Tube and Fitting Scaffolding guidance associated with timber frame structures

1.0 Introduction

This scaffold guidance is associated with the construction of traditional tube and fitting scaffolding erected for the construction timber frame structures.

The guidance must be read in conjunction with the sections 1-20 within the main trade specification for scaffolding.

Alternative proprietary scaffold solutions are available such as Kwistage, CupLok, Layher systems.

Proprietary System scaffolds are widely selected within the construction industry and commonly associated with timber frame construction as an extremely versatile and effective alternative solution to tube and fitting scaffolding.

All system scaffold must be installed in accordance with the specific Manufacturer's Guidance.

2.0 Design Requirements

2.1 Tube and fitting scaffolding erected for timber frame structures falls outside TG20:21 (Technical Guidance for tube and fitting scaffolding) and has separate guidance known as SG28:17.

2.2 SG28:17 confirms that specific drawings will need to be supplied for each timber frame project, which should include suitable details for the erection of the scaffold being built. In some instances where the building design is repeated, it can be acceptable to use existing generic designs.

2.3 Refer to Appendix 1 & 2 for examples designs for external buttresses, outriggers used to provide stability to timber frame tube and fitting scaffolding. The use of physical ties must be assessed where external stability control measures cannot be installed.

2.4 Within the SG28:17 guidance, any specific drawings should be issued to the client for approval before work commences.

2.5 Where the services of a 'Scaffolding Contractor' are engaged on a Project, the following conditions will apply and the Scaffolding Contractor must:

• Ensure that the design of any tube and fitting or proprietary system scaffold structure complies with the specification provided by the client, covers all statutory requirements, complies with the manufacturer's technical information and is safe to use and fit for purpose.

• Ensure that the scaffold design has strength and stability calculations as required by the Work at Height Regulations 2005 and that the design is based on a generally recognised standard configuration (e.g. NASC TG20 for tube and fitting scaffolds or the manufacturer's instruction manual for system scaffolding) and designed in accordance with the current wind code.

• Ensure that the selection of access and egress requirements onto the scaffolding takes due consideration as to the height, frequency of use of the scaffolding, including any emergency arrangements.

It is the responsibility of the scaffold contractor to review the setting out of any scaffold components selected and erected to ensure the safe access for internal trade contractors.

• Scaffold contractors must provide a detailed design, including a plan and elevations. Detailed sections should be provided at various intervals where there is a change in the type of construction.

2.6 Any proprietary system scaffold selected for the construction of timber frame structures must be erected in accordance with the manufacturer's information.

2.7 Where tube and fitting scaffold is selected, the scaffold contractor is responsible for compliance with current guidance associated with tube and fitting guidance for timber frame structures.

3.0 Design Information

3.1 The design should be fully annotated giving, where appropriate, the following details as a minimum:

• Type of scaffold (e.g. Tube & Fitting or NASC Approved System)
• Bay sizes
• Lift heights
• Number of boarded lifts (including how many main boards and inside boards)
• Access arrangements (e.g. staircases or single lift internal ladders)

• Access arrangements (e.g. phased access permission may be required for upper lifts, which may be out of bounds until the building has reached that level, such as for wall panel installation, which is usually is completed from the floor below)

• Allowable loads
• Number of buttresses (sometimes known as loading towers)
• Number of loading bays
• Bracing positions
• Tie locations and tie details (including size and type of tie)
• Requirement for inside guardrails
• Arrangements for future adaptions (including if telescopic transoms or board brackets are to be used)
• Any additional hazards and risks
• Kentledge requirements (where applicable)
• Consideration of the space between house types under construction must be assessed which may affect the ability to install outriggers, buttresses to ensure stability. A site specific scaffold design will be required to ensure the stability of the scaffold in this instance.

3.2 The scaffold designer will decide on the type of kentledge used (such as concrete blocks, weights, scaffold tube etc.).

3.3 Where scaffold tubes are used as kentledge, it is recommended that consideration be given to tying the load down to prevent unauthorised removal and painting kentledge (so as to identify any items removed).

• Take into consideration the requirement and suitability of ground conditions. The Main Contractor to approve prior to works commencing.

• The design should include the most appropriate means of access and egress on to the working platform and there should be sufficient details to enable the scaffold contractor to erect the scaffold and to ensure that the scaffold can be built in accordance with best practice (e.g. SG4).

