
Temporary Barrier Rail

Design Manual
Chapter 9
Traffic Control

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General

Temporary Barrier Rail (TBR) is a safety device designed to prevent errant vehicles from penetrating into areas behind the barrier. A TBR installation consists of individual sections of TBR connected end-to-end. Its primary purposes are: to protect drivers from obstacles in the work area, and to protect workers from vehicles leaving the traveled way.

Iowa DOT uses two types of TBR: concrete ([BA-401](#)) and steel ([560-7](#)). Concrete TBR is mostly used on roadway projects; however, it is also used on many bridge projects where lane width is not an issue. Steel TBR is used almost exclusively on bridge projects where a narrow-width barrier is required. Contact the [Roadside Safety Engineer](#) prior to using steel TBR.

TBR Use

TBR use is outlined in §630.1108(a) of [23 CFR 630 Subpart K](#). The use of TBR should be based on engineering judgment. TBR should be installed to shield a hazard only if the result of a vehicle impacting the TBR would be less severe than a vehicle hitting the unshielded hazard. Use may also be based on the probability of run-off-the-road accidents and economic factors. Common cases where TBR may be warranted include:

- Work in locations that provide workers no means of escape from an errant vehicle such as:
 - Bridge deck overlays/reconstruction.
 - Bridge rail construction/retrofit.
- Work operations that place workers close to open lanes of traffic for more than two weeks.
- Roadside hazards left in place overnight or longer such as:
 - Drop-offs on structures.
 - Drop-offs or excavations near the traveled way (refer to Section [9C-2](#)).
 - Excavations for bridge piers.
- Work zones in place for one or more construction seasons with high traffic volumes and high operating speeds.
- Separation of two-way traffic in freeway work zones.
- To protect pedestrians in work zones.

Lane Width

A TBR installation must be designed to provide adequate lane width for vehicles to travel through the work zone, yet at the same time provide sufficient space for construction activity. Sometimes compromises must be made to achieve acceptable results. Maintain a minimum width of 14 feet 6 inches between TBR and bridge rail or other barriers whenever possible. This provides sufficient clearance for legal-width loads and a 1 foot cushion. Loads wider than 13 feet 5 inches require a special permit. See the Iowa Truck Information Guide for more information on permitting requirements.

<https://iowadot.gov/mvd/motorcarriers/truckguide.pdf>



Whenever a 15 foot 6 inch clearance cannot be provided, special signing must be placed in advance of the work zone. Notify the Office of Traffic and Safety, and include Standard Road Plans [TC-81](#) and [SI-881](#) or [SI-882](#), as appropriate, in the project plans.



If a TBR installation results in a lane width less than 10 feet 6 inches, contact the [Traffic Control Engineer](#) for a TBR design review.

Access to the Work Area

How a TBR installation may impact the flow of construction vehicles through the work zone is an important consideration. Provide an entrance to the work area that is wide enough to allow passage of the types of construction vehicles that will be present on the project. However, to discourage the general public from inadvertently entering the work area, the entrance should be as narrow as possible and should be offset from the flow of traffic. The use of adjacent shoulders as part of the entrance is encouraged.

Wherever space and work zone configuration allows, a separate exit from the work area should be provided for construction vehicles. This prevents exiting vehicles from using the entrance, which could cause bottlenecks or backups onto the open traffic lane.

Placement

Whenever possible, TBR should be installed at a minimum of 2 feet from the edge of the nearest traffic lane. This distance provides drivers with a level of comfort and maintains the flow of traffic through the work zone.

The distance TBR is installed in front of a hazard is also a significant design consideration. Although they are very heavy, TBR may slide several feet when impacted by a vehicle. Therefore, sufficient clear distance must be provided behind the TBR to allow for this movement.

Anchoring TBR to the pavement reduces the amount of clear distance required behind the TBR, but increases costs and can damage pavement. Therefore, avoid placing TBR in locations requiring anchoring whenever possible. Anchorage requirements and minimum offsets are shown in Table A of Standard Road Plan [BA-401](#) and Road Design Detail [560-7](#).

Alignment

TBR generally follows a constant offset from the traveled lane. However, it is often necessary to transition a line of TBR toward traffic, especially at the beginning of the project or near entrance ramps. The maximum flare rate toward traffic is 6:1, measured parallel to the path of adjacent traffic. Due to the limited space between individual sections of TBR, the 6:1 flare rate must be developed incrementally using a minimum of four TBR sections. Figure 1 illustrates how the 6:1 flare rate is developed.

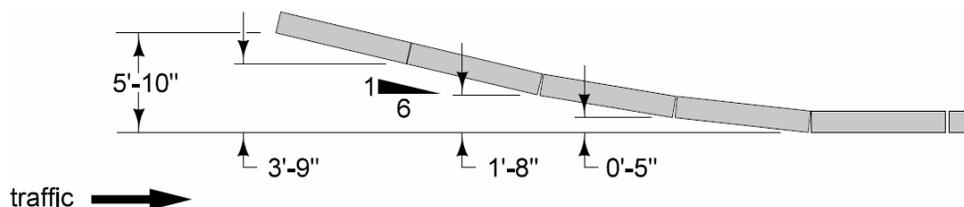


Figure 1: Concrete TBR Transition to 6:1 flare.

End Treatments

The end of the TBR must be protected if it terminates within the clear zone distance of the temporary traffic control zone (see Section [1C-2](#)) for approaching traffic.

Consider these options for end treatment:

1. Flare the TBR beyond the temporary traffic control clear zone distance.
2. Where posted speed limit is 35 mph or less, the tapered end section is considered adequate end treatment for concrete TBR.
3. Protect the approach end of TBR with a crash cushion. See Section [8C-5](#) for specific requirements and limitations for crash cushions.

Illumination

Refer to Section [9B-6](#) for information on lighting requirements.

Chronology of Changes to Design Manual Section: 009B-009 Temporary Barrier Rail

10/31/2023	Revised Revised minimum clearance that initiates need for special signing.
5/20/2019	Revised Revised a reference to BA-400 on Page 2 to BA-401.
4/29/2019	Revised Changed BA-400 to Design Detail 560-7.
5/17/2018	Revised Minor edits to improve readability. Added TBR may be warranted to protect pedestrians in work zones.
4/17/2012	Revised Change the width for restricted width signing from 14'5" to 14'6" to match the Standard Road Plan
11/30/2011	Revised Updated link from 8B-12 to 8C-5.
7/29/2011	Revised Updated link to the Traffic Control Engineer, Office of Construction.
8/31/2010	Revised Added sentence that TBR is governed by 23 CFR 630 Subpart K.
1/29/2010	Revised Update standard numbers