



Guidance Note #4 – Superstructure only projects for small developers/self-builders

1. Introduction

The following is a basic guide to timber frame superstructure projects. The aim is to explain simply and accurately what is involved, what is included as standard and what is required of the client to enable a timber frame structure to be designed, manufactured and erected efficiently.

The goal is to make your project as straight forward and easy as possible by detailing the various stages of commissioning a timber frame structure and explaining how each stage works and what needs to be done to ensure your project succeeds as planned.

2. Understanding Timber frame

What is a timber frame superstructure?

When considering a timber frame for your building it is important to understand exactly what you will be getting.

A superstructure is for all intents the portion of the building which ensures the walls remain standing and the roof does not fall in, in other words all the structural components needed to form the load bearing skeleton of the building. The structure does not have to be insulated, wind or watertight to be a finished superstructure.

What services are supplied?

When ordering a timber frame from your supplier you are engaging in a Design & Build contract. The usual route is your supplier will be issued Plan and Elevation drawings by your architect and will design the timber frame to match the architect's drawings. As such the supplier takes responsibility for the structure designed for which they will issue a warranty to you at the end of the project.

As a Design & Build contract you can expect the following as standard:

- Design of all the super-structure elements– this will include all the approval, manufacturing and construction drawings
- Fabrication of the structural timber components to suit
- Management of the construction works by dedicated Contract and/or Project Managers

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- Delivery of the super-structure kit to your site
- Installation of the frame by qualified and professional tradesmen

What is included in a timber frame quote?

This can vary greatly but a supply only quote should include:

- Design and engineering of the super-structure with drawing issue
- Off-site fabrication of the super-structure elements
- All of the structural wall elements, including internal load bearing, racking and party walls
- Non-load bearing internal partition walls
- All load bearing elements necessary for the timber frame super-structure including posts/columns/beams and all ironmongery
- Any structural layers comprising floor joists and decking material
- The roof structure including any structural/racking sheathing/sarking and party wall spandrel panels. Spandrel panels will be pre-finished with VCL membrane (optional) and plasterboard (mandatory) already installed
- Breather membrane to the outer face/cavity face of the external panels
- Any fire-stop/cavity barrier or cavity insulation that cannot be fitted to the timber super-structure once erected

A supply and erect quote will also include:

- Site erection of the frame
- Plant/cranes to erect the frame
- Dedicated Project/Contract Manager to oversee the pre-start, erection and sign-off phases

There are many, many items that are frequently requested as additions to the basic timber frame super-structure package. The most common are listed below:

- Insulation within the panel
- Insulation to the floor/roof layers/cavity wall
- VCL membrane fitted to the internal face of the perimeter panels
- Air-tightness membranes fitted at panel junctions and floor layers
- Fascias, barge boards and soffits
- Plasterboard ceiling noggins
- Carcassing to cupboards, under-stairs, eaves and SVP boxing
- Service voids or penetrations through the perimeter walls/floor beams/roof
- Fire-stop batten around structural openings
- Porches
- Balconies
- Verandas
- External decking and access ramps/walkways
- Floating floors
- Stairs
- Balustrading and handrails

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These items may not be part of the initial estimate and will be priced as additions to the final quote.

3. Ordering a Timber frame

Stage 1 – Getting a quote

As with most things the more information available at the start, the easier it is to get an accurate quote. The following documents are required to help your supplier to generate a quote:

- Site details – an accurate address for the site and full contact details for yourself, the architect and any other designers involved in the project (structural engineers/interior designers etc)
- A site plan - this needs to be accurately scaled and detailed as to where the structure will be positioned within the site
- Dimensioned plan and elevation drawings
- Initial window schedule showing window/door positions and required dimensions
- Access plan – this needs to detail how and where deliveries and plant will enter and exit the site. Any restrictions to delivery times or the type of delivery vehicle need to be clearly communicated on the access plan. Ideally the best route to the site via the public highway needs to be detailed as well – ideally avoiding any low bridges, single track highways, weight restricted roads etc.
- Any performance or technical specifications for the building *ie. Is the building designed to passive house standards? Are the structural posts/beams designed to be visible? Do any timber sub-frames need to be treated? Do you need service cut-outs through structural beams?* This information is often contained within the Architects or Contractors Specification or is sometimes detailed in the Bill of Quantities. If this type of information is available, it is imperative that it is passed to your supplier to enable them to price the project accurately. Failure to pass this information on will result in your supplier having to reprice your project and can lead to lengthy delays getting the project to site. If you have not got around to detailing specific requirements for the building that is ok – but please be prepared to answer a lot of questions from the suppliers Design Team
- Timescales – when will the site be ready for the frame to be delivered and ideally when would you like the installation works to start. Most importantly when do you need the quote by?