4.0 Communication of Scaffold Design and Safe Systems of Work

4.1 The scaffold contractor must ensure that the approved design and all design information is issued to their scaffold operatives prior to erection.

4.2 Drawings should give clear and concise instructions relating to any design implications.

4.3 During the pre-start briefing of the Method Statement/Risk Assessment (RAMS) by the Supervisor, which includes a review of the design drawings, all operatives must confirm (by a record of their signature), that this information has been received and understood.

4.4 Scaffold Erect Sequence

This timber frame erection sequence must be considered during tendering scaffolding to ensure all adaptions are included within the tendering process and contracts awarded.

Detached, Two Storey Semi Detached and 3 blocks with trussed cold roofs:

- Timber trussed roof built on slab.
- Scaffold built around slab/roof with hop ups left out.
- Roof lifted out on the day of the kit erect and a scaffolder to be in attendance to install hop ups as required to erect the kit.
- Timber Frame Panels and cassettes erected.
- Roof lifted into place.
- Scaffolder to allow for internal hop up adjustments to suit the build process for both the timber frame erector and additional trades upon completion of the timber frame structures
- Ensure adaption included for maximum 450mm step height for roof works.

Option for Larger Terraces/Three Storey Buildings with trussed cold roofs:

- Scaffold built around slab with hop ups as shown on relevant Oregon sections only.
- Timber Frame Panels and cassettes erected.
- Timber trussed roof built roof built on upper cassette
- Roof lifted out and a scaffolder to be in attendance to install hop ups as required to erect the kit.
- Upper walls erected on upper cassette.
- Roof lifted into place.
- Scaffolder to allow for hop up adjustments to suit the build process for both the timber frame erector and additional trades upon completion of the timber frame structures.

- Ensure adaption included for maximum 450mm step height for roof works.

Panellised Roof housetypes:

- Scaffold built around slab with hop ups as shown on relevant Oregon sections only.
- Timber Frame Panels and cassettes erected.
- Scaffolder to be in attendance.
- Hop Ups installed as shown on Oregon sections.
- Upper walls and panellised roof built on upper cassette.
- Scaffolder to allow for hop up adjustments to suit the build process for both the timber frame erector and additional trades upon completion of the timber frame structures
- Ensure adaption included for maximum 450mm step height for roof works.

5.0 Changes to Scaffold Design

5.1 During the construction phase, where the scaffold structure needs to be altered from the original design, which is likely to affect the integrity and stability of the scaffold. The original design must be checked by the scaffold designer and a new design provided with calculations.

5.2 Confirmation must be received from the scaffold designer that it is acceptable to continue.

5.3 Consultation with the principal contractor and the timber frame supplier must take place prior to any alterations to the scaffold structure that may affect the timber frame building.

5.4 The scaffolding contractor must ensure that any scaffold design changes are communicated to the site management and the scaffold operatives in an appropriate manner before the erection starts or continues.

6.0 Stability Considerations

6.1 The scaffold design must include the measures in place to take account of the stability of the scaffold and any wind forces it may be subjected to, including any other imposed loads.

6.2 There may not be a building or structure against which to tie (when initially erecting any scaffolding associated with timber frame buildings).

6.3 Therefore, the stability of the scaffold must be achieved by means other than ties to the building or structure.

Note: All types of freestanding structures depend for their stability against overturning either on self-weight, additional guys, anchors, outriggers or kentledge.

6.4 It is important that the work is planned and designed to ensure the appropriate measures can be put in place to maintain stability.

6.5 Rakers/outriggers are one method of improving stability, but there are others. See comments in 7.4

(Fig 1 example of external outriggers to provide stability to scaffold structure)

7.0 Preventing internal collapse of scaffold structures

7.1 Where there is a risk that the scaffold can “fall forward” – e.g. in cases where the scaffold will remain in place for weeks before timber frame installation – then temporary inner buttresses may be required.
Site management teams and timber frame supplier to confirm delivery and installation dates to prevent scaffold being erected for long periods

