

Timber Frame Construction

To facilitate this ambition of getting the quality right, these checks should take place:

Design / pre-manufacture

- Check you have an approved design with all calculations
- During the design stage, check for preformed openings for mains service runs
- You must have building control approval

One week before frame delivery

- Ensure you have an erection Method Statement and Risk Assessment
- Foundations construction correctly using setting out drawings
- Top of substructure is level within tolerance
- Top of substructure is square and diagonal within tolerance
- Foundations are dimensionally correct
- Problems reported and rectified
- Scaffolding completed
- Access and plant off load available. Check access for delivery vehicles as they usually have large loads that require lots of space to manoeuvre
- Crane hardstanding agreed
- Storage space available
- Check substructure against standards

Upon delivery

- Check all components delivered
- Check for damage to frame
- Report shortages / damage
- Standard checks for lifting appliances
- Check training and qualifications of lifting crew.

Storage

- Keep materials off ground, cover and maintain ventilation
- Store panels flat with sheathing side up
- Keep material under cover but maintain ventilation
- Keep trusses vertical on bearers at node points or flat on adequate bearing

During erection

- Take care to avoid damage
- Follow drawings, details and standards
- Ensure temporary bracing is fitted
- Ensure floors are not overloaded by materials
- Ensure safe systems of works are implemented
- Flooring is protected or cleared of excessive moisture
- Ensure panels are correctly nailed and secured
- Ensure work is progressed systematically, floor-by-floor
- Tidy up as you go – reduce fire risk
- Ensure all work is completed per level (do not drop back later)

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- Ensure scaffolding progresses well ahead and safely (do not modify without authority)
- The stability of the structure needs to be checked at the end of each working shift

Upon completion of erection

What to check for generally

- Frame is anchored to slab
- All damage is repaired
- Check external cladding and cavity width requirements – cross-reference to the design drawings
- Appropriate to the work scope that the structure is wind and weathertight, i.e. felted and battened, windows and doors fitted
- Structural shell is handed over and signed for.

Wall construction to check

- DPCs are under all ground floor walls in contact with slab
- Cavities are clear
- Panels are correct way up, in correct position and plumb to tolerance
- All joints are aligned and tight to tolerance
- All fixings as per schedule / specification
- Breather membrane laps are present and repaired, if necessary
- Multiple studs present under beam loads
- Partitions are plumb and square
- Vertical DPCs are fitted to all external openings
- Locating plate and headbinders fitted

Floor construction to check

- Flooring is protected or cleared of excessive moisture
- Joists are in accordance with design drawings, with decking correctly screwed or nailed to them. Do not rely on adhesive alone
- Joists have adequate veering – cross reference to the design drawings. Typically minimum 45mm, but some joist hangers and support conditions may require more
- Joists are nogged or blocked as per the design. Note, engineering joists designs don't usually include mid-span structing / dwangs (Scottish term). Cross reference to the design drawings
- Joist connections are nailed and tight as per design
- Joists are level and even
- Stair is trimmed correctly with fixings to the design
- Notching or drillings are only as per details – if not detail, then ask
- Joist hangers are fully nailed and close fitting. Check joist hanger veering and size compliance – do not use oversized hangers
- No excessive loads are applied to the floor, i.e. plasterboard stacks, etc

Roof construction to check

- Trusses are correctly spaced and plumb to tolerance
- All trusses have clips fitted or are adequately nailed

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- Trusses are correctly braced
- Roof is watertight before starting internal work
- Loose infill is tight and well-connected
- Girder trusses are bolted or nailed in accordance with design details
- Multiple studs are fitted under point loads
- Locating plate and headbinder plate is fitted if required
- Eaves plumb cuts are straight and true
- Soffit is supported with noggins
- Valley boarding is fitted
- Ladder sections connected to spandrel panels
- Roof bracing connected to spandrel panels
- All shoe ironmongery fitted and fully nailed
- Water tanks are placed on platforms
- Eaves cent ducts fitted to give 50mm airflow or breather membrane with third party accreditation used

