SHB
Scottish House Builders
Health & Safety Forum

Donaldson
Timber Systems

August 2023 Whitburn

By John Smith, Technical Director and David Nimmo, Construction Director

- A bit about us: who we are and what we do
- Fire Safety in Construction
- Fire Safety for the In-Service Condition
- Q&A

With you all the way

Our Profile

163

YEAR HISTORY & HERITAGE

UK'S LEADING INDEPENDENT GROUP

TRACK RECORD IN NATIONWIDE ON-SITE DELIVERY

MARKET LEADER IN OFFSITE, INTERIORS & DISTRIBUTION

FULLY INTEGRATED TEAMWORK

AWARD WINNING

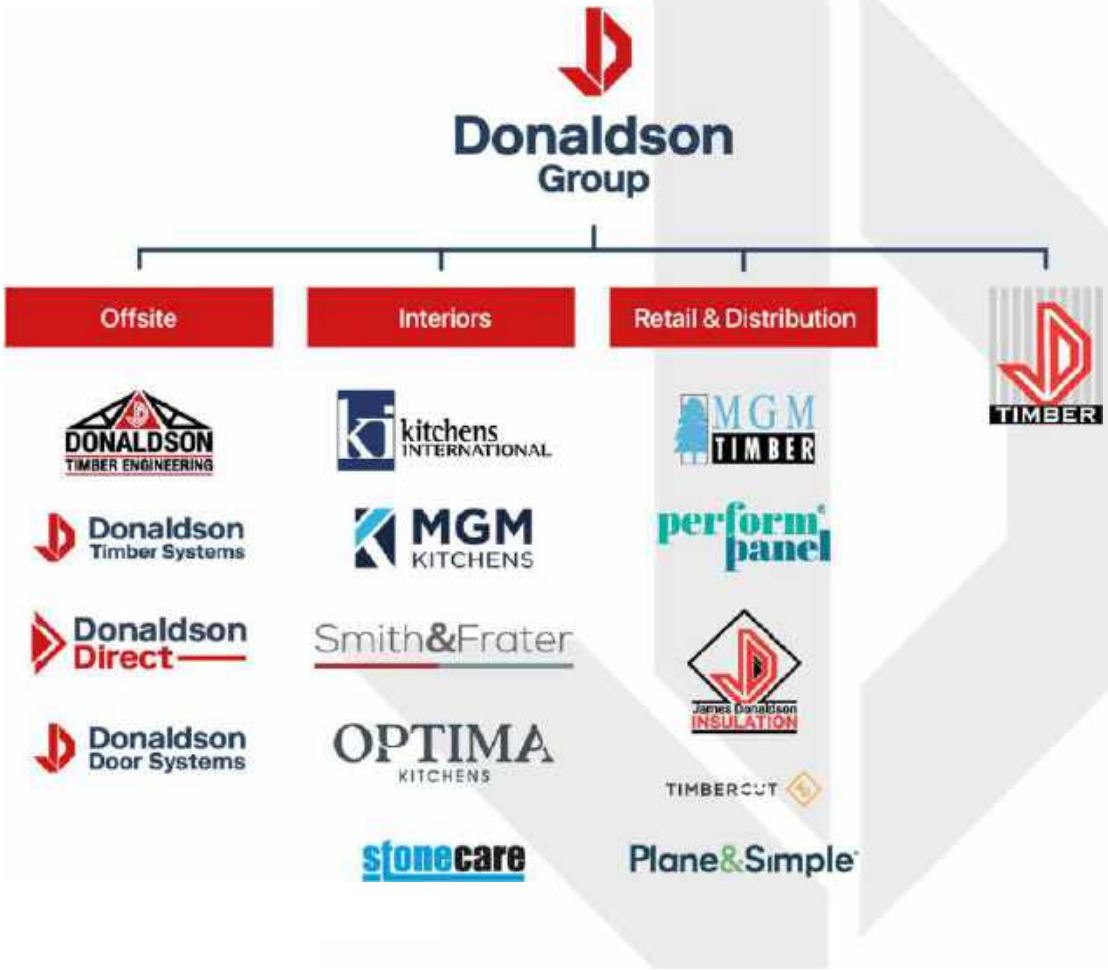
A leading independent group, leading the way in our industry

Offsite: The UKs leading supplier of timber frame, roof, floor and door systems.

