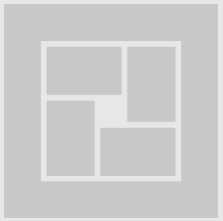


CAT-TIE



CAT-TIE APPLICATION

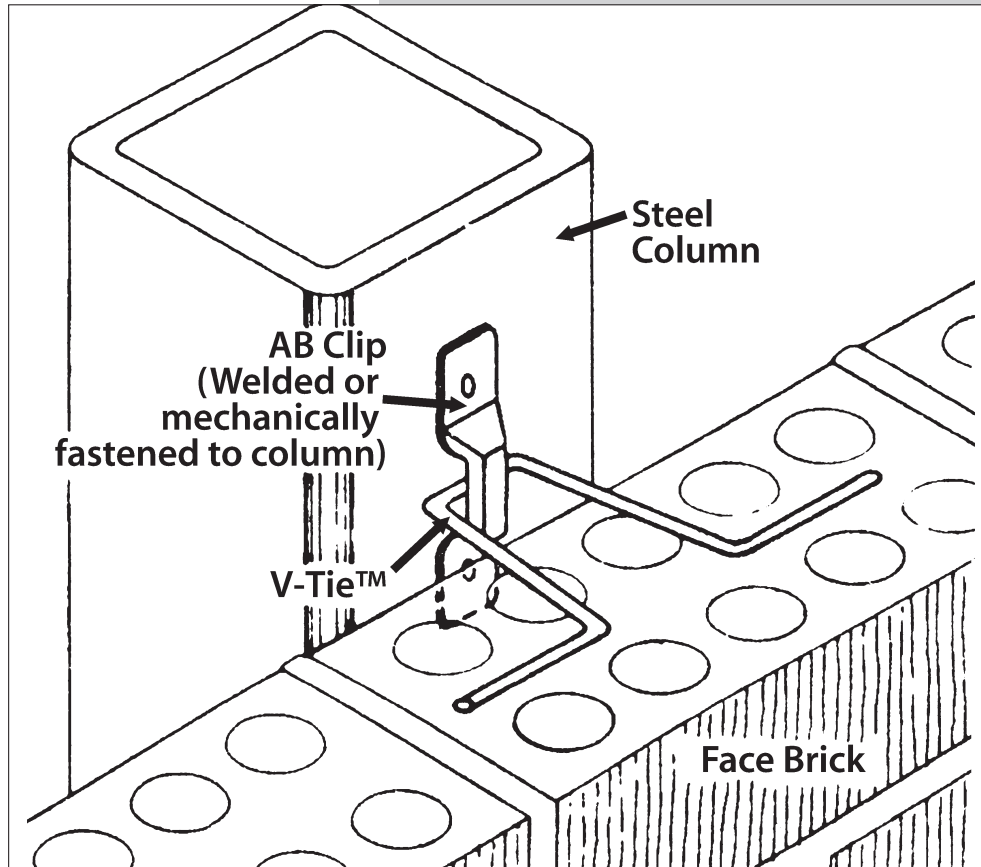


Figure 1

Cat-Tie System

The Cat-Tie (Column Adjustable Tie) is a heavy-duty adjustable support designed to resist large lateral loads. The Cat-Tie can be welded or mechanically fastened to steel members to provide structural support for masonry. *Figure 1* illustrates a typical Cat-Tie application.

Cat-Tie Components

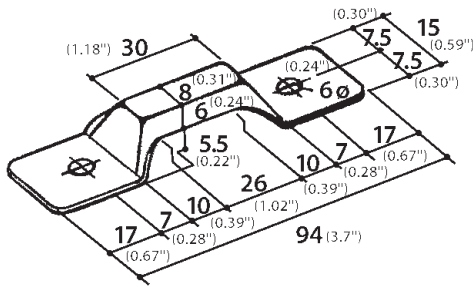


Figure 2 AB-Clip

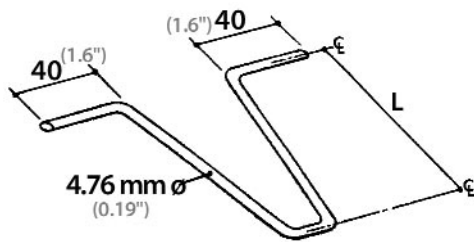


Figure 3 V-Tie™

The Cat-Tie consists of an AB-Clip used in conjunction with a V-Tie™. The Cat-Tie components are presented in *Figures 2 and 3*.

AB-Clip: The AB-Clip is manufactured from 16 gauge (1.61 mm [0.063"] thick) sheet metal conforming to ASTM A570, and is available in hot dipped galvanized finish (conforming to CSA CAN3-A370-04 and ASTM A153 requirement of 458 g/m²/side [1.5 oz/ft²/side] of zinc coating) and stainless steel.

V-Tie™: The V-Tie™ is manufactured from 4.76 mm (0.19") diameter wire conforming to CSA Standard G30.3, and is available in hot dipped galvanized finish (conforming to CSA CAN3-A370 and ASTM 153 requirement of 458 g/m²/side [1.5 oz/ft²/side] of zinc coating) and stainless steel. The V-Tie™ is available in 60 (2.4"), 80 (3.1"), 100 (3.9"), 120 (4.7"), 140 (5.5"), 160 (6.3"), 180 (7.1"), 200 (7.9"), 225 (8.9") and 250 mm (9.8") lengths. The length of the V-Tie™ should be specified as the distance from the face of the structural steel support to the desired location of the legs of the V-Tie™ in the masonry wall.

