEACHING OF UNDERSIDE NEXT TO TRUSSES
Wearing Surface: GOOD
Superstr: GOOD - PEELING OF PAINT AND SURFACE RUST AT LOWER CHORDS.
Substr: GOOD - SPALL @ N CONCRETE END BENT MUDWALL
Channel: SATISFACTORY - MINOR EROSION & UNDERMINING
Culvert: NA
Approach Roadway: N/A - NO APPROACH LEADING TO BRIDGE

<u>MATERIAL</u>	<u>RATING</u>
CONCRETE	7
MONOLITHIC CONCRETE	7
STEEL	7
CONCRETE END BENTS	7
GROUTED RIPRAP	6
NA	NA
EARTH	NA

APPRAISAL

Structural: GOOD - SURFACE RUST AND LEACHING
Geometry: GOOD - TRAIL
Bridge Railing: GOOD - STEEL TUBE WITH TIMBER HANDRAIL HAVING SOME SPLITS
Waterway Adequacy: BRIDGE ABOVE APPROACHES
Roadway Alignment: STRAIGHT, CREST VERTICAL CURVE - NO TRAIL APPROACH TO BRIDGE
Scour: STABLE - SCOUR AT TOE OF SPILL SLOPES
Foundation: UNKNOWN (LIKELY PILES)

<u>RATING</u>
7
7
7
8
NA
5

REMARKS

UNDERSIDE OF DECK IS LEACHING AT TRUSS INTERFACE. PAINT PEELING AND SURFACE RUST AT LOWER CHORD OF TRUSSES. HOMELESS ACTIVITY UNDER BRIDGE. GRAFFITI ON TRUSS MEMBERS. HEAVY VEGETATION ALONG WEST TRUSS. CONCRETE APPROACH & TRAIL SIGNS ARE GONE. SPALL WITH EXPOSED REBAR IN THE WEST CORNER OF NORTH CONCRETE END BENT. SOME UNDERMINING AT TOE OF GROUTED RIPRAP SPILL SLOPES. BRIDGE NEXT TO WATER PLANT. VERIFY WARRANTY INFORMATION AND PAINT SPECIFICATIONS WITH BRIDGE MANUFACTURER PRIOR TO PERFORMING ANY WORK.



CITY OF GOSHEN BRIDGE NO. 103

**MAPLE CITY GREENWAY
OVER
ROCK RUN CREEK**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING EAST



SECTION LOOKING WEST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 103

Facility Carried: MAPLE CITY GREENWAY
Feature(s) Intersected: ROCK RUN CREEK

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: ROCK RUN CREEK
Facility Carried: MAPLE CITY GREENWAY
Location: 100' E. OF CRESCENT STREET
Latitude: 41° 35' 18.25"
Longitude: 85° 49' 41.77"

GEOMETRIC DATA

Structure Length:
Max. Span Length:
Deck Width (O-O):
Br. Rdwy Width:
Approach Width:
Total Hor. Clearance - Over:
Bridge Skew:
Stream Skew:

REMAINING LIFE

91'-0" Estimated Remaining Life:
85'-6" Wearing Surface: 8 Years
16'-4" Deck: 8 Years
12'-9" Joints: NA Years
7'-5" Superstructure: 8 Years
7'-5" Substructure: 8 Years
30 Degree(s) Approach: 15 Years
30 Degree(s) Channel: 8 Years
Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: RIVETED STEEL THRU GIRDER
Str. Type-Appr: NA
Deck Str. Type: TIMBER
Wearing Surface: TIMBER
Thickness of Asphalt: 0 Inches
No. of Spans - Main: 1
No. of Spans - Approach: 0

CLASSIFICATION

Historical Significance:
Maintenance Responsibility:
Owner:
Design Load:
Operating Rating:
Inventory Rating:
Gross Tons or H Rating:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed: 2023
City Type Work: REHABILITATION - CONTRACT
City
REPAIR SUBSTRUCTURE WITH EPOXY CRACK INJECTION AND CONCRETE PATCHING. REPAIR THROUGH GIRDERS NEAR BEARINGS, CLEAN AND PAINT GIRDERS, FLOOR BEAMS, AND STRINGERS
PEDESTRIAN
NA
85 PSF
85 PSF
NA Bridge Imp. Costs: \$120,000
NA Roadway Imp. Costs: \$0,000
OPEN Total Project Costs: \$120,000
Yr. of Cost Estimate: 2020
2008

AGE OF SERVICE

Year Built: 1850
Reconstructed: UNKNOWN
Repaired: UNKNOWN
Type of Service: PED./BIKE over WATERWAY
Lanes on Structure: TRAIL
ADT - Over: NA VPD
ADT Year Over: 2008
Paint Date: UNKNOWN
Paint Rating: 4 - POOR
Detour: NA

LOAD RATING AND POSTING

Design Load:
Operating Rating:
Inventory Rating:
Gross Tons or H Rating:
Posting:
Date Posted/Closed:
Open, Posted, or Closed:
Tons Posted:
Year of Rating:
Inspections
Inspection Date:
Des. Inspection Frequency:
Prev. Inspection Date:

MAINTENANCE NEEDS

Year Needed: 2021
Describe Work:
7/29/2020 48 Months PERIODICALLY CLEAN DEBRIS AND LEAVES FROM BRIDGE DECK AND BEARINGS. CLEAR HOMELESS ACTIVITY
3/7/2018
Total Maintenance Costs: \$2,000

CONDITION

	<u>CONDITION</u>	<u>MATERIAL</u>	<u>RATING</u>
Deck:	SATISFACTORY - WORN/FEW SPLITS & SEPARATION	TIMBER	6
Wearing Surface:	SATISFACTORY - WORN	TIMBER	6
Superstr:	POOR - HEAVY RUST OF GIRDERS, FLOOR BEAMS, STRINGERS, AND BEARINGS	STEEL	4
Substr:	FAIR - SCALING ALONG WATERLINE, VERT. CRACKS, & SPALLING	CONCRETE ABUTMENTS	5
Channel:	FAIR - MISALIGNED, HITS SOUTHWEST CORNER OF BRIDGE	NATURAL	5
Culvert:	NA	NA	NA
Approach Roadway:	GOOD - MINOR EROSION AT EAST APPROACH	BITUMINOUS	7

APPRAISAL

		<u>RATING</u>
Structural:	POOR - STEEL RUST, DELAMINATION AND CRACKING OF CONCRETE ABUTMENTS	4
Geometry:	GOOD - TRAIL	7
Bridge Railing:	SATISFACTORY - TIMBER RAIL ALONG APPROACHES; PL GIRDER AT BRIDGE	6
Waterway Adequacy:	BRIDGE ABOVE APPROACHES	8
Roadway Alignment:	STRAIGHT, SLIGHT CREST CURVE - TRAIL	8
Scour:	STABLE - RIPRAP INSTALLED AT SOUTHWEST CORNER OF ABUTMENT	5
Foundation:	UNKNOWN (LIKELY SPREAD FOOTING)	

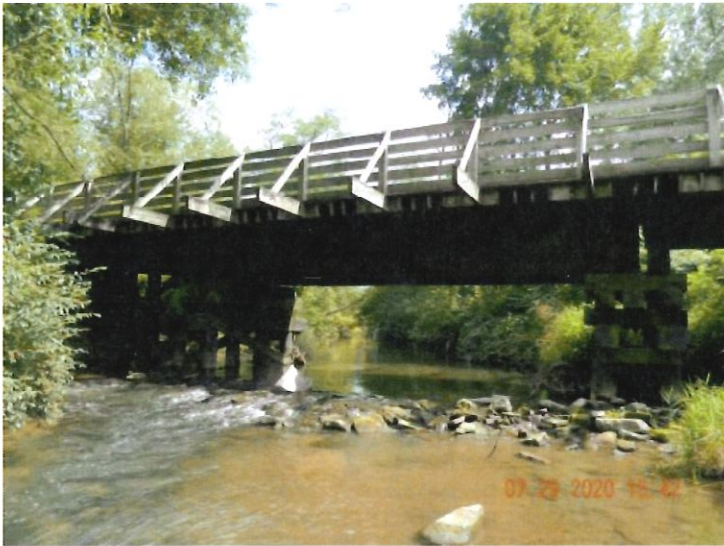
REMARKS

YEAR BUILT ESTIMATED BASED ON HISTORICAL RECORDS. BRIDGE DECK, ESPECIALLY OUTSIDE OF RAILING, SHOULD BE CLEANED PERIODICALLY TO PREVENT DEBRIS AND WATER ACCUMULATION ADJACENT TO THE STEEL THROUGH GIRDERS. A FEW DECK BOARDS WITH WARPING, SPLITS, CHECKS, AND SEPARATION. A FEW OF THE STEEL STIFFENERS ARE TWISTED ABOVE THE DECK. TOP OF FLOOR BEAM FLANGE AND WEB TWISTED IN 4 OF 5 INTERIOR FLOOR BEAMS. HOLES IN WEB PLATE OF SOUTH GIRDER AT EAST BEARING. RIVET HEADS CORRODED THROUGHOUT, SEVERELY AT BEARINGS. PACK RUST AT CONNECTIONS OF STRINGERS TO FLOOR BEAMS AND AT FLOOR BEAMS TO THRU GIRDERS. GUSSET PLATES TWISTED. CHANNEL HITS WEST ABUTMENT TOWARDS SOUTHWEST CORNER, WITH CONCRETE SCALING AND ABRASION AT THIS LOCATION. SCALING & ABRASION ALSO AT EAST ABUTMENT, AT NORTHEAST CORNER. EROSION AND UNDERMINING BELOW STORM PIPES AT NORTHWEST BANK.



CITY OF GOSHEN BRIDGE NO. 104

**MAPLE CITY GREENWAY
OVER
ROCK RUN CREEK**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING EAST



SECTION LOOKING WEST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 104

Facility Carried: MAPLE CITY GREENWAY
Feature(s) Intersected: ROCK RUN CREEK

IDENTIFICATION

State: INDIANA
 District: FORT WAYNE
 County: ELKHART
 City/Town: GOSHEN
 Feature Int'd: ROCK RUN CREEK
 Facility Carried: MAPLE CITY GREENWAY
 Location: 1250' E. OF LINCOLN AVENUE
 Latitude: 41° 35' 11.40"
 Longitude: 85° 49' 17.76"

GEOMETRIC DATA

Structure Length: 103'-0"
 Max. Span Length: 31'-0"
 Deck Width (O-O): 14'-2"
 Br. Rdwy Width: 12'-0"
 Approach Width: 12'-0"
 Total Hor. Clearance – Over: 12'-0"
 Bridge Skew: 0 Degree(s)
 Stream Skew: 0 Degree(s)

REMAINING LIFE

Estimated Remaining Life:
 Wearing Surface: 8 Years
 Deck: 8 Years
 Joints: 10 Years
 Superstructure: 10 Years
 Substructure: 10 Years
 Approach: 15 Years
 Channel: 10 Years
 Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: RIVETED STEEL DECK GIRDER
 Str. Type-Appr: HEAVY TIMBER STRINGER
 Deck Str. Type: TIMBER
 Wearing Surface: TIMBER
 Thickness of Asphalt: 0 Inches
 No. of Spans – Main: 1
 No. of Spans – Approach: 6

CLASSIFICATION

Historical Significance: NOT ELIGIBLE
 Maintenance Responsibility: City
 Owner: City
LOAD RATING AND POSTING
 Design Load: PEDESTRIAN
 Operating Rating: NA
 Inventory Rating: 85 PSF
 Gross Tons or H Rating: 85 PSF

PROPOSED IMPROVEMENTS

Year Needed: 2028
 Type Work: REHABILITATION - CONTRACT
 CLEAN AND PAINT STRUCTURAL STEEL. REPLACE DECK

AGE OF SERVICE

Year Built: UNKNOWN
 Reconstructed: UNKNOWN
 Repaired: UNKNOWN
 Type of Service: PED./BIKE over WATERWAY
 Lanes on Structure: TRAIL
 ADT – Over: NA VPD
 ADT Year Over: NA
 Paint Date: UNKNOWN
 Paint Rating: 4 - POOR
 Detour: NA

INSPECTIONS

Posting: NA
 Date Posted/Closed: NA
 Open, Posted, or Closed: OPEN
 Tons Posted: 2008
 Year of Rating: 2008
 Inspection Date: 7/29/2020
 Des. Inspection Frequency: 48 Months
 Prev. Inspection Date: 3/7/2018

MAINTENANCE NEEDS

Year Needed: 2021
 Describe Work: CLEAR DEBRIS FROM CHANNEL. REFASTEN LOOSE DECK PLANKS WITH GALVANIZED SCREWS

Total Maintenance Costs: \$5,000

CONDITION

	<u>CONDITION</u>	<u>MATERIAL</u>	<u>RATING</u>
Deck:	SATISFACTORY - SOME LOOSE DECK PLANKS. SPLITS & CHECKS	TIMBER	6
Wearing Surface:	SATISFACTORY - SOME LOOSE DECK PLANKS. SPLITS & CHECKS	TIMBER	6
Superstr:	FAIR - HEAVY RUST OF STEEL, MINOR DECAY OF HEAVY TIMBER WITH SPLITS AND CHECKS	STEEL/TIMBER	5
Substr:	FAIR - MODERATE DECAY OF PILES AND CAPS. SPLITS IN CAPS	TIMBER BENTS	5
Channel:	SATISFACTORY - MINOR DEBRIS ACCUMULATION	EARTH	6
Culvert:	NA	NA	NA
Approach Roadway:	GOOD - TRAIL	BITUMINOUS	7

APPRAISAL

		<u>RATING</u>
Structural:	FAIR - HEAVY RUST AND PITTING OF STEEL GIRDERS, MINOR TO MODERATE DECAY OF TIMBER BEAMS AND PIERS	5
Geometry:	GOOD - TRAIL	7
Bridge Railing:	GOOD - TIMBER	7
Waterway Adequacy:	BRIDGE ABOVE APPROACHES	8
Roadway Alignment:	SLIGHT HORIZONTAL CURVE, LEVEL - TRAIL	8
Scour:	STABLE	5
Foundation:	TIMBER PILES	

REMARKS

OLD RAILROAD TRESTLE STRUCTURE. THE STRUCTURE'S PIERS COLLECT SIGNIFICANT AMOUNTS OF DEBRIS. THEREFORE, THE CHANNEL SHOULD BE CLEARED OF DEBRIS FOLLOWING ANY SIGNIFICANT STORM EVENT. HEAVY RUST AT STEEL BEARINGS. MANY STIFFENERS ON INTERIOR SIDE WITH 100% SECTION LOSS. RIVET HEADS WITH SOME DETERIORATION. PACK RUST AT DIAPHRAGM CONNECTIONS AND AT STIFFENERS. MINOR DECAY AND SPLITTING OF LONGITUDINAL TIMBER BEAMS. MODERATE DECAY AT TIMBER BENTS. DECK EDGES AT BRIDGE ENDS ARE ROUGH WITH BOARDS GETTING LOOSE. LARGE SPLIT IN EAST PIER CAP, SUPPPORTING EAST APPROACH SPAN. TREE LOG NEXT TO WEST PEIR OF MAIN SPAN.



CITY OF GOSHEN BRIDGE NO. 201

**UNNAMED TRAIL
OVER
THE ELKHART RIVER**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 201

Facility Carried: UNNAMED TRAIL
Feature(s) Intersected: ELKHART RIVER

IDENTIFICATION

State: INDIANA
 District: FORT WAYNE
 County: ELKHART
 City/Town: GOSHEN
 Feature Int'd: ELKHART RIVER
 Facility Carried: UNNAMED TRAIL
 Location: 70' W. OF CLINTON ST./NEW ST.
 Latitude: 41° 35' 16.19"
 Longitude: 85° 50' 20.82"

GEOMETRIC DATA

Structure Length:
 Max. Span Length:
 Deck Width (O-O):
 Br. Rdwy Width:
 Approach Width:
 Total Hor. Clearance – Over:
 Bridge Skew:
 Stream Skew:

REMAINING LIFE

Estimated Remaining Life:
 Wearing Surface:
 Deck:
 Joints:
 Superstructure:
 Substructure:
 Approach:
 Channel:
 Culvert:

STRUCTURE DATA

Str. Type-Main: WELDED STEEL PONY TRUSS
 Str. Type-Appr: NA
 Deck Str. Type: TIMBER
 Wearing Surface: TIMBER
 Thickness of Asphalt: 0 Inches
 No. of Spans – Main: 2
 No. of Spans – Approach: 0

CLASSIFICATION

Historical Significance:
 Maintenance Responsibility:
 Owner:
LOAD RATING AND POSTING
 Design Load:
 Operating Rating:
 Inventory Rating:
 Gross Tons or H Rating:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed: 2021
 City Type Work: REHABILITATION - CONTRACT
 City
 INSTALL NEW JOINTS. INSTALL CHECKERED PLATES.
 CLEAN AND PAINT STEEL SUBSTRUCTURES. CLEAN
 RUST OFF AT DECK ANGLES. REPLACE DECK.
 PEDESTRIAN
 NA
 80 PSF
 80 PSF
 NA Bridge Imp. Costs: \$50,000
 NA Roadway Imp. Costs: \$0,000
 OPEN Total Project Costs: \$50,000
 2008 Yr. of Cost Estimate: 2020

AGE OF SERVICE

Year Built: 1990
 Reconstructed: NA
 Repaired: 2011
 Type of Service: PED./BIKE over WATERWAY
 Lanes on Structure: TRAIL
 ADT – Over: NA VPD
 ADT Year Over: NA
 Paint Date: 1990
 Paint Rating: 4 - POOR
 Detour: NA

INSPECTIONS

Posting:
 Date Posted/Closed:
 Open, Posted, or Closed:
 Tons Posted:
 Year of Rating:
 Inspection Date:
 Des. Inspection Frequency:
 Prev. Inspection Date:

MAINTENANCE NEEDS

Year Needed: 2021
 7/29/2020 Describe Work:
 48 Months UNTIL DECK IS REPLACED, REPLACE DETERIORATED
 3/6/2018 TIMBER BOARDS AS NEEDED
 Total Maintenance Costs: \$3,000

CONDITION

CONDITION
 Deck: FAIR- SPLITTING AND CHECKS
 Wearing Surface: FAIR - SMALL KNOTS AND HOLES
 Superstr: GOOD - SURFACE RUST & PITTING AT DECK ANGLES
 Substr: SATISFACTORY - SURFACE RUST ON WEST BENT AND PIER
 Channel: GOOD - STEEP EAST SLOPE
 Culvert: NA
 Approach Roadway: GOOD - TRAIL

MATERIAL **RATING**
 TIMBER 5
 TIMBER 6
 WEATHERING STEEL 7
 STEEL & CONCRETE 6
 EARTH AND BOULDERS 7
 NA NA
 CONCRETE 7

APPRAISAL

Structural: SURFACE RUST OF SUBSTRUCTURE. PACK RUST AT DECK ANGLES. 6
 Geometry: GOOD - TRAIL 7
 Bridge Railing: GOOD - STEEL TUBE 7
 Waterway Adequacy: BRIDGE ABOVE APPROACHES 8
 Roadway Alignment: CONSTANT SLOPE, STRAIGHT ALIGNMENT - TRAIL 8
 Scour: STABLE 8
 Foundation: SPREAD FOOTING AND PILES

REMARKS

FAILED EXPANSION JOINTS. WEST EXPANSION JOINT OPEN 1 1/2". WEST ABUTMENT STEEL CAP WITH SURFACE RUST. INTERIOR PIER CAP WITH SURFACE RUST. SUBSTRUCTURE PAINT FLAKING. DECK TIMBER BOARDS ARE SPLITTING WITH MINOR KNOTS AND SMALL KNOT HOLES. THREE TIMBER BOARDS HAVE BEEN REPLACED. SURFACE RUST & PITTING AT ANGLES CONNECTING TIMBER DECK TO STRUCTURE. PACK RUST OBSERVED IN A FEW WELDS CONNECTING THE ANGLES TO THE TRUSS VERTICALS. VERIFY WARRANTY INFORMATION WITH BRIDGE MANUFACTURER PRIOR TO PERFORMING ANY WORK.



CITY OF GOSHEN BRIDGE NO. 202

**UNNAMED TRAIL
OVER
THE ELKHART RIVER**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 202

Facility Carried: UNNAMED TRAIL
Feature(s) Intersected: ELKHART RIVER

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: ELKHART RIVER
Facility Carried: UNNAMED TRAIL
Location: 1200' E. OF INDIANA AVENUE
Latitude: 41° 34' 53.30"
Longitude: 85° 50' 37.86"

GEOMETRIC DATA

Structure Length:
Max. Span Length:
Deck Width (O-O):
Br. Rdwy Width:
Approach Width:
Total Hor. Clearance – Over:
Bridge Skew:
Stream Skew:

REMAINING LIFE

120'-0" Estimated Remaining Life:
65'-0" Wearing Surface: 12 Years
11'-4" Deck: 12 Years
9'-0" Joints: 0 Years
9'-0" Superstructure: 25 Years
9'-0" Substructure: 25 Years
0 Degree(s) Approach: 15 Years
0 Degree(s) Channel: 10 Years
Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: STEEL TWO GIRDER SYSTEM
Str. Type-Appr: NA
Deck Str. Type: CONCRETE
Wearing Surface: MONOLITHIC CONCRETE
Thickness of Asphalt: 0 Inches
No. of Spans – Main: 3
No. of Spans – Approach: 0

CLASSIFICATION

Historical Significance:
Maintenance Responsibility:
Owner:
LOAD RATING AND POSTING
Design Load:
Operating Rating:
Inventory Rating:
Gross Tons or H Rating:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed: 2025
City Type Work: REPAIR - CONTRACT
City
REPLACE EXPANSION JOINTS. REPLACE BRIDGE RAILING.
PEDESTRIAN
NA
85 PSF
85 PSF
NA Bridge Imp. Costs: \$50,000
NA Roadway Imp. Costs: \$0,000
OPEN Total Project Costs: \$50,000
Yr. of Cost Estimate: 2020

AGE OF SERVICE

Year Built: 1975
Reconstructed: NA
Repaired: 2009
Type of Service: PED./BIKE over WATERWAY
Lanes on Structure: TRAIL
ADT – Over: NA VPD
ADT Year Over: NA
Paint Date: NA
Paint Rating: NA
Detour: NA

INSPECTIONS

Posting:
Date Posted/Closed:
Open, Posted, or Closed:
Tons Posted:
Year of Rating:
Inspection Date:
Des. Inspection Frequency:
Prev. Inspection Date:

MAINTENANCE NEEDS

Year Needed: 2025
7/29/2020 Describe Work:
48 Months INSTALL RIPRAP AT SPILL SLOPES
3/6/2018
Total Maintenance Costs: \$5,000

CONDITION

CONDITION
Deck: SATISFACTORY - EXPANSION JOINTS FAILED AT EACH END
Wearing Surface: SATISFACTORY - ROUGH
Superstr: GOOD - MINOR PITTING
Substr: GOOD
Channel: GOOD - SOME EROSION AT BANKS
Culvert: NA
Approach Roadway: GOOD - TRAIL

<u>MATERIAL</u>	<u>RATING</u>
CONCRETE	6
MONOLITHIC CONCRETE	6
WEATHERING STEEL	7
CONC. ABUTMENTS AND STEEL PILES	7
RIPRAP/NATURAL	7
NA	NA
CONCRETE	7

APPRAISAL

	<u>RATING</u>
Structural: GOOD CONDITION	7
Geometry: GOOD - TRAIL	7
Bridge Railing: FAIR - ALUMINUM - POOR FIELD WELD ON ADDITIONAL HORIZONTAL RAILS	5
Waterway Adequacy: BRIDGE ABOVE APPROACHES	8
Roadway Alignment: CREST VERTICAL CURVE, STRAIGHT ALIGNMENT - TRAIL	8
Scour: STABLE	5
Foundation: SPREAD FOOTING AT ABUTMENTS AND PILES AT PIERS	

REMARKS

ADDITIONAL HORIZONTAL RAILS ADDED TO THE EXISTING RAIL TO REDUCE THE CLEAR SPACE BETWEEN RAILS. POOR FIELD WELD ON ADDITIONAL HORIZONTAL RAILS. NO JOINTS ON ADDITIONAL HORIZONTAL RAILS, THUS WELDS BREAK AT SOME LOCATIONS. 2ND HORIZONTAL RAIL FROM TOP, AT NORTH BRIDGE RAIL IS UNATTACHED NEAR THE EAST END. TOP HORIZONTAL RAIL AT SOUTH BRIDGE RAIL IS ALSO UNATTACHED NEAR EAST END. DECK EXPANSION JOINTS FAILED. FOUNDATION SEAL AT EAST ABUTMENT EXPOSED. UNDERMINING AT GROUTED SPILL SLOPE NEXT TO EAST ABUTMENT.



CITY OF GOSHEN BRIDGE NO. 203

**MAPLE CITY GREENWAY
OVER
ELKHART RIVER**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 203

Facility Carried: MAPLE CITY GREENWAY
Feature(s) Intersected: ELKHART RIVER

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: ELKHART RIVER
Facility Carried: MAPLE CITY GREENWAY
Location: 950' W. OF 3RD STREET
Latitude: 41° 34' 28.46"
Longitude: 85° 50' 18.68"

GEOMETRIC DATA

Structure Length:
Max. Span Length:
Deck Width (O-O):
Br. Rdwy Width:
Approach Width:
Total Hor. Clearance – Over:
Bridge Skew:
Stream Skew:

REMAINING LIFE

Estimated Remaining Life:
Wearing Surface: 5 Years
Deck: 5 Years
Joints: 5 Years
Superstructure: 35 Years
Substructure: 35 Years
Approach: 15 Years
Channel: 20 Years
Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: WELDED STEEL PONY TRUSS
Str. Type-Appr: NA
Deck Str. Type: TIMBER
Wearing Surface: TIMBER
Thickness of Asphalt: 0 Inches
No. of Spans – Main: 3
No. of Spans – Approach: 0

CLASSIFICATION

Historical Significance:
Maintenance Responsibility:
Owner:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed: 2021
City Type Work: REHABILITATION - LOCAL FORCES
City

AGE OF SERVICE

Year Built: 1995
Reconstructed: NA
Repaired: NA
Type of Service: PED./BIKE over WATERWAY
Lanes on Structure: TRAIL
ADT – Over: NA VPD
ADT Year Over: NA
Paint Date: NA
Paint Rating: NA
Detour: NA

LOAD RATING AND POSTING

Design Load: PEDESTRIAN
Operating Rating: NA
Inventory Rating: 60 PSF/10,000 LB TRUCK
Gross Tons or H Rating: 60 PSF/10,000 LB TRUCK

REPLACE DETERIORATED BOARDS. RESET EXISTING BOARDS TO REDUCE 1" GAPS.

