London Assembly Planning and Housing Committee
Fire Safety in London's Residential Buildings Investigation
Combined Evidence Received

Contents

FS001 London Councils

Dear Jenny Jones AM

Investigation into Fire Safety in Tall and Timber framed Buildings in London

Many thanks for your invitation to London Councils to respond to the London Assembly's 'Investigation into Fire Safety in Tall and Timber framed Buildings in London'. London Councils welcomes the Assembly's investigation and fully supports any efforts to highlight the importance of fire safety for London's residents and any related remedial action.

Since the tragic events of the fire at Lakanal House in July last year our borough partners, both officers and members, have been particularly concerned about fire safety issues. We have explored these issues at various meetings and will continue to support and lobby on behalf of boroughs in their efforts to ensure the safety of all tenants and leaseholders.

At this stage however, we do not have specific data or information that would be of immediate use to the Assembly's investigation, and therefore do not feel that we are able to submit evidence.

As you will know we do not own or manage any properties of our own and do not hold the statistical information about the properties owned and managed by London's boroughs needed to answer the first three of the investigation's questions.

We will, of course, closely follow the work of the Assembly's investigation and will extend any assistance we can to GLA officials in their work, we look forward to the Assembly's findings and to taking forward its findings and recommendations where possible.

FS002 Morgan Professional Services (Morgan Sindall PLC)

1. MPS would estimate an increase in numbers or general trends for timber framed residential buildings, within the next ten years, with respect to cost and sustainability issues.

2. No MPS historical records of the number of fires in either tall or timber framed residential buildings. Would expect these records to be available from insurance companies and local authorities.

3. Would anticipate the London fire brigade or local building control would be aware of new construction or refurbishment on the basis of planning applications, building regulations submittals for approval and fire certification.

4. Relevant regulations would include BS5266, BS5839, BS5306, Building Regulations Approved Documents - Parts L, M & B, the Regulatory Reform Act and Planning Policy Statement 1.BS7974, BS5588-12, BS9251,BS5446,BS5449,BS476, BSEN13501-1, ISBN1-870409-19

5. Responsibility would be allocated at different times of the project. Through the design and planning stage, the responsibility would lie with the design team, i.e. architect, C&S Engineer, M&E Engineer and Fire Engineer. Through the construction period, the construction team would be responsible, including the Clerk of Works. In addition, the fire officer and building control would also be responsible throughout the project.

6. If correctly treated, there is no reason why timber framed buildings should have any additional specific fire risk implications to that of more traditional building methods.

7. MPS would recommend that the timber framing of the building should be treated by impregnation rather than surface treatments. If this is the case there is no reason why timber framed buildings should have any additional specific fire risk implications to that of other materials/building methods.

8. It is our considered opinion that the specific risk associated with tall and timber framed buildings, is that of egress time during a fire condition, i.e. how quickly you can evacuate the building. The issues which can compromise egress post construction are poor maintenance of the automatic detection system, vulnerability of the fire alarm system to vandalism and false alarms caused by lack of commissioning and defective installation. Inherent false alarms will reduce the integrity and confidence respective to the automatic detection system, leading people to consider alarm activation with contempt.

9 Following a consultation process undertaken in 2005 the 200 edition of the Building regulations Part B and the Approved Document B were amended in an attempt to improve fire safety in Dwellings and Non Dwelling buildings.
The main areas of change are set out below:

- Remove provision for self-closing devices in apartments (except doors opening onto common escape routes) and dwellinghouses (except garage doors)
- Amend the provisions for smoke ventilation of common access areas in apartment buildings
- Provide for an additional smoke alarm in apartments and dwellinghouses
- Provide for a suitable system of smoke alarms where an extension is proposed
- Remove the separate guidance on loft conversions in dwellinghouses
- Provide for sprinkler protection in high rise apartments and residential care homes
- Provide for cavity barriers in dwellings and non-dwellings
- Introduce provisions for measures on inclusive design
- Amend the provisions for firefighting shafts

- Provide for dry rising mains in tall buildings
- Discounting stairs in tall buildings with phased evacuation procedures
- Design compartment walls to take account of deflections during a fire

10 Would suggest that incidents are reviewed between legislation time periods, i.e. review the incidents after legislation revision and enhancements against the previous legislation, in order to measure effectiveness. MPS do not possess any such statistics and are not aware of any published document.

11 Outstanding actions required to reduce the risk and number of fire incidents would include improved commissioning of automated systems, monitor maintenance standards and the retrofit of new standards within older properties.

12 Additional proposals we feel that should be considered include no 'battery only' powered smoke detectors – hard wired only, Sprinklers to be incorporated in all circulation and common areas, Phased evacuation of a floor rather than a single tenancy, on activation of a fire alarm. We also believe that an education campaign should be instigated to educate people of the consequences of good maintenance of alarm/protective systems and to discuss the consequences of vandalism.

13 Educating community action groups via a simplistic Operating and Maintenance manual to inform of procedures and scenarios respective to when the fire alarm system does not work or telephone numbers when vandalism occurs and what to look for in their building to reduce danger, i.e. the obstruction of fire doors or fire doors jammed open, etc.

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FS003 Aviva Insurance UK (Via RISCAuthority)

In the drive to improve and add to the UK's housing stock new building techniques are being adopted that also support the sustainability agenda. These build methods are often described under the general heading of 'Modern Methods of Construction (MMC)' and include timber frame, structurally insulated panel, and pod techniques.
The Fire Protection Association through RISCAuthority (the UK insurer research funding scheme) collate fire loss statistics and investigate fires of special interest. There is now almost universal acceptance by both insurers and Fire & Rescue Services that completed, occupied structural timber framed buildings are not performing well in fires. Ignitions that would normally be contained to their point of origin (e.g. within the consumer unit in an under stairs cupboard) are progressing into the timber voids inherent in the design and are then travelling unchecked to other parts of the building. In our investigations it is clear that Fire & Rescue Services are ill-equipped to address fires in these structures; the usual techniques and equipment not being deployable since they may damage the structural integrity of the building itself. Insurers are also having to re-appraise their EML (Estimated Maximum Loss) figures for this build technique which will ultimately affect the occupier's premium or even (as we saw in the food industry with polystyrene sandwich panels) make them very difficult to insure at all. Extensive large-scale testing was conducted at BRE on multi-storey timber frame buildings but the construction details bear little relevance to the in-use buildings we are seeing today. The principle difference is that all timber voids were carefully packed to the limits with fire resisting insulation and fire stopping to all areas was rigorously implemented in accordance with Approved Document 'B' (as would be expected from any programme of work aimed at supporting structural timber building techniques). Fire experience shows that typically:
• the timber voids are empty or loosely filled with thin insulation for sound
• fire stopping is often not present where it should be
• ventilation of the voids encourages fire spread through even very narrow voids that result from building tolerances (not officially voids at all)
• fittings such as sockets and switches, suitable for traditional build methods are still being used in locations where the fire boundary is penetrated. They should be of the fire resisting type.
• cable and pipe runs, formerly routed in a well managed fashion to reduce the number of penetrations through block-work, are now replaced by a multitude of smaller penetrations as each service runs its own path 'as-the-crow flies' since holes are easily made in timber. The uncontrolled routing of services means that capable cavity barrier fire stopping devices are replaced by 'goo-gun' sealant techniques which are generally poor by any standard.

Once the building is complete all these issues are hidden from view and they are being passed as compliant by the building or approved inspector.
Whilst accepting that where fires have occurred there may have been deviations from the requirements contained in Approved Document B, these fires are occurring with increasing regularity in high risk occupancies with devastating consequences and now need urgent consideration and detailed investigation by CLG. Traditional building techniques contained high safety factors to deviations from the building codes as would be expected from building with non-flammable products. Newer building techniques possess no such comfort zone and as such strict and absolute compliance is essential. A standard that is easily abused or un-policeable is a poor standard. It is our opinion that AD 'B' could be improved to make it more resilient to abuses of this type and that CLG should act immediately to review this and the complimentary issues of the inspection process and external fire spread. To date CLG have stated that building methods seem to be changing daily, yet they are unprepared to review AD 'B' until 2012 – this appears a contradiction and poor judgement. Whilst our investigations are based around the insurer financial experience, we are convinced that many of the issues highlighted are equally relevant to the safety of the occupants themselves.

FS004 Andrew Barry-Purssell

Alex-

I am replying to Jenny Jones' letter of 8th February.

The issues raised in the letter are more directly relevant to Building and Fire Regulations rather than the planning system. As you may know, Government discourages use of the planing system to address issues that are dealt with through other regulatory systems.

Having said that, Policy 3A.6 in the current London Plan (which deals with quality of new housing provision) does state that design of residnetial development should take into account the safety and security of residents. Policy 4B.6 deals specifically with safety, security and fire prevention and protection. Policy 4B.10 on tall buildings states that tall buildings should be safe and secure in terms of their own of their own integrity and the safety of occupiers.

A different approach is taken in the draft Replacement London Plan, where there is a specific policy (7.3) on safety, security and resilience to emergency which applies to all development. Paragraph 7.38 states that:

"New development should incorporate fire safety solcutions and represent best practice in fire safety planning in both design and management. The London Fire and Emergency Planning Authority (LFEPA) should be consulted early in the design process to ensure major projects and venues have fire engineering built-in."

The London Plan Supplementary Planning Guidance on Sustainabkle Design and Construction does refer to the importance to install sprinker systems and hard-wire smoke alarms where feasible (page 59). This was considered to take the matter as far as it is possible to do through the planning system, and the point was raised during consultation that this is something more approriately dealt with through the Building Regulations.

I am afraid we do not hold any of the information sought by the ten detailed questions raised in the letter.

I am sorry not to be more helpful, but please let me know if there is anything else I can do.

Andrew

FS005 Royal Borough of Kingston upon Thames

Dear Alex,

Further to Jenny Jones' letter dated 8th February 2010 concerning the above (copy attached) please find my responses below on behalf of The Royal Borough of Kingston. I have answered each of the 11 questions posed(to the best of my ability) using the same numerical references.

There are roughly 68,000 residential units in the Borough but we have no data concerning the proportion that are tall, or timber framed.
We have no data and are unable to provide even an estimate for Kingston concerning this.
The Borough has no data concerning this but I would imagine the LFEPA might.
New-build is certainly notifiable under the Building Regs (and some refurbs as well). We have an informal arrangement with the London Fire Brigade to advise them of any significant timber framed developments that are proposed.
The Building Control provider – either the Local Authority or private sector Approved Inspectors.
The Building regulations only apply to structures in their completed state and if complied with, should adequately control the risk of fire spread/external fire spread at this stage. Timber framed buildings are inherently more at risk from fire during construction, than other (generally non-combustible) construction forms and the problem is exacerbated by the fact that fire protective linings and claddings are usually only applied after the frame is erected. A period of high risk is therefore almost unavoidable and needs to be carefully managed by the contractor (minimising hot works etc) to mitigate this. In my view, this is not an area where further regulation is appropriate or necessary as the potential for serious economic loss should be sufficient to motivate diligence.
The regulations have not been changed as a consequence of the advent of tall buildings of this type. Perhaps a review by BRAC (Building Regulations Advisory Committee) or a similar body is appropriate, to confirm present measures (formulated when Buildings of this type were generally low rise) are still adequate.
To what "recent amendments to fire safety regulations" do you refer?
This is a question that would be best answered by those responsible for the ongoing management of this building type. The employment of timber framed construction is a risk factor that ought to be considered under a RRO risk assessment.
Improved risk management during construction and better quality control (particularly in relation to cavity barrier istallation) to improve the fire performance of the finished structure.
Examination of the mechanisms by which fire can spread within and over the surfaces of external walls (by-passing comparmentation) need to be reviewed, particularly in the light of contempory practice of applying thin coat renders over combustible insulation. The assumption that cavity barriers in the external walls of timber framed buildings are generally correctly installed is also probably flawed and this may prove to be a more significant defect in high rise structures.

It is acknowledged that some of these comments are more intuative than evidenced based, but none the less, I hope you find them of some assistance.

Regards

Lead Officer, Building Control
Royal Borough of Kingston upon Thames

FS006 Kent Fire Safety

Alexandra

Thank you for the opportunity to comment As you point out some of the questions are London specific and as such I have not made comment only to the questions I feel we have something to offer.

Q4 Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?

This should be consulted upon during the building control consultation period. Once the relevant standards have been agreed it falls to the building inspector (either Local Authority or Approved Inspector) to ensure that they visit and inspect at the appropriate stages to ensure that the construction is to the required standard as agreed. It is suggested that these visits should be made mandatory and recorded for review at a later date should the building be involved in fire and the fire safety measures fail.

Q5. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?

The potential for rapid fire spread and early structural collapse coupled with difficult access and water supplies for firefighting has been realised in several incidents. At present there are limited controls to be prevent fire spread during construction. It would be beneficial to specify the maximum size of unprotected and uncompartmented structures that could be allowed during construction to minimise fire spread and prevent total loss of structures as have previously occurred. Due to the speed and severity of fires a fire detection system should be installed and extended to provide early warning and allow workers to escape in the event of fire. Due to the radiated heat produced, spacing in line with the regulations is insufficient as these are designed for the finished structure. Early application of the external finish is suggested to reduce the impact on adjacent buildings in the event of a fire.

Q6.What are the specific risks associated with both tall and timber framed buildings residential buildings that are occupied? What can compromise fire safety post construction?

The ability for occupants to escape in the event of a fire in the building is a problem in tall structures. It is usual that only the occupants directly involved in the fire compartment will need to escape the remainder of the occupants should be safe to remain in their premises unless evacuated by the fire service in the event of fire spread. The risk of all of the residents trying to evacuate the building in the vent of a fire in a single

compartment heightens the risk of other injuries to fleeing occupants and could severely hamper the fire service in tackling the incident.

Unregulated or unreported work either by contractors, or occupants of flats that compromise the fire stopping or fire compartmentation allowing smoke and fire to spread via the cavities is a considerable danger in occupied premises. This could impact on the elderly or disabled people who often in an evacuation will if they have to evacuate their premises will be held in a place of relative safety within a fire resisting lobby until the Fire Service decide on whether they need to be evacuated the spread via cavities into these areas could compromise these safe havens.

FS007 Westminster City Council

Dear Alexandra,

Investigation into fire safety in tall and timber framed buildings in London

I refer to your letter dated 8th February addressed to Rosemarie MacQueen, Strategic Director for the Built Environment. I note you have addressed similar letters to other officers in the City Council and this response has been compiled on behalf of them all. Our response to your numbered questions is in the same order as follows;

1. We do not record how many residential units are classified as being in 'tall' buildings. The stock managed by CityWest Homes (CWH) on behalf of Westminster City Council (WCC) has (subject to verification) 11,373 residential units in tall buildings as defined here. We do not believe that any timber framed residential buildings have been built in the City yet.
2. There are no estimates, but most new buildings in the City are of five or more storeys already. CWH estimates that it will build up to 7 buildings of 5 or more storeys in the next 5 years, subject to consultation, planning and funding. We would expect there to be more timber framed buildings in the future as it is a sustainable material and can be an effective way of producing an energy efficient envelope of minimal thickness (very important for maximising useable floor areas).
3. No, but the London Fire Brigade has extensive records and you should approach them for this information across London.
4. Local Authority Building Control (LABC) is made aware of new or extended buildings. Where it, rather than a private Approved Inspector (AI), is carrying out the Building Regulations function it will also know the height and materials of construction. Information is supplied to them by the developer and their agents (architects, surveyors, etc.)
5. The ultimate responsibility for complying with Building Regulations lies with the developer, but Building Control (either LABC or AI) is responsible for ensuring they do comply. LABC has the legal power to enforce compliance.
6. Due to the low weather resistance of typical timber frame wall claddings (i.e. plasterboard) provided for fire resistance, it is not applied until the structure has been weather-proofed. The structure will remain unprotected from the effects of fire until the roof covering and external wall claddings have been applied. In traditional construction of load-bearing block and brick walls, the fire protection is built in, as these materials are non-combustible. Because of the break between combustible elements a fire will develop much slower in a traditional building than a timber frame that has continuous areas of combustible material. Once completed and fire clad there is no reason to believe a timber frame building will perform any worse than a traditional building of brick and block.
7. Regulatory control does not really differentiate very much for timber frame over more traditional methods, but it does for tall buildings. Tall buildings present two significant problems over low-rise; means of escape in case of fire and fire fighting. Excess height makes it difficult for occupants to descend many flights of stairs in the short evacuation time the codes recommend. It also makes it difficult for the Fire Brigade to tackle a fire externally due to the limiting height of their ladders and platforms. Legislation has been in place since 1939 specifically to deal with fire fighting in tall buildings. The definition of a tall building is twice that (30m) of the scope of your research.
8. The advent of 'fire engineered' buildings has seen greater use of active fire safety measures (suppression systems, smoke extraction, automation fire detection and warning) as opposed to the more passive measures like fire resistance, compartmentation and short travel distances.
9. Fire risk assessments of buildings managed by CWH are carried out in accordance with the RRO and available guidance. CWH stock control surveys of the stock it manages seek to identify risks in line with the HHSRS which are then acted upon as appropriate.

10. Tall residential buildings are designed so that a full evacuation during a fire is unnecessary. The high level of compartmentation between flats and common areas should ensure that a fire is contained long enough for the Fire Brigade to extinguish it. There needs to be greater information to residents about what action they should take in a fire and why. Confidence in what they are being told about staying put will now be low following the recent fires in South London. From what I have heard about these recent fires, this compartmentation has failed due to poorly undertaken alterations in the common parts (often related to fire stopping) and generally low standards of property maintenance. Clearly, there needs to be greater control over such work to ensure that fire compartmentation is maintained.

The construction process for timber framed buildings, as described in item 6 above, is a vulnerable time and greater efforts need to be made by the developer to ensure fire risk is minimised. A similar control of 'hot works' (use of flames by roofers, plumbers, etc.), as applied in historic buildings, should be adopted and full-time security while the site is closed should be employed to minimise the risk of arson.

As a general point, greater clarity from the enforcing authority on what constitutes compliance, particularly with respect to fire risk assessments and competence would greatly assist those who have duties under the RRO to understand and comply with those duties.

11. The adoption of a 15m height to define a tall building is a bit arbitrary and has no logical relevance in terms of fire safety. According to the Building Regulations 11m is the height at which a simple single staircase can no longer be provided, 18m is the height at which a fire-fighting shaft (to allow fire fighters to approach a fire safely from within) needs to be provided inside a building, while 30m is the height at which fire fighters are no longer able to tackle a building fire from outside and special measures need to be put in place (such as fire suppression systems) to control the growth of a fire.

It is suggested that the focus of any investigation into fire risk in residential premises identifies, as far as is reasonably possible, what the risk factors are. Historical information (perhaps from the London Fire Brigade) should identify the risks and relative importance. The results of such analysis should, of course, be publicised and would help duty holders ensure they target risks appropriately and effectively.

A major risk factor that should be recognised is believed to be human behaviour, particularly where it presents in malicious or unintentional form; the latter could, for example, be due to age, mental or physical status or any combination of a range of factors.

We do not consider it necessary for our response to be confidential and look forward to publication of your research and findings in due course.

Yours sincerely,

Rosemarie MacQueen

Strategic Director Built Environment

FS008 Chief Fire Officers Association (CFOA)

CFOA Response to London Assembly Planning and Housing Committee

1. ***Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?***

   The CFOA housing workgroup does not collect information like this, as such this question is better fielded by the London Fire Brigades response.

2. ***How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?***

   The local Building Control or an Approved inspector must be consulted for any work where the Building Regulations 2000 apply. The type of work to which the Regulations refer is governed by Regulation 3 (1) which details a list of criteria, the most important being (i) the erection or extension of a building, and (ii) the material alteration of a building. Regulation 3 (2) defines the material alteration as works which results in a building being less satisfactory in relation to compliance with the requirements of parts B1 (means of escape), B3 (Internal fire spread-structure), B4 (External fire spread), or B5 (Access and facilities for the fire service), than it was before, and is controllable under Regulation 3 (meaning of building work), and Regulation 4 (requirements to building work)

   On consultation, details of the construction should be supplied by the designer/builder to the approvals authority to confirm that the construction materials and methods will satisfy the functional requirements of the Building Regulations. The detail supplied at this point will reveal that the construction will be of a timber frame type and allow suitable comments to be made by the approval authority in relation to its suitability and compliance. Additionally, if the building is being, or is to be, put to a use once occupied where the Fire Safety Order applies, then the submission of full detailed plans is required for consultation with the fire safety enforcing authority.

   In relation to residential buildings that come under the Fire Safety Order, purpose built blocks of flats that are provided with common parts that lead to the front door of each flat comes under the Order (excluding the private dwellings) and are enforced by the Fire Authority and would therefore require full plans submission for consultation with the Fire Authority. Therefore at this point both the Fire Safety Enforcing Authority, and the Local Building Control/Approved Inspector will be aware of the nature of the construction methods

3. ***What are the relevant, policies plans or guidance in relation to construction, design, planning and fire safety that apply to the construction and subsequent occupation of both tall and timber framed residential buildings? What are the relevant regulations in relation to refurbishment of existing tall residential buildings?***

   The construction and design, or material alteration of, any new build structure should conform to the functional requirements of the Building Regulations 2000. Refurbishments of a structural nature should also conform to the Regulations if they are deemed to be building work as a requirement of Regulation 3(1) and 3(2). Guidance on complying with these functional requirements is given in the suite of Approved Documents to the Building Regulations. Approved Document B is the document which relates directly to the fire safety

4. ***What are the specific risk implications for various building designs, construction materials and construction methods in relation to both tall and timber framed residential buildings?***

The highest risk implication in relation to tall buildings is that the first principle of high standards of fire resisting compartmentation is present to allow a “stay put” policy to be operated within the building. Stay put is the keeping of persons within the building that is affected by fire due to the fact that each dwelling unit is constructed as a fire resisting box, and the standard of construction is such that fire cannot break out of such a box and affect the rest of the building. It relies on the confidence that all wall and floors are constructed as compartment walls and floors, and services such as water and heating pipes, gas and electrical services are passing through risers that are adequately fire stopped to resist the passage of fire.

Subsequent refurbishment works undertaken in such buildings, if uncontrolled, can undermine this high level of compartmentation and allow unseen fire spread if not detected.

Timber framed construction is essentially a wooden framework upon which a system of panelling is attached to form the structure. Sound proofing and fire resisting material may be enclosed within the voids of the structure which are created, but relies very heavily on a high standard of craftsmanship throughout the build process to ensure adequate fire resistance is achieved. It is this aspect that invariably lets it down.

5. ***What are the specific risks associated with both tall and timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?***

Standards of fire safety on construction sites is influenced and controlled in a number of ways. Firstly, as a workplace, the Fire Safety Order applies, placing a duty on the Responsible Person to undertake a suitable and sufficient fire risk assessment of the general fire precautions and is enforced by the Fire Authority.

Process fire risk which may be present on site is controlled and enforced by the Health and Safety Executive through the Construction Design and Management Regulations 2007. Presently, the guidance document

6. ***What are the specific risks associated with both tall and timber framed residential buildings that are occupied? What can compromise fire safety post construction?***

Tall residential buildings, if built to standard, are constructed in such a way as to ensure each dwelling unit is constructed as a fire resisting box, and that the fire resisting standard of compartment floors is such that fire spread is unable to occur between floors. This enables a stay put policy for fire to operate within the premises.

This standard is far easier to achieve if the materials used in construction are non combustible such as concrete, block or brick, with the real difficulty in maintaining the fire resisting standard is through ensuring that common service risers for water and soil pipes, heating electrical and refuse are fire stopped and protected to a sufficient degree to restrict spread of fire out of the compartment of origin.

The nature of timber framed construction means that possibility of creating voids within the structure is greater, and the reliance on the quality of workmanship is greater both in the application of the panel and boarding element, and with the fire stopping of voids and common service risers

However, both situations present the same element of risk if this high level of compartmentation is breached.

7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?

Prior to the 1st October 2006 when the Fire Safety Order came into force, there was no reason in legislative terms fire the Fire Authority to be involved in the management of fire safety within residential blocks. Since then, the prioritisation of premises to be audited by the Fire Authority is determined by the Risk Based Inspection Program (RBIP) that is required to be in place for all Fire Authorities. The RBIP is influenced by a number of different factors that can include legacy data such as previous history of fire, previous knowledge of fire safety compliance, perceived life risk, and the generic use to which the premises is put. Such information is assessed and the frequency of inspection determined accordingly. In the case of all but a small number of Fire Authorities, no real data existed to suggest that tall residential blocks should attract a high priority, therefore within the RBIP they did not attract an audit of the fire risk assessment. Despite this, the requirement to undertake and produce a fire risk assessment remained with the Responsible Person. In many cases the fire risk assessments had not been undertaken prior to the incident in Camberwell. Since then, this issue is being addressed.

Experience is showing that there are an excessive number of poor quality risk assessments being done by Responsible Persons or consultants that they engage, which fall significantly short of confirming whether or not the buildings of these types are able to sustain a stay put policy ,or accurately determine the effect of subsequent refurbishment works on the fire resting capability of the structure

Prior to the coming into force of the Fire Safety Order, the safety provisions were determined at construction stage via the Building Regulations approvals process. The standard of construction of many of the older existing tall residential blocks was determined by the *British Standard Code of Practice CP3 Chapter IV Part 1 1971 Code of Basic Data for the Design of Buildings.* This has since been reviewed, updated and incorporated into the Approved Documents to the Building Regulations

8. *What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?*

Following the fire at Lakanal House, the report on the emerging issues undertaken by the Chief Fire and Rescue Advisor recommended that an extensive program of auditing of such high rise blocks should be undertaken to determine whether or not suitable and sufficient fire risk assessments are in place and that subsequent refurbishment works that have been undertaken have not undermined the original fire strategy for

9. ***What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?***

In terms of tall residential buildings, there is currently a lack of understanding by Responsible Persons around the technical and practical issues surrounding the production of a suitable and sufficient fire risk assessment in these types of premises. Also, there is little guidance surrounding the application of interim measures of a sufficient nature to address serious breaches in compartmentation and whether or not a stay put policy can be maintained within the building. This is where additional guidance from CLG may prove useful

In relation to timber framed construction; the main issue is the standard of workmanship and attention to detail which is the important aspect. This can only be ensured through adequate training of the craftsmen involved, third party accreditation of the processes by the appropriate trade body, but perhaps more importantly, a greater level of inspection by the Building Approvals Authority.

It is often the case that economics of Local Authority involve the reduction in numbers of Building Control Inspectors which reduces the capacity for onsite inspection. Commercially driven Approved Inspectors are always under pressure to maintain site inspection to an appropriate level. It is perhaps this that may prove to be of greatest benefit, and easiest to achieve.

10. ***Do you have any other comments that might be useful to the investigation?***

Some further points for consideration are:

Whilst the designed in safety of the building is very important there should be recognition that when asking questions relating to suitability and risk there should also be a focus on the tenant and individual occupying the building.

Fire safety education of tenants is important and consideration should be given to the inclusion in the tenancy agreement of fire safety information, explaining clearly the responsibility of the tenant and the landlord on matters relating to fire safety i.e. front doors, common areas, fire compartmentation, means of escape, refuges etc. This information should be supplied in a language which is clearly understandable to the parties involved. In order that this important element can be successfully achieved the risk assessment supporting the information must have full understanding of the occupant's needs assessment and structural information as exchanged through the requirements of regulation 16b.

Ultimately when considering the probability of occupiers and trades persons breaching fire compartmentation and the impact potential in this type of construction of life and property loss the most effective control would be the use of Automatic Fire Suppression Systems which if included in initial construction would be relatively low cost.

FS008b: CFOA Practitioners Forum

Dear Jenny
Investigation into Fire Safety in Tall and Timber framed Buildings in London
Further to your letter of 5th February 2010 requesting assistance with the investigation please find below our contribution.
1. Information
1.1 The increased use of TF construction particularly in larger residential accommodation has resulted in a number of serious fires. The evidence from all of these fires has shown that the volume of timber in construction contributes to the fire hazards and the risk level presented to both construction workers and firefighters alike. It is evident that fires in TF buildings, particularly the larger projects under construction, pose unique fire hazards in comparison to traditionally built premises. Fire development and spread are rapid and generate extremely large amounts of radiant heat flux.
1.2 Following a serious fire involving two timber framed buildings under construction at Colindale, Hendon, London on the 12 July 2006 which destroyed two, six storey buildings that were almost complete and started fires in neighbouring premises, some 15 metres away, doubt was cast over the safety and integrity of timber frame as a construction method.
1.3 The fire at Colindale raised serious concern over using timber as a construction material in such a manner with the rapid fire spread resulting in the building in which the fire originated being destroyed within 10 minutes of the fire starting. The heat produced by the fire was so intense as to hamper firefighting operations and resulted in fire spread by radiant heat to the adjacent building which also was totally destroyed.
1.4 Subsequently, a number of significant fires have occurred involving timber framed buildings under construction and a common theme has been the rapid fire spread leading to early collapse of the structure and horizontal fire spread to adjacent buildings.

2. Practitioner's Forum / Business Community Safety Forum Joint Task & Finish Group
2.1 In 2007 the Chair of the Practitioner's Forum (PF) and the then Director of Fire and Resilience agreed that the Forum should establish a Task & Finish Group together with the Business Community Safety Forum (BCSF) to examine emerging concerns over rapid fire spread in timber framed buildings. The Group, chaired by Peter Holland on behalf of the IFE, included FRS staff and trade union representatives as well as officials from Communities and Local Government (CLG), the Health and Safety Executive (HSE) and the Building Research Establishment, and reported back to the PF in February 2009 and to the BCSF in March 2009.
2.2 A Joint Ministerial Submission from the PF and the BCSF entitled, 'The Dangers of Fires in Timber-Framed Construction' was forwarded to the then Fire Minister, Sadiq Khan on 2 April 2009. The findings of the submission are included within this report.
2.3 The submission called for urgent action to address the issue and highlighted the main findings of the report as follows:
Main Findings of the Report
Unlike traditionally built property, a timber framed building is very likely to be at the greatest risk of fire during the early stages of construction due to the amount of exposed and unprotected combustible elements and where there is minimal active or passive form of fire protection.
Fires in timber framed buildings have all seen very rapid fire spread and early structural collapse, and the severity of heat generated has caused spread to neighbouring buildings.
Within completed timber frame buildings the risk of fire spread in the event of a fire occurring can increase dramatically should there be any aspects of poor workmanship in areas such as cavity barriers, fire stopping or finish quality.
There is concern that, in the longer term, wear and tear as well as professional and DIY

alterations will increase the risk of fire spread in completed buildings, even if workmanship on the original construction is good.
2.4 A number of issues in relation to timber framed buildings were highlighted in the report completed by the PF/BCSF Task and Finish Group and the Group made a number of recommendations in an attempt to reduce the occurrence of fires in TF buildings. The recommendations are reproduced as appendix A.
2.5 The following is a summary of the findings of the PF/BCSF Task and Finish Group.
3. Existing guidance
3.1 Within the existing Codes and Guides covering fire risk management and construction i.e. CDM Regulations, HSG 168 (Fire Safety in Construction Work) Joint Code of Practice etc a number of different elements of fire risk management are addressed in a different way depending on which guide is used. It was a recommendation of the PF/BCSF Task and Finish Group that further work should be undertaken to examine these issues in more detail.
3.2 The Health and Safety Guidance, Fire Safety in Construction Work (HSG 168) has recently been reviewed and is currently out for consultation. The guidance makes specific reference to timber framed buildings and sets out detailed measures to be taken for sites under construction.
4. Consultation and the gathering of information
4.1 There are details in guidance documents of the requirement for liaison at the various stages of the construction project, including at the design phase. There are also statutory requirements relating to Building Regulations approvals. The fire and rescue service is a statutory consultee for matters relating to fire safety within the Building Regulations process. Building Regulations and Fire Safety – Procedural Guidance (paragraph 1.31) states that where the building is to be put to a use to which the Fire Safety Order applies there is a statutory requirement to consult the fire safety enforcing authority. The Fire and Rescue Service also has a statutory duty arising from the Fire and Rescue Services Act 2004 (Section 7.2.d) to make arrangements for obtaining information needed for the purpose of extinguishing fires and saving life and property in its area.
5. Means for giving warning in case of fire and means of escape
5.1 Recent fires have shown the potential for rapid fire spread on larger multi storey TF construction sites is significant. This identified risk highlights the importance of having appropriate means for giving warning in the case of fire and of having sufficient and suitable means of escape for construction workers in the event of a fire. Within the recently produced UKTFA draft document (Fire Safety on Timber Frame Construction Sites) and other guidance documents there are relevant sections that attempt to deal with these issues.
5.2 There is however concern that, in spite of the guidance, the dynamic and at times noisy nature of construction, coupled with the fact that fire protection measures designed for occupant safety will not be in place from the outset, there is a likelihood that means for giving warning and escape will be compromised, particularly on the larger more complex projects. It is recognised that, by the very nature of building construction, and all the practical activity it involves, the implementation of this guidance will prove to be extremely problematic particularly at the early stages of the project, which as previously described is the phase when there is a greater risk of fire and fire spread in TF construction.
5.3 The draft revision to HSG 168, 'Fire Safety in Construction Work' states that fire warning systems are required in all but very small high-risk buildings and that alarms should be interconnected (by protected cables or wireless).
6. External fire spread
6.1 Fires involving timber framed buildings under construction that have not had the external cladding complete generate a tremendous amount of thermal radiation and a significant number of fires involving TF buildings have resulted in fire spreading to adjacent buildings. For example the fire at Colindale, London radiated enough heat to ignite a second block,

some 19 metres away, damage cars 15 metres away and halls of residence 11 metres away at the closest point. The buildings were not particularly close, indeed they were well beyond the minimum distances set out in Approved Document B of the Building Regulations. The issue is that the Regulations apply to completed buildings which have the benefit of full fire protection and whilst the building is unprotected it is a potential fire hazard to nearby structures.

6.2 Where buildings are constructed from traditional, predominantly non-combustible materials the radiant heat flux from a fire is likely to be low. This is not necessarily the case for buildings constructed from TF. Prior to fire resistant protection in the form of external finishes being completed, the potential radiant heat flux can be considerable with the likelihood that it will endanger surrounding buildings. The existing approach to the management of this risk is to concentrate on reducing the likelihood of ignition by minimising ignition sources, including those within temporary structures on site. Of particular concern is the potential for external fire spread to other occupied buildings or to buildings within the same development where partial occupation has occurred.

6.3 The Fire and Resilience Directorate have included research into timber framed buildings within the Directorate's draft annual Fire and Resilience Research Programme for 2010/11 and it is understood that this research will consider a number of issues with regard to TF buildings, including external fire spread from such buildings.

7. Partial occupation of incomplete buildings

7.1 At least one example is known where occupation was planned in areas of a development which were completed whilst construction continued on those areas still under construction. This incident occurred prior to any occupation of the building. The resultant fire was severe and spread rapidly. It is clear from the outcome that although the completed phase of the building had all its active and passive fire protection in place, the extent of the fire in the incomplete parts of the building compromised the effectiveness of fire safety, in particular the passive fire protection measures in the completed section of the building.

8. Fire procedures in completed TF and tall residential buildings

8.1 Approved Document B requires heightened passive fire safety measures to be installed in large residential buildings. This has meant in the past that, in the event of fire, it has been acceptable to evacuate only the residence that is involved in fire. The likelihood of fire spread is low, and wider evacuation is left to the discretion of the attending fire officers following an assessment of the risk. This tactic is known as 'defend in place' or 'stay put policy'. A 'defend in place' strategy for tall buildings is based upon a fire being contained within the original compartment of origin with one hour's fire resistance negating the need for other residents within the building having to evacuate.

8.2 Recent experience in London however, suggests that 'defend in place' may put occupants at risk in the event of fire in completed TF buildings where rapid, unseen and unpredictable fire spread can occur. Furthermore, where breaches to the compartmentation have occurred due to a poor initial standard of work or subsequent alterations, fire spread beyond the compartment of origin has resulted in the 'defend in place' strategy being inappropriate. The challenge is that in a residential building, there is no overall control to co-ordinate simultaneous full evacuation.

8.3 In the UK, there has been a noticeable increase in the use of fire engineered design solutions to determine adequate life safety requirements allowing the escape of occupants from a building in case of fire. Designers, architects and engineers are constantly seeking to design modern builders that are increasingly larger, taller and more innovative without the constraints of a prescriptive approach contained within Approved Document B of the Building Regulations.

8.4 During the construction of new buildings, the responsibility for ensuring the adequacy of fire safety provision rests with the Health and Safety Executive under the Construction (Design

and Management) Regulations. Once the building is complete it is handed over to the occupier who is then, through the 'responsible person' responsible for ensuring a suitable and sufficient risk assessment is undertaken for ensuring the fire safety within the building is adequate.

8.5 In England and Wales, the Fire Service enforces the Regulatory Reform (Fire Safety) Order, however this does not involve routine inspections of buildings, the onus is solely on the responsible person to manage the building and ensure that all aspects of an engineered solution function effectively. Without adequate management, the occupants of the building are at greater risk should a fire occur.

8.6 Regulation 16B of the Building Regulations states that fire safety information should be passed to the responsible person upon completion of a building to help facilitate the risk assessment process and to help ensure ongoing fire safety. Essentially this equates to a manual on the use of the fire safety measures within the building, it would appear however that the requirements of Regulation 16B are not being routinely complied with.

9. Fire spread within the structure

9.1 The presence of cavities within the finished structure and the effectiveness of the cavity barriers and fire stopping are of major importance in preventing fire spread through the structure. Failure of the cavity barriers in TF structures has lead to unexpected fire spread and internal collapse in a number of reported incidents. This is a particularly significant problem if the fire breaches structural fire protection measures, rendering the previously held 'defend in place' strategy unsustainable.

9.2 A fire test undertaken at the Fire Research Centre at Cardington involving the test TF 2000 building, a 6 storey TF construction highlighted the issue of cavity barriers and fire stopping when the FRS were called back to the site after extinguishing an initial test fire. A fault with the fire stopping in the test building resulted in a secondary fire starting remote from the initial fire due to fire spread through the cavity.

9.3 Over the life cycle of a TF building there is a greater likelihood of the structural fire protection measures being compromised to a greater or lesser extent than in traditional build methods eg concrete and block construction. This can happen either through general wear and tear or changes that are made to the building by occupants completing projects such as fitting additional electrical sockets or other fittings. Such changes can occur in any type of building but the issue in relation to TF construction is the extent to which the passive fire protection is compromised as a result. This situation is exacerbated by the fact that a significant proportion of new large scale TF development is intended for the social housing market.

