Class HA Head Obstructions

V1 10/22/20

Introduction:

This document has been prepared to address questions related to ASTM A970 Class HA headed bar obstructions and specifically how these relate to the HRC 555 and HRC 670.

Background:

Commonly, engineers have questions about the obstructions defined in ASTM A970 Annex A1 for Class HA heads and how they relate to HRC 555 Headed Bars and HRC 670 Field Installed Heads. There are a wide variety of methods used to attach heads to bars, some of which involve obstructions, or interruptions of the bar deformations within the bond length leading up to the bearing face of the head.

ASTM A970:

In ASTM A970, obstructions and the limitations for Class HA heads are defined in Annex A1 *REQUIREMENTS FOR CLASS HA HEAD DIMENSIONS*.

A1.1.1.5 For heads with an obstruction with a gap adjacent to the head, the net bearing area is the gross area of the head minus the area of the obstruction adjacent to the bearing face, provided that the gap has a width not less than the larger of ⅜ in. and ⅜ bar diameters, the depth of the gap does not exceed the width of the gap, and the obstruction everywhere within the gap falls inside a straight line connecting the outer dimension of the obstruction at the initiation of the gap with the dimension of the obstruction at the bearing face of the head (Fig. A1.2), and shall not be less than four times the nominal cross-sectional area of the bar (Fig. A1.1). In addition, the gross area of the head minus the maximum area of the obstruction shall not be less than 2.8 times the nominal cross-sectional area of the bar.

NOTE A1.1—The criteria for the size of a gap, the shape of the obstruction within a gap, and the minimum values for the gross area of the head minus the maximum area of the obstruction are based on successful performance in tests.[6]

A1.1.1.7 Obstructions or interruptions of the bar deformations and non-planar features on the bearing face of the head shall not extend more than 5.25 nominal bar diameters from the bearing face and shall not have a diameter greater than 2.2 nominal bar diameters (Fig. A1.1). Obstructions exceeding any of these limits are not permitted, with the exception that obstructions that do not extend from bearing face of the head more than 0.6 nominal bar diameters for No. 8 [No. 25] and larger bars or the smaller of 0.6 in. [15 mm] and the nominal bar diameter for bars smaller than No. 8 [No. 25] and do not have a diameter greater than 1.5 nominal bar diameters shall not be considered to detract from the net bearing area of the head (Fig. A1.3).

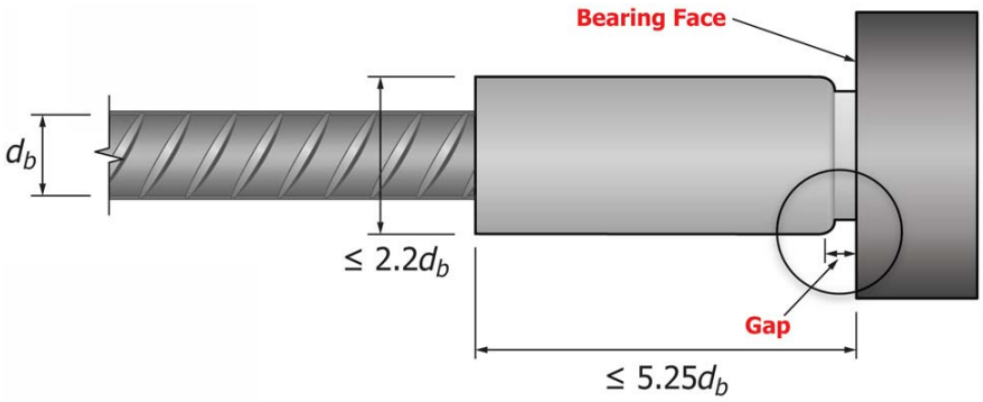

FIG. A1.1 Maximum Dimensions and Non-Planar Features of Obstruction or Interruptions of Bar Deformations