Interiors: High quality kitchen, bedroom, bathroom and worktop design, manufacture and installation to all market sectors.

Retail and Distribution: Regional network of builder's merchants and material distributors.

JDT: The original business, still supplying sawmilling and timber products through the group and our key markets.



It's #TimeforTimber as a building material.

The push for timber-based products in the UK is growing significantly, as we work together with the industry to achieve net zero carbon targets.

As a 6th generation business, with sustainability a commitment at the heart of what we do, we're leading the way in our industry:

- **with a sustainable business model to support a sustainable industry**
- **Innovation in product development to build a better future**
- **Working with our customers every step of the way**

We manufacture our timber products offsite, ensuring they are designed to perform, so we can continue to build better homes that are better for the planet.

#Buildingpositivefuturestogether

Making it the only truly naturally renewable building material

Contains the lowest CO_2

Reduces waste

Lessens pollution

Can substantially reduce greenhouse gas

Donaldson Timber Systems

With you all the way

48
Year History

Track Record in Nationwide Delivery

10K
Units Per Annum

UK's Leading Off-site Manufacturer

Proven Product & Site Solutions

Investment Underway to Grow to 15k Units

Our Output in Scotland over the last 10-years:

- Over 30,000 plots manufactured, delivered and installed
- 1 in every 6 new housing starts

Donaldson Timber Systems

With you all the way

Absolute Focus On Core Market

Private and Affordable Housing

Scalability & Potential

Robust strategy to take further market opportunity

Offsite Solution To Skills Crisis

Providing delivery certainty to clients

Tried & Tested Systems

Third party reassurance for our stakeholders

Quality Of Product & Service

Consistent volume delivery of high standards

Nationwide Coverage

Confidence to manage national portfolios

Sustainable Business Model

Providing critical carbon advantages to clients

Our Focus on Sustainability

Our People

We strive to develop a happy, healthy and inclusive workforce engaged in delivering first class customer service

CULTURE AND LEADERSHIP | INCLUSION AND DIVERSITY

HEALTH SAFETY AND WELLBEING

TALENT DEVELOPMENT & RETENTION

Our Planet

We recognise the impact that our operations have on the future of our planet and implement behaviours that provide positive solutions

RESPONSIBILITY TO OUR SOCIETY

RESPONSIBILITY TO OUR NEIGHBOURS

COMMUNITY ENGAGEMENT

Our Product

Through the use of timber from renewable sources we provide build systems that allow our customers to build more sustainably