10. Identifying timber framed buildings once completed

10.1 TF buildings will often have a façade of a different material and as a result during the later stages of construction and certainly on completion of the building process it will be almost impossible to distinguish the premises from one that has been built in a traditional fashion. The resultant difficulty in being able to assess the method of construction could result in an inappropriate dynamic assessment of the risk being made by the firefighters.

11. Information provided to Fire and Rescue Services regarding timber framed buildings

11.1 One of the particular areas of concern of the PF/BCSF Task and Finish Group was the lack of awareness of Fire and Rescue Services with regard to the construction of timber framed buildings within the FRS' area. Subsequently a meeting was held between Peter Holland, the Chair of the PF/BCSF Task and Finish Group, representatives of the Building Control Alliance (BCA), CLG (Building Regulations), the HSE and the Director of Prevention and Protection of CFOA, Iain Cox.

11.2 It was agreed at the meeting that the BCA would amend an existing standard letter used both by Approved Inspectors and Local Authority Building Control, originally produced to notify FRSs of fire engineered buildings, to advise the relevant FRS of both large TF buildings and

also innovative construction methods. This was actioned immediately after the meeting by Paul Timmins (BCA) and Iain Cox with a planned introduction date early in 2010. Both organisations are to circulate it with very clear guidance. From CFOA's perspective, it was agreed that CFOA would make clear the importance of the information for both operational and fire safety staff. In addition, from an FRS perspective, CFOA also agreed to recommend strongly to FRSs the need for operational crews to inform fire safety staff when they become aware that a large timber framed building is being constructed within. Equally the BCA agreed to include in the letter to their members clear direction about their statutory responsibility to advise the FRS prior to occupation including partial occupation.

11.3 The Chief Fire and Rescue Advisers Unit are currently developing Operational Guidance, which will include Firefighting and Access, through the Operational Guidance Programme Board. An element of this piece of work will include activity within the 'Built Environment' which will include all aspects of Innovative Construction Products and Techniques.

11.4 The Chair of the PF/BCSF Joint Task & Finish Group contacted Geoff Arnold, Chair of the UK Timber Frame Association, (UKTFA) in December 2009 to seek an assurance that the UKTFA would establish a process whereby the Association's member companies inform every FRS of large timber framed buildings that are either planned, in build or already constructed.

11.5 Following the Chair's request a positive response has been received from the UKTFA who have contacted all of their members requesting that each member write to the relevant Fire Authority, utilising a standard format, to inform them of current large timber frame projects, i.e., those of 4 storeys or higher or of greater average floor area than 2500m². This includes those already constructed, those currently under construction and also information on buildings in the planning stage.

11.6 The UKTFA have also collected details from all of their members of the large sites they are currently engaged in to obtain a general picture of the number of sites which meet the 'large ' criteria that are in progress presently. There are currently 75 in progress with the following geographical spread:

Wales 4
Scotland 10
Northern Ireland 1
England 60

11.7 The UKTFA have also developed a 'SiteSafe' procedure which was launched in January 2010. It is a requirement of this procedure that each member company when engaging with a 'large' site, should inform the relevant Fire Authority. This will be step 1 in a three step plan. Step 2 will involve recommendations on how the building can be protected from entry by potential arsonists and Step 3 is a research and development project in which UKTFA will investigate the fitting of sprinklers, the application of fire retardant treatments and compartmentation of buildings.

11.8 The UKTFA's response appears to be having an immediate effect with Fire Authorities reporting that they have already been contacted by Timber Framed Construction Companies advising of large projects within their area of responsibility.

We are, of course, happy to help in any way possible to reduce the risks and occurrence of fires in tall and timber framed buildings.

FS008c

RECOMMENDATIONS MADE BY THE JOINT BUSINESS AND COMMUNITY SAFETY FORUM AND PRACTITIONERS FORUM TASK AND FINISH GROUP

ON

FIRES INVOLVING TIMBER FRAMED BUILDINGS

1. Statutory and other Consultation

It is recommended that consideration is given to developing a requirement within the Building Regulations or the associated Procedural Guidance that Building Control Departments and Approved Inspectors inform the fire and rescue service and Health and Safety Executive on all occasions when an application is made for large TF building projects. An additional recommendation involves the assessment of existing codes of practice to ensure consistency of guidance relating to liaison prior to and during construction. It is recommended that further work be considered to look into the differing approaches to the risk management strategies described within the differing guides. In particular the identification of anomalies contained in technical material and guidance should result in the means by which consistency is determined and published.

It is further recommended that arrangements are put in place to secure a definition of 'Large TF' in order to inform consultation and other processes. Such a definition could be based on a project of Four Storeys, or over 2500 sq m in floor area or a contract value of £2.5 million or above (taken from Joint Code of Practice).

2. Timber Frame buildings under construction

Means for giving warning in case of fire and means of escape

It is recommended that further research into the provision of fire warning and means of escape for TF building construction projects, to establish whether the minimum means for giving warning in case of fire should be by an electrically operated system, and for such recommendations if found to be included in all relevant codes and guidance. Consideration should also be given to assessing the means of escape requirements across all codes and guidance in order to establish consistent and appropriate recommendations for means of escape in case of fire, given the hazards associated with large scale TF projects and the likelihood of rapid fire spread. Greater importance and emphasis that best practice guidance is followed and publicised through the industry bodies should be given careful consideration.

External fire spread

It is recommended therefore that further research be carried out into the risks associated with external fire spread from fires in construction sites in order to identify practical solutions and guidance to reduce both potential risk and impact in the event of a fire.

Partial occupation of incomplete buildings

It is recommended that the application of a risk assessment is a suitable means of deciding whether to allow partial occupation of an incomplete building and that no occupation shall be permitted until all fire protection measures and installations are complete and commissioned. Consideration should be given to the production of guidance to help in this assessment.

Firefighting and access

It is recommended that urgent consideration be given to the development of guidance for the fire and rescue service dealing with risk assessment and planning requirements pre-incident and for firefighting operations during the construction phase. The London training package could be used as the basis for the operational element of this work.

Incident analysis

In order to raise the levels of awareness and the extent and outcomes of fires in ICPT buildings it is further recommend that all fires in such buildings of 4 storeys or above and / or have a total floor area over 2500m2 should be reported to CLG as a Fire Of Special Interest (FOSI) and to the Fire Protection Association in order to continue the research work previously undertaken into fires involving TF and other ICPT projects. Due to the absence of a historical database for fires in TF buildings the group recommend the creation of a database to capture real fire incident information. It is imperative that all FRSs contribute to it.

Completed ICPT/ Timber Frame buildings

Fire spread within the structure

It is recommended that further research should be carried out in order to:

Identify and quantify common failures in construction and fire protection in completed buildings.

Assess the effectiveness of current methods of fire stopping and products for preventing fire and smoke spread in cavities.

Evaluate whether or not an apparent systemic failure of fire protection measures identified in recent incidents is associated with insufficient regulatory control or inspection regimes, materials employed or workmanship and, based on the outcomes of that work, to review guidance, control measures and sanctions available to prevent reoccurrence.

That investigation be undertaken into the feasibility of a marking scheme for firefighters to alert them to the use of ICPT/TF construction.

Resilience of ICPT/TF buildings

It is recommended that consideration be given to further research into the concerns relating to the resilience of TF buildings and in particular the possibility for passive fire protection measures being compromised. In addition it is recommended that the recommendations within this report are cross-referenced with those in the recently

produced document from CLG entitled “Innovative Construction Products and Techniques” (January 2008).

Fire procedures in completed TF buildings

It is recommended that:

i Research should be carried out into the suitability of the ‘defend in place’ strategy for large TF buildings.

ii Research should explore alternative (practical) strategies if appropriate.

iii The potential risks associated with the ‘defend in place’ strategy for large TF buildings should be included in guidance for the fire service.

FS009 British Precast Concrete Federation

Dear Ms Beer,
1 March 2010
I am writing on behalf of my members in response to your call for evidence to the investigation into fire safety in tall and timber-framed buildings in London, British Precast Concrete Federation represents the precast concrete and masonry products industry in the UK
We welcome the Assembly investigation as long overdue, There is a very serious problem - one that was epitomised by the Peckham fire that triggered the investigation, There has been a problem apparent to us since high-rise timber-frame development started a decade ago,
There has been a plethora of fires since then, The lack of consequent Government interest has been appalling, In the attached Building magazine article of July 2002, Mostyn Bulloch, a fire speCialist from Chiltern International Fire part of the timber body TRADA, Is quoted as saying "There is another World in Action programme waiting to happen. What if one ofthese student blocks went up and people died 7. These places are death traps." That last comment, made at a Government sponsored meeting, was never withdrawn as far as we can discover. Yet the warning went unheard and construction of such structures carried on, and grew, fuelled by Government support for timber-frame construction regardless of consequence.
Even the catastrophic fire at Colindale in 2006, documented in the second attached article, failed to gain Government attention. By common consent that fire could easily have taken lives in the adjacent student accommodation blocks at a different time of day.
From our viewpoint the continuing use of subsidised, imported high-rise timber -frame has distorted the market and has unfairly taken business and jobs away from my members products and systems. We would like a level playing field in every aspect of design and procurement. Competing against flammable, and therefore unsustainable, building systems has worked against our range of fireproof products and systems.
You ask about trends. Timber-frame housing is falling back in market share from 27% to 18% in the last 9 months, partly because the ABI has woken up at last and realised the extent of losses and risk, We expect that trend to continue but the risks remain as the Peckham area has twice seen. Consequently we urge a ban on timber-frame high rise in urban areas until risk can be eliminated. Colindale and Peckham showed that the lessons of Pudding Lane nearly 350 years ago have not been learned.
To assist the investigation we have assembled the attached file of documents and multi-storey fire reports that have appeared in the press. I would stress that as a small organisation we are not able to monitor all reports - in particular we have understated the regular arson-related fires in Scotland. We have Included a series of reports from Ireland where there have been many fires including those featuring spreads through cavities and roof spaces.
Included in the file are two important reports from Professor Ulrich Schneider of Austria and we commend them to the Committee.

(Attachment: Report)

FS010 Civil Engineering Contractors Association (CECA)

Dear Madam,

I refer to your letter to the Civil Engineering Contractors Association dated 8 February 2010 regard the above consultation.

As CECA is not involved in buildings as such I feel that, on this occasion, CECA will decline to comment.

CECA represents civil engineering contractors and our area of remit is infrastructure works and not buildings and I feel that comments should be restricted to those with the appropriate expertise in this area.. However, CECA would be delighted to receive further consultations relevant to our remit and I hope you will bear this in mind for the future.

For your records could you please note CECA's change of address as indicated below.

Many thanks for your attention to this matter.

LONDON FIRE BRIGADE

Evidence for GLA Planning and Housing Committee: **Fire safety in London's residential buildings**

5 March 2010

Contents

Background

1. The Planning and Housing Committee is reviewing fire safety and building regulations, planning policies, construction codes and other guidance to assess their robustness. The review will concentrate on residential buildings in London, covering the distinctive fire safety aspects of both tall buildings that are already occupied and timber-framed buildings, particularly during the construction phase.

2. The terms of reference for the investigation are:

    - To identify existing planning policies and guidance as well as current regulations applicable to tall and timber framed buildings in London, for buildings under construction and subsequent occupation.
    - To determine how effective building and fire safety regulations, together with the London Plan and other guidance, are in reducing the risk of and number of fire incidents in tall and timber framed buildings in London.
    - To establish what the Mayor and Government can do through the London Plan and other guidance to address the issues and if amendments to current London-wide and national regulations are required.

3. This submission sets out the comments and views of officers of the London Fire Brigade, in response to the questions which have been provided by the Committee. It has not been approved by the governing body for the London Fire Brigade, which is the London Fire and Emergency Planning Authority.

Question 1: Are there any estimates for the likely increase in numbers or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?

4. The LFB does not have any specific estimates for the increase in numbers, or general trends for construction of either tall or timber framed residential buildings in London over the next 10 years. For its own planning purposes, the Brigade relies upon the information published in the Mayors Housing Strategy and the GLA's 2008 London Strategic Housing Market Assessment (SHMA).

5. Separate data from the UK Timber Frame Association indicates the likelihood of an increasing market share for timber frame housing. This is largely due to it being seen as a sustainable form of construction, with advantages such as speed, lighter foundation and ease of prefabrication.

6. As the need for affordable housing in London remains high, it is hard to predict what proportion of new build housing may be high rise. What seems clear from the available predictions is that to enable the various targets to be met there is likely to be a greater number of both tall and timber framed constructions being built and the issues associated with these types of premises will manifest themselves on a greater scale.

Question 2: Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?

7. Details of all primary fires[1] (and al other incidents) are collected by the Brigade via its Incident Management System (IMS) (see Appendix 1 for the relevant input screens). These collection arrangements generally follow the requirements of the government's national Incident Recording System (IRS). In 2009 there where 7,060 fires in residential dwellings in London. Of these, 13 percent (943 fires) happened on the third floor or above of the building and 1.3 percent (92 fires) happened on the tenth floor or above of the building. While the reporting system captures the type of buildings involved in fire and information regarding the severity and cause of fire, not all of the many variables involved in each incident are recorded. For example, the Brigade does not routinely record building construction details and materials. However, as can be seen from Appendix 1, the recording arrangements include a facility to note 'special method of building construction involved' which can record, amongst other things, timber-framed construction. However, of 197 records for 2009 where timber-framed construction was identified and recorded, about one third of these were garden sheds. From time to time, the Brigade publishes topic reports on aspects of our work and at Appendix 2 is a copy of a recent report on long term fire trends.

8. When mobilising to emergency incidents, the Brigade 'tags' each call with the likely type of incident and, since 2007, potential fires in high-rise buildings have been specifically tagged (where it is clear from the caller that it is a high-rise building). The tagging has been more about the resources to be deployed to the incident than a robust means of identifying all such fires and the tagging is not a wholly reliable indication of the number of fires in tall buildings (i.e. tall building fires may not be tagged in this way, and some may be tagged in error). However, in 2009/10 (to date) there has been an average of 58 such calls a month compared to 49 a month in 2007/08. This increase cannot necessarily be attributed to a greater number of potential fires in tall buildings and may simply reflect greater use of the code when tagging calls. Not all such calls turn out to be a fire. Since 2007 approximately one third (34 per cent) of such calls were recorded as a primary (or serious) fires, with a further 13 per cent as a secondary (or smaller) fires. The remainder are false alarms.

Question 3: How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?

9. In general, any new building (or material change to an existing building) in London is subject to application for building control approval. This may be made to the local borough but often for housing, is made to an approved inspector. Statutory undertakers however (e.g. Network Rail, utility companies and London Underground Ltd) are exempt from Building Regulations and do not have to seek any authorisation or consult with us.

10. Regardless of the detail of who is providing building control services, if the Regulatory Reform (Fire Safety) Order 2005 (Fire Safety Order) will apply when the building is completed, a statutory

[1] A primary fire is a fire in a building, vehicle or most outdoor structures (which is not derelict). A primary fire is also any fire attended by five or more pumping appliances at any type of property or any fire where there are fatalities, injuries or rescues.

consultation must take place between the building control body and the Brigade. This will include all tall buildings but not housing occupied as single private dwellings which have no common / shared parts such as corridors or stairs.

11. Although the building control bodies are responsible for a range of matters, they are only required to consult with the Brigade over fire safety matters (and then generally only those matters over which the Fire Safety Order will have some force – typically means of escape). Traditionally, this consultation will not indicate the construction materials involved. However, recent work has been completed to request this information from local authority building control offices at the time of the consultation (the Committee may wish to note that Croydon Council have expressed an interest in piloting more formal information sharing arrangements, which it is intended to discuss further with them). It is a more complex matter to obtain this information from other approved inspectors and this will be discussed with representative bodies.

12. With regard to construction of new timber frame buildings, since the identification of this type of construction as a potential risk we have implemented a range of measures to mitigate this within the London area. We have been working to identify the location of all timber framed building sites in London in order to allow us to proactively work with owners and operators of these sites and to pre plan for the safety of those who may be affected if a fire occurred. To this end we have contacted the HSE, all Local Authority Building Control bodies and Approved Inspectors for this information and now have a comprehensive register of 140 sites and their location. Once obtained, information about such sites is then disseminated to our operational crews and fire safety teams for pre incident planning and regulatory purposes.

Question 4: Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?

13. Building Control Bodies (BCB) are responsible for ensuring relevant guidance on materials and construction is followed during the construction phase of a building and the HSE are responsible for the overall fire safety management of the premises during this phase.

14. Upon completion, all buildings other than private dwellings fall under the jurisdiction of the local fire and rescue authority who are responsible for ensuring the building complies with the provisions of the Fire Safety Order

15. Unlike most other premises, tall residential blocks of flats and other premises containing more than one dwelling are subject to two separate legislative fire safety regimes. Domestic premises of these types are the only class of premises to be routinely subject to two regimes in this way. Our experience is that this can be confusing for those who try to understand "who does what".

16. The principle means of regulation and control for residential property, including high rise blocks, are the Housing Acts 1985 and 2004. These Acts make Housing Authorities specifically responsible for keeping the condition of all housing in their area, including their own housing stock, under review and for checking all aspects of health and safety, including fire safety. The legal duty on local Housing Authorities applies in respect of the whole building including the private living accommodation (i.e. the individual flats).

17. The second regime that applies is the Fire Safety Order. This applies to virtually all premises including offices and shops, premises that provide care, pubs and clubs, schools, hospitals, hotels, shops, factories etc. It does not apply to individual, domestic premises occupied by a single family group (i.e. houses and flats), but does apply to the parts of blocks of flats that are used in common by the occupants of more than one dwelling in the premises. This includes common staircases, corridors, structure and services.

Question 5: What are the specific fire risks associated with timber framed buildings under construction?

Timber framed buildings under construction

18. A major risk associated with timber framed buildings during the construction phase is that fire spread is likely to be extremely rapid and the unprotected structure is liable to early collapse, posing a hazard particularly to the safety of construction workers.

19. High levels of radiated heat are likely, constituting a hazard to members of the public and to firefighters (and equipment), with the possibility of offsite fire spread to adjacent structures. The intense radiant heat flux can make nearby fire hydrants inaccessible and make it extremely difficult for firefighters to approach sufficiently close to the fire to commence firefighting. In all likelihood, once the fire has established itself, firefighting action is unlikely to be effective.

20. Evidence relating to a number of fires in large timber framed buildings under construction indicates that in all likelihood once the fire is established, firefighting tactics are likely to be defensive e.g. from the outside of the structure. Attempting to enter an unprotected timber frame structure in a fire should be considered an extremely hazardous action in any circumstances.

Partial occupation of timber framed developments

21. Commercial pressures may lead a developer to consider pursuing partial occupation of a development before it is wholly complete (such as the Colindale development).

22. Because of the intensity of the fires in timber framed buildings under construction, the extent of the fire in the incomplete parts of the development present a serious risk of compromising the effectiveness of fire safety, in particular the passive fire protection measures, in the completed section of the building.

Completed timber frame structures

23. In completed buildings generally, key risks tend to relate to unseen or uncontrolled spread of fire and smoke through voids such as the wall structure, where inadequate general fire precautions have been built into the structure (or those which were in place have not been adequately maintained).

24. In the case of timber framed structures this can lead to fire spreading to the roof and other parts of the building and can result in early structural collapse. In other buildings of traditional construction, fire and smoke can travel to other flats and/or block the means of escape from the premises.

Question 6: Do current regulations sufficiently control fire spread/external fire spread (both during construction and after completion)?

25. Where buildings are constructed of traditional, predominantly non-combustible materials, the radiant heat flux from a fire is likely to be relatively low. However in the case of timber frame construction, prior to fire resistant protection being added, the potential radiant heat flux can be massive and can endanger surrounding buildings.

26. The Building Regulations restrict the materials that can be used on the external walls of tall buildings in order to reduce external fire spread and require that finished buildings are adequately space separated to prevent fire spread from one building to another by radiant heat flux. This requirement clearly does not apply to buildings under construction.

27. Currently the main thrust of risk management, as applied by others, seems to be to minimise ignition sources and "manage the hazard". However, risk is a combination of likelihood and consequence and our view is that the former is more addressed than the latter. It is accepted that this is not an easy problem to resolve, but it does raise questions about the suitability of large, relatively high, timber frame construction on brown field sites where existing adjacent buildings are in close proximity.

Question 7: What risks do other materials and construction methods pose in comparison?

28. In order to meet the challenging requirements of the modern built environment many new Innovative Construction Products and Techniques (ICPT) are being developed. As with all construction methods, it is necessary to ensure that innovation does not have a detrimental impact on safety. Whilst there is the potential for ICPT to be used in all buildings, they are probably most prevalent in the residential sector.

29. The main forms of ICPT used for residential buildings include:

- **Light steel frame** – this includes frames constructed using sticks, panels and modules using light gauge (cold-formed) galvanised steel.
- **Steel frame** – construction using hot-rolled steel components. 'Traditionally' used in commercial applications but now increasingly used for apartment buildings when height exceeds say, six storeys.
- **Timber frame. –** This includes on-site and off-site systems.
- **Structural insulated panel systems (SIPS).**

30. Whilst the list is not exhaustive, there are some primary concerns from a firefighting and fire safety aspect:

- Innovative structural forms sometimes "mimic" traditional construction and the Brigade may not be aware of the nature of the building and the key structural elements.
- The increasing use of polymeric materials in building construction. The reduced fire performance of some polymeric materials can provide a route for fire to spread by bypassing cavity barriers or fire stopping measures. This issue is relevant to external walls, cladding systems, internal walls and cavities between floors.
- Some forms of construction are particularly vulnerable to the effects of a fire during construction, especially where light framing systems rely on applied fire protection. These are often not fixed until the entire frame has been erected, thereby remaining completely unprotected for a period of time.
- Solid timber joists are increasingly being replaced by engineered wood products, which are lighter and stiffer than solid timber. Deep joists can be produced allowing much larger distances to be spanned without the need for intermediate structural support. There are concerns that once involved in fire these engineered wood products will fail more quickly than traditional forms of construction.

31. These issues and many others have been identified in a Building Research Establishment report which identifies a need for urgent research to establish effective strategies for dealing with the use of ICPT (http://www.communities.gov.uk/documents/planningandbuilding/doc/650698.doc).

32. Effective planning processes, building control awareness, good site management and high standards of workmanship will go some way to counter the problems envisaged. A pro-active stance by the Brigade, working with the HSE and Building Control Bodies is ongoing.

Question 8: What are the specific risks associated with both tall and timber framed buildings residential buildings that are occupied?

33. As with all buildings, the specific risks associated with occupancy are ensuring that the ongoing management of the premises, including fire safety management, is understood, effective and well communicated.

34. In tall residential blocks the requirements of both the Housing Act and the Fire Safety Order should ensure that risks to tenants are either eliminated or minimised through the Risk Assessment process and that effective management regimes are in place. These should include clear, unambiguous information and instructions to residents regarding the do's and don'ts of good fire safety management, coupled with effective policing of fire safety practises.

35. At Appendix 3, Members of the Committee will find an overview of some of the key issues which have recently been raised with the Brigade. Members will see that the fire safety regime is not completely straight-forward and that the potential scale of the task involved is great.

Question 9: What can compromise fire safety post construction?

36. Over time, the lack of consistent and well maintained fire safety management of the building will compromise safety. Defective fire alarm systems, poor maintenance of lifts and smoke stop doors, lack of signage are all examples of poor fire safety management and will play a part in an unsafe building. Where alterations and refurbishments take place they are planned in accordance with the way the building is designed to perform in a fire and that appropriate materials are used. All alterations and improvements must be subject to proper approvals process and signoff.

37. The additional risks presented with the occupancy of timber framed buildings is that internal alterations are easier to achieve and therefore greater care needs to be taken by responsible persons to ensure the internal integrity of flame and fire stopping is not compromised by unapproved actions.

Question 10: How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?

Building regulations

38. The Building regulations for fire are supported by an approved code of practice (Approved Document B (ADB)). These are updated relatively infrequently (the next CLG review not due until 2013) and the changes are generally iterative and not wide ranging. A recent example of this was to include sprinklers in +30m residential buildings. To some extent they lag behind current trends – e.g. open plan flats are not generally allowed under ADB but many are currently being proposed and built using alternative solutions to meet the functional requirements of the Building Regulations.

Fire safety codes

10.2 These are many and varied, ranging from prescriptive to risk based codes to fully engineered solutions. The move to harmonised European codes is ongoing.

Fire risk assessments

39. Risk assessments for fire were originally introduced by the Fire Precautions (Workplace) Regulations 1997 and extended by Regulatory Reform (Fire Safety) Order to most buildings in 2006. Single private dwellings or individual flats within blocks are however excluded (corridors and stairs etc are covered).

40. The scope and application of this relatively new legislation is being influenced by the Courts and this is evidenced by some of the judgements that have been passed since the introduction of the Order. It places direct significance on the introduction of preventative measures and protective measures to deal with remaining risk to protect people from death or injury in the event of fire. Difficulties have been highlighted in blocks of flats where, for example, the duty to ensure appropriate general fire precautions are in place rests with the landlord but the front doors to flats (which should be fire resisting) in order to protect the means of escape) have become the property of the owner/lessee of the flat who chooses to change the door to a non fire resisting one.

41. Questions have also risen more recently regarding:

- what constitutes a "suitable and sufficient" fire risk assessment as 'suitable and sufficient" is not defined term in the Fire Safety Order;
- how competency to carry out a fire risk assessment can be determined by a responsible person who is seeking to appoint a third party to carry out fire risk assessments for them; and
- what constitutes a simple or complex building (and so determines whether the responsible person may be able to carry out a fire risk assessment themselves (in house) or will need to appoint an expert).

Question 11: What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied?

42. With the introduction of the Regulatory Reform (Fire Safety) Order residential buildings are now subject to the responsibility of the fire authority who are responsible for ensuring compliance in the common areas.

43. The CLG conducted a review of how the Fire Safety Order is bedding which concludes that overall it is bedding in well but which also highlighted a number of issues raised in this report. The document can be found at: http://www.communities.gov.uk/publications/fire/regulatoryreformorder.

44. For construction sites the Fire Safety Order is enforced by the HSE although anecdotally the Order has had little impact on fire safety on construction sites.

Question 12: What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?

45. For tall buildings, there appears to be a need for better communication to all sectors including landlords and housing authorities regarding their responsibilities for the fire safety of residents under both the Fire Safety Order and the Housing Act. We would anticipate that CLG will seek to address the issues raised in their initial evaluation of the Fire Safety Order and that further guidance will be forthcoming once more detail of fires that have occurred can be released. This may well lead to changes to the Building Regulations Approved Code of Practice as well as guidance to support the Fire Safety Order.

46. As for timber framed buildings, the risk of fire spread by radiant heat flux does not appear to have been a significant consideration for designers or contactors although it should be considered in any fire risk assessment for the site under Article 9 of the Fire Safety Order. Arguably further measures could be

47. taken by HSE either under CDM Regulations or the Fire Safety Order to enforce this requirement on sites that are notified to them under CDM requirements. The timber frame industry is always likely to direct efforts to managing the problem rather than tackling the consequences. Clearly fire prevention is the first step but not the only one given that there is always a risk that a fire will occur. Proposed protective measures to date have been predicated on adding fire barriers during construction to reduce the potential fire load provided by the incomplete timber frame. However even if the integrity of such barriers could be maintained, the likely heat flux is still likely to be substantial and probably ineffective for a city site overlooked by adjacent buildings. A solution not yet fully explored is to treat the timber frame with a fire retardant material.

Question 14: What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?

Tall buildings

48. Statistically the likelihood of fire occurring is related to building size, building use and the nature of the occupancy of individual dwellings. In the absence of prescriptive legislative requirements to control fire risk within occupied private dwellings continued audits under the Fire Safety Order for the common parts by the fire authority and a sharper focus on ensuing Housing Authorities carry out their Housing Act responsibilities are needed. On the people side better engagement with residents needs to occur in order that they understand the fire safety elements of their building and take ownership and responsibility for ensuring it is actioned. Fire and rescue authorities seek to achieve this through community fire safety work such as Home Fire Safety Visits.

Timber frame buildings during construction

49. Explore the use of fire retardants or preclude or limit development in congested areas where the risk to adjacent premises is high. Taking into account sustainability issues a formula could be developed based on space separation to guide prospective planning applications.

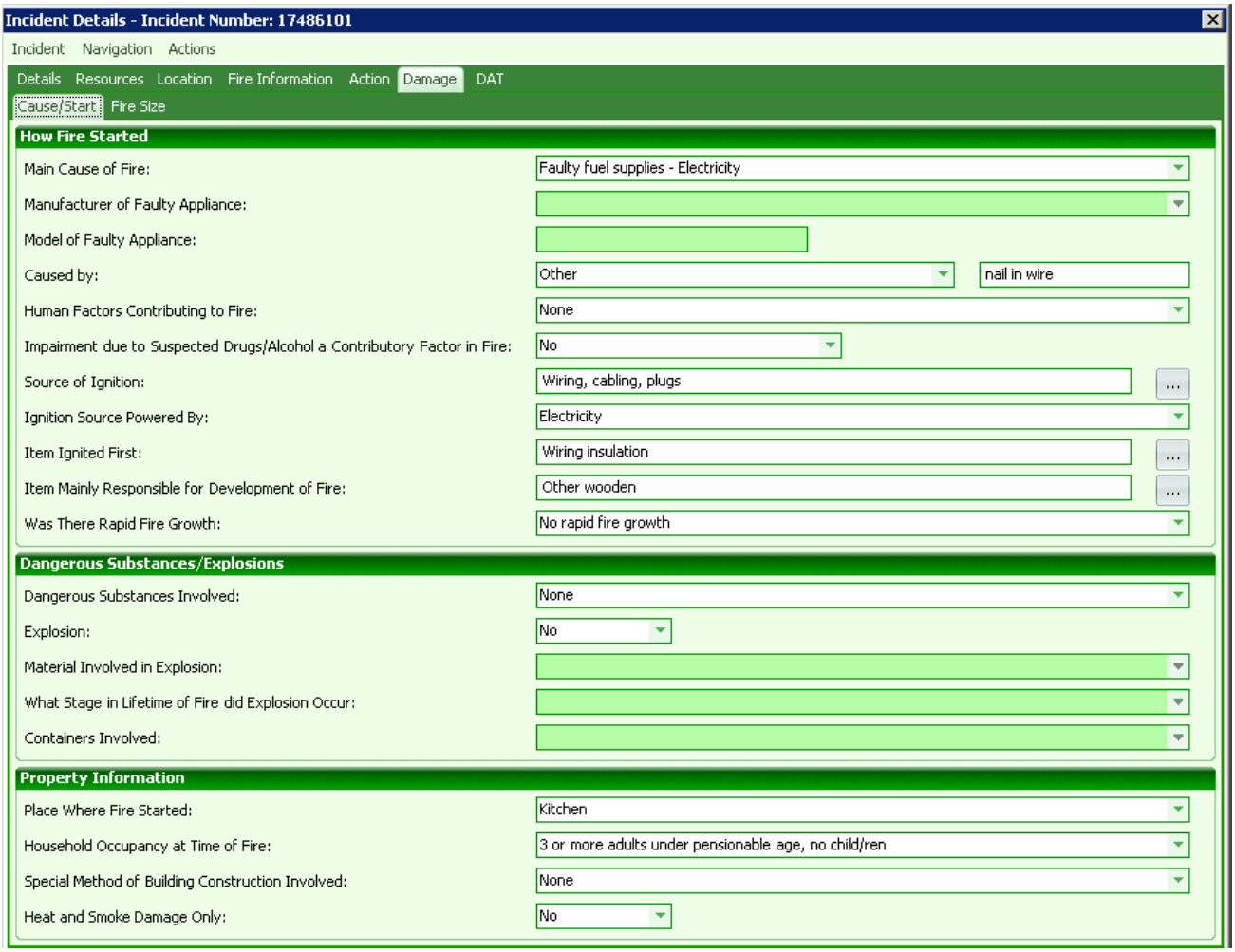
Question 15: Do you have any other comments that may be useful to the investigation?

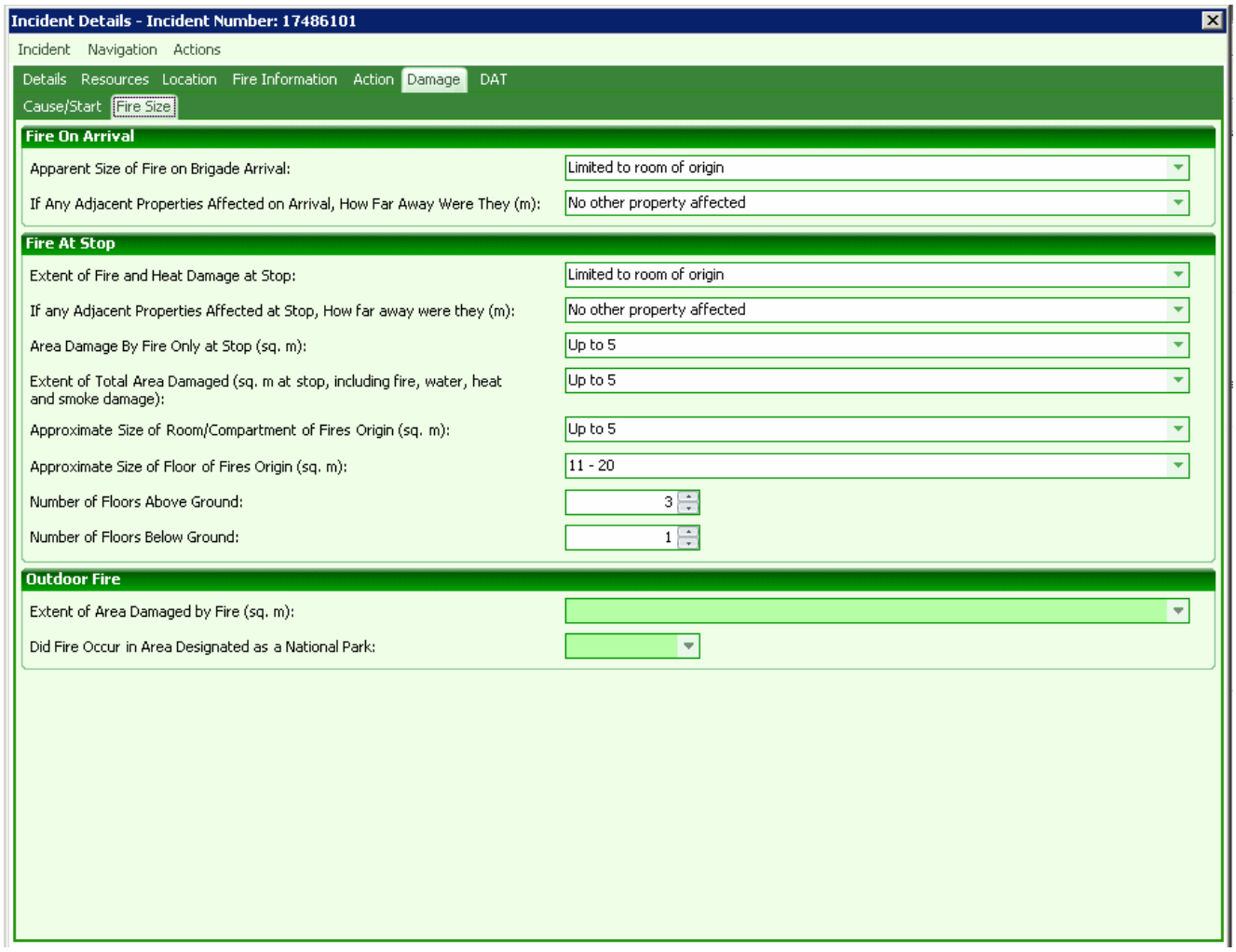
50. LFEPA seeks to promote the use of sprinkler systems, on a risk appropriate basis, as an effective means of controlling and reducing fire risk. This includes promoting sprinklers in major new housing developments such as the Olympic village which will, in part, become social housing after 2012. Consideration of the benefits that sprinkler systems can bring in tall and/or timber framed buildings during construction and post occupation may be a useful area for the Scrutiny Committee to explore.

51. Throughout this document we have stressed the many risks which present themselves to firefighters when attempting to control, extinguish and contain fires in timber framed buildings (and affected surrounding buildings). LFB officers hope to have an opportunity to share with the Committee some of the particular training interventions we have developed to assist our fire crews and senior operational officers. We are sure that seeing these will greatly enhance the understanding of Committee members of some of the issues we have discussed in this submission. The main training package called 'Modern Methods of Construction' (Appendix 4) has been developed specifically to respond to the risks posed by fires in timber-framed construction and has also been picked up nationally, by the government's Chief Fire and Rescue Advisor and is being used by many other brigades in the country. A second training package entitled 'Signs and Symptoms of Collapse', has also been developed specifically relating to our experience in this area of firefighting operations (Appendix 5).

52. It is also apposite to mention that developing the relevant training interventions for timber framed buildings and for other innovative and novel construction methodologies is only the front end of the training task presented to the Brigade. It is risk critical that the training packages are made available to all staff, in a highly structured and variable fashion and this involves a minimum of 452 business units (watches) and approximately 300 senior operational officers. This is a considerable challenge and expense for the Brigade and has only been achieved through the development of a computer based training (CBT) solution that allows all operational staff to access the training material via the Brigade's intranet.