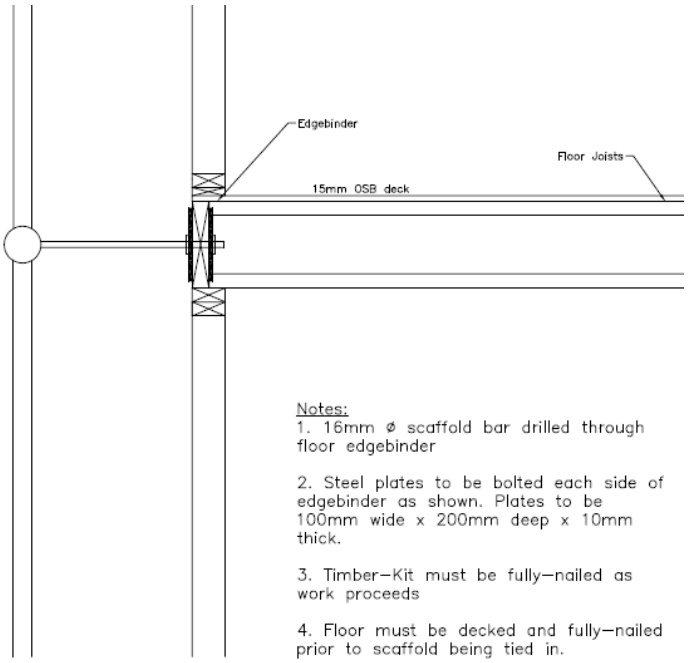
7.2 Where inner buttresses are installed these must be covered within the scaffold designs. Outer buttresses are often spiked to the ground, whereas inner buttresses may need to use drilled fixings into the slab (if there is one).

7.3 Where a raker or buttress is tied back to the scaffold, pairs of raking tubes may also need to be braced together.

(Fig 2 example of inner buttress erected to prevent inward collapse)

7.4 When the scaffold structure is being built progressively together with the erection of the timber frame building, ties to the ring beam of the timber frame building structure may be used subject to design and will require a pull test using calibrated testing equipment. Tying whilst being an option should be considered as a last option.

7.5 Agree the tie type, size and location with the client/principal contractor and the TF engineer at the design stage.
Any ties selected will require a pull test using calibrated testing equipment. All ties must have a DO NOT REMOVE tag installed to prevent unauthorised removal.



(Fig 3 example of tie secured to timber frame structure)

8.0 Access arrangements

8.1 Stair towers, ladder bays, loading bays can be used as an alternative method of maintaining the stability of the structure, this must be taken into consideration at the tender/planning stage (and where required added to the design).

8.2 Refer to section 5 of the trade specification for scaffolding for additional information on positioning ladder towers or staircase access requirements.

8.3 A ladder can be installed to provide access the first floor through the stairwell during construction of the timber frame.

9.0 Selection and Use of Extended transoms, Telescopic Transom Units, Inside-board Brackets

9.1 Inner platforms may also be supported using inside-board brackets.

A principal advantage of this method is that the platforms can be stepped upward or downward with the progress of the work.

9.2 The platform maybe fixed initially in the step-down position, then raised to the level of the main lift, and finally raised to the step-up position.

9.3 This working method allows a scaffold with 2.0 m lifts to be used for bricklaying and blockwork, instead of a traditional bricklayer's scaffold with 1.35-1.5 m lift heights, allowing the scaffold to be used for other purposes without first adapting it to provide walkthrough lifts.

9.4 If used in conjunction with telescopic transom units, the inside boards at the main platform level can be easily reinstated as the brackets are moved upwards or downwards through the scaffold with the progress of the works.

9.5 The width of the main platform can be extended by supporting *inside boards*, between the inner line of standards and the building.
The scaffold contractor must ensure that inside board are installed at suitable heights to comply with Work at Height regulations and for suitable work heights for timber frame erectors and any following trades within their quotation.

Several methods of supporting inside boards are available:

• *Extended transoms:* the transoms from the main platform can be made long enough to cantilever beyond the inner ledger to provide an extended platform at the working level, this method generally requires more adaptions to suit follow on trades.

• *Telescopic transom units* can be used, which allow the width of the inside board platform to be changed, or the platform to be removed, with the progress of the work;

• *Inside-board brackets:* The inside platform can be supported by inside-board brackets, informally known as 'hop-up' or 'step-down' brackets, which allow the inner platform to be raised above or lowered below the main platform level.

NOTE: This is the preferred option when changing heights of inside boards for timber frame erectors, bricklayers.

9.6 Some brackets provide an extending section that allows a third board to be accommodated across the width of the platform.

