Detailed Bridge Inspection Report

- 2016 -

Indiana & Ohio Rail Corporation

DT&I Line (Old South Charleston Portion Only)

Springfield, OH to Jeffersonville, OH

Inspection Summary Report

Indiana & Ohio Rail Corporation

DT&I Line (Old South Charleston Portion Only)

The purpose of this inspection was to identify structural deficiencies within the bridges and to determine the extent of internal decay in the timber members. On timber bridges, particular attention was paid to decay vulnerable areas such as the groundline, waterline, brace bolt connections and bearing areas of the members. The size and location of internal voids were then recorded, along with any visual observations. Concrete and steel bridges were examined in areas which commonly develop structural deficiencies, such as bearing areas and connection points.

This inspection used subjective inspection techniques and also relied heavily upon human judgment. It is possible that some deficiencies may not have been discovered. The inspection does not guarantee that all defects will be identified in steel and concrete members. Internal steel defects and defects in inaccessible areas may not be located, as only visual inspection techniques will be utilized by means of climbing. However, we are confident that all of the critical visible defects and critical internal wood fiber deterioration have been found. This inspection did not include underwater inspection, excavation of buried members, or a rating of the structures.

This report summarizes the defects found and provides a prioritized listing of repair recommendations. Our priority rating system is a measure of the level of importance associated with repairing defective members or conditions found at the time of the inspection. All high priority conditions should be repaired in a timely fashion, since the seriousness of a particular defect can become greater over time, and with it, the structure's repair priority. Railroad Bridge components are interactive with each other structurally; therefore, substandard members can affect the overall structural integrity of a Railroad Bridge. An explanation of this priority system can be found on the blue sheets included in this report.

Substandard timber components are classified as EXCEPTION or POSSIBLE EXCEPTION. An "exception" is defined as a timber component that has either failed, been damaged, or decayed to the point where it can no longer safely carry the load to which it is being subjected. "Exception" conditions should be monitored frequently until repairs are made. A "possible exception" refers to a timber component not decayed or damaged sufficiently to be classified as an exception, but is deteriorated enough to be considered for replacement in the future. "Possible Exception" and other conditions have been noted in the following report, but are not assigned repair recommendations at this time. Priority ratings can be found in the Boring or Structure Report. "Possible Exception" and other conditions should be monitored and assessed for repair based on the rate of deterioration.

We recommend that all of the timber bridges containing over 20% decay be in-place preservative treated to control existing decay and help reduce costly future repairs. Once decay is established, it continues to grow at an accelerated rate, subsequently leading to substantial section loss and eventual failure of the component. Service records to date have shown that in-place preservative treatment is effective in controlling decay and prolonging the life of timber structures.

Dimensions of all members shown in the inspection records should be field verified before commencing repairs.

Inspection Summary Report

Indiana & Ohio Rail Corporation

DT&I Line (Old South Charleston Portion Only)

At the time of inspection, the following bridges were flagged for Engineer Review. The conditions at these bridges are high priority and should be reviewed by the Railroad Bridge Engineer to determine monitoring frequencies, speed restrictions or other restrictive measures required to protect train operations.

Bridge Number/Section

No bridges were flagged for Engineer Review at the time of inspection.

All recommendations and priority ratings are the result of good faith subjective judgments of Inspectors based on conditions present at the time of this inspection, utilizing industry standards and procedures as well as information made available to Koppers by the Railroad. Recommendations and priority ratings are based on defects found that may limit or adversely affect the original capacity or structural integrity of the Railroad Bridge. Due to the potential for inaccessible or hidden conditions, not all defective members or conditions will be found. No capacity or load rating of the Railroad Bridge has been performed. Conditions and standards can and do change, so frequent re-inspection and evaluation is recommended. Railroad Bridge components are interactive with each other structurally; therefore, substandard members can affect the overall structural integrity of a Railroad Bridge. Koppers makes no warranty or guarantee, express or implied, as to structural integrity and Koppers assumes no responsibility or liability whatsoever for any loss or damage incurred as a result of any performance failure of any Railroad Bridge or structure.

KOPPERS

Indiana & Ohio Rail Corporation

BRIDGE LIST

LINE: DT&I Line (Old South Charleston Portion Only)

Springfield, OH - Jeffersonville, OH

Bridge NO.	Location	ST	Mile Post	SEC NO.	Spans	Type	Timber/ Steel Bents	Timber Piers	Concrete/ Steel Piers	Abutments	Year Const	SEC Length	AVG Span Length	MAX Height EST
201.25 OHH	Springfield	OH	201.25	1		OHH								
201.27 OHH	Springfield	OH	201.27	1		OHH								
222.22	Jeffersonville	OH	222.22	1	5	Beam Span	4			2	2008	125	25	11
223.20 OHH	Jeffersonville	OH	223.20	1		OHH								
223.22 OHH	Jeffersonville	OH	223.22	1		OHH								
223.52	Jeffersonville	OH	223.52	1	3	Beam Span			2	2	1954	144	48	15
224.70	Jeffersonville	OH	224.70	1	5	Beam Span	4			2	2007	120	24	10

Indiana & Ohio Rail Corporation

Bridge Inventory

Line/Subdivision	Bridge Number	Section Number	Mile Post	Town/Station	State	County	Type	NO Spans	NO Tracks	Section Length	Avg. Span Length	Max. Height Est.	Deck Type	Year Const.	Feature Crossed	Latitude	Longitude
DT&I Line (Old South Charleston Portion Only)	201.25 OHH	1	201.25	Springfield	OH	Clark	OHH	0	1						Interstate 70	N 39 53.414	W 83 45.895
DT&I Line (Old South Charleston Portion Only)	201.27 OHH	1	201.27	Springfield	OH	Clark	OHH	0	1						Interstate 70	N 39 53.4417	W 83 45.9064
DT&I Line (Old South Charleston Portion Only)	222.22	1	222.22	Jeffersonville	OH	Fayette	Beam Span	5	1	125	25	11	Open	2008	Sugar Creek	N 39 39.43	W 83 33.79
DT&I Line (Old South Charleston Portion Only)	223.20 OHH	1	223.20	Jeffersonville	OH	Fayette	OHH	0	1						Interstate 71	N 39 38.735	W 83 33.06
DT&I Line (Old South Charleston Portion Only)	223.22 OHH	1	223.22	Jeffersonville	OH	Fayette	OHH	0	1						Interstate 71	N 39 38.698	W 83 33.024
DT&I Line (Old South Charleston Portion Only)	223.52	1	223.52	Jeffersonville	OH	Fayette	Beam Span	3	1	144	48	15	Ballast	1954	Sugar Creek	N 39 38.5978	W 83 32.9045
DT&I Line (Old South Charleston Portion Only)	224.70	1	224.70	Jeffersonville	OH	Fayette	Beam Span	5	1	120	24	10	Open	2007	Sugar Creek	N 39 37.7504	W 83 32.1344

Span Lengths and Detailed Superstructure and Substructure information are located in individual bridge reports.

RECOMMENDATIONS

The following is a summary of recommendations for repair. These repair recommendations are prioritized based on Genesee & Wyoming specifications.

The priority rating for repairs listed below has been established by Genesee & Wyoming. Please note all Priority 1, 2 and 3 conditions can be and have previously been considered Koppers Priority 2 "Condition is structurally unsound and could cause failure at any time. Repair as soon as possible. Condition must be monitored by Railroad personnel until repairs have been completed."

An inspection sheet has been included for the structure inspected, summarizing the defects found, repair recommendations and priorities for implementing repairs. The priority rating is a measure of the level of importance associated with repairing defective members or conditions found at the time of the inspection. All Priority 1, 2 and 3 conditions should be repaired in a timely fashion, since the seriousness of a particular defect can become greater over time, and with it, the structure's repair priority. Bridge components are interactive with each other structurally; therefore, substandard members can affect the overall structural integrity of a bridge.