Appendix 1: LFB Incident Recording System – building information captured




Incident Details - Incident Number: 17486101
Incident
Navigation
Actions
Details
Resources
Location
Fire Information
Action
Damage
DAT
Cause/Start
Fire Size
Fire On Arrival
Apparent Size of Fire on Brigade Arrival:
Limited to room of origin
If Any Adjacent Properties Affected on Arrival, How Far Away Were They (m):
No other property affected
Fire At Stop
Extent of Fire and Heat Damage at Stop:
Limited to room of origin
If any Adjacent Properties Affected at Stop, How far away were they (m):
No other property affected
Area Damage By Fire Only at Stop (sq. m):
Up to 5
Extent of Total Area Damaged (sq. m at stop, including fire, water, heat and smoke damage):
Up to 5
Approximate Size of Room/Compartment of Fires Origin (sq. m):
Up to 5
Approximate Size of Floor of Fires Origin (sq. m):
11 - 20
Number of Floors Above Ground:
3
Number of Floors Below Ground:
1
Outdoor Fire
Extent of Area Damaged by Fire (sq. m):
Did Fire Occur in Area Designated as a National Park:

Appendix 2: Topic report on long term fire trends

Long term fire trends for Greater London

*This **topic report** looks at the number of fires in London since the formal creation of the Greater London area in April 1965.*

Introduction

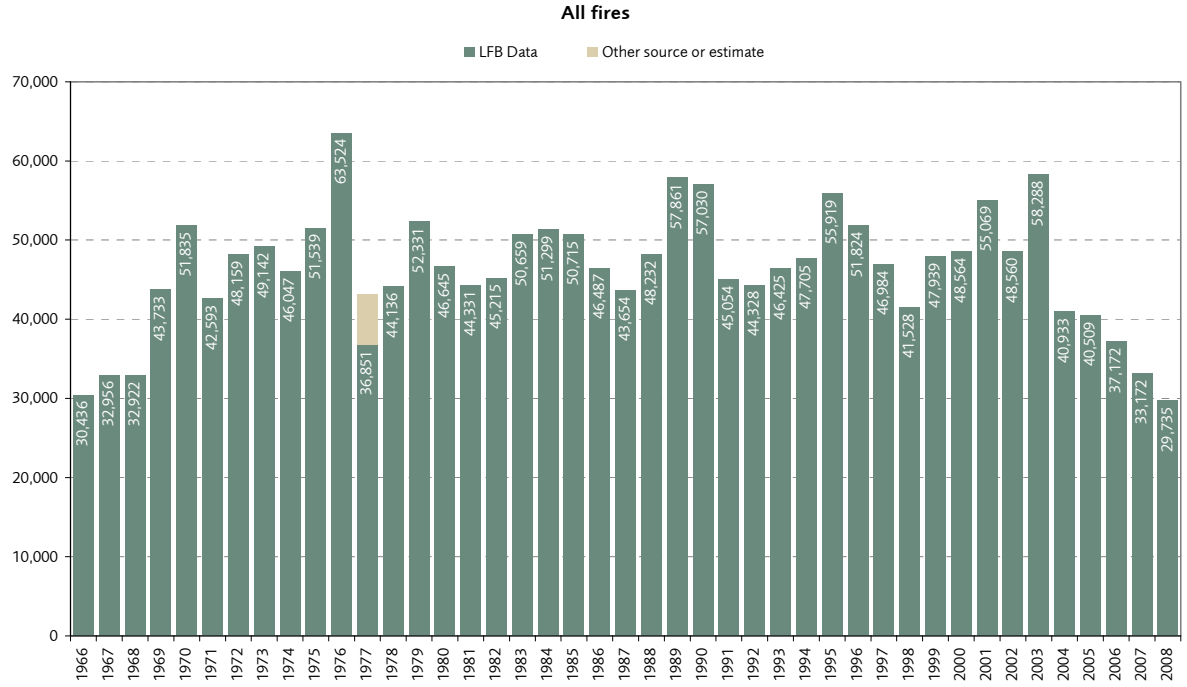
The Greater London area was formally defined and created by the London Government Act 1963, which came into force on 1 April 1965. This new area replaced the former administrative counties of Middlesex and London (London County Council), adding the City of London and absorbing parts of Kent, Surrey, Essex and Hertfordshire.

Greater London covers a geographic area of 1,579 km2 and in 1966 had an estimated resident population of 7.8 million people.

From 1966 to 1992 the Greater London Council (GLC) and then later the London Research Centre published 24 volumes of an "Annual Abstract of Greater London Statistics". This report uses those initial reports, together with a range of other sources, to compile a continuous time series of fire data from 1966 to the present. The data is presented in calendar years, and includes estimated data for periods where detailed records were not available.

All Fires

In compiling the time series of data for fires in Greater London the most complete data available has been that for the 'total number of fires'



The only gap in the series (where data has been approximated) is 1977 when, due to the national firefighters strike in November and December 1977, data was only recorded until the end of October of that year. There

was other industrial action during the mid 1970's[2] and further national fire strikes in 2002 and 2003[3], but during these periods data on the number of fires was collected.

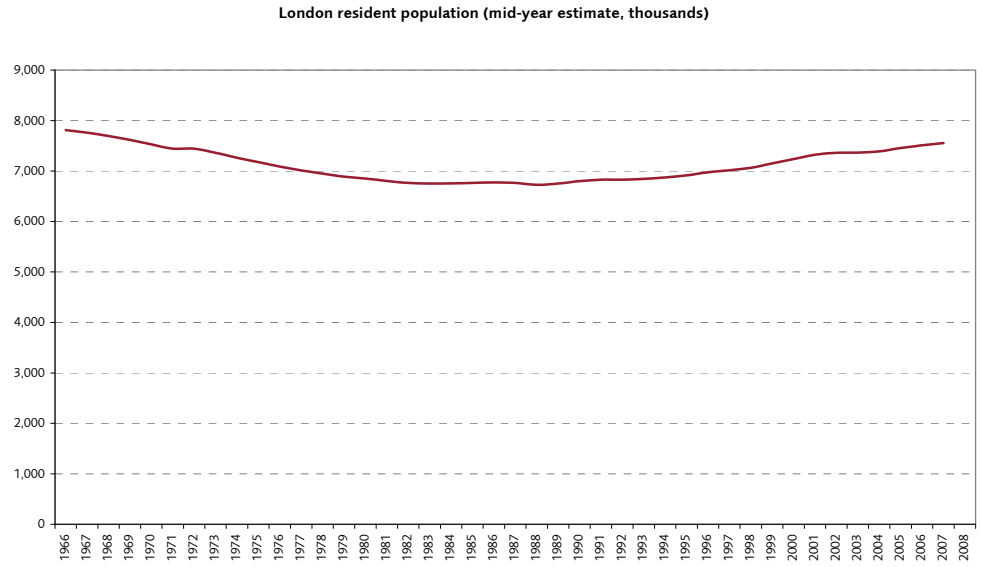
In 1966 the number of fires was 30,436 and the yearly total remained above 30,000 for 42 years until 2008 when the number reduced to 29,735.

For most of the past 42 years the total number of fires has fluctuated between 40,000 and 50,000 incidents. The years where the total number of fires exceeds 50,000 (and more than 60,000 in 1976) coincide with years with long dry spells and/or hot summers which cause many more grass fires.

While numbers have fluctuated, the downward trend of five years from 2003 to 2008 is the longest running continuous trend downward over the whole period.

Population

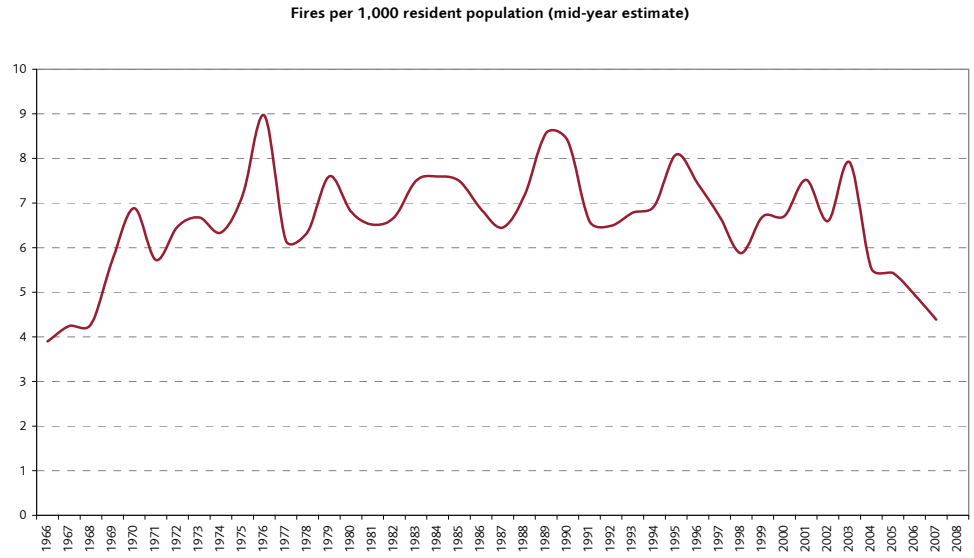
The peak of London's population is estimated to be around 8.6 million in 1939. In 1966 the population of Greater London was 7.8 million. That population declined to around 6.7 million in 1988 and has increased steadily since. By 2007 the estimated resident population was 7.5 million people. Population projections for 2026 estimate the population to rise to be between 8.3 and 8.6 million people.



The statistical relationship between the number of fires and the resident population is very weak (a correlation value of -0.2339). However, using population as a baseline shows that on average Londoners have experienced 6.6 fires per 1,000 resident population. At the end of 2007 the rate was 4.4 fires per 1,000 resident population. The rate of fires per population was slightly lower in 1966 than it was for 2008.

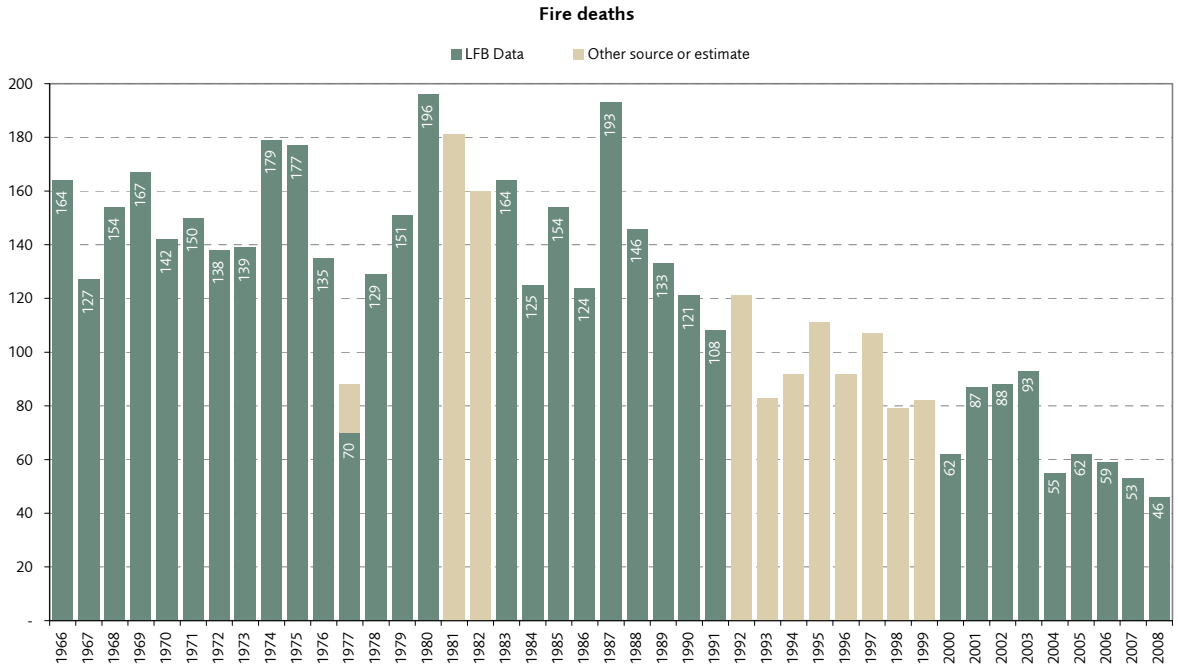
[2] 27 October - 13 November 1969; 28 September - 4 October and 16 December 1970 - 1 February 1971; 12-20 July 1972; 20 October - 20 November 1973; 27 February - 4 March, 14-20 March, 1-4 April, 1-2 May, 23-30 October, 17-18 December 1974; 12 May -17 august 1975 and at various times during 1976

[3] 13 November – 15 November and 22 November -29 November 2002; 21 January and 28 January – 29 January and 1 February – 2 February 2003.



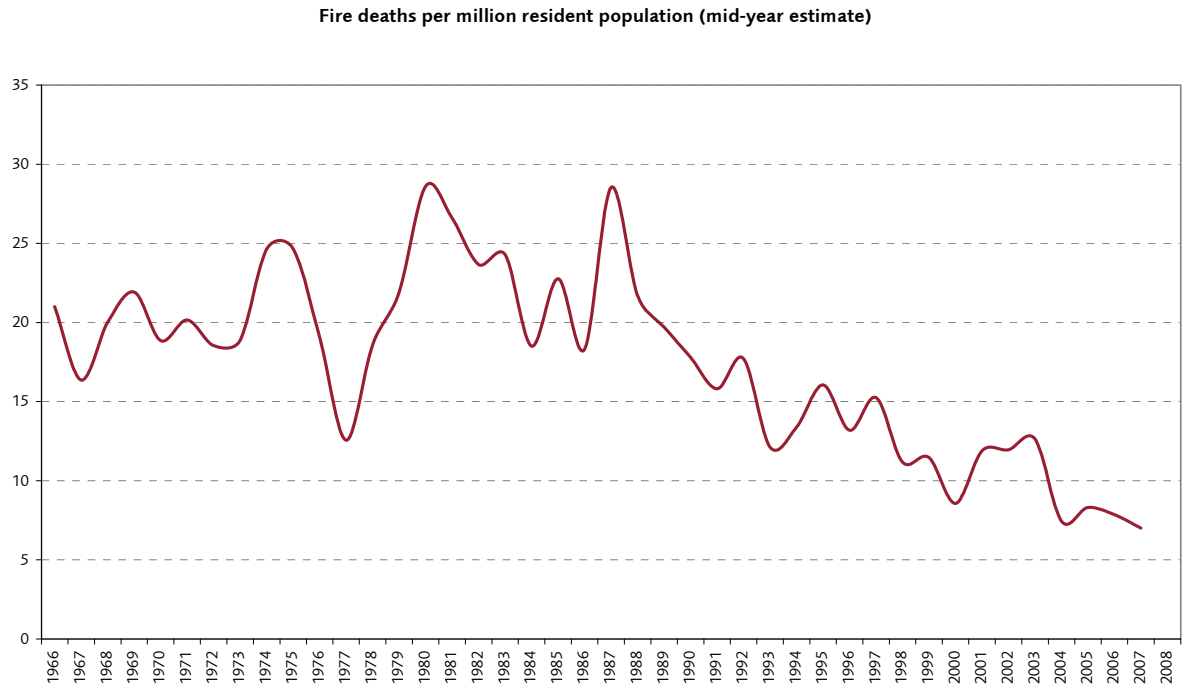
Fire deaths

The most fire deaths occurred in 1980 (196 fire deaths) and 1987 (193 fire deaths) and, with the exception of the strike year in 1977, fire deaths remained steadily above 120 deaths per year up until the 1990's. For more than 10 years fire deaths have been below 100 per year and in 2008 there were only 46 – which is more than 4 times lower than the peak in 1980.



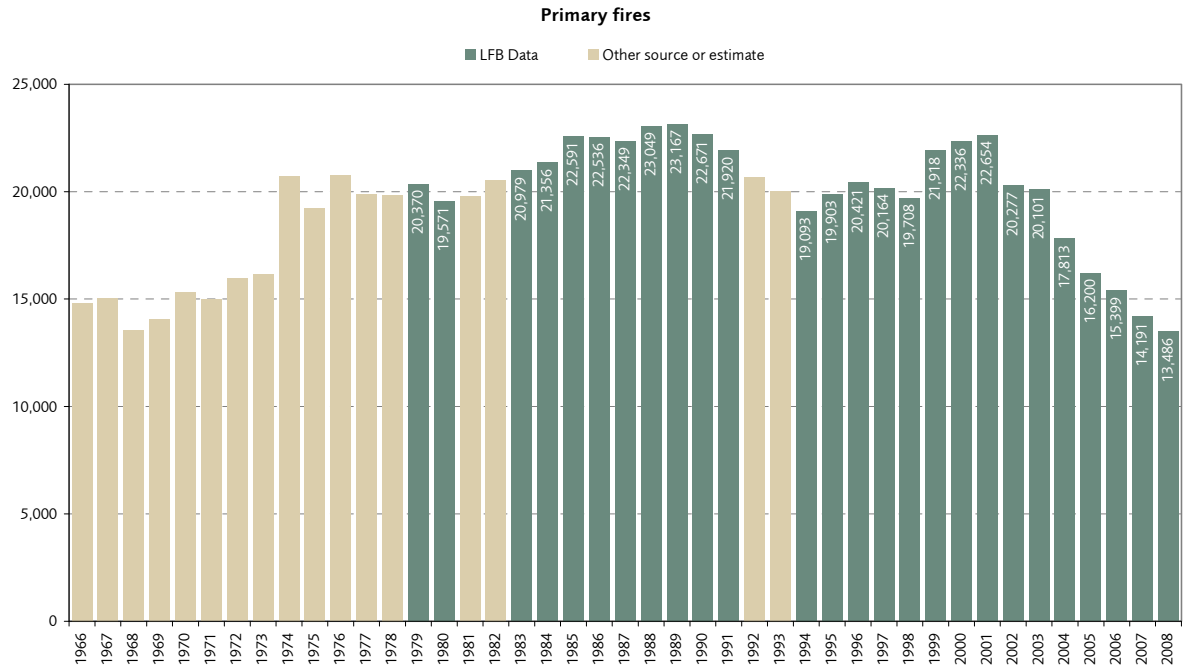
The rate of fire deaths per million people (resident population) also continues to fall. The rate is highest in 1981 (when the population was at its lowest) at around 28 fire deaths per million people whereas by 2008 the rate had reduced to only 7 fire deaths per million people[4].

[4] The national performance indicator NI49 calculates the rate of fire death per 100,000 population. The figures in this report are calculated per million population to make the chart easier to understand.



Primary fires

The classification of fires as either 'primary' or 'secondary' was introduced in 1977. Primary fires are broadly defined as fires in buildings, vehicles and outdoor structures or any fire involving casualties, rescues or fires attended by five or more appliances. From 1994 the definition was broadened to include the small number of fires where there is no fire damage but there was damage from heat or smoke.



The chart shows the number of primary fires since 1966. As the primary and secondary fire classification wasn't introduced until 1977, data for the period before is an approximation based on the current definition applied to the detailed data collected at the time.

On average primary fires fluctuate by less than 900 incidents per year. The numbers appear to increase from 1966 until the high of 1987 (23,167). A slight decrease occurs over the next five years, but this trend reverses until 2001, in which the third highest numbers of dwelling fires occurred (22,654).

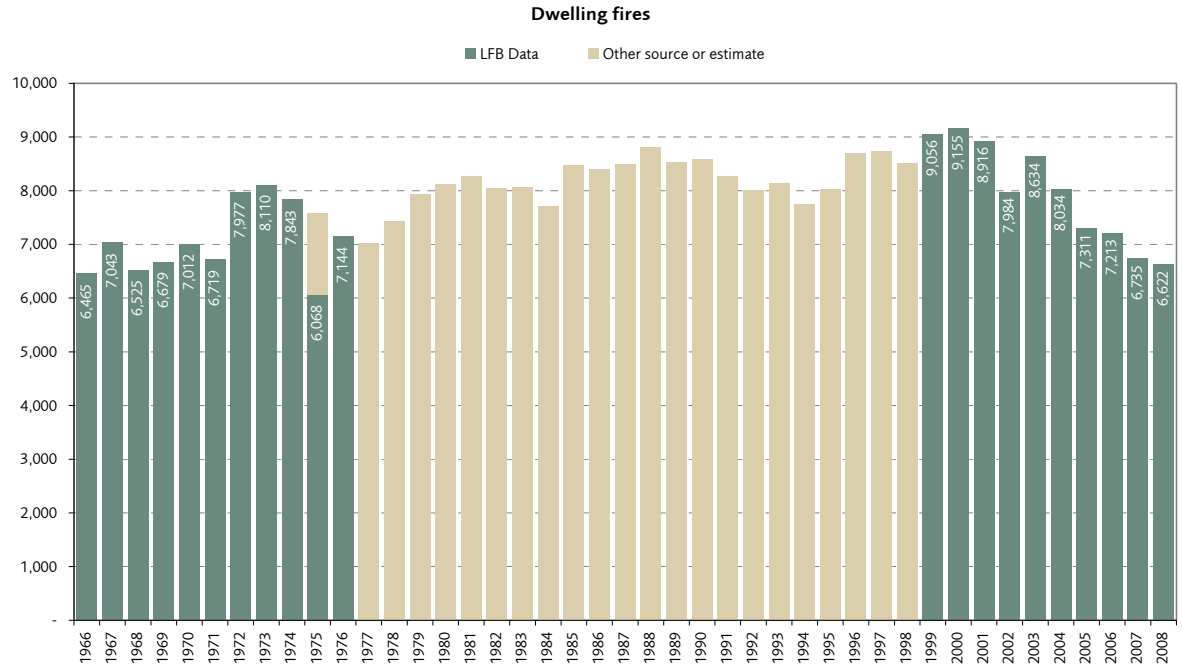
The longest sustained downward trend (seven years) starts in 2001with primary fires decreasing to their lowest levels at the end of 2008. This low mirrors the decrease seen with 'all fires'.

Dwelling fires

Most of the data for the numbers of dwelling fires – fires in houses, flats and other private households – come from those published by the Department for Communities and Local Government (CLG). This data, which is prepared by their fire statistics division, is based on a sample of data taken from Fire Damage Reports (FDR1) submitted by brigades. For London the sample included all incidents where there were fire casualties and a random sample of around 20 percent (1 in 5 FDR1 forms).

Over the period, dwelling fires have seen an average yearly fluctuation of 346 fires a year. The largest yearly change occurred in 1972 with an increase of 1,258 fires from 1971. The greatest number of dwelling fires occurred in 2000 with 9,155 fires.

The pattern of dwelling fires is very similar to that for primary fires with peaks around 1988 and 2000 (compared with 1989 and 2001 for primary fires). However, unlike primary fires, the decrease in dwelling fires recent years has yet to reduce below the levels of 1966.

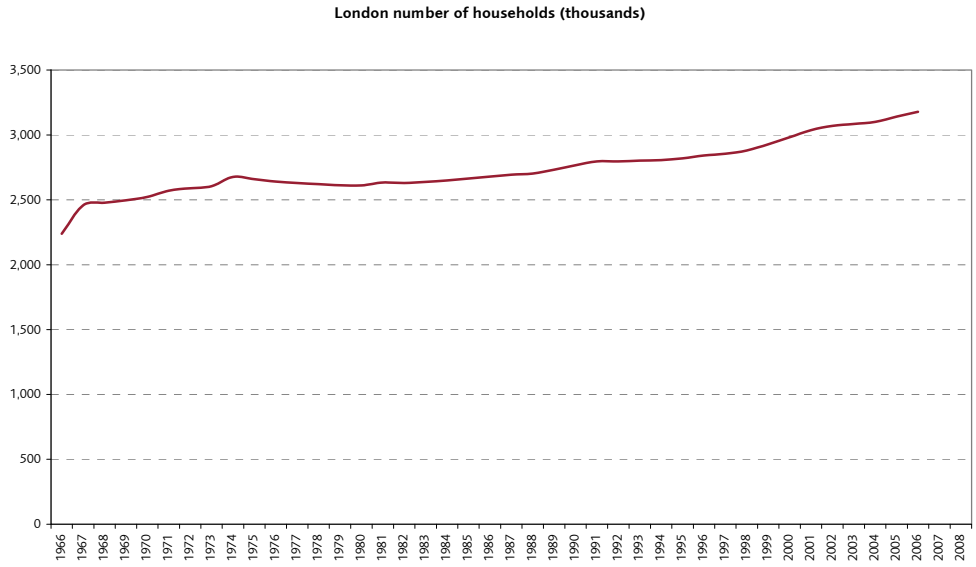


While the numbers of dwelling fires haven't yet reduced below the levels found in 1966, the rate of dwelling fires (per household) is at its lowest level.

Unlike population figures, the number of households in Greater London has steadily increased since 1966. In 1966 the number of households was around 2.2 million. By 2008 this had increased by almost one million homes to 3.1 million (a 42 percent increase).

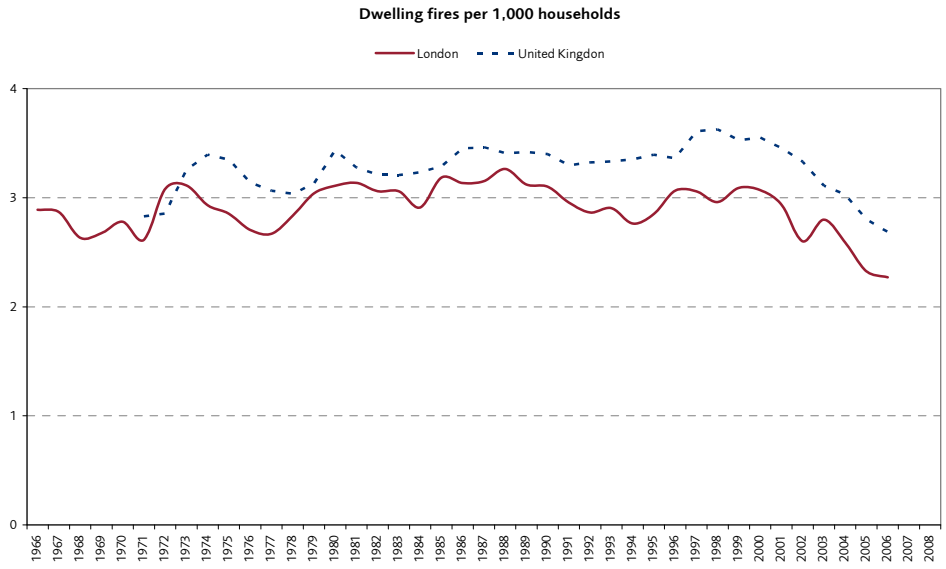
The General household Survey has documented the major changes in households, families and people which have occurred over the last 30 years. These include the decline in average household size and the growth in the proportion of the population who live alone, the increase in the proportion of families headed by a lone parent and in the percentage of people who are cohabiting.

In 1961 the average household size for the United Kingdom was 3.1 people per home. By 2000 this had reduced to 2.4 people per home[5].



As is the case with population figures and all fires, there is a weak link between the number of households and the number of dwelling fires (a correlation value of 0.2562).

However, comparing the rate of dwelling fires (the number of dwelling fires per 1,000 households) show that against the continuous increase in households, the number of dwelling fires has remained fairly constant at around 3 fires per 1,000 households.

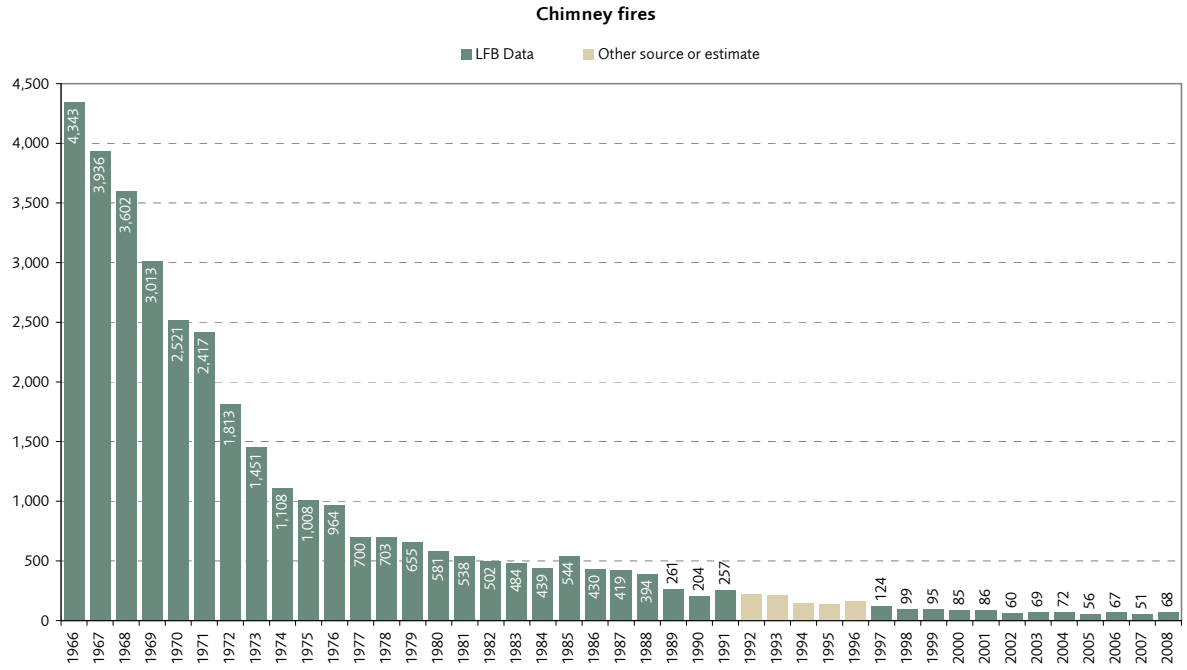


This compares favourably when compared with the figures for the whole of the United Kingdom as London has maintained a rate below the national rate since 1973. The rate of dwelling fires is lower in 2008 than at any other time since 1966.

[5] Source: Labour Force Survey ONS

Chimney fires

Back in 1966 fires in chimneys were very frequent, with more than 10 a day occurring in London. Due to the frequency of chimney fires at that time (and previous) these fires were recorded separately to all other fires and with very little detail. Between 1966 and 1974 chimney fires reduced at a rate of over 500 a year and by 1998 had dropped to below 100 (equivalent to one chimney fire every 3 to 4 days).



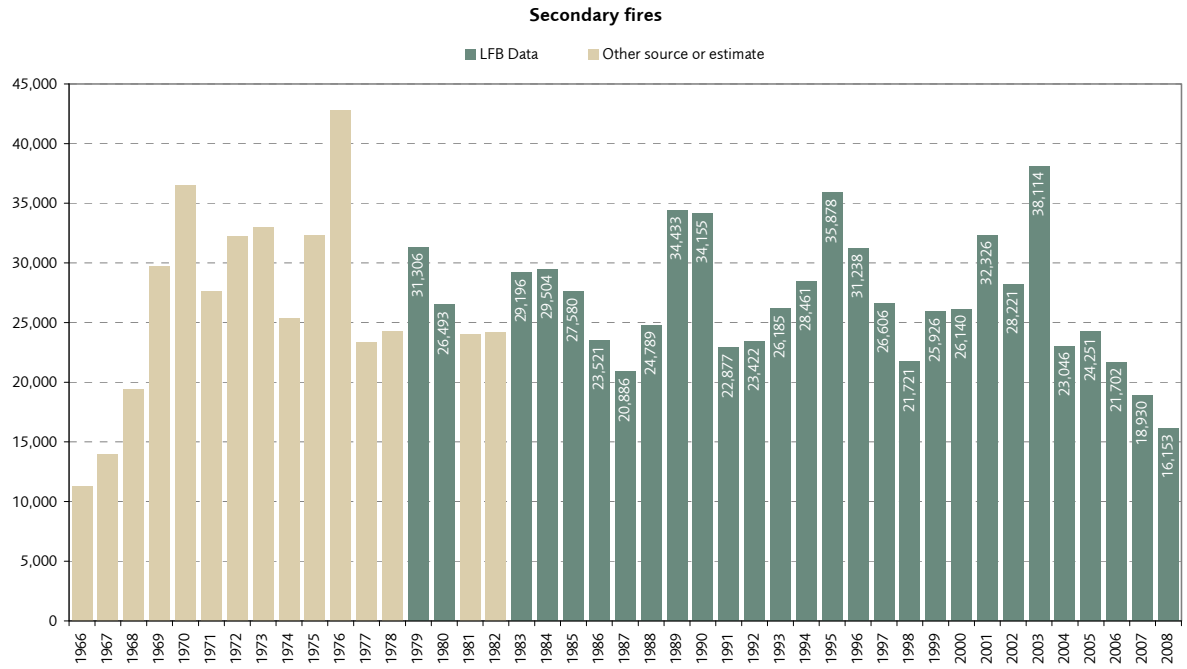
In the 1950's and 1960's open fires were a common means of household heating. However the air pollution from the use of coal and wood fuels caused smog – most notable of which was the 'Great London Smog of December 1952'. In response the Government introduced its first Clean Air Act in 1956. This Act aimed to control domestic sources of smoke pollution by introducing smokeless zones, where smokeless fuels had to be burnt. This requirement encouraged many households to change either to smokeless coals, but more significantly to gas or electric heating systems which are acknowledged to be the influence behind the dramatic decrease in chimney fires.

Secondary fires

Secondary fires have the most volatile trends of all the fire incident types. Secondary fires include fires in rubbish and open land and grass fires. Year-on-year changes are, on average, around 5,000 incidents per year but that change can be as great as 20,000 or less than 200.

The most secondary fires occurred in 1976 with 42,772 incidents (estimated figure as the secondary fire classification wasn't introduced until 1977). This is acknowledged as being due to the very dry and hot summer which led to a drought across the UK. Over 12,000 grass fires were recorded that year, but that figure could be higher as no details were recorded of the circumstances in which fires started during industrial action that year.

Dry summers feature elsewhere in the pattern of secondary fires with the summer heat-waves in 1995 and 2003 both causing in increase in secondary fires to above 35,000 in those years.



The high numbers of secondary fires in 1969 and 1970 were attributed to industrial action by refuse collectors during the periods 7 October - 8 November 1969 and 7 October - 19 November 1970. Rubbish fires in these years were 12,538 and 22,387 compared with only 6,671 in 1968.

For the most part, secondary fires have been above 20,000 incidents per year. As with the trend for all fires and for primary fires, secondary fires have been falling since 2005, although are not yet as low as the estimated levels for 1966 and 1967.

Conclusion

The main findings of this report are that;

- The number of all fires is lower at the end of 2008 (29,735) than at any other time during the existence of Greater London. This is less than half the greatest number of fires (63,524) which occurred in 1976.
- Since 2003 (which had the second highest number of fires), the number of fires have continuously reduced.
- London's population declined between 1966 and 1988 (from 7.8 million people to 6.7 million people) and has increased steadily since (to 7.5 million people in 2007).
- Fire deaths in 2008 (46) are more than four times lower than the high numbers in 1987 (193) and 1980 (196).
- The rate of fire death (deaths per million people) ranges from 28 (1981) to 7 (2007).
- Primary fires have continued to reduce since 2001.
- There has been an increase of almost one million households in London, yet the rate of dwelling fires has remained fairly constant (at around 3 dwelling fires per 1,000 households) and has been reducing since 2003.
- Chimney fires have reduced from more than ten a day to one chimney fire every three to four days.
- Year-on-year, secondary fires can change by as much as 20,000 incidents or as little as 200. On average secondary fires change by around 5,000 incident each year.
- High numbers of secondary fires coincide with years with long dry spells and/or hot summers which cause many more grass fires.

Appendix 3: Fire Safety in residential accommodation blocks

Background

1. Unlike most other premises, blocks of flats and other premises containing more than one dwelling are subject to two separate legislative fire safety regimes. Domestic premises of these types are the only class of premises to be routinely subject to two regimes in this way.

Relevant Legislation

2. The principle means of regulation and control for residential property, including high rise blocks are the Housing Acts 1985 and 2004. These Acts make housing authorities specifically responsible for keeping the condition of all housing in their area, including their own housing stock, under review and for checking all aspects of health and safety, including fire safety. The legal duty on local housing authorities applies in respect of the whole building including the private living accommodation (i.e. the individual flats).

3. The second regime that applies is the Regulatory Reform (Fire Safety) Order 2005 (the 'Fire Safety Order'). This applies to virtually all premises including offices and shops, premises that provide care, pubs and clubs, schools, hospitals, hotels, shops, factories etc. It does not apply to individual, domestic premises occupied by a single family group (i.e. houses and flats), but does apply to the *parts* of blocks of flats that are used in common by the occupants of more than one dwelling in the premises. This includes common staircases, corridors, structure and services.

Number of premises involved

4. Figures from the Valuation Office Agency (VOA) suggest that LFEPA has enforcement responsibilities for over 570,000 premises. Of these, it is estimated that up to 334,000 are premises where both the Housing Acts and the Fire Safety Order apply.

5. In addition to the above, there are an as yet unquantified number of premises of mixed commercial and residential use (e.g. shops and offices with flats above) and, we believe, unquantifiable examples of "informal" sleeping accommodation. For the flats over shops, the fire risk assessment for the commercial element must account for the safety of persons in the immediate vicinity (i.e. in the flats).

Enforcement method and responsibility

6. Under the Housing Act 2004, assessment of premises is by means of a housing health and safety rating system assessment of the premises. This assessment is made by the local authority. Guidance to local authorities from central Government is that these checks should be undertaken as part of the local authority's ongoing review of housing conditions in their area.

7. Under the Fire Safety Order, responsibility for compliance rests with the person (or body) that is responsible for premises being used (known as the 'responsible person'). The responsible person must undertake a fire risk assessment of the premises and implement appropriate preventative and protective measures (general fire precautions) in the light of the findings of the assessment.

8. LFEPA has a duty to enforce the Fire Safety Order. The purpose of the Authority's enforcement function is to ensure that preventative remedial action is taken to protect people and to secure compliance with the regulatory system. The term enforcement has a wide meaning and applies to all dealings between the Authority and those on whom the law places a duty.

9. The government guidance sets out the Secretary of State's expectations for enforcers of the Fire Safety Order and we are obliged to have due regard to it.

10. Consequently, LFEPA operates a risk based programme of premises audits which uses historic real fire data provided by the Department for Communities and Local Government to assist in the identification and targeting of premises that *potentially* pose the highest risk. The methodology used provides relative risk levels for different premises uses. For example, the relative risk to life of a fire in a residential care home where people sleep and also may have mobility or mental health problems is higher than the risk in an office where people are awake and the prevalence of people with mobility issues is usually much lower.

11. Identification and audit of premises is prioritised on the basis of the relative risks. Once audited, premises are given a risk score which takes into account the premises use, the quality of the general fire precautions measures in place and the management of the premises. Re-inspection/audit of premises is also prioritised on the basis of relative risk but as the premises have previously been audited, the priority given also takes into account the level of risk identified by the risk score for the premises. Premises with scores in the upper tiers of the risk band for a premises use type (e.g. care home, office etc.) will be re-inspected within a set period of time while those in the lower tiers will be subject to sampling to check the general ongoing compliance trend in that premises use group.

12. Although high rise blocks of flats do fall within one of the higher relative risk levels (when compared, for example, to offices), because there are very specific responsibilities placed upon housing authorities and because there are inspection regimes in place for the inspection and assessment of local authority performance, LFEPA's inspection programme does not prioritise inspection of the majority of the housing sector (the exception being mixed commercial/residential use). This approach is consistent with Better Regulation guidance from the Government and also the findings of the Hampton report into local authority enforcement practice.

13. The Authority has a wide range of interventions at its disposal to secure compliance with the law and to ensure a proportionate response to criminal offences. Officers may offer advice, either in person, in writing, or over the telephone. This may include a warning that, in the opinion of the officer, they are failing to comply with the law. Where appropriate, officers may serve an enforcement notice; prohibit or restrict the use of premises; or they may prosecute or give a simple caution.

