

Loss prevention standards

# Property:

# Timber Framed Buildings

Timber framed buildings are combustible and this document provides guidance on how to reduce the risk of loss from fire and escape of water.



# Timber Framed Construction



## Introduction

Timber framed properties are a significant proportion of the UK building stock. They were prevalent in the housing industry from the 1970's and from the 1990's onwards following changes to the building regulations in 1991, allowing timber framed properties to be built as high as eight storeys. Timber has been and continues to be used in the construction of commercial properties. 'Modern' timber framed properties do however date back as far as the 1920s in the public sector.



Timber framed buildings are considered inherently combustible with the added risk of combustible concealed spaces. As such, there is an increased fire exposure as soon as materials are delivered to a site, when construction begins through to the finished structure.

Once built, and in a fire situation, the seat of any fire tends to be very difficult to locate. Fires are very difficult to extinguish, can breakout at multiple locations in the structure and can grow unabated with sizeable exposure to both life and property.

In addition to fire, escape of water can also be another significant exposure creating considerable damage and impact on the actual structure.

If we consider the nature of the occupancies we see within timber framed properties, any incident can create very difficult, protracted, and long business interruption issues when looking at building recovery.

As a result, this document looks to offer advice and guidance in relation to these buildings with focus on two of the main exposures: fire and escape of water.

## Types of Property

Timber frames can be found in many types of commercial property but are prominent in:

- Care homes
- Hotels
- Leisure industry
- Pubs
- Residential (including Student Accommodation)
- Restaurants

## Construction

Timber framed construction is a popular build method in the UK with reduced costs, high thermal/energy performance, 'sustainability', speed and ease of construction, and high levels of quality control, when compared to traditional masonry structures. Its prominence in the UK is being increased as there is a significant housing need and a drive to consider the carbon footprint of any development.

Prefabricated timber frames can be erected on site faster than comparable brick and block construction. This enables interior trades such as plastering and electrics to begin work earlier in the build programme, as the exterior will be exposed to the elements for less time. Whilst the buildings are lighter and therefore footings are shallower, timber frames may require additional time for design and fabrication which can lead to a longer wait before work commences on site, but once it starts it is generally quick to build and complete.

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Thermal performance is generally enhanced over masonry buildings, by utilising insulation materials within the frame or as a surface fixing. These insulation materials can be combustible although they may still achieve Building Research Establishment Environmental Assessment Method (BREEAM) certification.

Timber is also considered sustainable and is classified as a renewable material. This is based on the principle that if a tree is felled, another should be planted in its place. As long as this balance is maintained, the supply will be sustainable. This relies on the tree species, its growth rate versus its usage rate. This sustainability is compared to other materials such as bricks and concrete, which rely on the extraction of finite raw materials or costly recycled aggregates and a higher energy input. In addition, timber construction creates less CO<sub>2</sub> to process and produce it than, for example, steel.

Off-site fabrication of timber frames should achieve a higher quality than those in the less well controlled conditions of a construction site that is exposed to the elements and all the other activities on a site. It can also be usual for the suppliers of prefabricated timber frames to undertake the on-site erection. This enables the controlled factory conditions to be followed through to completion, with appropriately familiar and qualified personnel and the associated quality assurance and guarantees.

Other benefits include:

- Cost – it is relatively cheap compared to other construction methods/materials
- Speed of construction – it is generally fast
- Its permitted – so why not
- The availability of labour
- It can be incorporated into Modern Methods of Construction
- It can be used to extend existing buildings

Understanding these positive elements is important although as mentioned earlier, the biggest exposure with this type of construction is that it is inherently combustible and will burn quickly. Loss experience indicates that fire damage within timber frame buildings is disproportionately more than for conventional build methods. Fires in timber framed properties burn with an extremely high heat release, are difficult to extinguish due to the ferocity of the fires which can remain hidden within voids/cavities (combustible concealed spaces), and so can enable fire to rapidly spread throughout a building which can break out in multiple areas. Fires in these structures can have the appearance of having multiple seats of origin, in fact, it is spreading hidden from fire-fighting activities within the frame.

## How to Identify Timber Framed Construction

One of the biggest challenges with a completed timber framed property is that retrospectively it can often be very difficult to identify that it is actually a timber framed structure. On many occasions outer walls are clad with brick, stone or render, giving the appearance of a traditional building construction. Inner walls are boarded and plastered and any loft spaces could easily be considered as a traditional wood truss and joist construction. Therefore, care and attention are required to understand what the building is actually constructed from. The key is to have appropriate drawings and documentation and ensure all risk assessments from the outset of the construction phase indicate when timber framed construction is present, and where it is located within the property.