SUSTAINABLE BUILD SYSTEMS

GREEN INNOVATION

ETHICAL PROCUREMENT

Our Services

Value Engineering

Early engagement to support lean construction

House Design & Engineering

Expert technical advice and development

Training & Preparation

Engaging series of timber frame modules

Product Range

Unique set of tested and accredited systems

Offsite Manufacturing

High-quality factory-made products

Site Services

Comprehensive suite of construction solutions

Technical Support

Experienced national team providing assistance

Collaborative Working

Track record of third-party relationships

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Donaldson Timber Systems

Managing Fire Risk

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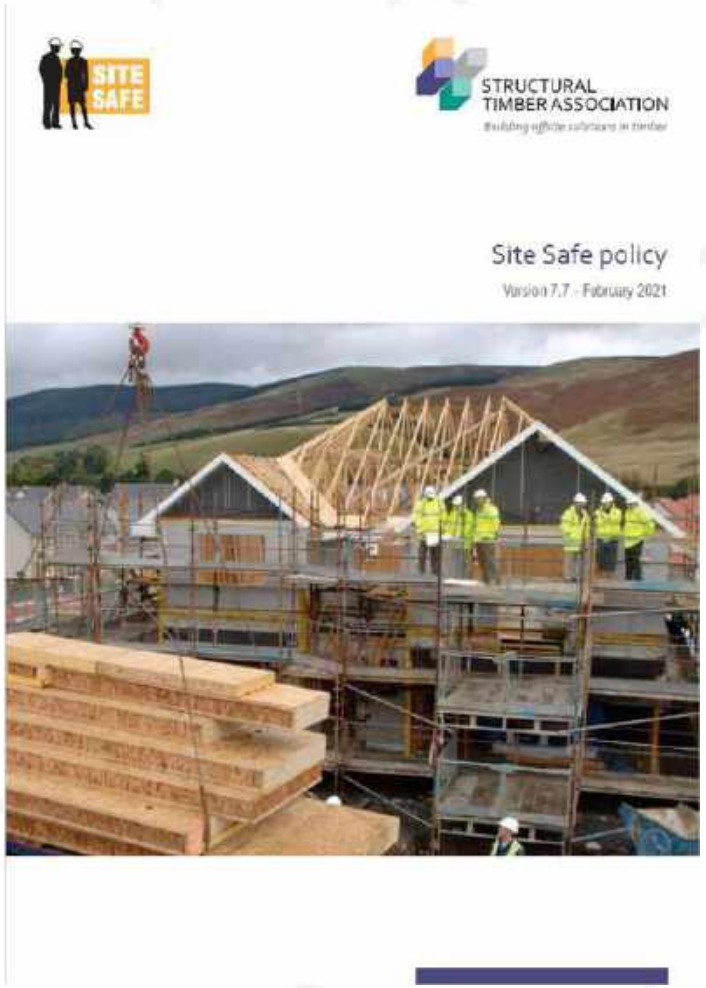
Site Safe Policy

Site safe

- Mandatory requirement for all Structural Timber Association (STA) members, with annual 3rd party audits to ensure compliance
- Policy includes:
  - 16-steps risk assessment guidance to prevent fire starting on site during construction
  - Series of advice notes for principal contractors and principal designers, as well as timber frame manufacturers
  - Design guide for separating distances to limit the impact of a fire on site during construction
- Every timber frame site over 600m^2 gross floor area registered with National Fire Chiefs Council (NFCC)
  - Links to HSE, and local fire service



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16-Steps

16 Steps to fire safety

- Endorsed as “Best Practice” when managing fire risk during timber frame construction phase by;
  - Health and Safety Executive
  - The Construction Risk Engineers Group (CIREG)
- Summary guidance for the preparation of Risk Assessment on new-build timber frame developments

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16-Steps

16 Steps to fire safety

- Guidance covers each stage of a project, from tender through to completion of the timber frame and hand-over to Principal Contractor

Fire risk assessment development stages

Phase	Responsibility	Actions	Example
Design phase	Principal Designer and Design team	Consider the fire risk in the choice of building location, materials and process of build. ***Action STA 16 Steps (numbers 1,2,3)***	Adjust location of the building; adopt fire robust timber solutions on sensitive sites. Undertake / commission a concept or full off the site fire risk assessment.
Tender phase	Principal Designer and Design team	Include the risk mitigation concepts for the constructor to fulfill. ***Action and communicate STA 16 Steps (numbers 1,2,3)***	Provide a concept or full off the site risk mitigation risk assessment report. STA site safe policy actions. STA 16 Steps compliance for the construction phase.
Construction phase: pre-site start	Principal Contractors and subcontractors	***Action STA 16 Steps (numbers 4-7)*** Check that Steps 1 to 3 have been completed and follow or commission additional detailed fire risk assessment	Appoint fire safety coordinator and create fire safety plan. Appoint STA site safe companies.
Construction phase: during construction	Principal Contractors and subcontractors	***Action STA 16 Steps (numbers 8-16)*** Plus Review Steps 4 to 7 for compliance	Fire hazard and warning procedures implemented. STA site safe checks.
Practical completion	End of construction fire prevention		

