Maura Healey, Governor
Kimberley Driscoll, Lieutenant Governor
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Phillip Eng, General Manager & CEO

massDOT
Massachusetts Department of Transportation

DESIGN DIRECTIVE

To: Distribution

From: Rodney DeLisle
Deputy Chief of Technical Engineering & Design

Initial RD

Date: April 8, 2025

RE: Emergency Guard Rail Requirements

This Design Directive is intended to define the MBTA's use of Emergency Guard Rail within transit rail territory. This directive will supersede the current Transit Design Standards Manual guidance (Section 4.C.13). In the event that conditions warrant deviation from this directive, the Engineer of Record shall submit a request for a waiver to the Chief Engineer or designee.

DEFINITIONS

EMERGENCY GUARD RAILS shall refer to rail installed parallel to the running rails to prohibit derailed trains from traveling laterally away from the track centerline and causing unnecessary damage to critical infrastructure, the vehicle, or to the public.

ELEVATED STRUCTURES shall refer to any bridge, viaduct, or other structure specifically constructed of timber, steel, or concrete to support the track above the ground. This does not include an earthen embankment supporting the track.

PRINCIPLES

a. Emergency Guard Rails shall be installed at the following locations:

i. Open Deck Track

- Emergency Guard Rails (double rail) shall be used on all open deck track (bridges and elevated viaducts) throughout the MBTA system regardless of the type of bridge construction or span length. Emergency Guard Rails shall be installed as shown on **Plan Nos. 900** and **905**, attached.

ii. Elevated Ballasted Deck or Direct-Fixation Structures (other than Open Deck)

- In elevated ballasted deck or direct-fixation structures with a span length **longer than 75-feet**, Emergency Guard Rails shall be installed at locations where the edge of the structure is **5-feet or less** from the gauge side of the nearest running rail. For this purpose, a single Emergency Guard Rail shall be installed at these locations on the track closest to the edge of the structure, adjacent to the running rail located farthest from the edge of the elevated structure.

iii. Other Locations

- Emergency Guard Rails may be required at other locations as specified by Track Engineering. The Emergency Guard Rails in these locations shall be installed along a length of 39-feet at both ends of the bridge or object being protected.

b. Where Crash Walls or similar structural elements designed to protect the structure from derailment loads, or to contain a train within the right-of-way limits, are present, Emergency Guard Rail is not required.

c. Emergency Guard Rail shall extend 39-feet ahead of the protected area on the approach end and extend 39-feet beyond the protected area on the departure end.

d. Attention shall be paid to the details of the Emergency Guard Rail fastening, as they relate to the facilitation of track surfacing and other track maintenance operations, as well as to assure the effectiveness of the emergency guard rail functions.

e. When it is necessary to remove Emergency Guard Rail to perform maintenance work, the Emergency Guard Rail will be re-installed only where required by the above instructions.

f. At locations with more than two tracks, Emergency Guard Rail shall only be installed on the tracks closest to the edge of the structure.

g. When the object being protected exists only on one side of the track, a single Emergency Guard Rail shall be installed adjacent to the running rail located farthest from the side of the object being protected.

h. The horizontal distance between the gauge face of the running rail and the side face of the Emergency Guard Rail closest to the running rail shall be 12 $^{5}/_{8}$-inch.

i. In all cases, except at station platform areas and locations with signal equipment, the Emergency Guard Rail will be curved and brought to the center of the track as shown in **Plan No. 900**. Emergency Guard Rail installations through signal boxes and other equipment shall end just before the obstruction, leaving a gap no larger than 3' between the ends of the Emergency Guard Rail ends on both sides of said obstruction. The web and base only of the Emergency Guard Rail may be torch cut at the obstruction and bent properly in accordance with **Plan No. 900**.

j. Emergency Guard Rail ends should rest on a crosstie and be securely spiked.

