HECKMANN BUILDING PRODUCTS

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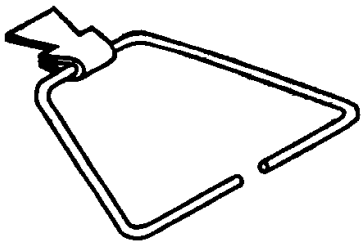
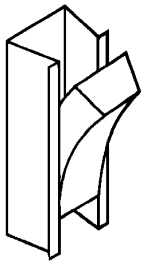
#103 DOVETAIL TRIANGLE TIE WITH #100 DOVETAIL ANCHOR SLOT

SIZE: Dovetail clip portion is 12 gage hooked onto a 3/16" (4.762mm) diameter wire triangle tie available in lengths of 3" (76.2mm), 4" (101.6mm), 5" (127mm), 7" (177.8mm), 9" (228.6mm), and 11" (279.4mm). The anchors tested were the 3" (76.2mm) long triangle for the 1" (25.4mm) cavity and 5" (127mm) long triangle for the 3" (76.2mm) cavity.

APPLICATION: Dovetail Triangle Ties are hooked into dovetail slots cast into concrete walls or columns. The wire triangle portion is placed in mortar joints of Block or Brick walls. Usual installation is 16" (406.4mm) o.c. vertically.

TEST CONDITIONS: 23-5/8" (600mm) wide x 17-5/8" (447.6mm) high walls 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 Dovetail 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) and the Triangle Tie was embedded into the bed joint 1-1/2" (38.1mm). Type N mortar was used which had a compressive strength of 2,200 psi. A 12" (304.8mm) piece of 26 gage (0.025") dovetail slot was cast into a concrete wall.
Testing was conducted by the Engineering Research Institute Iowa State University.





#103 Dovetail Triangle Tie & #100 Dovetail Anchor Slot (continued)

TEST RESULTS	TENSION	COMPRESSION		SHEAR
		1" Cavity (25.4mm)	3" Cavity (76.2mm)	
R.E.E.L. Loads deflection	327 lbs .039 in. (.9906mm)	509 lbs .072 in. (1.828mm)	282 lbs .044 in. (1.117mm)	138 lbs .039 in. (.9906mm)
R.E.M. Loads deflection	713 lbs .179 in. (4.546mm)	560 lbs .090 in. (2.286mm)	386 lbs .140 in. (3.556mm)	347 lbs .361 in. (9.169mm)
Peak Loads deflection	751 lbs .286 in. (7.264mm)	616 lbs .140 in. (3.556mm)	701 lbs .272 in. (6.908mm)	371 lbs .452 in. (11.48mm)

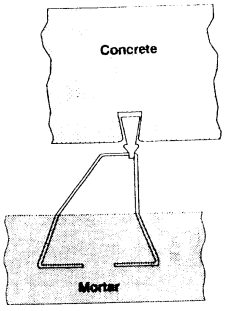
R.E.E.L. values indicate the end of the elastic region (initial straight line portion of the graph) and the start of the inelastic region. (R.E.E.L. loads are those recommended to which the appropriate safety factors should be applied for the design values based upon elastic behavior.)
R.E.M. values 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 Load were taken from the graphs prior to a significant decrease in load or at an abrupt failure point.

Tension Test: As the tie was loaded, the dovetail clip attached to the triangle tie bent to a 90o angle. This action was followed by the wire pulling free of the clip plate. During the R.E.E.L loads the elongation of the triangular wire tie occurred. During R.E.M there was a combination of the wire bearing on the bent clip as well as elongation of the wire.
Compression Test: The primary failure mode was a rotation of the clip plate followed by the crimped clip coming to bear on the dovetail slot, with the triangle tie eventually pushing through the crimped clip. During the REEL loads the triangle tie began to bend and there was small rotation of the clip plate. During R.E.M there was a large rotation of the clip plate prior to the connector bearing against the dovetail slot. The 1" (25.4mm) cavity resulted in three of the five connectors pushing through the clip and bearing against

#103 Dovetail Triangle Tie & #100 Dovetail Anchor Slot (continued)

the column while in the 3" (76.2mm) cavity three of the five connectors tested rotated and came to bear against the concrete wall.

Shear Test: The failure mode was that of the clip plate slipping on the wire and bearing on the corner of the triangular tie which eventually deformed and pulled out of the mortar joint.



Shear Test Failure