Some indicators may be with the inner construction. It could consist of:

- Structural timber engineered components including prefabricated I-Joists (also used as studs), laminated veneer lumber (LVL), parallel strand lumber (PSL) and cross laminated timber (CLT)
- Flooring is most commonly chipboard, but softwood boards and plywood may also be present

If you are unaware of the nature of the construction, the Local Authority Building Control Department could be an appropriate data source. It **may have plans and details of the building's construction method.**

A word of warning – based on the exposure to life, property and your business, it is very dangerous to assume the building is non-combustible or not timber framed, just because the external facades and other construction features suggest or give the impression of a traditional build.

There are many similarities with brick and block construction that can make timber framed properties difficult to identify, but there can be some identifiable differences:

- Lightweight claddings that are attached via battens to the timber frame, e.g. tile, slate, cement render on lath, timber boarding or shingles
- Thickness of the wall can be an indicator that cement render is on backed lath rather than blockwork
- **A 'hollow' sound if hit**
- Look for any signs of damage to see what is exposed

## Fire Compartmentation in Timber Framed Properties

Fire compartmentation in timber framed buildings needs careful attention within the design, during the construction phase and ongoing once occupied. The basis of the compartmentation needs to be considered versus the objective, e.g. life safety to ensure all persons are evacuated safely or property and business protection. It is worth understanding that if comprehensive, well-designed, well-constructed and maintained fire compartments are not in place, a timber framed building could be considered as a single fire area. As such, any fire has the potential to cause total (100%) damage to the structure.

As with the construction, it is not a basis of good risk management to assume the fire compartmentation of a timber framed building is fit for purpose based on what is visible. Any fire, if it spreads to the timber frame, as discussed previously is essentially within a combustible concealed space and is unlikely to be extinguished externally, until collapse or elements are forcibly removed. Therefore, the fire compartmentation should be consistent throughout the construction through to its operational phase.

It is worth noting that it is not uncommon for elements of designed fire compartmentation to be omitted in the construction phase by the builders/contractors involved. Close and rigorous management of the fire compartmentation installation at all phases of the construction project should be formally in place.

The key to understanding the fire compartmentation is to establish what physical vertical and horizontal barriers are constructed from, and how they are arranged. If brick or concrete walls and floors are not present to prevent fire spread, then fire compartmentation should really only be considered appropriate for life safety and not for property or business protection purposes.

Consider plasterboard walls/ceilings and wooden framed walls and floors, then add to this any penetrations, such as plug sockets; light switches and roses; utility cables and piping; shelving; cooker extract ducting; etc. These would all compromise any plasterboard/stud wall or floor. Then consider door and window frames; air bricks; changes in roof height; balconies; guttering; fascias; and soffits; etc. – these all potentially compromise the fire compartmentation strategy in a timber framed structure. Consider a fire breaking out of a UPVC window and licking up the outside of a building - windows, balconies, fascias and soffits will all be exposed and there is the potential for the fire to break back into any loft space via the building perimeter or eaves.

Even where the walls and floors allow for safe personnel evacuation, penetrations such as those highlighted above will allow smoke and combustion gases to spread through the building, exposing life and the construction. Aside from the internal finishes, timber is porous, so smoke can and does contaminate such construction elements.

Where fire compartmentation is indicated as being in place the following should be provided:

- A formal fire compartmentation drawing should be produced detailing the walls/barriers and their fire resistance rating
- Compartment walls should be inspected regularly (at least quarterly) and all inspections recorded and any deficiencies acted upon
- All openings should be protected with automatically closing fire/smoke doors/dampers/shutters with an appropriate fire resistance rating. These should actuate on automatic fire detection/fire alarm with a quick response frangible element as a back-up. This includes ventilation openings (vented ducts), conveyor openings, cable trays, etc.
- Fire/smoke doors should be of appropriate fire resistance rating and should actuate on automatic fire detection/fire alarm activation with a fusible link/frangible bulb back-up (particularly if it is a sprinklered building)
  - Personnel doors should not be wedged open
- Penetrations should be sealed-up using approved/listed non-combustible materials having a fire resistance rating consistent with the existing construction
  - The use of **expandable 'pink foam' should be prohibited**
- Glazed elements should be considered in the fire compartmentation strategy and this includes the frames, external windows, etc.
  - If an internal fire can melt or break out of an external window and then repeat to enter back into the building, then the fire compartmentation strategy is compromised
- Fire compartment walls/barriers should be clearly detailed in any management of change process and be detailed in any risk assessments

Any work on the building or structure by anyone, including contractors, should be closely controlled and monitored throughout to ensure it does not damage or compromise the fire resistance rating or fire compartmentation strategy of the building. This strict control during a change is critical in maintaining the integrity of the fire compartmentation strategy.