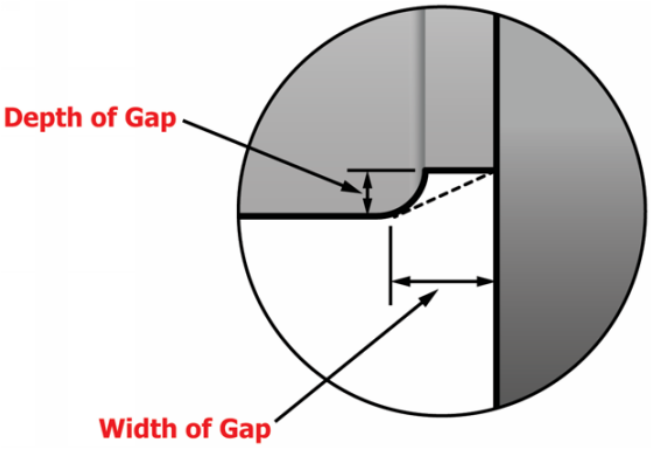

FIG. A1.2 Details of Gap in Obstruction Adjacent to Head

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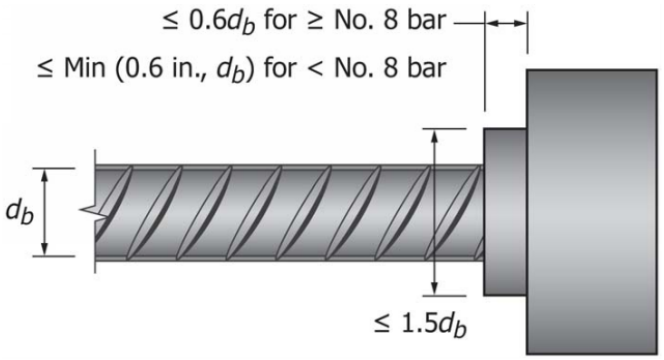
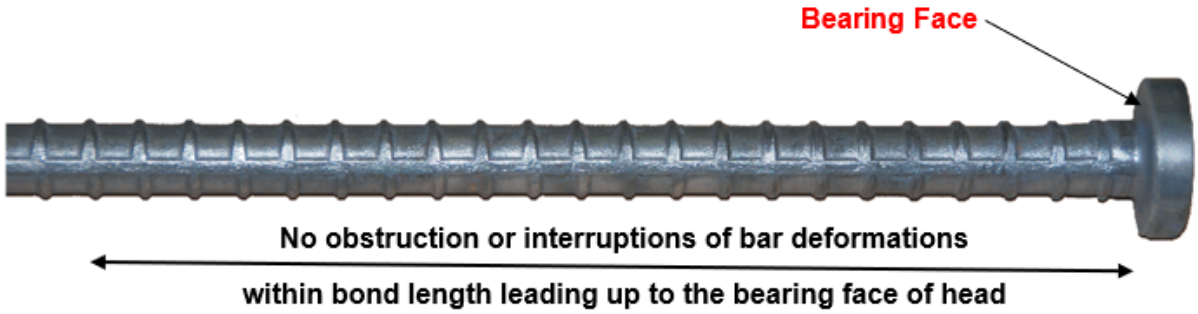


FIG. A1.3 Obstruction Not Considered to Detract From the Net Bearing Area of the Head

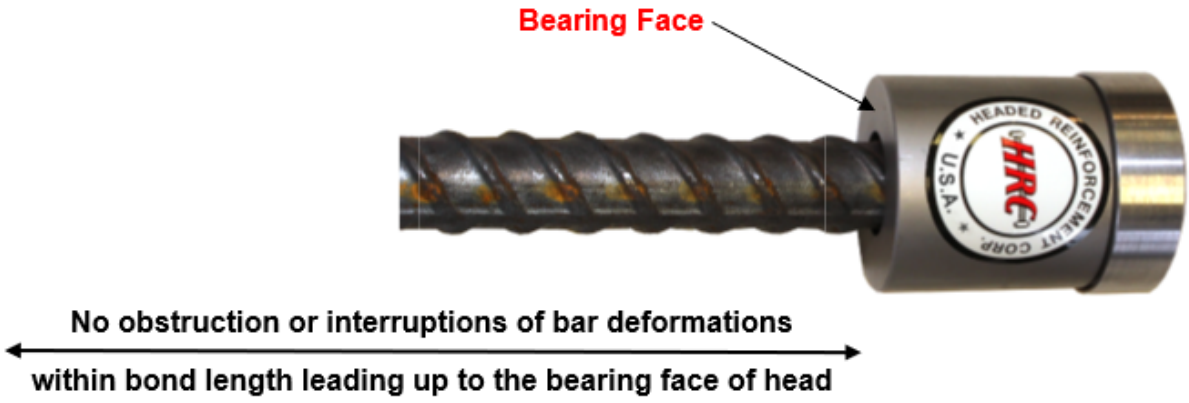
HRC Products:

HRC products that meet ASTM A970 Class HA requirements do not have ANY obstructions or interruptions of bar deformations within the bond length leading up to the bearing face of the head.

HRC 555 Headed Bars



HRC 670 Field Installed Heads



Warning:

HRC products are designed to meet and exceed the standards referenced in this document, but individual project specifications and quality control requirements apply. HRC destructively tensile tests finished products daily as part of our quality control, but cannot be responsible for material furnished by local fabricators and/or contractors using HRC related equipment or components. Aspects of structural design, evaluation of product fitness for use, suitability or similar attributes are the responsibility of others.