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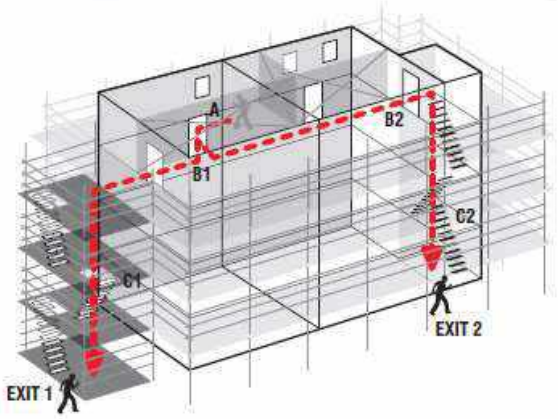
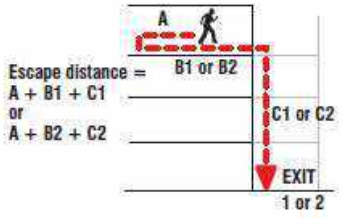
Advice Notes

Advice Notes

Note 7, Part 5: Design of escape routes

- Compliments Step 8
- Guidance for principal contractors, planners, timber frame contractors
- Maximum travel distance from furthest place of work to a place of safety (ground level of a protected area)
- Takes account of the category of the timber frame, and single or multiple escape routes.

Reference	Situation and description	Diagramatic picture
Internal escape 1	**External scaffold exits and internal stair cores for persons from within the building** Category A standard structural timber frame with combustible ceilings and walls through the building route (dimensions A and B) Exit routes with full 16 Steps and STA membership guidance can be: A+B1+C1 or A+B2+C2 <= 35m Otherwise 25m A < 12m (dead end distance) A dead end is the room in which the worker is in and the distance to the point of alternative routes ***NOTE:*** *Distance C1 and C2 assumes that stair flights occur in the same tower / zone and there is no more than 3m horizontal distance between flights. If this is not the case the distance between flights shall be added to the calculation for travel distances stairs*	  Escape from unprotected building / scaffold routes

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Advice Notes

Advice Notes

Note 15, Part 1: Legal Responsibilities

- Compliments Step 1
- Clarifies the legal requirements for the Principal Designer and Principal Contractor to manage the risk of fires during the construction phase of a project
- Guidance on different types of contract, as well as the requirements of the structural timber frame contractor


STA Advice Note 15

Fire safety guidance

STRUCTURAL TIMBER ASSOCIATION

Part 1 - Legal responsibilities for fire safety on construction sites

Who should read this advice note?

The Construction (Design and Management) Regulations - 2015

Health and Safety at Work Act 1974

Fire safety legislation

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Advice Notes

Advice Notes
Note 15, Part 2: Understanding the inputs for a fire safety plan

- Guidance for Principal Designers obligations to consider off-site fire risk during construction
- Guidance for Principal Contractors role to manage both on-site and off-site risks during construction phase
- Typical examples for the level of risk assessment required for a project


STA Advice Note 15

Fire safety guidance

STRUCTURAL TIMBER ASSOCIATION

Part 2 - Understanding the inputs for a fire safety plan

Who should read this advice note?