9.7 Note that only one platform per elevation of scaffolding is allowed to have 3 inner boards at a time.

9.8 The spacing requirements for transoms are described in TG20 but typically are 1.2m apart.

10.0 Documentation

10.1 The following documents and records will need to be made available and retained on site during operations:

• Approved Scaffold Design(s)
• Risk Assessment and Method Statement (as detailed above)
• Handover Certificates and Scaffold Inspection Records
• Tie Tester Calibration Certificate
• Tie Tests records (these maybe encompassed within the Handover note)
• Copies of operatives CISRS cards

10.0 List of Appendices

Appendix 1 Example of 2 storey timber frame tube and fitting scaffold design showing examples of installation of buttresses and outriggers

Appendix 2 Example of 3 storey timber frame tube and fitting scaffold design showing examples of installation of buttresses and outriggers

Guidance for establishing number of working lifts and adaptions

Appendix 3 Working lift heights for construction of timber frame two storey house type showing lift heights for timber frame erectors

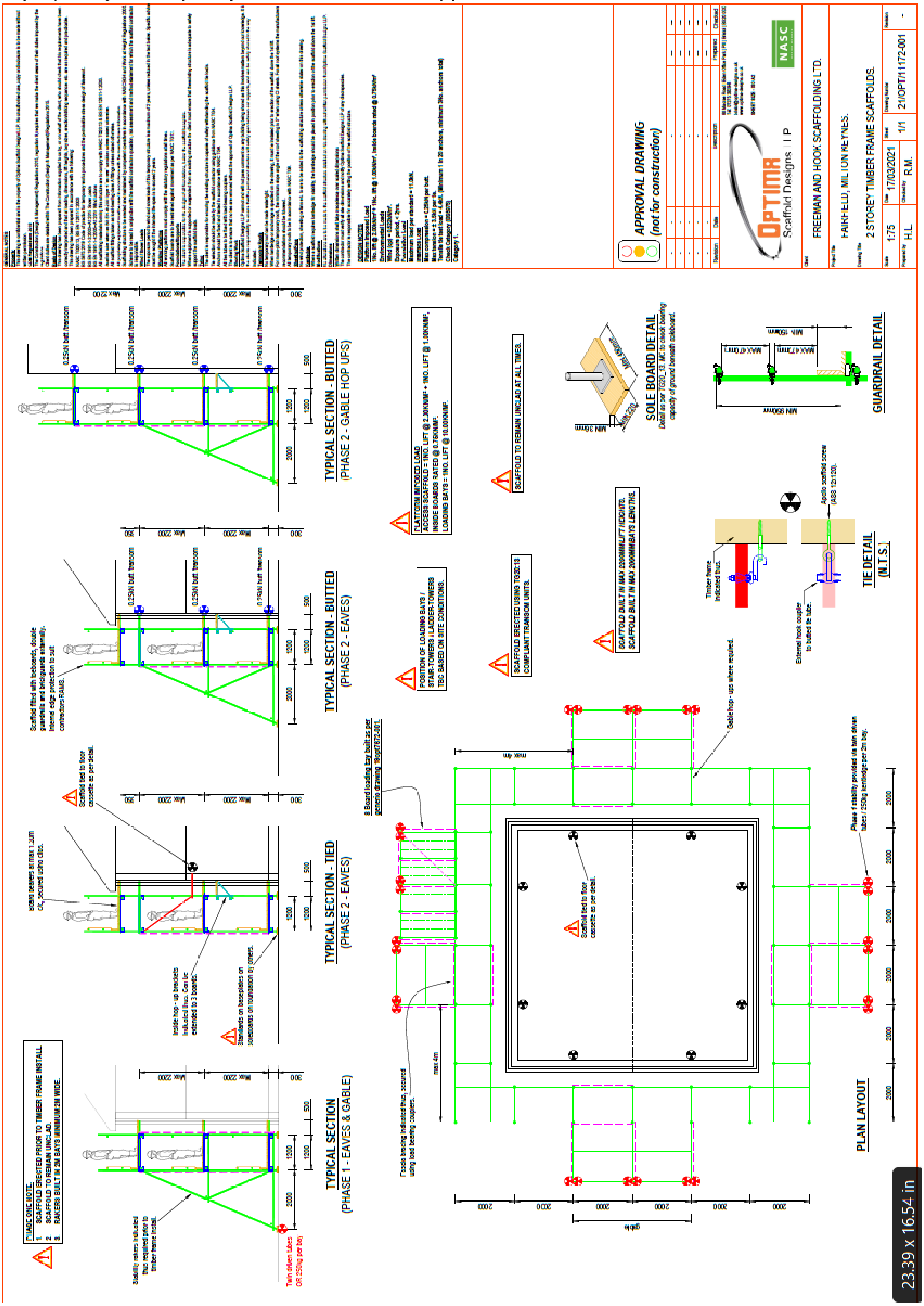
Appendix 4 Working lift heights for construction of timber frame 2.5 storey house type showing lift heights for timber frame erectors