14. In addition to the risk based audit and re-inspection programme, fire safety officers will attend and audit premises to which the Fire Safety Order applies if there has been a reported fire or if an allegation of fire risk is made to us. In the case of allegations of fire risk, we operate 24 hour, 365 days a year, cover and response.

Guidance to the responsible person on risk assessment and fire safety requirements

15. Guidance on carrying out fire risk assessments is available in a series of guidance documents published by the Government. Guidance is also available from the British Standards Institution in the form of a publicly available specification (PAS 79).

16. Once a fire risk assessment is completed, the responsible person must record the significant findings where:

- They employ 5 or more employees;
- A license under any enactment applies to the premises (this includes registration and permissioning regimes such as those for care homes and independent schools as well as licensing of houses in multiple occupation (HMO)); or
- An alterations notice (a notice served by the enforcing authority for the Fire Safety Order which requires the responsible person to notify the enforcing authority of any changes are to be made to the premises) is in force in relation to the premises

17. 'Significant findings' is a largely undefined term but the Fire Safety Order does specify that the measures that have been or will be taken, together with details of any group of persons identified as being especially at risk, must be included. Government guidance provides further advice.

18. The responsible person is not required to submit their fire risk assessment to the enforcing authority. This was a decision taken by the Government to avoid enforcers being overwhelmed by tens of thousands of assessments being sent to them.

19. The fire risk assessment and the preventative and protective measures must then be kept under review by the responsible person. The Fire Safety Order does not specify a specific time span within which the assessment and fire precautions must be reviewed. This is because the assessment is supposed to be an ongoing process that adjusts and reflects changes in the premises. The Fire Safety Order does specifically provide that the assessment must be reviewed if:

    "(a) there is reason to suspect that it is no longer valid; or
    (b) there has been a significant change in the matters to which it relates including when the premises, special, technical and organisational measures, or organisation of the work undergo significant changes, extensions, or conversions."

20. Government guidance then provides explanations of events or changes that should trigger specific review and the Government's fire risk assessment template also suggests that in any event a formal review date should be set by the risk assessor.

LFEPA Enforcement activity for residential premises

21. Although the principal control measure for residential properties is the Housing Acts, since 1 October 2006 (when the Fire Safety Order came into force), fire safety inspectors have conducted over 4000 audits of residential properties which equates to over 10 per cent of all audits undertaken. This includes over 2250 blocks of flats of four or more stories. The audits of blocks of flats of four or more storeys have resulted in 1 Prohibition Notice and 903 other enforcement actions (both formal and informal according to the risk level found) being taken.

22. The Brigade has written to local authorities (and also to other residential social landlords) on a number of occasions to highlight landlord's responsibilities. Our local fire safety teams and Borough Commanders seek to work with local housing authorities and other social landlords to put in place appropriate programmes to ensure residential property is brought into compliance with the Order.

23. Where companies or local authorities have major property portfolios of property for which fire risk assessment and necessary remedial works, our primary concern is to bring the premises into compliance with the law.

24. Our usual practice, which has been developed through work with local authorities and major housing providers, is to firstly have the body concerned prioritise fire risk assessment of their buildings according to the potential for risk to life. This element of prioritisation will take into account a number of factors including premises type, construction methods, use and any other material factors such as the presence of vulnerable persons. One particular factor taken into account is that premises housing large numbers of people (for example, large residential care homes, hospitals, of blocks of flats) potentially pose a relatively higher risk of significant numbers of death or serious injury due to the numbers of people present than would exist for say a row of ground and first floor maisonettes that is used for sheltered housing but where the number of people present in each property is much smaller.

25. The carrying out of remedial works is prioritised in a similar way but also takes into account the level of risk identified through the fire risk assessments, with priority being given to the most risk critical measures and within that to the most risk critical in the highest potential risk premises.

26. For both the carrying out of the fire risk assessments and the carrying out of remedial works we ask the body concerned to propose timescales for the various necessary activities. Those timescales do need to be reasonable and for all works across a large portfolio can run to several years for all works to be completed. However, the carrying out of fire risk assessment of potentially higher risk premises, and the carrying out of risk critical improvements must be over a shorter period.

27. Where agreement cannot be reached, then enforcement powers can be used to give legally binding effect to the programme and dates that we consider to be reasonable in the circumstances of the case (subject to any legal appeal that may be lodged).

BBC reports

28. In reports on 5 October, the BBC alleged that, through Freedom of Information Act (FOI) requests, they had identified that 102 high rise blocks of flats in London were considered by local housing authorities to be "high risk". The report however, does not identify the size of building that the BBC considers to constitute 'high rise blocks'.

29. From our own investigations with the various Boroughs it is clear that various definitions are used. At least one authority considers anything above 6 floors to be high rise while another other considers anything of 9 floors or less to be low/medium rise. This is wholly consistent with prioritisation of risk assessments and remedial works according to relative risks within the Borough Housing portfolio. For example, a seven storey block may be one of the tallest residential buildings in one Borough but may be comparatively low rise to another borough which has large numbers of twenty plus storey residential blocks.

30. In the report, 'high risk' has been defined by the BBC as 'possible occurrence of an extremely harmful event or likely occurrence of a harmful event'. However, from discussion with a number of councils that responded to the BBC FOI requests it is apparent that this is not a consistent definition amongst the respondents. Whether a building may be of higher potential risk depends on many issues not just that a fire may occur or is likely to occur. Consideration has to be given to factors such as the use of the premises, the vulnerability of the occupants of the premises (for example those with mobility difficulties or mental health issues including learning difficulties); and the construction type of the premises.

LFB
LONDON FIRE BRIGADE

MODERN METHODS OF BUILDING CONSTRUCTION (MMC)

May 2007

TO DELIVER THIS TRAINING SESSION YOU MUST PRINT A COPY OF THE PRESENTATION IN NOTES PAGE FORMAT TO HAVE ALL THE INFORMATION

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AIM

To familiarise personnel with the hazards, risks and operational considerations associated with modern methods of construction

OBJECTIVES

- Describe the methods of construction
- Explain the associated hazards and risks
- State the operational considerations

Session One

This first session will look at principals that underline new "Modern methods of construction" used in building construction within London.

This will be followed up in Session Two by a case study that occurred within London as well as examining Operational considerations.

MMC – Gaining popularity

By 2008 25% of all new buildings in London will be of lightweight timber frame construction

It is therefore important that all personnel understand the potential risks involved when dealing with these types of building

MMC – Building system types

- Volumetric/Modular Construction
- Panellised
- Hybrid (Semi-volumetric)
- Site-based systems

Volumetric construction London examples

Murray Grove, Hackney

Barling Court, Stockwell

Container City - Docklands

Created from 20 shipping containers

Formed 15 dwellings

Installation time 4 days

Panellised systems

SIPS Panels

Site based systems

Millennium Plus - Hackney

Insulating concrete formwork

Lightweight steel

Exploded view – Typical modular system

1. OSB board
2. T & G moisture resistant
3. Rockwool mineral wool insulation
4. Tyvec breather membrane
5. Gyproc moisture resistant membrane
6. Gyproc Fibreline Duplex plasterboard
7. Fermacell gypsum - fibreboard
8. Crown glass mineral wool insulation
9. Light steel frame floor
10. Light steel frame wall panel
11. Gyproc plank
12. Light steel frame ceiling
13. Fermacell gypsum - fibreboard
14. Gyproc Wallboard

Courtesy of Corus PLC

London example

Beaufort Court, Fulham

Timber construction

Timber research

Quality of builders work

Information for the Fire Service

Importance of cavity barriers and fire stopping

Engineered wood products

Pre-fabricated roof trusses

Engineered floor joists

Exposed to fire

Glulams

Identification

False chimneys

Construction phase

Finished buildings

Roof trusses

Engineered floor joists

Combustible cavities – Fire stopping /cavity barriers

Fire stopping / Cavity fire

Timber firefighting stairs

Site storage

Session Two

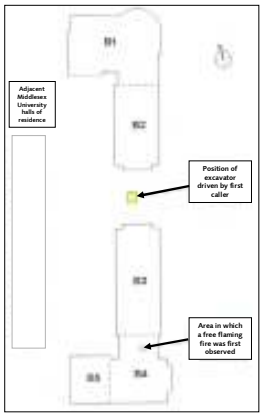
This session will look at a Case study that occurred within London and identifies Operational considerations appropriate to Modern Methods of Construction.

Timber frame construction site fires - Case study

Case study – Fire Colindale

July 2006
Timber framed construction site
20 Appliances, 2 HPs & 2 hose laying vehicles
2 Water relays, 10 ground monitors and 6 main jets
Site consisted of two large apartment blocks
Rapid fire spread
Neighbouring buildings involved

Site layout



Initial fire development

15 Minutes

Fire development - Bldg 2

Means of escape & access

Impact on neighbouring buildings

Building 1 Post fire

OPERATIONAL CONSIDERATIONS

Operational considerations

Alight in under 20 minutes

Full structural collapse at an early stage of the fire

Significant damage to surrounding buildings

Summary Objectives

- Describe the methods of construction
- Explain the associated hazards and risks
- State the operational considerations

EVALUATION

A Level 2 Evaluation has been provided, to allow the Watch Manager to assess the "Acquisition of learning" of their staff following the delivery of this package.

The outcomes of this assessment can be used to identify if further training sessions, using this pack, may be required to fulfil any training needs identified by this process. This can then be recorded in the STEP system.

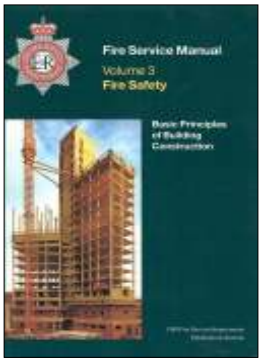
MMC Level 2 Assessment

1. In relation to "Modern methods of construction" – What does the abbreviation "SIPS" stand for?
   a) System for industrial process
   b) Standard industry performance systems
   c) Side impact protection system
   d) Structural insulated panels
2. What percentage of new property in London will be built utilising lightweight timber frame construction - MMC's by 2008?
   a) 5% b) 15% c)20% d) 25%
3. List 3 modern building system types.
4. Identify 4 materials that may be bulk stored at a modern building sites utilising MMC and what dangers do they pose for firefighters.
5. Identify this system used in modern methods of construction

MMC Level 2 Assessment

6. List three dangers to firefighters from engineered floor joist constructions.
7. Please fill in the blank spaces in the sentence below:
   Timber frame can be built up to ____ storeys high (___metres) in accordance with the Building Research Establishment Design Guide, but need <u>not</u> be built from ground floor.
8. Can modern methods of building construction, normally be recognised from looking at the outside of the building?
9. List 3 operational considerations when attending a fire at a timber framed construction site?
10. Identify the type of construction being used here.

Further support



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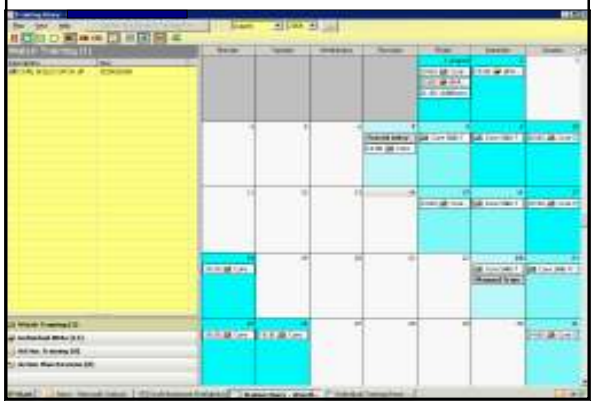

LONDON FIRE BRIGADE

Station Training Support and Performance Team

LONDON FIRE BRIGADE

SIGNS AND SYMPTOMS OF COLLAPSE

May 2007

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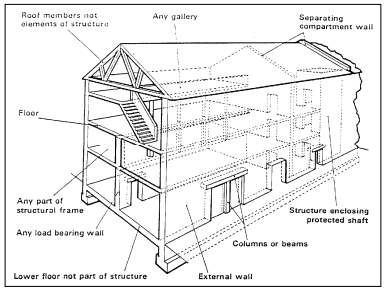
AIM

TO INFORM PERSONNEL HOW TO RECOGNISE THE SIGNS OF BUILDING COLLAPSE AND RELATED SYMPTOMS

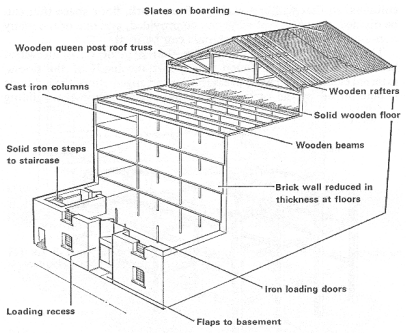
OBJECTIVES

- State the elements of structure
- Explain the causes of collapse
- Describe the signs that may indicate possible collapse

The parts of a building which contribute to the overall stability of the building

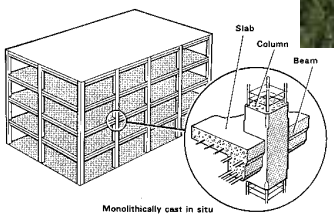


Solid construction (Traditional masonry)



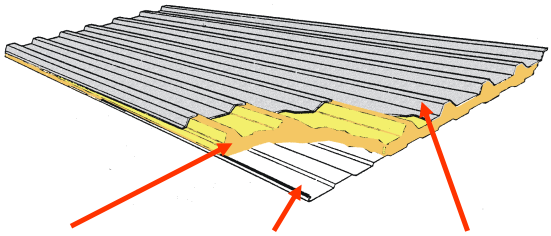
Structural steel frame

Reinforced concrete

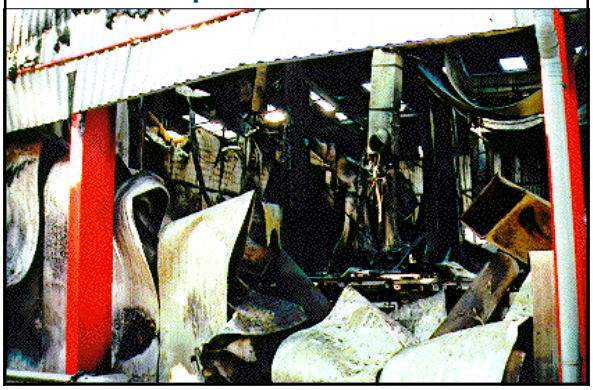


Lightweight steel

Sandwich panels



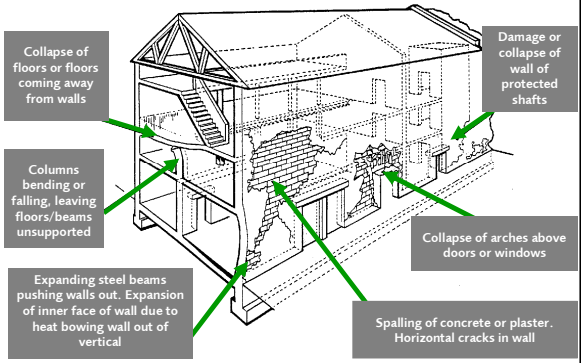
Sandwich panels

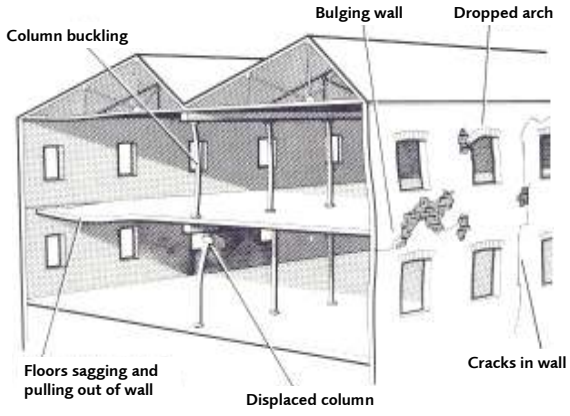


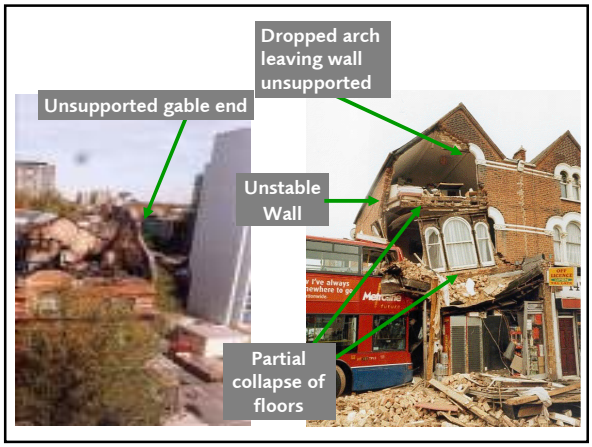
Timber construction

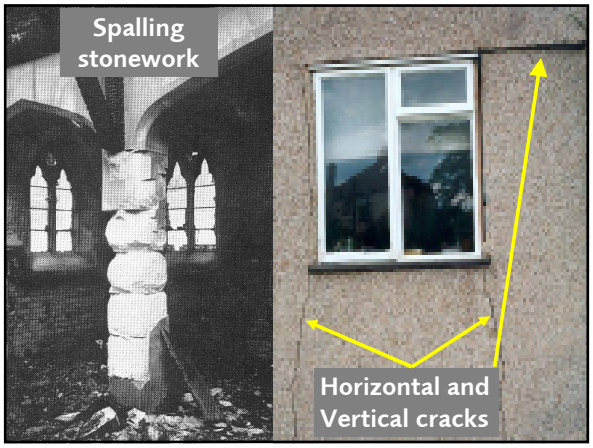
Building Collapse

Diagram showing the signs and symptoms of collapse and the causes of collapse of walls.

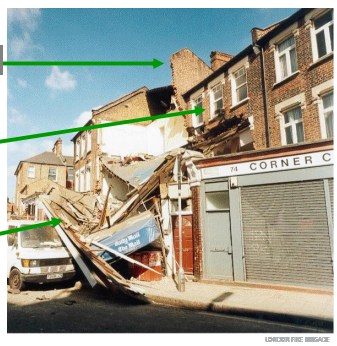






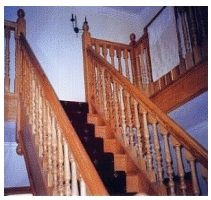


Bending and buckling of steel columns and beams

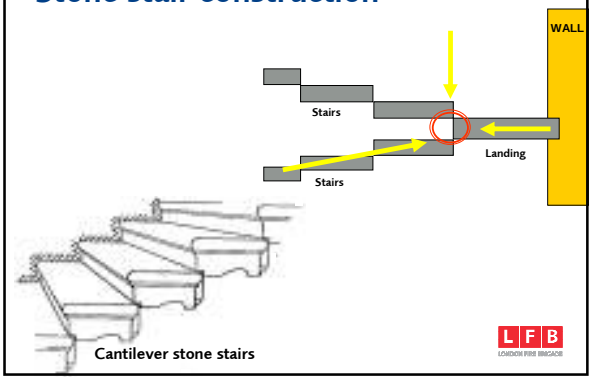


Floor construction

Stairs



Stone stair construction



Stone stairs involved in fire

Summary objectives

- State the elements of structure
- Explain the causes of collapse
- Describe the signs that may indicate possible collapse

EVALUATION

A Level 2 Evaluation has been provided, to allow the Watch Manager to assess the "Acquisition of learning" of their staff following the delivery of this package.

The outcomes of this assessment can be used to identify if further training sessions, using this pack, may be required to fulfil any training needs identified by this process. This can then be recorded in the STEP system.

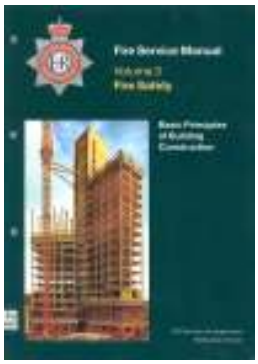
Signs & symptoms of collapse Level 2 Assessment

1. List 4 of the 7 elements of structure.
2. Are sandwich panels used as elements of structure?
3. Why would you avoid cooling a stone staircase with water?
   a) It would make the staircase wet and slippery.
   b) It may cause the staircase to collapse without warning.
   c) It would cause water damage.
4. What is the lowest temperature that **structural steelwork** looses two thirds of its structural strength?
   a) 200°C b) 400°C c) 600°C d) All of the above
5. State the reason why the building in this picture has suffered partial collapse?

Signs & symptoms of collapse Level 2 Assessment

6. List four types of building material used for staircase construction.
7. List three firefighting hazards associated with sandwich panels.
8. What does the fire resistance of reinforced concrete depend on?
9. What are the two functions of a floor?
10. Other than a house, list three types of building that are constructed using a timber frame.

Further support



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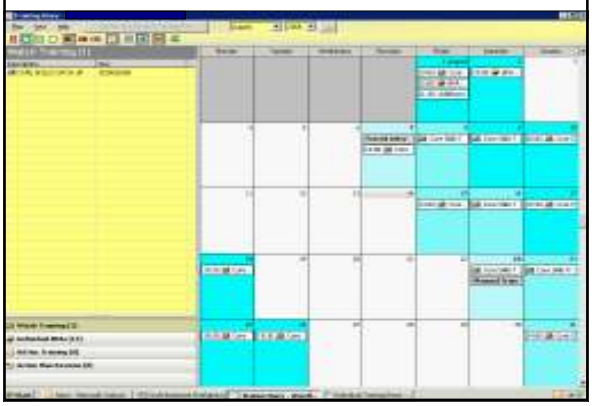

LONDON FIRE BRIGADE

Station Training Support and Performance Team

FS012 London Borough of Harrow

My Ref: AT/GP/1

Dear Sirs,

Re: Investigation into Fire Safety in Tall and Timber Framed Buildings in London

I refer to your letter dated 8th February 2010 regarding an investigation into Fire Safety in Tall and Timber Framed Buildings. As requested, I make the following response to your questions on behalf of Harrow Council: -

1. There are approximately 84,000 residential units in the Borough of Harrow, of which an insignificant number are classified to be in 'tall' buildings. It is not possible to determine how many of these units are timber framed from our records.

2. There are no estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in Harrow over the next 10 years.

3. This Authority has no records of the number of fires in either tall or timber framed residential buildings in Harrow, either under construction or occupied.

4. This Council's Building Control Section will generally become aware of tall or timber framed residential buildings being constructed or refurbished in Harrow when a full plans building regulations application is deposited for the 'controllable' work. This is not necessarily the case if the application is made to an 'Approved Inspector' instead of the Local Authority. Details of the proposed building work (dependant on extent of work) will generally be supplied by the Applicant's Agent (Designer or Contractor).

5. Ultimately, 'the person carrying out the building work' is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed, however the Designer and Contractor will generally share responsibility. The Building Control Body (Local Authority or Approved Inspector) will also scrutinise plans and inspect elements of the building work to confirm the relevant guidance, if controllable, has been followed.

6. In my opinion, the large expanse of exposed combustible material is a contributory factor to the specific fire risks associated with timber framed buildings under construction. Sufficient Building Regulations exist to control fire spread/ external fire spread after completion or occupation, primarily to protect people in and about the building rather than the building itself; however these requirements do not apply to a building during construction. In comparison, masonry (brick/block), concrete and steel frame construction will reduce the inherent fire risk while under construction.

7. The building regulations and associated fire safety codes/guidance relating to tall and timber framed residential buildings have developed to place a greater focus on fire prevention, including fire engineered solutions, management of the premises, residential sprinklers and fire alarms. The Regulatory Reform (Fire Safety) Order, which consolidated over 100 separate pieces of fire safety legislation, requires fire risk assessments to be carried out for some buildings.

8. Recent amendments to the fire safety regulations, generally imposes a greater responsibility on the 'responsible person' for certain completed or occupied buildings, and less reliance on the Fire Authority; however this does not apply during construction. The use of sprinklers in blocks with flats over 30m high is

now required in order to increase safety. The Department for Community and Local Government are better placed to advise on future guidance relating to fire safety.

9. This Council's Building Control Section consult and /or notify the Fire Authority on applications deposited under the Building Regulations, where the Regulatory Reform (Fire Safety) Order applies. Informally, the Building Control Section also advises the Fire Authority of any new buildings where timber frame construction is known to be used.

10. In my opinion, comprehensive guidance and possibly additional legislation relating to fire safety in buildings could contribute to reducing the number of fire incidents in timber framed buildings while under construction.

11. The Loss Prevention Council may be able to offer their opinion on the protection of such buildings, when complete and under construction.

I trust this response addresses your request

FS013 London Borough of Haringey

Dear Ms Beer,

I refer to your email regarding your consultation on fire safety in tall and timber framed buildings and would respond as follows using your numbering system:

1. 100,444 according to Haringey data in 2008. We do not have a record of how many are tall or timber framed.

2. There is an estimated increase in residential units in the next 10 years of 12,000, however there is no estimate of how many of these will be tall or timber framed.

   The emerging Core Strategy identifies Haringey Heartlands/Wood Green and Tottenham Hale as suitable areas for some tall buildings. There is no prediction for timber framed.

3. We have no records of these. Local Authority Building Control does not hold this information. Please refer to the LFEPA

4. It is a requirement of the Building Regulations 2000 (as amended) that a person intending to construct a new building or refurbish an existing building [where this includes notifiable building work, a material alteration or material change of use] is required to deposit full plans with local Building Control. Alternatively a private sector Approved Inspector [AI] can be chosen to act as the Building Control Body [BCB] and in this case an Initial Notice has to be registered with the relevant local authority.

   Local Authority Route

   Full plans are defined as plans in sufficient detail to show that the proposed work would comply with the Regulations. This includes fire strategy, relevant plans, structural calculations, construction details, etc.

   In the case of buildings to which the Regulatory Reform [Fire Safety] Order 2005 [RRO] apply, i.e. '*relevant buildings*' , the local authority is required to consult the Fire Authority [LFEPA] in respect of fire safety. The consultation includes plans and details of the proposed new building or works and the form of construction [if known] is also notified, in particular where timber framed.

   Note: '*Relevant buildings* ' includes most buildings with the exception of single family dwellings. Flats are covered by the Order due to the common parts.

A person [using the local authority route] who proposes to carry out building work shall not commence that work unless -

(a) he has given the local authority notice that he intends to commence work; and
(b) at least two days have elapsed since the end of the day on which he gave the notice.

Private Approved Inspector Route

The private sector AI supplants the local authority as the Building Control Body [BCB] and the person intending to carry out the work and the AI jointly 'register' an Initial Notice [IN] with the local authority indicating the location of the building and describing the work. Where an AI is

appointed to act as the BCB there is no requirement for either detailed plans or notice of commencement to be given to Local Authority Building Control.

The IN remains in force until the AI registers a Final Certificate with the local authority to indicate satisfactory completion of the building or work. The local authority is prohibited from further involvement once an Initial Notice is in force.

AI's are also obliged to consult the Fire Authority [LFEPA] on fire safety matters and before a Final Certificate is issued for relevant buildings. AI's are represented by the ACAI.

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If Haringey Building Control receives a Building Regulation application for the construction of a timber framed building we would know it was timber framed and we would advise the Fire Brigade as part of the consultation process in all cases.
If Haringey Building Control receives a Building Regulation application for an alteration to a timber framed building we may know it is timber framed depending on what the alteration is and what the building history is. If for example the building was original constructed using an Approved Inspector (AI) as the Building Control body then Haringey Building Control would not know the original construction.
Where AI initial notices are received for the construction or alteration of timber framed buildings, Haringey Building Control would not know there was a timber frame involved.
You would need to check with the Fire Brigade if the AI's inform them of timber framed construction during consultation in the same way Local Authorities do.

5. In general, during the design stage it is the responsibility of the project design team and their client. During the construction phase it is the responsibility of design team, the client and the contractor. Once completed it is the responsibility of the building owner and their management team.
   The Building Control Body (LA or AI) has a duty to consider Part B matters when dealing with the Building Regulation application and the work on site but they are not considered to be the responsible party.
   The Health and Safety Executive (HSE) have an enforcement role which we suggest you should seek comment on.
   The Fire Brigade also have an enforcement role under the RRO which we suggest you should seek comment on.

6. Site Risks: We are advised by the Fire brigade that the two main fire risks on timber framed sites are smoking and hot works. Due to the quantity of timber on site arson can have a larger consequence then on other types of sites.

   We consider the impact of following trades damaging fire stopping, fire walls /floors and cavity barriers as a risk both during construction and after completion.

   Current Regulations relay on the inspections by Building Control to find and remedy problems. It is impossible for officers visiting sites from time to time to find all situations of such problems many of which are covered up.

Further information can be sourced from the CLG and UK Timber Frame Association.

7. There has been a move away from prescriptive regulation to functional requirements with non mandatory guidance issued by CLG and their predecessors. This has increased the number of fire related solutions proposed by designers based on risk assessment including Fire Engineered solutions. The release of BS9999 has offered a more generous range of fire solutions than ADB including increased travel distances and smaller door ways and stairways on escape routes.
   The guidance in the CLG Approved documents has changed over the years with relaxation of advice in some cases and a tightening of advice in others e.g. The need for self closers on some fire doors removed but the introduction of the need for sprinklers in certain high rise buildings (over 30m).

   The current Regulatory controls on external fire spread appear less onerous than in the past under the London Constructional By-laws. Consideration should be given to the fire effects of materials such as window /door frames and gutter/soffits.

8. The biggest impact has been the introduction of the recommendation in Part B of the Building regulations for sprinklers in blocks containing flats over 30m above ground level.

CLG is best placed to comment on new guidance anticipated in the future on either timber framed buildings or fire safety

9. The Housing Health and Safety Rating System (HHSRS) is actively used by the Private Sector Housing Group to ensure that residents are not subjected to unacceptable levels of risk from their accommodation. Where necessary and appropriate, in line with the Council's Private Sector Housing Enforcement Policy, enforcement action is taken under the Housing Act 2004 to secure improvements to the accommodation to mitigate any HHSRS hazards identified. In some houses in multiple occupation the Council's enforcement powers overlap with those of the fire and rescue service under the Regulatory Reform (Fire Safety) Order, and in these cases we are currently in the process of agreeing a working protocol to establish which organisation will take the enforcement lead.

10. Make owners aware of their responsibility under the RRO including prosecutions of owners who fail to comply. Publicise the RRO and in particular the duty of ‘Responsible Persons’ to carry out fire risk assessments and to ensure the maintenance of fire safety arrangements, and measures provided for protection of fire-fighters [article 38 of the RRO].

    Review resources available to statutory bodies to take enforcement actions against contractors who are not taking proper precautions against fire during construction including controls on smoking and hot works.

    Review options for dealing with following trades damaging fire barriers i.e. Experience shows that one cause of the compromise of fire safety post construction is unauthorised work e.g. the running of cables in common areas and protected shafts, where fire stopping is disturbed or removed and compartmentation is breached.

    These issues should now be recognised and addressed by the ‘Responsible Person’ designated under the RRO, as should the maintenance of active fire safety measures, e.g. ventilation

arrangements and systems to common parts/internal fire fighting access, which form an integral part of a fire strategy to ensure they function correctly at the required time.

Review the controls in place to limit external fire spread between units both vertically and horizontally.

11. No

FS014 London Borough of Merton

INVESTIGATION INTO FIRE SAFETY IN TALL AND TIMBER FRAMED BUILDINGS IN LONDON

Thank you for your letter of 8th February, 2010, regarding your investigation into fire risks in flats. I would respond to your questions as follows.

1. The Council do not maintain records in the format you are asking. However, from local knowledge I can confirm that there are at least 10 tall buildings within the London Borough of Merton. Only one of which is believed to be of timber framed construction that has recently been completed.

There are numerous sites adopting timber frame construction, however, a proportion of the residential development is subject to certification by approved inspectors who do not submit construction type when they send details on their initial notices. It is likely that tall build ings in timber framed construction will be restricted by the Building Regulations requiring taller buildings to be of robust construction that will be difficult to achieve with timber framed construction that is commonly used at present.

2. I suspect that more timber frame constructions will be adopted over the next 10 years given that it is a more sustainable method of construction and will likely be able to achieve higher standards of insulation to comply with the sustainable homes initiative.

3. We are aware of fires in the tall blocks, which in most cases have been restricted to the flat with the origin of the fire, but with some smoke damage to adjacent properties. There is some evidence that the adoption of pvc windows can cause a fire to leap frog up to the outside of the building due to the premature failure of these windows.

4. When the refurbishment involves alterations requiring a building regulation submission the Council have a duty to consult the London Fire Brigade if there are common parts and, indeed, such consultation happens on a regular basis. If the building owner chooses to use an approved inspector, the Council do get notified of building work, but do not undertake any inspection. The approved inspector has the same obligation to consult the Fire Authority regarding the proposals. There is no censure should they fail to consult the Fire Brigade.

5. The building owner/contractor is required to ensure safety of their operatives. The developers normally decide on the construction methods and the Building Control body assess the construction for compliance with the Building Regulations.

The timber frame construction is vulnerable to fire during construction, which is an issue for the contractor to resolve. The contractor needs to undertake the building work in a safe way, which ultimately is in accordance with the requirements of the Health and Safety Executive until completion.

6. There are very high specific risks associated with timber framed buildings under construction in that the timber is generally kiln dried and thus combustible and presents a high fire load before it is clad to give the structure fire resistance. Masonry construction is less vulnerable to fire during construction. There is no reason to suspect that once completed the two types of construction should perform similarly, although it is likely that the structural elements constructed in masonry are likely to provide a higher level of fire resistance than a timber frame construction, which is likely to achieve a minimum of 30 minutes for external walls and 60 minutes for separating structures which is required by building regulations. However, masonry structures are likely to achieve a higher standard than the

minimum required.
7. The minimum standards for fire resistance have not changed over recent years, although it is fair to say that timber frame structures tend to be more factory made and have less penetrations which improves levels of fire safety. That is not to say that both methods of construction suffer from post construction installations that breach the fire resisting elements. Generally speaking modern constructions should perform more effectively in fire in that buildings now need to be pressure tested and acoustically tested which demands higher levels of fire stopping to reduce air leakage.
8. There have not been any significant changes in the substantive fire safety regulation for residential buildings in recent years. Although the requirements for means of escape and access for fire fighting were introduced some years ago.
9. The Regulatory Reform Order requires that building owner undertake risk assessment on a regular basis to ensure fire safety. The Council respond to complaints regarding fire safety, but do not have an active survey programme in place to assess all flats in Merton.
10. I think it is important that all service installers understand the importance of fire barriers where elements are penetrated and use intumescent mastics to seal service penetrations and it should be the responsibility of the service installer to notify the Council when such work is proceeding and give notice when it is complete so that it can be inspected. The costs of providing this service should be paid for by the building owners. Experience suggests that tradesmen tend to make holes bigger than they need to make it easy to feed cables, trunking, etc., through a bu.ilding and do not return and make good the damage once the installation is complete, leaving air paths through fire resisting elements which has an adverse effect on fire safety, sound inSUlation and even thermal insulation.
11. Fires in flats have always been a danger and I understand the number of deaths due to fires has not changed very much over recent years. One issue of concern is the replacement of timber framed windows with pvc double glazed units which tend to fail early in a fire, releasing the glass giving a fire an opportunity to attack the window above with the radiant heat from the fire setting light to the curtains and allowing the fire to leap frog up the outside of a building. This is particularly dangerous with full storey height frames.
Secondly, the fire stopping of buildings can easily be tested without much intrusion. It can be achieved by pressure testing flats which would give some evidence of the quality of fire stopping which could be misconstrued if the flat also had ill frtting windows, doors and gaps within the floor voids that could be covered with skirting boards, covings etc. The focus on fire stopping has become more relevant in recent years with the development of the intumescent mastics which were not readily available many years ago, leading to cement mortars being used for this purpose that do not readily accommodate thermal movement, which is an important issue with plastic pipework etc., being used more extensively.
In conclusion a timber frame construction is more sustainable but is vulnerable to fire before it is clad to protect it and thus more vigilance is required on site by the contractors not using hot processes in close proximity to the construction and by improving site security whilst sites are unoccupied to avoid arson attempts being successful.

FS015 Local Authority Building Control (LABC)

Re: Investigation into Fire Safety in Tall and Timber framed Buildings in London
I refer to Jenny Jones letter dated 5 February addressed to Chief Executive, Local Authority Building Control (LABC) and as indicated in his email to you earlier today (he) has asked me as Chair of Fire Safety Committee in LABC London Region (also known as the London District Surveyors' Association, LDSA) to respond on behalf of LABC.
Set out below are responses to the questions using the numbering in Jenny Jones' letter.
1. Local authority Building Control does not hold this information. Please refer to the London Fire and Emergency Planning Authority [LFEPA].
2. It is a requirement of the Building Regulations 2000 (as amended) that a person intending to construct a new building or refurbish an existing building [where this includes notifiable building work, a material alteration or material change of use] is required to deposit full plans with local Building Control. Alternatively a private sector Approved Inspector [AI] can be chosen to act as the Building Control Body [BCB] and in this case an Initial Notice [IN] has to be registered with the relevant local authority.
Local Authority Route
Full plans are defined as plans in sufficient detail to show that the proposed work would comply with the Regulations. This includes fire strategy, relevant plans, structural calculations, construction details, etc.
In the case of buildings to which the Regulatory Reform [Fire Safety] Order 2005 [RRO] applies, i.e. 'relevant buildings' , the local authority is required to consult the Fire Authority [LFEPA] in respect of fire safety. The consultation includes plans and details of the proposed new building or works and the form of construction [if known] is also notified, in particular where timber framed.
Note: 'Relevant buildings ' includes most buildings with the exception of single family dwellings. Flats are covered by the Order due to the common parts.

A person [using the local authority route] who proposes to carry out building work shall not commence that work unless
(a) he has given the local authority notice that he intends to commence work; and
(b) at least two days have elapsed since the end of the day on which he gave the notice.
Private Approved Inspector Route
The private sector AI supplants the local authority as the Building Control Body [BCB] and the person intending to carry out the work and the AI jointly 'register' an Initial Notice [IN1 with the local authority indicating the location of the building and describing the work.
Where an AI is appointed to act as the BCB there is no requirement for either detailed plans or notice of commencement to be given to local authority Building Control.
The IN remains in force until the AI registers a Final Certificate with the local authority to indicate satisfactory completion of the building or work. The local authority is prohibited from further involvement once an IN is in force.
Als are also obliged to consult the Fire Authority [LFEPA] on fire safety matters and before a Final Certificate is issued for relevant buildings. Als are represented by the ACAI.
The Association of Consultant Approved Inspectors [ACAI]
c/o 14 Berkeley Street
London
W1J BOX
3. Construction work is covered by the Construction (Design & Management) Regulations 2007 which impose duties on Clients, Designers, and Contractors including notification of construction projects to the HSE.