Before dry lining

What to check for generally

- Frame moisture content is less than 20% and watertight before fixing insulation and plasterboard
- Cavity barriers are fitted to separating floors and walls
- Insulation is to specification
- Insulation is fitted correctly (acoustic and thermal) with no gaps
- If vapour control plasterboard / boarding is used, there is no requirement for a separate polythene vapour control layer
- If fitting polythene based vapour control layer check that:
 - It is the correct density
 - 100mm laps at all joints
 - It is fitted to warm side of insulation
 - Holes for services are neat, tidy and taped to specification
 - Splits etc. are repaired
 - Check correct sealing around sockets boxes
- Vapour control layer or vapour control plasterboard is fitted to all external walls and laps to floor junctions

Services to check

- Notching or drilling carried out as per details
- Noggins / dwangs fitted as required
- Vapour control layer fitted
- Check all service holes in vapour control layer are neat and tidy
- Insulation is still in place
- No timber contact with flues or chimneys. A suitable clearance air gap should be provided
- Services in separating walls are protected so they do not affect the sound / fire performance of these walls (e.g. by battening out)
- Avoid services in separating walls if possible
- No cables except service tails in external cavities
- All first fix services installed as drawings

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After dry lining

- Lining is securely fixed in accordance with manufacturer's instructions with nails or screws not overdriven
- Installation matched to standards
- All joints sealed with filler, tape or skim and jointing compound

After external cladding

- Roof is tiled to manufacturer's requirements
- Roof is correctly ventilated or a breather membrane is installed
- Cavity perpendicular vents are fitted and not blocked
- Wall ties (plus fixings) and nails are stainless steel and fixed at correct centres
- Wall ties are fitted to the stud centre line, sloping away from the timber frame. They should be straight and not have collected mortar droppings
- Check cavity width. Cavity barriers should be correctly installed and completely close the cavity
- Settlement gaps are fitted, e.g. at eaves, sills, penetrations and verges and are filled with suitable compressible filler, such as impregnated foam tape
- Window and door apertures are sealed, using an impregnated foam tape for example – and where relevant cover strips used.

Defect Warning – Substructure

- Badly laid and inaccurate substructure is the single biggest problem faced on site by the timber frame erector
- Extreme care must be taken to rectify faults before the construction begins

Defect Warning – Sole plates

- Any faults at foundation stage only become exaggerated as each storey is erected
- If foundations are not within recommended tolerances, they must be rectified before panel erection starts. Errors cannot be rectified at a later stage
- Consult design team about suitable fixing types matched to the packing and bedding depths
- Ensure fixing length takes account of packing depth. If in doubt, ask
- Avoid splitting the timber sole plates or damaging the substructure as this may cause the edges of masonry or slabs to spall. Should this occur, consult the design team

Defect Warning – Frame erection

- Always check line, level and diagonals of substructure before erection. If they are not within the tolerances, do not start. Instead, consult site supervisor
- Remember, the more accurate the plumb and alignment, the more constant the cavity width
- Repair damaged areas with surplus material lapped correctly below and over the existing material and securely stapled
- Make sure any membrane tears are properly repaired. None of the timber frame structure should be visible once the membrane is fixed and any tears made good
- Check that panels do not creep over the slab prior to commencing outer leaf facing brick work as this will reduce the cavity size

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Defect Warning – Insulation

- Fixing and insulation to be in accordance with manufacturer's guidance. If in any doubt, stop and consult
- **Filling behind return studs is essential to avoid uninsulated zones**
- For the party wall cavity check there is a minimum 50mm clear gap and the distance between the internal faces or plasterboard is a minimum of 240mm

Defect Warning – Thermal efficiency and airtightness

- If the detail is not considered practicable, then consult with the design team – do not change the design intent

Defect Warning – Cavity barriers

- Cavity barriers must be fixed accurately in all positions shown on drawings and to the appropriate material specification. All floor and party wall cavity barriers to be positioned against solid timber members e.g. studs, rim beam. If you are in any doubt about the position, please ask

Defect Warning – Cavity barriers and fire stops at party walls

- Fire stop to be installed at floor level if wall is not detail to have a full filled party wall insulation (fire stop materials at floor level junction may form part of the fully filled party wall solution)
- **Before starting to build external masonry walls, plumb down from the eaves and gables of timber frame to check that the cavity widths will fall between the minimum and maximum tolerances. If they do not, then consult and agree actions**
- Keep cavities clean and vented. On no account should breather paper, cavity trays or cavity barriers be damaged when cleaning cavities

Defect Warning – Summary

- Stop and ask
- **Do not take risks**
- Think 100% Safe
- **Perfect Delivery**

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