The Genesee & Wyoming priority ratings are as follows:

PRIORITY 1 - Immediate attention. Existing condition compromises the structural integrity of the bridge to safely carry rail traffic. Rail traffic will be immediately protected by reducing speed or other restrictive measures. Repairs are to be programmed immediately to avoid an unplanned bridge outage and the condition is to be monitored frequently until repairs are complete.

PRIORITY 2 - High priority. Existing condition presents a risk to the structural integrity of the bridge to safely carry rail traffic. Rail traffic may need to be protected by reducing speed or other restrictive measures. Repairs should be programmed into the next capital program to avoid a possible unplanned bridge outage during the next inspection cycle. The existing condition is to be monitored regularly until repairs are complete.

PRIORITY 3 - Deficient condition. Existing condition exhibits deficiencies that may soon become a risk to the structural integrity of the bridge to safely carry rail traffic at timetable speed. Repairs should be programmed into a three year capital program. The deficient condition is to be monitored annually to determine the rate of deterioration.

PRIORITY 4 - Moderate condition. Bridge components are structurally sound but beginning to show signs of mechanical wear and/or deterioration. Some bridge components may be borderline deficient condition. Moderate condition bridge components may need to be programmed into a five year capital bridge program depending on the rate of mechanical wear and/or deterioration. Condition is to be monitored annually to determine the rate of deterioration.

PRIORITY 5 - Generally good condition. Bridge components are structurally sound and in generally good condition with very minor to no component defects. Bridge components are to be inspected annually and any changes in component conditions noted accordingly.

All recommendations and priority ratings are the result of good faith subjective judgments of Inspectors based on conditions present at the time of this inspection, utilizing industry standards and procedures as well as information made available to Koppers by the Owner. Recommendations and priority ratings are based on defects found that may limit or adversely affect the original capacity or structural integrity of the Railroad Bridge. Due to the potential for inaccessible or hidden conditions, not all defective members or conditions will be found. No capacity or load rating of the Railroad Bridge has been performed. Conditions and standards can and do change, so frequent re-inspection and evaluation is recommended. Railroad Bridge components are interactive with each other structurally; therefore, substandard members can affect the overall structural integrity of a Railroad Bridge. Koppers make no warranty or guarantee, express or implied, as to structural integrity and Koppers assumes no responsibility or liability whatsoever for any loss or damage incurred as a result of any performance failure of any Railroad Bridge or structure.

Indiana & Ohio Rail Corporation

Recommendations Listed By Bridge

Line: DT&I Line (Old South Charleston Portion Only) — Springfield, OH - Jeffersonville, OH

Bridge Number: 201.25 OHH — **Section #: 1**

Item	Recommended Work	Priority
1	No repair recommendations required at the time of inspection	5

Bridge Number: 201.27 OHH — **Section #: 1**

Item	Recommended Work	Priority
1	No repair recommendations required at the time of inspection	5

Bridge Number: 222.22 — **Section #: 1**

Item	Recommended Work	Priority
1	Refer to Boring/Structure Report for Priority 4 Conditions.	4

Bridge Number: 223.20 OHH — **Section #: 1**

Item	Recommended Work	Priority
1	No repair recommendations required at the time of inspection	5

Bridge Number: 223.22 OHH — **Section #: 1**

Item	Recommended Work	Priority
1	No repair recommendations required at the time of inspection	5

Bridge Number: 223.52 — **Section #: 1**

Item	Recommended Work	Priority
1	Refer to Boring/Structure Report for Priority 4 Conditions.	4

Bridge Number: 224.70 — **Section #: 1**

Item	Recommended Work	Priority
1	Refer to Boring/Structure Report for Priority 4 Conditions.	4

RECOMMENDATIONS

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Indiana & Ohio Rail Corporation

Recommendations Listed By Priority

Line: DT&I Line (Old South Charleston Portion Only) Springfield, OH - Jeffersonville, OH

Priority: 4

Bridge Number	Mile Post	Section #	Recommended Work
222.22	222.22	1	Refer to Boring/Structure Report for Priority 4 Conditions.
223.52	223.52	1	Refer to Boring/Structure Report for Priority 4 Conditions.
224.70	224.70	1	Refer to Boring/Structure Report for Priority 4 Conditions.

Indiana & Ohio Rail Corporation

Recommendations Listed By Priority

Line: DT&I Line (Old South Charleston Portion Only) Springfield, OH - Jeffersonville, OH

Priority: 5

Bridge Number	Mile Post	Section #	Recommended Work
201.25 OHH	201.25	1	No repair recommendations required at the time of inspection
201.27 OHH	201.27	1	No repair recommendations required at the time of inspection
223.20 OHH	223.20	1	No repair recommendations required at the time of inspection
223.22 OHH	223.22	1	No repair recommendations required at the time of inspection

RECOMMENDATIONS

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Indiana & Ohio Rail Corporation

(2016) Detailed Inspection

Bridge 201.25 OHH

Location

Town/Station: Springfield
State: OH
Latitude: N 39 53.414
Longitude: W 83 45.895

Access:

Notes:

Description

Type: OHH
Deck Type:
Number of Spans: 0
Number of Tracks: 1
Height:
Length:
Year Constructed:
Feature Crossed: Interstate 70
Bents/Piers/Abutments in Water: 0
Max Water Depth: 0
Scour Susceptible: No
Tangent/Curve: Curve
Skewed: No
Super Elevation: No
Super Elevation Direction:
Walkway: No
GuardRail: No
Utilities Present: No
Utility Type:
Mileage Increases: North to South
Members Numbered: East to West
Lead Inspector: T. Baumel
Date Approved: 08/19/2016

Indiana & Ohio Rail Corporation

Inspection Summary

Line: DT&I Line (Old South Charleston Portion Only)

Bridge in a curve.

Bridge # 201.25 OHH

Milepost: 201.25

Section: 1

Type: OHH

Location: Springfield, OH

Inspection Date(s): 06/15/2016

Inspector: T. Baumel, D. Petersen

Inspection Type: Detailed

Critical Review By RBE: No

Findings:	Finding Notes:
Other	This bridge is an Overhead Highway Bridge (Interstate 70) No readily visible defects were identified from the track

Recommended Work:

Item#	Priority	Repair Description
1	5	No repair recommendations required at the time of inspection

Completed Work:

Date	Item#	Repair Description

Indiana & Ohio Rail Corporation

(2016) Detailed Inspection

Bridge 201.27 OHH

Location

Town/Station: Springfield
State: OH
Latitude: N 39 53.4417
Longitude: W 83 45.9064

Access:

Notes:

Description

Type: OHH
Deck Type:
Number of Spans: 0
Number of Tracks: 1
Height:
Length:
Year Constructed:
Feature Crossed: Interstate 70
Bents/Piers/Abutments in Water: 0
Max Water Depth: 0
Scour Susceptible: No
Tangent/Curve: Curve
Skewed: No
Super Elevation: No
Super Elevation Direction:
Walkway: No
GuardRail: No
Utilities Present: No
Utility Type:
Mileage Increases: North to South
Members Numbered: East to West
Lead Inspector: T. Baumel
Date Approved: 08/19/2016

Indiana & Ohio Rail Corporation

Inspection Summary

Line: DT&I Line (Old South Charleston Portion Only)

Bridge in a curve.