New and refurbished buildings have to comply with the relevant functional requirements of the Building Regulations irrespective of whether the BCB is the local authority or an AI. Guidance on compliance is contained in a suite of Approved Documents which are published in respect of each requirement e.g. ADA covers Part A - Structure and ADB covers Part B - Fire Safety, etc

Additionally in inner London section 20 of the London Building Acts (Amendment) Act 1939 allows the 13No inner London boroughs to impose conditions for certain specific matters over and above what is covered by Part B. Section 20 applies to tall buildings [over 30m in height or 25m in height and over 930m2 in area] or buildings of excess cubical extent [Le. over 7,1 00m3

] used for trade or manufacture. LDSA Guide N01: Fire Safety in Section 20 Buildings provides guidance on section 20.

Following amendments by virtue of the coming into force of the RRO Section 20 conditions that may be imposed after consulting the Fire Authority are limited to the provision in the completed building of the following;

(a) fire extinguishing appliances and installations;

(b) effective means of removing smoke in case of fire;

(c) adequate means of access to the site of the building for fire brigade personnel and appliances

Occupation and Completion

Building Regulations require a person carrying out work to notify the local authority not more than 5 days after completion or at least 5 days before any part of the building is occupied.

The local authority will either issue a completion certificate or a certificate for occupation prior to completion subject to all relevant building regulations having been complied with. Where an AI acts as the appointed BCB a Final Certificate is required to be registered with the local authority not more than 4 weeks after occupation of a relevant building [i.e. where RRO applies] or 8 weeks in the case of all other buildings, including those containing only flats and common parts serving those flats.

In the case of the construction, extension or relevant change of use of a building to which the RRO applies [including flats] BCBs should not give completion certifcates [local authorities] or Final Certficates [Als] unless they have been able to ascertain that 'fire safety information' has been passed to the 'responsible person'.

"Fire safety information" means information relating to the design and construction of the building or extension, and the services, fittings and equipment provided in or in connection with the building or extension which will assist the responsible person to operate and maintain the building or extension with reasonable safety;

'Responsible person' has the meaning given by article 3 of the RRO.

4. This question should be referred to BRE and/or CLG

5. This question should be referred to CLG and UK Timber Frame Association.

6. Experience shows that a common cause of the compromise of fire safety post construction is unauthorised work e.g. the running of cables in common areas and protected shafts, when fire stopping is disturbed or removed and compartmentation is breached.

There are also reported cases where long standing fire safety measures e.g. opening vents/windows to common parts have been disabled or rendered ineffective.

These issues should now be recognised and addressed by the 'Responsible Person' designated under the RRO, as should the maintenance of active fire safety measures, e.g. ventilation arrangements and systems to common parts/escape routes and internal fire fighting access, which form an integral part of a fire strategy to ensure they function correctly at the required time.

7. This question should be referred to CLG

8. The biggest impact has been the introduction of the recommendation in Part B of the Building regulations for sprinklers in blocks containing flats over 30m above ground level. CLG is best placed to comment on new guidance anticipated in the future on either tailor timber framed buildings or fire safety.
9. Publicise the RRO and in particular the duty of 'Responsible Persons' to carry out fire risk assessments and to ensure the maintenance of fire safety arrangements, and measures provided for protection of fire-fighters [article 38 of the RRO].
38.-(1) Where necessary in order to safeguard the safety of fire-fighters in the event of a fire, the responsible person must ensure that the premises and any facilities, equipment and devices provided in respect of the premises for the use by or protection of fire-fighters under this Order or under any other enactment, including any enactment repealed or revoked by this Order, are subject to a suitable system of maintenance and are maintained in an efficient state, in efficient working order and in good repair.
10. No further comments.

FS016 Zurich

Dear Ms Jones,

Thank you for your letter dated 12 February 2010, requesting input to the 'Investigation into Fire Safety in Tall and Timber framed Buildings in London'. Zurich welcomes the opportunity to submit a response to this investigation, and hopes that our comments are useful.

PLEASE NOTE: Responses are to be considered as **CONFIDENTIAL** and are only applicable to this project.

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1. Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?

No measurable estimates as to the potential increases or trends for the construction of tall/timber buildings are available from Zurich.

2. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?

We do not have accurate data in respect of numbers of fires in premises of this construction. Generally, losses in such buildings are only investigated/recorded where the fire loss value is greater than £100,000. Additionally, as we are only one insurer within this market, data would only represent our market share, which fluctuates on an annual basis.

In relation to causes, the most common are malicious fires, together with accidental fires for example as a result of candles being used within individual dwellings.

3. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?

Building Control bodies are responsible for monitoring compliance with Building Regulations, relating to appropriate standards of construction and that the materials used are fit for purpose. However, this relates purely to life safety aspects and not necessarily the wider behaviour of the building in fire. Additionally, the Building Control function is not aimed at ensuring that every aspect of a building is inspected / monitored on site, but is designed to ensure that it is built in accordance with approved plans that comply with the regulations in place at time of approval.

It is considered that this is a potential area of weakness within many construction projects, as the quality of workmanship on site is critical in achieving acceptable levels of fire safety and determining overall building behaviour in a fire. The use of third party approval schemes can, and does, assist in ensuring acceptable levels of workmanship are achieved. As insurers, we consider the use of third party approval schemes to generally improve overall risk in bringing about confidence around the likely fire behaviour of a building based upon the initial building design.

Insurers do not inspect buildings for compliance with building regulations, however insurers will become involved within the design process in cases where the building insurer is determined at design stage or prior to building completion. This input does not however relate specifically to the life safety aspects around the design of the building, but to the overall insurance loss potential for that particular building. Insurers do offer guidance on the suitability and acceptability of materials for particular projects, and generally require materials to carry approvals (such as the Loss Prevention Council Board (LPCB) approvals). Despite this, where elements of a building do not carry such approvals, they commonly remain insurable, though may be subject to increased insurance terms.

4. What are the specific fire risk implications for various building designs, construction materials and construction methods in relation to both tall and timber framed residential buildings?

Zurich's views on specific fire risk implications for various building designs, construction materials and construction methods are set out below:

Building Designs

- **Height above level of access** - this creates means of escape issues and causes difficulty in terms of fire fighter access
- **Mixed occupancy (i.e. residential over commercial occupancy)** - this can increase the potential for fire
- **Cellular layout** - effective and robust compartmentation improves overall risk and reduces fire spread potential
- **Open plan type accommodation** – this has the potential for increased fire/smoke spread; the negative impact of available escape time given sleeping risks and 'stay put' arrangements
- **Internal atria spaces** – the potential negative impact on escape scenarios? - effectiveness of engineered solutions? Conflict of means of escape provision with fire fighting access
- **Stepped / sloping facades** - this can increase the potential for fire spread
- **External balconies** - these have the potential to assist or restrict vertical fire spread. The materials used should be considered (see below), as well as the - use of balconies by tenants (i.e. storage, BBQs & gas cylinders, timber sheds)
- **Adjoining occupancies** - plaza type accommodation arrangements beneath the high rise element have the potential to promote external fire spread by creating a significant and sustained fire load at the base of a potentially combustible tower above
- **Space separation between buildings, either within same development or neighbouring sites** - impact of fire spread through radiated heat, assisted by wind conditions. The fire from the building under construction in South London recently spread to buildings in excess of 40m.
- **Design of and orientation of window openings and external envelope details** - these can increase fire spread potential, and therefore designers should consider spread in all directions, including downward via falling fire debris

Construction Materials and Methods

- **Untested or unproven materials** – these present potential for undetermined / significant increase in risk exposure
- **Appropriateness of fire testing** – fire testing should reflect the particular fire dynamics of the proposal
- **Increased fire risk during construction phase** - the extent of exposure and impact on neighbouring properties need to be considered
- **Long term robustness of materials** – Ongoing performance in relation to fire (i.e. routine damage in common areas, degradation due to weather exposure etc) should be considered to ensure that materials are sufficiently robust to withstand day to day use. Substantial materials are preferred. Lightweight elements can become damaged and increase potential for fire spread.
- **Cladding and insulation** - Fire behaviour of the structural frame and its integrity can be significantly impacted by cladding and insulation choices. Non-combustible insulation materials and cladding systems are key to ensuring known fire performance for most constructions. Material properties and behaviours must be considered in relation to realistic and researched risk analysis
- **Concealed elements (i.e insulants (thermal and acoustic), linings to voids, service ducts)** – these are critical elements in ensuring compartmentation is maintained and fire behaviour can be assessed accurately

5. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread / external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?

During construction phase timber structures require significantly improved protection measures such as increased security, phasing/sequencing of construction, applied fire protections, housekeeping and strict management of hot work. Given recent fire losses involving these buildings under construction, the current arrangements appear insufficient in providing a measurable and acceptable fire behaviour

pattern. Significant and perhaps unprecedented levels of fire spread (in distance terms) were experienced in the most recent losses, with a clear demonstration of the significant extent of radiated heat produced from such buildings under construction.

Whilst the fire behaviours are likely to be more measurable and reduced at the more advanced stages of construction, conventional fire protection measures (i.e. internal fire separation, fire stopping etc) offer limited resistance until virtually the final stages of construction in a timber framed structure. This contrasts significantly to that provided in a more traditionally constructed or fire resisting construction system (i.e. steel, concrete, traditional masonry) where the applied protection measures offer an immediate benefit in being applied to a non-combustible and generally more stable building elements.

6. What are the specific risks associated with both tall and timber framed buildings residential buildings that are occupied? What can compromise fire safety post construction?

Specific Risks

Tall and timber framed buildings:

- Complex fire escape strategies and internal layouts
- Protection to neighbouring properties/risks
- Often confined sites presenting logistical fire fighter challenges
- In some properties the fixed fire-fighting systems are unknown or not tested or maintained frequently enough, and may be secured to avoid damage
- The need for extended hose lines for fire fighting operations
- Realistic assessment of escape behaviours, i.e. whether the building provide a safe environment in which to facilitate escape, particularly for vulnerable occupants. This would be a significant issue where a fire could not be readily controlled and there became a need to instigate a full scale evacuation.

Timber framed buildings:

- Familiarity of fire crews with the new type of construction - 'Identification' of these buildings is an emerging and serious concern for many aspects of Modern Methods of Construction

Tall buildings:

- Fire fighter access problems due to height of building

Post construction issues

- Unknown and potentially high fire loads
- Uncontrolled use by tenants, including increased fire risks such as smoking, use of candles, deep fat fryers etc
- Anti-social behaviour issues - vandalism, damage to risers, fire doors, emergency lighting, alarm systems etc
- Misuse of areas - combustibles stored within escape routes, balconies etc.
- Life cycle occupant related resilience – whether the materials used are resistant to interference by occupants, including DIY alterations (such as the replacement of flat entrance doors with a non-fire resisting door)
- Internal doors (including flat entrance doors) wedged open for general occupancy desires
- Ongoing control - maintenance needs, life cycle costs and logistical issues, enforcement challenges
- Need for improved guidance and awareness in Fire Risk Assessment issues - robust guidance and mechanism for demonstrating understanding of the escape procedures
- Need for effective and tested communication of fire awareness, behaviour and procedures for occupants (including visitors, new tenants, vulnerable occupants etc)

- Future alterations to the building - alterations can impact on designed fire safety features such as internal compartmentation

7. What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?

Many of the aspects identified above relate to the long standing concerns and challenges to the construction industry. Zurich welcomes the increasing use of environmentally friendly design concepts, which often incorporate the most innovative products and techniques. However, the good work done in this regard also needs to consider the likely impact a fire would have on such structures. It is commonly the case that many of the more environmentally friendly products used have a limited performance in the event of a fire. Lightweight structures with combustible elements generally offer little resistance to the development and spread of fire.

Zurich believes that to be truly 'sustainable' in the long term sense of the word, architects and planners need to place much greater emphasis on the fire risk associated with modern construction methods.

A review of both the need and desire to construct timber frame buildings of any significant height/proportion is needed.

Whilst there are well documented and significant benefits to the use of conventional timber frame construction, it is essential that these risks are balanced robustly with the potential risk. Risks such as construction exposure, life cycle maintenance issues, resilience to routine use, appropriate occupancy groups and overall scale of potential loss are examples of essential considerations. In addition, overall life expectancy of the buildings must be assessed and considered.

One potential way of managing the risks associated with tall and timber framed buildings would to require the provision of sprinklers in any timber frame construction over, for example, four floors in height. This concept warrants further examination involving all stakeholders to determine costs vs benefits.

8. Do you have any other comments that may be useful to the investigations?

No.

Zurich
March 2010

FS017 UK Timber Frame Association

(04/03/10)

Dear Madam,
Investigation into Fire Safety in Tall and Timber Framed Buildings in London
Thank you for your letter of 5th Feb in which you sought our view on a range of questions on the above matter. Please see below our responses to the 10 set questions.
1. The UKTFA is aware of a five fires in timber frame buildings under construction in the London area over the period of the last 5 years. These were in Colindale, Charlton, Hackney, Peckham and Southwark. All available evidence suggests that arson was the cause in all cases other than Colindale, where the cause is unknown. Fires on timber frame construction sites are a result of sufficient initial fuel load being present and available to the arsonist. This fuel load does not come from the timber frame but from other, more combustible materials which are lit in order to spread and enlarge the fire. It is extremely difficult to set fire to an open timber frame without an initial fuel load. Examples of the initial fuel load could be diesel, petrol, dry waste material etc.
2. The UKTFA have implemented the mandatory Sitesafe scheme to reduce the incidence of construction site fires. One of the demands of Sitesafe is that Members of the UKTFA notify the appropriate regional Fire Service of the existence of a large timber frame project. Large is defined as being over four storeys in height or over 2500m2 in aggregate floor area. As such, the London Fire Brigade will be notified of all large London projects proposed to be carried out by UKTFA Members. The information supplied to the LFB includes the name of the Member company, the location of the project, the size of the project and an invitation is offered to the LFB to visit the project site in order that the LFB familiarize themselves with the specifics of the project. Additionally, there is the existing reporting procedure which forms part of the normal Building Warrant process. In this, the Building Control body should consult the local Fire Service on matters relating to new warrant applications for many large projects. From this consultation, the Fire Service are able to determine the construction material of the building.
3. The Building Regulations give the standards to be met with regards to the health safety and welfare of people using the building after it is competed and is occupied. During the construction period the CDM regulations, fire safety enforcement and other Health and Safety matters are under the jurisdiction of the Health and Safety at Work Act during working hours and the Emergency Services at all other times.
4. The UKTFA seeks to provide the best guidance to its Members and to the project main contractor as to how best to reduce the risk of construction site fires. The documents "Fire Safety on Timber Frame Construction Sites" and the "16 steps to fire safety on construction sites" have been written by the UKTFA with this objective. These documents outline the UKTFA's recommendations for steps to be taken, where appropriate and after individual risk analysis so as to avoid site fires or to reduce their incidence.
During the construction phase there are no specific fire risk implications for differing construction materials. The HSE guidance document HSG168 outlines the process which one should undertake in order to assess the fire risk on a construction site. The guidance does not differentiate between material types but it is clear that an individual risk analysis should be made of all aspects of a construction site and clearly the materials used will be part of that analysis. The design of any building should meet the requirements of the relevant Building Regulations and in all cases that design should be implemented on site in the proper manner in order to reduce the likelihood of site fire.
5. This question should be answered looking at two clearly separate areas. Firstly, there are no specific fire risks associated with completed timber framed buildings. All buildings must be

designed and constructed to meet the requirements of the building regulations. The Building Regulations demand an appropriate period of fire resistance from all buildings regardless of their construction materials. The evidence of performance is there to demonstrate that completed timber frame buildings meet building regulation requirements. The amount of fireload in any habitable room is the fire risk regardless of the construction material.
Secondly, during the construction phase the perceived risk is that the timber frame itself is combustible. Whilst it is true that timber is combustible, this does not confirm that there is a specific risk associated with timber frame, as many construction materials are either combustible, have poor fire resistance or both. The specificity is in the risk assessment of the construction site, and the management procedures put in place in order to mitigate those risks.
In order to assist the UKTFA's Member companies, the Principle contractor, the HSE and the Fire Service, the UKTFA has, with the awareness of CFOA commenced the Sitesafe programme. The implementation of Sitesafe is mandatory for membership of the UKTFA. Sitesafe requires that all large timber framed projects (over 4 storeys and/or 2500m2 aggregate floor area are notified to the appropriate Fire Authority and the UKTFA prior to commencement of work. The ongoing timber frame erection process will be audited to ensure compliance as far as is possible with the UKTFA documents as mentioned in item 4 above. This necessitates a large degree of cooperation between the UKTFA member company and the main contractor, whose responsibility it is to ensure the fire safety of the construction site.
6. There are no additional risks associated with an occupied timber frame building. The Building Regulations ensure that buildings of all construction types meet the same standard of fire safety. As with all buildings, there is a risk if the building is not constructed properly and to the correct level of workmanship.
Fire resistance, non - combustibility and surface spread of flame are matters affecting all construction materials. Whilst timber is combustible, it has a high degree of fire resistance and resistant to initial combustibility. Steel is non combustible but has poor fire resistance in that it readily weakens when exposed to heat, resulting in buckling. Brickwork and concrete are non combustible but again are not infinitely fire resistant, and heat will cause their structural failure through spalling and cracking on expansion.
So it would be reasonable to say that all construction materials have inherent strengths and weaknesses. Each material has a process to achieve a completed building performance without undue fire risk during construction.
7. The Building Regulations are there to ensure the health safety and well being of the building users. This principle is continued in the Code for Sustainable Homes with the inclusion of many features to benefit the user and the Environment. Timber frame construction has embraced these principles and is the construction method which can offer most to the building designer, builder and user in terms of CO2 reduction.
The risk assessment process and procedures to follow as a result of the assessment with regards to timber frame buildings has best been developed and enhanced by joint working of the HSE CFOA and the UKTFA in the development of the "Fire Safety on Construction Sites" and the Sitesafe process. These are comprehensive in their approach and have been very well received in their practical application on site, by the HSE and the regional Fire Authorities.
8. The draft version of HSG 168 mirrors many of the principals within the UKTFA "Fire Safety on Construction Sites". The UKTFA welcomes the HSE guidance regarding timber frame buildings contained within the draft.
The UKTFA is in the process of reviewing its current guidance documents with a view to strengthening its recommendations on fire safety on construction sites, and is in the process of drafting the second phase of the guidance documentation. When "Fire safety etc" was written, the intention was to publish the full suite of guidance documents in phases, to allow the necessary research to be carried out. This second phase is now underway, with an anticipated publication date of the end of 2010. The second phase will address issues not considered in the first phase such as the use of fire suppression systems, fire retardant timber treatments and

further compartmentation. Additionally the UKTFA is addressing its current guidance with a view to ensuring a more secure timber frame building in terms of break - ins, vandalism and arson during the construction phase, with the use of measures such as the secure boarding of ground floor windows and doors at the end of the working day.
The UKTFA is also working with Timber Research And Development Association to produce a guidance document on the best practice of installing fire stopping. This will be of great value to site workings, to ensure that the finished building is as fire safe as possible.
9. The full implementation of the Sitesafe process by UKTFA members and the principle contractor, with necessary liaison with the HSE and the London Fire Brigade will ensure a robust process to reduce or eliminate the risk of on timber frame construction site.
10. The UKTFA would be pleased to discuss further the current and future guidance it has prepared on this matter, Sitesafe and the steps it is taking to reduce the incidence of timber frame construction site fires. We would also ask that the UKTFA be involved with future initiatives and discussions on these issues as we are keen to work with the appropriate bodies to achieve positive solutions.

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(22/03/10)

March 22nd 2010
Dear Councillor Jones
Subject: London Assembly Investigation - Planning and Housing Committee
Fire Safety in Tall and Timber Framed Buildings in London
Firstly thank you for inviting me to your meeting on March 16th 2010. I found the discussion both informative and appropriate.
Following the meeting I would like to clarify two things:
1. I was asked, if I remember correctly by Navin Shah, as to how many building were 6 storey and above in timber frame. I think at the time I mentioned 10% of all timber frame buildings are built at this height. On reflection I am mistaken. The figure is more like 1 %. I have been in my company 8 years and am aware of two projects that include designs for 6 storey. We typically run around 50-100 project per year. I am sure the figure is similar for the rest of the industry where the larger suppliers are concerned. Smaller suppliers would not engage in 6 storey timber frame.
2. In the briefing notes following your consultation, in paras 2.7 and 2.18 you make the point that timber frame is cheaper and quicker to build. The latter is certainly true. With regard to the former point, I refer you to the National Audit Office report in respect of whether timber frame is 'cheaper':
http://www.nao.org.uk/publications/0506/modern methods of construction.aspx
The executive summary in the document states:
"Cost ranges [compared to traditional building methods] are comparable depending on specific project circumstances, although they are higher on average"
The reasons the market share of timber frame has grown over the past decade to attaining the level of 1 in 4 new homes in the UK being built in timber frame are in my opinion:
1. The government had a clear agenda which was later evidenced by the NAO report above, that more homes could be built in a shorter time using modern methods of construction than could be aChieved using more traditional methods such as concrete blocks. As a result they directed funds to public sector funded housing developments on the proviso that the developer would use a modern method of construction.

2. Latterly this constraint on funding has been removed and has been replaced with the funds directed to delivering high energy efficient homes. As timber frame enables the building of high performance building fabrics, the momentum on increased timber frame usage has

continued. Furthermore timber is a sustainable building material and is essentially a carbon sink. This gives it further advantages in meeting the Code for Sustainable Homes criteria.
In summary the popularity of timber frame is now driven through its environmental considerations and its ability to deliver high quality building fabrics rather than the fact it is 'cheaper'.

FS018 London Borough of Newham

Question	Reply
1. In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed?	102,619 residential units according to data from the Council Tax section on 22.02.10. We do not have a record of how many are tall or timber framed. *As a result of this survey I propose to change how we record B Reg applications for Tall and Timber framed buildings in the future so that we can run reports to find such data.*
2. Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?	There is an estimated increase in residential units in the next 10 years of 25,000 however there is no estimate of how many of these will be tall or timber framed. Forward Planning do anticipate there will be tall buildings around Stratford High St, Canning Town and other transport hubs but cannot predict numbers. There is no prediction for timber framed. *BC officers in Newham report that the majority of new residential developments up to 4 stories are timber framed construction. They also report that there are currently at least 4 major school sites where timber framed construction is being used. 3 of these have Approved Inspectors as the Building Control Body.*
3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?	We have no records of these. We have liaised with the fire brigade and they also have no records of numbers of fires in tall or timber framed buildings in Newham.
4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?	If Newham Building Control (BC) receives a B Regs application for the construction of a timber framed building we would know it was timber framed and we would advise the Fire Brigade as part of the consultation process in all cases. If Newham (BC) receives a B Regs application for an alteration to a timber framed building we may know it is timber framed depending on what the alteration is and what the building history is. If for example the building was original constructed using an Approved Inspector (AI) as the Building Control body then Newham BC would not know the original construction. Where AI initial notices are received for the construction or alteration of timber framed buildings Newham BC would not know there was a timber frame involved. You would need to check with the Fire Brigade if the AI's inform them of timber framed construction during consultation in the same way Local Authorities do.
5. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?	Our view is that: During the design stage it is the responsibility of the project design team and their client. During the construction phase it is the responsibility of

	design team, the client and the contractor. Once completed it is the responsibility of the building owner and their management team. The Building Control Body (LA or AI) has a duty to consider Part B matters when dealing with the B Regs application and the work on site but we do not consider them to be the responsible party. The health and safety executive (HSE) have an enforcement role which we suggest you should seek comment on. The Fire Brigade have an enforcement role under the RRO which we suggest you should seek comment on.
6. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?	Site Risks: We are advised by the Fire brigade that the two main fire risks on timber framed sites are smoking and hot works. Due to the quantity of timber on site arson can have a larger consequence then on other types of sites. We consider the impact of following trades damaging fire stopping, fire walls /floors and cavity barriers as a risk both during construction and after completion. Current Regulations relay on the inspections by Building Control to find and remedy problems. It is impossible for officers visiting sites from time to time to find all situations of such problems many of which are covered up. The current Regulatory controls on external fire spread appear less onerous then in the past under the London Constructional By-laws. Consideration should be given to the fire effects of materials such as window /door frames and gutter / soffits.
7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?	There has been a move away from prescriptive regulation to functional requirements with non mandatory guidance issued by CLG and their predecessors. This has increased the number of fire related solutions proposed by designers based on risk assessment including Fire Engineered solutions. The release of BS9999 has offered a more generous range of fire solutions then ADB including increased travel distances and smaller door ways and stairways on escape routes. The guidance in the CLG Approved documents has changed over the years with relaxation of advice in some cases and a tightening of advice in others. E.g. The need for self closers on some fire doors removed but the introduction of the need for sprinklers in certain high rise buildings (over 30m).
8. What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?	No record of impact. CLG may have statistics. See CLG future of Building Control document.
9. How do you follow the RRO (Regulatory Reform Order) Fire Risk	The Housing Health and Safety Rating System (HHSRS) is actively used by the Private Sector Housing

Assessment process for ongoing building and occupant life safety under the Housing Health and Safety Rating System (HHSRS)?	Group to ensure that residents are not subjected to unacceptable levels of risk from their accommodation. Where necessary and appropriate, in line with the council's Private Sector Housing Enforcement Policy, enforcement action is taken under the Housing Act 2004 to secure improvements to the accommodation to mitigate any HHSRS hazards identified. In some houses in multiple occupation the council's enforcement powers overlap with those of the fire and rescue service under the Regulatory Reform (Fire Safety) Order, and in these cases we are currently in the process of agreeing a working protocol to establish which organisation will take the enforcement lead. .
10. What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?	Make owners aware of their responsibility under the RRO including prosecutions of owners who fail to comply. Review resources available to statutory bodies to take enforcement actions against contractors who are not taking proper precautions against fire during construction including controls on smoking and hot works. Review options for dealing with following trades damaging fire barriers. Review the controls in place to limit external fire spread between units both vertically and horizontally.
11. Do you have any other comments that may be useful to the investigation?	No

FS019 London Borough of Hounslow

Dear Ms Beer,
RE: Investigation into Fire Safety in Tall and Timber framed Buildings in London
Thank you for your letter dated the 8th February 2010 addressed to Michael Jordan – Director of Environment
with respect to the above. Your letter has been forward to me to respond. Having reviewed your questions I would respond as follows:
1. In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed?
LB Hounslow has a total of 95,173 residential units according to data received from our Council Tax section on 4th March 2010. I note that 2,134 residential units are classified as being in tall buildings from our Hounslow
Homes partnership however no information is available with respect to the numbers of privately owned units within tall buildings. We do not have a record of how many are timber framed.
2. Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?
There is an estimated increase in residential units in the next 10 years however there is no estimate of how many of these will be tall or timber framed buildings. There is no prediction for timber framed buildings.
3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?
Local Authority Building Control does not hold this information. Please refer to the LFB
4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?
It is a requirement of the Building Regulations 2000 (as amended) that a person intending to construct a new
building or refurbish an existing building [where this includes notifiable building work, a material alteration or
material change of use] is required to deposit full plans with local Building Control. Alternatively a private sector Approved Inspector [AI] can be chosen to act as the Building Control Body [BCB] and in this case an Initial Notice has to be registered with the relevant local authority.
Where AI initial notices are received for the construction or alteration of timber framed buildings Hounslow BC
would not know if timber frame is involved.

Local Authority Route
Full plans are defined as plans in sufficient detail to show that the proposed work would comply with the Regulations. This includes fire strategy, relevant plans, structural calculations, construction details, etc.
In the case of buildings to which the Regulatory Reform [Fire Safety] Order 2005 [RRO] apply, i.e. 'relevant buildings' , the local authority is required to consult the Fire Authority [LFEPA] in respect of fire safety. The consultation includes plans and details of the proposed new building or works and the form of construction [if
known] is also notified, in particular where timber framed.
Note: 'Relevant buildings ' includes most buildings with the exception of single family dwellings. Flats are covered by the Order due to the common parts.
A person [using the local authority route] who proposes to carry out building work shall not commence that work unless -
(a) he has given the local authority notice that he intends to commence work; and
(b) at least two days have elapsed since the end of the day on which he gave the notice.
Private Approved Inspector Route

The private sector AI supplants the local authority as the Building Control Body [BCB] and the person intending to carry out the work and the AI jointly 'register' an Initial Notice [IN] with the local authority indicating
the location of the building and describing the work. Where an AI is appointed to act as the BCB there is no requirement for either detailed plans or notice of commencement to be given to local authority Building Control.
The IN remains in force until the AI registers a Final Certificate with the local authority to indicate satisfactory
completion of the building or work. The local authority is prohibited from further involvement once an Initial Notice is in force.
AIs are also obliged to consult the Fire Authority [LFEPA] on fire safety matters and before a Final Certificate
is issued for relevant buildings. AIs are represented by the ACAI.
The Association of Consultant Approved Inspectors [ACAI]
c/o 14 Berkeley Street
London
W1J 8DX
5. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?
My view is that:
During the design stage it is the responsibility of the project design team and their client.
During the construction phase it is the responsibility of design team, the client and the contractor.
Once completed it is the responsibility of the building owner and their management team.
Construction work is covered by the Construction (Design & Management) Regulations 2007 which impose duties on Clients, Designers, and Contractors including notification of construction projects to the HSE.
New and refurbished buildings have to comply with the relevant requirements of the Building Regulations irrespective of whether the BCB is the local authority or an AI. Guidance on compliance is contained in a suite
of Approved Documents which are published in respect of each requirement e.g. ADA covers Part A ~ Structure and ADB covers Part B ~ Fire Safety, etc
The Building Control Body (LA or AI) has a duty to consider Part B matters when dealing with the Building Regulation application to ensure that the minimum standards of the Building Regulations are achieved. However as indicated it is the responsibility of the design team to select materials to achieve this minimum standard.
The Fire Brigade have an enforcement role under the RRO which we suggest you should seek comment on.

6. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?
Refer to CLG and UK Timber Frame Association.
7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?
There has been a move away from prescriptive regulation to functional requirements with non-mandatory guidance issued by CLG and their predecessors. This has increased the number of fire related solutions proposed by designers based on risk assessment including Fire Engineered solutions. The release of BS9999 has offered a more generous range of fire solutions then ADB including increased travel distances and smaller doorways and stairways on escape routes. The guidance in the CLG Approved documents has changed over the years with relaxation of advice in some cases and a tightening of advice in others. E.g. the need for selfclosers on some fire doors removed but the introduction of the need for sprinklers in certain high rise buildings (over 30m).
Please refer to CLG for full details.
8. What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?
The biggest impact has been the introduction of the recommendation in Part B of the Building regulations for

sprinklers in blocks containing flats over 30m above ground level.
CLG is best placed to comment on new guidance anticipated in the future on either tall timber framed buildings or fire safety.

9. How do you follow the RRO (Regulatory Reform Order) Fire Risk Assessment process for ongoing building and occupant life safety under the Housing Health and Safety Rating System (HHSRS)?

The Housing Health and Safety Rating System (HHSRS) is actively used by our Private Sector Housing to ensure that residents are not subjected to unacceptable levels of risk from their accommodation. Where necessary and appropriate enforcement action is taken under the Housing Act 2004 to secure improvements to the accommodation to mitigate any HHSRS hazards identified. Further consultation would be required with our Private Sector Housing with respect to Regulatory Reform (Fire Safety) Order which is outside of my remit.

10. What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?

Publicise the RRO and in particular the duty of 'Responsible Persons' to carry out fire risk assessments and to ensure the maintenance of fire safety arrangements, and measures provided for protection of fire-fighters [article 38 of the RRO].

38.*—(1) Where necessary in order to safeguard the safety of fire-fighters in the event of a fire, the responsible person must ensure that the premises and any facilities, equipment and devices provided in respect of the premises for the use by or protection of fire-fighters under this Order or under any other enactment, including any enactment repealed or revoked by this Order, are subject to a suitable system of maintenance and are maintained in an efficient state, in efficient working order and in good repair.*

Additionally to review resources available to statutory bodies to take enforcement actions against contractors who are not taking proper precautions against fire during construction including controls on smoking and hot works. Plus reviewing options for dealing with trades damaging fire barriers.

11. Do you have any other comments that may be useful to the investigation?

No

FS020 London Borough of Richmond

Question	Reply
1. In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed?	There are an estimated 80,000 households in the borough. We do not have an exact classification of the number of units in tall buildings.
2. Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?	In terms of the likely increase in numbers, planning policies do encourage higher densities in sustainable locations, subject to other policy considerations. There are forward planning discussions about a number of large sites where we anticipate there may be future development of tall buildings over the next 10 years. These would total 300 to 1,000 units but will be very dependent on whether developments are taken forward.
3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?	Building Control records indicate that in November 2008 in relation to a three storey block of town houses (Meadway, Twickenham) a down lighter set light to notes in the roof space and burnt out the roof space and ceiling, which collapsed onto the second floor. However, the main timber frame remained intact. The separating wall was not suitably fire stopped and the fire spread to the neighbouring roof void. This is the only information data available.
4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?	Local Building Control receive submissions under the Building Regulations. The details contained within the submission will include the nature of works proposed and the description of the building. Premises subject to control under the Regulatory Reform Fire Safety Order are subject to formal notification by the Building Control authority to the Fire Authority. The information provided to Building Control is normally provided by an agent working on behalf of the building owner. However, if an Approved Inspector is involved, the local authority would not have any knowledge of the construction, but register an Initial Notice suspending the responsibility of the local authority.
5. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?	During the design stage we would suggest it is the responsibility of the project design team and their client. During the construction phase it is the responsibility of design team, the client and the contractor. Once completed it is the responsibility of the building owner and their management team. The Building Control Body (LA or AI) has a duty to consider Part B matters when dealing with the B Regs

	application and the work on site but we do not consider these bodies to be the responsible party. The health and safety executive (HSE) have an enforcement role and the Fire Brigade have an enforcement role under the RRO
6. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?	Experience shows that one cause of the compromise of fire safety post construction is unauthorised work e.g. the running of cables in common areas and protected shafts, where fire stopping is disturbed or removed and compartmentation is breached. There are also reported cases where long standing fire safety measures e.g. opening vents/windows to common parts have been disabled or rendered ineffective. These issues should now be recognised and addressed by the 'Responsible Person' designated under the RRO, as should the maintenance of active fire safety measures, e.g. ventilation arrangements and systems to common parts/internal fire fighting access, which form an integral part of a fire strategy to ensure they function correctly at the required time: The Fire brigade advise the two main fire risks on timber framed sites are smoking and hot works. Due to the quantity of timber on site arson can have a larger consequence than on other types of sites. There is also the impact of following trades damaging fire stopping, fire walls /floors and cavity barriers as a risk both during construction and after completion. Current Regulations rely on the inspections by Building Control to find and remedy problems. It is impossible for officers visiting sites from time to time to find all situations of such problems many of which are covered up. The current Regulatory controls on external fire spread appear less onerous than in the past under the London Constructional By-laws. Consideration should be given to the fire effects of materials such as window /door frames and gutter / soffits.
7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?	There has been a move away from prescriptive regulation to functional requirements with non mandatory guidance issued by CLG and their predecessors. This has increased the number of fire related solutions proposed by designers based on risk assessment including Fire Engineered solutions. The release of BS9999 has offered a more generous range of fire solutions then ADB including increased travel distances and smaller door ways and stairways on escape routes. The guidance in the CLG Approved documents has changed over the years with relaxation of advice in some cases and a tightening of advice in others. E.g. The need for self closers on some fire doors removed

	but the introduction of the need for sprinklers in certain high rise buildings (over 30m). In general terms, regulations have addressed potential for disproportionate collapse and greater consideration of junctions of elements. Fire safety codes moved towards less prescription and introduction of risk assessment.
8. What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?	It should be noted references to 'buildings under construction' are the responsibility of the Health and Safety Executive and items associated with this aspect of the construction process should be addressed to the H.S.E. The biggest impact has been the introduction of the recommendation in Part B of the Building regulations for sprinklers in blocks containing flats over 30m above ground level. Additional Impact of recent amendments to fire safety regulations for residential buildings has been to require fire risk assessments to common areas pursuant to the RRO. This should identify risks and provide mitigation for the common escape routes in these buildings. In reality, the enforcement (by the Fire Authority) is dependent on the policy of the fire authority to police these. No record of impact. CLG may have statistics and See CLG future of Building Control document.
9. How do you follow the RRO (Regulatory Reform Order) Fire Risk Assessment process for ongoing building and occupant life safety under the Housing Health and Safety Rating System (HHSRS)?	The responsibility in Richmond is the remit of two groups. The information available is more comprehensive in relation to one of the groups but generally all risk assessments have been carried out on larger blocks and any urgent works revealed from this process have been initiated. RHP Group does not have any tall buildings which are timber framed. In Richmond we have 21 blocks that are "tall" under the definition in which there are 535 homes. These are 2 x 9 storey blocks, 1 x 7 storey block, 3 x 6 storey blocks and 15 x 5 storey blocks. Of these 9 blocks are wimpey no fine construction and the remainder are traditional RHP has carried out fire risk assessments on all of its general purpose communal areas. A major fire safety upgrade programme has been carried out to improve fire doors, strips and signage over the past two years. We have also written to all customers and provided them with a copy of the Fire Brigade guide to safety in the home. Finally, we have adopted a zero tolerance approach to storage of items in the communal areas including things like bicycles, toys, mats and plants. These are stickered and removed within 48 hours of notification. Ongoing block risk assessment is carried out by caretakers and housing officers on a regular basis with any hazards being actioned through an industry standard health and safety management database called RIVO. Full FRAs are carried out on an annual

	basis by appropriately trained staff. RHP has built a good relationship with the Fire Service who have approved the version of our FRA in use and have also advised on and approved our form of block fire signage. We are responding to any issues raised by the Fire Service on inspections to blocks. The Fire Authority has the Enforcement role in these areas. In addition, RCT have approximately 9 blocks in excess of 3 storeys and some 3 storey and a number of units under 3 storeys. None of the larger are timber frame, some of the smaller will be timber frame Similar criteria as above re risk assessments and fire authority role
10. What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?	Make owners aware of their responsibility under the RRO including prosecutions of owners who fail to comply. Review resources available to statutory bodies to take enforcement actions against contractors who are not taking proper precautions against fire during construction including controls on smoking and hot works. Review options for dealing with following trades damaging fire barriers. Review the controls in place to limit external fire spread between units both vertically and horizontally. The incident to which I referred in item 3 could also have occurred in a non-timber frame building. Currently regulations only require fire hoods to recessed lighting in floor voids – this could also be extended to include any installation with a void above.
11. Do you have any other comments that may be useful to the investigation?	No

FS021 Family Mosaic

Investigation in Fire Safety in Tall and Timber Framed Buildings in London

1.