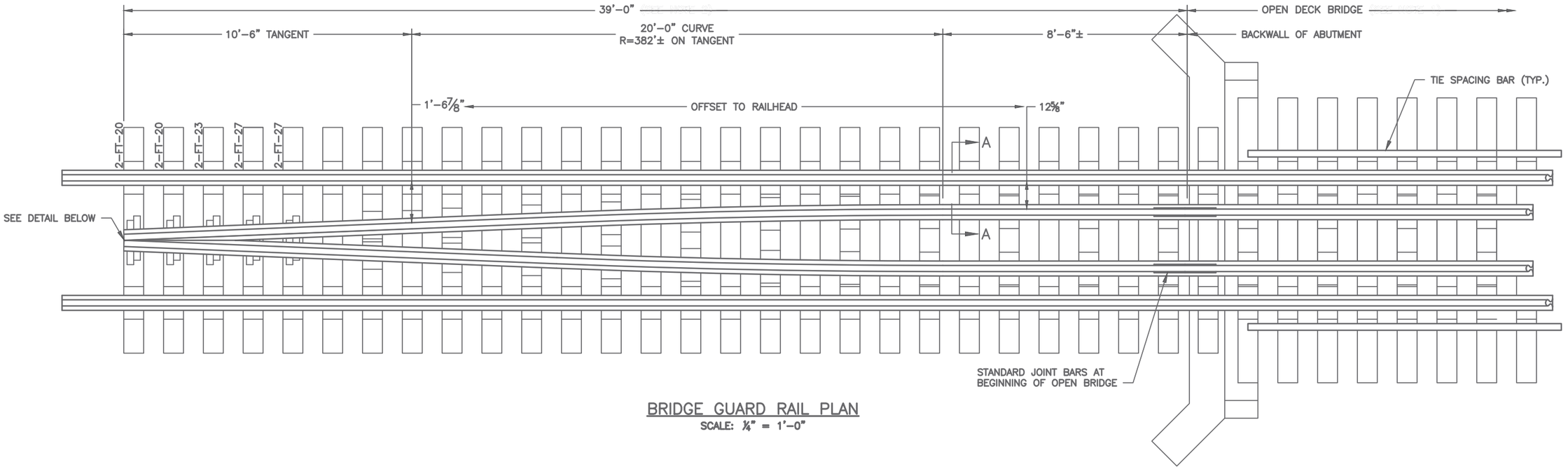
k. The top of the Emergency Guard Rail shall not be more than $^{3}/_{4}$-inch lower than the top of the adjacent running rail. In no case shall the top of the Emergency Guard Rail be higher than the top of the adjacent running rail. If side worn rails are used as emergency guard rails, the worn side shall be placed facing the center of the track.

l. Emergency Guard Rails shall be secured every other crosstie with resilient plates with elastic fasteners, except for the ends, which shall be fully supported by twin hook frog tie plates as shown in **Plan No. 905**. Spike holes shall be pre-drilled. Each elastic plate supporting the

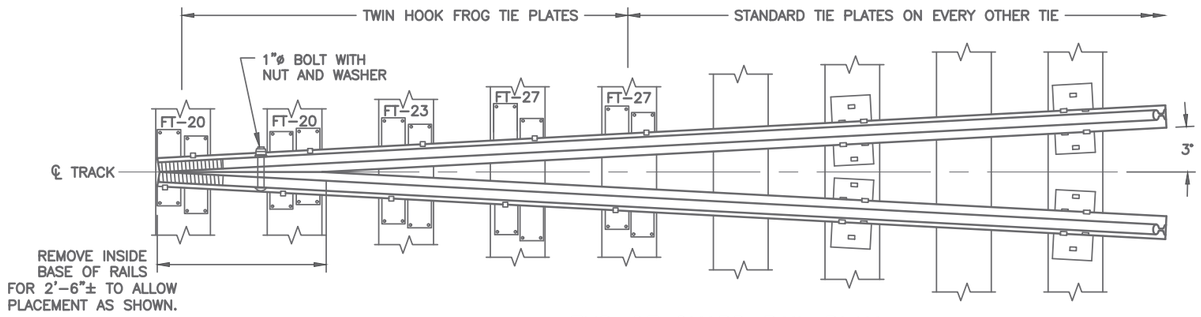
Emergency Guard Rail shall have a minimum of two (2) hold-down screw spikes, one at each side of the plate, diagonally opposite each other.

m. Emergency Guard Rails shall be spliced using six-hole joint bars with a minimum of four (4) bolts in each joint. All bolt heads shall be between the Emergency Guard Rail and the nearest running rail.