Bridge # 201.27 OHH

Milepost: 201.27

Section: 1

Type: OHH

Location: Springfield, OH

Inspection Date(s): 06/15/2016

Inspector: T. Baumel, D. Petersen

Inspection Type: Detailed

Critical Review By RBE: No

Findings:	**Finding Notes:**
Other	This bridge is an Overhead Highway Bridge (Interstate 70) No readily visible defects were identified from the track

Recommended Work:

Item#	Priority	Repair Description
1	5	No repair recommendations required at the time of inspection

Completed Work:

Date	Item#	Repair Description

Indiana & Ohio Rail Corporation

(2016) Detailed Inspection

Bridge 222.22

Location

Town/Station: Jeffersonville	State: OH
Latitude: N 39 39.43	Longitude: W 83 33.79

Access: R

Notes:

Description

Type: Beam Span	Deck Type: Open
Number of Spans: 5	Number of Tracks: 1
Height: 11'	Length: 125'
Year Constructed: 2008	Feature Crossed: Sugar Creek
Bents/Piers/Abutments in Water: 3	Max Water Depth: 1'
Scour Susceptible: Yes	
Tangent/Curve: Tangent	Skewed: No
Super Elevation: No	Super Elevation Direction:
Walkway: No	GuardRail: No
Utilities Present: No	Utility Type:
Mileage Increases: North to South	Members Numbered: East to West
Lead Inspector: T. Baumel	
Date Approved: 08/19/2016	

Indiana & Ohio Rail Corporation

Inspection Summary

Line: DT&I Line (Old South Charleston Portion Only)

Bridge # 222.22

Milepost: 222.22

Section: 1

Type: Beam Span

Location: Jeffersonville, OH

Inspection Date(s): 06/15/2016

Inspector: T. Baumel, D. Petersen

Inspection Type: Detailed

Critical Review By RBE: No

Findings:	Finding Notes:
Abutment 1	Slight undermining Minor ballast on seat
Abutment 2	Ballast on Seat
Steel Bent 2	
Bearings	Bearing 3 - 2 Connection Bolt Nuts - Missing Bearing 6 - 2 Connection Bolt Nuts - Missing Bearing 7 - 2 Connection Bolt Nuts - Missing
Approaches	Low
Ties	OK
Line and Surface	OK

Recommended Work:

Item#	Priority	Repair Description
1	4	Refer to the Boring/Structure Report for Priority 4 Conditions.

Completed Work:

Date	Item#	Repair Description

Indiana & Ohio Rail Corporation

Line: DT&I Line (Old South Charleston Portion Only)

Structure Report

Bridge # 222.22

Milepost: 222.22 | **Section: 1**

Type: Beam Span | **Location: Jeffersonville, OH**

Inspection Date(s): 06/15/2016 | **Inspector: T. Baumel, D. Petersen**

Inspection Type: Detailed | **Critical Review By RBE: No**

Substructure

Structure	Member	Priority/ Status	Remarks	Dimensions (WxDxL)
Abutment 1			Slight undermining Minor ballast on seat	
	Bearings	OK		
Abutment 2		4	Ballast on Seat	
	Bearings	OK		
Steel Bent 1		OK	Steel Bent with Steel Cap and 3 H-Piles H2O	6'
	Bearings	OK		
Steel Bent 2			Steel Bent with Steel Cap and 3 H-Piles H2O	7'
	Bearings	4	Bearing 3 - 2 Connection Bolt Nuts - Missing Bearing 6 - 2 Connection Bolt Nuts - Missing Bearing 7 - 2 Connection Bolt Nuts - Missing	
Steel Bent 3		OK	Steel Bent with Steel Cap and 3 H-Piles H2O	9'
	Bearings	OK		
Steel Bent 4		OK	Steel Bent with Steel Cap and 3 H-Piles	8'
	Bearings	OK		

CN - Cornering	G/L - Groundline Area	P/W - Heavy Duty Pile Wrap	SR - Shell Rot	Mileage Increases from: North
CR- Crushing	H - Heart	PE - Possible Exception	ST - Shell Thickness	
D/P - Drift Pin	HS - (Cap) Heart Separation	PP - Previously Posted	V - Void	Members are Numbered From: East
DP - Decay Pocket	HS - (Stringer) Horizontal Shear	RS - Ring Separation	VE - Visual Exception	
DR - Decay Ring	MD - Mechanical Damage	S - Min. or Max Shell	VS - Vertical Split	
E - Exception	O/W - OsmoWeld	SLCR - Slight Crushing	WPH - Wood Pecker Hole	*(Railroad Directions)*

Indiana & Ohio Rail Corporation

Line: DT&I Line (Old South Charleston Portion Only)

Structure Report

Bridge # 222.22

Milepost: 222.22 | **Section: 1**

Type: Beam Span | **Location: Jeffersonville, OH**

Inspection Date(s): 06/15/2016 | **Inspector: T. Baumel, D. Petersen**

Inspection Type: Detailed | **Critical Review By RBE: No**

Superstructure

Structure	Member	Priority/ Status	Remarks	Dimensions (WxDxL)
Span 1		OK		25'-0"
	Beams	OK	4 Beams	
	Bracing	OK		
Span 2		OK		24'-4"
	Beams	OK	4 Beams	
	Bracing	OK		
Span 3		OK		24'-0"
	Beams	OK	4 Beams	
	Bracing	OK		
Span 4		OK		24'-4"
	Beams	OK	4 Beams	
	Bracing	OK		
Span 5		OK		25'-0"
	Beams	OK	4 Beams	
	Bracing	OK		

Other

Structure	Member	Priority/ Status	Remarks	Dimensions (WxDxL)
Approaches		4	Low	
Ties		OK	Tie Count: 104	8.75"x9"x10'
Line and Surface		OK		

CN - Cornering	G/L - Groundline Area	P/W - Heavy Duty Pile Wrap	SR - Shell Rot	Mileage Increases from: North
CR- Crushing	H - Heart	PE - Possible Exception	ST - Shell Thickness	
D/P - Drift Pin	HS - (Cap) Heart Separation	PP - Previously Posted	V - Void	Members are Numbered From: East
DP - Decay Pocket	HS - (Stringer) Horizontal Shear	RS - Ring Separation	VE - Visual Exception	
DR - Decay Ring	MD - Mechanical Damage	S - Min. or Max Shell	VS - Vertical Split	
E - Exception	O/W - OsmoWeld	SLCR - Slight Crushing	WPH - Wood Pecker Hole	*(Railroad Directions)*

Indiana & Ohio Rail Corporation

(2016) Detailed Inspection

Bridge 223.20 OHH

Location

Town/Station: Jeffersonville
State: OH
Latitude: N 39 38.735
Longitude: W 83 33.06

Access:

Notes:

Description

Type: OHH
Deck Type:
Number of Spans: 0
Number of Tracks: 1
Height:
Length:
Year Constructed:
Feature Crossed: Interstate 71
Bents/Piers/Abutments in Water: 0
Max Water Depth: 0
Scour Susceptible: No
Tangent/Curve: Tangent
Skewed: No
Super Elevation: No
Super Elevation Direction:
Walkway: No
GuardRail: No
Utilities Present: No
Utility Type:
Mileage Increases: North to South
Members Numbered: East to West
Lead Inspector: T. Baumel
Date Approved: 08/19/2016

Indiana & Ohio Rail Corporation

Inspection Summary

Line: DT&I Line (Old South Charleston Portion Only)

Bridge # 223.20 OHH

Milepost: 223.20

Section: 1

Type: OHH

Location: Jeffersonville, OH

Inspection Date(s): 06/15/2016

Inspector: T. Baumel, D. Petersen

Inspection Type: Detailed

Critical Review By RBE: No

Findings:	Finding Notes:
Other	This bridge is an Overhead Highway Bridge (Interstate 71) No readily visible defects were identified from the track

Recommended Work:

Item#	Priority	Repair Description
1	5	No repair recommendations required at the time of inspection

Completed Work:

Date	Item#	Repair Description

Indiana & Ohio Rail Corporation

(2016) Detailed Inspection

Bridge 223.22 OHH

Location

Town/Station: Jeffersonville
State: OH
Latitude: N 39 38.698
Longitude: W 83 33.024

Access:

Notes:

Description

Type: OHH
Deck Type:
Number of Spans: 0
Number of Tracks: 1
Height:
Length:
Year Constructed:
Feature Crossed: Interstate 71
Bents/Piers/Abutments in Water: 0
Max Water Depth: 0
Scour Susceptible: No
Tangent/Curve: Tangent
Skewed: No
Super Elevation: No
Super Elevation Direction:
Walkway: No
GuardRail: No
Utilities Present: No
Utility Type:
Mileage Increases: North to South
Members Numbered: East to West
Lead Inspector: T. Baumel
Date Approved: 08/19/2016

Indiana & Ohio Rail Corporation

Inspection Summary

Line: DT&I Line (Old South Charleston Portion Only)

Bridge # 223.22 OHH

Milepost: 223.22

Section: 1

Type: OHH

Location: Jeffersonville, OH

Inspection Date(s): 06/15/2016

Inspector: T. Baumel, D. Petersen

Inspection Type: Detailed

Critical Review By RBE: No

Findings:	Finding Notes:
Other	This bridge is an Overhead Highway Bridge (Interstate 71) No readily visible defects were identified from the track

Recommended Work:

Item#	Priority	Repair Description
1	5	No repair recommendations required at the time of inspection

Completed Work:

Date	Item#	Repair Description

Indiana & Ohio Rail Corporation

(2016) Detailed Inspection

Bridge 223.52

Location

Town/Station: Jeffersonville
State: OH
Latitude: N 39 38.5978
Longitude: W 83 32.9045

Access: R

Notes:

Description

Type: Beam Span
Deck Type: Ballast
Number of Spans: 3
Number of Tracks: 1
Height: 15'
Length: 144'
Year Constructed: 1954
Feature Crossed: Sugar Creek
Bents/Piers/Abutments in Water: 2
Max Water Depth: 1'
Scour Susceptible: Yes
Tangent/Curve: Tangent
Skewed: Yes
Super Elevation: No
Super Elevation Direction:
Walkway: No
GuardRail: No
Utilities Present: No
Utility Type:
Mileage Increases: North to South
Members Numbered: East to West
Lead Inspector: T. Baumel
Date Approved: 08/19/2016

Indiana & Ohio Rail Corporation

Inspection Summary

Line: DT&I Line (Old South Charleston Portion Only)

Bridge # 223.52

Milepost: 223.52

Section: 1

Type: Beam Span

Location: Jeffersonville, OH

Inspection Date(s): 06/15/2016

Inspector: T. Baumel, D. Petersen

Inspection Type: Detailed

Critical Review By RBE: No

Findings:	Finding Notes:
Abutment 1	Minor spalling East side
	Minor cracking of concrete
Bearings	Surface rust on Steel
Abutment 2	Minor cracking on concrete
Bearings	Surface rust on Steel
	Bearing 4 Outboard Anchor Bolt - Bent
Concrete Pier 1	
Bearings	Minor rust and corrosion on Masonry Plates
Concrete Pier 2	
Bearings	Minor rust and corrosion on Masonry Plates and Anchor Bolts
Span 1	West Side Top Steel Retainer - Missing
	Light corrosion developing
	Surface rust on all Steel
Span 2	West Side Top Steel Retainer Angle missing
	Light corrosion developing
	Surface rust on all Steel
Span 3	Light corrosion developing
	Surface rust on all Steel
Approaches	OK
Decking	Losing Ballast through Drainage System
Line and Surface	OK
Other	Loose Anchor Bolt Nuts throughout

Recommended Work:

Item#	Priority	Repair Description
1	4	Refer to the Boring/Structure Report for Priority 4 Conditions.

Completed Work:

Date	Item#	Repair Description

Indiana & Ohio Rail Corporation

Line: DT&I Line (Old South Charleston Portion Only)

Structure Report

Bridge # 223.52

Milepost: 223.52 | **Section: 1**

Type: Beam Span | **Location: Jeffersonville, OH**

Inspection Date(s): 06/15/2016 | **Inspector: T. Baumel, D. Petersen**

Inspection Type: Detailed | **Critical Review By RBE: No**

Substructure

Structure	Member	Priority/ Status	Remarks	Dimensions (WxDxL)
Abutment 1			Concrete with Sheet Pile Return Walls Minor cracking of concrete Minor spalling East side	
	Bearings		Surface rust on Steel	
Abutment 2			Concrete with Sheet Pile Return Walls Minor cracking on concrete	
	Bearings	4	Surface rust on Steel Bearing 4 Outboard Anchor Bolt - Bent	
Concrete Pier 1			Concrete Surrounded by Driven Sheet Pile H2O	7'
	Bearings		Minor rust and corrosion on Masonry Plates	
Concrete Pier 2			Concrete Surrounded by Driven Sheet Pile H2O	7'
	Bearings		Minor rust and corrosion on Masonry Plates and Anchor Bolts	

CN - Cornering	G/L - Groundline Area	P/W - Heavy Duty Pile Wrap	SR - Shell Rot	Mileage Increases from: North
CR- Crushing	H - Heart	PE - Possible Exception	ST - Shell Thickness	
D/P - Drift Pin	HS - (Cap) Heart Separation	PP - Previously Posted	V - Void	Members are Numbered From: East
DP - Decay Pocket	HS - (Stringer) Horizontal Shear	RS - Ring Separation	VE - Visual Exception	
DR - Decay Ring	MD - Mechanical Damage	S - Min. or Max Shell	VS - Vertical Split	
E - Exception	O/W - OsmoWeld	SLCR - Slight Crushing	WPH - Wood Pecker Hole	*(Railroad Directions)*

Indiana & Ohio Rail Corporation

Line: DT&I Line (Old South Charleston Portion Only)

Structure Report

Bridge # 223.52

Milepost: 223.52 | **Section: 1**

Type: Beam Span | **Location: Jeffersonville, OH**

Inspection Date(s): 06/15/2016 | **Inspector: T. Baumel, D. Petersen**

Inspection Type: Detailed | **Critical Review By RBE: No**

Superstructure

Structure	Member	Priority/ Status	Remarks	Dimensions (WxDxL)
Span 1		4	Light corrosion developing West Side Top Steel Retainer - Missing Surface rust on all Steel	48'-0"
	Beams	OK	4 Beams	
	Bracing	OK		
Span 2		4	Knee Braces and Scupper Drains on Both Sides. Steel Floor Plate with Concrete on Top West Side Top Steel Retainer Angle missing Light corrosion developing Surface rust on all Steel	48'-0"
	Beams	OK	4 Beams	
	Bracing	OK		
Span 3			Light corrosion developing Surface rust on all Steel	48'-0"
	Beams	OK	4 Beams	
	Bracing	OK		

