

BRIDGE LOAD RATING REPORT

**SUM-261-10.22R (S.R. 261 NB over the Little Cuyahoga
River and MRTA Railroad) SFN: 7708653**



Prepared For:

Ohio Department of Transportation – District 4

Prepared By:

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URS

Description of Bridge

SUM-261-10.22 R is a 19 span structure carrying S.R. 261 over the Little Cuyahoga River and the MRTA Railroad. The Superstructure consists of a non-composite reinforced concrete deck on continuous haunched steel plate girders. The superstructure is separated into 4 units at hinges in the plate girders. The substructure consists of wall type and single column piers supported on both piles and drilled shafts and full height and stub-type reinforced concrete abutments supported on piles.

Notes on Load Rating Assumptions

- 1. Based on URS' field inspection on 9/25/12 as well as previous experience with the 2010 rehabilitation there is no significant deterioration to the existing weathering steel plate girders. Additionally any deck and or parapet deficiencies were corrected during the rehabilitation.**
- 2. The attached rehabilitation plans as well as original design plans were used for loading and current condition. Where appropriate for ease of evaluating the minor curved structure, dimensions that varied to the 1/16" were conservatively rounded to half inches.**
- 3. The full length of the bridge will be modeled with appropriate hinges included.**
- 4. An additional 5% detail factor on the dead load has been conservatively added to account for the minor curvature effects as well as any miscellaneous connections.**
- 5. Per ODOT District 4 direction, the load ratings were initially performed using LRFR methods. Due to differences in the design model and the load rating model (i.e. 90% Truck Pair in LRFR) the structure cannot carry the full HL-93 LRFR loads. As the rating for HL-93 was below the LRFR capacity the bridge has been rated using LFR methods which correspond to the original bridge design loading of HS-20-44. This assumption is in accordance with section 900 of the 2004 edition of the ODOT Bridge Design Manual.**

BRIDGE LOAD RATING SUMMARY REPORT				
PROGRAM RESPONSIBILITY		OHIO DEPARTMENT OF TRANSPORTATION		
MAINTENANCE RESPONSIBILITY		OHIO DEPARTMENT OF TRANSPORTATION		
SFN	BRIDGE NUMBER		DISTRICT	
7708653	SUM-261-10.22R		4	
ORIGINAL CONSTRUCTION YEAR		REHABILITATION YEAR		OVERALL STRUCTURE LENGTH (FT. 3351.0)
1981		2010		3410.00
FIPS	FEATURE INTERSECTED:		FACILITY CARRIED	
AKRON	Little Cuyahoga River and MRTA Railroad		SR 261	
SPECIAL ASSUMPTIONS & COMMENTS:		Using construction drawings dated 1979; 20 span non-composite reinforced concrete deck on haunched steel plate girders (81.6', 100', 80', 121', 181', 208', 225', 205', 198', 202', 220', 209', 209', 209', 209', 200', 197', 197', and 150')		
PLEASE SELECT ON RIGHT, WHERE APPROPRIATE, BY USING UP-DOWN ARROW BUTTONS				
LOAD RATING PURPOSE:		1- Initial Load Rating		▲▼
LOAD RATING SOFTWARE:		3 - VIRTIS		▲▼
RATING SOURCE:		1 - Plan information available for load rating analysis (Default)		▲▼
METHOD OF RATING:		2 - Load Factor Rating (LFR)		▲▼
ORIGINAL DESIGN LOADING:		6 - H520-44 & Alternate Military Loading		▲▼
STRUCTURE RATING SUMMARY				
LOADING TYPE	GVW (TONS)	RATING FACTOR - RF (x.xxx)	SAFE GVW (TONS)	Current Design Loading
INVENTORY RATING		1.299		2 - H520 Loading
OPERATING RATING		2.169		2 - H520 Loading
OHIO LEGAL - 2F1	15	4.549	68	OHIO LEGAL LOADS OVERALL MINIMUM RATING FACTOR
OHIO LEGAL - 3F1	23	3.096	71	150%
OHIO LEGAL - 4F1	27	2.769	75	OHIO LEGAL LOADS OVERALL CONTROLLING TRUCK
OHIO LEGAL - 5C1	40	2.695	108	OHIO LEGAL - 5C1
LOAD RESTRICTIONS RECOMMENDATION		NO ACTION IS NEEDED		
RATED BY, PE#		REVIEWED BY, PE#		REPORT DATE
David Buchanan, EI		Paul Wischt, PE #54482		11/29/2012
AGENCY/FIRM		PHONE NUMBER		EMAIL
URS Corporation		330-836-9111		david.buchanan@urs.com