Bridge Imp. Costs: \$5,500
Roadway Imp. Costs: \$0,000
Total Project Costs: \$5,500
Yr. of Cost Estimate: 2020

INSPECTIONS

Posting: NA
Date Posted/Closed: NA
Open, Posted, or Closed: OPEN
Year of Rating: 2012
Inspection Date:
Des. Inspection Frequency:
Prev. Inspection Date:

MAINTENANCE NEEDS

Year Needed: 2021
Describe Work:
7/29/2020 REMOVE VEGETATION AT WEST END, NEXT TO NORTH
48 Months TRUSS. FIX UNDERMINING @ EAST APPROACH
3/6/2018

Total Maintenance Costs: \$5,000

CONDITION

Deck: SPLITTING AND KNOTS; ISOLATED ROT SPOTS; 1" SEPARATION
Wearing Surface: SPLITTING AND KNOTS; ISOLATED ROT SPOTS; 1" SEPARATION
Superstr: GOOD - MINOR PITTING & RUST
Substr: GOOD
Channel: GOOD
Culvert: NA
Approach Roadway: UNDERMINING BELOW CONCRETE @ EAST APPROACH

<u>MATERIAL</u>	<u>RATING</u>
TIMBER	5
TIMBER	5
WEATHERING STEEL	7
CONCRETE CAPS ON STEEL PILES	7
RIPRAP/NATURAL	7
NA	NA
CONCRETE	6

APPRAISAL

	<u>RATING</u>
Structural: GOOD - MINOR RUST ON TRUSSES	7
Geometry: GOOD - TRAIL	7
Bridge Railing: GOOD - STEEL	7
Waterway Adequacy: BRIDGE ABOVE APPROACHES	8
Roadway Alignment: CREST VERTICAL CURVE, STRAIGHT ALIGNMENT - TRAIL	8
Scour: STABLE	8
Foundation: PILES	

REMARKS

SAFETY RAIL DAMAGE AT SOUTHWEST CORNER. TIMBER DECK SPLITTING AND ISOLATED ROT IN A FEW BOARDS. KNOTS IN SEVERAL BOARDS IN WEST AND CENTER SPANS. LOOSE BOARDS NEXT TO EAST PIER. 1" SEPARATION ON MULTIPLE BOARDS IN ALL 3 SPANS. HEAVY VEGETATION NEXT TO NORTH TRUSS AT WEST END, KEEPING BRIDGE WET. VERIFY WARRANTY INFORMATION AND WELDING SPECIFICATIONS WITH BRIDGE MANUFACTURER PRIOR TO PERFORMING ANY WORK.



CITY OF GOSHEN BRIDGE NO. 300

**MILLRACE CANAL TRAIL
OVER
MILLRACE HYDRAULIC CANAL**



EAST ELEVATION



SECTION LOOKING NORTH



SECTION LOOKING SOUTH

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 300

Facility Carried: MILLRACE CANAL TRAIL
Feature(s) Intersected: MILLRACE HYDRAULIC CANAL

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: MILLRACE HYDRAULIC CANAL
Facility Carried: MILLRACE CANAL TRAIL
Location: 175' W. OF 2ND ST./WASH. ST. INTER.
Latitude: 41° 35' 5.38"
Longitude: 85° 50' 17.81"

GEOMETRIC DATA

Structure Length:
Max. Span Length:
Deck Width (O-O):
Br. Rdwy Width:
Approach Width:
Total Hor. Clearance - Over:
Bridge Skew:
Stream Skew:

REMAINING LIFE

34'-0" Estimated Remaining Life:
16'-0" Wearing Surface: 30 Years
21'-9" Deck: 30 Years
17'-0" Joints: NA Years
10'-0" Superstructure: 50 Years
17'-0" Substructure: 20 Years
0 Degree(s) Approach: 10 Years
0 Degree(s) Channel: 20 Years
Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: PRES. CONC. H.C. SLAB
Str. Type-Appr: NA
Deck Str. Type: CONCRETE
Wearing Surface: MONOLITHIC CONCRETE
Thickness of Asphalt: 0 Inches
No. of Spans - Main: 2
No. of Spans - Approach: 0

CLASSIFICATION

Historical Significance:
Maintenance Responsibility:
Owner:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed:
City Type Work:
City
NO MAJOR WORK NEEDED AT THIS TIME

LOAD RATING AND POSTING

Design Load: H-20/HS-20
Operating Rating: 45 TON
Inventory Rating: 36 TON
Gross Tons or H Rating: 20 TON

AGE OF SERVICE

Year Built: 1898
Reconstructed: 2010
Repaired: NA
Type of Service: PED./BIKE over WATERWAY
Lanes on Structure: TRAIL
ADT - Over: NA VPD
ADT Year Over: NA
Paint Date: NA
Paint Rating: NA
Detour: NA

Posting: 5 - EQUAL OR ABOVE LEGAL LOADS
Date Posted/Closed:
Open, Posted, or Closed: OPEN
Tons Posted:
Year of Rating: 2012

Bridge Imp. Costs: \$0,000
Roadway Imp. Costs: \$0,000
Total Project Costs: \$0,000
Yr. of Cost Estimate:

INSPECTIONS

Inspection Date: 7/30/2020
Des. Inspection Frequency: 24 Months
Prev. Inspection Date: 3/6/2018

MAINTENANCE NEEDS

Year Needed:
Describe Work:
NO MAJOR MAINTENANCE NEEDED

Total Maintenance Costs:

CONDITION

	<u>CONDITION</u>	<u>MATERIAL</u>	<u>RATING</u>
Deck:	VERY GOOD	CONCRETE	8
Wearing Surface:	VERY GOOD	MONOLITHIC CONCRETE	8
Superstr:	VERY GOOD	PRESTRESSED CONC.E HOLLOW CORE SLABS	8
Substr:	FAIR - ABRASION/ SCALING/ WORN	CONCRETE	5
Channel:	GOOD	CONCRETE	7
Culvert:	NA	NA	NA
Approach Roadway:	GOOD - TRAIL - MINOR CRACKS IN RCBA	GRAVEL	7

APPRAISAL

	<u>RATING</u>
Structural: FAIR - CONCRETE ABUTMENTS AND CENTER PIER ARE WORN WITH SCALING AND ABRASION	5
Geometry: GOOD - TRAIL	7
Bridge Railing: VERY GOOD - STEEL PEDESTRIAN RAIL	8
Waterway Adequacy: OVER HYDRAULIC CANAL WITH FLOW CONTROL	9
Roadway Alignment: STRAIGHT AND LEVEL - TRAIL	8
Scour: STABLE	8
Foundation: UNKNOWN (LIKELY SPREAD FOOTING)	

REMARKS

ACCESS TO SUBSTRUCTURE IS OBTAINED BETWEEN WEST COPING AND POWERHOUSE. A 20' EXTENSION LADDER, 3' STEP LADDER, AND CANAL MUST BE LOWERED AT A MINIMUM FOR ACCESS. MINOR CRACKING IN REINFORCED CONCRETE APPROACH SLABS. HONEYCOMBING IN BEAM 4 FROM WEST IN SOUTH SPAN. BEARING PAD IN BEAM 2 FROM WEST IN SOUTH SPAN AT PIER, HAS STARTED TO WALK OUT.



CITY OF GOSHEN BRIDGE NO. 301

**JEFFERSON STREET
OVER
MILLRACE HYDRAULIC CANAL**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 301

Facility Carried: JEFFERSON STREET
Feature(s) Intersected: MILLRACE HYDRAULIC CANAL

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: MILLRACE HYDRAULIC CANAL
Facility Carried: JEFFERSON STREET
Location: 350' W. OF 3RD STREET
Latitude: 41° 35' 1.27"
Longitude: 85° 50' 14.64"

GEOMETRIC DATA

Structure Length:
Max. Span Length:
Deck Width (O-O):
Br. Rdwy Width:
Approach Width:
Total Hor. Clearance – Over:
Bridge Skew:
Stream Skew:

REMAINING LIFE

48'-0" Estimated Remaining Life:
21'-3" Wearing Surface: 2 Years
11'-0" Deck: NA Years
9'-1" Joints: NA Years
10'-0" Superstructure: 15 Years
9'-1" Substructure: 15 Years
0 Degree(s) Approach: 1 Years
0 Degree(s) Channel: 15 Years
Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: EARTH FILLED MASONRY ARCH
Str. Type-Appr: NA
Deck Str. Type: NA
Wearing Surface: BITUMINOUS
Thickness of Asphalt: 5 Inches
No. of Spans – Main: 2
No. of Spans – Approach: 0

CLASSIFICATION

Historical Significance:
Maintenance Responsibility:
Owner:
Design Load:
Operating Rating:
Inventory Rating:
Gross Tons or H Rating:

PROPOSED IMPROVEMENTS

ELIGIBLE Year Needed: 2021
City Type Work: REPAIR - CONTRACT
City
REPAIR EROSION HOLE AND SETTLEMENT IN WEST APPROACH. INSTALL PEDESTRIAN TRAFFIC ONLY SIGNS IN EAST APPROACH. REPAIR EROSION AT SOUTHEAST EMBANKMENT.
UNKNOWN
NA
1 TON
1 TON

LOAD RATING AND POSTING

Posting: 1 - 30.0-30.9% BELOW LEGAL LOADS
Date Posted/Closed: 40969
Open, Posted, or Closed: POSTED
Tons Posted: PEDESTRIAN ONLY
Year of Rating: 2008

AGE OF SERVICE

Year Built: 1880
Reconstructed: UNKNOWN
Repaired: 2009
Type of Service: PED./BIKE over WATERWAY
Lanes on Structure: 01
ADT – Over: 0 VPD
ADT Year Over: 2008
Paint Date: NA
Paint Rating: NA
Detour: < 1 MILE

MAINTENANCE NEEDS

Year Needed: 2021
Describe Work: 7/30/2020
INSTALL RIPRAP AT WEST BANK. CLEAR VEGETATION 24 Months
3/6/2018

Total Maintenance Costs: \$5,000

CONDITION

<u>CONDITION</u>	<u>MATERIAL</u>	<u>RATING</u>
Deck: NA	NA	NA
Wearing Surface: FAIR - TRANSVERSE CRACKS / SETTLEMENT AND EROSION	BITUMINOUS	5
Superstr: SATISFACTORY - CRACKS AND EFFLORESCENCE	STONE MASONRY	6
Substr: SATISFACTORY - ABRASION	STONE MASONRY	6
Channel: GOOD	EARTH AND RIPRAP	7
Culvert: NA	NA	NA
Approach Roadway: POOR - CRACKED & SETTLED AT WEST END	BITUMINOUS	4

APPRAISAL

<u>APPRAISAL</u>	<u>RATING</u>
Structural: SATISFACTORY- CRACKING AND LEACHING OF ARCHES	6
Geometry: GOOD - TRAIL	7
Bridge Railing: GOOD - STEEL PEDESTRIAN HANDRAIL	7
Waterway Adequacy: OVER HYDRAULIC CANAL WITH FLOW CONTROL	9
Roadway Alignment: STRAIGHT AND LEVEL- TRAIL	8
Scour: STABLE - RIPRAP ADDED AT ABUTMENTS AND PIER	5
Foundation: SPREAD FOOTING	

REMARKS

EAST APPROACH CLOSED AT THE TIME OF INSPECTION DUE TO CONSTRUCTION OF NEARBY BUILDING. BRIDGE ADEQUATE FOR PEDESTRIAN TRAFFIC ONLY. THE MASONRY IS SOLID WITH NO LOOSE STONES FOUND. THE BRIDGE SHOULD BE KEPT CLEAR OF VEGETATIVE GROWTH. PATCHES ON EAST SPAN IN GOOD CONDITION. RIPRAP AROUND ABUTMENTS AND PIER. RIPRAP IN NORTHEAST AND SOUTHEAST CORNERS. RIPRAP AT SOUTHEAST CORNER IS ERODING. MASONRY REPOINTING IN GOOD CONDITION. ABRASION AT WEST ABUTMENT AT ORDINARY HIGH WATER MARK. ABRASION AT WEST SIDE OF PIER. CRACKING WITH LEACHING IN WEST SPAN NEAR PIER. TRANSVERSE SEALED CRACKS IN PAVEMENT. EROSION AND SETTLEMENT IN WEST APPROACH. VOID/SETTLEMENT AT WEST APPROACH IS 4.5' X 2.5' X 5" DEEP IN SOUTHWEST SIDE OF APPROACH. APPROACH HAS SETTLED AROUND HOLE. FILL ON SOUTHWEST SIDE OF APPROACH IS BEING FILTERED OUT AT WINGWALL. SPALLING AND DETERIORATION AT SOUTHWEST WINGWALL.



CITY OF GOSHEN BRIDGE NO. 302

**MADISON STREET
OVER
MILLRACE HYDRAULIC CANAL**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 302

Facility Carried: MADISON STREET
Feature(s) Intersected: MILLRACE HYDRAULIC CANAL

IDENTIFICATION

State: **INDIANA**
 District: **FORT WAYNE**
 County: **ELKHART**
 City/Town: **GOSHEN**
 Feature Int'd: **MILLRACE HYDRAULIC CANAL**
 Facility Carried: **MADISON STREET**
 Location: **375' W. OF 3RD STREET**
 Latitude: **41° 34' 56.33"**
 Longitude: **85° 50' 15.10"**

GEOMETRIC DATA

Structure Length:
 Max. Span Length:
 Deck Width (O-O):
 Br. Rdwy Width:
 Approach Width:
 Total Hor. Clearance – Over:
 Bridge Skew:
 Stream Skew:

REMAINING LIFE

Estimated Remaining Life:
 Wearing Surface:
 Deck:
 Joints:
 Superstructure:
 Substructure:
 Approach:
 Channel:
 Culvert:

STRUCTURE DATA

Str. Type-Main: **ENCASED STEEL BEAM**
 Str. Type-Appr: **NA**
 Deck Str. Type: **CONCRETE**
 Wearing Surface: **MONOLITHIC CONCRETE**
 Thickness of Asphalt: **0** Inches
 No. of Spans – Main: **4**
 No. of Spans – Approach: **0**

CLASSIFICATION

Historical Significance:
 Maintenance Responsibility:
 Owner:
LOAD RATING AND POSTING
 Design Load:
 Operating Rating:
 Inventory Rating:
 Gross Tons or H Rating:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE
 Year Needed: **2026**
 City Type Work: **REPLACEMENT - CONTRACT**
 City

CONSIDER REPLACING STRUCTURE WITH NEW VEHICULAR BRIDGE.

AGE OF SERVICE

Year Built: **UNKNOWN**
 Reconstructed: **2008**
 Repaired: **2012**
 Type of Service: **VEHICULAR over WATERWAY**
 Lanes on Structure: **02**
 ADT – Over: **10** VPD
 ADT Year Over: **2014**
 Paint Date: **UNKNOWN**
 Paint Rating: **4 - POOR**
 Detour: **SINGLE ACCESS POINT - NO DETOUR**

LOAD RATING AND POSTING
 Design Load: **H-20/HS-20**
 Operating Rating: **51**
 Inventory Rating: **23**
 Gross Tons or H Rating: **12 TON**
 Posting: **4 - 0.1-9.9% BELOW LEGAL LOADS**
 Date Posted/Closed:
 Open, Posted, or Closed: **B - OPEN, POSTING REQUIRED**
 Tons Posted:
 Year of Rating: **2020**

Bridge Imp. Costs: **\$530,000**
 Roadway Imp. Costs: **\$80,000**
 Total Project Costs: **\$610,000**
 Yr. of Cost Estimate: **2020**

MAINTENANCE NEEDS

Year Needed: **2021**
 Describe Work:
24 Months **INSTALL GATE AT EAST APPROACH. INSTALL LOAD POSTING SIGNS**
3/6/2018

Total Maintenance Costs: **\$5,400**

CONDITION

CONDITION
 Deck: **FAIR - TRANSVERSE CRACKING, EFFLORESCENCE, SPALLING**
 Wearing Surface: **FAIR - POTHOLES, DELAMINATION IN SW CORNER**
 Superstr: **FAIR - EXPOSED BOTTOM FLANGES HAVE DETERIORATION/SECTION LOSS**
 Substr: **POOR - BENT CAPS WITH HEAVY SURFACE RUST AND HEAVY SECTION LOSS**
 Channel: **SATISFACTORY - FLOWS AGAINST EAST ABUTMENT**
 Culvert: **NA**
 Approach Roadway: **GOOD**

MATERIAL
CONCRETE **RATING** **5**
MONOLITHIC CONCRETE **5**
CONCRETE ENCASED STEEL BEAM **5**
STEEL PILE BENTS AND CONC. ABUTMENTS **4**
EARTH **6**
NA **NA**
BITUMINOUS AT WEST APPROACH. CONCRETE AND BRICK PAVERS AT EAST APPROACH **7**

APPRAISAL

Structural: **POOR - HEAVY CORROSION OF H-PILES/ SECTION LOSS AT STEEL CAP BEAMS**
 Geometry: **SOMEWHAT BETTER THAN MINIMUM ADEQUACY TO LEAVE IN PLACE**
 Bridge Railing: **FAIR - STEEL W-BEAM - SUBSTANDARD**
 Waterway Adequacy: **OVER HYDRAULIC CANAL WITH FLOW CONTROL**
 Roadway Alignment: **STRAIGHT AND LEVEL / NO SPEED REDUCTION REQUIRED**
 Scour: **STABLE**
 Foundation: **PILES AND SPREAD FOOTINGS**

RATING

4
5
5
9
8
5

REMARKS

SURFACE SPALL AT CENTER OF DECK. DELAMINATED AREA IN SOUTHWEST CORNER OF DECK. EROSION BEHIND SOUTHWEST, SOUTHEAST, AND NORTHEAST WINGWALLS. HEAVY RUST ON H-PILES WITH MODERATE SECTION LOSS. CROSS BEAMS IMMEDIATELY ADJACENT TO ABUTMENTS (BENTS 2 & 6) HAVE SEVERE SECTION LOSS/DETERIORATION OF FLANGES AND 100% SECTION LOSS OF WEB, NO LONGER SUPPORTING SUPERSTRUCTURE. OLD BENT CAPS AT BENTS 3, 4 & 5 WITH AREAS OF 100% SECTION LOSS OF WEBS AND HEAVY RUST THROUGHOUT. NEW BENT CAPS INSTALLED AT BENTS 3, 4 & 5 IN 2008. MINOR TO MODERATE SECTION LOSS OF EXPOSED BOTTOM FLANGES OF SUPERSTRUCTURE BEAMS. DECK UNDERSIDE HAS SPALLING AND EXPOSED, CORRODED REINFORCING. 1" CRACK IN EAST ABUTMENT. WATER FLOWS AGAINST EAST ABUTMENT. SHIMS INSTALLED IN 2012 TO PROVIDE POSITIVE BEARING OF SUPERSTRUCTURE BEAMS TO ORIGINAL BENT CAP BEAMS AT BENTS 3, 4 & 5. GATES AT WEST APPROACH ARE NOT LOCKED AND CAN BE LIFTED. NO GATE AT EAST APPROACH. NO LOAD POSTING SIGNS. CRACKING AND DETERIORATION OF WEST ABUTMENT AT BEARING SEATS. CONCRETE APPROACH SLAB AND BRICK PAVERS AT EAST APPROACH.



CITY OF GOSHEN BRIDGE NO. 303

**UNNAMED TRAIL
OVER
MILLRACE HYDRAULIC CANAL**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 303

Facility Carried: UNNAMED TRAIL
 Feature(s) Intersected: MILLRACE HYDRAULIC CANAL

IDENTIFICATION

State: INDIANA
 District: FORT WAYNE
 County: ELKHART
 City/Town: GOSHEN
 Feature Int'd: MILLRACE HYDRAULIC CANAL
 Facility Carried: UNNAMED TRAIL
 Location: 400' W. OF 3RD STREET
 Latitude: 41° 34' 39.49"
 Longitude: 85° 50' 14.87"

GEOMETRIC DATA

Structure Length:
 Max. Span Length:
 Deck Width (O-O):
 Br. Rdwy Width:
 Approach Width:
 Total Hor. Clearance – Over:
 Bridge Skew:
 Stream Skew:

REMAINING LIFE

Estimated Remaining Life:
 Wearing Surface: 6 Years
 Deck: 6 Years
 Joints: NA Years
 Superstructure: 10 Years
 Substructure: 15 Years
 Approach: 15 Years
 Channel: 10 Years
 Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: SIMPLE STEEL BEAM
 Str. Type-Appr: NA
 Deck Str. Type: STEEL FLOOR PLATE
 Wearing Surface: STEEL
 Thickness of Asphalt: 0 Inches
 No. of Spans – Main: 1
 No. of Spans – Approach: 0

CLASSIFICATION

Historical Significance:
 Maintenance Responsibility:
 Owner:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed: 2021
 City Type Work: REHABILITATION - CONTRACT
 City

AGE OF SERVICE

Year Built: UNKNOWN
 Reconstructed: UNKNOWN
 Repaired: 2009
 Type of Service: PED./BIKE over WATERWAY
 Lanes on Structure: TRAIL
 ADT – Over: NA VPD
 ADT Year Over: NA
 Paint Date: UNKNOWN
 Paint Rating: 4 - POOR
 Detour: NA

LOAD RATING AND POSTING

Design Load:
 Operating Rating:
 Inventory Rating:
 Gross Tons or H Rating:

PEDESTRIAN
 NA
 80 PSF
 80 PSF

CLEAN AND PAINT STRUCTURAL STEEL. INSTALL CHECKERED PLATES AT EACH END OF BRIDGE DECK.

Bridge Imp. Costs: \$13,750
 Roadway Imp. Costs: \$0,000
 Total Project Costs: \$13,750
 Yr. of Cost Estimate: 2020

INSPECTIONS

Posting:
 Date Posted/Closed:
 Open, Posted, or Closed:
 Tons Posted:
 Year of Rating:
 Inspection Date:
 Des. Inspection Frequency:
 Prev. Inspection Date:

7/29/2020
 48 Months
 3/6/2018

MAINTENANCE NEEDS

Year Needed: 2021
 Describe Work:
 SECURE FENCE ALONG TOP OF BRIDGE RAILING AND EAST APPROACH RAILING. REPAIR LOOSE BOTTOM TIMBER KICK BOARD ALONG THE SOUTH BRIDGE RAILING. REPAIR BENT RAILING ALONG NORTHWEST APPROACH RAIL & CONCRETE SPALL AT SOUTHEAST BEARING.
 Total Maintenance Costs: \$9,000

CONDITION

Deck: SATISFACTORY - SURFACE RUST AND PITTING
 Wearing Surface: SATISFACTORY
 Superstr: FAIR - PACK RUST AND PITTING - SECTION LOSS AT BEARINGS
 Substr: GOOD-RIPRAP IN FRONT OF ABUTMENTS
 Channel: GOOD
 Culvert: NA
 Approach Roadway: SATISFACTORY - TRAIL

MATERIAL	RATING
STEEL FLOOR PLATE	6
STEEL	6
STEEL BEAM	5
CMU BLOCK W/ CONC. ENCASEMENT	7
EARTH/RIPRAP	7
NA	NA
CONCRETE/GRAVEL	6

APPRAISAL

Structural: FAIR - STEEL SECTION LOSS AT BEARINGS/ RUST AND PITTING OF BEAMS AND DECK PLATE
 Geometry: GOOD - TRAIL
 Bridge Railing: FAIR - STEEL TUBE WITH CHAIN LINK FENCE
 Waterway Adequacy: OVER HYDRAULIC CANAL WITH FLOW CONTROL
 Roadway Alignment: STRAIGHT AND LEVEL - TRAIL
 Scour: STABLE
 Foundation: SPREAD FOOTINGS

RATING

5
 7
 5
 9
 8
 5

REMARKS

PACK RUST AT BEARINGS. WEB HOLE IN NORTHWEST BEARING. PACK RUST AT DIAPHRAGM CONNECTIONS. WELDED SPLICE AT CENTER SPAN. TIMBER RETAINING WALL IN SOUTHEAST CORNER LEANING OUTWARD. CONCRETE SPALL AT SOUTHEAST BEARING. SMALL GAP, <1/8", IN STEEL FLOOR PLATE NEAR WEST END. SMALL GAP AT WEST APPROACH AND END OF DECK PLATE. MINOR CRACKING OF WEST APPROACH. FENCE LOOSE AT TOP OF BRIDGE RAILING AND EAST APPROACH. BOTTOM KICKBOARD AT SOUTH BRIDGE RAILING LOOSE NEAR MIDSPAN. APPROACH RAIL IN NORTHWEST QUADRANT IS BENT.



CITY OF GOSHEN BRIDGE NO. 304

**MURRAY STREET
OVER
MILLRACE HYDRAULIC CANAL**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 304

Facility Carried: MURRAY STREET
Feature(s) Intersected: MILLRACE HYDRAULIC CANAL

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: MILLRACE HYDRAULIC CANAL
Facility Carried: MURRAY STREET
Location: 475' W. OF WILSON AVENUE
Latitude: 41° 34' 20.84"
Longitude: 85° 50' 1.32"

GEOMETRIC DATA

Structure Length:
Max. Span Length:
Deck Width (O-O):
Br. Rdwy Width:
Approach Width:
Total Hor. Clearance – Over:
Bridge Skew:
Stream Skew:

REMAINING LIFE

66'-6" Estimated Remaining Life:
63'-9" Wearing Surface: 15 Years
11'-6" Deck: 15 Years
10'-10" Joints: NA Years
11'-6" Superstructure: 10 Years
10'-10" Substructure: 15 Years
0 Degree(s) Approach: 20 Years
0 Degree(s) Channel: 10 Years
Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: RIVETED STEEL PONY TRUSS
Str. Type-Appr: NA
Deck Str. Type: TIMBER
Wearing Surface: TIMBER
Thickness of Asphalt: 0 Inches
No. of Spans – Main: 1
No. of Spans – Approach: 0

CLASSIFICATION

Historical Significance:
Maintenance Responsibility:
Owner:
LOAD RATING AND POSTING
Design Load:
Operating Rating:
Inventory Rating:
Gross Tons or H Rating:

PROPOSED IMPROVEMENTS

ELIGIBLE Year Needed: 2022
City Type Work: REHABILITATION - CONTRACT
City
CLEAN AND PAINT STRUCTURAL STEEL. REPLACE
TIMBER CURBS.
PEDESTRIAN
NA
85 PSF
85 PSF
NA Bridge Imp. Costs: \$105,000
NA Roadway Imp. Costs: \$0,000
OPEN Total Project Costs: \$105,000
Yr. of Cost Estimate: 2020

AGE OF SERVICE

Year Built: 1909
Reconstructed: 2010
Repaired: 2016
Type of Service: PED./BIKE over WATERWAY
Lanes on Structure: TRAIL
ADT – Over: NA VPD
ADT Year Over: NA
Paint Date: UNKNOWN
Paint Rating: 5 - FAIR
Detour: NA

INSPECTIONS

Posting:
Date Posted/Closed:
Open, Posted, or Closed:
Tons Posted:
Year of Rating:
Inspection Date:
Des. Inspection Frequency:
Prev. Inspection Date:

MAINTENANCE NEEDS

Year Needed: 2021
7/30/2020 Describe Work:
48 Months CLEAR VEGETATION AROUND BRIDGE
3/6/2018
Total Maintenance Costs: \$5,000

CONDITION

<u>CONDITION</u>	
Deck:	GOOD
Wearing Surface:	GOOD
Superstr:	FAIR - SECTION LOSS OF FLOOR BEAMS AND TRUSS CHORDS
Substr:	GOOD - ABUTMENTS REPAIRED. ELASTOMERIC BEARING PADS ADDED
Channel:	GOOD
Culvert:	NA
Approach Roadway:	GOOD

<u>MATERIAL</u>	<u>RATING</u>
TIMBER	7
TIMBER	7
STEEL	5
CONCRETE	7
EARTH	7
NA	NA
CONCRETE	7

APPRAISAL

<u>APPRAISAL</u>	<u>RATING</u>	
Structural:	FAIR - SECTION LOSS OF FLOORBEAMS/ TRUSSES. ABUTMENTS REPAIRED	5
Geometry:	GOOD - TRAIL	7
Bridge Railing:	FAIR - LATTACED STEEL RAIL	5
Waterway Adequacy:	OVER HYDRAULIC CANAL WITH FLOW CONTROL	9
Roadway Alignment:	STRAIGHT AND LEVEL - TRAIL	8
Scour:	STABLE	5
Foundation:	UNKOWN (LIKELY SPREAD FOOTING)	

REMARKS

FLOOR BEAMS HAVE 50% SECTION LOSS OF TOP FLANGE. HEAVY PITTING OF FLOORBEAMS. TRUSS TOP CHORD HAS PACK RUST AT ALL COVER PLATES. MINOR SURFACE RUST AND PITTING ON STRINGERS. SECTION LOSS AT EYEBARS AND CONNECTION PLATE OF LOWER CHORD. ABUTMENTS REPAIRED IN FEBRUARY 2016. DETERIORATED CONCRETE ALONG THE ABUTMENTS FACES WAS REMOVED AND NEW CONCRETE WITH NEW WELDED WIRE FABRIC WAS PLACED. ELASTOMERIC BEARING PADS ADDED AT ALL THE TRUSS BEARINGS. ABUTMENT REPAIRS ARE HOLDING VERY WELL. SPLITTING OF KICKBOARDS AND MINOR CHECKS IN TIMBER DECK.