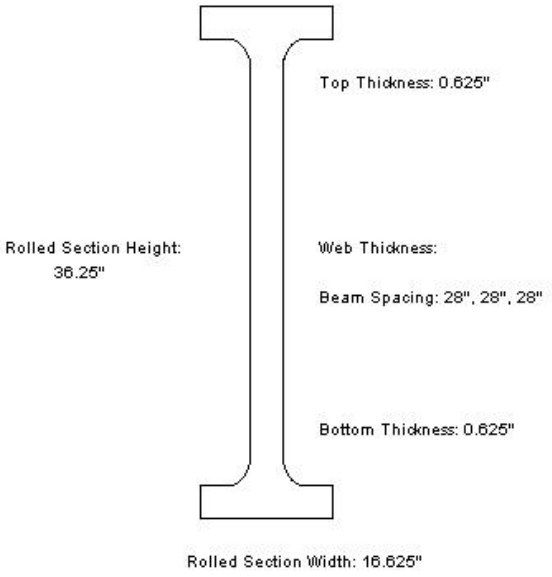
Other

Structure	Member	Priority/ Status	Remarks	Dimensions (WxDxL)
Approaches		OK		
Ballast				15'x16"
Decking			Losing Ballast through Drainage System	
Line and Surface		OK		
Other		4	Ballast Deck - Steel Plate with Concrete on Top Loose Anchor Bolt Nuts throughout	

CN - Cornering	G/L - Groundline Area	P/W - Heavy Duty Pile Wrap	SR - Shell Rot	Mileage Increases from: North
CR- Crushing	H - Heart	PE - Possible Exception	ST - Shell Thickness	
D/P - Drift Pin	HS - (Cap) Heart Separation	PP - Previously Posted	V - Void	Members are Numbered From: East
DP - Decay Pocket	HS - (Stringer) Horizontal Shear	RS - Ring Separation	VE - Visual Exception	
DR - Decay Ring	MD - Mechanical Damage	S - Min. or Max Shell	VS - Vertical Split	
E - Exception	O/W - OsmoWeld	SLCR - Slight Crushing	WPH - Wood Pecker Hole	*(Railroad Directions)*

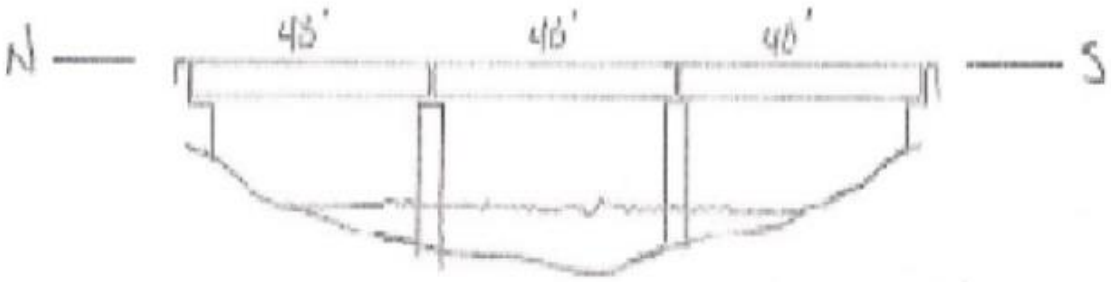
Indiana & Ohio Rail Corporation

Bridge Number: 223.52, Section Number: 1, Beams (2 beams per chord)



Indiana & Ohio Rail Corporation

Bridge 223.52



WEST ELEVATION)

REAR AUX. SIDE)

Indiana & Ohio Rail Corporation

(2016) Detailed Inspection

Bridge 224.70

Location

Town/Station: Jeffersonville
State: OH
Latitude: N 39 37.7504
Longitude: W 83 32.1344

Access: T

Notes:

Description

Type: Beam Span
Deck Type: Open
Number of Spans: 5
Number of Tracks: 1
Height: 10'
Length: 120'
Year Constructed: 2007
Feature Crossed: Sugar Creek
Bents/Piers/Abutments in Water: 3
Max Water Depth:
Scour Susceptible: Yes
Tangent/Curve: Tangent
Skewed: No
Super Elevation: No
Super Elevation Direction:
Walkway: No
GuardRail: No
Utilities Present: No
Utility Type:
Mileage Increases: North to South
Members Numbered: East to West
Lead Inspector: T. Baumel
Date Approved: 08/19/2016

Indiana & Ohio Rail Corporation

Inspection Summary

Line: DT&I Line (Old South Charleston Portion Only)

Bridge # 224.70

Milepost: 224.70

Section: 1 Main Section

Type: Beam Span

Location: Jeffersonville, OH

Inspection Date(s): 06/15/2016

Inspector: T. Baumel, D. Petersen

Inspection Type: Detailed

Critical Review By RBE: No

Findings:	Finding Notes:
Abutment 1	Debris on Seat
Abutment 2	Debris on Seat
Approaches	Low
Ties	OK
Guard Timber	OK (steel straps)
Headwalls	OK

Recommended Work:

Item#	Priority	Repair Description
1	4	Refer to the Boring/Structure Report for Priority 4 Conditions.

Completed Work:

Date	Item#	Repair Description

Indiana & Ohio Rail Corporation

Line: DT&I Line (Old South Charleston Portion Only)

Structure Report

Bridge # 224.70

Milepost: 224.70
Section: 1 Main Section
Type: Beam Span
Location: Jeffersonville, OH
Inspection Date(s): 06/15/2016
Inspector: T. Baumel, D. Petersen
Inspection Type: Detailed
Critical Review By RBE: No

Substructure

Structure	Member	Priority/ Status	Remarks	Dimensions (WxDxL)
Abutment 1		4	Debris on Seat	
	Bearings	OK		
Abutment 2		4	Debris on Seat	
	Bearings	OK		
Steel Bent 1		OK	Steel Bent with Steel Cap and 3 H-Piles	2'
	Bearings	OK		
Steel Bent 2		OK	Steel Bent with Steel Cap and 3 H-Piles H2O	4'
	Bearings	OK		
Steel Bent 3		OK	Steel Bent with Steel Cap and 3 H-Piles H2O	6'
	Bearings	OK		
Steel Bent 4		OK	Steel Bent with Steel Cap and 3 H-Piles H2O	5'
	Bearings	OK		

CN - Cornering	G/L - Groundline Area	P/W - Heavy Duty Pile Wrap	SR - Shell Rot	Mileage Increases from: North
CR- Crushing	H - Heart	PE - Possible Exception	ST - Shell Thickness	
D/P - Drift Pin	HS - (Cap) Heart Separation	PP - Previously Posted	V - Void	Members are Numbered From: East
DP - Decay Pocket	HS - (Stringer) Horizontal Shear	RS - Ring Separation	VE - Visual Exception	
DR - Decay Ring	MD - Mechanical Damage	S - Min. or Max Shell	VS - Vertical Split	
E - Exception	O/W - OsmoWeld	SLCR - Slight Crushing	WPH - Wood Pecker Hole	*(Railroad Directions)*

Indiana & Ohio Rail Corporation

Line: DT&I Line (Old South Charleston Portion Only)

Structure Report

Bridge # 224.70

Milepost: 224.70
Section: 1 Main Section
Type: Beam Span
Location: Jeffersonville, OH
Inspection Date(s): 06/15/2016
Inspector: T. Baumel, D. Petersen
Inspection Type: Detailed
Critical Review By RBE: No

Superstructure

Structure	Member	Priority/ Status	Remarks	Dimensions (WxDxL)
Span 1		OK		24'-6"
	Beams	OK	4 Beams, 2 Per Chord	
	Bracing	OK		
Span 2		OK		24'-0"
	Beams	OK	4 Beams, 2 Per Chord	
	Bracing	OK		
Span 3		OK		24'-0"
	Beams	OK	4 Beams, 2 Per Chord	
	Bracing	OK		
Span 4		OK		24'-0"
	Beams	OK	4 Beams, 2 Per Chord	
	Bracing	OK		
Span 5		OK		24'-6"
	Beams	OK	4 Beams, 2 Per Chord	
	Bracing	OK		