BR-100 [REV 4/2012]

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G1

Member Alt: GIRDER EXT

LFR

Live Load	Live Load Type	Rating Method	Inventory Load Rating (Ton)	Operating Load Rating (Ton)	Inventory Rating Factor	Operating Rating Factor	Inventory Location (ft)
HS 20-44	Lane	LFD	59.03	98.58	1.640	2.738	1399.58
Alternate Military Loading	Axle Load	LFD	48.88	81.64	2.037	3.402	16.32
HS 20-44	Axle Load	LFD	58.16	97.13	1.616	2.698	16.32
2F1	Axle Load	LFD	50.37	84.12	3.358	5.608	16.32
3F1	Axle Load	LFD	52.57	87.79	2.286	3.817	16.32
4F1	Axle Load	LFD	55.19	92.16	2.044	3.414	16.32
5C1	Axle Load	LFD	79.57	132.88	1.989	3.322	16.32

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G1

Member Alt: GIRDER EXT

LFR

Live Load	Inventory Location Span-(%)	Operating Location (ft)	Operating Location Span-(%)	Inventory Limit State	Operating Limit State
HS 20-44	9 - (100.0)	1399.58	9 - (100.0)	Design Flexure - Steel	Design Flexure - Steel
Alternate Military Loading	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
HS 20-44	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
2F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
3F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
4F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
5C1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G1

Member Alt: GIRDER EXT

LFR

Live Load	Impact	Lane
HS 20-44	As Requested	As Requested
Alternate Military Loading	As Requested	As Requested
HS 20-44	As Requested	As Requested
2F1	As Requested	As Requested
3F1	As Requested	As Requested
4F1	As Requested	As Requested
5C1	As Requested	As Requested

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G2

Member Alt: GIRDER INT

LFR

Live Load	Live Load Type	Rating Method	Inventory Load Rating (Ton)	Operating Load Rating (Ton)	Inventory Rating Factor	Operating Rating Factor	Inventory Location (ft)
HS 20-44	Lane	LFD	46.77	78.10	1.299	2.169	1399.58
Alternate Military Loading	Axle Load	LFD	39.65	66.22	1.652	2.759	16.32
HS 20-44	Axle Load	LFD	47.18	78.79	1.311	2.189	16.32
2F1	Axle Load	LFD	40.86	68.24	2.724	4.549	16.32
3F1	Axle Load	LFD	42.64	71.22	1.854	3.096	16.32
4F1	Axle Load	LFD	44.77	74.76	1.658	2.769	16.32
5C1	Axle Load	LFD	64.55	107.79	1.614	2.695	16.32

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G2

Member Alt: GIRDER INT

LFR

Live Load	Inventory Location Span-(%)	Operating Location (ft)	Operating Location Span-(%)	Inventory Limit State	Operating Limit State
HS 20-44	9 - (100.0)	1399.58	9 - (100.0)	Design Flexure - Steel	Design Flexure - Steel
Alternate Military Loading	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
HS 20-44	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
2F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
3F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
4F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
5C1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G2