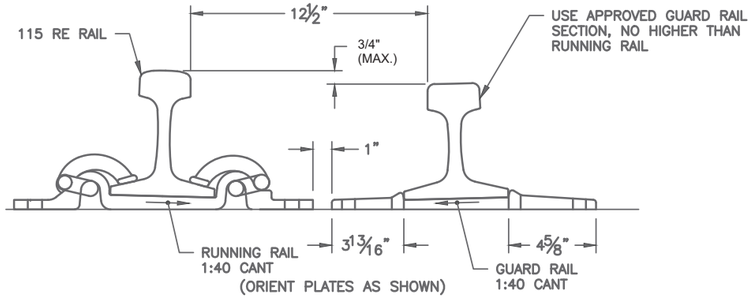
n. Where restraining rail is used, the Emergency Guard Rail shall only be installed along the side where the restraining rail is not present. At locations with double restraining rail, no Emergency Guard Rails are required.



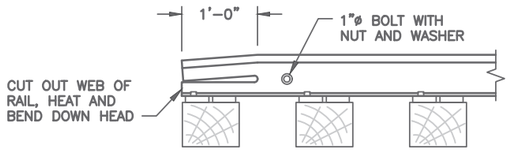
BRIDGE GUARD RAIL PLAN
SCALE: ¼" = 1'–0"



END OF GUARD RAIL PLAN
SCALE: ½" = 1'–0"



SECTION A–A
SCALE: 1½" = 1'–0"



END OF GUARD RAIL ELEVATION
SCALE: ½" = 1'–0"

REVISION HISTORY

NO.	DATE	DESCRIPTION

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

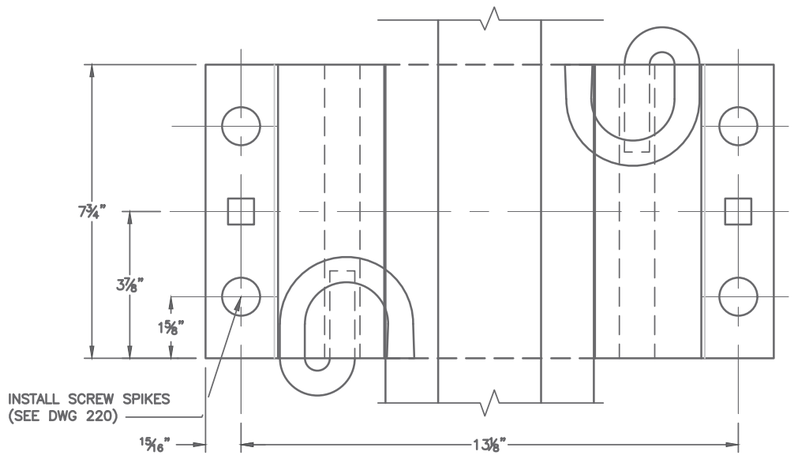
MAINTENANCE OF WAY DIVISION

DIRECTOR - MAINTENANCE OF WAY DATE

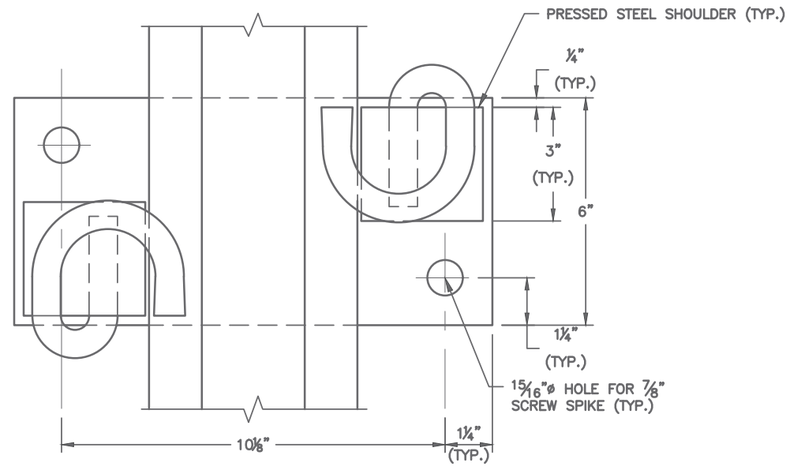
DEPUTY DIRECTOR - MAINTENANCE OF WAY DATE