CITY OF GOSHEN BRIDGE NO. 305

**WAVERLY AVENUE
OVER
MILLRACE HYDRAULIC CANAL**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 305

Facility Carried: WAVERLY AVENUE
Feature(s) Intersected: MILLRACE HYDRAULIC CANAL

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: MILLRACE HYDRAULIC CANAL
Facility Carried: WAVERLY AVENUE
Location: 525' W. OF SR 15 (MAIN ST.)
Latitude: 41° 34' 5.74"
Longitude: 85° 49' 50.34"

GEOMETRIC DATA

Structure Length: 87'-2"
Max. Span Length: 30'-0"
Deck Width (O-O): 12'-0"
Br. Rdwy Width: 12'-0"
Approach Width: 12'-0"
Total Hor. Clearance - Over: 10'-0"
Bridge Skew: 0 Degree(s)
Stream Skew: 0 Degree(s)

REMAINING LIFE

Estimated Remaining Life: 10 Years
Wearing Surface: 10 Years
Deck: 10 Years
Joints: NA Years
Superstructure: 10 Years
Substructure: 10 Years
Approach: 10 Years
Channel: 15 Years
Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: SIMPLE STEEL BEAM
Str. Type-Appr: NA
Deck Str. Type: BOLTED STEEL GRATE
Wearing Surface: STEEL
Thickness of Asphalt: 0 Inches
No. of Spans - Main: 3
No. of Spans - Approach: 0

CLASSIFICATION

Historical Significance: NOT ELIGIBLE
Maintenance Responsibility: City
Owner: City

PROPOSED IMPROVEMENTS

Year Needed:
Type Work:
City
NO MAJOR WORK NEEDED AT THIS TIME

LOAD RATING AND POSTING

Design Load: H-20/HS-20
Operating Rating: 45 TON
Inventory Rating: 31 TON
Gross Tons or H Rating: 20 TON

AGE OF SERVICE

Year Built: UNKNOWN
Reconstructed: UNKNOWN
Repaired: 2015
Type of Service: VEHICULAR over WATERWAY
Lanes on Structure: 01
ADT - Over: 10 VPD
ADT Year Over: 2014
Paint Date: 2015
Paint Rating: 8 - VERY GOOD
Detour: SINGLE ACCESS POINT - NO DETOUR

Posting: 5 - EQUAL OR ABOVE LEGAL LOADS
Date Posted/Closed:
Open, Posted, or Closed: OPEN
Tons Posted:
Year of Rating: 2012

Bridge Imp. Costs: \$0,000
Roadway Imp. Costs: \$0,000
Total Project Costs: \$0,000
Yr. of Cost Estimate:

INSPECTIONS

Inspection Date: 7/30/2020
Des. Inspection Frequency: 24 Months
Prev. Inspection Date: 3/6/2018

MAINTENANCE NEEDS

Year Needed: 2021
Describe Work: CLEAR VEGETATION. PLACE RIPRAP AT PIERS

Total Maintenance Costs: \$10,000

CONDITION

CONDITION
Deck: GOOD
Wearing Surface: GOOD
Superstr: FAIR - HEAVY PITTING, MODERATE SECTION LOSS AT FLANGES
Substr: FAIR - CRACKING/ EFFLOR. AT PIER ENDS, MINOR UNDERMINING AT W. PIER
Channel: SATISFACTORY - SCOUR AT SOUTH END OF PIERS
Culvert: NA
Approach Roadway: CRACKED AT EAST APPROACH

MATERIAL RATING
BOLTED STEEL GRATE 7
STEEL 7
STEEL 5
CONCRETE 5
EARTH AND RIPRAP 6
NA NA
BITUMINOUS 6

APPRAISAL

APPRAISAL RATING
Structural: FAIR - SCOUR AT SOUTH END OF PIERS. MINOR UNDERMINING AT WEST PIER. BEAM SECTION LOSS WITH HEAVY PITTING 5
Geometry: MEETS MINIMUM TOLERABLE LIMITS TO LEAVE IN PLACE 4
Bridge Railing: GOOD - STEEL TUBE - DOES NOT MEET STANDARDS 7
Waterway Adequacy: OVER HYDRAULIC CANAL WITH FLOW CONTROL 8
Roadway Alignment: STRAIGHT AND LEVEL, MINOR SPEED REDUCTION REQUIRED. TRAIL INTERSECTION AT WEST END. 6
Scour: STABLE - PREVENTIVE ACTION REQUIRED 4
Foundation: UNKNOWN (LIKELY SPREAD FOOTING)

REMARKS

BRIDGE CLEANED AND PAINTED IN 2015. NEW STEEL TUBE RAIL INSTALLED. NEW RAILING WELDED TO FASCIA CHANNEL BEAMS AND BOTTOM FLANGE OF 1ST AND 2ND INTERIOR W-BEAMS(FATIGUE PRONE DETAIL). 15 MPH SIGNS POSTED. ONE LANE BRIDGE SIGNS POSTED. HEAVY PITTING ON ALL BEAMS, WORST IN BEAMS SPACED CLOSELY TOGETHER. SCOUR HOLE AND UNDERMINING AT WEST PIER, SOUTH SIDE. TOP OF FOOTING EXPOSED AT WEST SIDE OF WEST PIER. EAST PIER HAS SCOUR DEPRESSION AT SOUTH END. LOW CLEARANCE AT BEAMS TOWARDS ABUTMENTS. HEAVY VEGETATION AT EAST END OF BRIDGE. SEWER LINES ON NORTH SIDE. POWER LINES AT SOUTH SIDE. GAS LINE ON SOUTH SIDE. TRAIL INTERSECTION AT WEST END OF BRIDGE. THINNING OF TOP FLANGE OF EAST INTERIOR CENTER BEAM (INTERIOR BEAM 3).



CITY OF GOSHEN BRIDGE NO. 306

**MILLRACE CANAL TRAIL
OVER
MILLRACE HYDRAULIC CANAL**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 306

Facility Carried: MILLRACE CANAL TRAIL
Feature(s) Intersected: MILLRACE HYDRAULIC CANAL

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: MILLRACE HYDRAULIC CANAL
Facility Carried: MILLRACE CANAL TRAIL
Location: 220' W. OF RIVER VISTA DR.
Latitude: 41° 33' 41.53"
Longitude: 85° 50' 7.44"

GEOMETRIC DATA

Structure Length:
Max. Span Length:
Deck Width (O-O):
Br. Rdwy Width:
Approach Width:
Total Hor. Clearance – Over:
Bridge Skew:
Stream Skew:

REMAINING LIFE

64'-3" Estimated Remaining Life:
20'-9" Wearing Surface: 10 Years
13'-11" Deck: 10 Years
11'-8" Joints: NA Years
12'-6" Superstructure: 10 Years
11'-8" Substructure: 10 Years
0 Degree(s) Approach: 10 Years
0 Degree(s) Channel: NA Years
Culvert: NA Years

STRUCTURE DATA

Str. Type-Main: ENCASED STEEL BEAM
Str. Type-Appr: NA
Deck Str. Type: REINFORCED CONCRETE
Wearing Surface: REINFORCED CONCRETE
Thickness of Asphalt: 0 Inches
No. of Spans – Main: 3
No. of Spans – Approach: 0

CLASSIFICATION

Historical Significance:
Maintenance Responsibility:
Owner:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed: 2030
City Type Work: REHABILITATION - CONTRACT
City

LOAD RATING AND POSTING

Design Load: UNKNOWN
Operating Rating: 35
Inventory Rating: 28
Gross Tons or H Rating: 16 TON

REMOVE AND REPAIR UNSOUND CONCRETE. EPOXY INJECT CRACKS. MILL AND OVERLAY CONCRETE DECK.

AGE OF SERVICE

Year Built: 1868
Reconstructed: UNKNOWN
Repaired: 1995
Type of Service: PED./BIKE over WATERWAY
Lanes on Structure: TRAIL
ADT – Over: NA VPD
ADT Year Over: NA
Paint Date: NA
Paint Rating: NA
Detour: NA

Posting: 5 - EQUAL OR ABOVE LEGAL LOADS

Date Posted/Closed:
Open, Posted, or Closed:
Tons Posted:
Year of Rating:

Bridge Imp. Costs: \$270,000
Roadway Imp. Costs: \$30,000
Total Project Costs: \$300,000
Yr. of Cost Estimate: 2020

INSPECTIONS

Inspection Date:
Des. Inspection Frequency:
Prev. Inspection Date:

MAINTENANCE NEEDS

Year Needed: 2025
7/30/2020 Describe Work:
24 Months FILL VOIDS IN GROUDED RIPRAP. FIX EROSION BEHIND
4/25/2018 NORTHWEST AND NORTHEAST WINGWALLS. REPLACE
PAVED SIDE DITCH
Total Maintenance Costs: \$15,000

CONDITION

Deck: SATISFACTORY - ROUGH/ SCALING & CRACKING
Wearing Surface: SATISFACTORY - ROUGH/UNEVEN
Superstr: CRACKING AND LEACHING / EXPOSED BOTTOM FLANGE
Substr: HEAVY CRACKING AND LEACHING / ABRASION BELOW WATERLINE
Channel: GOOD - AT GOSHEN DAM
Culvert: NA
Approach Roadway: GOOD

<u>MATERIAL</u>	<u>RATING</u>
REINFORCED CONCRETE	6
REINFORCED CONCRETE	6
CONCRETE ENCASED STEEL BEAM	5
REINFORCED CONCRETE	5
NATURAL/CONCRETE	7
NA	NA
BITUMINOUS AT WEST APPROACH. CONCRETE AND BRICK PAVERS AT EAST APPROACH	7

APPRAISAL

Structural:	FAIR - HEAVY CRACKING AND LEACHING	RATING	5
Geometry:	GOOD - TRAIL		7
Bridge Railing:	GOOD - STEEL TUBE - DOES NOT MEET STANDARDS		7
Waterway Adequacy:	OVER HYDRAULIC CANAL WITH FLOW CONTROL		9
Roadway Alignment:	STRAIGHT AND LEVEL - TRAIL		8
Scour:	STABLE		5
Foundation:	UNKNOWN (LIKELY SPREAD FOOTING)		

REMARKS

DECK SURFACE IS ROUGH AND UNEVEN, EXHIBITING ABRASION AND CRACKING. HEAVY CRACKING WITH LEACHING AT UNDERSIDE OF STRUCTURE AND PIER WALLS. 8" THICK REINFORCED CONCRETE SLAB SUPPORTED ON ENCASED STEEL BEAMS. THE BOTTOM FLANGE OF THE BEAMS ARE EXPOSED, EXHIBITING SURFACE RUST. GROUDED RIPRAP AT POND SIDE. THE GROUDED RIPRAP EXHIBIT SOME UNDERMINING WITH VOIDS BELOW THE WATERLINE. EROSION BEHIND THE NORTHWEST AND NORTHEAST WINGWALLS. UNDERMINING IN THE PAVED SIDE DITCH BEHIND THE NORTHWEST WINGWALL.



CITY OF GOSHEN BRIDGE NO. 401

**PLYMOUTH AVENUE
OVER
MAPLE CITY GREENWAY**



NORTH ELEVATION



SOUTH ELEVATION



SECTION LOOKING WEST



SECTION LOOKING EAST

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 401

Facility Carried: PLYMOUTH AVENUE
Feature(s) Intersected: MAPLE CITY GREENWAY

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: MAPLE CITY GREENWAY
Facility Carried: PLYMOUTH AVENUE
Location: 200' W. OF SOUTH 3RD ST.
Latitude: 41° 34' 31.80"
Longitude: 85° 50' 9.80"

GEOMETRIC DATA

Structure Length:
Max. Span Length:
Deck Width (O-O):
Br. Rdwy Width:
Approach Width:
Total Hor. Clearance – Over:
Bridge Skew:
Stream Skew:

REMAINING LIFE

17'-0" Estimated Remaining Life:
14'-0" Wearing Surface: 15 Years
80'-0" Deck: 15 Years
41'-6" Joints: NA Years
41'-6" Superstructure: NA Years
41'-6" Substructure: NA Years
0 Degree(s) Approach: 15 Years
0 Degree(s) Channel: NA Years
Culvert: 45 Years

STRUCTURE DATA

Str. Type-Main: REINFORCED CONCRETE
Str. Type-Appr: NA
Deck Str. Type: REINFORCED CONCRETE
Wearing Surface: REINFORCED CONCRETE
Thickness of Asphalt: 0 Inches

CLASSIFICATION

Historical Significance:
Maintenance Responsibility:
Owner:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed:
City Type Work:
City
NO MAJOR WORK NEEDED AT THIS TIME

AGE OF SERVICE

Year Built: 2009
Reconstructed:
Repaired:
Type of Service: VEHICULAR over PED./ BIKE
Lanes on Structure: 02
ADT – Over: 12224 VPD
ADT Year Over: 2019
Paint Date: NA
Paint Rating: NA
Detour: 5 MILES

LOAD RATING AND POSTING

Design Load: HS-25
Operating Rating: 45 TON
Inventory Rating: 36 TON
Gross Tons or H Rating: 20 TON
Posting: 5 - EQUAL OR ABOVE LEGAL LOADS
Date Posted/Closed:
Open, Posted, or Closed: OPEN
Tons Posted:
Year of Rating: 2009

Year Needed:
Bridge Imp. Costs: \$0,000
Roadway Imp. Costs: \$0,000
Total Project Costs: \$0,000
Yr. of Cost Estimate:

CONDITION

Deck: SATISFACTORY - LONGITUDINAL CRACKING
Wearing Surface: SATISFACTORY - LONGITUDINAL CRACKING
Superstr: NA
Substr: NA
Channel: NA - NOT OVER WATERWAY
Culvert: SATISFACTORY - LONGITUDINAL CRACKING OF TOP SLAB.
Approach Roadway: GOOD

MAINTENANCE NEEDS

Year Needed: 2025
Describe Work:
24 Months SEAL CRACKS IN TOP SURFACE OF SLAB
Total Maintenance Costs: \$10,000

CONDITION

<u>MATERIAL</u>	<u>RATING</u>
REINFORCED CONCRETE	6
REINFORCED CONCRETE	6
NA	NA
NA	NA
NA	NA
REINFORCED CONCRETE	6
BITUMINOUS	7

APPRAISAL

	<u>RATING</u>
Structural: SATISFACTORY- CRACKING OF TOP SLAB	6
Geometry: SOMEWHAT BETTER THAN MINIMUM ADEQUACY	5
Bridge Railing: GOOD - NESTED GUARDRAIL ON SOUTH SIDE	7
Waterway Adequacy: NA - NOT OVER WATERWAY	NA
Roadway Alignment: STRAIGHT AND LEVEL, NO SPEED REDUCTION REQUIRED	8
Scour: NA - NOT OVER WATERWAY	NA
Foundation: BOX CULVERT	

REMARKS

LONGITUDINAL SHRINKAGE CRACKING OF TOP OF REINFORCED CONCRETE BOX. LONGITUDINAL SHRINKAGE CRACKING WITH LIGHT LEACHING AT UNDERSIDE OF TOP OF SLAB. LONGITUDINAL CRACKS ARE SPACED ANYWHERE FROM 2'-6" TO 5'-6" APART. MINOR MAP SURFACE CRACKING OF BOTTOM SLAB OF CULVERT. EROSION BEHIND NORTHWEST CORNER OF TUNNEL.



**CITY OF GOSHEN BRIDGE NO. 402
NORFOLK SOUTHERN RAILROAD
OVER
WINONA TRAIL BIKE**



EAST ELEVATION



WEST ELEVATION



SECTION LOOKING NORTH



SECTION LOOKING SOUTH

STRUCTURE INVENTORY AND APPRAISAL FORM

Bridge Number: 402

Facility Carried: NS RAILROAD
Feature(s) Intersected: WINONA TRAIL BIKE

IDENTIFICATION

State: INDIANA
District: FORT WAYNE
County: ELKHART
City/Town: GOSHEN
Feature Int'd: WINONA TRAIL BIKE
Facility Carried: NS RAILROAD
Location: 780' S. OF COLLEGE AVE.
Latitude: 41° 33' 49.80"
Longitude: 85° 49' 33.96"

GEOMETRIC DATA

Structure Length:
Max. Span Length:
Deck Width (O-O):
Br. Rdwy Width:
Approach Width:
Total Hor. Clearance – Over:
Bridge Skew:
Stream Skew:

REMAINING LIFE

14'-0" Estimated Remaining Life:
12'-0" Wearing Surface: 25 Years
54'-0" Deck: NA Years
NA Joints: NA Years
NA Superstructure: NA Years
NA Substructure: NA Years
0 Degree(s) Approach: 15 Years
0 Degree(s) Channel: NA Years
Culvert: 75 Years

STRUCTURE DATA

Str. Type-Main: REINFORCED CONCRETE
CULVERT
Str. Type-Appr: NA
Deck Str. Type: NA
Wearing Surface: RAILROAD BALLAST
Thickness of Asphalt: 0 Inches
No. of Spans – Main: 1
No. of Spans – Approach: 0

CLASSIFICATION

Historical Significance:
Maintenance Responsibility:
Owner:
Design Load:
Operating Rating:
Inventory Rating:
Gross Tons or H Rating:
Posting:
Date Posted/Closed:
Open, Posted, or Closed:
Tons Posted:
Year of Rating:

PROPOSED IMPROVEMENTS

NOT ELIGIBLE Year Needed: 2025
City Type Work: REPAIR - LOCAL FORCES
City REPLACE CRACKED SIDEWALK AT WEST STAIRS APPROACH
E-80 COOPER TRAIN
NA
40 TON
40 TON
NA Bridge Imp. Costs: \$0,000
NA Roadway Imp. Costs: \$7,000
OPEN Total Project Costs: \$7,000
Yr. of Cost Estimate: 2020

AGE OF SERVICE

Year Built: 2011
Reconstructed:
Repaired:
Type of Service: RAILROAD over PED./ BIKE
Lanes on Structure: 00
ADT – Over: NA VPD
ADT Year Over: NA
Paint Date: NA
Paint Rating: NA
Detour: NA

LOAD RATING AND POSTING

MAINTENANCE NEEDS

Year Needed:
Describe Work:
24 Months NO MAJOR MAINTENANCE NEEDED

Total Maintenance Costs:

CONDITION

Deck: NA - UNDER RAILROAD FILL
Wearing Surface: GOOD
Superstr: NA
Substr: NA
Channel: NA - NOT OVER WATERWAY
Culvert: GOOD - MINOR SURFACE SPALLS/ SHRINKAGE CRACKS
Approach Roadway: CRACKING IN WEST APPROACH STAIRS

<u>MATERIAL</u>	<u>RATING</u>
NA	NA
RAILROAD BALLAST	7
NA	NA
NA	NA
NA	NA
REINFORCED CONCRETE	7
CONCRETE SIDEWALKS	7

APPRAISAL

	<u>RATING</u>
Structural: GOOD CONDITION	7
Geometry: GOOD - CONCRETE STAIRWELL	7
Bridge Railing: GOOD - STEEL HANDRAIL	7
Waterway Adequacy: NA - NOT OVER WATERWAY	NA
Roadway Alignment: TRAIL UNDER RAILROAD	8
Scour: NA - NOT OVER WATERWAY	NA
Foundation: BOX CULVERT	

REMARKS

CRACKING IN WEST APPROACH SIDEWALK. MINOR SHRINKAGE CRACKS IN CONCRETE RETAINING WALLS, WEST STAIRS. MINOR MAP SURFACE CRACKING IN BOTTOM SLAB OF CULVERT. MINOR SURFACE SPALLS IN UNDERSIDE OF TOP SLAB OF UNIT 2 FROM WEST.





INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

APPENDIX A

ADDITIONAL PHOTOGRAPHS

CITY OF GOSHEN BRIDGE NO. 101

CITY OF GOSHEN BRIDGE NO. 101



APPROACH LOOKING EAST



APPROACH LOOKING WEST



UPSTREAM CHANNEL LOOKING SOUTH



DOWNSTREAM CHANNEL LOOKING NORTH

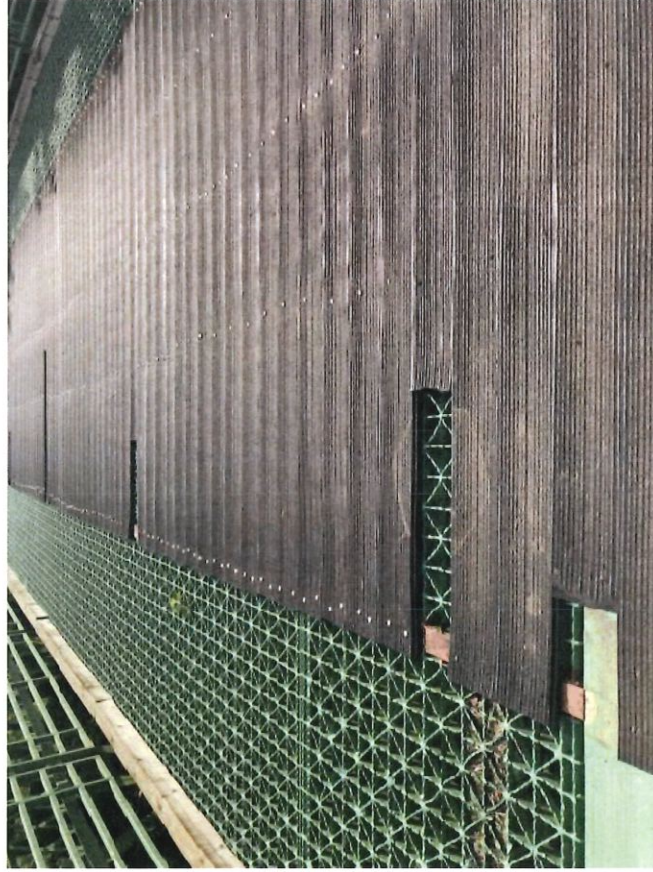
CITY OF GOSHEN BRIDGE NO. 101



BRIDGE PLAQUE



TYP. RUBBER MAT PIECES MISSING



TYPICAL CONDITION OF RUBBER MAT



HEAVY DEBRIS IN CHANNEL

CITY OF GOSHEN BRIDGE NO. 101



TYP. PACK RUST AT LOWER CHORD OF TRUSS



TYPICAL UNDERSIDE OF BRIDGE



TYP. PACK RUST AT FLOORBEAM TO LOWER CHORD CONN.



SECTION LOSS IN TOP FLANGE OF STRINGERS

CITY OF GOSHEN BRIDGE NO. 101



TYP. SECTION LOSS AT TOP FLANGE OF STRINGER/ FB CONN.



