



# Rebar Cage U-Bolt Connectors

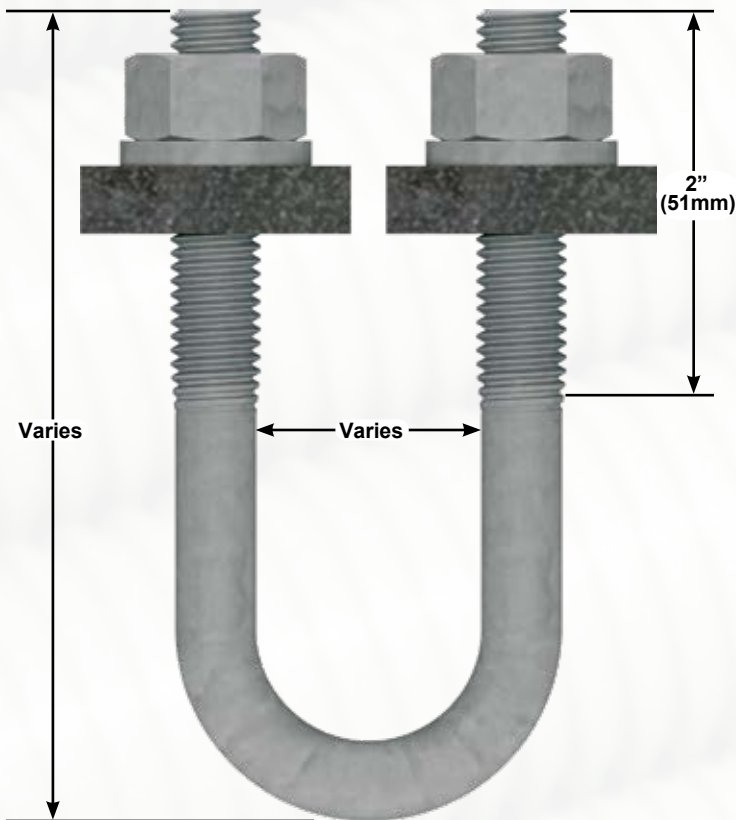
Perhaps the riskiest part of installing a drilled shaft is hoisting the rebar cage from a horizontal position to a vertical to allow placement in the shaft. This is even more true in large rebar cages and requires careful planning of the pick, as well as methods of cage construction to provide the best possible chance for success.

Historically, rebar cages have been tied at intersections of longitudinal and transverse reinforcement with tie wire. However, engineering knowledge of the stress levels within tie wire as cages are hoisted to the upright position is virtually unknown. Rebar cage fabricators have used methods of tying that have worked on past projects, but as cages get larger, so many variables can increase the chances of failure of the cage during this critical step creating a very real safety concern.



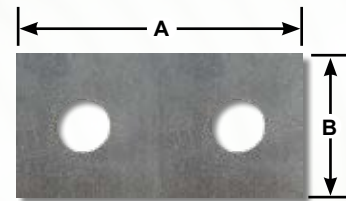
Williams Form Engineering Corporation can now offer help with this problem. Rather than using only the traditional tie wire, Williams Form now makes a much more robust connection for use at critical rebar intersections. Consisting of two high-strength steel U-Bolts with threaded ends, connected with 2 plates (see figure 1), these relatively low-cost connectors have been shown to significantly increase the cage stability and safety.

Because of the virtually infinite possibilities of cage configurations, Williams Form's mechanical rebar connectors are custom-fabricated to fit the specific rebar configuration. Guidance on the use of these connectors was provided in the recent publication of research conducted by the University of Nevada at Reno with funding from the ADSC among others. Williams Form donated the mechanical connectors used for this research as well as those used in the demonstration performed at IFCEE 2024.



**UNC Threaded U-Bolt** ASTM A108 Grade C1045

Bar Diameter & Pitch	Minimum Net Area Thru Threads	Minimum Ultimate Strength	Minimum Yield Strength	Part Number
1/2" - 13 (13 mm)	0.142 in <sup>2</sup> (91.6 mm <sup>2</sup> )	17.0 kips (75.7 kN)	13.1 kips (58.0 kN)	B8S-04



**Steel Plate**

Hole Diameter	A Dimension	B Dimension	Thickness	Part Number
5/8" (16 mm)	Varies	1-5/8" (41 mm)	3/8" (10 mm)	S1KP-03



**Heavy Duty Hex Nut**

Bar Diameter	Across Flats	Across Corners	Thickness	Part Number
1/2" (13 mm)	7/8" (22 mm)	1.0" (26 mm)	31/64" (12 mm)	H1F-04