

Everyone's talking timber frame

Are they right?



Robin Lancashire - Timber Frame Consultant
Exova BM TRADA

frameCHECK✓

- Training
- Design detail evaluation
- Structural checks
- Manufacturer assessment
- On-site quality assessment
- Defects and remedial
- Expert witness
- Timber frame publications



Do You Live in a Timber Frame Home?

- Over 70% of the developed world population do
- In Canada and the US, over 90% of low-rise buildings are
- In Scotland, $\frac{3}{4}$ of all new build houses are
- Up to 90% of UK self build houses are



Timber Frame?



Longevity 1780 - 2017



Building Regulations and Warranties

- Structure ✓
- Thermal ✓
- Acoustics ✓
- Fire Resistance ✓



Advantages for builders

- Faster to build
- Build in wet and cold
- Off-site accuracy
- Designed and built for them
- Reduced foundations
- Exceed thermal standards
- Reduce site waste
- Less reliant on traditional skills



Advantages to occupiers

- Sustainable
- Energy efficient thermal envelope
- Air tight
- Low heating cost
- No drying out from new



The Grand Designs effect



Essential reading

Timber frame construction

Ballistic or masonry nails to give 25 mm minimum penetration into concrete slab (nail spacing of concrete slab). Spacing of nails determined by timber frame engineers' calculations.

Figure 4.2a Typical sole plate fitting to concrete slab using nails (also suitable for reliable bricks)

Figure 4.2b: Typical sole plate fitting to concrete slab using sole plate anchors. Shows a cross-section of a sole plate with anchors embedded in a concrete slab.

Anchor fastened with ballistic or masonry nails into concrete slab and nailed to sole plate. Spacing of nails determined by timber frame engineer's calculations.

This method can be used to fit through gas membranes if a self-sealing gasket is installed between the anchor and gas membrane at the location of fitting.

Figure 4.3b Typical sole plate fitting to concrete slab using sole plate anchors

Figure 4.3c: Typical sole plate fitting to concrete slab using shoe plate fittings. Shows a cross-section of a sole plate with shoe plate fittings attached to a concrete slab.

U-fitting with ballistic or masonry nails, spanning full length of sole plate above concrete slab and nailed to sole plate. Spacing of nails determined by timber frame engineer's calculations.

Figure 4.3c Typical sole plate fitting to concrete slab using shoe plate fittings

62

- provides a nailing plate for the timber wall panels or ground floor joists
- secures and protects the dpc

TRADA Technology recommends that, because of their position in the building and the difficulty associated with remedial work, sole plates be treated with a preservative that fixes in the wood (that is least susceptible to leaching), such as the copper-organic types.

Sole plate fixings serve two purposes:

- to locate the plates and an accurate jig for set
- to transfer vertical loading is completed

Sole plates may be fixed slab through the dpc (JG have shown that no pre ballistic or masonry nail the nail 12 larger diameter in the dpc to minimise the risk of gas leakage.

Alternatively use approx 4.3b. These move the dpc reducing the risk of spill gas membranes if a self anchor and the gas mem

Sole plates can also be fixed fittings. One method, with the plastic and the finish strip of dpc between the plate, fit the U-shaped strip of dpc between the side of the dpc

Once wall panels have are typically cut out. Do consideration for door removed. Place findings to door jambs.

In exposed areas, the sole plates can be temp of the ground floor panel studs and built in with this method, the can be delayed until after the can be met.

It is typical to use a ring their effect on different CHAPTER 9 and Figure 9.

the number of sole plates

Timber frame construction

Maximum length depends on overall weight, transportation and handling loads

Panel length

Double stud wall panel indicates joint laid directly above

Panel height usually 2.3 - 2.4m

Sheathing (gap may be required at butt joints)

Frame: type or similar bracing stud positions for dividing battens and/or fixings

Weather membrane (may be site or factory fixed. May not be used if self-impregnated softwood or 'waxed' medium board sheathing, providing effects or details are used to deflect moisture away from the timber frame at all panel joints, floor and sole plate levels, and over openings)

Structural nogging, if required, see to be factory fixed

Support nogging (may be site or factory fixed)

Figure 4.7 Typical externally sheathed wall panel

For structural panels, compliance with BS EN 13986 requires the involvement of a European Wooded Body to assess and certify the factory production control. Panels complying with BS EN 13986 for use as sheathing should be marked with the words WALL SHEATHING and will, as an additional requirement, have been subjected to a suitably impact test against the requirements of BS EN 12874 (Wood-based panels). Performance specifications and requirements for load bearing boards for use in floors, walls and roofs⁽⁶⁾. Further information is given in Appendix 1 and in TRADA's Wood Information Sheet 210-27 (Specifying wood-based panels for structural use⁽⁶⁾).

When considering a sheet material for sheathing, the following performance criteria should be considered:

- evidence of racking strength for calculation purposes derived from testing to the method in BS EN 519 Timber structures: Test methods: Racking strength and stiffness of timber frame wall panels⁽⁵⁾
- evidence of durability in use
- vapour resistance should be significantly less than the combined resistance of the internal lining and vapour control layer; a factor of 1.5 is generally taken as an acceptable rule of thumb
- resistance to site and transport damage (impact damage)

66

timber frame construction

designing for high performance

5th edition

robin lancashire and lewis taylor

Everyone's talking timber frame

Are they right?



Robin Lancashire - Timber Frame Consultant
Exova BM TRADA