Member Alt: GIRDER INT

LFR

Live Load	Impact	Lane
HS 20-44	As Requested	As Requested
Alternate Military Loading	As Requested	As Requested
HS 20-44	As Requested	As Requested
2F1	As Requested	As Requested
3F1	As Requested	As Requested
4F1	As Requested	As Requested
5C1	As Requested	As Requested

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G3

Member Alt: GIRDER INT

LFR

Live Load	Live Load Type	Rating Method	Inventory Load Rating (Ton)	Operating Load Rating (Ton)	Inventory Rating Factor	Operating Rating Factor	Inventory Location (ft)
HS 20-44	Lane	LFD	46.77	78.10	1.299	2.169	1399.58
Alternate Military Loading	Axle Load	LFD	39.65	66.22	1.652	2.759	16.32
HS 20-44	Axle Load	LFD	47.18	78.79	1.311	2.189	16.32
2F1	Axle Load	LFD	40.86	68.24	2.724	4.549	16.32
3F1	Axle Load	LFD	42.64	71.22	1.854	3.096	16.32
4F1	Axle Load	LFD	44.77	74.76	1.658	2.769	16.32
5C1	Axle Load	LFD	64.55	107.79	1.614	2.695	16.32

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G3

Member Alt: GIRDER INT

LFR

Live Load	Inventory Location Span-(%)	Operating Location (ft)	Operating Location Span-(%)	Inventory Limit State	Operating Limit State
HS 20-44	9 - (100.0)	1399.58	9 - (100.0)	Design Flexure - Steel	Design Flexure - Steel
Alternate Military Loading	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
HS 20-44	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
2F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
3F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
4F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
5C1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G3

Member Alt: GIRDER INT

LFR

Live Load	Impact	Lane
HS 20-44	As Requested	As Requested
Alternate Military Loading	As Requested	As Requested
HS 20-44	As Requested	As Requested
2F1	As Requested	As Requested
3F1	As Requested	As Requested
4F1	As Requested	As Requested
5C1	As Requested	As Requested

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G4

Member Alt: GIRDER EXT

LFR

Live Load	Live Load Type	Rating Method	Inventory Load Rating (Ton)	Operating Load Rating (Ton)	Inventory Rating Factor	Operating Rating Factor	Inventory Location (ft)
HS 20-44	Lane	LFD	59.57	99.48	1.655	2.763	1399.55
Alternate Military Loading	Axle Load	LFD	49.14	82.07	2.048	3.419	16.32
HS 20-44	Axle Load	LFD	58.47	97.64	1.624	2.712	16.32
2F1	Axle Load	LFD	50.64	84.56	3.376	5.638	16.32
3F1	Axle Load	LFD	52.85	88.26	2.298	3.837	16.32
4F1	Axle Load	LFD	55.48	92.65	2.055	3.431	16.32
5C1	Axle Load	LFD	79.99	133.58	2.000	3.339	16.32

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G4

Member Alt: GIRDER EXT

LFR

Live Load	Inventory Location Span-(%)	Operating Location (ft)	Operating Location Span-(%)	Inventory Limit State	Operating Limit State
HS 20-44	9 - (100.0)	1399.58	9 - (100.0)	Design Flexure - Steel	Design Flexure - Steel
Alternate Military Loading	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
HS 20-44	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
2F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
3F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
4F1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel
5C1	1 - (20.0)	16.32	1 - (20.0)	Design Flexure - Steel	Design Flexure - Steel

Rating Results Summary Report

Name: Y-BRIDGE NB

Bridge ID: SUM-261-10.22R

NBI: 7708653N

Struct-Def: NB SUPERSTRUCTURE

Member: G4

Member Alt: GIRDER EXT

LFR

Live Load	Impact	Lane
HS 20-44	As Requested	As Requested
Alternate Military Loading	As Requested	As Requested
HS 20-44	As Requested	As Requested
2F1	As Requested	As Requested
3F1	As Requested	As Requested
4F1	As Requested	As Requested
5C1	As Requested	As Requested