DEBRIS UNDER BRIDGE AND BETWEEN LATERALS



REPLACED RIPRAP AT WEST SPILLSLOPE



EXPOSED GEOTEXTILES AT WEST SPILL SLOPE

CITY OF GOSHEN BRIDGE NO. 102

CITY OF GOSHEN BRIDGE NO. 102



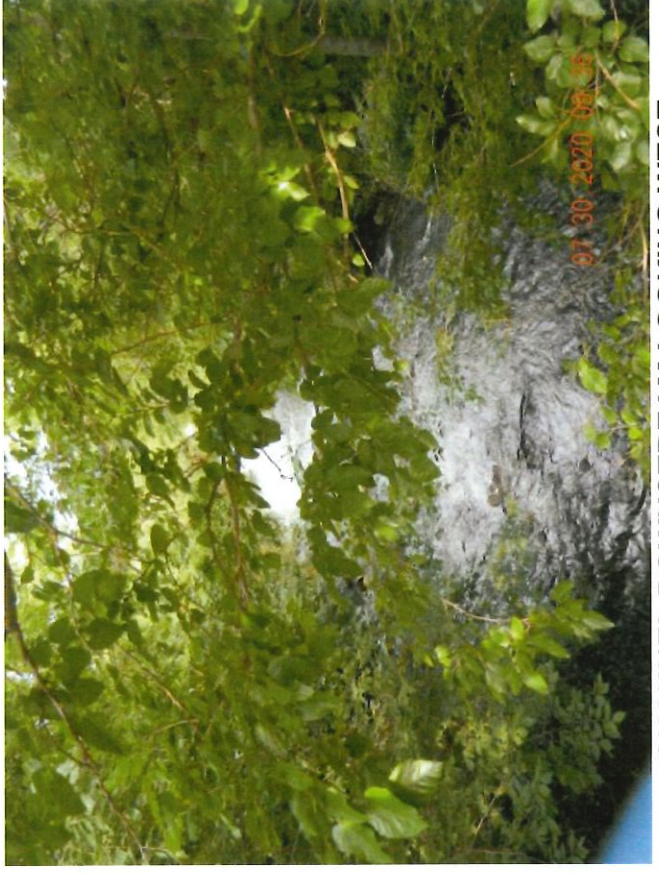
APPROACH LOOKING NORTH



APPROACH LOOKING SOUTH



CHANNEL UPSTREAM LOOKING EAST



CHANNEL DOWNSTREAM LOOKING WEST

CITY OF GOSHEN BRIDGE NO. 102



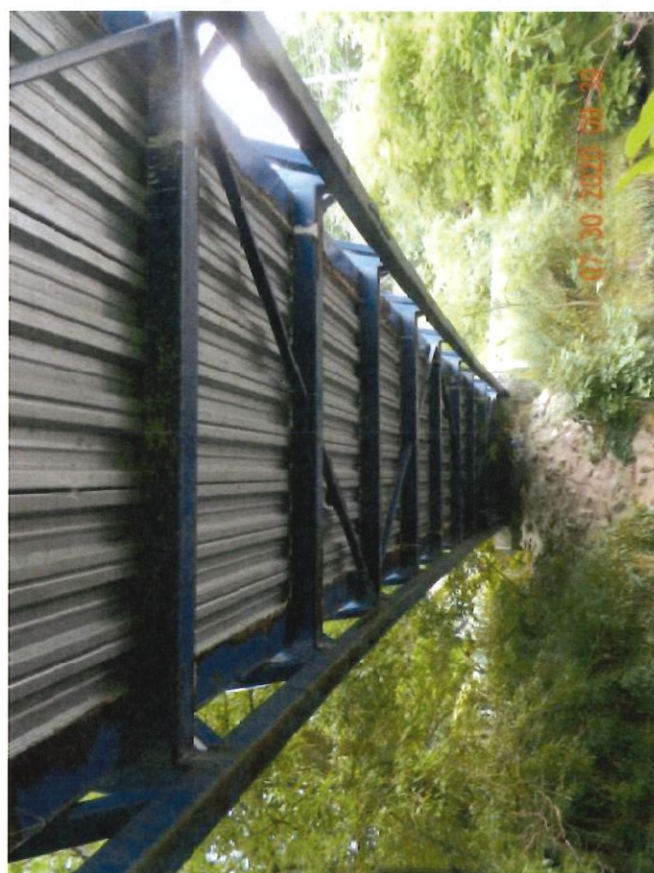
BRIDGE PLAQUE



HEAVY VEGETATION ON WEST TRUSS



SOUTH END BENT



UNDERSIDE OF BRIDGE LOOKING NORTH

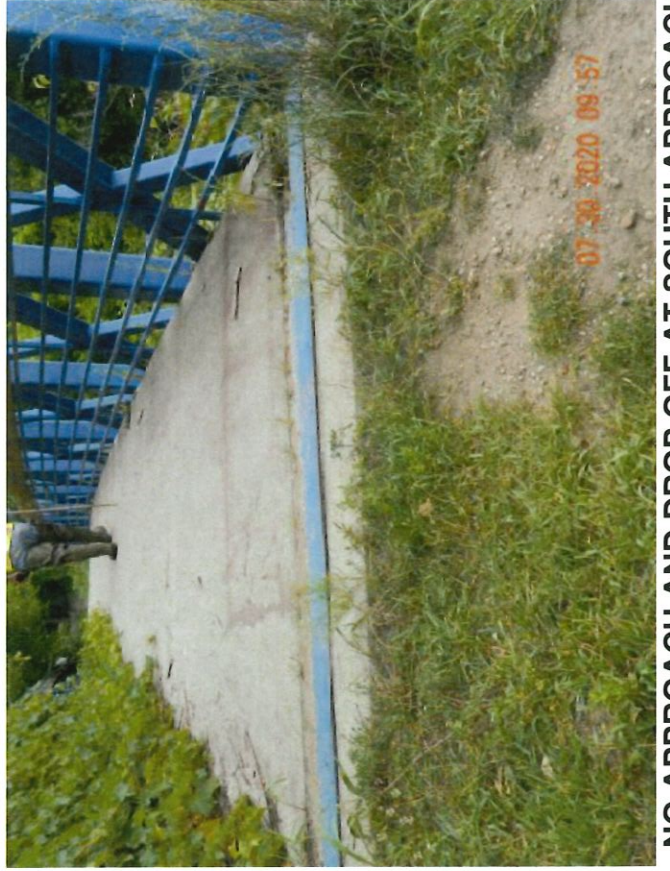
CITY OF GOSHEN BRIDGE NO. 102



TYP. LEACHING AND RUST AT TRUSS/ DECK INTERFACE



NORTH END BENT



NO APPROACH AND DROP OFF AT SOUTH APPROACH



NO APPROACH AND DROP OFF AT NORTH APPROACH

CITY OF GOSHEN BRIDGE NO. 102



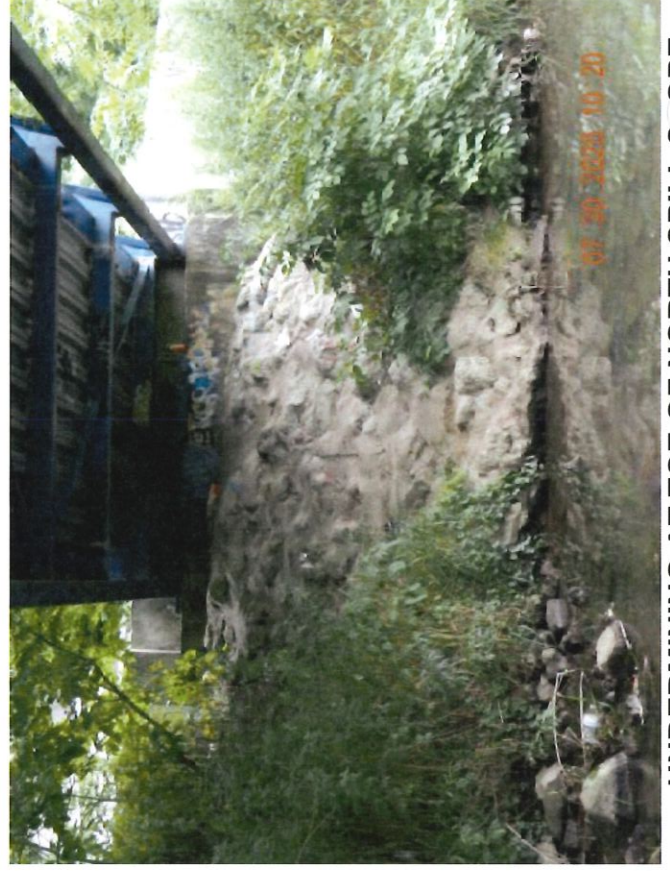
6.5" DROP OFF AT NORTH APPROACH



SPALL IN WEST CORNER OF NORTH END BENT MUDWALL



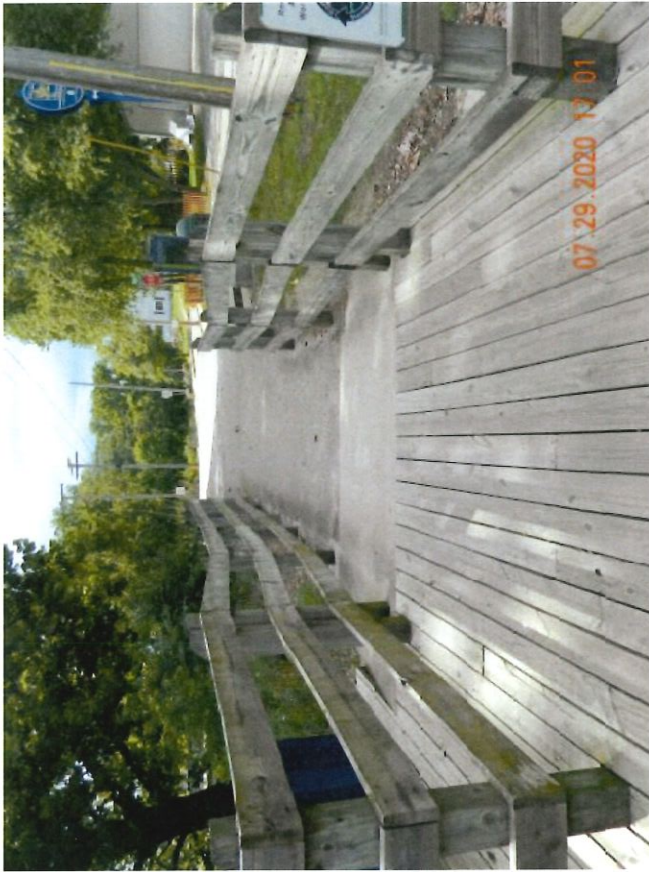
UNDERMINING AT TOE OF SOUTH SPILL SLOPE



UNDERMINING AT TOE OF NORTH SPILL SLOPE

CITY OF GOSHEN BRIDGE NO. 103

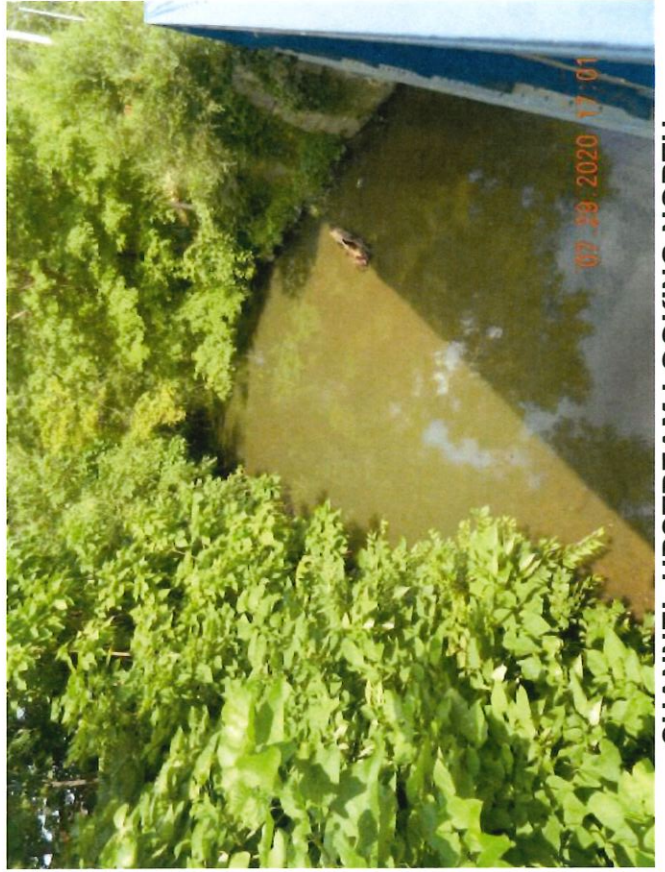
CITY OF GOSHEN BRIDGE NO. 103



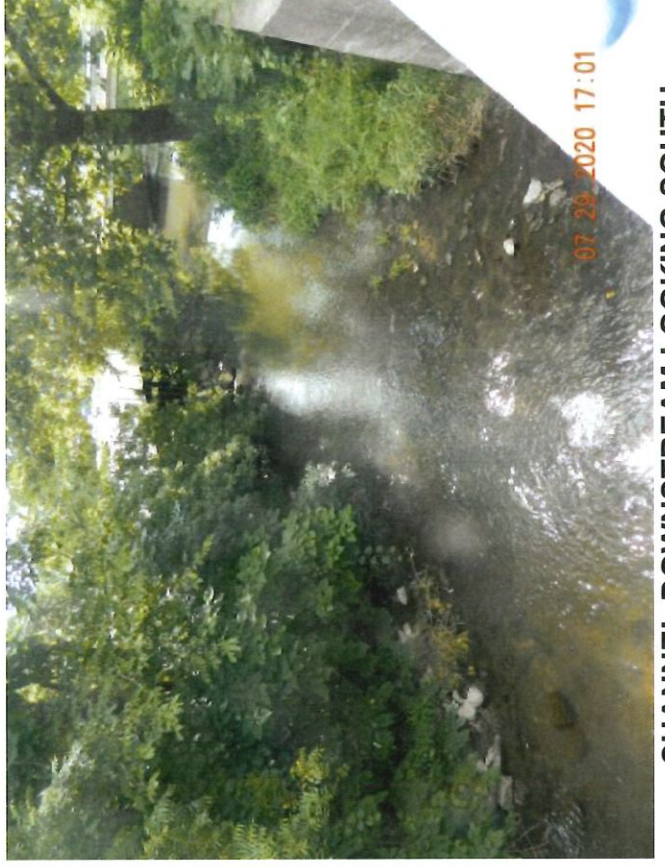
APPROACH LOOKING WEST



APPROACH LOOKING EAST



CHANNEL UPSTREAM LOOKING NORTH



CHANNEL DOWNSTREAM LOOKING SOUTH

CITY OF GOSHEN BRIDGE NO. 103



UNDERMINING IN EAST APPROACH



WARPING IN DECK TIMBER BOARDS



TWISTED STEEL STIFFENER ABOVE DECK



00% SECTION LOSS IN WEB PL OF S. GIRDER AT 3RG.

CITY OF GOSHEN BRIDGE NO. 103



TYP. TWISTING IN TOP FLANGE AND WEB OF FLOORBEAMS



TYP. BENT GUSSET PLATE



TYP. TWISTING IN TOP FLANGE AND WEB OF FLOORBEAMS



TYP. BENT GUSSET PLATE

CITY OF GOSHEN BRIDGE NO. 103



CRACKING AND SCALING IN WEST ABUTMENT



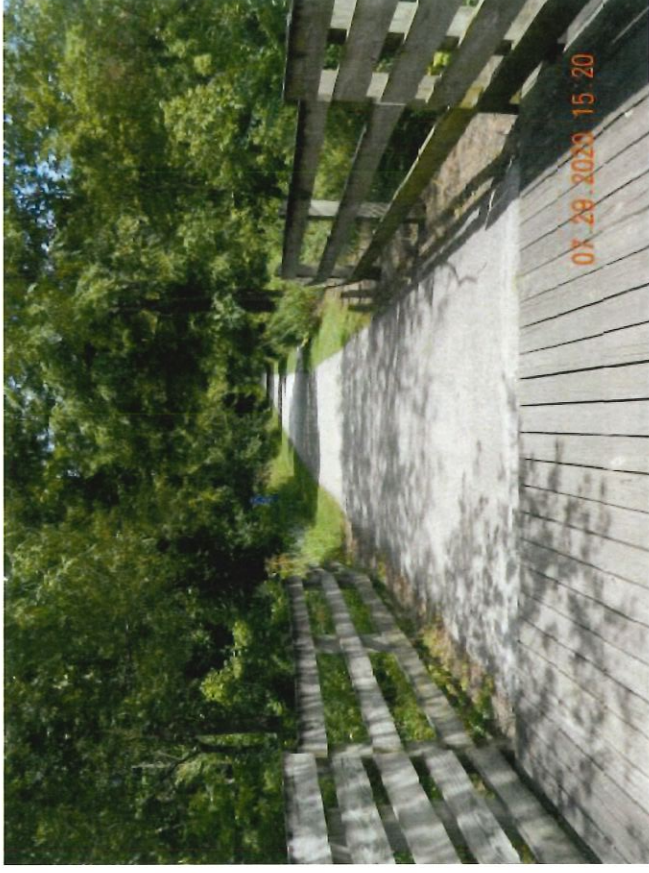
SCALING AND ABRASION IN EAST ABUTMENT

CITY OF GOSHEN BRIDGE NO. 104

CITY OF GOSHEN BRIDGE NO. 104



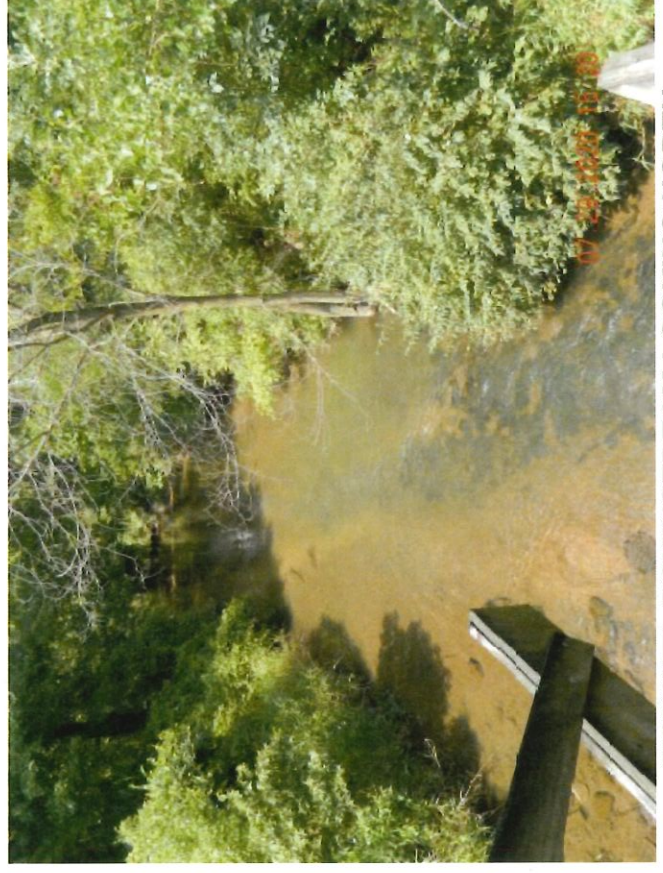
APPROACH LOOKING WEST



APPROACH LOOKING EAST



CHANNEL UPSTREAM LOOKING SOUTH



CHANNEL DOWNSTREAM LOOKING NORTH

CITY OF GOSHEN BRIDGE NO. 104



CHECKING OF TIMBER DECK



SPLITTING OF TIMBER DECK BOARDS



TIMBER DECK BOARDS PRYING UP



LOOSE TIMBER BOARDS AT WEST END

CITY OF GOSHEN BRIDGE NO. 104



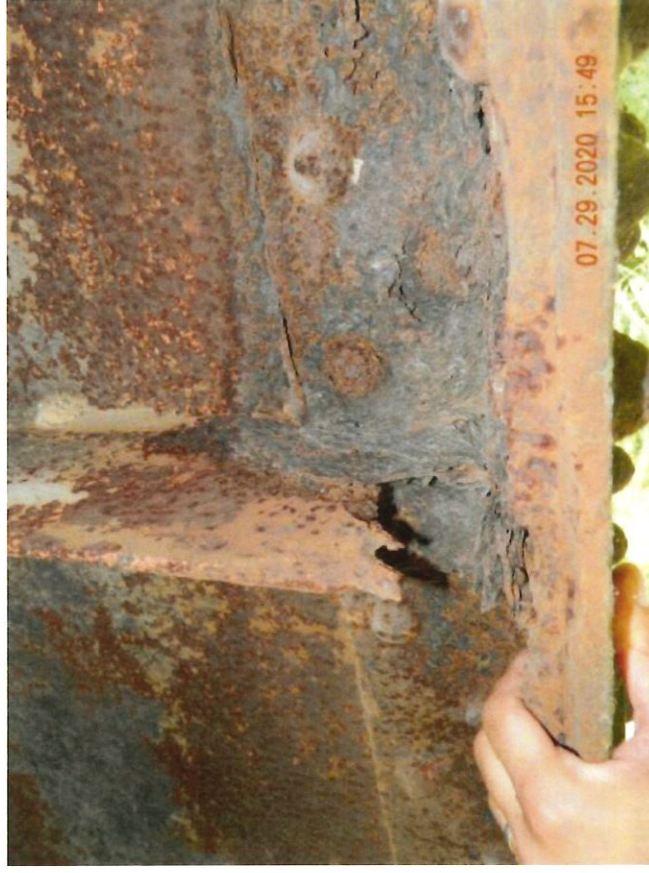
EROSION BEHIND SOUTHWEST CORNER



LARGE SPLIT IN TIMBER CAP OF EAST PIER OF MAIN SPAN



100% SECTION LOSS IN STEEL STIFFENERS



HEAVY PACK RUST AND PITTING AT STEEL STIFFENERS

CITY OF GOSHEN BRIDGE NO. 104



TYPICAL UNDERSIDE OF MAIN SPAN



TYPICAL SPLITS IN PIER CAPS OF APPROACH SPANS

CITY OF GOSHEN BRIDGE NO. 201

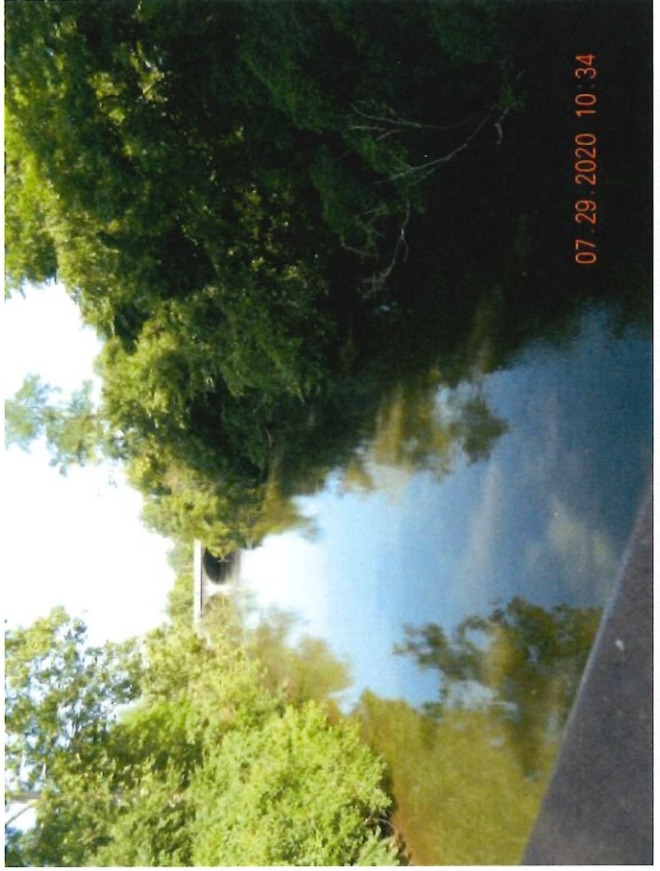
CITY OF GOSHEN BRIDGE NO. 201



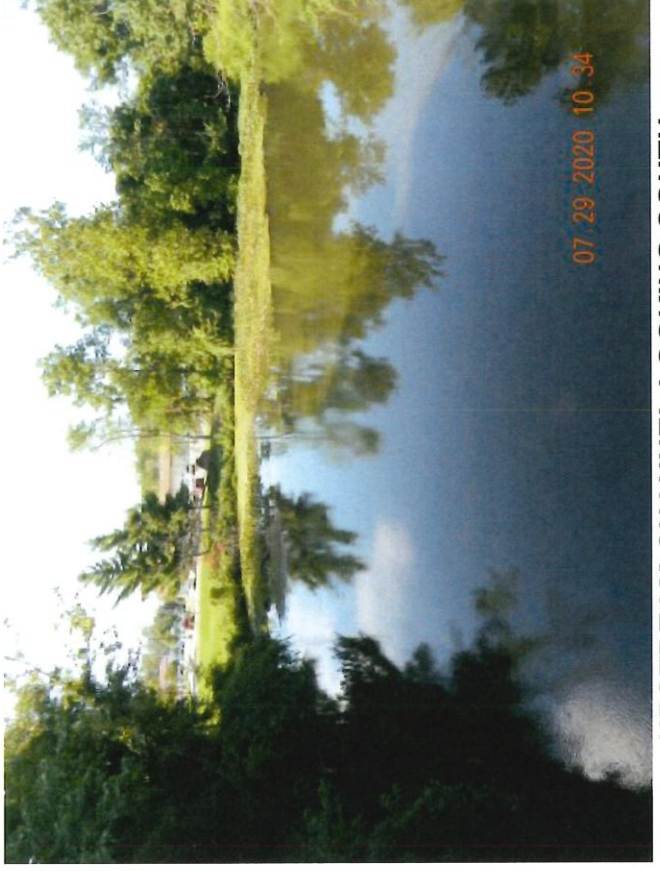
APPROACH LOOKING WEST



APPROACH LOOKING EAST



DOWNSTREAM CHANNEL LOOKING NORTH

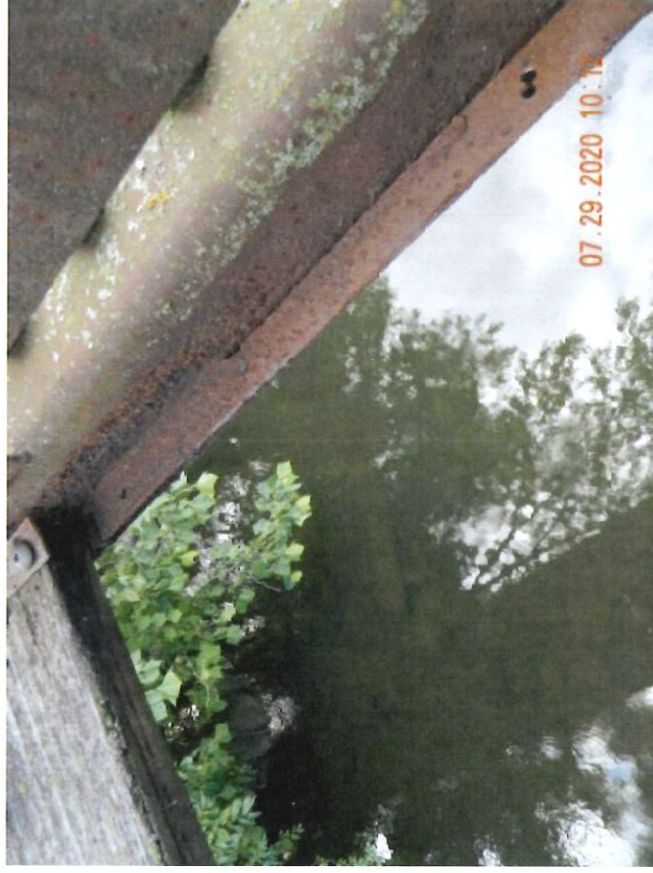


UPSTREAM CHANNEL LOOKING SOUTH

CITY OF GOSHEN BRIDGE NO. 201



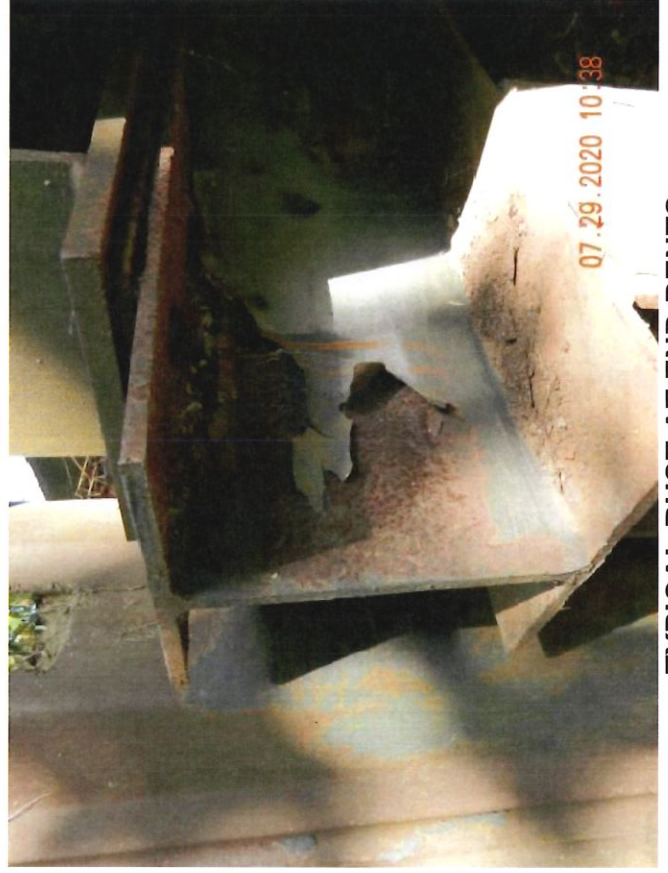
BRIDGE PLAQUE



RUST AND PITTING AT LOWER CHORDS NEXT TO BOARDS

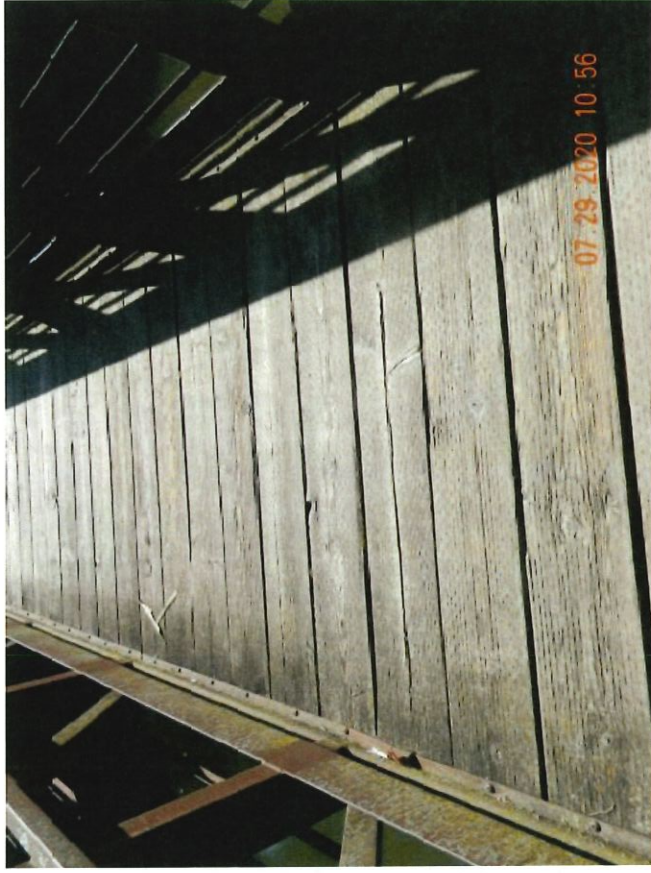


REPLACED TIMBER BOARDS NEAR MIDSPAN



TYPICAL RUST AT END BENTS

CITY OF GOSHEN BRIDGE NO. 201



TYPICAL SPLITS & CHECKS IN TIMBER DECK



TREE NEXT TO SOUTH TRUSS KEEPING BRIDGE WET



KNOTS AND SPLITS IN TIMBER DECK



WEST APPROACH END WITH 1" VERTICAL OFFSET

CITY OF GOSHEN BRIDGE NO. 201



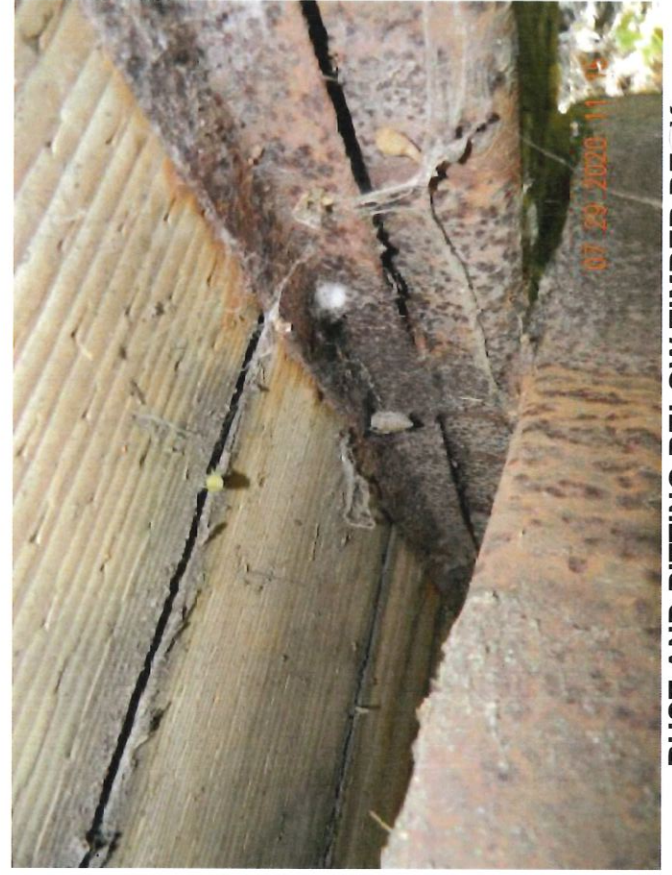
EXPANSION JOINT AT WEST END MISSING MATERIAL



