BLOCK WALL REINFORCING FOR TRUSS TIE DOWNS

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In Guideline No.3, I reported on research done in 1996 by the James Cook University Cyclone Structural Testing Station (CTS) on hold down brackets for trusses.

Although the testing was done with steel angle brackets anchored down to the supporting foundation with a rod, the more common practice in cyclonic regions has been to use flat steel brackets cast into masonry block walls.

The findings were reported in CTS Technical Report No.44, and were readily adapted by the industry into the more common flat cast-in brackets, with the inclusion of a top horizontal reinforcement bar threaded through the bottom of the cast-in plate.

However, the question of how well the uplift loads were resisted by the wall reinforcement was not entirely clear.

As a result, further research was done at the CTS to examine this issue and the results were published in Technical Report No.49 dated February 2003.

The research found that uplift strength was greatest when the cleat was located right beside vertical reinforcement that extended all the way down to the foundation.

Vertical reinforcement away from the cleat or not anchored to the foundation exhibited much lower strength.

Table 1 shows their comparative strength.

Without vertical reinforcement hooked around the bond beam bar beside the cleat, the bond beam lifts at lower loads and "unplugs" itself from the wall.

The presence of vertical reinforcing beside the cleat resists such unplugging.

We have since updated our tie down specification sheet with these results. These can be obtained from your local truss supplier.

(Acknowledgement: Thank you to the Cyclone Structural Testing Station for photographs and permission to report these findings. Please contact them for a full copy of this report.)

Table 1: Approximate Uplift Capacity vs. Reinforcing Method

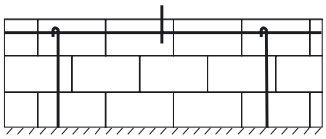
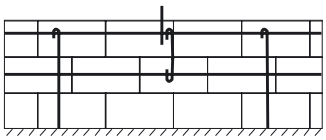
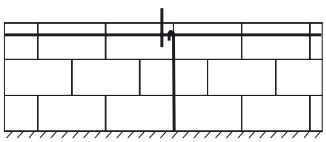
Reinforcing Method	Typical Example of Reinforcing Elevation	Approximate Uplift Capacity
1. Cleat in between vertical reinforcement @ 1200 centres		10-15 KN
2. Cleat right beside W8 shear ties to second bond beam		20-25 KN
3. Cleat right beside N12 verical bars anchored to foundation		35-40 KN

Table 1
Approximate Uplift Capacity vs. Reinforcing Method. (*Figures are indicative only. Refer to Technical Report No.49).*

Figure 3
Ideal vertical reinforcement anchored down to foundation and hooked over bond beam reinforcement right beside cleats.

Figure 1
Typical Truss Cleat Cast Into Blockwork.

Figure 2
Typical failure mode where bond beam lifts or "unplugs" when vertical reinforcing is not alongside the cleat.