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Frequently Asked Questions

Multi-Ply Girders by Rachel Smith

Girders are trusses specially designed to carry extra loads that are a result of the structural framing members they support. Sometimes a single ply girder truss is insufficient to carry the entire load, so the truss designer designs a multiple ply girder. This is where identical trusses are built and fastened to-gether to act as one unit to support the load. ANSI/TPI 1-1995 states that girder trusses up to three plies thick can be fastened together with nails. Girders over three plies must be pre-drilled and bolted rather than nailed. The maximum number of plies is five for girders that are supporting the extra load from only one side. If the loads are tying into both sides, the maximum number of plies is six.

No matter what type of fastener is used, the fastening schedule will appear on the girder truss design drawing. Some connector companies have recently introduced another option for girder truss fastening, a high strength wood screw that does not require pre-drilling. Truss design software vendors have reported that they are working on adding this option to their programs.

QUESTION:

We do not assemble our multi-ply girder trusses in the plant; the framers are expected to do this in the field. Are there any requirements that would suggest assembling them on the production floor is necessary? I would like to change our company policy but need help backing up my opinion, aside from a series of unhappy framers.

ANSWER:

There are no requirements for truss manufacturers to fasten girder plies together. ANSI/TPI 1-1995, which is referenced in all major building codes as the standard for truss design and manufacturing, states only that the truss design must contain information on structural framing connections such as truss-to-girder and truss ply-to-ply. From a strict standpoint, supplying the nail, bolt or screw schedule on the truss design drawing is your only obligation. The construction industry in general has to presume that the framers have the basic competency to follow construction plans, or truss design drawings for that matter.

From a practical standpoint, it is easy to imagine how this connection may not be executed properly. One common error occurs when the framer does not use the correct nail. Truss designers have responded by specifying box nails rather than common nails because most framers use gun nails, which typically have the same capacity as box nails. Some truss manufacturers choose to nail, bolt or screw multiple girder plies together in the shop to avoid any potential attachment errors in the field. This may be a good solution in many cases, but it can also lead to handling difficulties due to the large size or weight of the pre-assembled girder. No matter where this is done, it is good practice to assemble the girder plies before lifting the girder into place and attaching the supported framing. This avoids overstressing individual plies before locking them into position with the fasteners. It also ensures that one ply does not deflect more than the other plys causing an uneven ceiling.

WTCA produces several tear-proof warning tags to attach to trusses. One of them warns installers that the truss is “A MULTI-PLY TRUSS” and they must check on the truss design drawing for the fastener schedule. The goal of each of the tags and the Truss Technology in Building brochures is to provide concise information to the field so that components are used as efficiently as possible with a variety of installation methods.

To pose a question for this column, email us at faq@woodtruss.com. To view other questions visit the WTCA website.

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