TYPICAL UNDERSIDE OF STRUCTURE



RUST AND PAINT PEELING IN CENTER PIER



RUST AND PITTING BELOW TIMBER DECK

CITY OF GOSHEN BRIDGE NO. 202

CITY OF GOSHEN BRIDGE NO. 202



APPROACH LOOKING WEST



APPROACH LOOKING EAST



CHANNEL UPSTREAM LOOKING SOUTH



CHANNEL DOWNSTREAM LOOKING NORTH

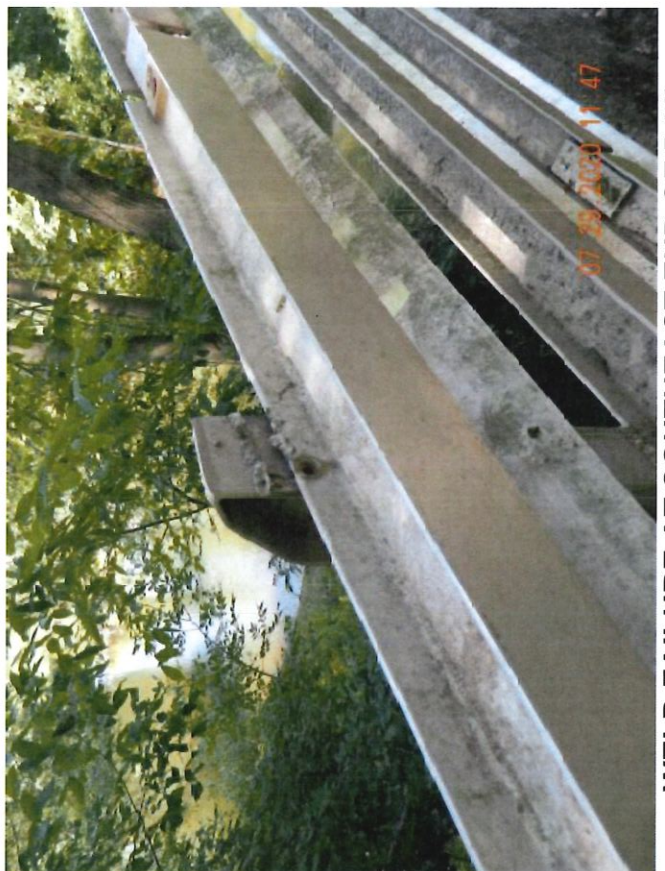
CITY OF GOSHEN BRIDGE NO. 202



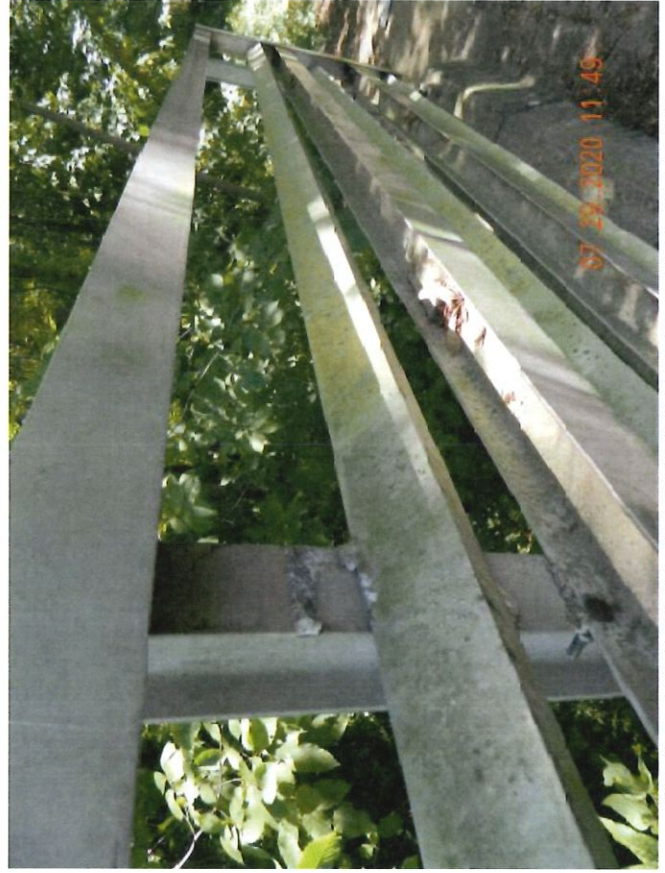
EAST ABUTMENT



EAST PIER



WELD FAILURE AT SOUTHEAST END OF RAIL



WELD FAILURE AT NORTHEAST END OF RAIL

CITY OF GOSHEN BRIDGE NO. 202



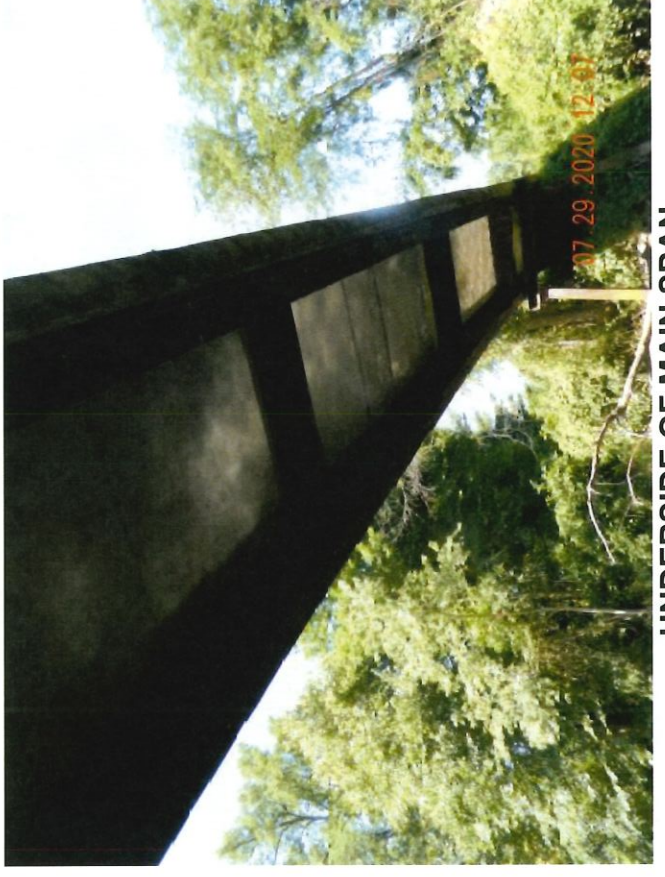
FAILED EAST EXPANSION JOINT DECK



FAILED WEST EXPANSION JOINT DECK



UNDERSIDE OF FAILED EAST EXPANSION JOINT DECK



UNDERSIDE OF MAIN SPAN

CITY OF GOSHEN BRIDGE NO. 202



WEST ABUTMENT



WEST PIER

CITY OF GOSHEN BRIDGE NO. 203

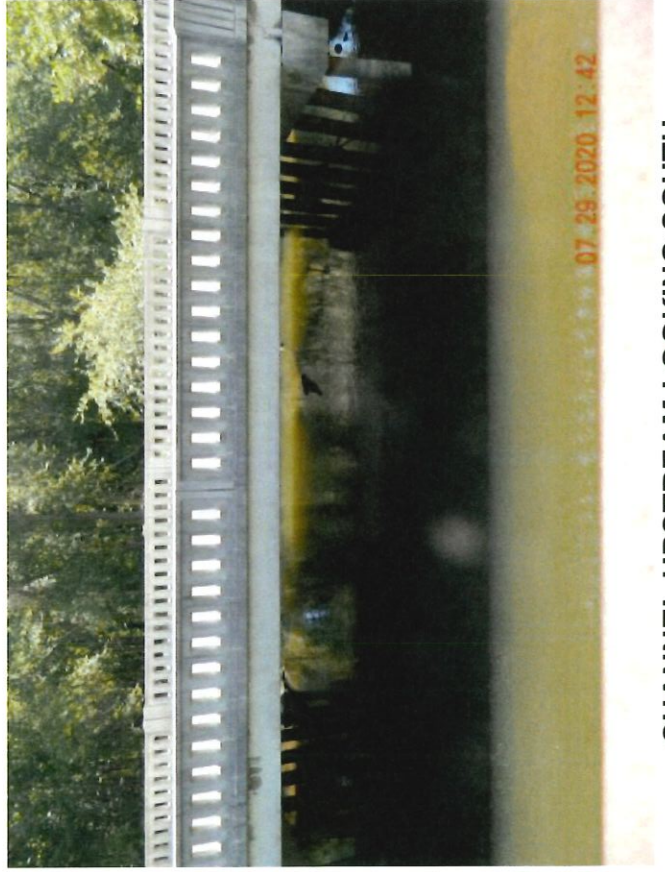
CITY OF GOSHEN BRIDGE NO. 203



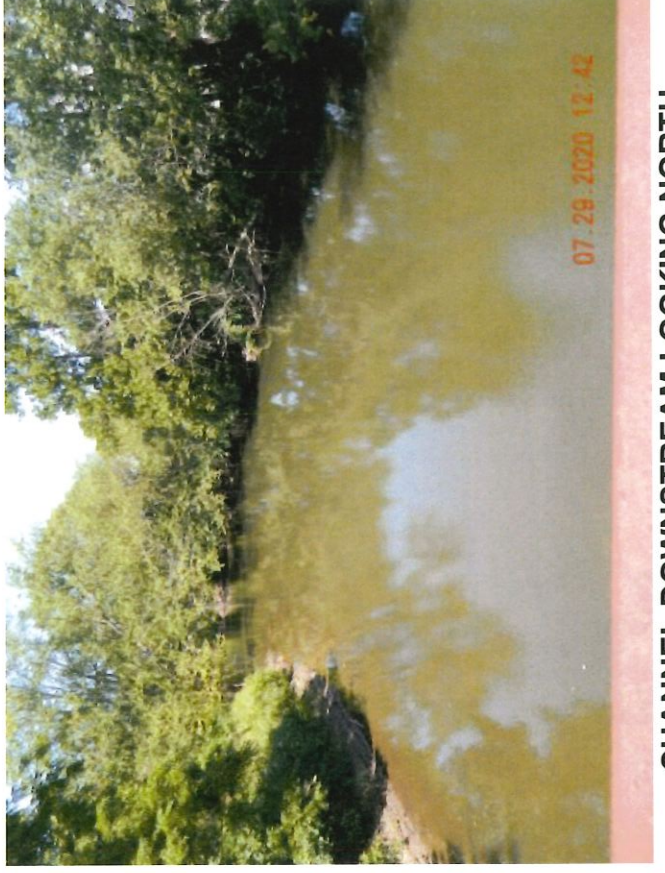
APPROACH LOOKING WEST



APPROACH LOOKING EAST



CHANNEL UPSTREAM LOOKING SOUTH



CHANNEL DOWNSTREAM LOOKING NORTH

CITY OF GOSHEN BRIDGE NO. 203



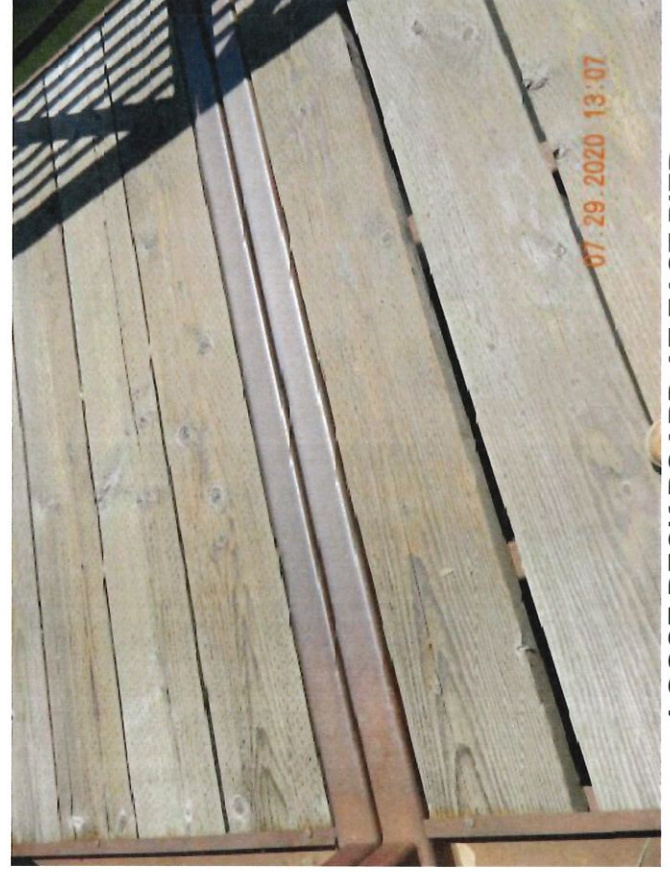
UNDERMINING AT EAST APPROACH



SEPARATION OF TIMBER BOARDS



SEPARATION OF TIMBER BOARDS



LOOSE DECK BOARD AT EAST PIER

CITY OF GOSHEN BRIDGE NO. 203

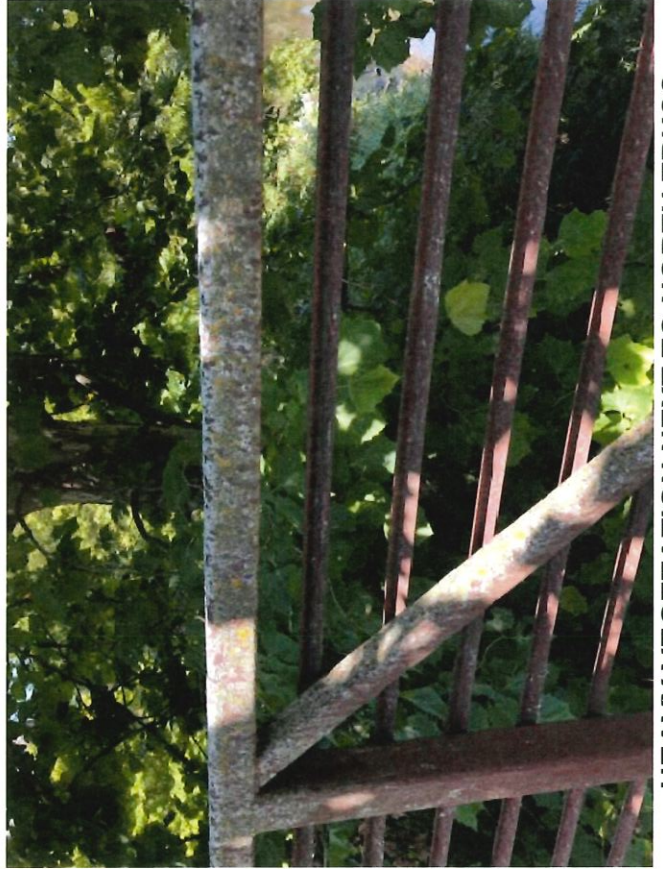


>1" SEPARATION AT EAST APPROACH END

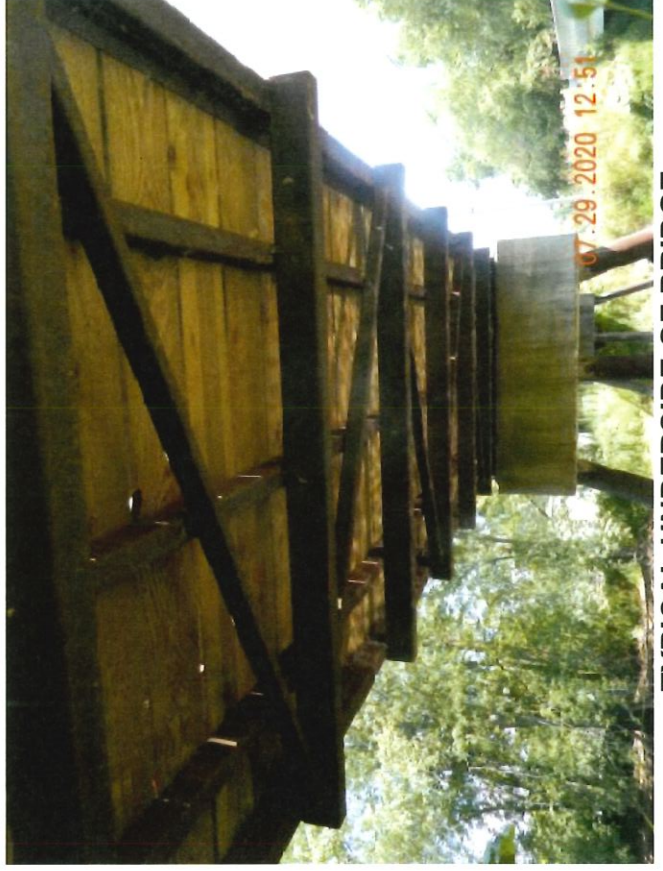
07.29.2020 13:01



BRIDGE PLAQUE



HEAVY VEGETATION NEXT TO NORTH TRUSS

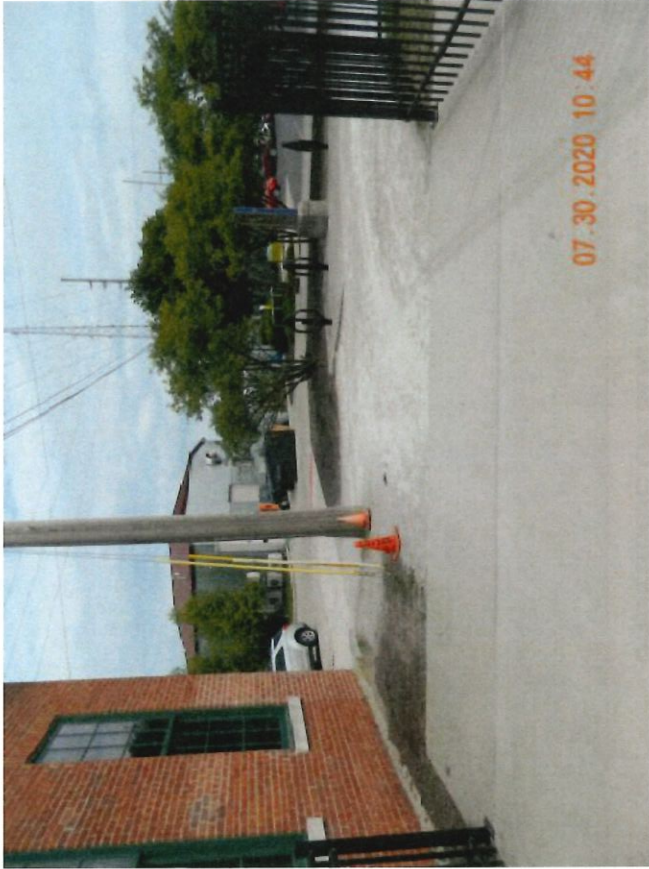


TYPICAL UNDERSIDE OF BRIDGE

07.29.2020 12:51

CITY OF GOSHEN BRIDGE NO. 300

CITY OF GOSHEN BRIDGE NO. 300



APPROACH LOOKING NORTH



APPROACH LOOKING SOUTH

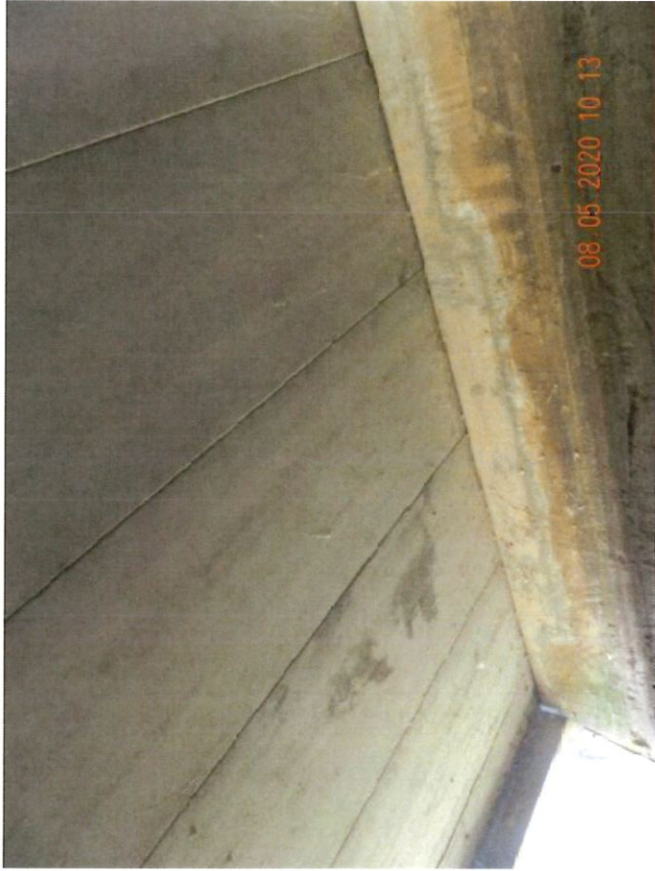


MINOR CRACKS IN SOUTH APPROACH SLAB



CENTER PIER, SOUTH FACE

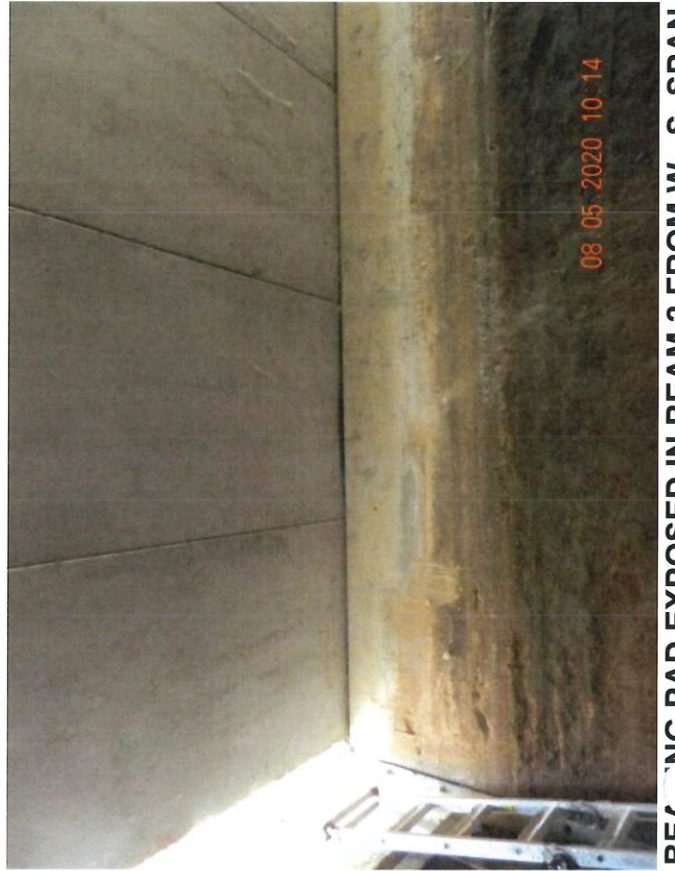
CITY OF GOSHEN BRIDGE NO. 300



UNDERSIDE OF SOUTH SPAN



SOUTH ABUTMENT



BEARING PAD EXPOSED IN BEAM 2 FROM W., S. SPAN



HONEYCOMB IN BEAM 4 FROM W., S. SPAN

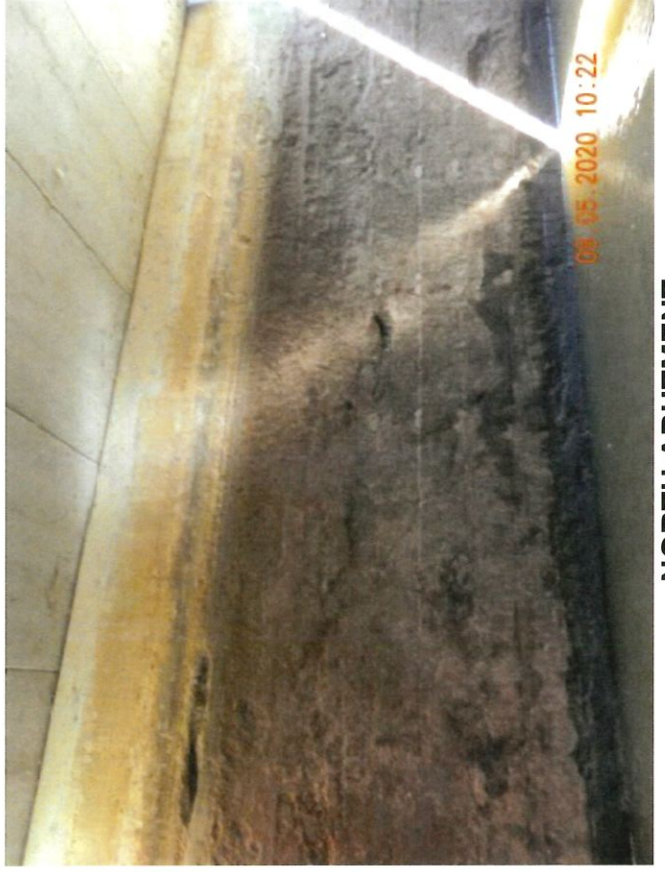
CITY OF GOSHEN BRIDGE NO. 300



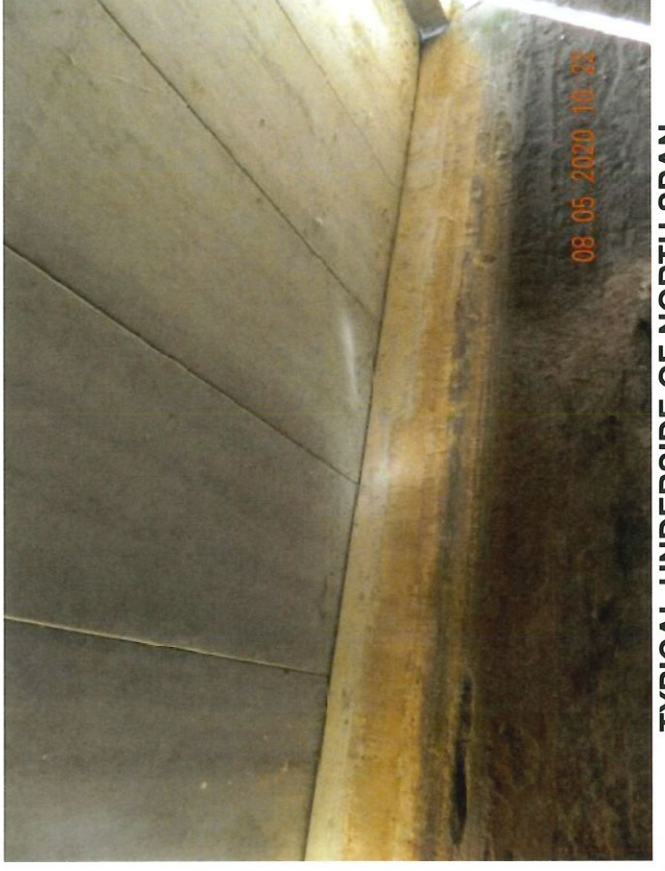
CANAL SCREEN AT SOUTH SPAN



GATE AT SOUTH SPAN



NORTH ABUTMENT

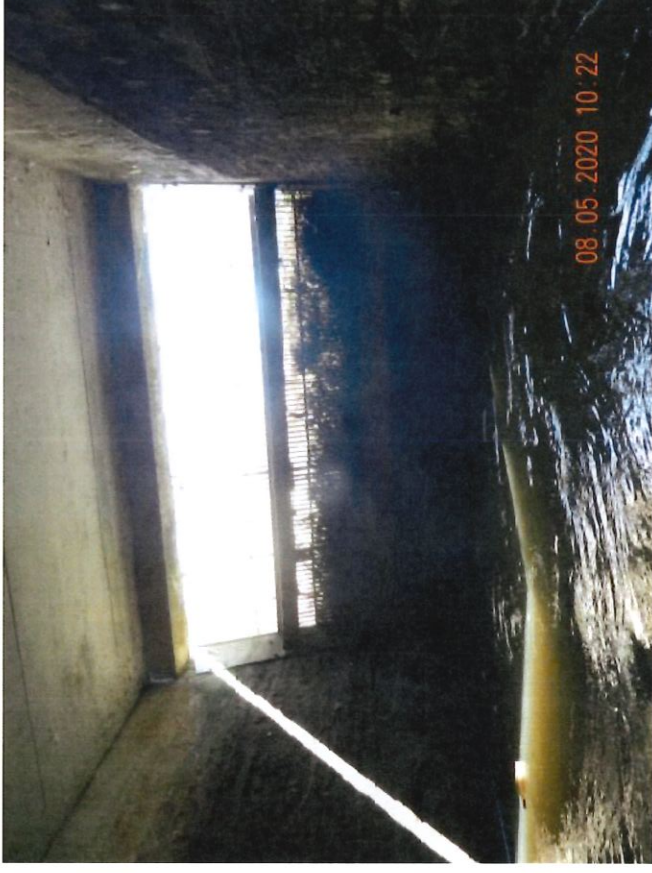


TYPICAL UNDERSIDE OF NORTH SPAN

CITY OF GOSHEN BRIDGE NO. 300



GATE AT NORTH SPAN



CANAL SCREEN AT NORTH SPAN



CENTER PIER, NORTH FACE



TYPICAL UNDERSIDE OF NORTH SPAN

CITY OF GOSHEN BRIDGE NO. 301

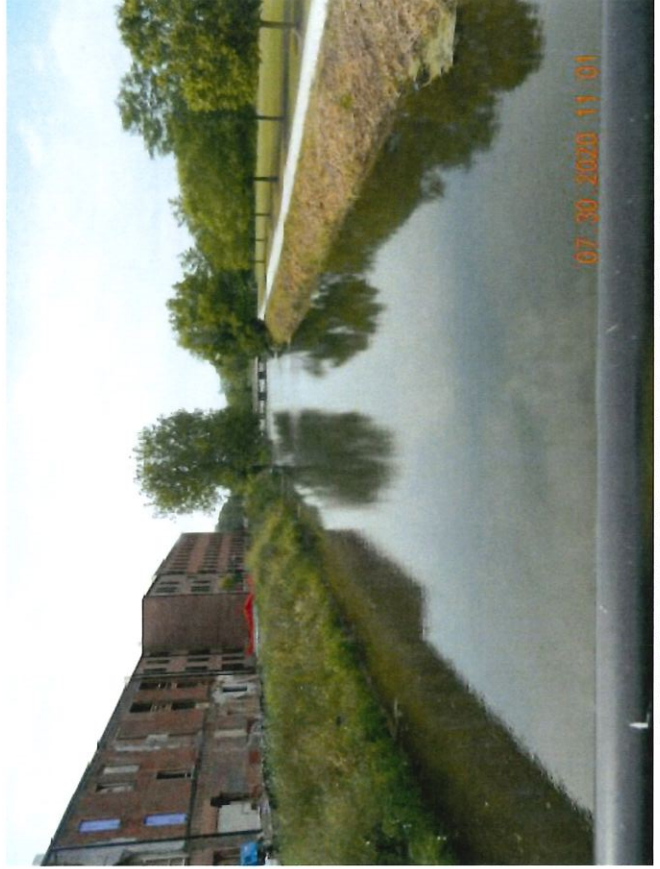
CITY OF GOSHEN BRIDGE NO. 301



APPROACH LOOKING WEST



APPROACH LOOKING EAST (CLOSED DUE TO CONSTR.)



UPSTREAM CHANNEL LOOKING SOUTH



DOWNSTREAM CHANNEL LOOKING NORTH

CITY OF GOSHEN BRIDGE NO. 301



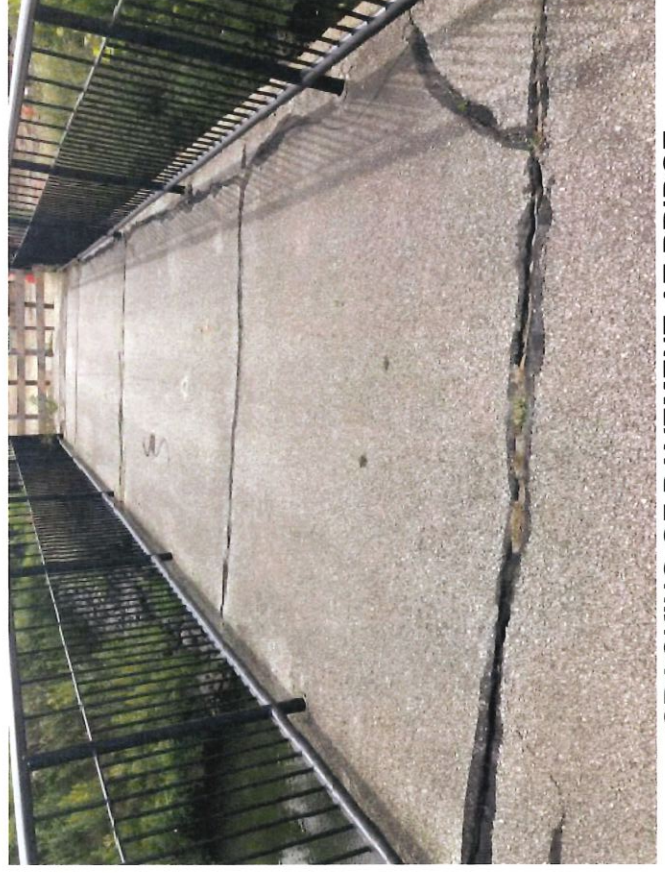
SETTLEMENT IN WEST APPROACH



SETTLEMENT AND CRACKING OF WEST APPR. PAVMT.



