

Design Advisory

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Index:
Limited Deflection TCB
Special Provisions,
Chapter 7 of the Road Design
Manual

Questions regarding this
Design Advisory should be
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Limited Deflection Temporary Concrete Barrier (TCB)

The purpose of this advisory is to inform and remind designers that:

1. Limited deflection TCB should only be used when absolutely necessary due to site-specific conditions requiring the TCB to be placed near a precipitous drop-off.
 - With very few exceptions, limited deflection TCB is required when the offset between the toe of the barrier on the construction side and a precipitous drop-off is less than 26 inches.
2. Special provisions and separate pay items are required when calling for limited deflection TCB.
 - Please note, the *Conc Barrier, Temp* pay items (furnished, operated, adjusted, and relocated) from the 2012 Standard Specifications for Construction cannot be used to pay for limited deflection TCB.
3. When calling for limited deflection TCB, designers are responsible for:
 - a. Specifying the barrier offset from the drop-off;
 - b. Specifying the detail type(s), from Special Detail R-53-Series, required at each location; and
 - c. Ensuring that the specified detail type(s), from Special Detail R-53-Series, can be properly installed at each location.
4. When limited deflection TCB is required, designers should try to use Detail 1 (Box Beam Stiffened Method) from Special Detail R-53-Series whenever possible.
 - a. Please note that Detail 1 can only be used when the offset between the toe of the barrier on the construction side and the precipitous drop-off is at least 12 inches.
5. Designers are responsible for determining the need for Type J1/J2 assemblies, as shown in Special Detail R-53-Series, and specifying the number of Type J1/J2 assemblies required at each location. However, *Type J1/J2 assemblies should only be used when absolutely necessary*. Please contact Carlos Torres, Crash Barrier Engineer, if planning to use Type J1/J2 assemblies on any projects.

Unlike standard TCB that require no pinning to the underlying surface or additional stiffening elements, limited deflection TCB requires the use of specific TCB types and hardware for reducing TCB impact deflection (e.g., pinning the TCB sections to the underlying surface, attaching box-beam stiffening elements to the TCB sections, etc.). Limited deflection TCB will ultimately result in additional materials, labor, equipment, and costs compared to standard TCB. Furthermore, pinning TCB sections to the underlying surface should be minimized to reduce the potential of damaging the underlying pavement or bridge deck.

As a result, *limited deflection TCB should only be used when necessary*. Per Special Details R-126-Series, R-53-Series, and Chapter 7 of the Michigan Road Design Manual (RDM), limited deflection TCB is required when the offset between the toe of the barrier on the construction side and a precipitous drop-off is less than 26 inches. Therefore, designers should try to place the TCB at least 26 inches from a precipitous drop-off whenever possible and, by doing so, avert the need for limited deflection TCB.

It should be noted that TCB placed near precipitous drop-offs with very shallow depths and/or narrow widths may not necessarily require the use of limited deflection TCB. Therefore, designers are urged to consult with Chris Brookes, MDOT Work Zone Delivery Engineer for guidance.

When specifying limited deflection TCB, some or all of the following special provisions (SPs) and the pay items contained in the SPs are required:

- TEMPORARY CONCRETE BARRIER, LIMITED DEFLECTION FURNISHED AND OPERATED
 - Current Special Provision Number: 12RC812-A515-01
- TEMPORARY CONCRETE BARRIER, LIMITED DEFLECTION ADJUSTED
 - Current Special Provision Number: 12RC812-A530-01
- TEMPORARY CONCRETE BARRIER, LIMITED DEFLECTION RELOCATED
 - Current Special Provision Number: 12RC812-A505-02
- TEMPORARY CONCRETE BARRIER, LIMITED DEFLECTION, J1/J2 ASSEMBLY
 - Current Special Provision Number: 12RC812-A510-01

Please note that designers must specify the detail type required at each location by inserting the detail number in the appropriate pay items shown below:

- Conc Barrier, Temp, Limited Deflection, Det __, Furn Foot
- Conc Barrier, Temp, Limited Deflection, Det __, Oper Foot
- Conc Barrier, Temp, Limited Deflection, Det __, Adj Foot
- Conc Barrier, Temp, Limited Deflection, Det __, Relocated..... Foot

Type J1/J2 assemblies are measured and paid for using the following pay item:

- Conc Barrier, Temp, Limited Deflection, J1/J2 Assembly, Furn.....Each

Before attempting to use limited deflection TCB on any project, designers are urged to thoroughly review Special Detail R-53-Series, the limited deflection TCB special provisions, and Section 7.01.70 of the RDM. Any questions related to the use of limited deflection TCB should be directed to Carlos Torres, Crash Barrier Engineer, or Chris Brookes, Work Zone Delivery Engineer.