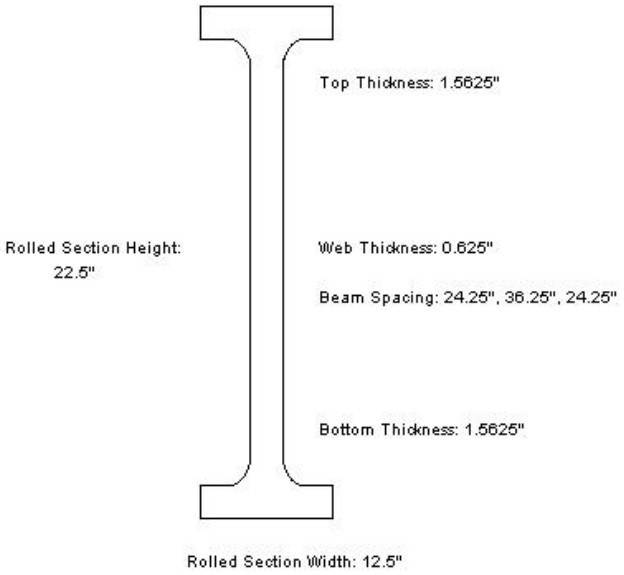
Other

Structure	Member	Priority/ Status	Remarks	Dimensions (WxDxL)
Approaches		4	Low	
Ties		OK	Tie Count: 104	9"x8.5"x10'
Guard Timber		OK	OK (steel straps)	
Headwalls		OK		

CN - Cornering	G/L - Groundline Area	P/W - Heavy Duty Pile Wrap	SR - Shell Rot	Mileage Increases from: North
CR- Crushing	H - Heart	PE - Possible Exception	ST - Shell Thickness	
D/P - Drift Pin	HS - (Cap) Heart Separation	PP - Previously Posted	V - Void	Members are Numbered From: East
DP - Decay Pocket	HS - (Stringer) Horizontal Shear	RS - Ring Separation	VE - Visual Exception	
DR - Decay Ring	MD - Mechanical Damage	S - Min. or Max Shell	VS - Vertical Split	
E - Exception	O/W - OsmoWeld	SLCR - Slight Crushing	WPH - Wood Pecker Hole	*(Railroad Directions)*

Indiana & Ohio Rail Corporation

Bridge Number: 224.70, Section Number: 1, Beams (2 beams per chord)



TERMINOLOGY

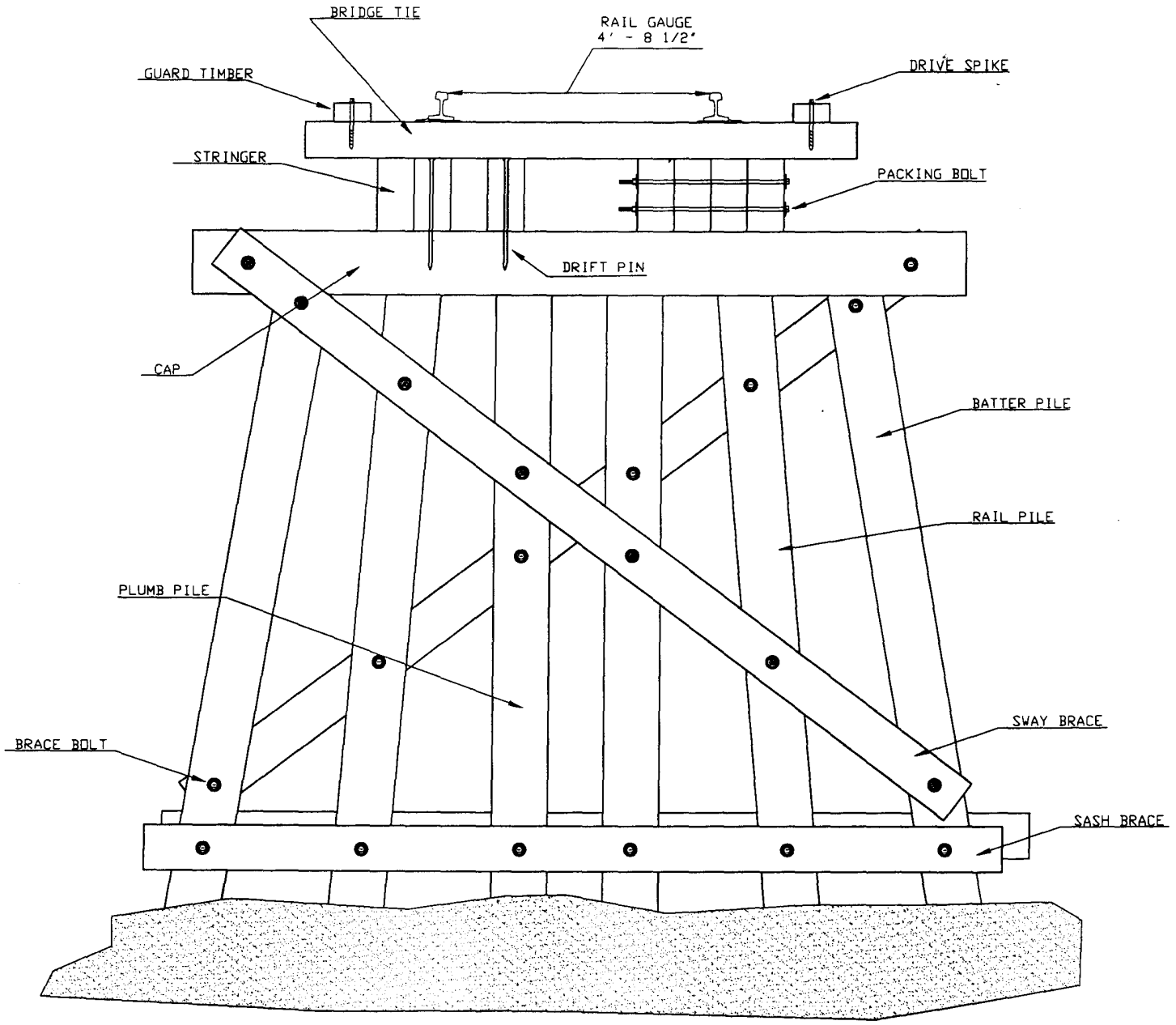
Bent	A supporting unit of a trestle made up of vertical members connected at the top by a cap.
Dump Bent	The end bent of a bridge. There is usually a retaining wall or backwall next to the dump bent.
Cap	The top, horizontal member of a bent. It holds the vertical members in their proper place and distributes the superstructure load to them.
Defer Treatment	Bridge timbers that do not contain enough decay at this time to warrant treatment, but should be considered for re-cruising in 5-10 years.
Drift	Brush, logs and other debris carried by high water. If it accumulates against a bridge, it should be removed to reduce fire hazards and pressure against the bridge.
Groundline (G/L)	In bridge piling, the portion from 2-3 feet below the ground level to 1-2 feet above. An area where rapid decay growth can take place.
Longitudinal Bracing (Santa Fe)	Horizontal structural members which span from bent to bent and are usually fastened to a sash brace near the top of the piles or posts.
Girt Bracing	A horizontal member which spans from bent to bent and is usually fastened above the sash brace, normally 11 to 15 feet down from the cap.
Pile (P)	A vertical structure member that has been driven into the ground.
Possible Exception (PE or PX)	Refers to members not decayed or damaged sufficiently to be classified as exceptions, but are deteriorated enough to be considered for replacement.
Post (Posting)	Replace a defective portion of a pile with a new section.
Exception (E or X)	A member that is severely decayed or damaged.
Riprap	Large stones, boulders, blocks of concrete, etc. placed around piles or piers to prevent scour.
Sash Brace	Horizontal member fastened to piles or posts of a bent to provide rigidity.
Sway Brace	Diagonal member fastened to piles or posts of a bent to provide rigidity.
Sill	Horizontal member supporting the posts of the bent.