SETTLEMENT IN WEST APPROACH

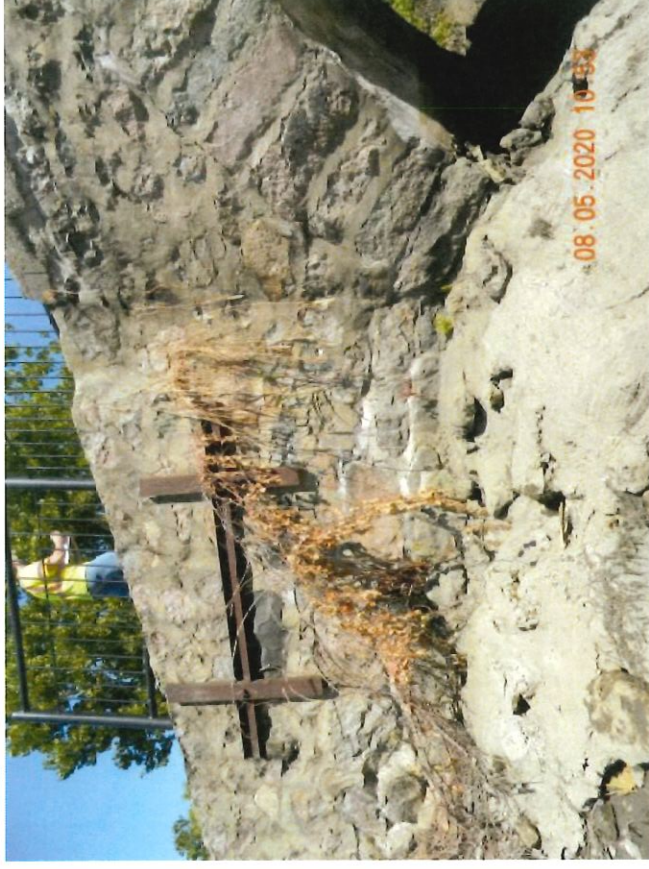


CRACKING OF PAVEMENT AT BRIDGE

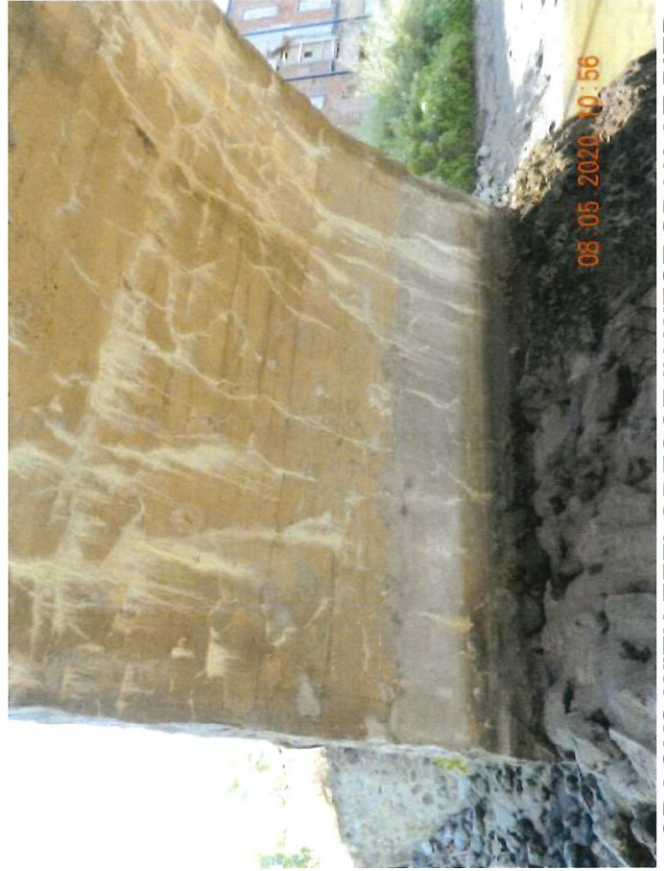
CITY OF GOSHEN BRIDGE NO. 301



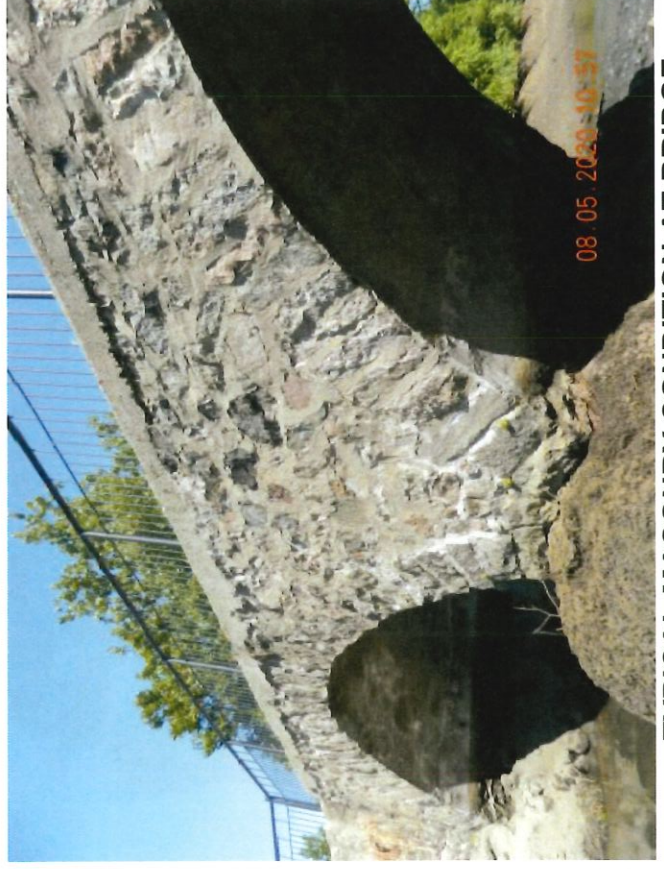
EROSION AT SOUTHWEST WINGWALL



VOIDS AT SOUTHWEST WINGWALL

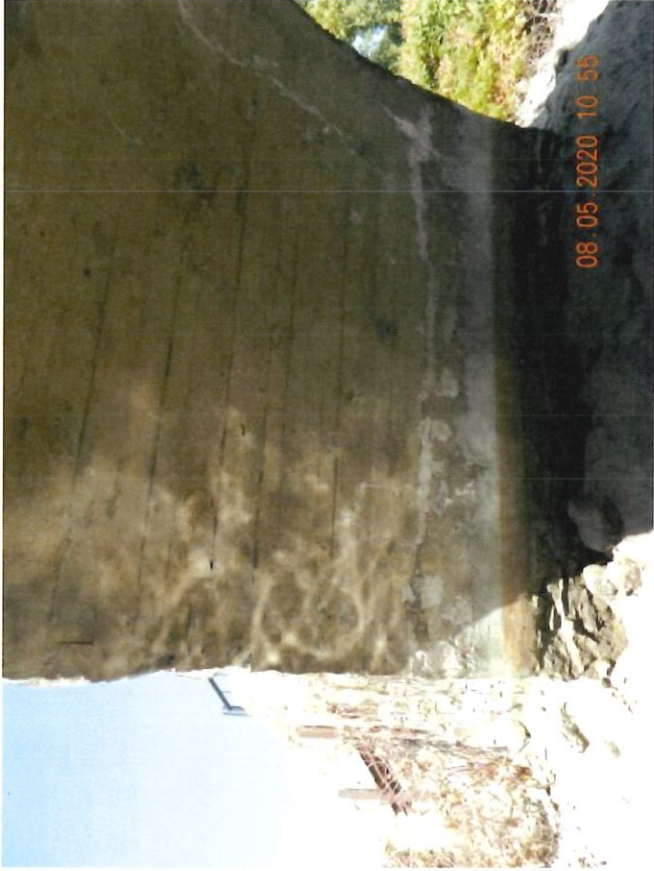


CRACKS WITH EFFLORESCE IN WEST SPAN AT PIER



TYPICAL MASONRY CONDITION AT BRIDGE

CITY OF GOSHEN BRIDGE NO. 301



WEST ABUTMENT



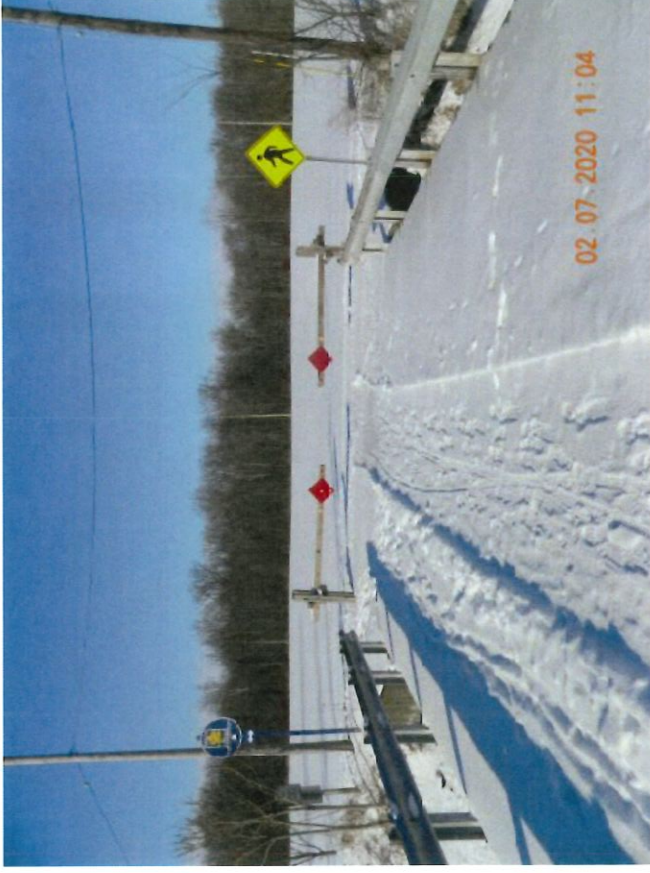
EAST ABUTMENT

CITY OF GOSHEN BRIDGE NO. 302

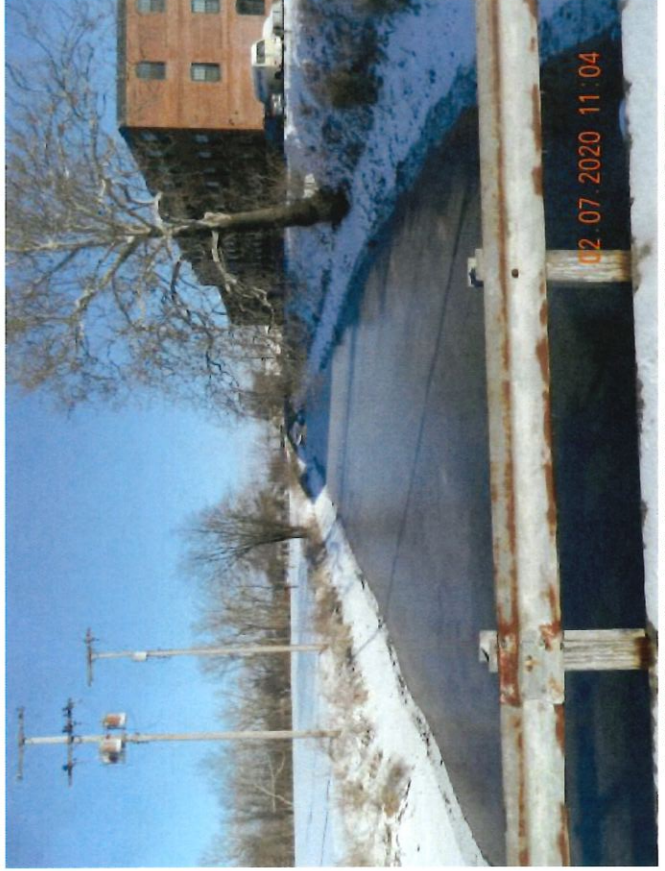
CITY OF GOSHEN BRIDGE NO. 302



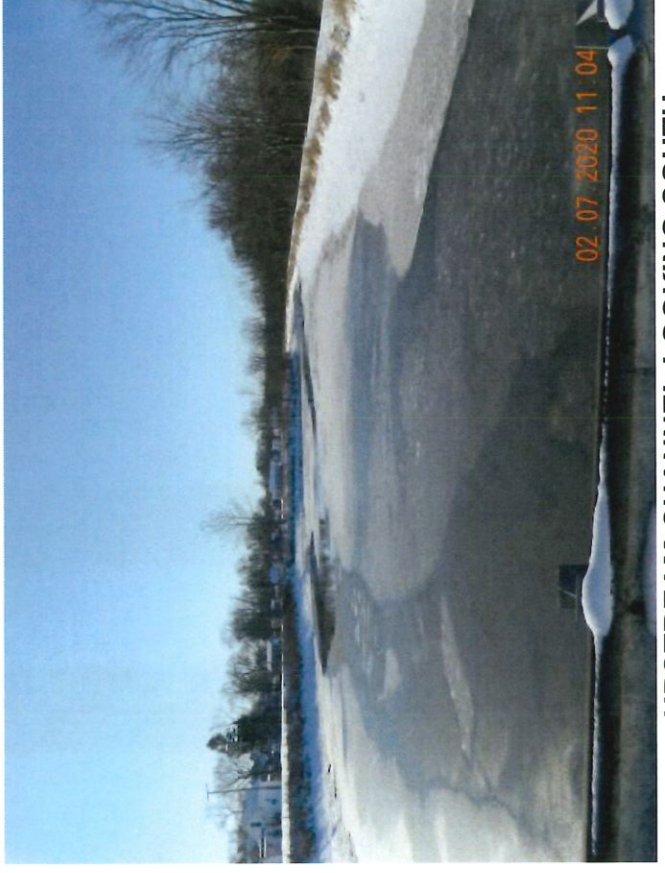
APPROACH LOOKING EAST



APPROACH LOOKING WEST



DOWNSTREAM CHANNEL LOOKING NORTH



UPSTREAM CHANNEL LOOKING SOUTH

CITY OF GOSHEN BRIDGE NO. 302



SECTION LOSS OF CAP BEAM AT BENT 2



SECTION LOSS OF WEST BENT CAP BEAM AT BENT 3



TYPICAL UNDERSIDE LOOKING EAST



TYP. PACK RUST IN ORIGINAL BENT CAPS AT BENTS 3, 4 & 5

CITY OF GOSHEN BRIDGE NO. 302



WEST BENT CAP BEAM AT BENT 4



SECTION LOSS OF CAP BEAM AT BENT 6



SECTION LOSS OF EAST BENT CAP BEAM AT BENT 5

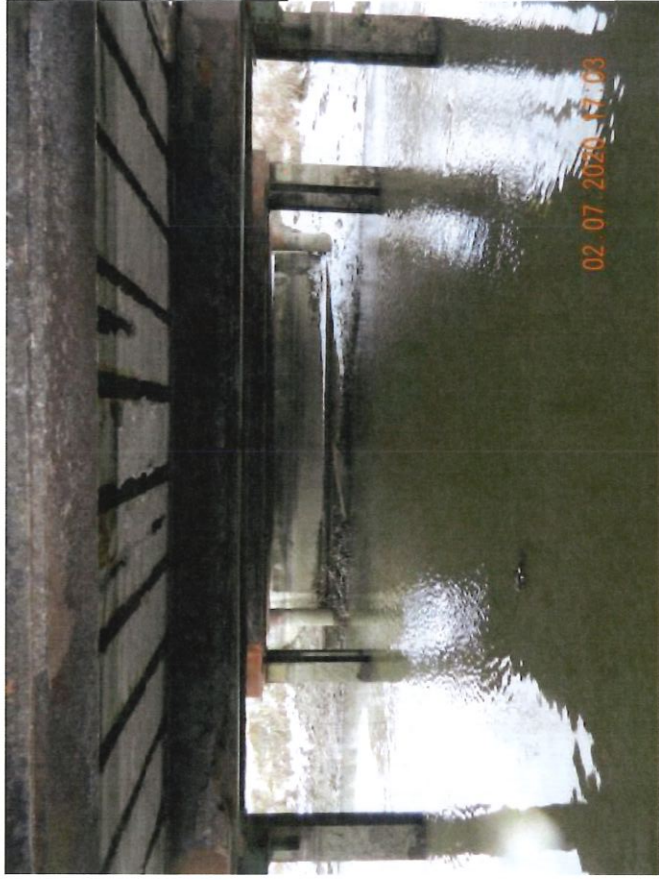


TYPICAL HEAVY RUST OF H-PILES

CITY OF GOSHEN BRIDGE NO. 302



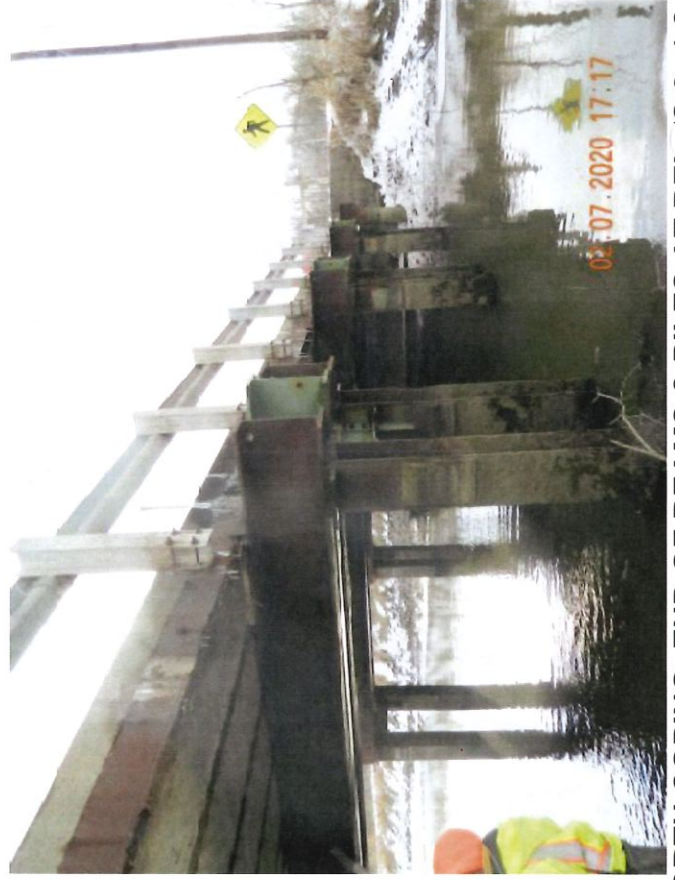
UNDERSIDE OF EAST SPAN



TYPICAL UNDERSIDE LOOKING WEST



EAST BENT CAP BEAM AT BENT 4



NORTH COPING, END OF BEAMS & PILES AT BENT 3, 4 & 5

CITY OF GOSHEN BRIDGE NO. 303

CITY OF GOSHEN BRIDGE NO. 303



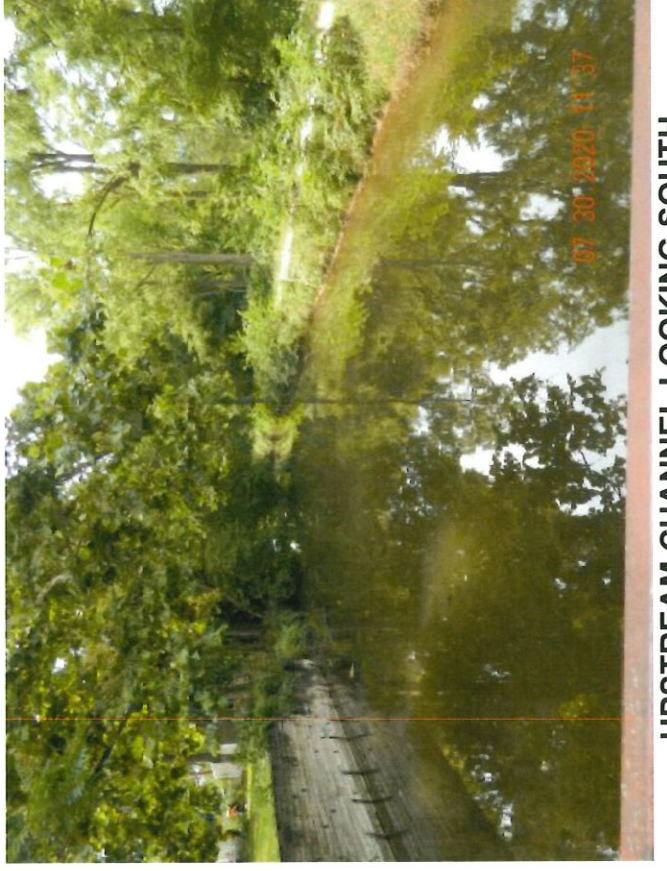
APPROACH LOOKING EAST



APPROACH LOOKING WEST



DOWNSTREAM CHANNEL LOOKING NORTH



UPSTREAM CHANNEL LOOKING SOUTH

CITY OF GOSHEN BRIDGE NO. 303



DENT IN DECK PLATE AT EAST END



GAP AT WEST APPROACH END OF BRIDGE



DAMAGED KICKBOARD IN SOUTH RAIL NEAR MIDSPAN



LOOSE FENCE IN NORTH RAIL AT EAST END

CITY OF GOSHEN BRIDGE NO. 303



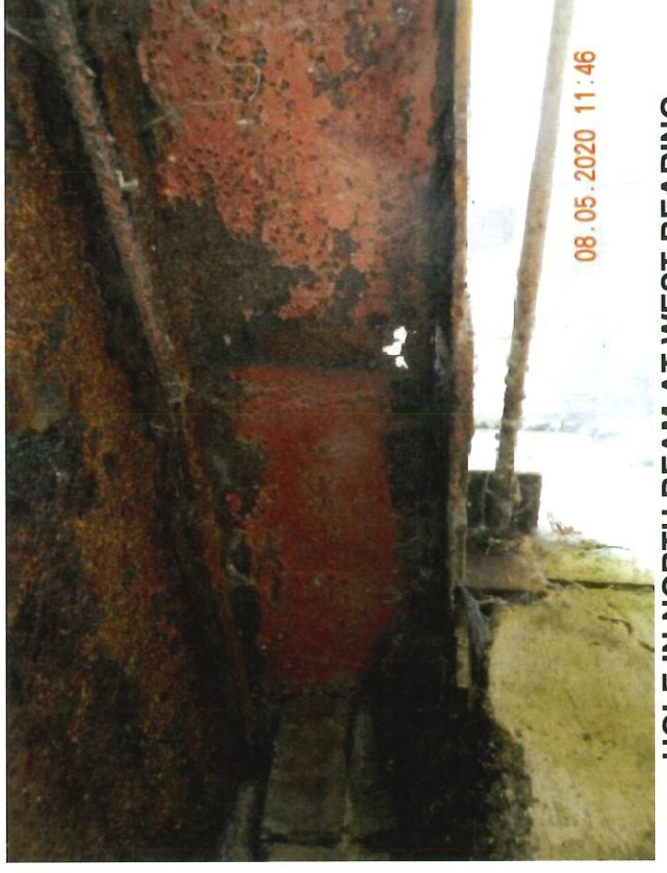
NORTH RAIL BENT AT WEST END



BROKEN TOP BAR IN BENT RAIL AT WEST END



BEARINGS AT WEST END



HOLE IN NORTH BEAM AT WEST BEARING

CITY OF GOSHEN BRIDGE NO. 303



TYPICAL RUST & PITTING OF STEEL BEAMS AND DECK PL



HEAVY RUST IN STEEL DIAPHRAGM



EAST ABUTMENT



SOUTHEAST RETAINING WALL LEANING

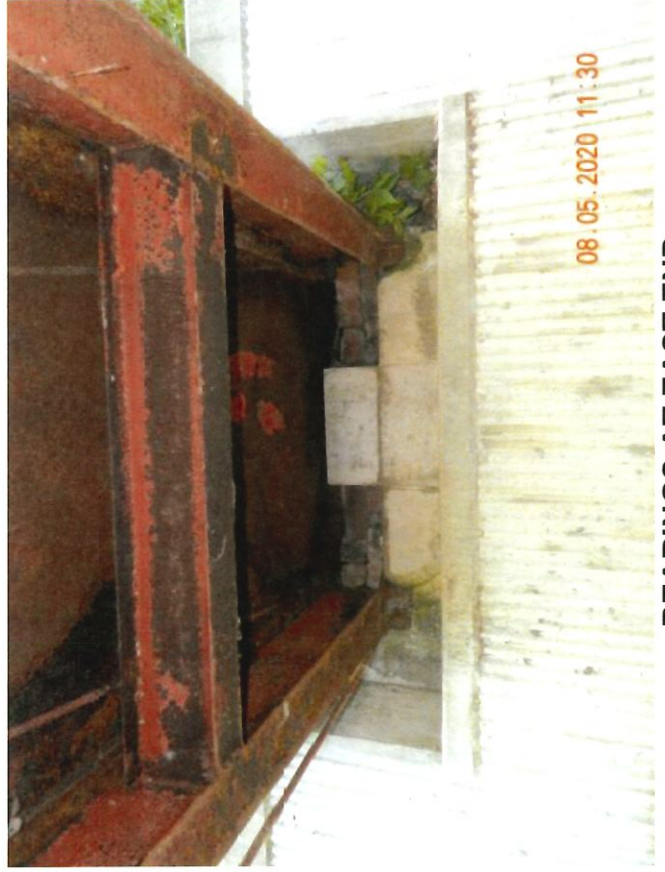
CITY OF GOSHEN BRIDGE NO. 303



WEST ABUTMENT



RUST AND SEPARATION OF DECK PL NEAR MIDSPAN



BEARINGS AT EAST END



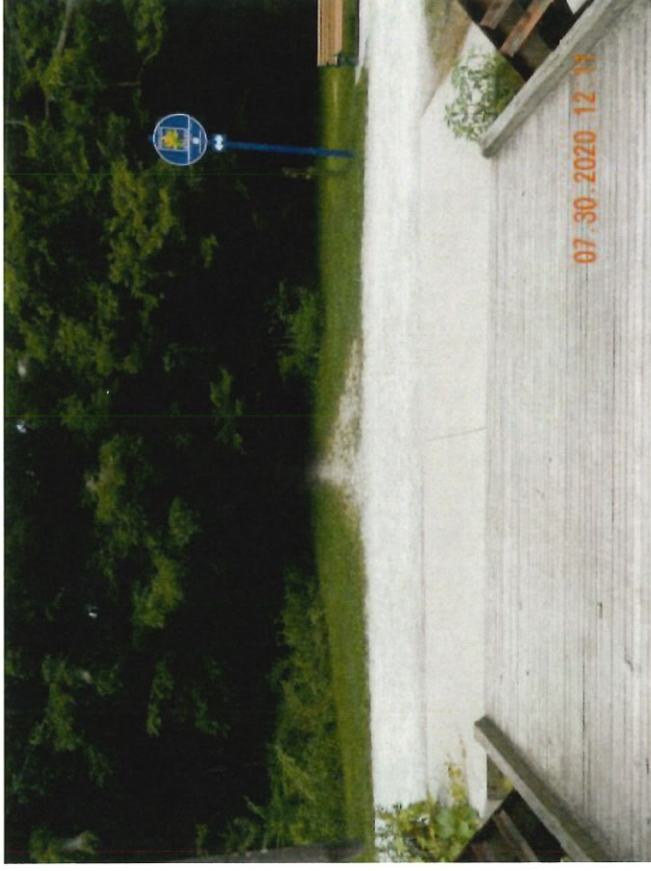
TYPICAL PACK RUST AT STEEL BEAMS & DECK PL

CITY OF GOSHEN BRIDGE NO. 304

CITY OF GOSHEN BRIDGE NO. 304



APPROACH LOOKING EAST



APPROACH LOOKING WEST



UPSTREAM CHANNEL LOOKING SOUTH

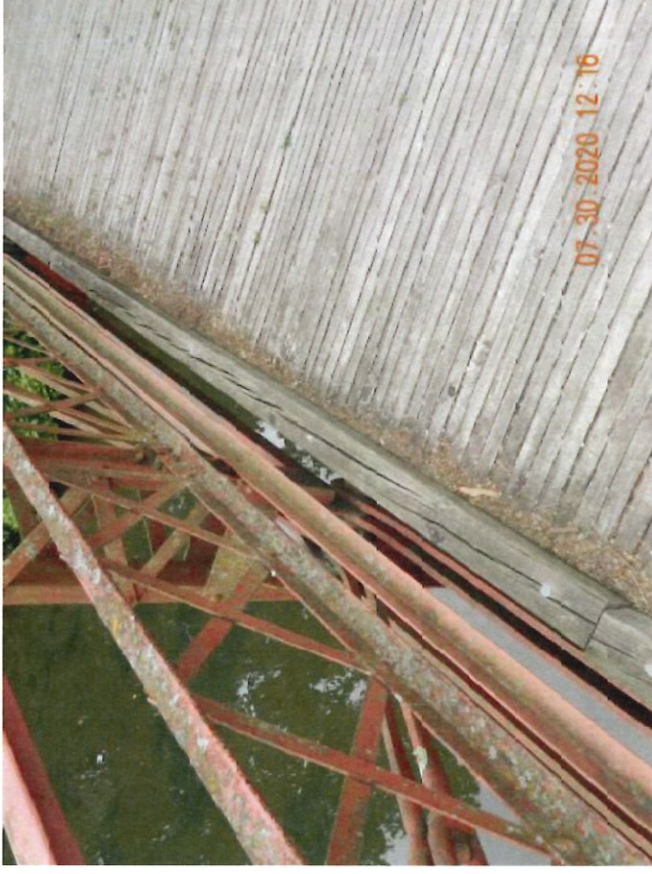


DOWNSTREAM CHANNEL LOOKING NORTH

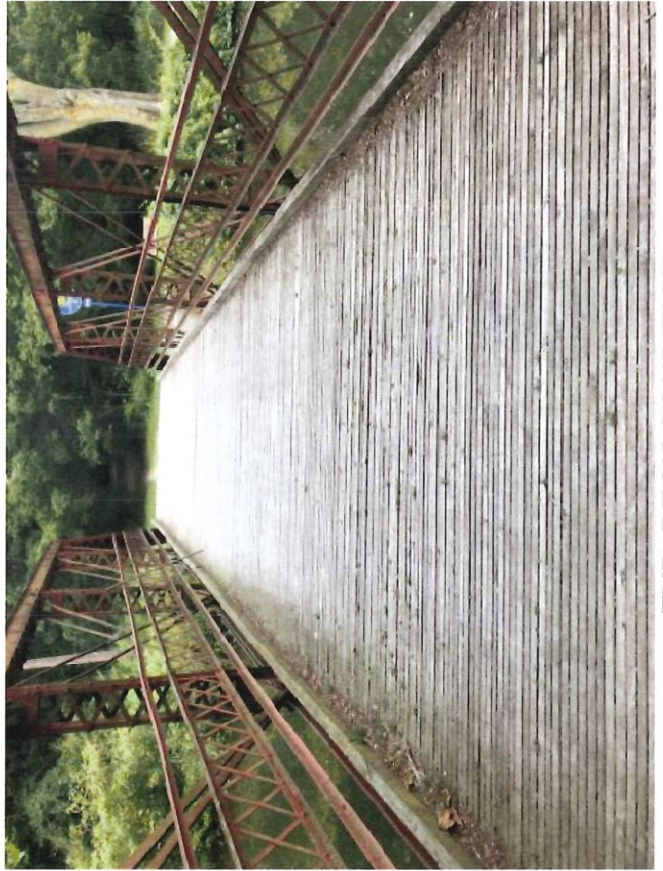
CITY OF GOSHEN BRIDGE NO. 304



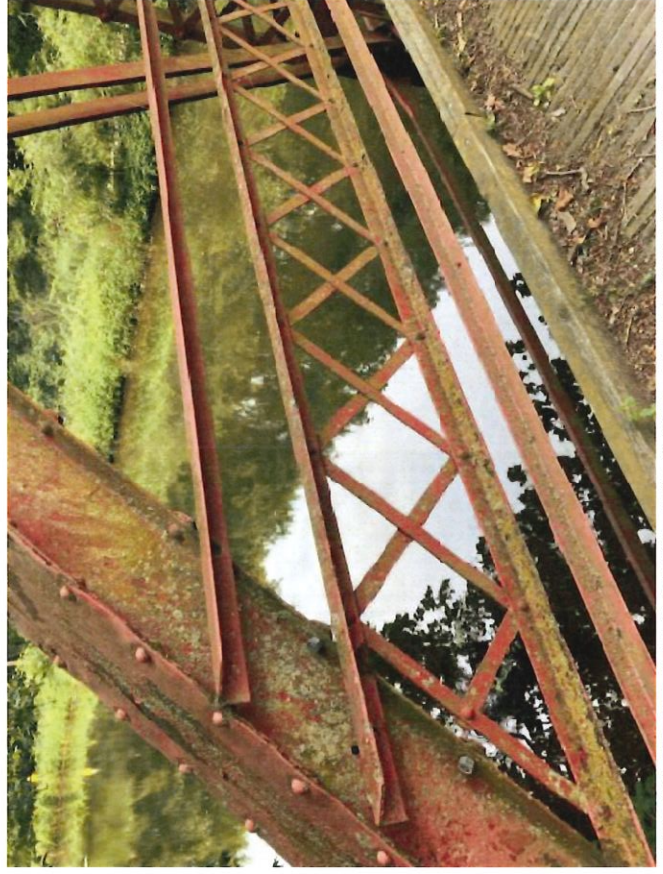
TYP. PITTING AND PAINT PEELING OF TRUSS



TYP. SPLITTING OF TIMBER CURBS



TYP. DECK CONDITION



MOISTURE AND RUST IN SOUTH TRUSS AT E ^ ST END

CITY OF GOSHEN BRIDGE NO. 304



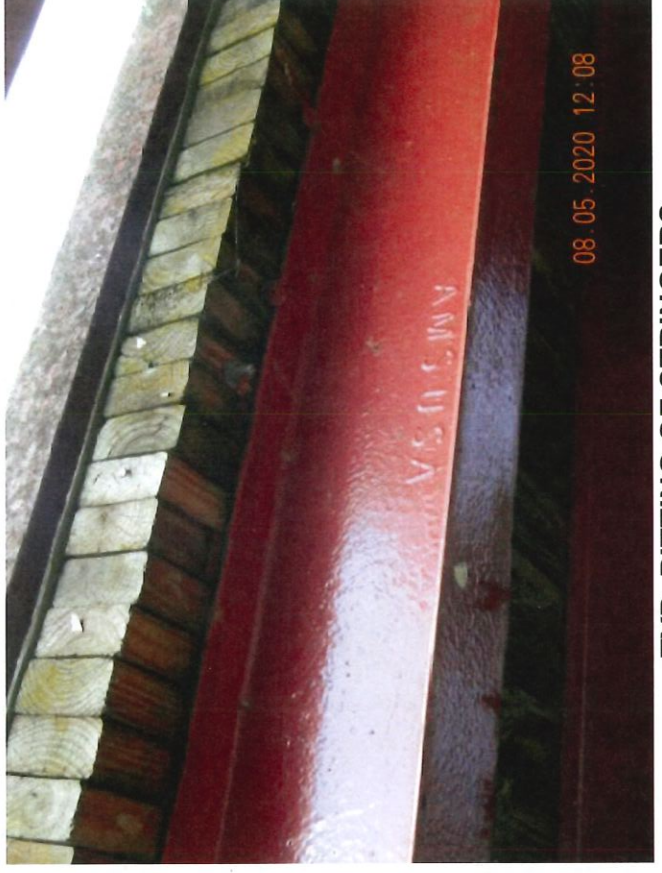
PITTING AND MINOR SECTION LOSS AT UPPER CHORD



