



SHELL ERECTION SCHEDULE

SCHEDULE RELATING TO THE ERECTION AND COMPLETION OF A SCANDIA-HUS TIMBER FRAME

INTRODUCTION

This Schedule outlines the work carried out by the entire building team. This includes the customer, the timber-frame erectors and the builder/trades working on site. It is intended to provide both valuable and essential guidance to the whole team. Each member of the unit has a vital role to play although, to ensure that the project runs smoothly, they must unite to form one team. The complete team may be together only during the 'main' timber-frame erection period but, as this constitutes singularly the largest and arguably the most important aspect of the build, it is vital that each member of the team fully understands his or her respective role. It is this understanding that forms the basic requirement for the overall success of the project.

The level of information relating to the main timber frame erection provided in this Schedule assumes a basic understanding on the part of the builder/trades, an in-depth knowledge by the shell erection team and more limited knowledge by the customer. This format ensures that the most important member of the team (the customer) is not disadvantaged by his or her lack of knowledge.

REQUIREMENTS PRIOR TO THE DELIVERY OF THE TIMBER FRAME

Preparation for the arrival of the timber frame is essential and these areas are set out in separate *Fact Sheets* that should be read in conjunction with this document: -

- *Fact Sheet no. 13 - Delivery Day and Shell Erection - Programme & Arrangements*
- *Fact Sheet no. 14 - Site Welfare*
- *Fact Sheet no. 15 - Materials - Delivery, Storage, Protection & Quantities*
- *Fact Sheet no. 16 - Scaffolding*
- *Fact Sheet no. 17 - Pre-Delivery Arrangements*
- *Fact Sheet no. 18 - Site Security*

Additional information relating to the construction of the building is given in more detail within this document as well as in the Builder's Manual, which will be issued together with the final working drawings.

TIMBER FRAME ERECTION

Substructure - Accuracy & Certification

When all materials have been successfully unloaded, the shell erection team will begin erecting the timber frame. As the accuracy of the timber frame is reliant upon the accuracy of the substructure, it is vital that the precision of the slab is determined prior to any timber frame components being placed upon it.

The dimensions and levels must be checked and assessed by the builder/customer, and information recorded on the 'Slab Letter', which will have been forwarded to the customer prior to delivery. This letter records dimensional and level information, which has to be signed and returned to Scandia-Hus Limited at our RH19 2LP, Felcourt address no later than 5 days prior to delivery of the 'Building Set' to site.

The maximum acceptable tolerances of the slab are set out in NHBC Standards 6.2.

Substructure & Soleplate Interface

Prior to the sole plates being fitted, the shell team foreman will check the accuracy of the substructure. If the structure is badly out of level or square, remedial work will be required to be undertaken by the builder/customer before work on the shell erection can commence. However, provided the tolerances do not exceed acceptable tolerances and the Slab Letter has been duly signed and returned to Scandia-Hus Limited, the shell erection foreman will usually decide to proceed with the timber frame erection, inserting minimum packing as required to enable the team to proceed. However, it remains the builder's / customer's responsibility to ensure that solid packers are subsequently fitted beneath every stud for the full width of the sole plate, i.e. 147mm. All voids are to be filled with non-shrinkable mortar.

Should dimensions and levels fall outside acceptable tolerances and the shell erection team be forced to abandon the shell erection and leave site, additional costs incurred in rescheduling a return visit to site will be charged to the customer.

SHELL ERECTION SCHEDULE OF WORKS

Soleplates - Solid Ground Floor Construction

- Position DPC in continuous lengths on top of the 140mm/100mm block upstand, as shown on the final working drawings. (The 140mm/100mm wide block upstand indicates the position of all ground floor wall panels).
- Position treated sole plates (supplied in random lengths) directly on top of the previously laid DPC (on top of the 140mm/100mm block upstands).
- 'Square up' sole plates and place temporary packing below any 'low spots' prior to the external and internal wall panels being placed upon them. Additional 'dry-packing' required below sole plates is the responsibility of the builder/customer and should be carried out in accordance with NHBC standards.
- Provide lateral restraint to soleplates by securing plates with M8x125mm long concrete screws at 900mm centres. Additional screws will be required at corners (300mm centres) and door openings where the plates are to be cut away (also 300mm centres).