Notes to consider

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Design Guide for Separating Distances

Separating Distances

- Focuses on the impact of a fire during construction on public and neighboring buildings beyond the construction site boundary
- Options for increased resistance to fire spread
- Suitable for “typical” neighboring buildings, for example:
  - Domestic housing
  - Hotel / Accommodation buildings
- Qualified fire engineering input required for other types of building with higher risk, for example:
  - Petrol station
  - Chemical store

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Design Guide for Separating Distances

Separating Distances

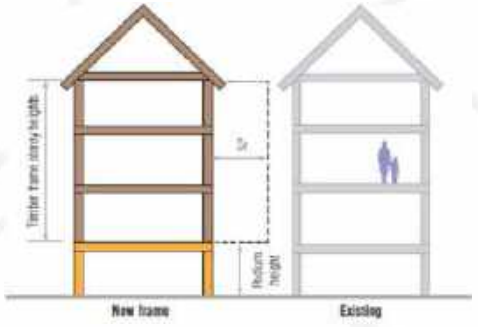
- Simplified approach using tables to allow assessments at initial design and tender stages, based on:
  - Height of building based on number of timber frame stories (excludes concrete podium for example), and
  - Overall length of building
- Includes factor of safety to provide min distance between timber frame in construction and neighboring property
- Fire engineer input required where a mixed category timber frame solution is recommended, as out-with the scope of the simplified guidance.

STRUCTURAL TIMBER ASSOCIATION

Separating distances for standard timber frame (Category A)

Table 1 for Category A - Timber frame separating distance (Sr) in metres

Number of timber frame storeys	Emitter length (eL)						
	≤5m	≤10m	≤15m	≤20m	≤25m	≤40m	>40m
1	5.5	7.25	8.25	8.75	9.5	10.25	10.5
2	7.5	10.5	12.75	14.25	15.5	18	20.25
3	9	13	16	18	20	23.25	28.5
4	10	15	18.5	21.25	23.5	28.5	36.75
5	11	16.5	20.5	23.75	26.5	32.5	41.75
6	11.5	18	22.5	26	29	36	47.25
7	12.25	19	24	28	31.5	39.25	52.5



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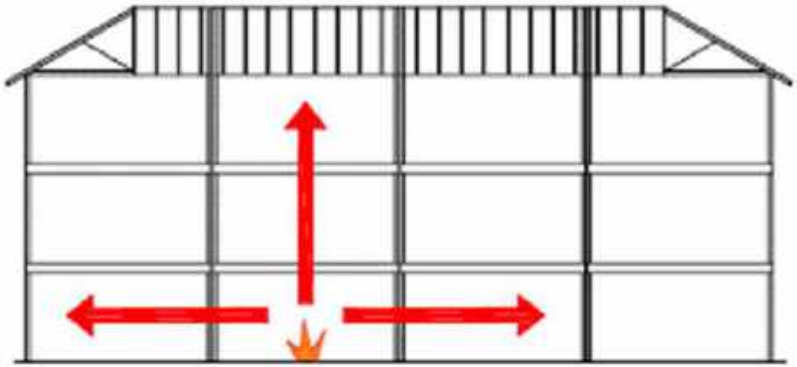
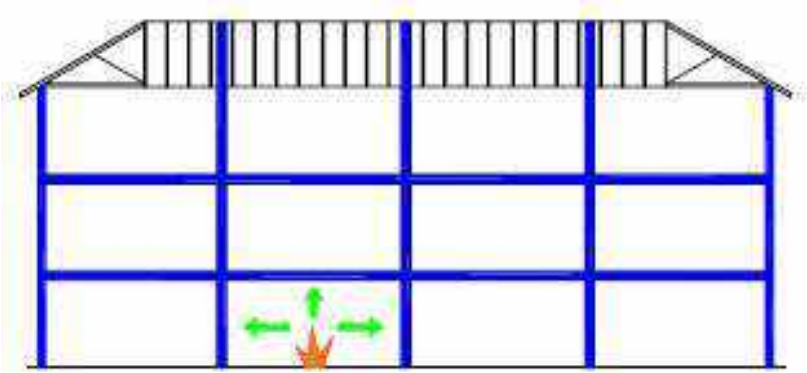
Categories of Timber Frame