Appendix 5 Working lift heights for construction of timber frame 3 storey house type showing lift heights for timber frame erectors

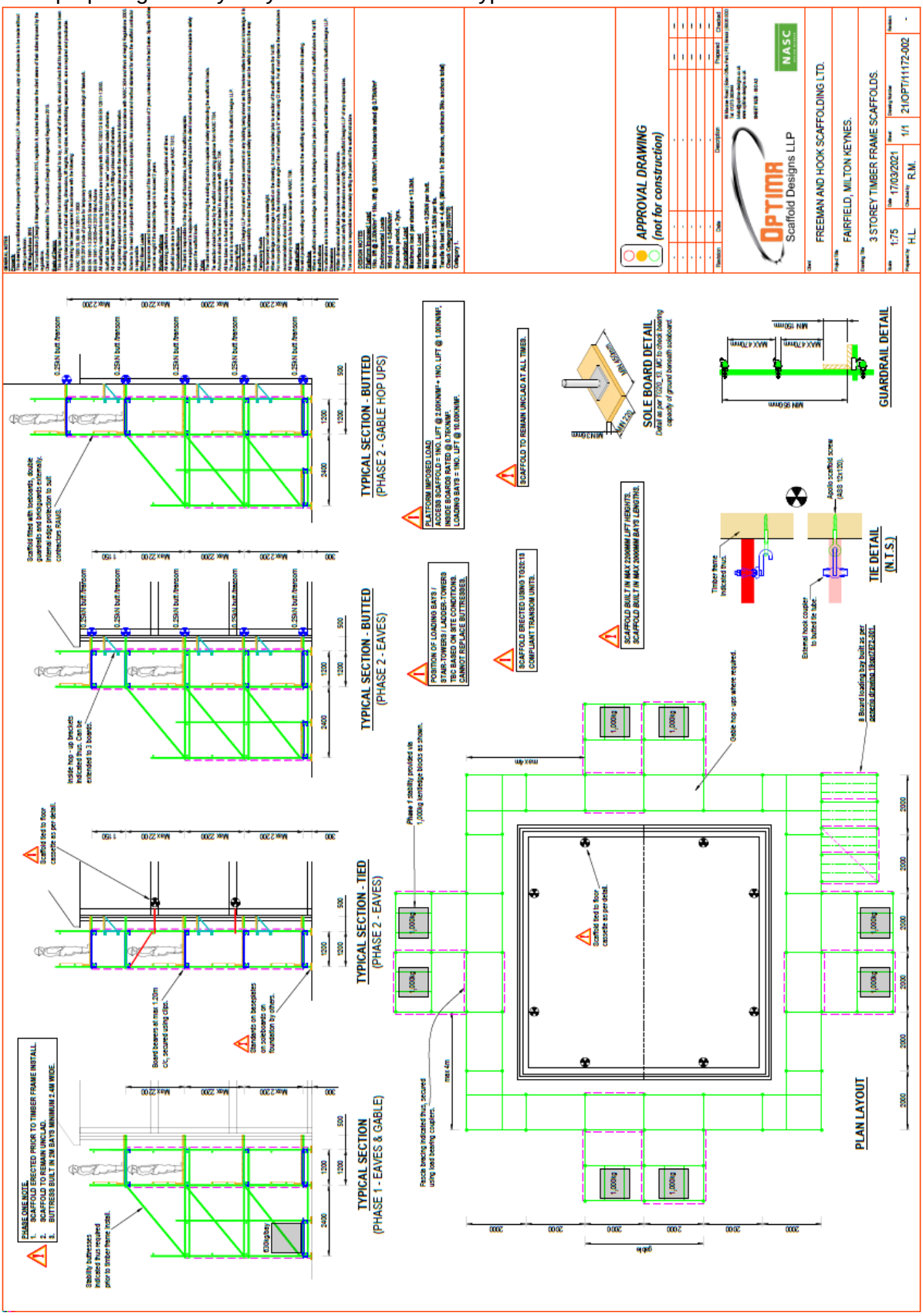
Appendix 6 Working lift heights for construction of timber frame 3 storey apartment block showing lift heights for timber frame erectors