## Risk of Fire

In theory, well designed and constructed buildings should protect lives and property. However, in practice a customer's needs or a designer can overlook certain elements; the design can be such that it only meets regulatory requirements; builders can cut corners in the construction or fail to fit (or incorrectly fit) correctly designed elements to prevent the spread of fire through floor, ceiling and wall cavities.

The key to understanding the performance of a timber framed building in a fire, is to consider it at the various stages of the life cycle of the building:

- Initial phases and during construction
- The end of the construction, just before completion
- Completed and new
- Occupied and aging – any protection features can deteriorate or be compromised by the occupants
- Alteration and/or renovation

Furthermore, and following building completion, routine repairs and refurbishments can compromise the fire compartmentation and protection measures, increasing the risks of fire spreading. The key is to understand that when people occupy or work on or in buildings, they can damage it. In a timber framed building, every element of damage has the potential to compromise the fire compartmentation measures provided and expose the combustible timber frame elements to a fire. As a result, formal fire risk assessments are recommended throughout the life of the building. This should not only meet any regulatory requirements for life safety but also consider the risk to property and business impact.

The following are some areas to consider and decide on the appropriate risk controls which should be in place:

Strict Ignition Source Management is Key

- Hot work is a principle cause of large fires for timber framed buildings
  - Any hot work activities should be considered the absolute last resort and should be treated as a high hazard and a severe exposure
  - All hot work operations should meet Aviva's Hot Work Operations Loss Prevention Standard as a minimum
  - There should be extra diligence throughout the entire process
  - There should be increased numbers of appropriately trained individuals to carry out fire watch duties
    - With appropriate fire extinguishing equipment
    - With an increased fire watch period post work
    - And other additional precautions based on the risk
  - There should be a full detailed risk assessment and method statements
- Fixed electrical testing should be completed
  - The suggested frequency as a minimum is that 100% of all the fixed wiring be completed at least every three years
  - All requirements and recommendations raised from such testing should be treated as a high priority and tracked through to completion

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- Annual portable appliance testing (PAT) should be completed
- Annual thermographic testing should be undertaken
- There should be strict control of smoking:
  - Ideally this should be prohibited within all areas of the building
  - External smoking should be limited to dedicated areas away from the building or foliage growing **close to the building**. See Aviva's Smoking and the Workplace Loss Prevention Standard for further guidance
    - Cigarette butt collectors should be as far away from buildings as possible; not fixed to buildings and should not be located below any canopies, porches, etc.
- There should be appropriate security and lighting to reduce the risk of arson
- Kitchen filters, canopies and ductwork should be cleaned throughout its entire length at regular intervals
  - Where extraction or ventilation ducts pass through any timber framed wall, the wall should be protected against any heated surface
  - **Extract system inspections and cleaning should meet the guidance outlined in Aviva's Loss Prevention Standard Commercial Kitchens – Extract Systems and Cooking Ranges**

#### Fire Detection and Protection

- Automatic fire detection systems should be provided throughout, in all compartments and within voids
  - In the UK it should be designed to conform as a minimum to [BS 5839 Part 1:2017 Category P1/M](#)
- Automatic sprinkler protection should be considered, and designed to a suitable sprinkler installation standard, such as in the UK, the [LPC Rules for Automatic Sprinkler Installations 2015 incorporating BS EN 12845](#)
  - Temporary sprinkler systems should be employed during the construction phase of the building and permanent systems provided when the building is operational
  - Recommended protection should be provided in all compartments, designed, installed, inspected, maintained and tested by listed/approved companies to an internationally recognised standard
    - Automatic sprinkler protection as described above should suppress most fires at its seat with 2 to 5 sprinkler heads operating
- All fire protection and detection equipment should be appropriately inspected, tested and maintained
- Manual firefighting water supplies and the location of fire hydrants should be understood. Where appropriate arrangements are not already in place, additional resources should be provided, e.g. water tanks or stored volumes of water and additional fire hydrants around the building
- The Fire & Rescue Services should be made aware that the property is timber framed and that they carry out annual familiarisation visits

#### Security

- A formal security risk assessment should be completed at all stages of the build and operational phase
  - Appropriate security measures should be in place for the risk at all stages of its life cycle
- Active 24-hour surveillance should be provided at any site under construction