EMERGENCY GUARD RAIL INSTALLATION DETAILS

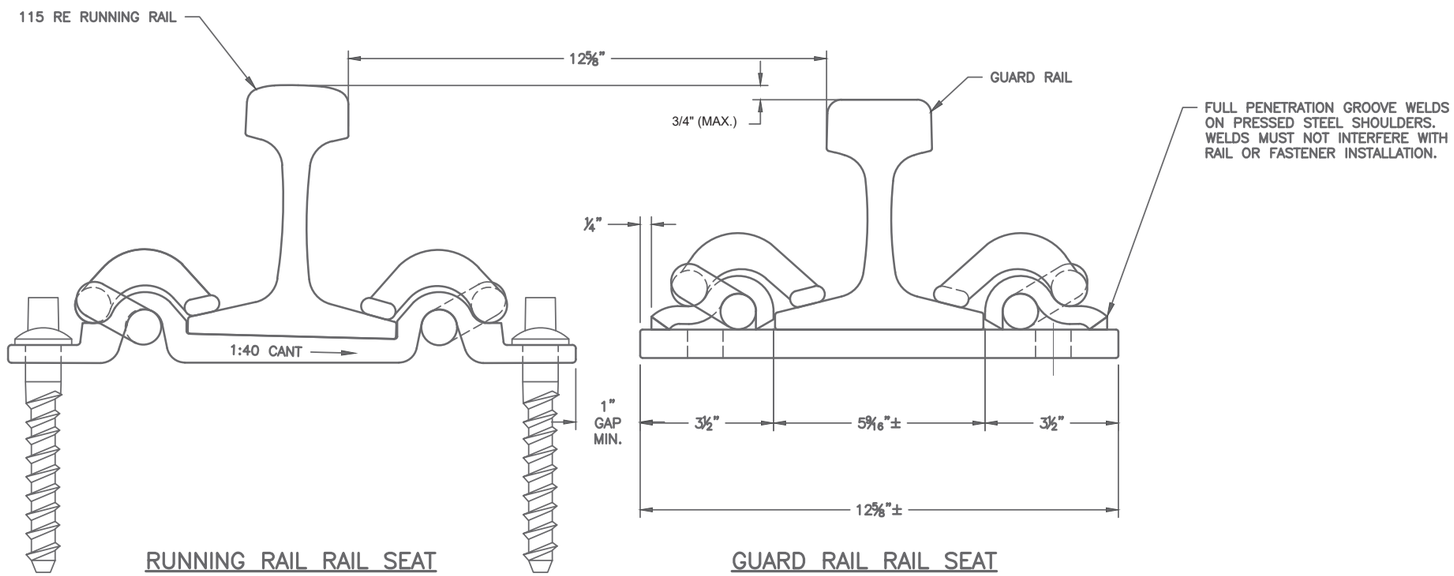
SCALE: AS NOTED	DRAWN BY CWB	DESIGN BY	CHECK BY	DWG NO. 900	ISSUE 1
DATE: APRIL 2025					



RUNNING RAIL



GUARD RAIL



RUNNING RAIL RAIL SEAT

TIE PLATE (SEE DWG. NO. 225)
LOCKSPIKES (SEE DWG. NO. 220)
FASTENERS (SEE DWG. NO. 240)

GUARD RAIL RAIL SEAT

TIE PLATE (AS SHOWN)
LOCKSPIKES
PRESSED STEEL SHOULDERS
FASTENERS

REVISION HISTORY

NO.	DATE	DESCRIPTION

MASSACHUSETTS BAY TRANSPORTATION AUTHORITY

MAINTENANCE OF WAY DIVISION

DIRECTOR - MAINTENANCE OF WAY DATE

DEPUTY DIRECTOR - MAINTENANCE OF WAY DATE

RESILIENTLY FASTENED EMERGENCY GUARD RAIL

SCALE: 3" = 1'-0"	DRAWN BY CWB	DESIGN BY	CHECK BY	DWG NO. 905	ISSUE 1
DATE: APRIL 2025					