BARRATT HOMES · BARRATT LONDON · DAVID WILSON HOMES · BARRATT DEVELOPMENTS PLC

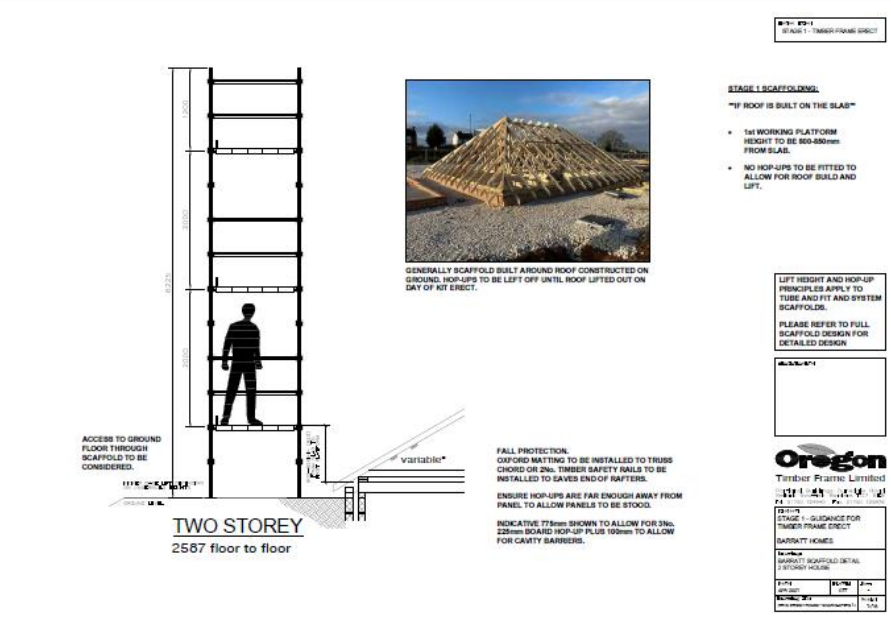
Appendix 1 Example of 2 storey house type design illustration only, not to used as hop up heights may vary for different house types.



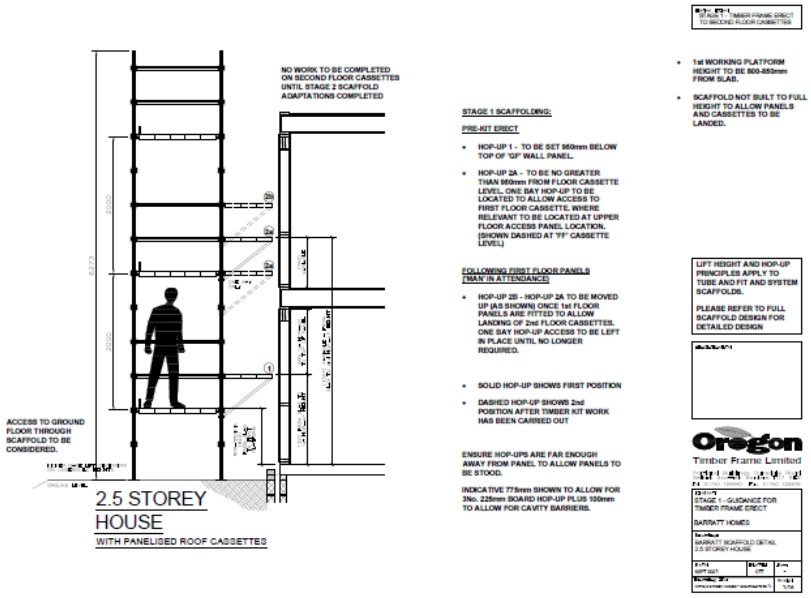
Appendix 2 Example of 3 Storey Timber Frame Design illustration only, not to used as hop up heights may vary for different house types.



