

NEW HAMPSHIRE DEPARTMENT OF TRANSPORTATION



BUREAU OF BRIDGE DESIGN



BRIDGE-MOUNTED SIGN SUPPORTS DETAIL SHEETS - REVISION HISTORY

Date of Revision	Name of Detail Sheet	Revision Description	Background
12/12/2023	Bridge-Mounted Sign Supports (Steel Girder)	Clarified notes to designer	Added and clarified notes to designer noting the sign size needs to be confirm it meets max. requirements and layed out on bridge sheets.
8/30/2023	Bridge-Mounted Sign Supports (Steel Girder)	Added note #8 and renumbered previous note to #9.	
7/31/2023	Bridge-Mounted Sign Supports (Steel Girder)	Converted from MicroStation V8i to MicroStation Connect. Changes made are shown with highlights on this Detail Sheet .	Contractor's have been post installing mechanical expansion anchor bolts instead of cip called for on the plans. The use of mechanical expansion anchor bolts are needed for bridge mounted sign structures replaced on existng bridges. The concern was with the larger sign heights abover the deck coping creating a tension load to the anchors due to wind on the back of the sign. After analysis and discussion, a policy was created for signs shall have a maximum height of 3.5' above the deck coping which brings the maximum sign height to the top of T3 bridge railing. Note #2 states the Contractor may use post installed mechanical expansion anchors and shall provide the anchor design for approval in accordance to the special provision.
6/29/2021	Bridge-Mounted Sign Supports (Steel Girder)	<p>Revised Top View (2 & 3 support): Added: "incl. aux. panels"</p> <p>Revised Anchor Plate Section: Increased angles to 4x4x3/8 from 4x4x1/4</p> <p>Revised Weld Termination Detail: Added "10" min." weld length</p> <p>Added Section D-D</p> <p>Revised View A: Added overhang distances and overhang brace Increased angles to 4x4x3/8 from 4x4x1/4</p> <p>Revised Design Criteria: (1) Specifications: To: AASHTO LRFD Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 1st Ed. 2015 as amended From: AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, 6th Ed. 2013 as amended To: NHDOT 2016 Standard Specifications as amended</p>	Re-analyzed structure for 2015 AASHTO code which required angles to increase to 4x4x3/8. Analyzed maximum height sign can overhang above top deck coping before an additional brace is required. Analyzed wind to the back of signs in addition to the front. Concrete Girder Bridge Mounted Sign Supports will be on a seperate sheet.

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		<p>From: NHDOT 2010 Standard Specifications as amended</p> <p>(2) Design Loading: To: Wind Pressure = 48 psf (2-support), 46 psf (3-support), Wind Speed = 130 mph From: Wind Pressure = 44 psf, Wind Speed = 100 mph</p> <p>Revised Support System Notes: To: (4) Diagonal sway brace members shall be L 4"x4"x3/8" (Two members on top and two members on bottom). From: (4) Diagonal sway brace members shall be L 4"x4"x1/4" (Two members on top and two members on bottom).</p>	
11/2/2015	Bridge-Mounted Sign Supports	<p><u>Plan View Detail:</u> Added rail posts and note "Space to avoid Rail Posts".</p> <p><u>Top View (2 Support System) Detail:</u> Added field weld symbol and "(TYP)" to anchor plate reference.</p> <p><u>Top View (3 Support System) Detail:</u> Added "See Anchor Plate Detail (TYP)".</p> <p><u>Section C-C Detail:</u> Re-drew gusset plate and structural tee on a skew.</p> <p><u>Section B-B Detail:</u> Added splice plate and note 6" Min.</p> <p><u>View A-A Detail:</u> Added reference to 1/8" pad and 1/2" Ø bolt. Drew panel extrusion planks for sign face. Added wording to note: "(using WT as a template)" and "or field splice plates".</p> <p><u>Weld Termination Detail:</u> Drew gusset plate and structural tee on a skew.</p> <p><u>Concrete Girder Attachment Detail:</u> Renamed title to "Concrete NEBT Girder Attachment Detail", added weld sizes, added dimensions to 1/2" plates, added "Seal with Silicone Joint Sealant (TYP) (Subsidiary)".</p>	<p>Clarification.</p> <p>The NEBT have the same dimensions so the 1/2" plates would be the same for all girders.</p>

