

Annotation Guidelines

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Notes: Initial submission of guidelines





Note:




- The classification of bearings and the creation of the annotation guidelines were based on the guidance outlined in the Bridge Inspector's Reference Manual (BIRM) (Ryan, Mann, & Chill, 2012), and the American Association of State Highway and Transportation Officials (AASHTO) code (AASHTO, 2018).
- To CITE this annotation guideline please use the reference of the journal article titled "*Development of Open-source Collaborative Structural Inspection Datasets*".
- All defect types with a condition better than "Fair" condition state 2 (CS2) are considered "Good" condition state 1 (CS1).




AASHTO. (2018). *Manual for Bridge Element Inspection (1st Edition), with 2015 and 2018 Interim Revisions*. American Association of State Highway and Transportation Officials (AASHTO).






Ryan, T. W., Mann, J. E., & Chill, Z. M. (2012). *FHWA Bridge Inspector's Reference Manual (BIRM)* (Vol. 1). Retrieved from <https://www.fhwa.dot.gov/bridge/nbis/pubs/nhi12049.pdf>




Defect Description	Ratings	Images
Corrosion:	<u>CS2</u> Fair: Freckled Rust, surface rust	 <p>Rocker Bearing</p>
	<u>CS3</u> Poor: Pack rust, deeper-than-surface-rust, some section loss but not enough to warrant structural review	 <p>Curved Bearing</p>
	<u>CS4</u> Severe: Excessive section loss and or is in a condition that can affect structural integrity	 <p>Rocker Bearing</p>

		 <p>Sliding Bearing</p>
Connection:	<p><u>CS2</u></p> <p>Fair: Loose bolts or connecting components</p>	 <p>Curved Bearing</p>
	<p><u>CS3</u></p> <p>Poor: Missing bolts, rivets, connecting components, and/or broken welds</p>	 <p>Pinned Bearing</p>
	<p><u>CS4</u></p> <p>Severe: Nuts and bolts are entirely absent or in severe enough condition to hinder structural integrity.</p>	 <p>Rocker Bearing</p>





		 <p>Unidentifiable Bearing</p>
Movement	<p><u>CS2</u></p> <p>Fair: Minor restriction to moving components (debris, obstacles)</p>	 <p>Sliding Bearing</p>
	<p><u>CS3</u></p> <p>Poor: Clear restriction to movement but not extensive enough to warrant a structural review</p>	 <p>Rocker Bearing</p>

	<p><u>CS4</u></p> <p>Severe: Extensive restriction to movement (excessive debris and/or corrosion) that can affect structural integrity</p>	 <p>Sliding Bearing</p>  <p>Rocker Bearing</p>
<p>Alignment / Bulging, Splitting, Tearing: (Temperature changes must be taken into account)</p>	<p><u>CS2</u></p> <p>Fair: Minor misalignment / bulging (no splitting or tearing) of bearing components</p>	 <p>Rocker Bearing</p>

		 <p>Elastomeric Bearing</p>  <p>Curved Bearing</p>
	<p><u>CS3</u></p> <p>Poor: Misalignment is clearly evident but not severe enough to warrant a structural review / splitting or tearing is present</p>	 <p>Rocker Bearing</p>  <p>Curved Bearing</p> 

		Elastomeric Bearing
	<p><u>CS4</u></p> <p>Severe: Significant misalignment or entire separation of bearing components</p>	<div><p>Rocker Bearing</p></div> <div><p>Curved Bearing</p></div> <div><p>Curved Bearing</p></div>

Bearing Types Not Shown in Guidelines

Bearing	Image
<p><u>Pot Bearing</u></p>	 <p style="text-align: center;">(AASHTO, 2018)</p>
<p><u>Roller Bearing</u></p>	 <p style="text-align: center;">(AASHTO, 2018)</p> <div style="display: flex; justify-content: space-around;">   </div> <p style="text-align: center;">(AASHTO, 2018)</p>
<p><u>Fixed</u></p>	