TYP. PITTING OF FLOORBEAMS

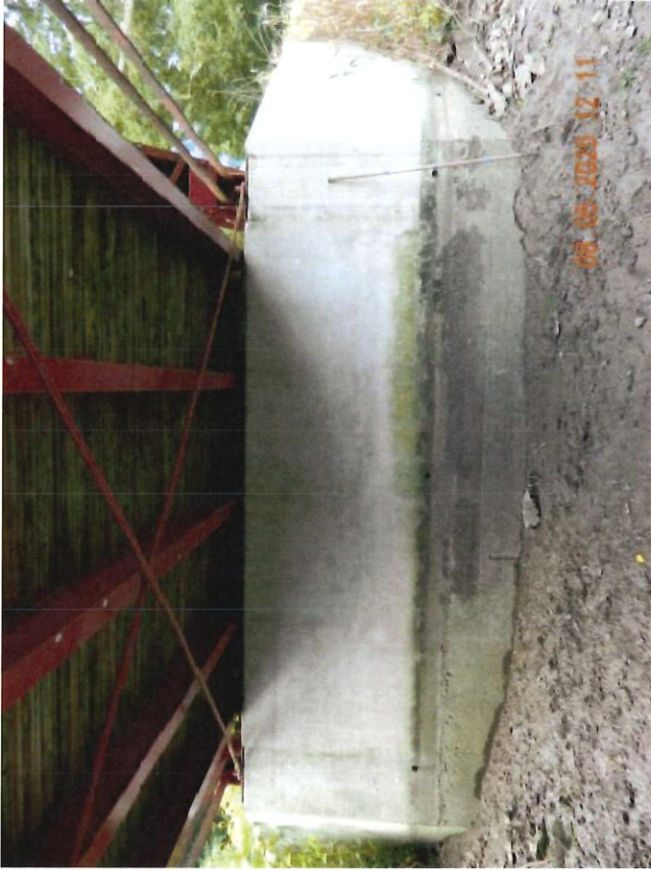


TYP. PACK RUST AND SECTION LOSS AT EYEBARS

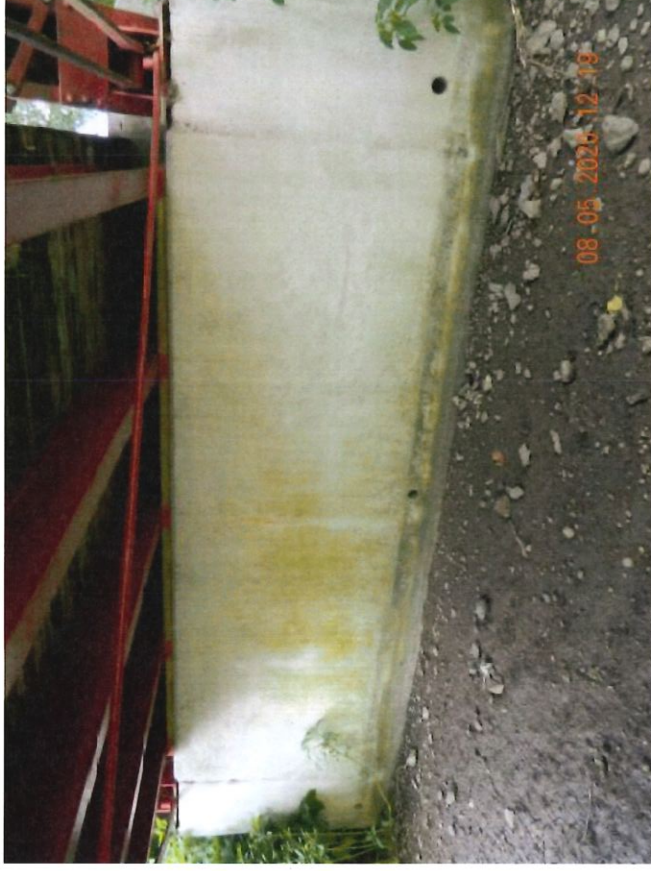


TYP. PITTING OF STRINGERS

CITY OF GOSHEN BRIDGE NO.304



WEST ABUTMENT



EAST ABUTMENT

CITY OF GOSHEN BRIDGE NO. 305

CITY OF GOSHEN BRIDGE NO. 305



APPROACH LOOKING EAST



APPROACH LOOKING WEST



UPSTREAM CHANNEL LOOKING SOUTH

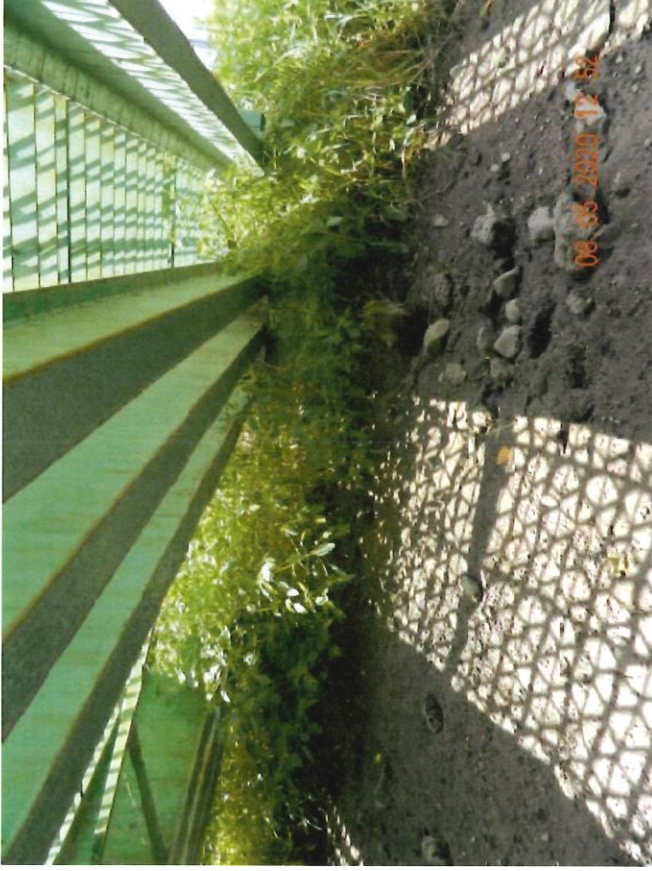


DOWNSTREAM CHANNEL LOOKING NORTH

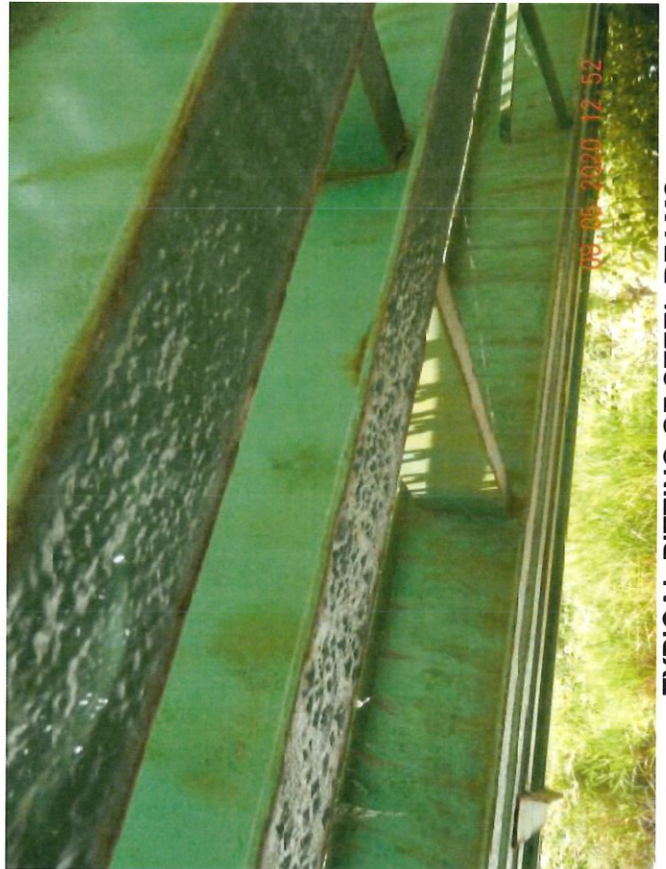
CITY OF GOSHEN BRIDGE NO. 305



VEGETATION GROWING UNDER EAST END OF BRIDGE



VEGETATION AT WEST END OF BRIDGE



TYPICAL PITTING OF STEEL BEAMS

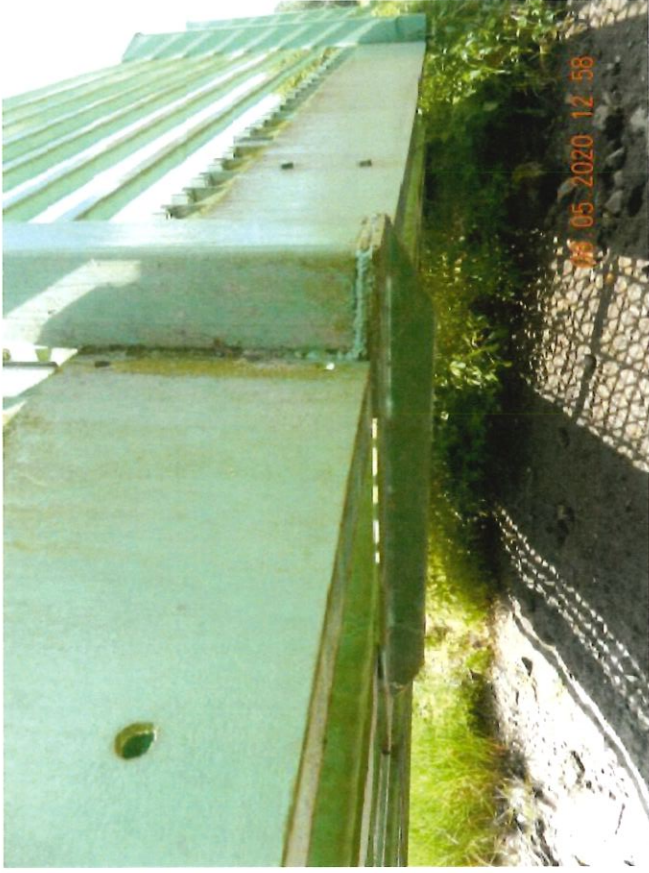


SCOUR DEPRESSION AT SOUTH END OF WEST PIER

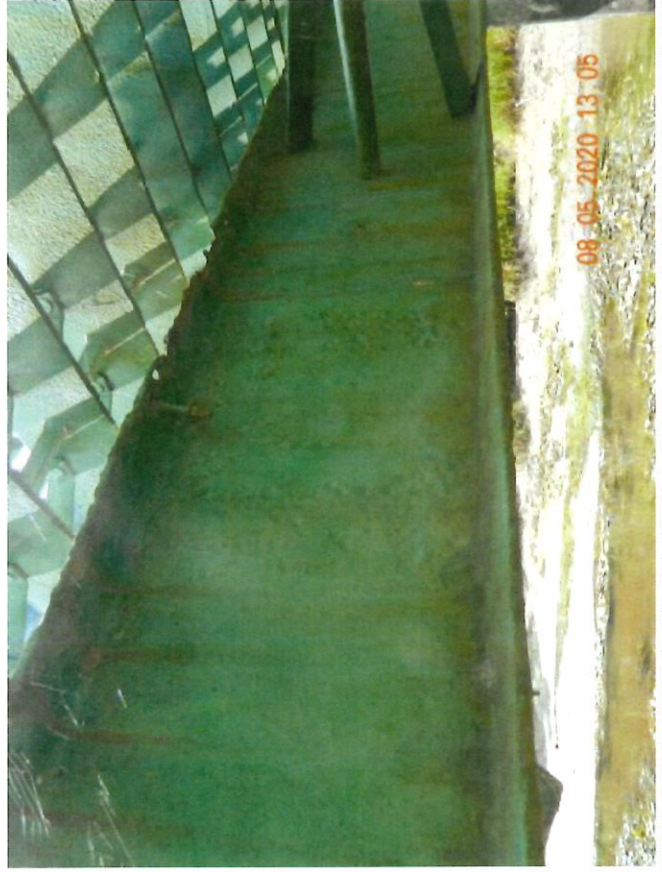
CITY OF GOSHEN BRIDGE NO. 305



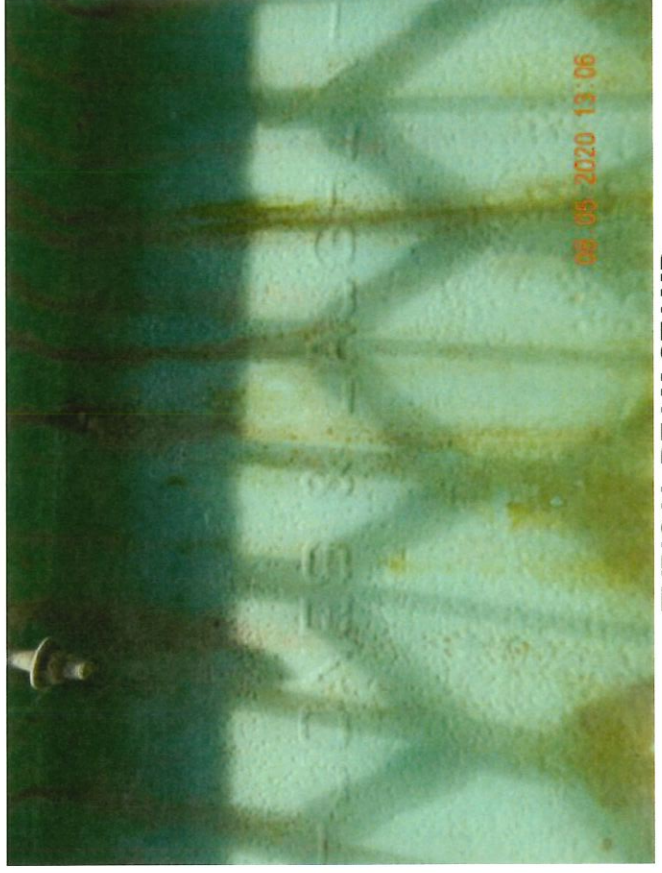
TYPICAL CRACKING WITH LEACHING AT PIERS



TYP. CONNECTION OF RAIL TO BEAMS



TYP. PITTING & SECTION LOSS ON FLANGES OF BEAMS



TYPICAL BEAM STAMP

CITY OF GOSHEN BRIDGE NO. 306

CITY OF GOSHEN BRIDGE NO. 306



APPROACH LOOKING EAST



APPROACH LOOKING WEST



UPSTREAM CHANNEL LOOKING SOUTH



DOWNSTREAM CHANNEL LOOKING NORTH

CITY OF GOSHEN BRIDGE NO. 306



TYP. CRACKING IN DECK SURFACE



CRACKING AND SCALING IN DECK SURFACE

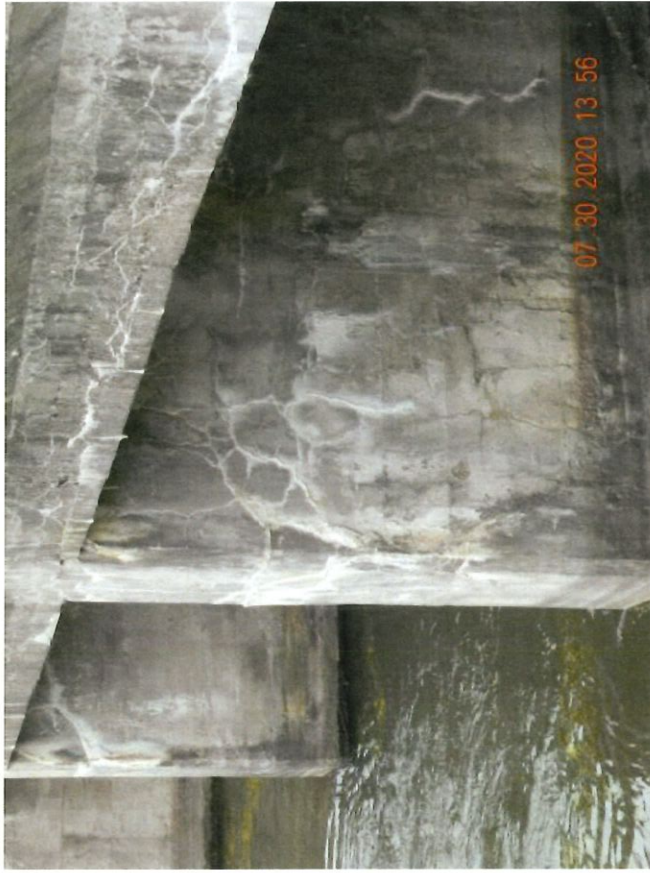


TYP. VOIDS IN GROUTED RIPRAP



CRACKING IN NORTH WINGWALL OF WEST ABUTMENT

CITY OF GOSHEN BRIDGE NO. 306



07 30 2020 13 56

HEAVY CRACKING WITH LEACHING IN PIER WALLS



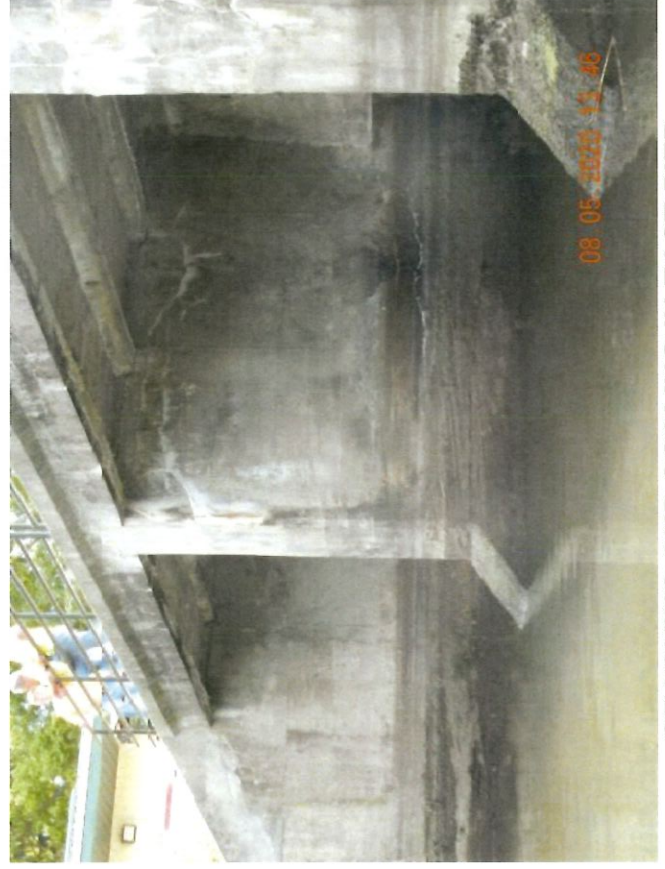
08 05 2020 13 44

UNDERSIDE OF WEST SPAN



08 05 2020 13 45

CRACKING AND SCALING IN WEST PIER



08 05 2020 13 46

CRACKING AND SCALING IN EAST PIER

CITY OF GOSHEN BRIDGE NO. 306



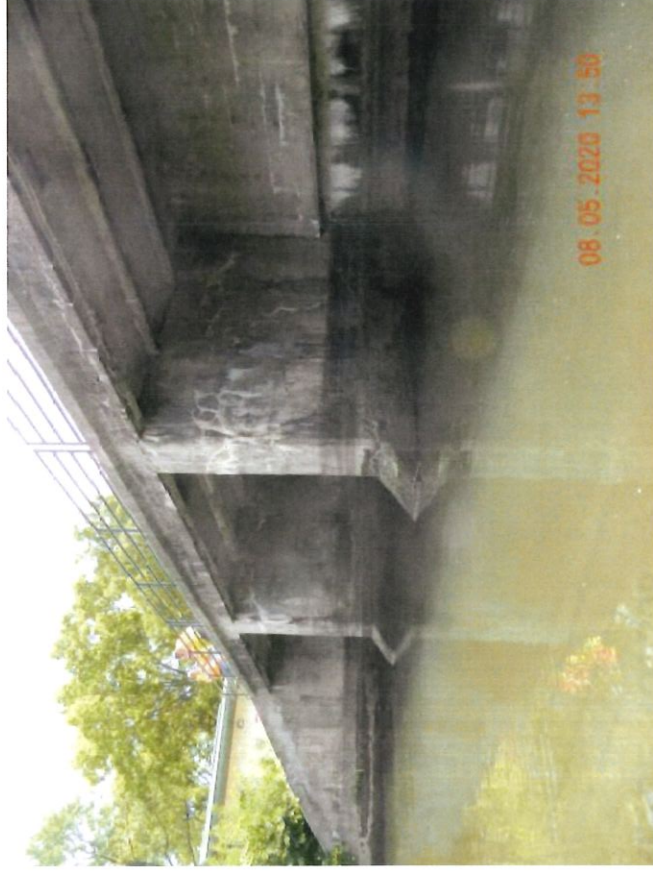
TYP. UNDERSIDE OF STRUCTURE



HEAVY CRACKING WITH LEACHING IN WEST PIER



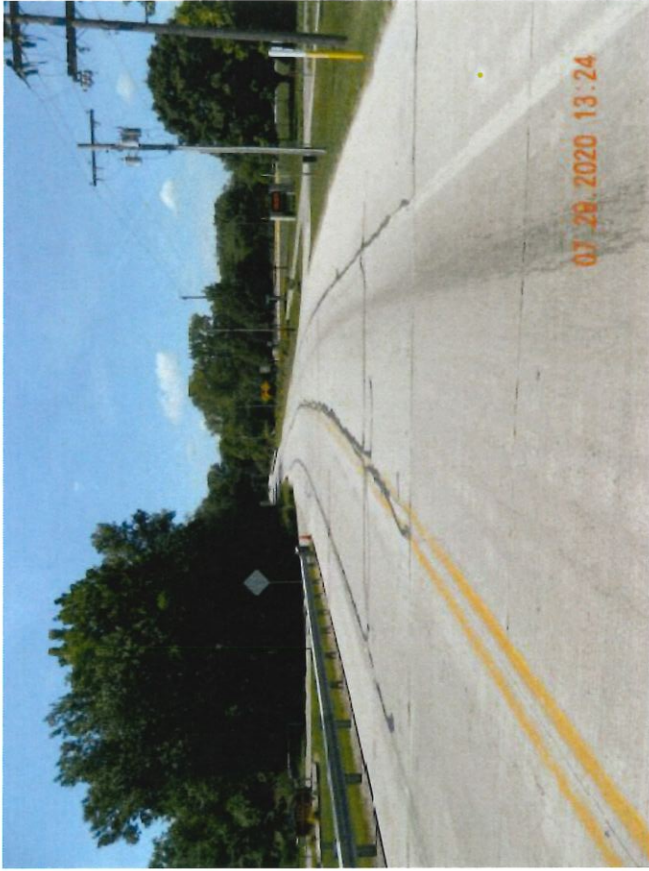
TYP. SCALING BELOW THE WATERLINE



NORTH ELEVATION OF STRUCTURE

CITY OF GOSHEN BRIDGE NO. 401

CITY OF GOSHLEN BRIDGE NO. 401



APPROACH LOOKING WEST



APPROACH LOOKING EAST

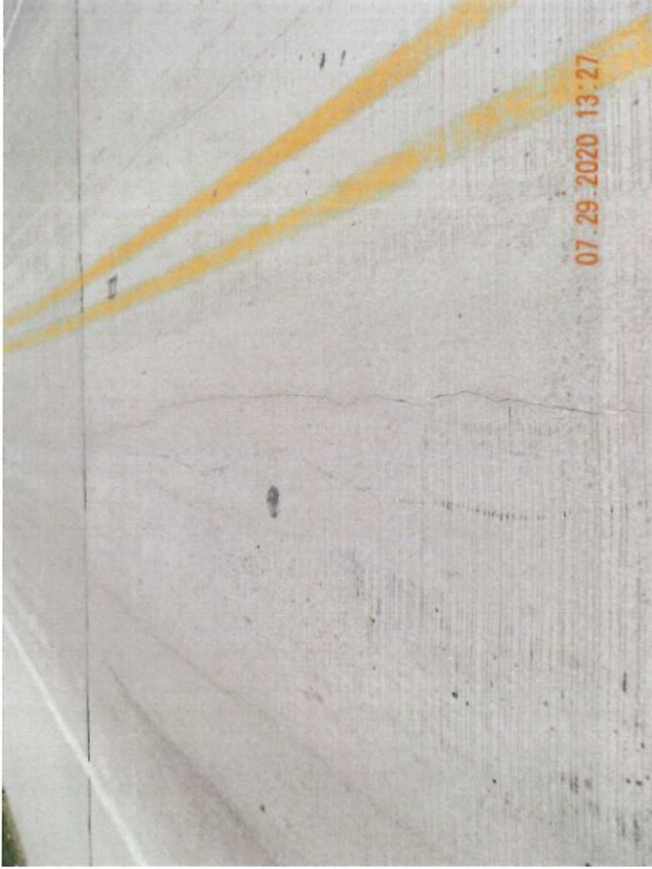


LONGITUDINAL CRACKING IN SLAB SURFACE



LONGITUDINAL CRACKING - TYP. SPACING

CITY OF GOSHEN BRIDGE NO. 401



LONGITUDINAL CRACKING IN SLAB SURFACE



UNDERSIDE OF TOP SLAB W/ LONGITUDINAL CRACKING



LONGITUDINAL CRACKING IN UNDERSIDE OF TOP SLAB



MINOR MAP CRACKING IN SURFACE OF BOT™ SLAB

CITY OF GOSHEN BRIDGE NO. 402

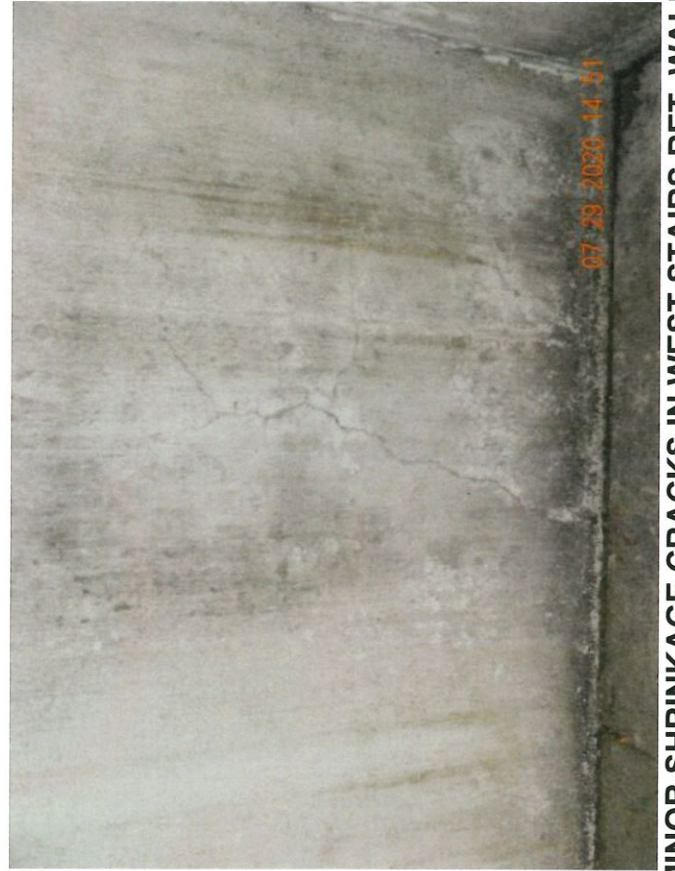
CITY OF GOSHEN BRIDGE NO. 402



WEST STAIRS LOOKING SOUTH



EAST STAIRS LOOKING SOUTH

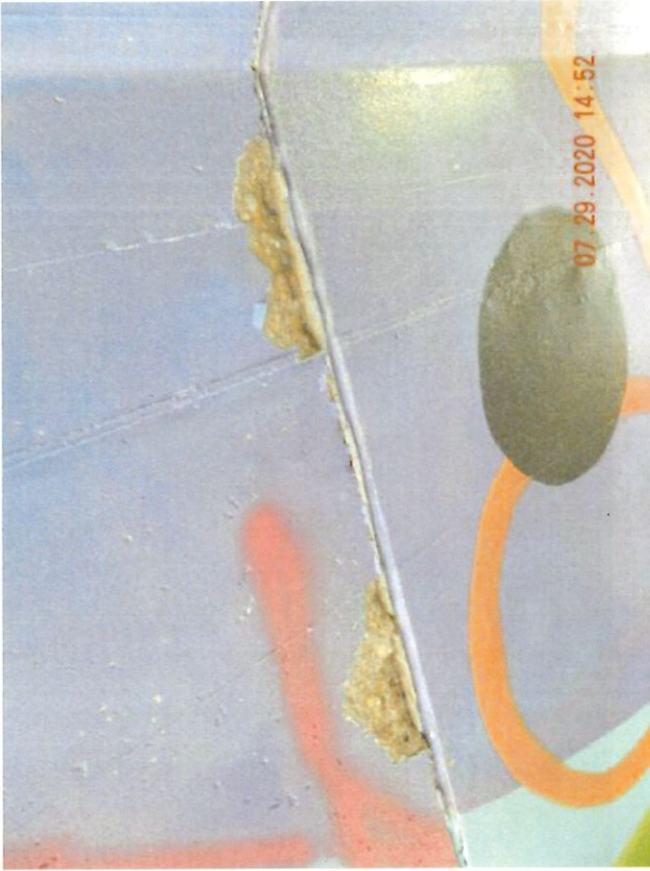


MINOR SHRINKAGE CRACKS IN WEST STAIRS RET. WALL



MINOR MAP CRACKING IN BOTTOM SLAB

CITY OF GOSHEN BRIDGE NO. 402



SURFACE SPALLS IN TOP SLAB OF UNIT 2 FROM WEST



CRACKING IN SIDEWALK APPROACH AT WEST STAIRS



INNOVATIVE IDEAS
EXCEPTIONAL DESIGN
UNMATCHED CLIENT SERVICE

APPENDIX B

DESCRIPTION OF ITEMS

APPENDIX B – NBI ITEM DESCRIPTIONS & GLOSSARY OF TERMS

1. State: “Indiana” (185) for all bridges.
2. Hwy District: INDOT highway district number in which the bridge is located.
3. County: County code and name.
4. City/Town: City and town code and name are listed. Bridges are listed as being in an urban area rather than within actual corporation limits. This item is coded all “zeros” for bridges in rural locations.
5. Features Intersected: This is the stream, road, railroad and/or other features under the bridge.
6. Facility Carried: This is the name of the local road as named by the county.
7. Bridge Number: This is the bridge number which, in general, follows the LTAP bridge numbering system.
8. Location: The location of the bridge using local road designations, county lines, other locally recognized features, or map boundary location codes.
16. Latitude: The latitude found on USGS maps.
17. Longitude: The longitude found on USGS maps.
26. Year Built: Year (or approximate year) the bridge was built.
27. Lanes on Str.: Lanes of highway traffic carried on the structure and lanes of highway traffic under the bridge.
28. ADT: Current average daily traffic count on bridge to the nearest ten vehicles. These were estimated where recent counts were not available.
29. Year of ADT: Year traffic count was taken or estimated.
30. Design Load: The live load which the bridge was evaluated for load rating purposes.
31. Approach Roadway Width/Shldr.: Shoulder-to-shoulder width of the approach roadway.
32. Skew: The angle of bridge skew to the nearest degree.
- 36B. Bridge Railing Type: Identifies the type of railing on the bridge.

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37. **Historical Significance:** This item indicates that a bridge may be a particularly unique example of the history of engineering; the crossing itself might be significant; the bridge may be associated with a historical property or area; or the bridge may be associated with significant events or circumstances. One of the following 1-digit codes are used as applicable:
1. Bridge is on the National Register of Historic Places.
 2. Bridge is eligible for the National Register of Historic Places.
 3. Bridge is possibly eligible for the National Register of Historic Places or bridge is on a State or Local historic register. (Requires further investigation before determination can be made.)
 4. Historical significance is not determinable at this time.
 5. Bridge is not eligible for the National Register of Historic Places.
38. **Open, Posted or Closed:** This item indicates the operational status of the bridge; “K” = closed to all traffic, “P” = open to traffic with load posted; “A” = open to traffic without load posted, “B” = open; posting required, “G” = new bridge; not yet open; “R” = posted for other than load.
39. **Type Service:** Describes the function of the bridge. This is usually highway or highway-pedestrian.
- 43A. **Structure Type-Main:** The structural type of bridge for the main spans of the bridge.
- 43C. **Main Widening Type:** The structural type of material used for widening, if that has occurred.
44. **Structure Type-Approach:** The structural type for the approach spans, if they are a different material or construction type than the main spans.
45. **Number of Spans-Main:** The number of spans in the main units of the bridge.
46. **Number of Spans-Approach:** The number of spans in the approach units of the bridge.
47. **Total Horizontal Clearance:** The distance to the nearest tenth of a foot between the most restrictive features limiting the roadway. Where no such features existed, the deck width was used. When two clearances are recorded after this item, the second clearance is the distance between the most restrictive features limiting the use of the highway or railroad under the bridge. This is recorded only when the bridge is over a highway or railroad.
48. **Maximum Span Length:** The length to the nearest tenth of a foot of the longest span.
49. **Structure Length:** The total length of bridge from backwall to backwall to the nearest foot.

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50. **Bridge Roadway Width (Curb-Curb):** The distance between curbs on the bridge to the nearest tenth of a foot. Where curbs do not exist, the distance between parapets, railings or guardrails is used.
51. **Deck Width (Out-Out):** The total width of the bridge roadway to the nearest tenth of a foot.
