GANG-NAIL GUIDELINES No.161

ANOTHER MITEK ADVANTAGE

WITHIN SCOPE OF SOFTWARE

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There is a story of a person who set his campervan on cruise control and retired to the back of the van to make a cup of tea, later explaining after the inevitable road accident that the instructions did not explicitly say not to do so.

Could some software users be hiding behind this same excuse?

Every piece of equipment or software is designed for a specific purpose and in addition to basic instructions also assumes that it will be used in a particular manner.

Truss software has evolved greatly since its inception.

Early versions were (by today's standards) severely limited by processor power and computer memory, so they had to simplify calculations by making many assumptions, e.g. GT & TG loading.

These days, loading is specifically calculated from input truss layout.

But do not think for a moment that we are at the stage where truss software no longer makes any assumptions and wholly designs from "scratch".

Albeit much improved from yesteryear, modern computers do not have limitless capability, which is why they will continue to improve at great pace for some time yet.

Consequently, today's software continues to simplify analytical processes so that each job is processed within an acceptable time frame.

Truss software is designed to suit common known applications and as applications widen and hardware improves, so too software is expanded.

But it has to happen hand in hand.

The following are typical assumptions found in truss software:

ARCHITECTURE

Building size and shape, architectural styles and building materials.

The loads on a tower or tall building are different to those on a simple bungalow.

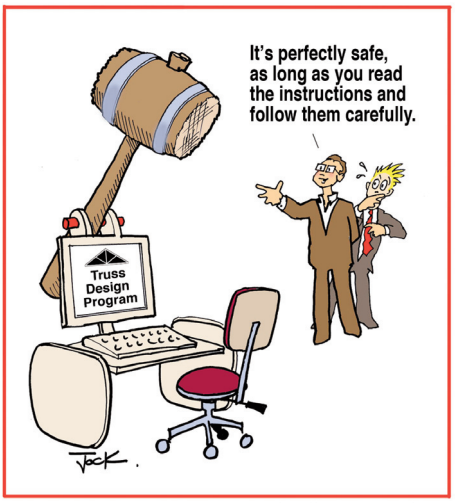
Swiss chalet roofs and domes require different considerations to commonly pitched roofs.

Billboards and mansards impose overturning loads.

DESIGN METHODS

It is almost impossible to apply every conceivable load combination and permutation; so only the most common critical ones are considered.

One can also use either quick and simple calculation methods or highly elaborate and lengthy analytical formulae to predict structural behaviour.



To produce effective designs within hardware ability and time frame, it is pointless applying "rocket science" when simpler methods are usually adequate under normal circumstances.

BUILDING PRACTICE

Assumptions are made on how trusses are erected and how supplementary framing assists.

For example creepers at the tail end of a hip rely on fascia support; roof and ceiling diaphragms must provide adequate restraints; that the supporting structure, ties and connections are sufficient; and the builder knows how to handle, store, install and brace trusses.

CODES AND STANDARDS

Different software versions may apply different editions of codes and standards.

Truss software generally work within the scope of AS1684, AS4440 and AS4055 and they mainly deal with residential buildings.

Although they may also apply to some non-residential buildings, their suitability cannot be assumed and must be verified.

USER SKILL AND TRAINING

The breadth of modern truss software warrants adequate training to operate it competently.

Training in the use of structural software is now a requirement under the ABCB protocol.

Users must never try to deliberately "trick" or manipulate the program to bypass its normal processes.

USER DISCRETION

The user is often required to apply his skill and know-how to make decisions, e.g. on acceptable relative cambers between trusses; optimum truss and girder layout; effective web arrangement; relevant warning messages and so on.

No software with complex functions is ever likely to have sufficient intelligence to make fool-proof decisions on every issue.

Virtually every software package requires users to monitor the output and spot any inconsistencies or irregularities that should alert a competent user of a computer or user error.

No one should ever put blind faith on computer outputs.

In summary, the first question one must ask before using any product is, "What must I know about the scope and limitation of using this equipment or software?"

That is lesson one in MiTek's software training course and displayed on the opening screen every time MiTek 20/20 is turned on.

For further information, refer GN Guideline 118. TTN