Index 5210 Traffic Railing/Sound Barrier (8'-0") (Rev. 07/12)

Design Criteria

NCHRP Report 350 TL-4; ***NCHRP Report 663***; ***AASHTO LRFD Bridge Design Specifications***, 5th Edition; ***Structures Design Guidelines (SDG)***, January 2011 Edition; except Index 5212 (Junction Slab) meets the ***AASHTO LRFD Bridge Design Specifications***, 6th Edition and the ***Structures Design Guidelines (SDG)***, January 2012 Edition

Design Assumptions and Limitations

The Traffic Railing / Sound Barrier (8'-0") is the basic non-proprietary crash tested traffic railing / sound barrier combination for use on FDOT bridges and retaining walls. It can also be used for ground mounted applications within the clear zone when used in conjunction with the foundations presented in Indexes 5212, 5213 and 5214. This railing is first and foremost a traffic railing that also serves as a sound barrier. To preserve the crashworthiness of the design, this railing must be used in accordance with the requirements of ***SDG*** 6.7 for all applications.

For bridge applications, design bridge decks supporting Traffic Railing / Sound Barriers (8'-0") in accordance with the requirements of ***SDG*** 4.2. For bridge decks up to a maximum thickness of 9", the two Bars 5S1 placed in the bridge deck may substitute for the longitudinal deck steel located within the limits of Bars 5V, provided that the total area of longitudinal deck steel beneath the railing, as required by calculation, is not reduced.

For retaining wall applications (Index 5212), resistance for overturning is calculated using a point of rotation located at the outside face of retaining wall. A special design may be required if bearing conditions between the junction slab and retaining wall warrant consideration for an alternate point of rotation. See NCHRP Report 663 for more information.

Form liners providing a textured finish are permitted on the outside face of the Traffic Railing / Sound Barrier (8'-0") with the following provisions: (1) The maximum amplitude of the form liner on the lower 2'-8" section shall be limited to 1" depth; (2) Any form liner used above 2'-8", must provide a thickened concrete section to maintain 2" cover. Full details of this thickened section and the form liner shall be provided in the plans. Form liners complying with the requirements of ***SDG*** 6.7 are allowed on the upper vertical portion of the inside face of the Traffic Railing / Sound Barrier but are not recommended.

When the Traffic Railing / Sound Barrier (8'-0") terminates on the bridge, the End Taper shall be located at an open joint. When the Traffic Railing / Sound Barrier (8'-0") terminates on the Approach Slab, the End Taper shall terminate at Begin or End Approach Slab as shown.

Indexes 6011, 5212, 5213, 5214, 5215, 20900 and 20910 contain details for the use of Traffic Railing / Sound Barriers (8'-0") on retaining walls, approach slabs and footings.

Project specific details are required for the use of 10'-0" and 12'-0" tall Traffic Railing / Sound Barriers on footings. Base these details on Indexes 5210 and 5211.

For treatment of Traffic Railing / Sound Barriers (8'-0") on skewed bridges see Index 420.

Details are available for increasing the crashworthiness of this Traffic Railing / Sound Barrier to ***NCHRP Report 350*** Test Level 5. Contact the Structures Design Office for more information.

Plan Content Requirements

In the Structures Plans:

In the Materials Note on the General Notes Sheet, specify the concrete class in accordance with the superstructure environment classification. See ***SDG*** 1.4.

Show and label the Traffic Railing / Sound Barrier (8'-0") on the Plan and Elevation, Typical Section, Superstructure, Approach Slab and Finish Grade Elevations Cross Section sheets, Retaining Wall Control Drawings, and other sheets as required. Include cross references to ***Design Standards*** Index 5210 and 20900 or 20910 as appropriate.

When the Traffic Railing / Sound Barrier (8'-0") ends on a bridge, provide an End Taper and terminate the low end of the End Taper at an open joint in the traffic railing, preferably at the end of a span. Continue the bridge mounted traffic railing along the remainder of the bridge.

When the Traffic Railing / Sound Barrier (8'-0") ends on an Approach Slab, provide an End Taper and terminate the low end of the End Taper at Begin or End Approach Slab. Provide an Index 400 Detail J Guardrail Approach Transition, Index 410 Concrete Barrier Wall or crash cushion at the low end of the End Taper.