In London how many residential units do you own and manage; how many units are classified as being in tall buildings and how many are timber framed (break down by borough if possible)?

We have 438 tall buildings or blocks (5 storey / 15meters) however it is currently not possible to identify how many of these are timber frame as we do not hold this data as part of our stock condition survey. (borough breakdown attached)

2.

Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next ten years? It is difficult to say from our current programme. We have currently 330 timber framed units under construction of which 133 are in blocks of around 15m high. Given the current economic situation, it is impossible to say how our programme will develop after, say, 2011-15.

3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last twenty years?

We have had fire incidents over the years but they have been mainly internal fires due to occupants carelessness or vandalism but unable establish any trends. Unfortunately we do not have any records of fires specifically identifying timber framed buildings.

4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom? Usually our contractors make contact with Local Building Control prior to start on site and submit an application for 'full plans' approval. This submission typically includes scaled plans clearly indicating the proposed construction details and where necessary supporting structural calculations. A Building Control Surveyor (BCS) will then check the plans for compliance with the Building Regulations. Part 'B' of the Building Regulations deals with 'Fire Safety', which provides for safe means of escape in case of a fire and other fire related issues, i.e. fire spread control, fire resistance of construction and access for fire fighting. Building Control have a second course of action, whereby they can consult with the London Fire Brigade(LFB) on specific matters on a scheme, where the proposed layout is unusual or the BCS feels that there may be higher risk. Any consultation that is made by LFB will be via Building Control, as Building Control are ultimately responsible for ensuring that the plans are in accordance with the *statutory requirements of the Building Regulations.*

5. **Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?** *The vast majority of our projects are procured on Design and Build basis. The responsibility for ensuring the relevant guidance on materials and construction in relation to fire safety principally lies with the Building Contractor and their designers. They have contractual obligations to comply with relevant British standards, Codes of Practice and legislations etc. However, the Building Control Inspector is responsible for ensuring that the building is being constructed in accordance with the Building Regulations. We also get warranties from such providers as NHBC Buildmark Choice, Premier Guarantee and inspections will also be made throughout construction with the purpose of satisfying the warrantor's requirements.*

In addition to the aforementioned, Family Mosaic commission services from consultants ((known as Employers Agent(EA)) for every project, who make regular inspections to check on compliance with drawings, Building & Fire Regulations and general good building practice and confirm status of the fire officers requirements on the design and construction. EA will ensure all relevant compliance certificates are in place before recommending the building for occupation.

6. **What are the specific risks associated with both tall and timber framed residential buildings that are occupied? What can compromise fire safety post construction?**

Specific risks that can be associated with high rise timber buildings post occupancy are principally the compartmentalising of both the residential unit and the means of escape. These risks can be compromised by resident removal of fire safety specifics such as automatic door closers or by storing flammable goods in communal areas and general storing of goods that obstruct means of escape.

Following major works, if fire seals are not installed correctly, the fire will spread more quickly than traditional buildings.

Poor understanding and maintenance of fire protective features such as automatic opening vents, dry risers and fire detection systems can compromise fire safety. These are addressed through maintenance measures being established at property handover.

7. **What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?**

There was a relaxation of the requirement for self-closing doors on escape routes within new flats and houses (came into force 6 April 2007). This is to say that fire doors within private parts of flats and within houses no longer need to be provided with self-closing devices. Although it is acknowledged that occupiers either disconnect door closers from doors or permanently prop

Currently the requirement for an automatic opening ventilator of at least 1.5m2 is only required where there is an occupied level over 18m above ground level. It would be beneficial if this is made mandatory for all single stair buildings, regardless of their size.

The UK timber Frame Association has issued comprehensive guidelines on the site construction methods and measures to be taken to eliminate potential fire on partially completed buildings. It is anticipated that similar guidelines will be issued to timber frame manufacturers.

Other changes may be to increase the fire resistance of compartment walls of single stair buildings and party/compartment walls of flats. Similarly, the introduction of dry risers in common parts of buildings below the current statutory level may become mandatory to assist the emergency services to control and prevent the spread of any outbreak of fire in completed buildings.

8. **How do you follow the RRO (Regulatory Reform Order) Fire Risk Assessment process for ongoing building and occupant life safety under the Housing health and Safety Rating System (HHSRS)?**

Family Mosaic has a programme of fire risk assessments for all buildings / block that access a communal areas. These are undertaken by a combination of external consultants and in-house surveyors. The assessments are held centrally on a database and reviewed annually or post any major refurbishment works. Family Mosaic also have a stock condition programme that inspects both the residential unit and communal areas and this incorporates HHSRS assessments.

9. **What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?**

Greater regulatory presence during construction process.

Service contracts duly set up to ensure specialist fire protection systems are properly tested and regularly maintained.

Fire safety and emergency procedures and testing could be instigated more regularly with the residents

Resident education needs to be embedded so that people are aware of the risks that their actions may pose to themselves and others. Particularly in relation to an understanding of personal responsibility to ensure a personal escape plan exists for all household members and that smoke alarms are regularly tested.

10. **Do you have any other comments that may be useful to the investigation?** *None*

Fire Safety in Tall and Timber Framed Buildings in London

Borough Code	Count
Hackney	112
Lambeth	48
Islington	47
Southwark	20
Waltham Forest	14
H & F	14
K & C	13
Greenwich	13
Brent	12
Newham	11
Westminster	9
Lewisham	9
Haringey	8
Barnet	4
Ealing	3
Merton	2
Bromley	1
Redbridge	1
Croydon	1
Tower Hamlets	1
Harrow	1
Wandsworth	1
Various Essex boroughs	93
Total Counts	**438**

FS022 Association for Specialist Fire Protection (ASFP)

Re: Investigation into Fire Safety in Tall and Timber Framed Buildings in London

Dear Ms Jones,

The Association for Specialist Fire Protection represents over 80 of the UK's major fire protection product manufacturers and contractors, as well as regulatory and certification bodies. The Association's aims are:

- To protect life, property and the environment
- To promote continuous improvement in all aspects of passive or 'Built-In' fire protection.
- To foster the education and training of all those involved in the development, specification and use of passive fire protection.
- To promote excellence in the design and installation of passive fire protection products through high quality and technical expertise.

The Association's publications are listed in Approved Document B (Fire safety) and these and more information can be found on our website.

We recently heard about your investigation into tall and timber framed buildings via the Fire Protection Association with whom we have close links; and we feel we are well placed to be able to assist you in your task. The Association offers its support in whatever way it can.
We note in the letter you wrote to various stakeholders that you asked a number of questions and we have provided our answers to them as best we can below. If you wish to discuss these, please do not hesitate to ask me or our Technical Officer Niall Rowan.

Question 1: Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?

Answer: We do not have this information

Question 2: Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?

Answer: We do not have this information; we think you would be better asking the FPA or the ABI. However, we note the concerns expressed by several stakeholders regarding the fire safety of timber frame constructed buildings. In particular we are concerned over the quality of the products and the installation of passive fire protection products in timber framed buildings and how this can allow fire to spread in concealed spaces. As my introductory paragraph in this letter stated, the quality of passive fire protection is something that the ASFP is passionate about. Niall Rowan gave a paper on this subject at the recent RISCAuthority annual seminar http://www.info4fire.com/in-depth-content/full/id/64982?doAsGroupId=10606&refererPlid=10709&_content_groupId=10606

Question 3: Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?

Answer: A large number of bodies are involved including:

- The designers of the building including the architects
- Building Control Bodies (Local Authority Building Control or Approved Inspectors)
- Main contractor and subcontractor
- HSE for health and safety during construction. There is a new draft HSG document on which consultation has just closed
- HSE under the Construction Design and Management Regulations
- Fire Authority in the enforcement of the Regulatory Reform (Fire Safety) Order 2005
- Trading Standards Organisations in the case of breaches of Trading Standards legislation

Question 4: What are the specific risk implications for various building designs, construction materials and construction methods in relation to both tall and timber residential buildings?

Answer: Timber frame is particularly vulnerable during the construction phase where the timber frame is exposed and fire compartmentation/fire stopping has not been installed. Once alight, unfinished timber framed buildings tend to burn rapidly allowing fire spread to other buildings as was seen at the Peckham fire.

Once occupied, timber framed buildings have been shown to have comparable fire safety to traditionally constructed buildings. This was demonstrated in the TF2000 series of tests at Cardington. However, there are problems associated with fire spread in cavities and other hidden spaces. This is caused by the use of flammable materials in cavities (instead of e.g. brick or block) and the lack of fire stopping or the poor installation of fire stopping allowing fire spread.

In addition, residents of timber framed buildings are usually unaware that many routine DIY activities like installing extra plug sockets perforate fire resisting walls and compromise the compartmentation. Over time, there will be many such breaches and the likelihood of fire spread increases.

Question 5: What are the specific risks associated with timber framed buildings under construction? Do current regulations sufficiently control fire spread / external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?

Answer: As stated earlier, timber frame is particularly vulnerable during the construction phase where the timber frame is exposed. The timber is finely divided and there is an ample supply of oxygen and so a fire tends to be rapid and severe. To illustrate the converse, the fires that occur in the hidden spaces post occupation tend to be slow burning because of a lack of oxygen.

Building regulations only apply to the completed buildings. HSE have revised HSG 168 and this has now has specific extra guidance on construction sites for timber framed buildings.

Buildings constructed using conventional techniques are more robust against fire in the construction phase. Post construction, timber frame buildings are more susceptible to poor workmanship. If they are built properly, they should not pose an unduly increased risk.

Question 6: What are the specific risks associated with tall and timber framed residential buildings that are occupied? What can compromise fire safety post construction?

Answer: As stated earlier, the occupier of timber framed building is most likely unaware that they have to take special care when undertaking DIY or commissioning other remedial work – particularly anything that

involves perforating the walls or ceilings.

Question 7: What do you think currently are the outstanding actions required to reduce the risk and number of fire incidents in tall and timber framed buildings in London?

Answer: A number of actions could be undertaken relatively quickly and easily including:

- Increased security during construction to prevent arson which is one of the most common causes of timber frame fires
- Proper inspection of buildings as they are being constructed. This is a perennial problem and something the Association feels very strongly about. Rogue/unskilled/ignorant contractors can install products poorly and know they will not be caught.
- Use of third party certificated installers for passive fire protection products (AD-B encourages this)
- Use of third party certificated products (AD-B encourages this also)
- Training of installers of passive fire protection products

In the longer term, there should probably be some research to check that AD-B 'works' for timber framed buildings. It may well need modifying. The next full review is not due until 2016.

Question 8: Do you have any other comments that may be useful to the investigation?

Answer: Not at this time.

I hope that the answers we have given to your questions will be of use to you and we would welcome the opportunity to assist you in your investigation, including meeting with you as required.

FS023 National House-Building Council (NHBC)

Investigation into Fire Safety in Tall and Timber framed Buildings in London
Further to your letter of the 8 February, regarding the above issue, please find our comments and information, which I hope will assist you with your investigation.
I have listed our responses against your original questions:
1. We don't keep comprehensive records of fire incidents, so unfortunately we cannot assist with this aspect.
2. Any new or refurbishment works resulting in either the creation of new residential units or material alterations (as determined by the Building Regulations) to existing residential buildings require a Building Regulations application. As such, a Building Control Body would have records of such building works where applications are submitted in accordance with the Building Regulations.
Applicants or developers are required to provide a notification to the relevant Building Control Body of the commencement of works on site. Building Control Bodies would therefore have records of sites that have commenced on site, although it should be noted the responsibility for notification of commencement rests with the person undertaking the work, so there could be some inaccuracies in records should notification not be given to the Building Control Body.
In addition, Building Control Bodies are required to consult the fire authority under the Regulatory Reform (Fire Safety) Order 2005, where new residential developments are determined to be a 'relevant building' under the Order. Consultations are required at the Initial Notice and Final Certificate stages of a project and for any amendments, however, there is no requirement to consult at the commencement of works on site.

3. The following is relevant legislation in respect of residential buildings we are aware of. The list is not exhaustive, but should provide an indication of the breadth of legislation involved:
The Building Act 1984
The Building Regulations 2000 (as amended)
The Building (Approved Inspector) Regulations 2000
Approved Document B - Volume 2
BS5266-1 :2005
BS5446-1 :2000
BS5446-2:2003
BS5499-1 :2002
BS5588-1 : 1990
BS5588-5:2004
BS5588-7: 1997
BS5588-8: 1999
BS5839-6:2004
BS9999
British Standard 476 series
Section 20 of the London Building Act 1936
The Regulatory Reform (Fire Safety) Order 2005
The Construction (Design & Management) Regulations 2007
Section 72 of the Housing Act 2004
4. Fire risk implications in respect of the application of Building Regulations for timber framed buildings are no different to the risks for buildings of traditional masonry construction. The fire risk principles for tall buildings remain the same also.
The issue requiring further investigation would seem to be the fire safety provisions to timber framed buildings during construction.
5. The UK Timber Frame Association would be better placed to comment on the relevant safety of timber framed buildings during construction.

The requirements for ensuring safety during construction is contained within The Construction (Design & Management) Regulations 2007, with the responsibility resting with the person undertaking the work.
In principle and providing the correct installation of fire resistance, compartmentation and firestopping, as with any method of construction, there should be no material difference between a timber framed building and one of traditional construction, either in terms of internal or external fire spread.
6. Information regarding specific fire risks of occupied buildings would be better answered by building management companies or the fire authority.
7. Our experience indicates the majority of legislation changes are reactive, which is usual given highly technical legislation relating to health and safety. It is unlikely this will change, although it is appropriate to base future legislation on practical issues and research undertaken.
8. Unfortunately, we don't have any information on the impact of recent amendments to fire safety regulations.

9. The UK Timber Frame Association would be a good organisation to offer comments on potential solutions to any problems. For sites under construction, the Health & Safety Executive may be better placed to assist.
I hope these comments are useful.
I have recently responded to the London Fire Brigade regarding their request for information on timber framed buildings in London.
In addition Mark Jones, General Manager - Technical Services will be attending the meeting arranged for the 16 March at City Hall on behalf of NHBC and I will be attending representing the Building Control Alliance.

FS024 Fire Protection Association (NFPA)

Dear Ms Jones

Re: Response to "*Investigation into Fire Safety in Tall and Timber Framed Buildings in London*"

The Fire Protection Association is the UK's National Fire Safety Organisation; a not for profit company limited by guarantee and is currently nominated by the UK insurance industry to represent them on technical issues of this kind through the RISCAuthority scheme. RISCAuthority funds activities that promote business and property protection; is the author of the UK Sprinkler Rules; the Building Design Guides, and provides an extensive library of guides, tools, and statistics which are available free of charge through the website at www.riscauthority.co.uk. All work is based on extensive research and fire investigation, and often demands large scale fire tests which the scheme funds.

RISCAuthority and FPA commend this initiative by the London Assembly to review the current known issues with the implementation of some building methods. Fires in timber framed buildings, both in-construction and occupied, are accounting for many of the recent large-losses and it is probable that they are contributing to the increased cost of fire against a background of stagnant fire incidences.

The comments in this letter are based upon good knowledge of the majority of the recent high profile incidences as we have been fortunate enough to personally investigate the fire scenes and revisit during various stages of stripping out and reconstruction where the fire has taken place in a completed and occupied building. The findings of our investigation are of such importance that we, together with representation from the Chief Fire Officer's Association, made presentation to the Fire Minister, Shahid Malik on 12th October 2009 and left him with a brief note of our concerns which I enclose as Appendix A with this letter. I also enclose copies of the FPA's Joint Code of Practice for Fire Safety on Construction Sites, which was amended in light of increasing losses on timber frame sites together with an investigation report into the Hendon fire that we produced to raise awareness within the insurance industry that includes a number of recommendations.

We have accumulated some very good pictorial evidence to support our comments and would welcome the opportunity to present and participate with this committee at the highest level possible on behalf of the UK insurance industry. Historically, other build techniques, particularly in the food manufacturing industry have been of such concern that insurance has become difficult; this is a situation we must all strive to avoid.

RISCAuthority appreciates the part that modern methods of construction have to play in providing better homes for the UK population and meeting the sustainability agenda; our main message is that the building must be assembled to the same fire safe quality that was employed for the research tests used to authenticate their introduction to the UK. Our current evidence is that we are far from this goal at present.

Question 1: *Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?*

We do not hold information of this type.

Question 2: *Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?*

RISCAuthority collates statistics for all large-loss fires within the United Kingdom (defined as fires where there is loss of life or costs exceed £150,000). The submission process for the collation of these statistics from loss-adjusters on behalf of insurers has recently been entirely reviewed specifically to enable the following of trends pertinent to new

construction methods. The 1st quarter reports are due for release at the end of March and whilst this information will be
informative it is unlikely that the dataset will be complete since not all insurers will have had visibility of the quality of
their own returns by that stage. The information at the time of 2nd quarter release will be of the required quality to determine prevalence and cost of these fires.
Whilst the data we hold may not put numbers to the size of the issue, the majority insurer view is that the new construction methods, in particular timber frame, are causing them significant problems and some are adjusting their
assessment, underwriting and pricing processes accordingly. There are many methods by which this is done and I would be happy to make introductions with specific underwriters of major insurers so they may provide you with an insight into their own mechanisms.
Question 3: *Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?*
The final specification for a building will be a combination of the decisions on fire strategy taken by the client and the
design team and the interpretation of that strategy by those who contract to provide the building.
Where the fire strategy for the project has been designed and approved by others (architects and design consultants,
building control bodies approved inspectors, etc) the Main/Principal Contractor should ensure this information is correctly converted into scope documents, drawings and specifications for the work and clearly the construction work
itself.
Building Control bodies and Approved inspectors along with client representatives (Clerk of Works/Site Inspector) should, during the build phase, ensure that appropriate specified materials are used. Guidance on Materials and Workmanship is given in The Building Regulations 2000: Materials and Workmanship. Approved Document to support
Regulation 7, 1999 edition, amended 2000.
Responsibility for enforcing H&S and fire safety legislation during the construction phase rest with both the HSE and
Fire Authorities dependent upon circumstances. In general terms the Fire Authorities are responsible for enforcing ‘general fire precautions’ in occupied buildings as specified by the Regulatory Reform (Fire Safety) Order 2005 whereas
the HSE cover ‘process fire precautions’ through the H&SAWA. However, the enforcement situation relating to construction sites is less than clear although steps to clarify this have been taken in the current consultation draft of HSG 168. (Fire Safety in Construction Work. HSG 168 - Guidance for clients, designers and those managing and carrying out construction work involving significant fire risks, HSE Books). The draft HSG 168 indicates that the Fire Authority will be responsible for enforcing general fire precautions only in the case of a non segregated site (i.e. where
the site is separated from an occupied premises by a breached partition). In all other instances the HSE are responsible for enforcing general and process fire precautions.
Planning
When making a planning application there is a requirement to provide plans of the site, elevations and cross sections
although there may be no requirement to specify building materials at that stage.
Application for Planning Permission
• A plan which identifies the land to which the application relates drawn to an identified scale and showing the direction of North (3 copies to be supplied unless the application is submitted electronically)
• A copy of other plans and drawings or information necessary to describe the subject of the application (3 copies to
be supplied unless the application is submitted electronically) including:
- Block plan of the site (e.g. at a scale of 1:100 or 1:200) showing any site boundaries
- Existing and proposed elevations (e.g. at a scale of 1:50 or 1:100)
- Existing and proposed floor plans (e.g. at a scale of 1:50 or 1:100)

- Existing and proposed site sections and finished floor and site levels (e.g. at a scale of 1:50 or 1:100)
- Roof plans (e.g. at a scale of 1:50 or 1:100)

Planning seeks to guide the way towns, cities and countryside develop. This includes the use of land & buildings, the

appearance of buildings, landscaping considerations, highway access and the impact that the development will have
on the general environment.

Building regulations approvals

Building Regulations set standards for the design and construction of buildings to ensure the safety and health for
people in or about those buildings. They also include requirements to ensure that fuel and power is conserved and facilities are provided for people, including those with disabilities, to access and move around inside buildings.
For many types of building work, separate permission under both regimes (separate processes) will be required. For
other building work, such as internal alterations, Buildings Regulations approval will probably be needed, but Planning
permission may not be.

If a Local Authority building control service is used for building regulations approval, there are three types of application
for approval you can make as listed below – there may be potential here for 'muddying of the waters' in respect of materials or making changes to type of construction – particularly if the building notice or Regularisation route is taken.

Full Plans: where drawings, details and other supporting information is submitted for checking and a formal decision
notice (approval, conditional approval or rejection) is given.

Building Notice: a less detailed form of application where minimal information is initially required (although the Local
Authority may request further detail) and no formal decision is given. The approval process is much more heavily weighted towards the work in progress.

Regularisation: a means of applying for retrospective approval of work that was previously carried out without Building Regulations approval.

CDM Regulations

Virtually everyone involved in the construction process have responsibilities under the Construction (Design and Management) Regulations 2007. This includes considering H&S matters at design and construction stage. CDM Regulations could be used to ensure appropriate materials are used, dependent upon location and nature of building I
suppose?

Question 4: *What are the specific risk implications for various building designs, construction materials and construction methods in relation to both tall and timber residential buildings?*

The issues are many in number and each could be discussed at length. Whilst they are bulleted here we would be happy to provide further information and evidence if required.

BUILDING SITES

 It has been said that on occasions planning approval is given for the erection of a building that uses traditional build methods which are then subsequently changed to modern methods such as timber frame as a later amendment. Any measures to report construction methods types as an aid to fire fighters will need to be immune to the later amendments.

 The building process requires the timber frame company to erect the structure on site before other contractors arrive to install services. There needs to be continuation of communication to ensure that the following trades that skin, plumb and wire the building preserve the fire safety design intention.

 An unprotected timber frame represents a highly combustible and easily ignitable structure that has a high vulnerability to arson attack. The potential for secondary fires resulting from radiated heat and burning embers means that careful consideration needs to be given to their use in built up areas – especially where they are adjacent to sleeping risk – and particularly social housing.

OCCUPIED BUILDINGS

 Traditional build methods employing bricks and mortar are very forgiving to deviations from Approved Document 'B' and there is no doubt that its contents, and the mechanisms for inspection through Building Control and Approved Inspectors, have evolved highly dependent upon this fact.

 Timber frame structures or any method of construction that places combustible content (structural or insulating) the other side of what must be a perfect plasterboard skin, are acutely vulnerable to very minor excursions from perfection as prescribed by Approved Document 'B'.

 Research commissioned by CLG to support the introduction of new build methods tested only 'perfect build' structures. Analysis of the TF2000 project experimental set-up to support the introduction of structural timber frame bears little resemblance to the as-built structures we are investigating fires in today. We believe there may

exist enough evidence to assume that rather than exposure of combustible elements to fire being considered impossible (as CLG currently appear happy to assume), exposure of voids, combustible structure and contained insulation is in fact highly likely – we are aware of no testing that has been done to reflect this. In a case of history repeating itself CLG are currently funding a similar programme of research to support the introduction is SIPs building techniques (wood and polystyrene sandwich walls) and again only perfect build is being considered which we know is unlikely to be replicated anywhere but these tests.

 Some timber frame structures, dependent upon the I-beam type require false ceilings for the routing of services. These have been shown to hide incomplete edges to the fire boundary

 The routing of services through bricks and mortar structures is difficult and expensive and as such their paths were

controlled, penetrating fire boundaries through large opening that were few in number for which very good passive fire stopping devices exist to maintain the compartment integrity. Our evidence shows a total lack of control of services which may now be routed as-the-crow flies from source to destination resulting in an exchange of a few well-stopped large holes for a massive number of smaller holes which, if stopped at all, are dependent upon unsatisfactory 'goo-gun' techniques for maintenance of the fire compartment.

 Fire compartment boundaries are difficult to identify and often wrongly interpreted. We have found passive protection devices installed in locations that are not the compartment boundary and missing altogether from boundaries that are.

 Construction, plumbing and electric trades seem entirely unaware that their practices and equipment need to change for these types of construction:

- incomplete boarding out of fire compartments
- unsatisfactory use of compression fit fire stopping in voids
- unstopped holes into timber voids behind consumer units
- non intumescing sockets and light switches deployed in fire compartment boundaries
- lack of fire stopping altogether which questions whether there is any consideration at all given to the concept of the fire compartment (again possibly due to the forgiving nature of bricks and mortar methods it has never been viewed as an issue)

 Fire and Rescue Services neither have the prior knowledge, equipment or training necessary to specifically address fires in buildings of this type. Building elements that would normally be cut away to facilitate firefighting in voids, being structural, must be left in place.

 Given the nature of fire spread within voids, for certain building occupancies, evacuation methods need review and

stay-put policies may not be deemed acceptable.

 Much of Approved Document 'B' considers only fires that may start within a fire compartment. Many new construction methods are externally vulnerable due to the surface finishes employed and the routing of services and systems through the combustible walls voids (heating ducts and drains).

Question 5: *What are the specific risks associated with timber framed buildings under construction? Do current regulations sufficiently control fire spread / external fire spread (both during construction and after completion)? What*

risks do other materials and construction methods pose in comparison?

Building site fires are particularly problematic for timber framed projects since the fire protection measures are the last

thing to be applied to the structure. The conditions of AD 'B' do not apply at this time so there is potential to amass an

enormously significant fuel load, in an arrangement that is optimised for easy ignition and rapid burning, in densely populated areas. The issues requiring consideration are:

 Site worker safety – egress from such a rapidly developing fire whilst working at height is problematic

 Site security to reduce the risk of arson

 Site management to propagate and police best practice in fire prevention

 Fire detection and alarm notification to all on site

 Fire separation to neighbouring buildings (radiation)

 Evacuation policy of neighbouring buildings (pre-planning)

 Impact of airborne embers on other buildings in a relevant area around the site

 Capability of local water supplies to support firefighting on the necessary scale

 Capability of the local Fire & Rescue Services to support firefighting on the necessary scale

 Consequence of incomplete buildings remaining for significant periods of time through constructor bankruptcy etc.

Many modern build methods will require a higher on-site fuel load than there would be for more traditional methods but
the scale will be determined by the choice of materials used, in particular, for insulation. Structural Insulated Panel techniques (SIPS) generally employ large quantities of combustible insulation such as polystyrene which aside from
being easily ignitable and providing for high heat release rate, may also melt as it burns to produce a flowing mobile fire
which might require bunding to contain properly and prevent spread to adjacent buildings.

Question 6: *What are the specific risks associated with tall and timber framed residential buildings that are occupied?*

What can compromise fire safety post construction?

Risks introduced during construction have been described in Question 4.

The point at which occupation of the building or indeed the site must be carefully considered in the context of the potential fire size and its impact on neighbouring buildings. Partial occupation of unfinished buildings is known within
the building sector but should not be deemed acceptable for modern methods where the fire resistance is added later.

Similarly occupation of completed building on a site where others remain uncompleted but in close proximity must also
be carefully considered.

Landscaping of the areas surrounding the building need similar attention with intelligent selection of finishings and potential fuel locations. One fire that is known started from a cigarette discarded from a balcony which set fire to the
bark chippings edging that ran to the cartilages of the building. The investigations showed that the bark chipping has
ignited fires on three previous occasions but the final one spread to the building fabric (I believe this was a total loss).

Post occupation there is the possibility that an occupant, or someone they may engage, will have little understanding
of the special construction techniques employed in producing their home and make changes to the building which will
compromise the fire safety design of their apartment and those in the rest of the building (since their design will not cater for fires pre-existing in voids).

Without doubt, those owning these homes will be unimpressed with the necessary curtailment of adjustments that they may make to their homes on a DIY basis. Any action that breaches the plasterboard skin of a fire compartment
boundary without the correct application of specialist materials to make-good the wall's fire performance will reduce the overall safety of the building. Such actions include:

- Putting up shelving
- Running new pipes and wires through walls
- Installation of recessed spot lighting
- Opening up of rooms
- Refurbishments (i.e. bathrooms)
- Changing switches and sockets
- Recessing of flat screen TV's into compartment walls (yes we have seen this)

All common place things to do in traditionally built homes. Normal wear and tear must also be considered as a factor
that will increase risks over time and if this is multiplied by the total number of flats in a residential block the overall deviation may become significant and widespread in a relatively short period of time. This is particularly relevant to public buildings such as schools and hospitals where those occupying the building have no ownership of it and may therefore treat it differently to their home.

Question 7: *What do you think currently are the outstanding actions required to reduce the risk and number of fire incidents in tall and timber framed buildings in London?*

In-construction

- Consider whether the location and its infrastructure can cope with a fire of the size that results from the entire consumption of the timber frame – if not – consider an alternative building method
- Overhaul of entire inspection process. It is failing and continuous inspection at all stages by building control is required
- Review building inspector and approved inspector training to cover modern methods of construction and their strengths and weaknesses to fire and susceptibility to deviations

 24 hour on-site security

 Effective on-site fire prevention
 Evacuation policy for workers
 Build orders that minimise fuel exposure (complete a block to a fire-safe and secure state before commencing others on site)
 Fire and Rescue Service pre-preparedness – Database of timber framed construction sites
 Neighbourhood pre-preparedness
 Suitability in heavily build up residential areas.
 Permit to work schemes
 Should all timber be combustion modified?
 Should weather protection be combustion modified?
 Given that the ground floor is most accessible (by arsonists) there may be a case for the completion of the ground
floor stage to a state of being fire safe before embarking on the construction of the rest of the building. Another approach might be to build the lower floor in concrete with the timber frame elements above.
 Overhaul and clarification of passive fire protection methods, equipment, systems, and certification for use in timber framed buildings.
 Requirement for the builder to record photographic evidence at critical points of the construction phase, particularly of fire stopping in situ, prior to the final fix of plasterboard which conceals any future inspection of the protections. Date stamped photos to be retained as part of the CDM file or other hand over document.
 Improved training and certification for the follow-on trades
 Review acceptability of insulation selection

Occupied

 Research on the fire performance of timber framed and MMC buildings where the starting point is that some exposure of the structure and insulating materials to fire is ‘certain’, rather than impossible.
 Re-evaluation of AD ’B’ in the context of the results of the aforementioned research programme
 Research on the fire performance of timber framed and MMC buildings where the fire source is external
 Re-evaluation of AD ’B’ in the context of the results of the aforementioned research programme
 Re-evaluation of the AD ‘B’ to consider the benefits of controlling the distribution of services to minimise penetration of the fire compartment boundaries
 Easily identifiable signage at entrance of building detailing construction method
 Handbooks for occupiers of permissible alterations and vulnerabilities
 Complete compartmentation inspection prior to handover from builder
 Fire and Rescue Service database of timber framed buildings
 Guidance on evacuation policies – is the ‘stay-put’ strategy appropriate?
 Should timber frame be restricted to low-rise buildings only?
 Review construction type and restrict in accordance with anticipated occupancy
 Update firefighter knowledge, training and equipment to keep up with modern methods of construction
 Review cavity barrier type suitability for timber frame construction – specifically where relying on a friction fit
 Review acceptability of insulation selection

Question 8: *Do you have any other comments that may be useful to the investigation?*

Enclosures:
Note to Fire Minister from RISCAuthority and the FPA highlighting occupied timber frame issues
RISCAuthority Collingdale (Hendon) fire investigation and recommendations
FPA Joint Code of Practice for Fire Safety on Construction Sites

Fire investigations give an excellent insight into the enormity of the problem; the lack of quality within the construction
industry; the absence of understanding by the fit-out trades; and the apparent total lack of inspection resulting in these
buildings being passed as fit-for-purpose. I would encourage any future investigations to additionally look beyond the

building that experienced the fire to the surrounding buildings if built as a single project – the same defects are probable and their continued habitation in the context of these deviations must be considered.

There is currently no consistent method in place for the conduct of fire investigations and often, once the cause has been found, investigation stops there. Ideally, the investigation would continue to consider how the building has responded to the initiation, evaluating the extent of damage and any contributing factors.

I hope you find these notes of some use to your committee. We are keen to participate at all levels possible and would
welcome the opportunity to attend and present accordingly. We are due to embark on a sizeable research programme
to address many of the issues described in this letter and would welcome your input and interest in these tests.

FS025 Homes For Islington

London Assembly
Planning and Housing Committee

Investigation into Fire Safety in Tall and Timber framed Buildings in London.

References to tall buildings include those buildings with 5 or more storeys or more than 15 metres and above ground level. Timber framed buildings refer to buildings where the main structural frame is made from timber.

1. In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed.

Total Units	35,250
Total No. units in Tall Buildings	13,830
Total No. units in Timber Framed Buildings	0

2. Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?

Due to the significant environmental benefits and the council's commitment to building sustainable homes, a number of Homes for Islingtons planned new build schemes in 2010/2011 are to some degree timber framed buildings.

There are 3 new build schemes planned, which are all relatively small scale, ranging from construction of 2 purpose built blocks of 6 & 7 dwellings. The remaining development is an infill of underground garages, with a timber framed building on each end. In its entirety, this development (including the timber framed aspects) will equate to 23 dwellings.

3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?

HFI do not hold a formal record of such incidents and may be unaware of minor fire incidents. The LEFPA may be better placed to provide more detailed information on trends etc, although anecdotally we understand that cooking fires have increased over recent years and are now one of the major causes for concern.

The majority of fire incidents in HFI properties over recent years have been confined to the dwelling of origin. We are aware of one recent fire in a tower block which originated in the ground floor electrical intake cupboard. The fire damage was confined to the electrical installation in the intake cupboard due to the fire resistant enclosure/cupboard it is located within.

4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?

For new build projects Islington Planning Department and Building Control would be notified through the planning process and liaise with LFB where appropriate (e.g. for access requirements, provision of dry rising mains/sprinkler systems etc). The appointed contractor would submit a Building Regulations notice and the appointed Building Control Officer would visit site at various stages of the project.

For refurbishment work notification would be via Building Notices (again submitted by the appointed contractor) or Section 20 application (where required) for buildings over 30m in height (or 25m if more than 930m2).

5. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?

Ensuring that relevant standards on materials and construction practices are met is the responsibility of the HFI appointed Client Representative or Contract Administrator, the Principal Contractor, the Clerk of Works, Construction, Design & Management Coordinator and in general the Project Team for each contract.

6. What are the specific fire risks associated with timber framed buildings under construction? Do current regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?

During the construction phase of timber framed buildings the potential for rapid spread of fire is significant, which could affect the structural integrity of the building very quickly. The levels of radiated heat generated are likely to hinder any fire fighting effort and may give rise to spread of fire to neighbouring structures etc, particularly as the nature of new build developments in inner London are often ‘infill’ sites to very small area/open spaces.

As the Regulatory Reform (Fire Safety) Order 2005 applies to construction sites, constructors must carry out suitable and sufficient fire risk assessment for the site, including all activities which take place on it. The Construction (Design and Management) Regulations 2007 require the appointment of suitably competent contractors, an assessment which is partly made on their experience of timber framed construction.

Whilst HFI does not have in-depth of experience in timber framed building, it is envisaged that use of competent contractors and good management arrangements for site security (arson), housekeeping, storage of materials (including LPG) and control of hot works etc. will minimise the risk of fire during the construction phase. Installation of temporary smoke/heat detection may also be a consideration. HFI H&S Group have already consulted the LFB Fire Safety Team on this issue and plan to have a pre-start meeting with the Project Team before any work on timber framed buildings commences.

As timber framed buildings have to attain the same Building Regulations standard as traditional brick/block construction, providing they are constructed properly, the risk of fire spread once completed should the same as any other building.

7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?

The introduction of the Regulatory Reform (Fire Safety) Order 2005 has resulted in a significant change in the fire safety strategy for the common areas of domestic housing stock. HFI had been completing bi-annual Fire Safety Audits (FSA) on a limited number of its tallest buildings since approximately 2000/2001, as these were generally considered to present the greatest fire risk and difficulty in fighting a fire.

As the RRFSO applies to all common parts irrespective of size, there are significant resource implications in completing FRA for all of our blocks. This change in legislation has resulted in HFI

completing FRA on approximately 1200 individual blocks, as opposed to the forty tallest buildings on bi annual basis. We are developing a strategy for reviewing all fire risk assessments on all housing stock on a regular basis but this is likely to require additional resource.

The introduction of BS9999:2008 has provided more detailed guidance on fire safety design, management and use of buildings, as have the CLG's FRA guidance documents which are tailored for various types of premises. HFI along with most other ALMO's are currently using the CLG guide ISBN 9781851128174 – Sleeping Accommodation, as there is no specific guide for the common areas of domestic housing stock (including tall buildings). See Q8

8. What has been the impact of recent amendments to the fire safety regulations of residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?

The London and South East ALMO health and safety group has requested assistance on a number of issues relating to FRA from the CLG. These include improved guidance, in particular relating to the scope/extent/review of FRA and also;

- Leaseholder responsibilities to maintain 'fire safe' front doors
- The development of a national register for approved fire risk assessors
- Format of standard fire risk assessments to give consistency of approach.
- Clarity on the time/period for updating fire risk assessments
- Consistency across Fire authorities on matters relating to:
    i. Items stored in communal areas
    ii. Specifications for windows
    iii. Maintenance and testing
    iv. Short term/make safe repairs

9. How do you follow the RRO (Regulatory Reform Order) Fire Risk Assessment process for ongoing building and occupant life safety under the Housing Health and Safety Rating System (HHSRS)?

HFI currently carries out annual Fire Risk Assessment (FRA) on all tall buildings of 7 floors or more. Buildings of 1-6 floors are assessed periodically, depending on the outcome of their original assessment. Timescales for re-inspection are currently between 12 and 36 months. This FRA regime is supplemented by a formal inspection of each block carried out on a fortnightly basis (completed by local officers) which includes fire safety related issues.

HFI completes HHSRS assessments as part of its void procedures when properties become vacant. Whilst fire safety is a consideration it is only one of numerous elements of the HHSRS assessment. A HHSRS assessment is also carried out by HFI officers during property surveys during the planning phase of Decent Homes refurbishment projects.

10. What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?

One of the main factors in reducing the risk of fire in tall buildings is the ongoing education and awareness of residents. Over the last two years, HFI has been working in partnership with the local London Fire Brigade to carry out Home Fire Safety Visits (HFSV). The HFSV includes useful fire prevention advice and installation of free smoke alarms where required.

