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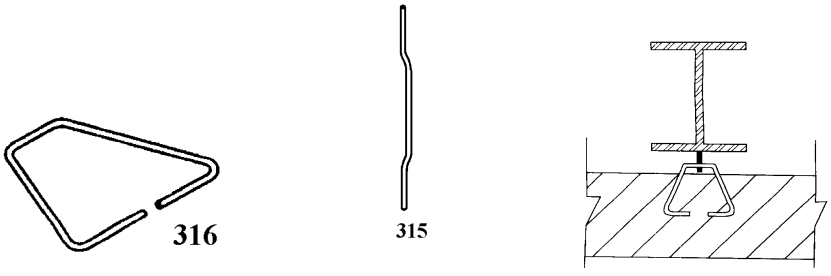
#315 WELD-ON ANCHOR ROD WITH #316 TRIANGLE TIE – TEST REPORT

SIZE: #315 Weld-On Anchor Rods, 1/4" (6.35mm) diameter wire x 5" (127mm) long with 2" (50.8mm) adjustment were tested with #316 Triangle Ties 3/16" (4.7625mm) diameter wire x 3" (76.2mm) long in 1" (25.4mm) cavity and 3/16" diameter wire x 4" (101.6mm) long in 2" (50.8mm) cavity.

APPLICATION: #315 Weld-On Rods are welded to steel beams. #316 Triangle Ties are inserted in the adjustable portion and installed in mortar joints of brick or block walls.

TEST CONDITIONS: Wall sections 23-5/8" (600mm) wide x 17-5/8" (447.6mm) high 3-5/8" (92.07mm) thick were made from ASTM C216 Clay Brick, grade SW, Type FBS. The specimens were three units long x six units high. The Triangle Ties were positioned between the third and fourth layers, and at the vertical centerline of the test specimens. The mortar joints were 3/8" (9.525mm) to 1/2" (12.7mm) thick and the Triangle Ties were embedded 1-1/2" (38.1mm) in the bed joint. The type N mortar used had a compressive strength of 2,200 psi. The Weld-On Rods were attached to steel columns with four 1/4" (6.35mm) to 3/8" (9.525mm) welds (two at the top and two at the bottom). Testing was conducted by The Engineering Research Institute Iowa State University.

#316 #315



#316 Triangle Tie #315 Weld On Rod Test Results Continued

TEST RESULTS:

	Tension	Compression 1" cavity (25.4mm)	Compression 2" cavity (50.8mm)
R.E.E.L Loads	233 lbs	731 lbs	615 lbs
deflection	.050 in. (1.27mm)	.027 in (.686mm)	.032 in. (.813mm)
R.E.M. Loads	816 lbs	1,159 lbs	702 lbs
deflection	.308 in. (7.823mm)	.060 in. (1.524mm)	.041 in (1.041mm)
Peak Loads	816 lbs	1,159 lbs	727 lbs
deflection	.308 in. (7.823mm)	.272 in. (6.91mm)	.107 in. (2.718mm)

R.E.E.L. values indicate the end of the elastic region (initial straight line portion of the graph) and the start of the inelastic region. (R.E.E.L loads are those recommended to which the appropriate safety factors should be applied for the design values based upon elastic behavior.)

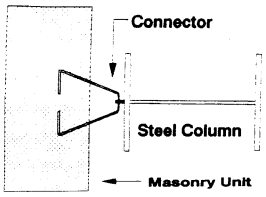
R.E.M. values indicate the load achieved at the end of the ductile (somewhat plastic) region of the load-deflection behavior, beyond which much larger deflections occur. The R.E.M is the load that the researchers felt was the appropriate "interpreted maximum" load. In most cases the peak loads beyond R.E.M. were due to highly inelastic behavior, rotations, contact bearing, or exaggerated deflections that one would not want to count as part of the correct specimen peak capacity. (R.E.M loads are those recommended to which the appropriate safety factors should be applied to arrive at the manufacturer's recommended design value based upon strength or limit states design.)

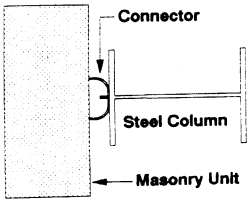
Peak Loads were taken from the graphs prior to a significant decrease in load or at an abrupt failure point.

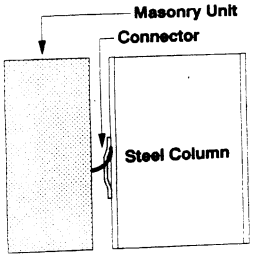
Tension Test: The failure mode of the tension test was the elongation of the triangular tie and its eventual pullout from the mortar joint.

#316 Triangle Tie #315 Weld On Rod Test Results Continued

Compression Test: The primary failure mode was characterized by the deformation and buckling of the wire with a secondary failure mode of the mortar joint. As the load increased the Triangle Tie buckled upward or downward until it came in contact with the portion of the Weld-On Rod which was welded to the column.







Unloaded View Compression Failure Top View Compression Failure Side View