Separating Distances

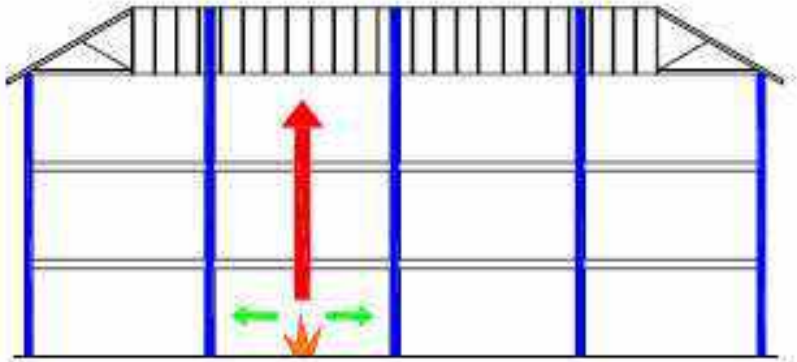
- The basic categories of timber frame
  - Category A : Standard timber frame
  - Category B : Limited fire spread
  - Category C : Non-fire spread



Category A



Category C



Category B

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Fire During Construction

Separating Distances

- Separating distances shown on sits plans, identifying neighboring buildings, and radiant heat line from timber frame in construction.
- On domestic sites of houses / apartments, it is likely to have a phased handover, so the site boundary will move as the project progresses
- Re-sequence or re-planning of site should trigger a review of the assessment

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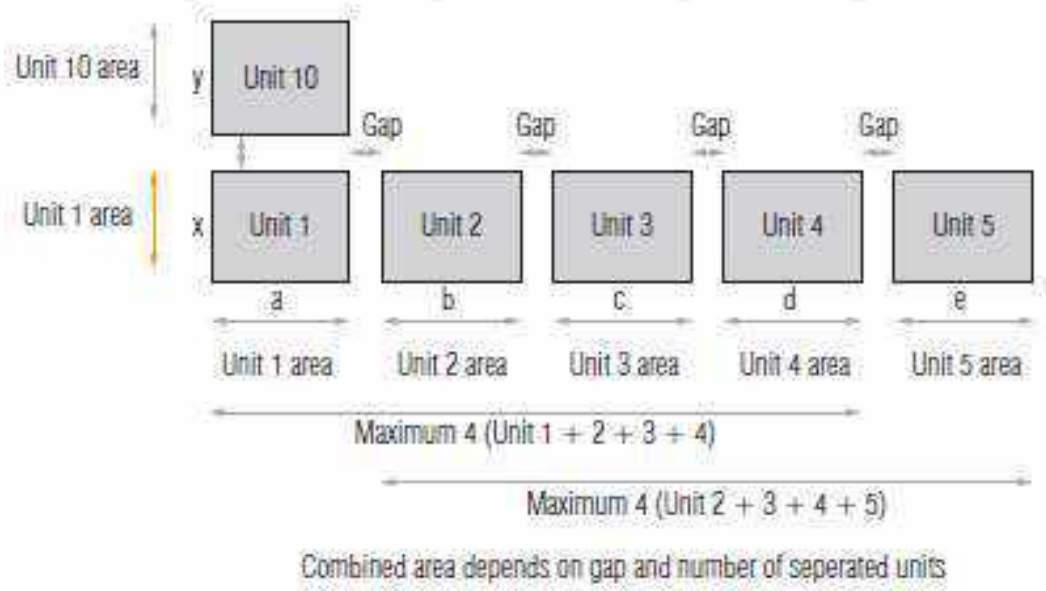
Small Buildings

Separating Distances for buildings <250m²

- For buildings below 250m² (and over 40m²), product paper 5 can be utilized to assess risk
- If plots are >2M apart, then consider each plot individually
- If plots are between >1M but <2M apart, then consider up to 2 units as one building
- If plots are <1M apart, then consider up to 4 units as one building