Note: The Cat-Tie is a structural connector and must therefore be engineered for each application.

V-Tie™ Performance and Placement

The Cat-Tie can be utilized with masonry walls constructed of solid or hollow units. For solid masonry walls, the legs of the V-Tie™ must be placed at the centerline of the wall in full mortar bed joints. For hollow masonry walls, the legs of the V-Tie™ must be placed at the centerline of the exterior face shell of the masonry unit. For increased pull-out capacity, the legs of the V-Tie™ can be grouted into the cores of the hollow masonry units.

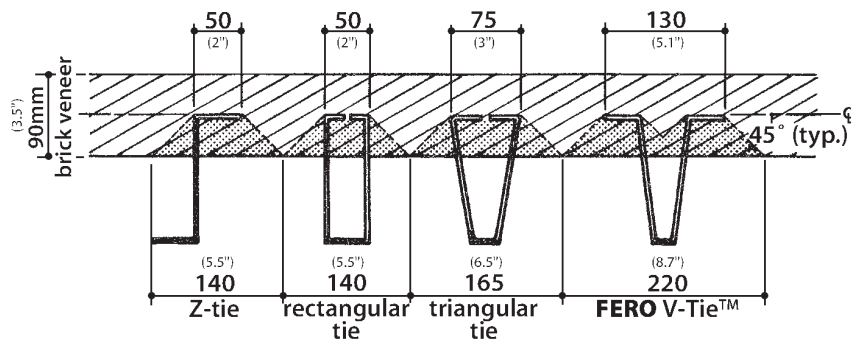


Figure 4
Effective Mortar Joint Area Pull-Out Resistance

The unique configuration of the V-Tie™ provides for much greater pull-out (or push-out) capacity from the mortar joint of the brick veneer than similar ties currently on the market. The area of mortar effective in providing support to the V-Tie™ is illustrated in *Figure 4*. The effective mortar area for a number of typical ties is also shown in the Figure. A comparison of the pull-out capacities of the various tie types is presented in Table 1.

Table 1 Comparison of Tie Pull-Out Capacity in 90 mm (3.5") Brick Application

Tie Type	Effective Mortar Area mm ² (in ²)	% of V-Tie™ Pull-Out Capacity
FERO V-Tie™	7250 (11.24")	100
Z-Tie	4275 (6.63")	59
Rectangular Tie	4275 (6.63")	59
Triangular Tie	5400 (8.37")	74

Cat-Tie Recommended Design Load and Deflections

1. Free Play (maximum):	0.74 mm (0.029")
2. 0.45 kN (100 lbs) Deflection - free play not included: - including free play:	0.42 mm (0.017") 1.16 mm (max) (0.046")
3. Recommended Design Load:	1.50 kN (336 lbs)
4. Recommended Design Load Deflection - free play not included:	0.89 mm (0.035")
5. Maximum Recommended Spacing:	As per design and code.

Notes

- (i) The design values reflect both the windward and leeward capacity of the Cat-Tie system, with the governing value listed.
- (ii) The tie system recommended design load value was formulated using working stress design following the procedures of CSA CAN3-A370-04 "Connectors for Masonry", ACI/ASCE/TMS/518 and U.B.C.
The value has been reduced to account for test result variation, and reflects a factor of safety of 3.0, as per Table 3 (A370).
- (iii) The allowable mortar pull-out or push-out design load for the V-Tie™ embedded at the centerline of 90 mm (3.5") brick veneer utilizing Type M, S or N mortar, exceeds or equals the recommended design load listed above.
- (iv) The spacing of the Cat-Tie will be governed by design, with maximum spacings as per clause 6.2 and 6.3 of CSA CAN3-A370-04 "Connectors for Masonry", ACI/ASCE/TMS/518 and U.B.C., addressing the "Spacing of Wall Anchors" and "Spacing of Partition Anchors".
- (v) The above design value relates to the capacity of the Cat-Tie components. Compatible fasteners or welds capable of resisting the design loads must be selected.
- (vi) The above design values are based on tests utilizing a 25 mm (1.0") cavity with the V-Tie™ located at the centerline of the AB-Clip, and the Cat-Tie fastened directly to a structural steel member.

Cat-Tie Design

Engineering evaluation is required if the Cat-Tie connector provides support for larger tributary areas than the standard veneer requirements outlined by CSA CAN3-A370-04, ACI/ASCE/TMS/518 and U.B.C.

For example, if the connector is used to fasten a concrete block wall to steel columns spaced at 6,000 mm (20') on center, and the design wind load is 1.0 kPa (0.145 psi), then the lateral load applied to the columns by the block wall will be 6.0 kN/m (411 lb/ft). Thus, the spacing of the Cat-Tie, the fastening of the AB-Clip to the steel member, and the embedment of the V-Tie™ into the masonry wall need to be evaluated.

Considering the lateral load of 6.0 kN/m (411 lb/ft) and the recommended design load of the Cat-Tie of 1.50 kN (336 lbs), a Cat-Tie is required every 250 mm (10") along the column (i.e., $1.50 \text{ kN} \div 6.0 \text{ kN/m}$ [$336 \text{ lbs} \div 411 \text{ lb/ft} \times 12"/\text{ft}$]). The connection of the AB-Clip to the structural steel column, and the connection of the V-Tie™ into the masonry wall must also be evaluated. As previously mentioned, bending the legs of the V-Tie™ into the cores and grouting the wall at such locations will provide for increased pull-out capacity.



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Patents Pending

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