Other Areas to Consider which may expose the timber frame to fire:

- Housekeeping should be of a high standard with weekly recorded self-inspections completed:
  - Internally
  - Externally
  - On the roof
- Foliage directly adjacent to the building should be well cared for and should not be allowed to dry out in prolonged dry periods
  - Care must be taken with any hot work, discarded smoking materials and broken glass (that can act as a magnifying material for sunshine)
- Waste and waste bins should be positioned a minimum of 10m away from the building(s)
  - Detritus should be cleared away regularly, and this includes within gutters and drains; on flat roofs, etc.
- Air bricks and UPVC windows should be identified as vulnerable areas
  - An air brick can readily allow any external fire to enter the building quickly and ignite any membrane, insulation or the timber frame
  - Some modern air bricks are constructed of plastic (combustible) materials and can melt and cause the fire to entrain into the timber frame void. This is obviously more of an exposure than a traditional clay type air brick
- Changes in roof height can cause an issue in a fire situation, as it can pass from one area to another
  - This is especially important if work is being completed on a roof and there is hot work involved, e.g. flat roof adjacent to a peaked roof
- External fire exposure from 3<sup>rd</sup> parties
- As discussed, internal fire breaking out of a building and then entering back inside or exposing external combustible elements
- The location of any external storage, sheds, etc.
- The location of external barbecues or pop-up vendors
- The exposure of fireworks landing on the building
- Bonfires too close to the building
- Bathroom, cooking and boiler extract ducting and vents
- Balconies on the building:
  - The construction of the balcony
  - The occupancy on the balcony, etc., e.g. barbecues, storage, activities such as smoking, etc.
- UPVC window frames – as indicated these can compromise the fire compartmentation strategy
- Door frames – as indicated these can compromise the fire compartmentation strategy
- The location of parked cars or car charging stations in proximity to the building and fire spread from these areas to the building.
  - Cars and charging cars do catch fire
- Behaviours of individuals in the building:
  - Smoking inside and out; on balconies
  - Use of candles and similar
  - Cooking facilities in kitchens

Other Challenges Include:

- By their very nature the elements of construction, voids, etc. are difficult to inspect and maintain
- The expansion and contraction of building materials can be significant. This poses real challenges for any fire compartmentation

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## What Can Happen in a Fire

Unless there is careful design, build and ongoing care and maintenance, any fire in a non-sprinkler protected timber framed building unless extinguished at the earliest of stages, must be assumed that it will spread to the timber frame itself. As a result, the fire will be hidden within the combustible concealed space and spread unabated away from the actions of the public fire authorities.

The main objective of the public fire authorities is to protect life and, if everyone is safely out of the building and the fire is within the timber frame, the fire is essentially burning uncontrolled. The fire brigade will not be able to extinguish this type of fire without collapse or pulling down sections of the building to halt the fire spread.

Even then there is no assurance that the building sections removed, collapsed or pulled down will be at the right time or the right areas to have prevented or to prevent the fire from spreading to other areas of the building. Experience has shown us that the fire can break out of the concealed spaces at multiple locations, confirming that the fire has spread significantly.

With this in mind, it should be assumed that in the majority of cases, a fire will:

- Eventually involve the majority if not the entire building, or
- The building will collapse or be pulled down to stop the fire spreading or expose the fire.
- Smoke, acid gas or water will damage the remainder of the building

From a property damage perspective, we could or even should therefore expect a total loss of such an unprotected building.

As indicated previously, in an appropriately designed, installed and maintained sprinkler protected building a fire should be suppressed, in the majority of cases, with 2 to 5 sprinkler heads operating.

It should be noted that even with a small amount of structural property damage, because of the nature of the construction, the smoke and water damage etc. the issues caused can result in long rebuilding schedules and significant business impact or long lengths of time to re-occupy.

## Case Study

3-storey residential block in London. A small amount of green mould growth/damp was being caused on the outside of the building at the location of a 32mm diameter copper overflow pipe, towards the ground. The overflow was re-routed and a 100mm piece of pipe added using hot work methods. A cut was made and soldering of two joints were completed within 50mm of the building exterior. It was not completed using cold cutting and cold jointing techniques.

This modification was completed to create a greater distance between the discharge point of the overflow pipe and the wall. It was hoped this change would stop the green mould growth, and it was completed largely for aesthetic reasons and was not considered a critical item.