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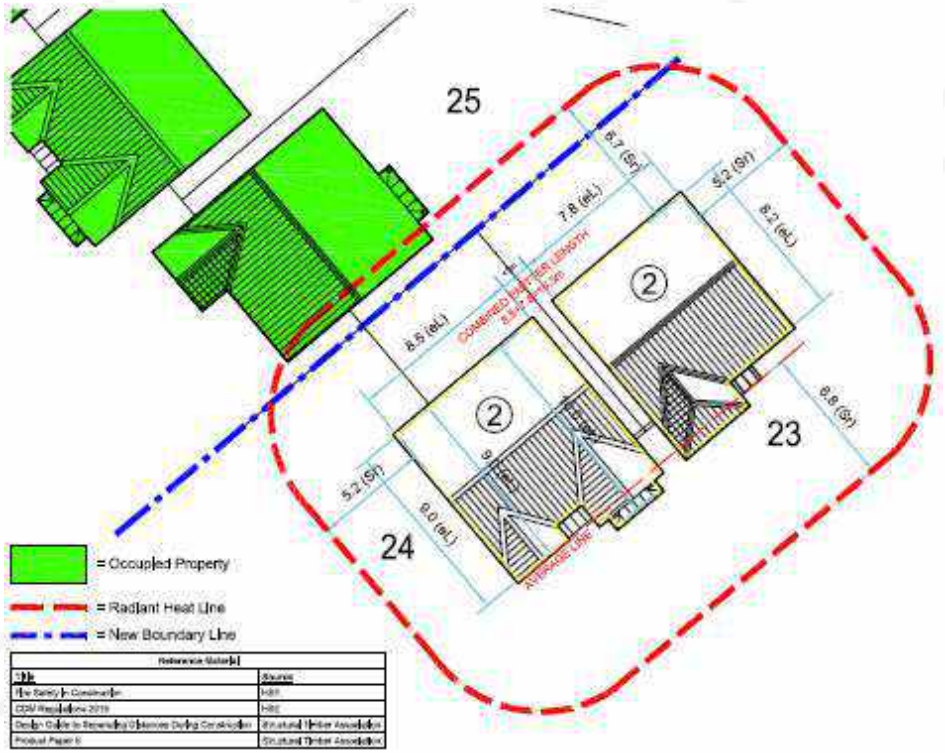
Small Buildings

Separating Distances for buildings <250m²

There are several ways to reduce the safe distance between timber frame in construction and neighboring occupied plots:

- Masonry cladding completed on one plot, prior to starting timber frame on adjacent plot
- Gable walls to both plots to be “FR Build” timber frame (FR treated sheathing and timber)
- Replace the gable walls OSB on both plots with non-combustible sheathing board

Early identification required, and second two options will impact on manufacture of the frame



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Fire In Service

Cavity Barrier Guidance

- Provides clarity on the location and detailing for cavity barriers, as well as:
  - Functional requirements
  - Responsibility for design, specification and installation
  - Good practice detailing
  - Checking and recording of installation

Pattern Book for common wall build-ups

- Details of commonly used timber frame wall constructions, fire tested to latest EN-standards
  - 30 minutes for single occupancy housing
  - 60 minutes for multiple occupancy housing and accommodation

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Fire In Service

Site recording

- Photographic record of all installed cavity barriers on completion of timber frame for every plot
- Understand specification of materials and suitable tolerances for different cavity barrier types
- Masonry cladding tolerances are key to principal contractor to monitor, as cavity barriers will be installed before masonry commences

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Fire In Service

BS-8414 Cladding tests

- Full scale test for 4 storey building to demonstrate fire performance of the build system with fire in the lower level
- Timber frame with masonry cladding and light-weight cladding
- Intense fire load in excess of 800^{o}C
- Cavity barriers and cladding performed extremely well

Wall and Floor tests

- All wall and floor build-ups tested:
  - 30 minutes for single occupancy housing
  - 60 minutes for multiple occupancy housing and accommodation
- Tested solutions becoming more critical, as changes to regulations leading to more innovative build-ups

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Thanks for listening