Whilst predominantly targeting vulnerable residents, since the fire at Lakanal House in July 2009, HFI has written to all residents of its tall buildings, offering the HFSV service. To date, the response from this exercise has been disappointing. Education and awareness of residents is also around inappropriate use of common areas for storing personal belongings/waste etc.

Much of the recent investment in the housing stock has focussed on the internal fixtures and fittings in dwelling e.g. kitchens and bathrooms. In relation to common areas, fire door sets installed 30 years ago and repaired on numerous occasions over the course of their life are unlikely to offer the same level of fire/smoke resistance they once did or as new door sets would. This is also true of emergency lighting systems, which would be of benefit in many blocks, although these and other issues would require significant additional resources.

FS026 Richmond Housing Partnership

Dear Alex,

Fire in Tall Buildings

Thank you for your letter of 8th February 2010 addressed to the Chief Executive. I have also replied to these queries via David Batsford at London Borough of Richmond Upon Thames.

Richmond Housing Partnership is an independent RSL and we took over the ex Council housing stock in 2001. The replies below deal only with our owned housing stock and not with any other stock that may be within the borough.

1) We have 21 blocks in Richmond which would count as "tall" under your definition. These house 535 residential dwellings. We have a further 11 blocks in LB Hounslow which house 409 dwellings. None of these blocks is timber framed.

2) Not applicable to RHP

3) We have no specific information about fires in tall buildings. We have had very few fires in the communal areas or in individual flats over the last ten years and those that have occurred have been related to customer actions (eg cooking, smoking or arson)

4) Not applicable to RHP

5) There are a variety of people involved in ensuring that guidance on materials and construction in relation to fire are followed depending on the nature of different roles. Caretakers and caretaking managers are responsible for the safe storage of materials on sites (eg. cleaning materials); housing management staff are responsible for ensuring that no items are stored in communal areas which could be hazardous; project managers with our external advisers are responsible for ensuring that fire standards are properly followed in the commissioning of new works and building control will be responsible for ensuring that this is applied in practice in new developments or major works projects.

6) Not applicable to RHP

7) Not applicable to RHP

8) There have been no specific changes required as a result of recent changes to fire regulations. However, we are all seeking to be more vigilant in relation to fire safety – particularly in communal areas – as a result of recent events. We have no new tall or timber frame buildings under construction.

9) Our approach to following the RRO and to carrying out fire risk assessments has a number of elements. RHP has carried out fire risk assessments on all of its general purpose communal areas. A major fire safety upgrade programme has been carried out to improve fire doors, strips and signage over the past two years. We have also written to all customers and provided them with a copy of the Fire Brigade guide to safety in the home. Finally, we have adopted a zero tolerance approach to storage of items in the communal areas including things like bicycles, toys, mats and plants. These are stickered and removed within 48 hours of notification.

   Ongoing block risk assessment is carried out by caretakers and housing officers on a regular basis with any hazards being actioned through an industry standard health and safety management database called RIVO. Full FRAs are carried out on an annual basis by appropriately trained staff.

10) Not applicable for RHP

11) Our other comments would be in relation to public awareness of risk. One of the most difficult areas to enforce is where customers store or leave items in the communal areas on their walkway or corridor in flats. We have adopted a zero tolerance policy and are enforcing removal of goods where these are left. However a public awareness campaign as to why this is necessary would be helpful in supporting our efforts which – understandably – can upset residents.

I hope that this deals with all of your queries, but do contact me if you have any further questions. I am copying this to David Batsford at LB RuT for completeness.

FS027 London Borough of Barnet

Question	Reply
1. In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed?	140,797 (includes part classifications, HMOs etc.) Barnet Homes have 28 high rise blocks with 1556 units. Do not have details whether timber framed or not and no details of private sector housing.
2. Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?	We expect 22,000 new homes to be provided of which 20,000 will be through new build, change of use and conversions. The remainder will come through non self contained accommodation and vacant properties brought back into use. Of the 20,000 we anticipate 65% will be in blocks of 5 or more stories. We do not know what proportion might be timber framed.
3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?	We do not collect this information, presumably the Fire Brigade do
4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?	If Building Control (BC) receives a B Regs application for the construction of a timber framed building we should know it was timber framed and we would be able to advise the Fire Brigade as part of the consultation process, this in not currently recorded. If BC receives a B Regs application for an alteration to a timber framed building we may know it is timber framed depending on what the alteration is and what the building history is. If for example the building was original constructed using an Approved Inspector (AI) as the Building Control body then BC would not know the original construction. Where AI initial notices are received for the construction or alteration of timber framed buildings BC would not know there was a timber frame involved.
5. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?	Our view is that: During the design stage it is the responsibility of the project design team and their client. During the construction phase it is the responsibility of design team, the client and the contractor. Once completed it is the responsibility of the building owner and their management team. The Building Control Body (LA or AI) has a duty to consider Part B matters when dealing with the B Regs application and the work on site but we do not consider them to be the responsible party. The health and safety executive (HSE) have an enforcement role which we suggest you should seek comment on. The Fire Brigade have an enforcement role under the RRO which we suggest you should seek comment on.

6. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?	Building regulations do not control internal/external fire spread during the construction process. We are advised by the Fire brigade that the two main fire risks on timber framed sites are smoking and hot works. Due to the quantity of timber on site arson can have a larger consequence then on other types of sites. We consider the impact of following trades damaging fire stopping, fire walls /floors and cavity barriers as a risk both during construction and after completion. Current Regulations relay on the inspections by Building Control to find and remedy problems. It is impossible for officers visiting sites from time to time to find all situations of such problems many of which are covered up. The current Regulatory controls on external fire spread appear less onerous then in the past under the London Constructional By-laws. Consideration should be given to the fire effects of materials such as window /door frames and gutter / soffits.
7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?	There has been a move away from prescriptive regulation to functional requirements with non mandatory guidance issued by CLG and their predecessors. This has increased the number of fire related solutions proposed by designers based on risk assessment including Fire Engineered solutions. The release of BS9999 has offered a more generous range of fire solutions then ADB including increased travel distances and smaller door ways and stairways on escape routes. The guidance in the CLG Approved documents has changed over the years with relaxation of advice in some cases and a tightening of advice in others. E.g. The need for self closers on some fire doors removed but the introduction of the need for sprinklers in certain high rise buildings (over 30m).
8. What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?	No record of impact. CLG may have statistics. See CLG future of Building Control document.
9. How do you follow the RRO (Regulatory Reform Order) Fire Risk Assessment process for ongoing building and occupant life safety under the Housing Health and Safety Rating System (HHSRS)?	The Housing Health and Safety Rating System (HHSRS) is actively used by the Private Sector Housing Group to ensure that residents are not subjected to unacceptable levels of risk from their accommodation. Where necessary and appropriate, in line with the council's Private Sector Housing Enforcement Policy, enforcement action is taken under the Housing Act 2004 to secure improvements to the accommodation to mitigate any HHSRS hazards identified. In some houses in multiple occupation the council's enforcement powers overlap with those of the fire and rescue service under the Regulatory Reform (Fire Safety) Order,
10. What do you think currently are	Make owners aware of their responsibility under the

the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?	RRO including prosecutions of owners who fail to comply. Review resources available to statutory bodies to take enforcement actions against contractors who are not taking proper precautions against fire during construction including controls on smoking and hot works. Review options for dealing with following trades damaging fire barriers. Review the controls in place to limit external fire spread between units both vertically and horizontally.
11. Do you have any other comments that may be useful to the investigation?	No

FS028 East Thames Group

Alexandra

I am providing information in response to the recent letter from Jenny Jones addressed to our Chief Executive, June Barnes.

The responses listed below correspond with the numbered questions in the letter from Jenny Jones:

1. In London we own and manage 10,958 residential units. The attached spreadsheet provides a breakdown of these per London borough. Nearly 700 existing residential units are of timber-framed construction. Approximately 300 additional timber-framed units are to be completed between now and the end of 2012. Of the timber framed units, we have 8 blocks that are of 5 storeys.

2. East Thames has taken a policy decision not to utilise timber frame for buildings of more than 4 storeys. This decision was taken prior to the recent fires involving timber framed structures.

3. We have no record of fires in either tall or timber framed buildings
- whether in construction or occupied.

4. Local Building Control will find out about works to refurbish &or construct timber framed buildings if they are the body confirming compliance with the building regulations (building control consent) for the respective scheme/project. London Fire Brigade will find out about works to or construction of timber framed buildings if they are consulted by those responsible for or involved in the scheme/project(s.)

5. East Thames takes specialist advice from consultants, in terms of fire safety, on specification and choice of materials. Our client requirements are amended accordingly to reflect and incorporate this advice.

6. Specific risks associated with occupied tall and/or timber framed buildings include but are not limited to:

* compromised fire stopping and/or creation of new penetrations ie holes for pipes, wires, etc
* removed or reduced compartmentation
* structural alterations that are not compensated through enhanced remedial measures
* unauthorised storage of flammable materials &/or equipment in the means of escape corridors and stairways
* unauthorised entry and malicious damage
* travel distance (& time taken) to get to a safe point

* failed or reduced active fire safety equipment

7. The impact is hard to quantify. However, we can advise that of the fires we have sustained in our properties in recent years these have been attributed to arson. That said, the number is very low.

8. We achieve this through a combination of using LACORS guidance and ensuring fire risk assessments are undertaken by competent persons. This is complemented through training and guidance for staff and residents.

9. Clarity around the need for fire detection/early warning systems in communal areas of tall buildings to be linked to the internal areas of the flats/apartments.

11. The need for enhanced guidance on ensuring fire safety during the construction phase of tall &/or timber framed buildings is obvious.

(Also Attached: East Thames Group Stock Summary.xls)

FS029 Stewart Milne Group

INVESTIGATION INTO FIRE SAFETY AND TIMBER FRAMED BUILDINGS IN LONDON
We refer to the above Investigation and wish to thank Jenny Jones AM for her letter of 8 February 2010 inviting our contributions to the Investigation of issues concerning fire safety in said building types during construction and post completion; we are pleased to offer our contributions.
As a leading designer and manufacturer of Timber Frame structures, we have provided many such buildings in Greater London from our manufacturing bases in Witney Oxfordshire and Aberdeen, Scotland with a capacity to produce 12,000 units per annum. Our Timber Frame systems have been developed in their level of technological sophistication over many years and their applications are wide: residential, commercial and public in low and medium rise forms. In Greater London alone we have constructed approx 1100 units in the last 2 years that are 5 storeys or greater.
We have therefore, not only an interest in participating in the Assembly's Investigation, but more over we are very supportive of the Investigation and its terms of reference. In it there exists the opportunity to provide the Mayor with strategic recommendations in terms of the London Plan and how it might be delivered as well act as a key influencer to HM Government for the evolution of future Building Regulations for the country as a whole.
In offering our contributions we have, as you would expect, majored on Timber Frame Buildings and less on other construction forms. Additionally we trust you will excuse us if our response appears, on first review, somewhat lengthy. However we thought it appropriate to offer detail and substance where our expertise and experience can lend weight to the investigation. Finally, as we respond to the twelve specific questions asked of us, we confirm that we would be more than happy to meet Ms Jones, other members or officials of the Assembly or the Mayor's office either to provide formal evidence or informal discussion to support the Investigation.
In respect of the question's Ms Jones raises we respond as follows:
1. Estimates for the likely Increase I General Trends in Timber Frame Buildings in London in Next 10 Years
The economic downturn has obviously made forecasting very difficult, 2009 was chaotic in terms of forecasting. However our intelligence suggests that whilst funding for development is likely to come under further pressure there remains a pent up demand or a new housing stock to meet the needs of the population. Coupled w'lth this underlying principle is the need to build new homes with reduced carbon emissions, availability of land, and affordability; hence there are London local initiatives such as the Thames Gateway regeneration programme and the Decent Homes programme.
The Mayor's London Housing Strategy sets out a vision for 50,000 more affordable homes by 2011, which as you know is actively being progressed in the current Mayoral term. Much of this plan, we understand, is being delivered through 'new build' of which timber frame will have a market share. Communities and Local Government report than in 2008 I 2009 there were 19,000 new house building completions in London and if that figure were to remain flat for say the next 5 years and timber frame retained its market share of 20% then there would be approximately 3800 new timber frame homes per annum.
However with likely future skills shortages arising out of the recession driving the need for offsite manufacture; the need to build sustainable homes in terms of low carbon emissions, low energy consumption and constructed from renewable raw materials and a longer term recovery in the economy over the 10 year outlook period it is probable, in our view, that London house building will grow in excess of 22,000 new homes per annum (the 200612007 peak) and that timber frame's market share increase too to approx 25% yielding a net output

of 5,500 new timber frame homes per annum.
What is less clear to us is the extent to which these shall be 5 storeys or greater. However we do not believe that there will be any growth in 5 storeys + timber frame as these are generally associated with apartments and believe that the emphasis shall fall on 2 and 3 storey family housing; especially 3 storey family housing where land pressures exist and 'town house' style affords flexibility in terms of life style homes.
Conclusion: We predict longer term growth in the use of timber frame for new build housing in London especially in three storeys but do not see growth, or retraction, in 5 storeys + timber frame apartments.
2. Records of numbers of Fires in Timber Framed Buildings in London I Trends in terms of Causes and Seriousness
Whilst we have no specific records we are aware of media exposure around 7 projects since 2006 where the timber frame buildings caught fire whilst were under construction in London. To the best of our knowledge all the fires occurred during night time, with the notable exception of Collindale which occurred during daytime. One of these developments, in Charlton, was a timber frame sub-contract by Stewart Milne where in a terrace of four houses, two plots were lost and the other two damaged.
Across the country as a whole we are aware of media attention over 32 projects since 2006 where the buildings caught fire under construction and again our information suggests that on the whole these. 3 projects were timber frame sub-contract by Stewart Milne; Charlton, Glasgow and Edinburgh. In addition we have records of fires in timber frames under construction where the fires did not attract media attention and these buildings were made good through the replacement of damaged or partially damaged structural components under the supervision of the Consultant Engineers.
In terms of fires in buildings under construction our information suggests:
- They occur 1 or are reported late at night 1 very early morning
- There are occurrences at weekends, in the early 1 late evening
- The building(s) were incomplete in terms of the frames were not clad internally with plasterboard and sometimes external claddings (mainly masonry) when the fire occurred.

We have no specific data of fires in completed 1 occupied Timber Frames in London. We are not unaware of fires in completed timber frame buildings and have, on occasion, been called to provide specialist advice in terms of reinstatement, in our role as Timber Frame designer. We have no specific records as such as we are no! generally engaged in a sub-contract to make fire good damaged completed properties. Therefore can only state in general terms from the anecdotal evidence that we have; which is that the fires were confined to the apartment in which it started and was controlled by the Fire Brigade before spreading. Fire stops, cavity barriers, insulation, plasterboard and fire doors were all found to be key components in checking the spread of the fire.
In terms of trends of causes, it is difficult for us to comment as the occurrences are often the subject of pOlice or HSE investigations and certainly always loss adjuster investigations, which can often be protracted due to their litigious nature. It is possible to speculate however that many of the occurrences of site fires are probably arson, given the time at which the incidents have been reported and the obvious time lag from any planned construction hot works.
In terms of trends of seriousness, it is the case that since 2006 there have been a number of very significant fires; Peckham requiring the attendance of 150 fire fighters and the evacuation of over 300 nearby residents. Larger buildings, under construction, have seen rapid fire spread, radiated heat, spreading embers and secondary fires. The seriousness of these fires is rightly attracting the attention of organisations such as COFA, HSE and UKTFA (of which we are a member) and balanced discussions and papers are being published with analysis of the facts and suggestions. Media coverage, trade and general, has also published

widely on recent fires.
One trend however has been the increased use of timber frame in buildings 5 storeys and greater. The TFOOO project led by TRADA and BRE along with industry partners is seen as a defining stage in the evolution of medium rise timber frame where previously developments of this nature were less common, supplied only by manufacturers with specialist engineering expertise such as our own but overall lacked the creditability of a Best Practise Guidance Document founded on research using scientific measurements. One of the test criteria for TF2000 was of course the timber frame's performance in fire and the research was seminal in influencing the direction of change in UK wide Building Regulations.
We have no hard evidence which tracks the growth curve in the Timber Frame structures 5 storeys and greater and the fires in large buildings under construction however we do consider it likely that the growth of Timber Frame as a build form in taller buildings is a far steeper curve than recently high profile fires.
Conclusion: We have no exact records of the total numbers of fires in London, either during construction or post construction and those occurring during the construction phase appear to be arson and occurred when the frames were not fully (if at all) protected with their internal claddings and cavity barriers; i.e. they were at a vulnerable stage. A number of factors have seen a growth in the use of timber frame in buildings 5 storeys and greater, not least TF2000. Fires that have occurred in these medium rise timber frames have tended to be very serious in the nature.
3. How Does London Fire Brigade or the Local Building Control know whether Timber Framed Buiidings are being Constructed or Refurbished?
There are a number of notices I applications that developers or principal contractors have to make before commenCing works and the type depends on whether it is new building or refurbishment. Generally however the Building Control Department of the relevant London Borough is notified through an Application for Consent under the London Building Acts. This requires disclosure of drawings and building form type. Additionally HSE are notified through the 'F10'. These official means of notifying authorities might be seen as indirect routes to the London Fire Brigade however it is our understanding the Principal Contractors will generally notify the Fire Brigade for any large development, as they will with local neighbours informally through visits to schools and notification of the local A&E Hospital department or through recognised schemes such as Considerate Constructors.
Until very recently the timber frame manufacturers have largely been disconnected with this process of notification to the authorities as they are seemingly sub-ordinate in the hierarchy through their role as a SUb-contractor. However the Timber Frame industry led initiative Site Safe very much seeks to change this. Site Safe is a scheme by the UK Timber Frame Association designed to encourage appropriate pre-construction notification and planning, onsite controls through techniques such as compartmentation, fire plans, traffic management plans, controlled build break points and completion and closure management. The application of Site Safe by UKTFA members on larger timber frame developments is audited and mandatory and is specific and prescriptive in certain process management issues such as notifying the local Fire Brigade. Stewart Milne are strongly supportive of this scheme, however we are sure the UKTFA would happily provide this Investigation further information of requested.
In respect of refurbishment, there is a degree to which CDM addresses this through the provision of the Health & Safety file so that risks can be identified and method statements put in place for the protection of life and property during refurbishment and alteration works.
Conclusion: Formal and informal notification systems have existed for some time, however UKTFA Site Safe seeks to extend this further through mandatory notification to the Fire Authority by the manufacturer.
4. Relevant Polices, Plans, Guidance for Construction, Design, Planning and Fire Safety for Construction I Occupancy

In the planning, design and construction phase one would refer to the following publications specifically to manage fire risk:
HSG 168: Fire on Construction Site, HSE
• Joint Code of Practise: Fire Prevention on Construction Sites, seventh edition May 2009
• Construction Site Fire Prevention Checklist, FPA 2009
• Health & Safety - UKTFA Code of Practise, 2008
Site Safe Policy, release version 1, UKTFA, 2010
• Fire Safety on Timber Frame Construction Sites, UKTFA, 2009
Obviously the HSWA 1974 and all relevant sub-ordinate legislation are key reference points too.
We believe that whilst all this information is published and very much available here and now to industry professionals, the industry needs a strong directional steer towards ensuring that sitting inside the manufacturers and principal contractors organisations there must be professionally qualified individuals who can use these tools confidently during the planning an construction phases. Fire Authorities such as Bucks & Milton Keynes offer training specifically for construction sites in terms of risk and hazard identification and fire management planning and we believe training and qualifications for those who manage building sites, at Principal Contractor level and manufacturer level should be a mandatory standard.
In respect of the occupancy stage, the principal document would be the Building Regulations, Approved Document B specifically for fire, as this is the standards to which new homes require be built to. NHBC Standards would be another recognisable document, however specifically for Timber Frame TRADA are considered expert in terms of their documentation. Most manufacturer's will provide detail manuals too, some such as Stewart Milne Group, have specific details manuals and supporting checklists for Fire Stopping and Cavity Barriers.
In respect of refurbishment works, we as a manufacturer of new building systems have less exposure to this aspect and in fact it is not often that we are asked to provide technical assistance to people considering refurbishment or alteration works. The Construction (Design and Management) Regulations do of course set down the obligation to provide the building owner I user with sufficient information on the design and construction of their building so that they can with appropriate professional assistance undertake risk assessment and method statement preparation before carrying out works.
Conclusion: It clear that there is sufficient and detailed information available now for industry professionals to execute building works safely however as ever training and competence are fundamental to ensuring standards translate into exceptional performance during construction and post construction.
5. Who is Responsible for Ensuring Guidance in relation to Fire Safety is Followed?
Arguably the responsibilities vary widely and are disparate depending on project types, procurement routes, local custom and practise and the application of enforcement across the devolved regions.
Obviously most professionals would recognise that at the upper end of the hierarchy Local Authorities have power and responsibilities over Town and Country Planning and enforcement of the Building Regulations whilst the Health & Safety Executive have similar powers over Health & Safety.
Middle tiers of responsibilities sit with "inspectors" such as NHBC, TRAOA 'Frame Check' and Zurich however their roles are dependant on the procurement route and contract type and to what extent the client insists on this through the contract. Traditional contracts also have roles for Architects, Clerk of Works, Building Surveyors and Quantity Surveyors in terms of their own site quality checks and certifications I measurements as the works progress. Often however these roles follow fairly strict demarcation lines between responsibility for ensuring compliance with technical construction standards and general site health & safety and it is the lower, but most 'safety critical', tier sits within the industry itself that has an all-embracing role;

Site Managers, Trades Foremen, Employers, Directors, in fact anyone with a managerial role throughout the supply chain; Principal Contractors, Manufacturers, other sub-contractors.
In terms of general building site safety we in Stewart Milne are a strong advocate for involving all tiers of the supply chain in the 'responsibility' ethos and whilst the fragmented nature of building contracts can appear to act as a counterweight to this ethos with seemingly greater burdens of responsibilities on Principal Contractors than on others, it is significant that UKFA Site Safe seeks at redress this imbalance by providing a tool through which the Timber Frame Manufacturer can now 'speak directly' with the CDM Co-ordinator and the Fire Authority. This in our view is right and appropriate as it brings to bare the manufacturer's specialist skills and experience, especially during the planning stages.
In terms of the COM Co-ordinator role, one would expect this role to be well understood at this stage since its inception in 2007. The co-ordination role is fundamental in joining together the various parties to ensure a co-ordinated plan for a safe build methodology and consequently ensuring best advise can be offered to the client.
Conclusion: In the context of Timber Frame, we see the UKTFA Site Safe programme as a very welcome development in terms of extending responsibilities into the specialist Timber Frame Manufacturers and whilst the application of Site Safe is mandatory for continued membership of UKTFA it is possible to envisage in the future that the scheme could become a condition of contract in UK standard construction contract forms such as JCT.
6. Specific Fire Risk Implications for various Building Designs in tall Timber Frame Buildings
Clearly taller buildings, irrespective of the principal structural construction form, inherently have greater risks than low rise buildings. Travel distance to ground level for emergency access and egress and the volume of materials that contribute to fire fuel load are enhanced. Additionally the hazards of collapse become greater in taller buildings.
For completed buildings the Building Regulations seek to address these risks with strategies that include compartmentation to limit loss within acceptable parameters, fire detection and suppression systems, the provision of safe havens for people with special needs, maxiumum travel distance strategies and apertures (windows and doors) of sufficient size for emergency access and egress.
In England & Wales the regulations do not identify 'specific' risks with anyone build form; on the contrary they specify performance standards for fire resistance expressed in time to allow for access and egress, which is dependant on the building use and height; with the 'Approved Documents' providing technical solutions for compliance. A broadly similar strategy of performance based regulation applies in Scotland albeit certain multiple occupancy buildings require the common stair flights to be on non-combustible materials.
Insurers, mortgage and finance providers adopt a similar view in that Timber Frame buildings, 'tall' or otherwise are not differentiated in terms of post completion fire risk when compared with other building forms.
In respect of fire risk during construction, there is an obvious risk that in 'tall' or large Timber Frame structures with unprotected timber and timber engineered products in significant volumes create a fuel load which if ignited can result in rapid fire spread, radiant heat and early structural collapse. For Stewart Milne Group, this is the nub of the issue and the probable reason for the Assembly invoking this Investigation. However we stress that the matter of Fire Safety in completed buildings must be segregated from that of buildings under construction; they are different issues requiring different solutions.
Large timber frame buildings, whilst under construction, can present a significant fire risk, if the development is not well managed. The UKTFA '16 Steps to Fire Safety' if implemented and managed with rigour can reduce this risk. Strategies such as planning in 'break points' in the build process to clad party walls, appropriate levels of security to prevent intruders entering site, good house keeping in terms of waste, controls around flammable fluids and

gasses, hot works permits, escape routes etc are all appropriate risk reduction measures, which combined can provide a generally safe environment within which to work. Additionally some manufacturers such as ourselves have a range of 'closed' wall panels with factory fitted windows which can significantly reduce the issues with spread of flames.
Conclusion: The significant risks are in the construction phase of tall and large timber frame buildings however these risks an be mitigated through the appropriate application of good planning of the build and the utmost attention to Health & Safety.
7. Specific Risks associated with Timber Frame under construction. Do the Regulations sufficiently control the spread of flames? What risks do other materials and construction methods pose?
The specific risks associated with Timber Frame are more pronounced in large buildings utilising unprotected open wall panel systems where the rate of build is faster than the ability of other trades to clad the framework hence exposing large volumes of timber which can result in very serious fires as described earlier. Smaller buildings (single, two and three storeys) detached, semi detached and terraced housing are less exposed given the lesser volumes of timber. Again our experience in building these structures suggests that this risk can be reduced through appropriate strategies outlined above, especially however through appropriate planning and co-ordination of tasks such as ensuring windows are fitted early and party walls are clad to introduce compartmentation, thus in fact realising the benefits of the speed of erection whilst progressively securing the building.
In terms of regulations to control fire spread during construction it could well be argued that what regulations are in place are not always effective, given some recent events. We believe that there is probably now a need for a single cohesive regulation, which ties together best practise in existing guidance and from other industries. However this alone will not be effective. Given the variables of building sites and the architecture they create, there is a need to further increase skills and knowledge through training, throughout all levels of the supply chain, this in fact being a pressing need to support the economic recovery. In addition to regulation and skills training, there is a need too to invest in new technologies. For example in conjunction with other industry partners we have formed a consortium to research and develop cost effective fabric only solutions for housing to the Code for Sustainable Homes, Level 4. It is likely one of the systems developed from this two year programme will be advanced timber frame closed wall panel systems, which should have resultant benefits in the fire resistance of the product during construction. A further technology for consideration would be fire detection and suppression systems, built into the timber frame, either on a permanent of temporary basis.
In terms of regulations to control fire spread during after completion we believe these are generally sufficient. Of course the integrity of the design, manufacture and on-site construction is of paramount importance to ensure that the buildings perform as the regulations intend. Building regulations, if they are to develop, however should be consistent across the country. Currently they are not; with the devolved administrations varying from England on a number of points. Consistency, at the higher standards, would be preferable for the industry given the transient nature of its workforce and would make skills and knowledge transfer easier to deliver.
In Wales changes to Building Regulations envisage fire detection and suppression systems as part of the overall strategy for all buildings, irrespective of the building height or whether or not it is timber frame or not. Currently the practises in new housing has been detection and alarm systems however it does seem appropriate that in large buildings, with a greater amount of occupants and often in the nearby vicinity of other buildings as is often the case in urban situations, that fire suppression systems all be used.
In Scotland, the regulations require non combustible stair flights in multiple occupancy buildings which, in practise, mean that the stairwell is normally constructed with concrete block walls, concrete landings and concrete or steel stair flights. Whilst this construction form

poses its own set of challenges, especially in the roof engineering, it does present a certain logic in that if these stairwell towers are constructed in advance of the timber frame they introduce a form of compartmentation, safe access / egress and 'safe havens' during the construction phase.
Conclusion: Further regulation should be considered for both construction practise during the build and to protect tall and large buildings, their occupants and neighbouring buildings post construction. However the use of new technologies and skills training are also essential tools.
8. What are the Specific Risks in Buildings that are occupied? What can Compromise Fire Safety post construction?
Poor construction quality and inadequate inspection and testing can leave latent defects which could seriously compromise post construction safety and in this area much can be done: harmonized standards and regulation; knowledge and skills training; 'Keep it Simple' build systems which have low maintenance and are user friendly and proven technologies being obvious solutions and are applicable to all build forms, not just timber frame.
Failure to provide appropriate maintenance and regular testing of electrical and other services can also pose a risk of fire, which is further increased during periods when buildings are temporarily unoccupied. To this end easy to use building manuals, factor management, remote monitoring, security systems, regular emergency drills and audits by insurers of multiple occupancy buildings are appropriate.
The issue of post occupancy alterations can also raise the risk of fire and works to the structure require the same, if not more, amount of pre-planning and control to guarantee the safety of the building's occupants and the building it.
Conclusion: The above risks are equally applicable across all construction forms and well built, well maintained buildings need not be seen as posing any extra hazard at all.
9. How have Building Regulations, Fire Safety Codes and Risk Assessment developed in Time?
The development of Building Regulations etc has often followed major incidents and has progressively altered the regulations to provide for safer buildings for the protection of life and property. For example studies of disasters have influenced thinking on human behaviour in fire situations. In recent years the Regulations have become more performance based and less prescriptive offering designers and constructors the ability to 'design solutions', however in practise buildings are often constructed to conform to the 'Approved Documents' or 'Technical Standards', the principle being that these are recognised, proven and deemed to satisfy solutions.
The notable exception to regulatory development which did not follow major disasters was the TF2000 research and development project which considered medium rise multiple occupancy Timber Frame as an emerging technology with the potential to become a main stream build form which could satisfy a number of needs and pressures in the construction industry and the built environment in general. In addition to a number of other test criteria, fire safety was also tested. The project has since become to be seen as a milestone in the development of medium rise Timber Frame in demonstrating compliance with fire safety codes building.
10. What is the Impact of recent amendments to Fire Safety Regulations? What new Guidance is anticipated?
As stated above TF2000 was, in our view, a milestone research programme which was followed by a change in regulations permitting the construction of Timber Frame Buildings higher than 11 metres. In practise Timber Frame is now constructed up to 6 storeys high, sometimes with lower floors in non-timber frame where the building is to be of mixed use; I.e. lower ground floor retail or car parking which is not uncommon.
In terms of new guidance the industry has already taken steps to produce this in terms of the UKTFA '16 Steps' and now the Site Safe scheme to effectively regulate its application. Site Safe was conceived by the UKTFA on behalf of its members and contributions were sought

and provided by HSE, NHBC and others. It is an attempt to provide succinct and specific guidance for large timber frame buildings under construction, however being industry led, the scheme's ability to elevate to a universally recognised Code of Practise may be a challenge. In this respect we believe there is, in Site Safe, an excellent template for future Guidance but it is the challenge of industry to engage with bodies such as the London Assembly, CFOA, HSE and central and devolved Governments to promote and embed the current template and indeed further develop it where it becomes regulatory through building contracts and ultimately a cultural necessity in the way in which general Health & Safety has rightly become.
In terms of new guidance for completed buildings we believe there to be a compelling argument for detection and supression systems in all tall buildings, irrespective of their construction form.
Conclusion: New guidance for fire safety in construction is anticipated and welcome by us. This need not be a radical re-think but more over a consolidation of existing reference documents into one single universally applicable Code of Practise.
11. What are the Current Outstanding Actions Required to reduce the Risk of Fire Incidents in London?
In terms of outstanding actions, the UKTFA have a planned review of Site Safe, in a few months time, following the scheme's launch earlier this year. In our view this review should only be a preliminary review as probably insufficient new projects will have commenced in the 3 or 4 months since Site Safe's launch to provide data, tends and appraise the overall effectiveness of the scheme. It might be prudent in fact to holder a further review, early Summer 2010, and include in both the review and sharing of the outcomes, bodies such as HSE, CFOA, Construction Skills and indeed the London Assembly; however UKTFA would have to make extend that invitation. Clearly however Site Safe needs to be an evolving scheme which responds to and embraces new technologies, best practises etc.
Site Safe must also be seen as not just a process, albeit one which is mandatory upon which continued membership of the UKTFA rests; moreover it must be seen as a catalyst to encourage a deeper and more mature culture of 'taking responsibility' at all tiers in the supply chain, and not just for fire safety in particular but Health & Safety wider, again as we have alluded to earlier. We believe that the whole Construction Industry is on a steady directional movement towards this culture, but it is a journey far from complete, and pressure must be sustained to get there. This may not be easy to achieve in a national Construction Industry which is fragmented, however leadership has to be exercised and be seen to be exercised, and in this respect there is an opportunity for Timber Frame manufacturers and erectors to take the lead.
Our own anecdotal evidence suggests that there are varying degrees of technical skills and knowledge around construction site fire risk assessment and fire safety. This should be addressed; in Stewart Milne Group for example we are soon to meet with the Fire Brigade to develop a training course specifically aimed at addressing the skills deficit.
The emergence of Site Safe might act as a forerunner to legislation. Whilst Site Safe is mandatory to U KTFA members it is not so for Principal Contractors, who must nevertheless engage in it so that the standards can be driven up. In this respect, as we allude to in items 4 and 10, there are a now a number of reference documents for fire safety in construction sites, of which Site Safe is the latest and possibly the next stage is a single entity, recognisable and enforceable code, right across the industry might be a desirable goal. Site Safe's evolution to ACoP status would be very effective in this respect.
Emerging technologies should also be considered and indeed encouraged by ensuring blockages such as funding, restrictive practises, negative campaigns from vested interests and weighty approval systems are removed for credible and worthy R&D projects. Obvious technologies would be fire detection and suppression systems that can be installed, removed and reused on a temporary basis during the construction phase and is not susceptible to freezing, site damage and can be powered by small PV cells for example.

At a more strategic level, which we make reference to in question 7, Stewart Milne Group have joined forces with other leading house builders, manufacturers and consultants to create consortium called AIMC4 which is part funded by the Technology Strategy Board at develop sustainable and cost effective house building systems that achieve the Code for Sustainable Homes from a solely 'fabric' solution. One probable outcome of this project would be advanced 'closed' wall panels which we have already brought to the market with our Sigma wall system. Insulated wall panels, in our view will significantly reduce issues such as spread of flames and burning embers and have 'compartmentation' built in to reduce the fire growth where a fire occurs during construction.

Build methods have been changing in recent years and continue to do so as described above. We believe that the direction of travel in inexorably towards more off-site pre-fabrication as the industry responds to the need to be build more energy efficient and sustainable homes set against a backdrop of traditional trades skills shortages as a result of the recession from which we are recovering. Pre-fabricated timber framed buildings with factory fitted fire protection is indeed the ultimate way forward to protect buildings during site construction. It is this agenda which we in Stewart Milne are following whilst delivering on short and medium term strategies around site construction fire protection, which we believe to be effective.

12. Any Other Comments

We do think that it is very important to segregate the issues of fires during the construction phase and fires in completed buildings. As we have alluded to above the strategies are very different, as are the risk profiles.

Furthermore the risk is undoubtedly greater, only at a particular period during the construction phase and it is this risk that has been exposed in many of the recent fires in London and else where. The Site Safe scheme and indeed our own internal Stewart Milne Group processes are most concerned with reducing this risk at this period in the construction phase, which in our experience can be successful with a well thought our and executed plan.

There are in the UK a great many buildings of a Timber Frame structure, the great majority of these being modern factory assembled units using an engineering system described as Platform Timber Frame, which can either be, for purposes of the degree of pre-fabrication, 'open' or 'closed' panel. This system of construction is now cons'ldered mainstream and in certain regions of the country, Scotland in particular, would be considered the norm. We believe, with real conviction, that these timber frame built homes, pose no greater a threat in their fire performance than other build forms, as evidenced by the TF2000 project, the Building Regulations an of course the matters raised in this letter. Furthermore we believe that not only can these building achieve excellent performance in fire, they can also out perform other products in terms of sustainability, quality of build, energy efficiency and acoustic performance, all within a commercially viable context.

Finally, we do thank you for your invitation to participate in this Investigation, an Investigation we feel to be very worthwhile, with an apparently far reaching mandate and certainly one whose outcomes can indeed be very influential. Should you wish to call for more evidence from us at an enquiry before the Assembly or the committee or an informal basis, we would happily oblige; please contact the writer.

FS030 Concrete Centre

This response has been produced by The Concrete Centre the technical market development organisation for the UK concrete sector. The Centre works in the interests of all those involved in concrete design and construction. It focuses on design and construction methods, education and training, research, new product and process development and the performance of concrete in practice. It works closely with other cement and concrete bodies in the UK. The Concrete Centre is part of the Mineral Products Association, the trade association for the aggregates, asphalt, cement, concrete, lime, mortar and silica sand industries.

Question 1: (Build forecasts) : Others are better placed to answer this question.

Question 2 (Records of fires) : Others are better placed to answer this particular question but it may be of use that statistics for multi-storey residential construction that we have collected over the last 5 years show that concrete and concrete masonry solutions represent
4 out of every 5 multi-storey residential buildings. We believe that the vast majority of the remainder are steel frames with concrete floors.

Question 3 (Responsibility for adherence to guidance): For the
permanent works, (i.e the building once completed) Building Control is responsible to protect the interests of society and the property owners interests are protected through the contracts with the design team in which responsibility is apportioned. During construction and for the temporary works responsibility will be (should be) apportioned through the contracts to different members of the contracting team, and in unusual cases members of the design team. The ethics of the professions involved in building design also requires that relevant guidance is followed.

Question 4 (Specific risk implications of different designs) : This is a wide and far reaching question. The response will be restricted to concrete or concrete masonry buildings for which we have an expertise.
Concrete is given the highest of seven possible ratings by the European
Commission: Rating A1 in accordance with EN13501-1. It does not burn, nor emit fumes and it has low thermal conductivity, meaning concrete elements (floors, walls, beams, columns and blocks) take a long time for the fire temperature on the surface to penetrate into their centre.
This is an important quality as it protects any steel reinforcement and the concrete itself, both of which do ultimately lose strength if they reach high temperatures. Engineers know to follow design codes and embed reinforcement deep enough in the concrete to ensure it does not get too hot in the event of fire & make elements thick enough so that they retain sufficient strength capacity. For tall buildings, a longer period of fire resistance will be required and the engineer will embed the reinforcement deeper & make elements thicker in accordance with the design code. Concrete and concrete masonry are also useful in providing integrity against fire spread, again because of low thermal conductivity and the inherent fire resistance of the material. Concrete and concrete masonry also provide a level of resistance that enables repair and refurb after a fire incident.

