

January 28, 2014

Mr. D. Carl Puzey  
Acting Engineer of Bridges and Structures  
Bureau of Bridges and Structures  
Illinois Department of Transportation  
2300 S Dirksen Parkway  
Floor 002, Room 240  
Springfield, Illinois 62764  
Phone: (217) 782-2125  
ATTN.: Mr. Kevin Riechers

Subject: Review of Double Rail and Post Bicycle/Pedestrian Railing

Dear Mr. Puzey:

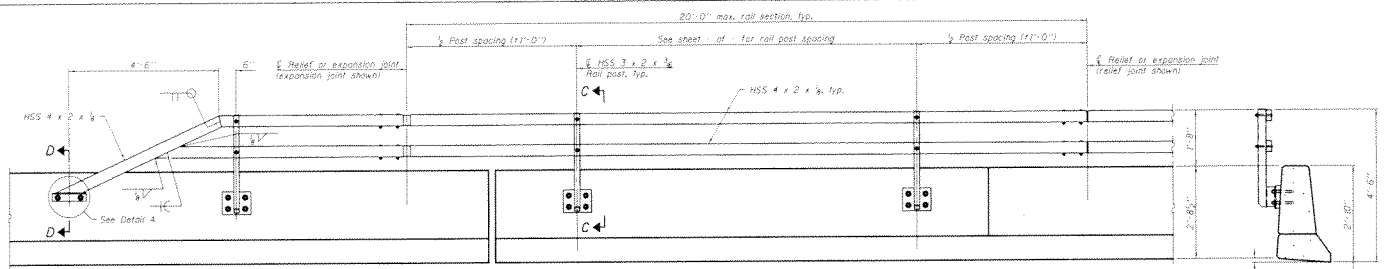
As per your prior request, the Midwest Roadside Safety Facility (MwRSF) at the University of Nebraska-Lincoln (UNL) has reviewed the draft details for a bicycle and pedestrian railing system for attachment to the backside of a 34-in. tall, reinforced concrete vehicle parapet. Based on our review, the selected members and configuration is believed to meet the geometric and design load requirements provided in the 2012 AASHTO LRFD Bridge Design Specifications with the 2013 Interims and found in Chapter 13, Sections 13.8 and 13.9. In addition, the proposed railing system is positioned more than 12 in. laterally away from the top front corner of the concrete parapet. Thus, the railing system is outside of the expected zone of intrusion (ZOI) and mitigates the risk of contact with a pickup truck when striking at the Test Level 2 (TL-2) conditions found in recent impact safety standards. As such, it is my opinion that full-scale vehicle crash testing is unnecessary for this bicycle/pedestrian railing system under TL-2 testing as it would be expected to provide acceptable safety performance when attached to typical reinforced concrete parapets measuring 32 in. tall or greater.

If you have any questions or comments regarding the information contained herein, please feel to contact me at your earliest convenience at (402) 472-6864 or via email at [rfaller1@unl.edu](mailto:rfaller1@unl.edu).

Sincerely,

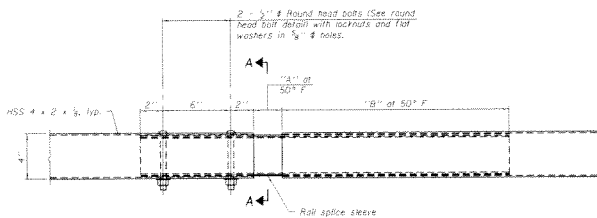


Ronald K. Faller, Ph.D., P.E.  
Director and Research Associate Professor

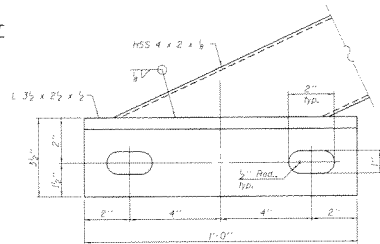


OUTSIDE ELEVATION OF PARAPET

SECTION THRU PARAPET  
(Taper backed parapet shown, straight backed parapet similar)



RAIL SPlice ELEVATION  
(AT expansion joint)

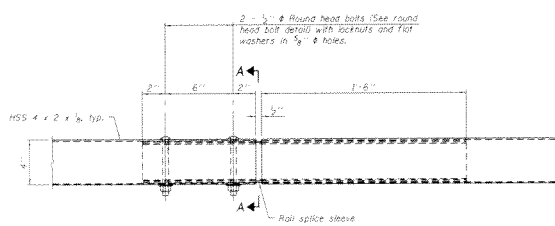


DETAIL A  
(Bolts omitted for clarity)

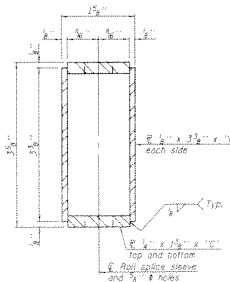
SPlice DIMENSIONS

SPlice	SPlice	SPlice	SPlice
4"	2 1/2"	1'-8"	2'-8"
6"	3 1/2"	1'-9 1/2"	2'-11"
8"	5"	1'-10 1/2"	3'-2"
10"	7"	2'-0 1/2"	3'-5 1/2"

\*T = Total movement at expansion joint (as shown on the design plans)



RAIL SPlice ELEVATION  
(AT relief joint)



SECTION A-A

Notes:  
All field drilled holes shall be coated with an approved zinc rich paint before erection.  
Posts shall not be located closer than 1'-3" to an existing bridge expansion joint or end of bridge.  
Railing expansion joints shall be provided between any two (2) posts which span a bridge expansion joint.  
Railing relief joints shall be placed between rail sections that do not span over an expansion joint.  
All steel rail elements shall be galvanized according to Article 509.05 of the Standard Specifications.  
All structural steel tubing in the rail shall be A500, Grade B.  
Threaded rods shall be ASTM F1554 for an Engineer-approved alternate material of the grades and diameters specified. The corresponding specified grade of AASHTO M314 may be used in lieu of ASTM F1554.  
Drill and set threaded rods according to Article 509.06 of the Standard Specifications.  
All structural steel plates shall be AASHTO M270, Grade 36 or 50.

BILL OF MATERIAL

Item	Unit	Quantity
Bicycle Railing (Parapet Mounted)	Foot	

R-38		1-28-14		(7'-0" to 10'-0" Post Spacing)		(Sheet 1 of 2)	
FILE NAME	DESIGNED	CHECKED	DESIGNED	CHECKED	DESIGNED	CHECKED	DESIGNED
PLAT SCALE	PLAT SCALE	PLAT SCALE	PLAT SCALE	PLAT SCALE	PLAT SCALE	PLAT SCALE	PLAT SCALE
PLAT DATE	PLAT DATE	PLAT DATE	PLAT DATE	PLAT DATE	PLAT DATE	PLAT DATE	PLAT DATE

STATE OF ILLINOIS DEPARTMENT OF TRANSPORTATION		BICYCLE RAILING (PARAPET MOUNTED) STRUCTURE NO.	
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SECTION	COUNT	DATE	NO.
CONTRACT NO.		SHEET NO.	