58. **Deck:** Describes the material and condition of the bridge floor, wearing surface, expansion joints, curbs, railings, deck drains and other associated items.
59. **Superstructure:** Describes the material and condition of the deck supporting members, their connections and bearings.
60. **Substructure:** Describes the material and condition of the superstructure supporting elements such as abutments, piers, bents, piles and others.
61. **Channel & Channel Protection:** Describes the channel, its protections and any problems associated with the channel.
62. **Estimated Remaining Life:** The estimated remaining life of the bridge with repairs but without major reconstruction. This estimate on each of the major components takes into account the material condition, the load rating, the traffic counts and other factors.
63. **Operating Rating:** Operating rating is the maximum live load that can be occasionally carried by a bridge. See Item 66, Inventory Rating.
64. **Inventory Rating:** Inventory rating is the maximum live load that can safely utilize an existing structure for an indefinite period of time. The range of loading above the inventory rating up to the operating rating should be allowed only by written permit from the County.
65. **Structural Condition:** Describes major structural deficiencies.
66. **Deck Geometry:** Describes deficiencies in deck width.
67. **Bridge Posting:** Describes the load capacity, relative to the legal load allowed, to show when posting is required.
68. **Waterway Adequacy:** Describes deficiencies in the waterway, the bridge opening and slope protection at the bridge. The waterway opening under the bridge was judged to be adequate or inadequate from drift and other signs and without a hydraulic analysis.

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69. **Year Needed:** The year that improvements, repairs or replacement is recommended by the inspecting engineer.
75. **Type of Work:** This describes the type of work recommended as repair, widening, replacement or construction of a new bridge at the same or another location or for a new type of service.
90. **Inspection Date:** The date the structure was inspected.
91. **Designated Inspection Frequency:** The designated inspection interval, in months, for each bridge in the inventory.

Bridges will require special non-scheduled inspections after unusual physical traumas.

92. **Bridge Improvement Cost:** Only bridge construction costs are included. No bridge maintenance costs are included.
93. **Roadway Improvement Cost:** Only roadway construction costs are included. No roadway maintenance costs are included.
94. **Total Project Cost:** All costs normally associated with the proposed bridge improvement project, including right-of-way, detour, preliminary engineering, construction inspection and other incidental costs are included. No maintenance costs are included.
95. **Year of Improvement Cost Estimate:** The base year of the improvement costs provided in Items 94 through 96, with cost data provided to be no more than 8 years old.
106. **Year Reconstructed:** Indicates the year of reconstruction or rehabilitation of the structure, where applicable.

For a bridge to be defined as reconstructed, the type of work performed, whether or not it meets current minimum standards, must have been eligible for funding under any of the Federal-aid funding categories. The eligibility criteria would apply to the work performed regardless of whether all State or local funds or Federal-aid funds were used.

107. **Deck Structure Type:** Describes the type of deck system on the bridge. If more than one type of deck system is on the bridge, the most predominant is indicated.
108. **Wearing Surface/Protective System:** Indicates information on the wearing surface and protective system of the bridge deck.



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113A. Scour: Identifies the current status of the bridge regarding its vulnerability to scour, as follows:

Code	Description
U	Unknown Foundation
N	Bridge not over waterway.
8	Bridge foundations (including piles) well above flood water elevations.
8	Bridge foundations determined to be stable for calculated scour conditions; calculated scour is above top of footings.
7	Countermeasures have been installed to correct a previously existing problem with scour. Bridge is no longer scour critical.
6	Scour calculation/evaluation has not been made (Use only to describe case where bridge has not yet been evaluated for scour potential).
1	Bridge foundations determined to be stable for calculated scour conditions; scour within limits of footing or piles.
4	Bridge foundations determined to be stable for calculated scour conditions; field review indicates action is required to protect exposed foundations from effects of additional erosion and corrosion.
3	Bridge is scour critical; bridge foundations determined to be unstable for calculated scour conditions: Scour within limits of footing or piles. Scour below spread-footing base or pile tips.
2	Bridge is scour critical; field review indicates that extensive scour has occurred at bridge foundations. Immediate action is required to provide scour countermeasures.
1	Bridge is scour critical; field review indicates that failure of piers/abutments is imminent. Bridge is closed to traffic.
0	Bridge is scour critical. Bridge has failed and is closed to traffic.

113B. Foundation Type: Identifies the type of foundation if known.

Items 58 through 62 and Item 65 are given a numerical “CONDITION” rating as follows:

Rating	Description
N	Not Applicable.
9	New Condition.
8	Very Good Condition: No repairs needed.
7	Good Condition: Some minor problems.



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6	Satisfactory Condition: Potential exists for “major maintenance” with major items in need of repair by maintenance forces.
5	Fair Condition: Potential exists for “minor rehabilitation” with major repair by contract needed.
4	Poor Condition: Potential exists for “major rehabilitation” with minimum adequacy to tolerate present traffic; immediate rehabilitation necessary to keep open.
3	Serious Condition: Repair or rehabilitation required immediately with inadequacy to tolerate present heavy load; “warrants closing bridge to trucks”.
2	Critical Condition: The need for repair or rehabilitation is urgent. The facility should be closed until the indicated repair is complete with inadequacy to tolerate any live load; “warrants closing bridge to all traffic”.
1	Imminent Failure Condition: The “facility is closed”. Study should determine the feasibility of the bridge being repairable, if desirable to reopen to traffic.
0	Failed Condition: The “facility is closed” and the bridge conditions are beyond repair; “danger of immediate collapse”.

Items 67 through 72 are given a numerical “APPRAISAL” rating as follows:

Rating	Description
N	Not Applicable.
9	Superior to present desirable criteria.
8	Equal to present desirable criteria.
7	Better than present minimum criteria.
6	Equal to present minimum criteria.
5	Somewhat better than minimum adequacy to tolerate being left in place as is.
4	Meets minimum tolerable limits to be left in place as is.
3	Basically intolerable condition requiring high priority of repair.
2	Basically intolerable condition requiring high priority of replacement.
0	Closed, immediate replacement necessary to put back in service.