Note: Additional wind-restraint straps are required to be fitted in Scotland, see Builder's Guide.

Wall Panels - All Construction Types

- Locate, plumb and fix all external ground floor wall panels to sole plates.
- Locate, plumb and fix all internal ground floor panels to sole plates. (Please note that you can opt to have non-load bearing walls supplied as loose timbers to be erected after shell erection).
- Fix each panel to the adjoining panel using 90mm and 150mm 'Timberlok' fixings, these are supplied loose and will need to be fitted in situ in accordance with the structural engineers nailing detail.
- Fit all 'head-binders' to tops of external and internal wall panels, ensuring that all corners and intersections of internal/external wall panels have head-binders crossing over the joints and fixings into the adjacent panel.
- Ensure that each internal and external corner panel is assembled correctly in accordance with the Shell Erection Manual.
- Panel props are fitted - which are to remain in place until the roof is loaded out with roof tiles.

First Floor Joist-Frame - Two-Storey Structures Only

- Assemble and fix joist-frame components in accordance with the final working drawings.
- 'Trim out' any openings (such as stairwells, etc.) and fit any joist hangers, as shown on the final working drawings, ensuring that the correct number and types of fixings are used.
- Fit all internal wall support timbers, as defined on the final working drawings.
- Fit all solid blocking and strutting, as defined on the final working drawings.
- Fit factory-prepared external cover-strip to perimeter of joist frame.
- Lay and fit 22mm 'Egger' board to form intermediate floor. 'Egger Joint and Joist' adhesive is to be applied as per manufacturer's instructions.

First Floor Zone - Chalet Designs with Rooms in the Roof Only

- Refer to the section 'Truss Installation' below for this element of the construction.
- Fit intermediate joists accurately in the positions shown on the final working drawings.
- Fix intermediate joists to all external and internal wall plates using the truss clips supplied and fix with correct number and type of fixings as specified in the Builder's Guide.
- 'Trim out' any openings (such as stairwells, etc.) and fit any joist hangers, as shown on the final working drawings, ensuring that the correct number and types of fixings are used.
- Fit all internal wall support timbers – where applicable - as shown on final working drawings.
- Fit all solid blocking and strutting as shown on the final working drawings.
- Fit factory-prepared external OSB cover strip to perimeter of joist frame / edge beams (if required).
- Lay and fit 22mm 'Egger' board to form intermediate floor. 'Egger Joint and Joist' adhesive is to be applied as per manufacturer's instructions.

Roof Trusses

Attic trusses are often used for creating rooms in the roof space and are constructed from TR26 structurally graded timber. Depending upon their size, attic trusses will arrive on site either in one piece or more often than not, in two pieces for ease of transportation. Once on site, they will be assembled.

Fink trusses for bungalow, two-storey and other designs which do not incorporate 'liveable' areas are generally not as large (or as heavy) as attic trusses. Therefore, they will usually arrive on site in one piece. However, if the span is particularly large, the trusses may have to be delivered in two or more sections for off-loading and assembly on site.

Trusses will arrive on site as sequenced during the shell erection period. Depending upon the truss type, size and configuration, they will be off-loaded either for erection or for assembly. If the supporting structure has been completed, they will be lifted directly into position. Usually, a mobile crane is used to lift trusses.

Roof Truss Installation

- The trusses are positioned on the wall plates and fixed to the plates using truss clips provided, and secured with the correct number and type of fixings.
- Where the trusses bear on internal load-bearing walls, the trusses have to be fixed to the internal load-bearing wall plate using truss clips provided, and secured with the correct number and type of fixings. However, at the time of the shell erection completion, before the roof trusses have been 'loaded out' with roof tiles, the bottom chord of the truss will not necessarily be bearing directly onto the wall plate. If this is the case, the truss chord must not be fixed or 'spiked' to the wall plate. It should be left unfixed in this location to allow the bottom chord to 'pull out' as the roof is loaded and the truss chord to settle onto the internal load-bearing wall plate, prior to fixing the truss clips. This then becomes the responsibility of the builder/customer, as the roof will not become loaded until the roof tiling has been completed, which may be several weeks after the shell erection team has left site.
- Any loose infill timber for the roof (rafters) will be marked up and packed together, these timbers are normally separated on the ground and then lifted in smaller packs to the area of the roof where needed. These rafters will need to be cut to size and then fitted in accordance with the drawings. Normally the rafters are fitted with glide shoes (these will need to be fitted prior to the rafter being fitted).