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11/2/2015	Bridge-Mounted Sign Supports	<p><u>Anchor Plate Notes:</u> Revised sentence in note (1): To: <i>The hole shall be filled with high strength non-shrink grout after the anchor bolt is installed (typical).</i> From: The hole shall be filled with high strength non-shrink grout after the anchor bolt is anchored (typical).</p> <p>Revised note (2): To: <i>For a C.I.P concrete coping, the 1/2" Ø high strength galvanized bolts shall be set in place before placement of the concrete.</i> From: (Alternate) 1/2" Ø high strength galvanized bolts set in place before placement of concrete.</p> <p>Deleted note (3)</p> <p><u>General Notes:</u> Revised note (3) To: "Type 1" From: "Type 3"</p> <p>Revised note (7): Removed "and" from 2nd sentence - made paragraph into 3 sentences.</p> <p><u>Support System Notes:</u> Revised note (4): Revised "Diagonal sway members" to "Diagonal sway brace members "</p> <p>Revised note (8): Added "and min. clear distances "</p> <p>Revised note (11): Deleted word "system".</p>	<p><u>Anchor Plate Notes:</u> (1): The word "anchored" was left from when the anchors were expansion anchors and created confusion on whether still using them. No longer using expansion anchors because they leave a gap under the bolt that can fill in with salt water and corrode the bolt. (2): Clarified note for C.I.P. copings. (3): Deleted note because not needed. Can't have less than 2 anchor plates and the anchor plates will always fall between rail posts.</p> <p><u>General Notes:</u> (3) The Detail Sheet shows only bolts in the attachment to the girder in which Type 3 (weathering steel) would be appropriate. However, the shop plans have been showing the angles bolted together temp. before welding and these bolts stay in place and should be Type 1 (galvanized). Decided to make all the bolts Type 1 (galvanized).</p>

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4/23/2015	Bridge-Mounted Sign Supports	<p>Revised note #1 Anchor Plate Notes to: <i>1/2" Ø high strength galvanized anchor bolts 8" long (1 1/2" above top of concrete) with standard galvanized nut and washer in drilled hole. The hole shall be filled with high strength non-shrink grout after the anchor bolt is anchored (typical). The anchor bolts shall conform to the requirements of ASTM A449.</i></p> <p>From: <i>1/2" E high strength galvanized expansion bolt 8" long (1 1/2" above top of concrete) with standard galvanized nut and washer in drilled hole. The hole shall be filled with high strength non shrink grout after the expansion bolt is anchored (typical).</i></p> <p>Revised note #3 General Notes to: <i>All bolts and related hardware shall conform to the requirements of AASHTO M164 (ASTM A325) Type 3. All bolts shall be slip critical (class B), 7/8" Ø high strength in 15/16" Ø holes.</i></p> <p>From: <i>All bolts and related hardware shall conform to the requirements of AASHTO M164 (ASTM A325) Type 1.</i></p> <p>Added hole dimension to Section B-B</p>	<p>Clarification what type of bolts to use in the anchor attachment and the girder attachment.</p> <p>The expansion bolt was removed because when it's installed, a gap is left between the bottom of the bolt and the bottom of the drilled hole. This can fill with water and corrode the bolt overtime, unnoticed. A regular anchor bolt shall be installed in a drilled hole and grouted.</p>
12/12/2014	Bridge-Mounted Sign Supports	<p>Updated sheet to include design criteria, note to designer, anchor plate detail, concrete girder attachment, and max. design dimensions.</p>	<p>Updated sheet.</p>