The hot work was undertaken without a full understanding of the exposure of the timber frame building. The small penetration around the 32mm copper pipe or the pipe itself conducting the heat, allowed the ignition source to pass into the timber frame and ignite the building. Whether this ignited the timber itself, the membrane or the insulation it is not known, but once the fire started in the concealed combustible void it spread throughout the structure and could not be extinguished with manual intervention.

December 6<sup>th</sup> - Day 1

11:12am - Initial fire alarm raised and two fire appliances despatched.

11.51am - Two further appliances requested – fire breaking out of the roof at the front of the building.

12.04pm - Aerial appliance requested as significant sized fire evident coming from the roof at the front of the building.

3.00pm - The fire spread across the roof causing partial roof collapse, including unburned roof trusses.

6.00pm - Previously undetected fire elsewhere in the timber frame was spreading.

Further attendances by the public fire brigade

9<sup>th</sup> December - an additional cavity fire detected elsewhere in the building.

10<sup>th</sup> December - an additional cavity fire detected elsewhere in the building.

11<sup>th</sup> December - an additional cavity fire detected elsewhere in the building.

12<sup>th</sup> December – The decision was taken on day 7 to demolish the entire building.

**The Fire & Rescue Service stated:** *“We were only convinced the fire was out for good once the building had been demolished.”*

This event clearly highlights the impact of hot work on timber framed buildings.

## Escape of Water

So far, the main focus of this document has been related to the fire exposure. However, an additional exposure to consider is escape of water. Please see Aviva’s **Loss Prevention Standard on Escape of Water** and Fluid Leakage – Property Protection. This document is not intended to replicate the information presented in that standard, but it does highlight that a wooden structure such as a timber framed building and its internal finishes, that are exposed to water damage does pose specific challenges from a risk management perspective that you do not have with traditional buildings, such as:

- Expansion of the frame
- Bowing
- Rotting and structural integrity issues
- Damage to internal finishes
- Problems with drying out water damaged areas and voids
- Challenges with repairs, without having to compromise larger sections of the timber frame structure, etc.

Attention should be focussed on a formal risk assessment; the quality, the nature of the installation including pipe and fitting type; the age and maintenance of the installation; change management; how to identify a leak should one occur; use of appropriate leak detection and water isolation technologies based on the risk and/or the incident history.

Note: From incident data:

- A previous escape of water claim makes it 50% more likely there will be a 2<sup>nd</sup> claim
- If there have been 2 or more claims from the same property then this likelihood increases to 150% that there will be a further claim

Therefore, if there has been any escape of water incidents at a property, it is much more likely additional incidents will occur in the future.

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## Emergency Response Plans and Business Continuity

Emergency response in a timber framed building is something that needs careful thought based on the events being considered. See Aviva's Loss Prevention Standards on Emergency Response Teams and Business Continuity Plan - Testing & Maintenance.

- Ensure all plans are based on your risk assessments
- Ensure all plans are formally documented and tested
- In the case of fire, plans should be co-ordinated with the public fire authorities, clearly explaining the fact the building is timber frame and the nature of the occupancy
- Ensure the Emergency Response Plan is maintained and considers the likely fast spread of fire
- Ensure the Business Continuity Plan is kept up to date and that this considers the risk of a total loss of the building

### Checklist

A generic Timber Framed Construction Checklist is presented in Appendix 1 which can be tailored to your own organisation

### Specialist Partner Solutions

Aviva Risk Management Solutions can offer access to a wide range of risk management products and services via our network of Specialist Partners who are reputable companies offering agreed discounted rates for Aviva customers.

For more information please visit:

[Aviva Risk Management Solutions – Specialist Partners](#)

### Sources and Useful Links

- [Fire in Timber Frame Buildings. A review of Statistics: BDM14](#) – RISCAuthority
- [A to Z of Essential Principles for the Protection of Buildings](#) - RISCAuthority
- [The Joint Code of Practice on the Protection from Fire of Construction Sites and Buildings Undergoing Renovation](#) – Fire Protection Association/RISCAuthority
- [Fire Safety in Construction \(HSG168\)](#) – Health and Safety Executive
- [16 Steps to Fire Safety](#) – Structural Timber Association
- [Design Guide to Separating Distances During Construction](#) – Structural Timber Association

*The links above are to third-party websites. The information provided by these sources has not been checked by Aviva. The information provided by the third-party websites is their own and Aviva will not be liable for any misinformation or errors provided on the same.*

## Additional Information

Relevant Loss Prevention Standards include:

- Arson Prevention
- Balcony and Terrace Safety: Residential Buildings
- Business Continuity Plan - Testing & Maintenance
- Business Impact Analysis
- Commercial Kitchens
- Control and Management of Combustible Waste Materials
- Electrical Installations - Inspection and Testing
- Emergency Response Teams
- Escape of Water
- External & Internal Third Party Exposures
- External Wall Insulation Systems
- Fire Compartmentation
- Fire Doors, Fire Shutters and Fire Dampers
- Fire Safety Inspections
- Hot Work Operations
- Housekeeping – Fire Prevention
- Impairment Management
- Smoking and the Workplace
- Managing Change - Property
- Managing Contractors
- Street Food Vendors
- Thermographic Surveys

To find out more, please visit [Aviva Risk Management Solutions](#) or speak to one of our advisors.

Email us at [riskadvice@aviva.com](mailto:riskadvice@aviva.com) or call 0345 366 6666.\*

\*Calls may be recorded and/or monitored for our joint protection.

# Appendix 1 – Timber Framed Construction Checklist



Location	
Date	
Completed by (name and signature)	

	Timber Framed Construction	Y/N	Comments
1.	For buildings under construction, have all the items presented in this document been considered for the various stages of the project from start through to completion and the proposed occupancy?		
2.	For an occupied building, have all the items presented in this document been considered for the building from new and as it ages?		
3.	Have you informed your insurer and your insurance broker that your building is a timber framed structure?		
4.	Are there any insurance policy conditions relating to the timber framed building?  Are you in compliance with these conditions?		
5.	Are formal drawings available that clearly indicate where the timber framed construction is/will be present in the building?  If accurate information is not available has the Local Authority Building Control Department been contacted?		
6.	Have formal fire risk assessments been completed?  Does this include: <ul style="list-style-type: none"> <li>• Property Damage?</li> <li>• Business Interruption?</li> </ul> Are these assessments and not just regulatory requirements?		

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7.	<p>Have formal security risk assessments been completed?</p> <p>Are appropriate security measures in place for the risk at all stages of its life cycle?</p> <p>Is there active 24-hour surveillance provided at any site under construction or undergoing changes?</p>		
8.	<p>Have formal escape of water risk assessments been completed?</p> <p>Are appropriate measures in place for the risk at all stages of its life cycle?</p>		
9.	<p>Are all risk assessments considered live documents and revisited or revised regularly or when changes are proposed/completed?</p>		
10.	<p>Is the fire compartmentation strategy clearly documented?</p> <p>Is this understood by Building Management and any occupants?</p>		
11.	<p>Are there formal fire compartmentation drawings?</p> <p>Do these drawings indicate the:</p> <ul style="list-style-type: none"> <li>• Fire resistance rating?</li> <li>• Location of the walls/floors?</li> </ul> <p>Does the fire compartmentation strategy include appropriate design/construction and fire resistance ratings to protect the property and the business and not just allow for the safe evacuation of people?</p> <p>Does this include any internal or external:</p> <ul style="list-style-type: none"> <li>• UPVC window frames?</li> <li>• Doors and door frames?</li> <li>• Glazed elements?</li> </ul> <p>These can compromise the fire compartmentation strategy.</p>		

12.	<p>Are there regular (e.g. quarterly or after any change) documented fire compartment audits?</p> <p>Does this include:</p> <ul style="list-style-type: none"> <li>• Verifying the fire compartment integrity?</li> <li>• Penetrations?</li> <li>• Glazed elements (insulation and integrity)?</li> <li>• Doors (insulation and integrity)?</li> <li>• Ducting?</li> <li>• Shutters?</li> <li>• Floor and ceiling voids?</li> <li>• Any changes that have taken place?</li> </ul>		
13.	<p>Are contractors and sub contractors formally managed on site?</p> <p>Is someone clearly responsible for the sub/contractor while they are present on site?</p>		
14.	<p>Is hot work on the timber frame prohibited?</p> <p>Hot work is defined as any task that includes the provision or generation of heat, flame and or sparks, <b>see Aviva’s Hot Work Operations Loss Prevention Standard.</b></p> <p>If not, is hot work considered the last resort?</p>		
15.	<p>Is hot work managed in accordance with Aviva’s Hot Work Operations Loss Prevention Standard plus the following additional features?</p> <ul style="list-style-type: none"> <li>• Are there full detailed risk assessment and method statements?</li> <li>• Are there an increased number of appropriately trained fire watches? <ul style="list-style-type: none"> <li>○ With appropriate fire extinguishing media?</li> <li>○ With an increased fire watch period post work?</li> <li>○ And other additional precautions based on the risk?</li> </ul> </li> <li>• If hot work is planned on the roof are there any changes in roof height? <ul style="list-style-type: none"> <li>○ Is this exposure included in the risk assessment?</li> </ul> </li> </ul>		

