

## Evaluation of Engineer Documents

Detailed evaluation of documents (letters, calculations, plans) prepared by engineer for builder is appropriate and necessary to demonstrate the overall conclusion that valley truss connections using only nails and screws do not have adequate design capacity.

Based only on preliminary evaluation of available design plans, the overall structural design for wind resistance appears to be adequate, for Exposure Category B. Tiedown connectors are specified for the main roof trusses. Various connectors are specified for header beams and wall framing to resist direct uplift and overturning uplift forces due to wind.

The relatively weak valley truss connection is not consistent with what appears to be adequate design for other connections that must resist wind.

If Exposure Category C is applicable for any house, overall structural design for wind resistance may not be adequate.

### Responsibility For Connection Design

Before wading into details of letters and calculations, the essential issue that must be addressed, at least to the extent feasible, is the reason that Mr. Thom became involved in design of valley truss connections at all, considering that Truswal had issued a standard connection drawing.

In available documents, there is no indication that Mr. Thom consulted Truswal about the proposed design change. There is also no explanation as to the reason why Mr. Thom was (apparently) asked by Del Webb to modify valley truss connections specified on the Truswal connection drawing. The most likely reason was to reduce cost for labor (primarily) and materials. Another potential reason may have been to validate as-built connections.

Of course, any structural design change implemented to reduce cost must not reduce structural capacity below that required by the building code.

Even with the gap under valley trusses, the H4 connector should have been relatively easy to install on the high side, where edge of the valley truss bottom chord bears on the main truss. However, a different connector could have easily been used if necessary (as specified on design plan sheet S4.1).

### Letter of July 7, 2005

- ➡ Written description (in letter) of connection requirements, specified on the valley truss connection drawing by Truswal, is grossly incorrect.

Failure to properly read the clear requirements noted on the Truswal drawing indicates lack of adequate experience by person responsible for the evaluation.