EXPLANATION OF COLUMN HEADINGS

COLUMN HEADINGS	*EXPLANATION*
BRIDGE	Bridge Number.
LOCATION	Nearest town.
MILE POST	Mile Post number (or same as bridge number if not stated)
BENTS	Number of bents in structure.
PIERS	Number of timber piers in structure.
SUBJ	Y - Candidate for inspection & in-place treatment or retreatment. R - Recommended for replacement. D - In-place treatment can be delayed. N/C - Not Cruised.
MAX HGT	Maximum height of bridge piling.
TYPE	BDPT - Ballast Deck Pile Trestle BDFT - Ballast Deck Frame Trestle ODPT - Open Deck Pile Trestle ODFT - Open Deck Frame Trestle OHH - Overhead Highway
CRSD	Letter designation of Inspector followed by year of cruising.
PLNG YR	Year that bridge was constructed.
DATE COMP	Completed date of inspection & in-place treatment, if applicable.
PLNG	The actual percent of piling with internal decay.
A DK	Derived from inspection & in-place treatment.
PLNG	Estimated percent of piling with internal decay.
E DK	Derived at time of cruising.
PLNG	The actual percent of piling classified as **"Exception"**.
A X	Derived from inspection & in-place treatment.
PLNG	Estimated percent of piling classified as **"Exception"**.
E X	Derived at time of cruising.
PLNG	Actual number of piling with external groundline decay.
A GL	Derived from inspection & in-place treatment.
PLNG	Estimated number of piling with external decay at groundline.
E GL	Derived at time of cruising.
STR SPANS	Number of timber stringer spans in structure.
STR DATA	Stringer data: Y: Recommend stringers to be inspected and in-place treated. Omit: Omit stringers. TR 1990: The year stringers were inspected and in-place treated.
ACC	Osmose vehicle needed to access bridge.
REMARKS	Additional information noted.