16.	<p>Is the electrical ignition risk managed?</p> <ul style="list-style-type: none"> <li>• Is fixed electrical testing completed with a minimum frequency of 100% of all the fixed wiring completed at least every three years? <ul style="list-style-type: none"> <li>○ Are all requirements and recommendations raised from such testing treated as a high priority and tracked through to completion?</li> </ul> </li> <li>• Is annual PAT completed?</li> <li>• Is annual thermographic testing completed?</li> </ul>		
17.	<p>Is there formal and strict control of smoking?</p> <ul style="list-style-type: none"> <li>• Is this prohibited within all areas of the building including on any balconies?</li> <li>• Is external smoking limited to dedicated areas away from the building and/or foliage growing close to the building.? <ul style="list-style-type: none"> <li>○ Are cigarette butt collectors as far away from buildings as possible; not fixed to buildings and located below any canopies, porches, etc.?</li> </ul> </li> </ul>		
18.	<p>Is there appropriate security and lighting to help reduce the risk of arson?</p>		
19.	<p>Are kitchens or cooking facilities provided with a local fire suppression system?</p> <p>Does this extend to the full length of the extract ductwork?</p>		
20.	<p>Are kitchen filters, extraction canopies and ductwork regularly cleaned?</p> <ul style="list-style-type: none"> <li>• Throughout its entire length?</li> <li>• Is this documented?</li> <li>• Are any areas recommendations tracked until completed?</li> <li>• Are any areas that are not accessible identified? <ul style="list-style-type: none"> <li>○ Will these be re-engineered to make them accessible?</li> </ul> </li> </ul> <p>Note: Extract system inspections and cleaning should meet the guidance outlined in Aviva’s Loss Prevention Standard: Commercial Kitchens – Extract Systems and Cooking Ranges</p>		



21.	<p>Do any extraction or ventilation ducts pass through any timber framed wall?</p> <ul style="list-style-type: none"> <li>• Bathroom?</li> <li>• Boiler?</li> <li>• Cooking extract?</li> </ul> <p>Have these been appropriately:</p> <ul style="list-style-type: none"> <li>• Protected so any hot surfaces are not in direct contact with the combustible construction?</li> <li>• If this is a fire compartment wall is the ducting and penetration appropriately arranged to maintain the integrity of this wall and its fire resistance rating?</li> </ul>		
22.	<p>Is housekeeping maintained to the highest standards?</p> <p>Are there weekly recorded self-inspections completed:</p> <ul style="list-style-type: none"> <li>• Internally?</li> <li>• Externally?</li> <li>• On any balconies?</li> <li>• If safe to do so, on the roof?</li> </ul>		
23.	<p>Is foliage growing directly adjacent to the building well cared for and maintained?</p> <p>Are plans in place to prevent it from drying out in prolonged dry periods?</p> <p>Is the foliage considered as part of the risk assessment with any hot work?</p> <p>Is the foliage considered in relation to the permitted smoking areas and discarded smoking materials?</p> <p>Is the foliage checked to remove any broken glass, which can act as a magnifying material for sunshine?</p>		
24.	<p>Is waste and are waste bins maintained a minimum of 10m away from the building(s)?</p>		
25.	<p>Is detritus cleared away regularly?</p> <p>Does this include within gutters and drains; on flat roofs, etc.?</p>		

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26.	<p>Are any air bricks and UPVC windows clearly identified as vulnerable areas in fire risk assessments?</p> <p>Is the construction of the air brick documented?</p> <p>Are any air bricks constructed of plastic?</p>		
27.	<p>Are there any external fire exposure from nearby third parties?</p> <p>If the exposure is too great, have you discussed any mitigation measures with your neighbours to help reduce your exposure?</p>		
28.	<p>Are there any external exposures from:</p> <ul style="list-style-type: none"> <li>• External storage?</li> <li>• Sheds?</li> <li>• External barbeques?</li> <li>• Pop-up vendors?</li> </ul> <p>Are these as far away from the building as possible?</p> <p>Is this at least 10m?</p>		
29.	<p>Has the exposure of fireworks landing on the building or a bonfire sited too close to the building been considered in risk assessments?</p> <p>What about at celebratory events or specific times of the year?</p>		
30.	<p>Are there any balconies on the building?</p> <p>Is their construction combustible?</p> <p>Is the occupancy of any balcony managed?</p> <ul style="list-style-type: none"> <li>• With combustible loads kept to a minimum?</li> <li>• Higher hazard items or activities prohibited, etc. e.g. barbecues, patio heaters, candles, smoking, etc.?</li> </ul>		
31.	<p>Are there any parked cars or electric car charging stations within 10m of the building?</p> <p>If less than 10m, can these be moved further away to prevent any fire spreading to the building?</p>		