On the Superstructure section sheets, show the two Bars 5S1 placed in the bridge deck within the Bars 5V along with the rest of the deck steel.

All concrete and Bars 5P, 5R, 5S and 5V required to construct the Traffic Railing / Sound Barrier are included in the Estimated Traffic Railing Quantities. Do not include Traffic Railing / Sound Barrier concrete in the estimated concrete quantities, or Bars 5P, 5R, 5S and 5V in the reinforcing bar lists and estimated reinforcing steel quantities for supporting bridge decks, approach slabs or retaining walls.

In the Roadway or Structures Plans when the Traffic Railing / Sound Barrier (8'-0") is used on retaining walls:

In the Materials Note on the General Notes Sheet, specify the concrete class in accordance with the retaining wall environment classification. See ***SDG*** 1.4.

Show and label the Traffic Railing / Sound Barrier (8'-0") on the Retaining Wall Control Drawings, and other sheets as required. Include cross references to ***Design Standards*** Index 5210 and 5212 and/or 6100 Series as appropriate.

For Index 5212, show and label the junction slab as either TYPE 1 or TYPE 2, based on the required width for stability. Determine the appropriate TYPE using Table 1 below. Project specific designs may be required for locations exceeding the listed design parameters.

When the Traffic Railing / Sound Barrier (8'-0") ends on a retaining wall, provide an End Taper and terminate the low end of the End Taper at an open joint in the traffic railing. Continue the retaining wall mounted traffic railing along the remainder of the retaining wall.

Table 1 Junction Slab Selection

Wind Speed (mph)	Retaining Wall Height (ft)	Junction Slab Width (ft)
110	≤ 50	5 ft. (TYPE 1)
130	≤ 50	5 ft. (TYPE 1)
150	≤ 50	6 ft. (TYPE 2)

In the Roadway Plans when the Traffic Railing / Sound Barrier (8'-0") is used for ground mounted applications:

In the Materials Note on the General Notes Sheet, specify the concrete class in accordance with the substructure or retaining wall environment classification. See ***SDG*** 1.4.

Show and label the Traffic Railing / Sound Barrier (8'-0") on the Plan and Profile, Cross Section and other sheets as required. Include cross references to ***Design Standards*** Index 5210, 5213, 5214 and 5215 as appropriate.

When the approach end of the Traffic Railing / Sound Barrier (8'-0") ends along the roadway within the clear zone, use one of the following treatments:

- Provide an End Taper and Index 400 Detail J Guardrail Approach Transition, Index 410 Concrete Barrier Wall or crash cushion at the low end of the End Taper.
- Flare the full height Traffic Railing / Sound Barrier (8'-0") out beyond the clear zone. Flare rates vary based on both design speed and highway application (i.e., Interstate, urban or rural installations). See ***Design Standards*** and ***PPM*** for applicable flare rates.
- Terminate the full height Traffic Railing / Sound Barrier (8'-0") within the clear zone and shield the end with a wide crash cushion. Ensure the traffic face of the wide crash cushion is offset at least 24-inches from vertical face of Traffic Railing / Sound Barrier (8'-0").

When the trailing end of the Traffic Railing / Sound Barrier (8'-0") ends along the roadway within the clear zone of adjacent traffic, and the trailing end is not within the clear zone of opposing traffic, the Traffic Railing / Sound Barrier (8'-0") can remain full height all the way to the end or the End Taper can be used. Provide Index 400 Guardrail or Index 410 Concrete Barrier Wall as required to shield hazards beyond the end of the Traffic Railing/ Sound Barrier.

Include project specific details for 10'-0" and 12'-0" tall Traffic Railing / Sound Barriers.

Payment

Item number	Item description	Unit Measure
521-5-20	Concrete Traffic Railing-Bridge, F Shaped With Sound Barrier Wall 8' Height	LF
521-7-1	Concrete Traffic Railing Barrier Retaining Wall System, F Shape With Sound Barrier Wall, 8' Height	LF
521-72-20	Shoulder Concrete Barrier Wall, F Shaped, With 8' Sound Wall	LF
521-72-21	Shoulder Concrete Barrier Wall, F Shaped, With 10' Sound Wall	LF
521-72-22	Shoulder Concrete Barrier Wall, F Shaped, With 12' Sound Wall	LF
521-72-23	Shoulder Concrete Barrier Wall, F Shaped, With 14' Sound Wall	LF