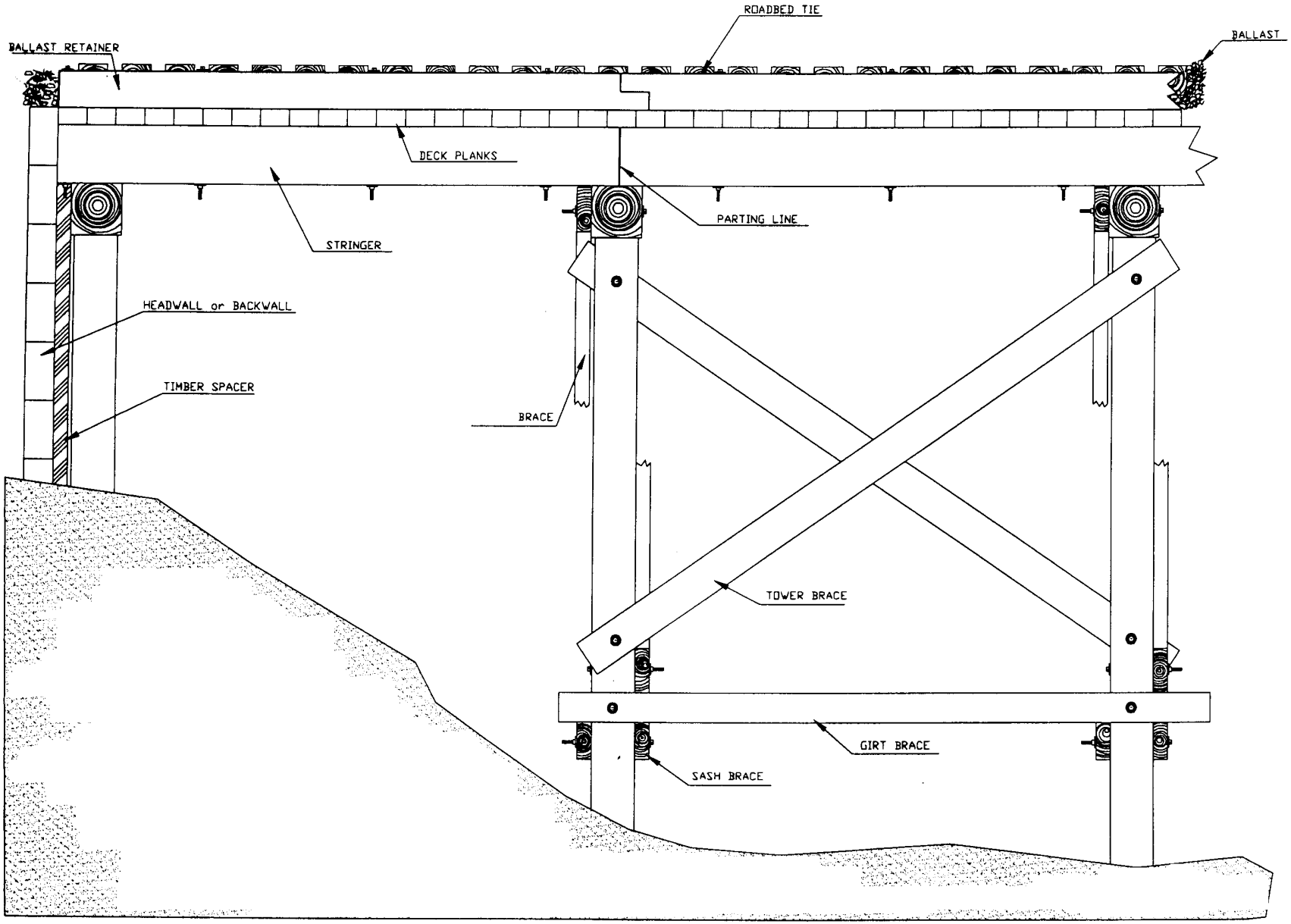
KOPPERS

Timber Pile Bent Schematic



KOPPERS

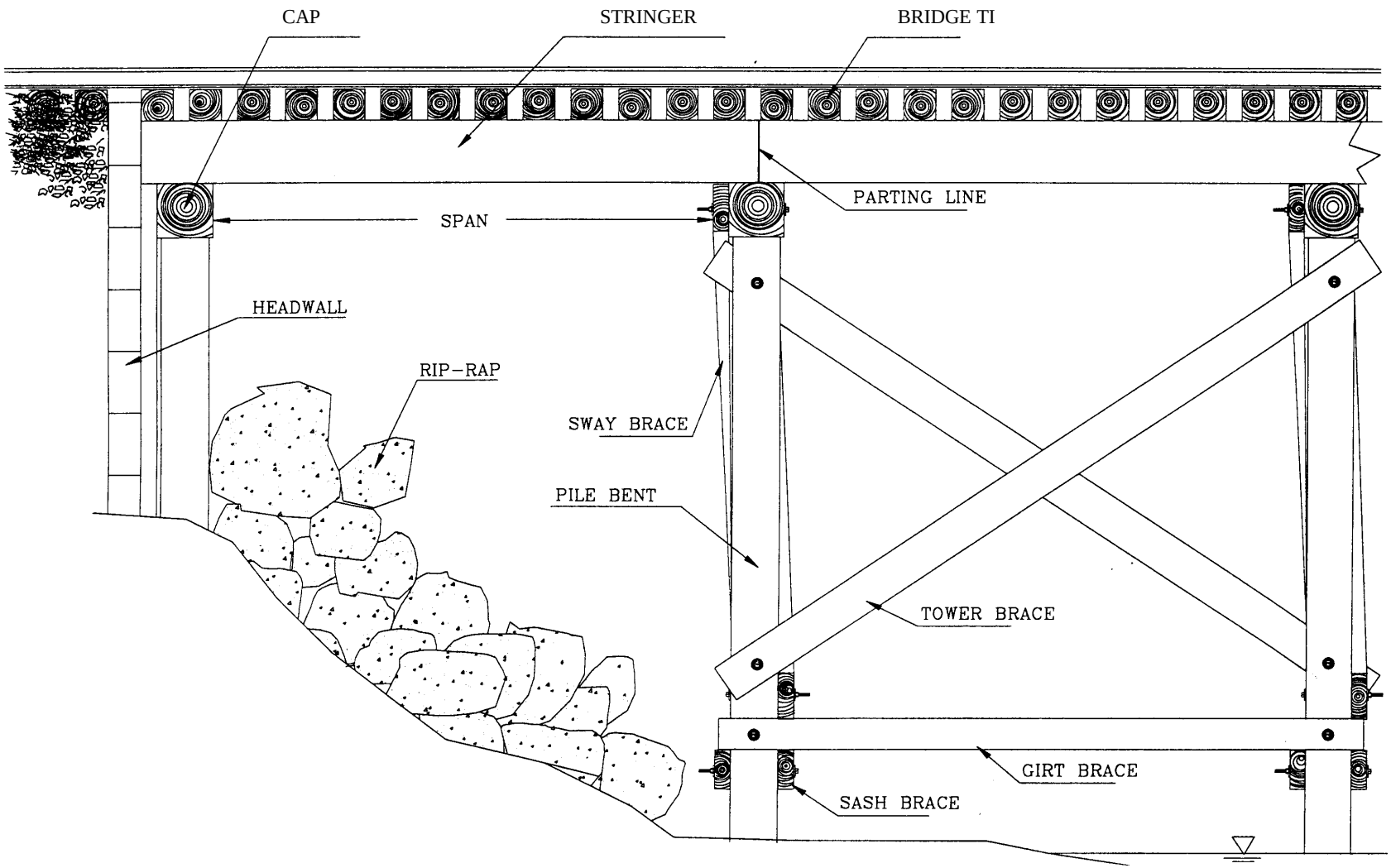
Ballast Deck Bridge Profile



KOPPERS

BRIDGE DIAGRAM

OPEN DECK PILE TRESTLE



KOPPERS

Bridge Terminology - Steel and Concrete Structures

Structural Crack

A crack that has progressed in magnitude, either in width, depth, or both, to the point that the structural integrity of the member is in jeopardy.

Surface Crack

A crack that extends only a few inches into the member, but not of sufficient magnitude to be of immediate concern. Without repair, though, a surface crack could progress into a structural crack.

Settlement Crack

A crack in a structure caused by differential settlement, or movement of various portions of the substructure. Repairs to these cracks should not be performed until the settlement problem has been corrected.

Working Crack

A structural crack that has divided the member into two or more components in which movement can be detected when load is applied, and could possibly permit differential settlement.

Efflorescence

Lime deposits on the surface of concrete caused by water leaching through cracks and porous concrete.

Spalling

General deterioration and breaking up of the surface of the concrete due to age, reactive aggregates, water damage, freeze-thaw action, abrasion, or impact damage.

Telescoping Bearing

Bearing plate has beaten down into the concrete or stone bridge seat causing damage to the concrete or stone.

Pumping Bearing

Bearing is moving up and down under load.

Drift

Brush, logs, and other debris carried by high water. The accumulation of drift against a bridge may increase the danger of fire and does increase the lateral load against the bridge substructure.

Rip Rap

Large Stones, boulders, blocks of concrete that are properly graded and placed to prevent scour.

Pack Rust

Corrosion that has occurred between two joined pieces of steel. This corrosion expands and deforms the two adjoining pieces of steel apart.

Delamination

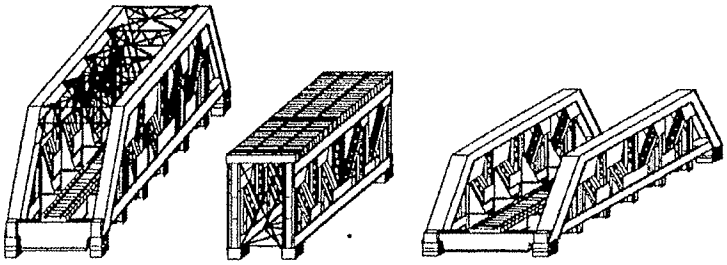
Delamination is the separation and flaking off of the grain on a heavy corroded piece of steel. Delamination can lead to very heavy section loss to the member because as one section of corroded steel flakes off, it exposes the underlying steel to further corrosion.

Surface Corrosion

Surface corrosion is corrosion to just the upper surface of the steel. It is usually minor and in most cases does not result in very heavy section loss.

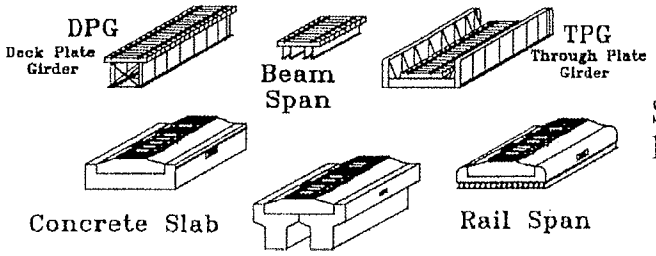
Common Types of Railroad Bridges

TRUSS BRIDGES

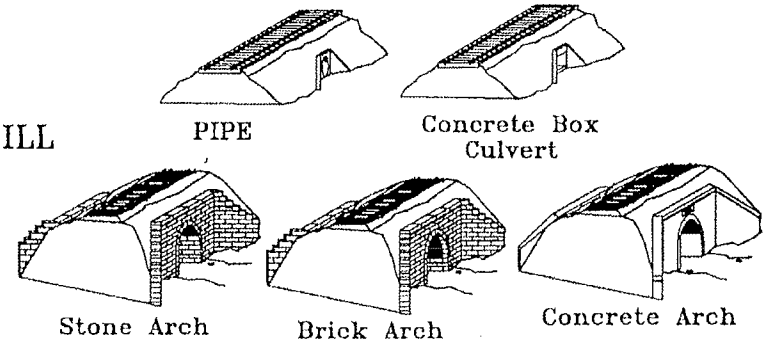


Through Truss | Deck Truss | Pony Truss

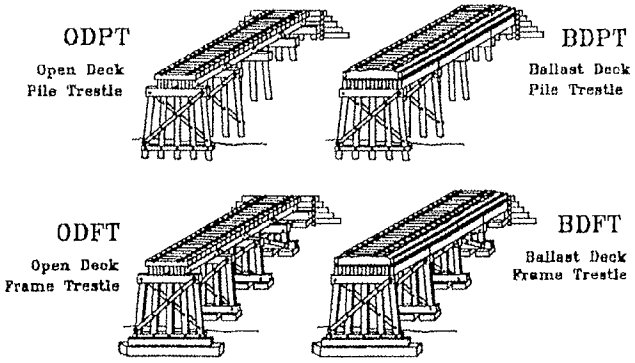
STEEL & CONCRETE BRIDGES



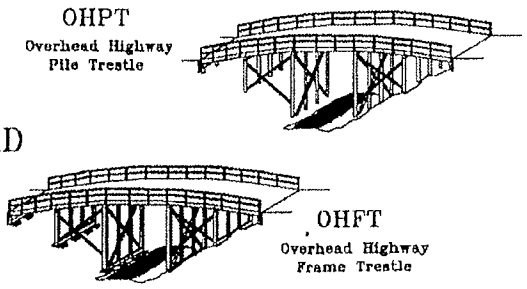
EARTH FILL BRIDGES



TIMBER RAILROAD BRIDGES



TIMBER OVERHEAD BRIDGES



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