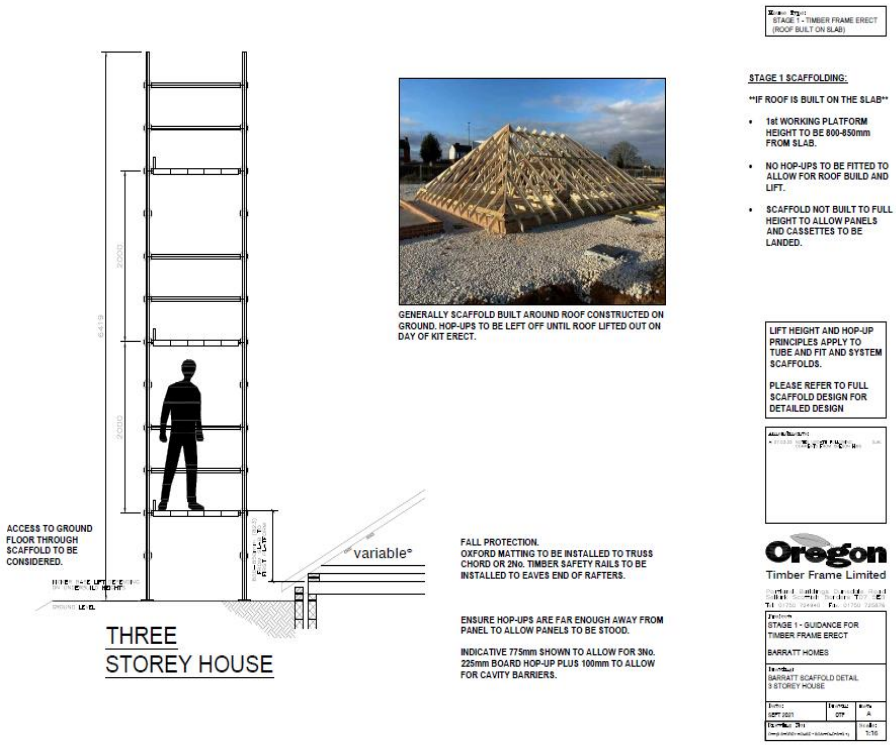
Appendix 3 Guidance for working lift heights for construction of two storey timber frame house type



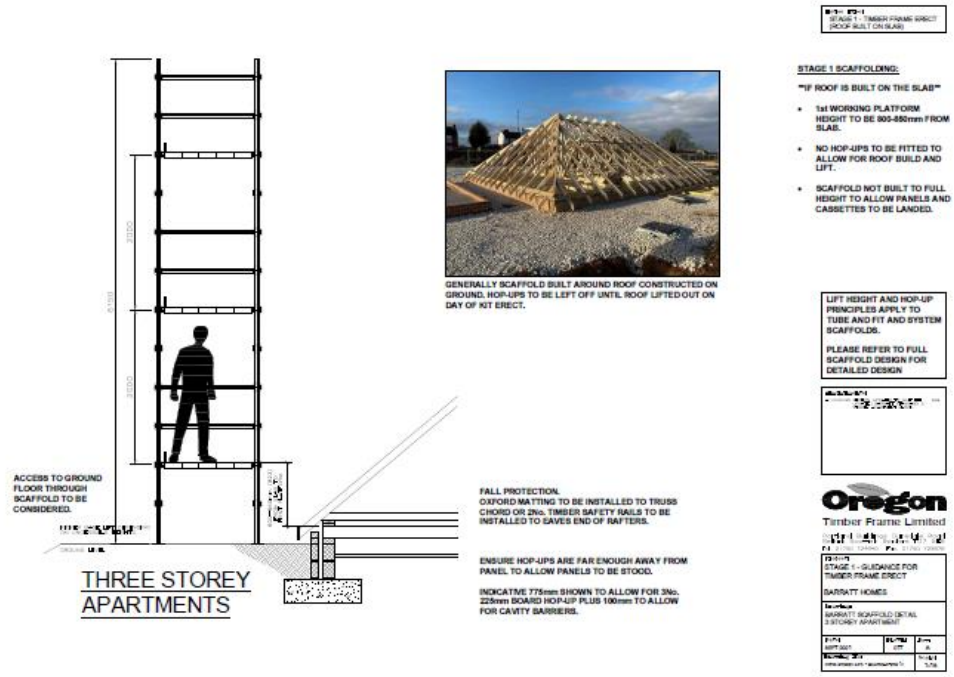
Appendix 4 Guidance for working lift heights for construction of timber frame 2.5 storey house type



Appendix 5 Guidance for working lift heights for construction of timber frame 3 storey house type



Appendix 6 Guidance for 3 storey apartment scaffold




BARRATT
HOMES


BARRATT
LONDON


DAVID WILSON HOMES
WHERE QUALITY LIVES


BARRATT
DEVELOPMENTS PLC