Once your supplier has all this information they may visit the site (pending what information comes back on the access plan) and the Design Team may contact you to check specific information or clarify anything that may not be obvious from the drawings/documents passed to them.

Stage 2 - The Quote

The supplier's quote is (hopefully!) a straightforward document. There should be a brief description of what they are pricing followed by a preliminary timescale of how long each stage will take to get your project on site and built. The bulk of the document is often a tick list of what has and just as importantly – what your supplier **has not** included in the quote. It cannot be stressed enough the importance of reading and understanding this document. It is your responsibility to check that our quote matches what you want your supplier to include in the price.

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It is also possible that the works may differ slightly from those initially designed by the architect, this could be due to the following factors:

- Your supplier will do an initial structural assessment of the building which can highlight additional engineering or structure requirements not considered by the architect
- As timber frame specialists your supplier has a better understanding of what is and what is not possible to do in timber and your supplier will often change architect's details to suit timber frame components and installation
- Your supplier may "value engineer" the project which means the timber frame design is as simple, efficient and cost effective to build as possible. This is sometimes at odds with the architectural scheme but it is often the best starting point for a design and the client should be aware and in charge of the decision to pay for architectural detailing.

The quote should also detail a list of "client attendances", in effect it is a list of works or services which the client has to undertake to get the site ready for the Timber Frame installation. These typically include:

- **Provision of site welfare facilities** – *ie.* Site hut, toilet, water supply etc
- **Site security** – a secure fence/hoarding around the site with appropriate warning signage to prevent accidental or deliberate trespass by the general public. This is an insurance requirement which is often overlooked on domestic self-builder sites
- **Sub-structure enabling works**– in other words all the works to prepare the foundations to accept the timber frame. This usually involves providing a structural floor such as a concrete slab or block and beam floor with upstand masonry plinths built in the position of the load-bearing and non-load bearing walls. This plinth effectively brings the frame level with the finished floor level (FFL) and is the industry standard for timber frame construction. Architects sometime detail the timber frame panels fixed directly to the slab/block & beam floor taking it below FFL. This is a poor detail and your supplier will always insist that an upstand plinth is used. Additional works may also be required, the Project or Contract Manager will usually advise but in the first instance of the quote your supplier will assume the responsibility for these works will rest with you
- **Crane pad** – Timber frame projects are usually erected with a crane. For the crane to set-up and operate safely a flat, well compacted area, sufficiently large to accommodate the crane with the outriggers fully extended needs to be installed close to where the building is being erected. The size of the structure's footprint, how many storeys high, or the weight of the components required to build it will dictate the size of crane and how big and what Ground Bearing Pressure (GBP) the crane pad must be constructed to. These factors may also necessitate the construction of more than one crane pad if for instance the building is especially large. The supplier's Project/Contract Manager will advise you to the required GBP of the crane pad and it is your responsibility to ensure that these requirements are met and provide proof, via GBP testing, that the crane pad meets those requirements
- **Access**– an adequately sized and constructed haul road to facilitate deliveries and plant movements into and out of the site. These works need to withstand site traffic with **axle weights of up to 20 tonne**. This often catches clients out and is a major cause of delays and costs once the site works have started. All deliveries are based on using **articulated lorries** unless site conditions dictate, or the supplier is told otherwise

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- **Scaffolding** – perimeter scaffolding and depending on the building type, internal or “birdcage” scaffolding will be the responsibility of the client. Your supplier is often asked to provide their own scaffolding but as the scaffold will be needed by other trades long after they finish their works, your supplier will not provide scaffold on supply only projects, and very rarely on supply and erect. Scaffolding needs to be free-standing by preference ie not tied to the building, but if that cannot be avoided then additional structure may need to be built into the wall panels to accept specialist scaffold ties which has a significant cost implication and prolongs the erection time on site due to the need for regular scaffold adaptations
- **Setting down area and secure storage** - The setting down area is a clear space, **10m x 10m** in size and free of other building material and plant where the deliveries can be off-loaded and temporarily stored prior to installation. A setting down area and secure storage is not essential (and you may not have the space to accommodate!) but if your supplier can only deliver as much as they can install in one day, then inevitably there will be more deliveries to site which will then cost you more.

