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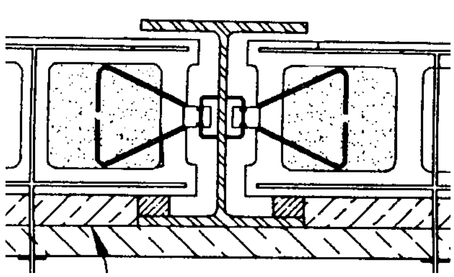
#129 CHANNEL SLOT TRIANGLE TIE WITH #130 WELD-ON CHANNEL SLOT

SIZE: 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 3" (76.2mm) long for the 2" (50.8mm) wide cavity and 5" (127mm) long for the 4" (101.6mm) cavity.

APPLICATION: Channel Slot Triangle Ties are hooked into channel slots that are welded to steel beams. 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: Four CMU units conforming to ASTM C90 were assembled to form a wall 2 units wide x 2 units high (15-5/8" (396.89mm) high x 31-5/8" (803.28mm) wide x 7-5/8" (193.68mm) thick). The Triangle Ties were positioned between the two units and at the vertical centerline of the specimen. 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. The cores were completely filled with mortar. The Channel Slot tested was 1/8" (3.175mm) thick Plain Steel x 8" (203.2mm) long. The Channel Slot was welded to the steel column with four welds 1/4" (6.35mm) to 3/8" (9.525mm) long. Testing was conducted by The Engineering Research Institute Iowa State University.



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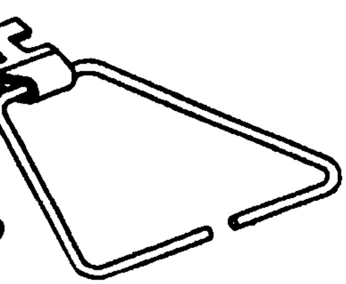

#129 Channel Slot Triangle Tie & #130 Weld-On Channel Slot (Continued

TEST RESULTS	TENSION no welded clip	TENSION welded clip	COMPRESSION 2" Cavity (50.8mm)	COMPRESSION 4" Cavity (101.6mm)
R.E.E.L. Loads Deflection	322 lbs .084 in. (2.1336mm)	357 lbs .269 in. (6.8326mm)	238 lbs .034 in. (.8636mm)	272 lbs .054 in. (1.3716mm)
R.E.M. Loads Deflection	832 lbs .271 in. (6.8834mm)	1,620 lbs .683 in. (17.3482mm)	271 lbs .070 in. (1.778mm)	309 lbs .091 in. (2.3114mm)
Peak Loads Deflection	935 lbs .311 in. (7.8994mm)	1,620 lbs .683 in. (17.3482mm)	515 lbs .166 in. (4.2164mm)	578 lbs .240 in. (6.096mm)

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: As the tie was loaded, the Channel Slot clip attached to the triangle tie bent to a 90o angle. This action was followed by the wire pulling free of the clip plate. An additional series of tests were performed to investigate the effects of securing the clip by placing a puddle weld between the clip plate and the end of the crimped clip. These results are shown in the tension welded clip column. In both cases the elongation of the wire occurred during the R.E.E.L. load. The R.E.M. load period is representative of both the wire bearing on the bent clip and the further elongation of the wire. The Peak Load occurred when the wire pulled out of the crimped clip for the non-welded test and when the tabs pulled out of the channel for the welded test.

#129 Channel Slot Triangle Tie & #130 Weld-On Channel Slot (Continued

Compression Test: The compression failure mode resulted in the opening of the clip end which allowed the wire to push through the clip and bear on the channel. The behavioral characteristics of the compression test were similar with both the 2" (50.8mm) cavity and the 4" (1-1.6mm) cavity. During the R.E.E.L. load there was bending and compression of the triangular wire with a small rotation of the clip in the channel slot. During R.E.M. load the clip loop opened. Two failure modes are shown below.

Compression Failure Mode 1 Compression Failure Mode 2