Sarked Roof Structure

- Prior to sarking the roof, a 9mm OSB upstand will need to be fitted in between the trusses and rafters. These are secured to the header plate and are fitted plumb to the roof. This gives a continuous OSB coverage up to the roof sarking. The upstand also acts as an insulation stopper internally and an insect/bird closure externally.
- When all the trusses have been erected, squared, plumbed and fixed, and all the roof components are in place, OSB sarking is fixed to the external face of the truss rafters.
- If the building has roof lights, these will be fitted by the builder/customer. The shell erection team will not make any provision for their installation, as customers' requirements with regard to the position of roof lights vary from site to site.

- Upon completion of the sarking, a breathable roofing membrane is applied over the complete surface of the roof boarding. This is held in place by counter-battens, which are fixed at each rafter position vertically (from gutter to ridge). The roofer will then cross batten (horizontally) on top of these battens.

Eaves Fascia Rail & Boards/ Gable Barge Boards & Soffit Boarding

- The fascia rail and fascia boards are fitted to the ends of the rafters by the shell erection team. The fascia rail needs to be fitted level and plumb. The fascia rail should be strung from one end to the other and any discrepancies in the truss/rafter feet should be cut to suit.
- The shell erection team will leave the fascia boards 'over length' to be trimmed on site to suit the eaves box detail completed by the builder/customer.
- The gable barge boards should be fitted by the builder/customer.
- Eaves and gable soffit-boards should be fitted by the builder/customer, as shown on issued details.

OSB Tilting Fillet & Gutter Drip

- The shell erection team will fit an OSB tilt board and 225mm DPC gutter drip at the fascia position.
- Breathable roofing membrane to be dressed over the DPC to enable any water to fall into the gutter.
- Install over-fascia or soffit vents in accordance with details. Vents are required only for 'cold roofs', the sarking should be left 50mm down on the roof to allow through ventilation.

Dormers & Roof Lights

- Dormers are delivered to site partially assembled. All the panels (cheeks, gables and front panels) are supplied to site as 'open cell' panels, which means that insulation, vapour control layer (VCL) and plasterboard are site-fitted by the builder/customer.
- Dormer roofs and associated fascias and soffits to be constructed as per the main roof detail.
- All work associated with the installation of roof lights is to be carried out by builder/customer, including the supply and fixing of 25mm expanded polystyrene and 12.5mm plasterboard linings around the roof light reveals.
- Any additional supports required at junctions/board ends to be formed by builder/customer.

ADDITIONAL ITEMS COMPLETED BY THE SHELL ERECTION TEAM

Upon completion of the main frame, the shell erection team will also undertake the following: -

- Overlap breather paper on all external panel joints.
- Where necessary, fit cavity-battens and cover the front face of battens with DPC.
- Construct structural elements of the balcony (if applicable).
- Construct bay window structures (if applicable).
- Firestop to be fitted in place with 100mm DPC.
- Tidy site, making use of skip provided by builder/customer.

Shell-Erection Hand-Over Inspection

On completion of the shell erection, work undertaken by the shell erection team will be inspected by the Scandia-Hus Limited Contracts Manager. The purpose of this inspection is to ensure that the erection has been undertaken correctly to the drawings and details supplied and that standards are being maintained.

At the end of the inspection, any further work found to be required to be undertaken by the shell erection team will be discussed and agreed with the foreman who will then arrange to complete any outstanding work or carry out any amendments/rectifications, as necessary.

Product Data Sheets

For further information with regard to the composition or properties of any materials or components incorporated within our 'Building Sets' and their toxicological or ecological effects (if any), or in respect of the handling, storing, disposal, etc. of materials supplied by us, please contact our sales team who will be pleased to provide copies for your reference.