The quote will finish with a summary of any assumptions your supplier has made concerning the design of the timber frame, any caveats regarding the design or specification (in short the more information you give the supplier the fewer caveats you will get on the quote!), the payment terms and your supplier's general Terms & Conditions. Again, this is worth reading and understanding – if you have any concerns or questions please contact the supplier and ask them to explain the quote in detail.

Stage 3 – Order Acknowledgement

Once you are happy with your supplier's quote and all parties understand exactly what and how the building is being built then your supplier is almost ready to start the design. However, your supplier will need the following before any design works can start:

- The Order Acknowledgement (OA). This will reiterate the details contained in the quote along with any changes that may have evolved during pre-order discussions. Please check the OA accurately reflects what has been agreed as this document is contractually binding and subsequent changes to the design or scope of works will be a variation to the contract and hence chargeable
- The OA will also be sent out with an invoice for the Design & Engineering works. The OA needs to be signed and returned and the Design & Engineering invoice needs to be paid. One or other is not sufficient to start the design phase of the project. However long or short the period from design start to site start, nothing will happen until the OA is signed and the Design & Engineering invoice is paid in full.

Stage 4 – Design Phase

The design is the most time consuming and difficult part of any project. It is also the part most important to get right.

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The Design Phase starts with the issue of a **Design RFI** (Request for Information). The RFI will detail all the information the Design Team needs, any assumptions made about the design and any changes or issues found with the initial architectural design. It will explain the key stages of the design process and highlight the milestones that need to be achieved to maintain the start date. The Design Team rely on the client or client's architect to supply and approve the design information as per the RFI milestones, failure to do so will result in delays. Furthermore, delays in design approval are not necessarily proportionate to the final delay getting to site – a three-day delay in drawing approvals can result in a missed manufacturing slot which can delay the site start date by several weeks! Needless to say, this is a scenario all parties wish to avoid which is why the Design RFI milestones are so important.

The design phase typically follows the sequence below:

1. Design RFI issued by your supplier
2. Design RFI queries answered by client/client's architect
3. Initial Timber Frame engineering undertaken to produce Line and Point (L&P) loads for the structure – these will usually be issued within 2-3 weeks of the design start and these must be passed to the designing engineer for the foundation design
4. General Arrangements (GA's) issued for comment – these drawings are issued, sometimes via the client to the Principle Designer, usually the architect for the project. It is the architect's job to check the footprint, elevations, internal dimensions and door and window positions as drawn by the Timber Frame designer matches the scheme they have drawn
5. GA's issued for approval – architects generally do not like "approving" someone else's design but this is a very important stage of the design process and often a sticking point between the two design teams. As the client you need to know what the law says about design liability – *"...approval of a drawing by the Principle Designer (architect) does not transfer all design liability from the timber frame designer to the Principle Designer. In the event of a design mistake liability is several and shared"*. The only exception to this is if the Principle Designer specifically issued an instruction to change a design detail
6. Once the GA's have approved the design will be considered set and this is most commonly referred to as the **Design Freeze**. Client or architect led changes to the design after this point will be chargeable and could be costly as well as impacting the lead time for the manufacturing phase of the supply
7. On Design Freeze the Timber Frame designer will first produce manufacturing drawings and then Construction Drawings. The Construction Drawings will be issued to site, usually on first delivery if not before, a set will also be issued to the client on completion of the installation if not before

Note# The length of the Design Phase will differ depending on the size and complexity of the project but can also be affected by manufacturing lead times. For instance, if there is a requirement for steel frames to be incorporated into the timber frame design there could be a 4-5 week lead time for manufacturing the steel, hence the steel will need to be designed first if overall delays to the manufacturing phase are to be avoided. Likewise, specialist items/non-standard materials can also prolong a design phase as these usually have long ordering lead-times meaning these items will also need to be designed first to ensure they are ready for the site start date. Combine both or more of the

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examples above, and you can see how the Design Phase can easily extend past what may seem (to you as the client) a reasonable period.