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32.	<p>Are there formal policies in place to help manage and educate the behaviours of individuals/occupants in the building?</p> <p>Does this prohibit, help manage and mitigate exposures from high hazard activities? Such as:</p> <ul style="list-style-type: none"> <li>• Smoking inside the building?</li> <li>• Smoking outside the building?</li> <li>• Smoking on any balconies?</li> <li>• Use of candles and similar?</li> <li>• Cooking facilities in kitchens?</li> <li>• Barbecues?</li> <li>• Bonfires?</li> <li>• Fireworks?</li> </ul>		
33.	<p>Is an automatic fire detection system provided throughout the entire building?</p> <ul style="list-style-type: none"> <li>• Within all compartments/rooms?</li> <li>• Within all voids?</li> </ul> <p>For buildings under construction, are temporary fire detection systems employed?</p>		
34.	<p>Is automatic sprinkler protection provided in all compartments, designed, installed, inspected, maintained and tested by listed/approved companies to an internationally recognised standard?</p> <p>For buildings under construction, are temporary sprinkler systems employed?</p>		
35.	<p>Is all fire protection and detection equipment appropriately inspected, tested and maintained?</p> <p>Is this formally recorded?</p>		
36.	<p>Are manual firefighting water supplies and the location of fire hydrants clearly understood and documented?</p> <p>Have these arrangements been tested and results confirmed as being appropriate for manual firefighting needs, e.g. at least 1900lpm at 1 bar residual pressure?</p>		

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37.	<p>Have the Fire &amp; Rescue Services been informed that the property is a timber framed structure?</p> <p>Have you confirmed the nature of the occupancy to them?</p> <p>Do they carry out annual familiarisation visits?</p> <p>Do you have an emergency 'grab bag' in place for them, so when they arrive, they have details of all key and critical issues?</p>		
38.	<p>Based on the escape of water risk assessment and any escape of water incidents (leaks), either at this or any similar installations, is water management treated as an exposure/high priority?</p> <p>Considering the water installation within the building, is attention focussed on:</p> <ul style="list-style-type: none"> <li>• The quality, the nature of; the age and maintenance of the fittings and piping?</li> <li>• Change management?</li> <li>• Identification of a leak or flowing water, should one occur?</li> <li>• The use of appropriate leak detection and water isolation technologies to help isolate any unmanaged escape of water?</li> </ul>		
39.	<p>Do you have an Emergency Response Plan?</p> <p>Is this plan based on your risk assessments?</p> <p>Does it cover:</p> <ul style="list-style-type: none"> <li>• Fire incidents? <ul style="list-style-type: none"> <li>○ Does it consider the likely fast spread of fire and the potential for concealed fires?</li> <li>○ Is the plan co-ordinated with the public fire authorities, clearly explaining the fact the building is timber framed and the nature of the occupancy?</li> </ul> </li> <li>• Security incidents?</li> <li>• Escape of water incidents?</li> </ul> <p>Is it:</p> <ul style="list-style-type: none"> <li>• Formally documented?</li> <li>• Maintained up to date?</li> <li>• Tested?</li> </ul>		

40.	<p>Do you have a Business Continuity Plan?</p> <p>Is the plan based on your risk assessments?</p> <ul style="list-style-type: none"> <li>• Is it formally documented?</li> <li>• Is it maintained and up to date?</li> <li>• Does it consider the risk of a total loss of the building?</li> <li>• Is the plan tested?</li> </ul>		
41.	Additional comments:		

## Please Note

This document contains general information and guidance only and may be superseded and/or subject to amendment without further notice. Aviva has no liability to any third parties arising out of ARMS' communications whatsoever (including Loss Prevention Standards), and nor shall any third party rely on them. Other than liability which cannot be excluded by law, Aviva shall not be liable to any person for any indirect, special, consequential or other losses or damages of whatsoever kind arising out of access to, or use of, or reliance on anything contained in ARMS' communications. The document may not cover every risk, exposure or hazard that may arise and Aviva recommend that you obtain specific advice relevant to the circumstances.

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