Stage 4 – Manufacturing

Once the design is finalised the Design Team will then produce Manufacturing Drawings. These will be passed to your supplier and at this stage you will be invoiced for the manufacturing stage payment.

This invoice is often sent out for payment to coincide with the start of the manufacturing cycle so that your investment in the manufactured items can be protected by a Vesting Certificate.

A Vesting Certificate is a legal document of ownership for the manufactured timber frame kit ensuring that in the event of an insolvency in any part of the supply-chain (material suppliers, your supplier, the haulier), your timber frame kits are immediately identifiable as your property. The components will be labelled, photographed and you can even visit the factory to view your property.

Stage 5 – First Delivery

The penultimate stage payment will usually be invoiced prior to the first delivery of your timber frame to site, usually to be paid 1 week prior to the first delivery date. The first delivery is usually the start date for the construction phase of the project.

Stage 6 – Installation Phase

- **5 Day Pre-start** - Five working days prior to the Start Date, a member of the Project Management Team should visit the site for a Pre-Start Meeting. This meeting is to introduce the Contract or Project Manager who will be overseeing the installation of your timber frame and to check that the "client attendances" (plinth upstands, scaffolding etc) have been successfully completed and are ready for the start date. They should also deliver the Site Folder – a folder with all the information, programme, Health & Safety and technical data that the supplier's site team and the client (or the client's agent) will need during the installation phase. This is a very important set of documents and you or your agent will be asked to sign to say you have received it
- **Start Date (SD)** – This is usually the same date as First Delivery and denotes the start of the installation phase on the build programme
- **Construction** – Your timber frame will be installed by experienced qualified carpenters/frame erectors. They will handle banking deliveries into and out of the site, offloading operations and all day-to-day installation works. Within each site team will be a nominated Team Leader and they are your first line of enquiry if you have questions about the installation methodology or sequence. Programme queries are best directed to your nominated member of the Project Management Team who will be visiting site to inspect the work at key stages and are always at the end of a phone during office hours
- **Practical Completion** – It is not uncommon that client's will want to push follow-on trades into the build as quickly as possible, quite often before your supplier has completed their works. To facilitate this your supplier may offer a Practical Completion Sign-off which effectively hands the

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installed components and all responsibilities for said components or areas of the building over to the client, and their follow-on trades, at a point at which the works are substantially complete but not necessarily finished. This does not absolve your supplier from finishing their works or any snagging (finishing or correcting minor defects) that may be outstanding

- **Snagging** – 2-3 days before the installers are due to complete the site works a member of the Project Management Team should visit site to conduct a snagging inspection. Any incomplete or defective works will be identified to the site team on a snagging list, a copy of which will be given to you or your agent on site. This is your chance to raise any issues and ask questions
- **Sign-Off & Handover** – A final inspection will be arranged with yourself, the site Team Leader and your nominated Contract/Project Manager. If the inspection tour is completed successfully you will be asked to sign a final Sign-off & Handover sheet to agree that all our works have been completed satisfactorily

Stage 7 – Contract Completion

Once your supplier is in receipt of the signed Sign-off & Handover sheet you will be invoiced for your last stage payment, the receipt of which will trigger the issue of the product warranties and any as-built drawings or amendments to the design.

4. In Conclusion

The above guide is not exhaustive and has been written as a roadmap as to how and what the process of ordering a timber frame super-structure should entail. No two suppliers will operate in exactly the same manner, but the stages and details outlined in this guide should bear close resemblance to how your supplier operates. Reputable companies will not be put off or alarmed by informed clientele, and armed with the basic knowledge of how this sector works will help you make informed decisions about your project's supplier and help ensure your project is a success.

We hope you found this Guide useful, if you require further information on this guide or any other aspect of timber frame or MMC construction projects please feel free to contact us directly.

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