Recent testing proving concrete's fire performance:

Hollowcore precast concrete planks are a commonly used product to form the floor slabs in tall buildings. They are typically 1200mm wide and range in depth from 150 to 400mm depending on the distance they need to span. Their name derives from cylindrical voids at mid-depth that run the full length of the plank. These planks have been

extensively tested; most recently by BRE (Bailey & Lennon(1)) with full scale tests using onerous fires. These tests demonstrated excellent fire performance of the planks. These products are extensively used across the UK and Europe in all building types.

Post tensioned (PT) floor slabs represent approximately half of concrete construction in USA and Australia, and has been popular since the 70's.
PT slabs have only become popular again in the UK in the last 10 years because of available competition amongst suppliers. Tests by Bailey(2) have shown that guidance in the Eurocodes is valid for PT slabs constructed using concrete of UK aggregates and UK concrete mix design.
A single test (by Kelly) on a PT specimen that showed a failure has been referred to in The Structural Engineer in Jan 2009, but the details of the test have never been made available to the research community. It may have been designed with high moisture level in the concrete which would lead to spalling.

Spalling is not a problem for normal buildings and normal fires, but there has been much research focused on the specialist applications like tunnels, high strength/ performance concretes or hydro-carbon fires. In these applications it has been found that using 'plastic' fibres in the concrete mix is successful in achieving the required fire performance.
At the BRE Cardington facility a full scale concrete structure was built to investigate different construction processes. Once the building had been completed it was decided to take the opportunity to do a full scale fire test. The test has been extensively written up including flaws in how the test was conducted. The unusually high strength concrete and very high moisture contents led to predictably high levels of spalling from the underside of the slab. Impressively, despite the loss of material the slab had sufficient capacity to carry the imposed load without undue deflection.

Question 5 (Risks during construction) : Building regulations apply once the building has been completed. Therefore the fire performance during construction is out of scope of building regulations. Many planners are not aware of this. They think responsibility for fire performance is covered by building regulations throughout the project lifecycle, but it is not. It is recommended that planners are overtly given responsibility for protection of neighbours from fire spread from construction sites. This could be executed by a condition on planning, or in the extreme a ban on certain practice like thatched roofs in high density localities.

The vast majority of high rise residential buildings are currently, and have in the past been, built from concrete. Major fires, during construction of this vast number of projects, has not ever been an issue. Therefore it can be concluded that in comparison to timber construction, concrete poses a far smaller risk. Concrete construction is perfectly suited to care homes, student accommodation, hotels and other residential buildings.

Concrete buildings' fire performance during construction has been seen to be very good from the few examples that have come to our attention.
The risk is from formwork systems that create the concrete moulds.
These systems are usually aluminium and timber/plywood. The risk is controlled because the quantity on site is relatively small. For example when building the 10th floor, the formwork is only on the 10th floor. A fire did occur in the Middle East several years ago but it was restricted to just one floor - the floor where there was formwork. The concrete slab was damaged but remained in place and was repaired.
(Details of this example are given in Concrete Society TR68). The UK has not experienced a fire even on this limited scale on a concrete frame during construction.

Question 6 (Risks once occupied)

i) Fire safety post construction can be compromised by lack of maintenance or building work & alterations.

Concrete does not rely on applied finishes for its fire resistance.
Therefore concrete buildings have very low risk of having their fire performance compromised by lack of maintenance, or building work and alterations that do not reinstate fire protection.

ii): Fire safety post construction can be compromised by poor building management and occupier awareness of the fire strategy with respect to refuges, escape routes etc. This is not a material issue and others are better qualified to comment.

The Windsor Tower fire in Madrid in 2005 highlighted the impressive performance of concrete structures. The building was being refurbished when a fire broke out. It was permitted by the authorities to burn itself out, and despite the intensity and duration of the fire the concrete performed well and the building did not collapse. The only portions that collapsed were steel columns, yet to be given fire protection as part of the refurbishment, and slabs that these columns supported. (To extend understanding of the behaviour of concrete structures in fire, this was the subject of a PhD at Edinburgh University which was completed in 2009. Example paper reference 3)

Question 7 (Actions to reduce risk) : To reduce risk & number of fire incidents :

- Ensure clarity of responsibility for fire performance during construction. It is recommended this responsibility be given to planners. (It is not currently building regulations as is often assumed)

- Maintenance of a register of high risk buildings during planning and construction phases, (probably) by planning authorities.

- Maintenance, management and occupier awareness of fire procedures of occupied buildings (no matter what material they are constructed from) is extremely important, and should be the responsibility of , we suggest, the building owner.

Question 8 (other comments): Building regulations cover buildings post construction and is concerned with life safety and fire spread to neighbours hence fire resistance periods are dictated (in the main) by period to evacuate. Property safety is not a concern of building regulations. Perhaps it should be.

Fire safety engineering has developed over recent decades and provides a more performance based rather than prescriptive approach to satisfying building regulations. The benefit to clients paying for this additional design service is that they can retain the same level of fire safety but can achieve different design solutions. However the assumptions made regarding occupancy, occupant behaviour etc need to be known by building owners throughout the life of the building to ensure the assumptions still hold true.

Structural Fire Engineering is a tool to better understand the behaviour of the structure when subjected to fire and clients pay for this service so that they can retain the same level of fire safety but reduce the cost of fire protection or the structure itself. Reinforced concrete has inherent fire resistance and there is little benefit to the industry to pursue structural fire engineering (it will not lead to removal of fire protection or much smaller elements) and it is for this reason that compared with other materials less fire testing has been done on concrete structures. The

sophistication of structural fire engineering models can be problematical for building control who may not have the capacity/skill to check their effectiveness. Validation of models relies on testing which itself may not cover the range over which the
models are applied.

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FS031 Concrete Today

Investigation into the Fire Performance of Timber Frame Structures

Submission to the GLA

Concrete Today Magazine Editor.

Date: 2010-03-04

Dear Sirs,
As an independent consultant to the Irish Concrete Industry and Editor of the Irish Concrete Industry magazine, Concrete Today, I have had cause to investigate issues relating Timber Frame Construction, since its initial 'meteoric' rise in popularity on the Irish Market over ten years ago.

As you are aware, until recently Irish Codes and Standards have been based substantially on their B.S. counterparts and this has provided an excellent and robust construction framework for many years. However, on the basis of what I myself have observed, in the course of forensic studies, following a number of Timber Frame fires, I am convinced that Codes and Standards relating to timber frame are not robust.

Timber Frame Fire Testing, Cardington
The reason for this is quite clear: whereas, some independent testing has been carried out in Cardington by the BRE, sponsored by the British and Irish timber frame industries, Timber Frame has never been subjected to a proper, comprehensive, independent, un-sponsored assessment, particularly where fire performance is concerned. Those limited assessments which have been carried out are inadequate and have been based on the false premise that Timber Frame is a hybrid form of masonry construction and, this in turn has given rise to an erroneous assumption that Timber Frame shares many of most of the characteristics of masonry construction.

It should be noted that:

a) Timber Frame is not in compliance with mandatory Building and Fire Regulations (which were written for masonry) and therefore any claim to equivalence is incorrect.
b) Timber Frame has never been subjected to full compliance testing with U.K. or Irish National mandatory Building and Fire Regulations.
c) Timber Frame tests have never been made available to the construction industry for critical analysis.

This deeply flawed approach has limited the scope of study into the fire performance of Timber Frame structures. Where a significant (6 storey) test rig was put in place in Cardington in yr. 2000, it would appear that this substantial structure was more for 'optics' than for testing, since the opportunity to properly fire test the structure to destruction (to assess all the effects) was passed over. In the event, the very basic fire test which was conducted, lead to burnout of three of the six test apartments, despite the presence of the Fire Brigade. The GLA must also make their own judgement as to whether or not the British Research Establishment perceive themselves to be and Independent Test Authority or simply 'Test Partners'. The inadequate testing at Cardington and the manner in which employees of the BRE have appeared at construction industry seminars in Ireland, behaving as salesmen for the timber industry, would suggest the latter.

Further evidence of the non compliance of Timber Frame is evident from the major fire at Colindale, where the fire was able to spread from block to block despite physical separation and where the fire was able to spread unencumbered through the completed block, producing unprecedented levels of heat radiation. The many serious Timber Frame fires which have taken place in the U.K. and Ireland in recent years are clear evidence that it does not conform to the required minimum standards and cannot be deemed safe.

Irish DOEHLG, Timber Frame Consortium Report
Approximately eight years ago, the Department of the Environment, Heritage and Local Government (DOEHLG, Ireland) commissioned a 'Timber Frame Consortium Report' (TFC), carried out by a noted Irish architectural firm, Reddy and Associates, in conjunction with engineering firm Arup and Partners and other consultants. The main recommendation of this report was that the restriction on the height of Timber Frame buildings be raised from three storeys to four storeys. Critically, it would appear that the authors of the TFC report only studied the construction in the cold state and did not consider fire considerations.

At that time, I wrote to the Consortium pointing out that despite the extensive nature of the report document (over 250 pages) that 'Fire' did not even appear as a heading in the document. This Consortium gave no consideration to the performance of such construction methods in their whole assembly when subject to fire. (See Concrete Today article on Ayrside, Swords, Co. Dublin. It should be noted that the form of construction employed at Ayrside, has full Irish Agr ment Board (IAB) approval. This fire demonstrates that the IAB considered 'cold state' construction considerations only, which has nothing to do with fire performance.)

I further suggested to the Timber Frame Consortium, that clearing the way for four storey Timber Frame structures made no sense when two and three storey structures were not in compliance and that what was required was a comprehensive study of the performance of two storey Timber Frame buildings in fire, based on forensic investigation of actual fires. No such study was ever conducted, despite the many instances of burnout of Timber Frame dwellings and in particular failure to achieve fire 'compartmentation' between adjoining dwellings.

In fact, the only fire studies carried out on Timber Frame were carried out in 1981,1982 and 1984 by Dr. Willie Crowe (IIRS – now NSAI) in conjunction with Noel C. Manning, The Department of the Environment (IRL) , the U.K. Home Office (Then the GLC) and Trada. The study came about as a direct result of the negative publicity caused by the World in Action programme, produced by the BBC at that time.

That study, which employed a novel 'firebar' system at roof level between adjoining properties, showed that it was possible to achieve fire compartmentation between adjoining 'single storey' Timber Frame structures. However, where fires occur in Timber Frame structures of two storeys and more, the added duration of the fire, height and volume of timber, together with the displacement of the party wall caused by the fulcrum / lever movement of the collapsing timber floor pan, becomes the critical factor in destabilising the party wall, in which case the use of fire compartmentation products at roof level becomes irrelevant. During this test other issues/ anomalies emerged, such as the disintegration of the hot plasterboard when the fire hose was directed at it and the subsequent driving of the fire into the cavity / opening up the cavity to the spread of smoke and fire contrary to the stated requirements of regulations.

In my correspondence to the Timber Frame Consortium Report authors, I also pointed to the fire problems which had occurred during the fire test carried out by the British Research Establishment (BRE) in Cardington , where re-ignition occurred within the cavity of a 6-storey Timber Frame test building (following a fire test), causing major fire damage.

No Basis for Mutli-Storey, Multi-Occupancy Timber Frame Buildings

I suggest to the GLA that it is self evident that Timber Frame cannot be considered a safe system for use in multi-storey, multi-occupancy buildings until such time as it can first be made safe at two storeys. If basic fire compartmentation cannot be achieved between adjoining two storey buildings, then no case for multi-storey, multi-occupancy Timber Frame buildings can be made. What must be established for two storey Timber Frame dwellings is a robust method of containment of fire for the longest possible time to the room of origin / building of origin and containment of fire from the adjoining property for the longest possible period.

It is important to note that fire problems in Timber Frame buildings increase in 'geometric proportion' to the height of the building(duration before venting, fire load) and the level of occupancy. In my opinion, and in the opinion of many of my colleagues, those living at higher levels in multi-storey, multi-occupancy Timber Frame dwellings, have little or no hope of escape in the event of serious fire. This is because timber is essentially 'fuel in a fire'. It burns rapidly, produces intense radiant heat an enormous volume of dense smoke. Moreover, the external masonry leaf, acts as an insulating / containing jacket, producing early 'flashover' and forcing the intense heat upward through the building. Given the large amount of flammable material inside the masonry external leaf and the ease with which fire and hot gasses can find a path through Timber Frame structures, the building can be compared to a 'kiln'. Such buildings give little chance of escape to the occupants, are a major threat to adjacent buildings and can produce such levels of radiant heat as to make fire fighting virtually impossible. In many cases, despite the early arrival of fire tenders to the scene (within less than 15 minutes), gaining entry to the building is either not an option or a very dangerous option, placing senior fire officers in a dilemma, where people may be trapped or unconscious in a building. These critical features of timber frame construction, which also raises serious Health and Safety issues for Fire Fighters, have already been demonstrated on numerous occasions in both the U.K. and Ireland.

Loss of Structural Stability – Party Wall

Another significant feature of Timber Frame fires is the rapid loss of structural stability. In this respect, it should be noted that typical Timber Frame structures, whereby the first floor pan (and subsequent floors) sits on top of the party wall structure, breaking the continuity of the party wall, is in blatant contravention of B.S. 476 part 20, which requires that the party wall be continuous in the vertical plane from the sub floor level to the underside of the roof covering. The collapse of the timber floor in fire, creates a lever effect, destabilising the party wall, leading to premature failure of the wall and loss of fire compartmentation between adjoining properties. It should also be noted that such detailing would not be permitted in masonry construction, where the party wall is constructed of non-combustible elements. As a result of the breech of regulation B.S. 476 Part 20 we are now witnessing collapse of Timber Frame party wall spandrels, including gable walls in house fires, something which we does not happen in masonry construction.

Loss of Structural Stability – Wall Ties
In Ireland, we have also observed that wall ties between the Timber Frame and the external masonry wall are grossly inadequate and come away even in relatively minor fires, creating serious structural instability. This is partially due to the flimsy nature of the wall ties currently being used and partially to the need for a better designed wall tie and 'ring beam' system. The need for a more robust tie system between the inner and outer leaf in Timber Frame structures is more pronounced as the building increases in height, since the wind forces and therefore the 'racking forces' increase. These forces are transmitted through the roof structure to the inner 'structural / load bearing Timber Frame. High wind loads (particularly on steep pitched roofs) and the effects of 'resonnance' coupled with inadequate roof bracing have been observed to give rise to vibration in the Timber Frame structure. Even with an improved wall tie design, premature structural instability of the inner structure may be next to impossible to ensure, due to the intensity of the fire.

Future of Timber Frame and the Rights and Interests of Consumers
If the Timber Frame industry is prepared to adopt a serious and responsible attitude, it can achieve a more viable structure. It should be pointed out however, that such structures will never be the equivalent of a masonry structures. In order to progress, the Timber Frame industry must adopt a ' back to basics approach', break the mental link with masonry construction and undertake serious and comprehensive study of the fire performance of Timber Frame.

One of the problems is that serious investigation, which will undoubtedly lead to revised specification, is likely to lead to the conclusion that many existing Timber Frame structures are inadequate and unsafe. This 'unthinkable spectre' explains the desire of the British Timber Frame Manufacturers Association to reduce the scope of investigation into 'how site practices can be improved to reduce the incidence of fire in the construction phase'. Reducing the exposure of Timber Frame in the construction phase may be a worthwhile objective, but it is very much the 'tip of the iceberg'. It is important that the GLA should take the basic rights and interests of the consumer into account. The consumer, who often commits her/his life savings to the purchase of a home, has the basic right to live in a structure which is safe and designed and built by experts. I would encourage the GLA to put this right foremost in their considerations.

During the course of my own investigations into timber frame, I have been fortunate to make the acquaintance of Mr. Noel C. Manning, a Wicklow based fire researcher and structural fire engineering specialist whose knowledge on the subject of Timber Frame and fire is second to none in these islands (See contact details below). Mr. Manning has a grasp of the subject 'from first principles' and has recently invented and tested a range of engineered design solutions/ fire products which substantially provides workable design solutions to the issues under consideration by the GLA forum. I suggest to the GLA that you contact Mr. Manning and invite him to make a presentation to you as part of your deliberations. I am sure he will be willing to do so and that you will greatly benefit from his knowledge.

If you are of the opinion that you would benefit from face to face discussion with myself, I would be happy to travel to London to meet with your committee.

I wish you every success in your investigation,

(Also Attached: Scanned Article from Concrete Today)

FS032 Royal Borough of Kensington and Chelsea

Investigation into Fire Safety in Tall and Timber framed Buildings in London
Thank you for your letter dated 8 February 2010 in respect of the above. The information to answer the questions has been gathered from the Council's Building Control and Environmental Health Departments and the Boroughwide Tenant Management Organisation, who manage the Council owned stock. The responses to the questions asked are as follows:
1. In your borough how many residential units are there, how many are classified as being tall buildings and how many are timber framed?
Our Stock Modelling! Stock Condition Survey in 2005!06 estimated that there were 85,334 dwellings in the Borough, of which 9489 dwellings are owned by the Council and 14,121 by other social landlords.
The TMO who manages the council stock has commented that there is no clear definition of what constitutes a "tall building", however, most recently this is being interpreted as a building of 6+ stories of which we have 27.
The TMO are not aware of any timber-framed buildings within the RBKC stock.
2. Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?
No information available.

3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?
Each year there are a small number of fires in RBKC blocks. These are virtually always fire originating in dwellings. We are unaware of any situations where fires have spread either to neighbouring dwellings or to common parts of the block in question. Within the last 6 months *two* residential fires have occurred (one at Pond House and one on the Worlds End Estate) and both fires were confined to the flat of origin and fortunately resulted in the residents having only minor injuries. In both cases the compartmentation of the flats were shown to be effective.
4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?
Building work is notified to the Local Authority Building Control but there is no requirement to specify whether the building is timber framed although this can be gleaned from drawings when/if submitted.
5. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?
The person undertaking the work is responsible for ensuring compliance with the fire regulations as with other parts of the building regulations.
6. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?

Building regulations are there to ensure that buildings, when finished, comply with at least the minimum standards laid down. Building regulations are not designed to control fire spread during construction.

7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?

It is felt that this is not a question that can be satisfactorily addressed in the timeframe given; it is almost a research paper in itself.

8. What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall framed buildings and fire safety is anticipated in the future?

Environmental Health has commented that it is unclear from the questions what "fire safety regulations" are being referred to i.e. fire safety requirements of Building Regulations, the Regulatory Reform Order or Housing, Health and Safety Rating System.

We anticipate new guidance may be necessary once the investigation in to the Lakanal House incident has been concluded but cannot comment further a this stage.

9. How do you follow the RRO (Regulatory Reform Order) Fire Risk Assessment process for ongoing building and occupant life safety under the Housing, Health and Safety Rating System (HHSRS)?

The TMO has adopted a risk-based approach to carrying out Fire Risk Assessments and are just about to complete all of the potentially high-risk blocks and then move onto the medium-risk programme. The TMO's latest Stock Condition Survey has just commenced on site and this will produce HHSRS assessment with regard to fire safety etc. We can confirm that this survey aims to access 21 % of the dwellings and the information will be fed into the TMO's newly procured Asset database so that the data can be further assessed, resources can be targeted at the area of highest priority and programmes of work etc can be finalised.

In respect of enforcement in the private sector, the RRO is enforced by the LFEPA and not the Council. The Council follows and enforces the HHSRS in the private sector and for premises subject to Part 1 of the Housing Act 2004. We adhere to, and have signed a protocol agreement with the local fire authority. We also have regular meetings and consultation regarding enforcement with them, bearing in mind the overlap in enforcement responsibility with these two pieces of legislation

10. What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?

All residential dwellings should have smoke and / or heat detection fitted (ideally this should be mains-powered with battery-back up) and

All front entrance doors should be adequately fire- resisting, self-closing, fitted with cold smoke seals and intumescent strips etc.

Additionally, we would expect the following to already be in place across London - all residential blocks should have regular and effective inspection regimes to identify any obstructions, stored items etc. in the communal areas, that waste disposal arrangements are effective, that fire safety measures e.g. emergency lighting wet / dry risers etc. are maintained as per the British Standards as part of

an effective planned preventative maintenance contract.
11. Do you have any other comments that may be useful to this investigation?
There are a number of areas where the standards are often unclear and are open to interpretation. We have sought clarification with the LFB but unfortunately this has not been forthcoming. A specific example is in cases of existing buildings of heights in excess 18 meters (usually just slightly higher at perhaps 19.5m) which were originally constructed without a dry rising fire fighting main. Whilst clearly if the building was constructed now a dry riser would be installed Building Regulations have never been considered retrospective and fire fighters equipment has become much more powerful. However, our local LFB Fire Safety Team are still insisting that we should retrospectively install dry risers at each of

these blocks and we have sought definitive view from more senior sources within the LFS's Fire Safety division but unfortunately this has been declined.
I trust that is information will be of use to your investigation.

FS033 London Borough of Bexley

Dear Alexandra

GLA Investigation into Fire Safety in Tall & Timber Framed Buildings

Thank you for you enquiry dated 8 February to Peter Ellershaw, Director of Environment and Regeneration Services, concerning a request for comments on 11 questions as part of your scrutiny investigation. This was passed for my attention and response.

Taking your questions in order :

1 . In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed?

Response : There are 94,622 residential units in the LB of Bexley. There are 40 high rise housing association blocks over 5 storeys in the borough, but the number of units in each, and the number that are timber framed, is not recorded by the LB Bexley. The Council transferred all its stock, including high rise, to housing associations in 1998.

2. Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?

Response – There are no estimates available for the LB Bexley.

3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?

Response – This information is not held / recorded by the LB Bexley.

4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?

Response – Our Building Control service is clearly aware when they are chosen by a developer to deal with building control construction matters for a tall building, and is such circumstances close liaison takes place with the London Fire Brigade. However, some tall buildings are dealt with by approved inspectors outside of the local authority, and the information is not made available to a local authority in the initial notice.

5. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?

Response – Risks in such circumstances are dealt with under the CDM Regulations, and these are enforced by the HSE.

6. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?

   Response : Key risk is fire spread due to compartmentation not being completed

7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?
   Response : Legislation has evolved, usually in response to major incidents that have occurred over time.

8. What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?

   Response : There is now increased liaison with the London Fire Brigade. No information available on new guidance that is expected.

9. How do you follow the RRO (Regulatory Reform Order) Fire Risk Assessment process for ongoing building and occupant life safety under the Housing Health and Safety Rating System (HHSRS)?

   Response : Survey questionnaires have been sent to every owner of shared residential blocks in the borough to identify whether Fire Risk Assessments have been completed. These are currently being followed up where no response has been made.

   The HHSRS regime also applies within individual flats as well as common parts, as opposed to the RRO regime that applies to common parts only. The HHSRS regime covers many housing condition risks, including fire safety, the Council responds to these primarily on a complaint led basis.

10. What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?
    Response : The HHSRS and RRO regimes have led to overlapping and duplicated responsibilities for fire safety, and it would help if there was one single agency with responsibility for fire safety related enforcement in high rise buildings.

11. Do you have any other comments that may be useful to the investigation?

Response - No further comment

I trust this is helpful

FS034 City of London

Investigation into Fire Safety in Tall and Timber framed buildings in London: City of London response

1. In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed?

   The number of residential units in the City of London is 5826. The vast majority of these are in buildings of over 15m in height but we do not have the precise number. None that we are aware of are in modern timber framed buildings but a few are in historic buildings that are timber framed.

2. Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?

   We do not have an estimate of the increase in the number or trend for the construction of tall or timber framed buildings over the next 10 years. However, it would be reasonable to assume that most new residential will be in buildings of over 15 m in height. The London Plan consolidated in 2008 expects 90 new units to be provided per annum (i.e. 900 over ten years) whilst the current review to the London Plan proposes to increase that number to 110 pa (i.e. 1100 over ten years).

3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?

   We do not have any records of fires in tall residential buildings in the City and are not required to have them .It is possible there have been fires in the Barbican etc but unless they are Dangerous or remedial rebuilding work is required we would not be involved. I am not aware that we have any timber framed residential buildings at all.

4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?

   The construction, conversion or refurbishment of these buildings requires a Building Regulations application and Approval. The Building Regulations function may be performed by the City or else by an Approved Inspector (AI- a private body authorised to perform the function in competition with LAs). Information must be submitted by the developer or architect etc. showing compliance with the Building Regulations. This includes a fire strategy or must indicate compliance with the solutions shown in Approved Document B. Where an AI is performing the Building Control function the LA is barred from involvement unless enforcement is required.

5. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?

   The developer and his team are responsible for complying with the Building Regulations during the design and construction process. The Building Control Body will carry out inspections of the works in progress having already approved the plans (possibly with conditions) and can require remedial work and/or take enforcement action. Once occupied the responsibility lies with the occupier/owner with enforcement powers under the RRO lying with the Fire Authority/LA (see Q9)

6. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?

We have no experience of timber framed construction so cannot comment. The Building Regulations do not lay down requirements for fire safety during construction. The requirements for internal and external fire spread for a completed building are functional and are the same for timber and non- combustible construction in terms of fire resistance and fire stopping etc.

7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?

The requirements have become more 'functional' rather than prescriptive and the Approved Document has undergone several revisions over the years to reflect experience and research such as fire stopping, cavity barriers, provision of sprinklers in certain situations (mandatory in flats exceeding 30m high) etc. It also allows a 'fire engineered ' solution or an intermediate solution adopting the guidance in BS9999 some of which reflects the Approved Document.

8. What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?

The guidance mentioned above came into force in April 2007 after a long consultation and will not be reviewed for a few years. New requirements take time to filter through to new developments so the effects of change are not readily apparent.

9. How do you follow the RRO (Regulatory Reform Order) Fire Risk Assessment process for ongoing building and occupant life safety under the Housing Health and Safety Rating System (HHSRS)?

The District Surveyors are not involved with the RRO. We must see evidence that the fire strategy has been passed on to the owner/occupier before we issue a Completion Certificate for a new building or conversion. The occupied situation under the HHSRS is controlled under a joint protocol agreement between our Environmental Health section and the LFEPA (under a London wide agreement) and Table 1 of the document outlines the split of responsibility.

10. What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?

To educate contractors of the importance of fire stopping and cavity barriers and to install fire resisting elements in accordance with their fire test certificates. Occupiers/owners should be made more aware of their responsibilities to maintain the fire safety measures they have in their buildings and the role of the RRO.

11. Do you have any other comments that may be useful to the investigation?
    For the purposes of this investigation we are seeking information on residential buildings

No

FS035 Department for Communities and Local Government (DCLG)

Dear Ms Jones

Investigation into fire safety in tall and timber framed buildings in London

You wrote on 5 February to officials in CLG and the Office of the Chief Fire and Rescue Adviser (CFRA) with information on the terms of reference of the Assembly's investigation into fire safety in London's tall and timber framed buildings, and seeking a CLG contribution to questions the Assembly's investigation is seeking to answer.

The note and Annex below set out a co-ordinated CLG/CFRA response to questions 1–8 of those set out in your letter.

Whilst we have noted that the Assembly has defined tall buildings as those with five or more storeys, or more than 15 metres above ground, you will wish to be aware that CLG and the fire and rescue service, as result of the fire safety requirements in the Buildings Regulations, use a definition based on buildings of over 18 metres in height (which equates to 6 storeys, or more).

We would be interested in hearing the outcome of your investigation. I am copying this letter electronically to Alexandra Beer, for information.

CLG response to the London Assembly's Planning and Housing Committee Investigation into fire safety in tall and timber framed buildings in London

1. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?

CLG hold a database of records of incidents attended by the Fire and Rescue Service (FRS). Since 1994 this has recorded the height of buildings. Whilst information is available on the cause (ie, accidental or deliberate) and seriousness (as indicated by the number of casualties) of fires in tall buildings, there is significantly less good quality data available on whether fire incidents were in buildings either unoccupied or under construction.

Data on fires in timber framed buildings started more recently - in April 2009 - with the introduction of the new Fire and Rescue Incident Recording System, and data for 2009/10 will be available in August 2010.

The conclusions which are possible across each element of information requested are presented in Annex A. Where it is possible to identify a trend, this has been flat or slightly downward.

2. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?

Building Control Bodies (BCBs) receive detailed plans of proposed buildings as part of the buildings approvals process. BCBs are required (under article 45 of the Fire Safety Order and Building Regulation 13) to consult the local fire and rescue authorities as part of this process.

3. What are the relevant policies, plans or guidance in relation to construction, design, planning and fire safety that apply to the construction and subsequent occupation of both tall and timber

framed residential buildings? What are the relevant regulations in relation to refurbishment of existing tall residential buildings?

Fire safety on construction sites is covered by the Construction (Design and Management) Regulations 2007 (CDM Regs) and the Regulatory Reform (Fire Safety) Order 2005 (the FSO). HSE has responsibility for policy and enforcement as regards self contained construction sites. Fire and Rescue Authorities have enforcement responsibility under the FSO for general fire safety precautions on partially occupied sites whilst HSE enforce 'process' fire precautions, ie, arrangements to ensure work processes do not start fires.

Building Regulations set out the requirements for the design and construction of new buildings, and those subject to major refurbishment, including fire safety.

The FSO sets out requirements for the safe operation and maintenance of all non-domestic premises, based on risk assessment. In residential buildings, the FSO applies to the common parts of the premises rather than to the individual dwellings themselves.

Part 1 of the Housing Act 2004, introduced the Housing Health and Safety Rating System (HHSRS) to ensure that dwellings are free from all serious (category 1) hazards, including fire. If a property is found to contain a category 1 hazard, the local authority has a duty to take the most appropriate action in relation to the hazard. The HHSRS applies to dwellings that are available for occupation, but not to buildings under construction.

4. What are the specific fire risk implications for various building designs, construction materials and construction methods in relation to both tall and timber framed residential buildings?

Fire presents risks in all forms of construction. The performance requirements of Building Regulations are applicable to all new buildings, regardless of the type of construction used.

The fire performance of completed timber framed buildings was an issue that was explored at length under a series of research projects collectively known as Timber Frame 2000. The general findings of this work were published in Multi-Storey Timber Frame Buildings: a Design Guide (ISBN: 1860816053)

5. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?

Fire presents risks in all forms of construction. The performance requirements of Building Regulations are applicable to all new buildings, regardless of the type of construction used. During construction, the specific nature of the risks throughout the construction process will be determined through the process of risk assessment under the CDM and FSO.

6. What are the specific risks associated with both tall and timber framed buildings residential buildings that are occupied? What can compromise fire safety post construction?

All buildings represent a fire risk. The specific nature of the risks in individual buildings will be determined through the process of risk assessment under the FSO, taking account of the design, construction, management, and occupancy/use of the particular premises.

7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?

Since the introduction of the modern building regulations system in 1984 there have been 4 iterations of Approved Document B (Fire Safety). These were published in 1985, 1992, 2000 and 2006.

The Fire Precautions Act 1971, and prescriptive standards of fire safety, was abolished in replaced by the Regulatory Reform (Fire Safety) Order 2005 in October 2006.

8. What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?

The introduction of the FSO in October 2006 simplified fire safety legislation by bringing all the legislative requirements together in a single Order. It replaced over 70 separate pieces of legislation and extended the principles of the 1997 Fire Precautions (Workplace) Regulations 1997, as amended, to all premises to which the public have access.

HSE are due to publish a revision of their publication HSG 168 – Fire Safety in Construction, later this year, having recently consulted on a draft. This will provide new guidance on the legislative requirements of the CDM Regulations and the FSO as well as detailed information on a range of appropriate risk mitigation measures for duty holders/responsible persons.

CLG (Housing and Fire Safety) are currently investigating with LACORS and other stakeholders whether additional fire safety and risk assessment guidance specifically for those with responsibility for blocks of purpose built flats, including those in tall buildings, would be helpful.

The CLG fire safety risk assessment guidance for less complex premises is available at www.communities.gov.uk/firesafety along with the LACORS/CFOA/CIEH guidance on fire safety in certain types of housing. Guidance on the fire safety aspects of the Building Regulations is available at www.planningportal.gov.uk

Annex A – CLG Analysis of dwelling fire Incidents in tall buildings, and dwelling fires incidents in all buildings that were under construction or unoccupied (1994 – 2008)

NB Analysis is limited by fluctuations, and reliable conclusions can only be reached from considering figures averaged over several years.

1. Proportion of all dwelling fire incidents that were in buildings of six or more storeys

a) This was lower over 2004-2008 (14.1% in London and 6.1% across England) than over 1994-2003 (16.1% of incidents in London and 7.2% across England).

b) The proportion of incidents which were apparently **deliberate** among all incidents in dwelling in buildings of 6+ storeys has also fallen - from 30% for 1994-2003 to 25% in 2004-2008 in London, and almost identical proportions across England for the same periods.

2. Proportion of all dwelling fire casualties in buildings of six or more storeys

a) Between 1994 and 2008 this has fluctuated between 11% and 17% of all dwelling fire casualties. The figures for all-England have fluctuated between 5.1% and 6.5%.

b) There is no trend in the proportion of casualties that were from incidents in buildings of 6+ storeys which were apparently **deliberate** between 1994 and 2008. On average, around 29% of these casualties were from deliberate incidents in London and 23% across England.

3. Proportion of *dwelling* fire incidents in *all* buildings that were *unoccupied*

Around 1% of dwelling fire incidents in London were reported to be in unoccupied dwellings from 1997 to 2004 (around 50 per year), whereas the proportion was nearer to 0.5% in 2005 to 2007 (around 25 per year).

Because of the small numbers of incidents, no picture can be derived for the sub-group of dwellings in tall buildings. For the whole of England, there are too many incidents with occupation recorded as 'not specified' since 2004 to allow any meaningful analysis.

4. Proportion of all *dwelling* fire incidents in *all* buildings that were *under construction*

The numbers reported are too few to permit any conclusion of trend (between zero and twenty eight incidents each year in London, and between 70 and 150 fires per year across England).

The same conclusion necessarily follows for the subset of dwelling fire incidents in tall buildings.

FS036 Health and Safety Executive (HSE)

INVESTIGATION INTO FIRE SAFETY IN TALL AND TIMBER FRAMED BUILDINGS IN LONDON

Thank you for your letter dated 5 February regarding the London Assembly Planning and Housing Committee's scrutiny investigation into issues around fire safety in buildings. We have noted the terms of reference for the committee's investigation, and I am replying on behalf of HSE's London Field Operations Division.
In answer to the specific questions you have raised:

1. Numbers of Fires:

The Reporting of Injuries Diseases and Dangerous Occurrences Regulations 1995 (RIDDOR) set out the categories of incident which must be reported to HSE. In all cases, reports arise from a work activity.

Not all work related fires are reportable. In order to be reportable fires have to either cause injury (fatal, major, over three days incapacity for work) or be serious enough to cause suspension of normal work on site for more than 24 hours (reportable as a dangerous occurrence). The responsibility for reporting under these Regulations generally rests with the employer or person in charge of the work. We do not investigate all reportable or all reported fires.

The attached spreadsheet has been prepared showing the number of fires on construction sites which were reported to HSE between April 2001 – March 2009. These have been broken down by region. Because of the nature of the information which the legislation requires to be reported, we cannot break down into further categories such as size of structure or type of building. Because large fires often receive widespread local and national publicity, we are often alerted to incidents long before the formal RIDDOR report is submitted.

Over the past 5 years or so we are aware of some significant fires which have occurred during the construction of timber frame buildings- including those at Colindale; Peckham; Camberwell, Edinburgh and Bournemouth. This increase in number of these fires has occurred during the period when the prevalence of this building method has increased, particularly in the arena of social housing and other accommodation.

2. Notification of Construction Work:

Construction work liable to exceed 30 days or 500 person days required to be notified to HSE under the Construction (Design and Management) Regulations 2007 (CDM) to notify. The prescribed particulars include the name and address of the Client, CDM Co-ordinator and Principal Contractor, address of the site and the nature of the work. There is no requirement to provide HSE with detailed information about the design or key features of the building under construction. HSE records such notifications on a database and uses this to help target its inspection work. HSE does not visit all construction sites, nor do inspectors check all aspects of construction health and safety during inspections. For the last three years HSE's Construction Division inspectors have been charged with assessing fire safety as a priority.

HSE do not supply information about notifications to the London Fire Brigade or Local Building Control authorities routinely- but we do exchange information on specific sites if the need arises.

3. Policies, Plans and Guidance:

HSE is responsible for enforcing all fire safety precautions in buildings under construction, and those being refurbished where the normal activities taking place in the building are suspended for the duration of the works. Where any part of the building remains in use during refurbishment or construction work, enforcement responsibility is divided- the responsibility for enforcing process fire safety issues on the construction site rests with the HSE, whilst the responsibility for general fire precautions (issues such as fire alarms and means of escape) remains with the enforcing authority who would normally be responsible for the activities in the building.

This means that for residential properties, where a construction site is contained within an occupied building, or where the site occupies part of the premises but the rest remains occupied, the enforcing authority for process fire precautions on the construction site rests with HSE, and the responsibility for general fire precautions in the premises as a whole (including the construction site) remains with the Local Authority. This is to ensure that if a fire on a construction site can affect persons within the residential property (or vice versa), the arrangements for raising the alarm and means of escape are coordinated.

In practice, the arrangements work well, as the enforcing authority with the skills, knowledge and experience are responsible for dealing with relevant risks. Fire safety is a core element of the training given to HSE inspectors, and HSE employs fire specialists and fire surveyors who are available when required to give technical advice and support to frontline inspectors. There are established arrangements for close liaison between the relevant authorities where this is needed, and these arrangements are working well.

The legislative framework is set out in the Regulatory Reform (Fire Safety) Order 2005 (RRO) and the Construction (Design and Management) Regulations 2007 (CDM). The RRO requires employers to assess fire safety and ensure adequate arrangements are in place to manage the risk. CDM 2007 has specific and provisions relating to fire including Regulation 39 on emergency procedures, Regulation 40 on emergency routes and exits, Regulation 41 on fire detection and fire fighting equipment.

Fire safety in completed residential buildings is covered by Building Regulations, policy responsibility for which rests with the Department of Communities and Local Government (CLG) in England and Wales. The Building Regulations are enforced by local authorities.

HSE provides guidance on a number of specific topics. Our key guidance book is HSG 168 - *Fire on Construction Sites*. It is not currently available as it is being revised to take account of legal changes, and to update it to provide additional information on higher fire risk sites including those using timber frames and multi-storey buildings. The draft guidance was distributed at the end of December 2009 and we are currently considering the comments which we have received. One of the themes which has emerged from the consultation is that the guidance should further emphasise the need for constructors to assess and control off-site fire risk as well as on-site. There will be some further limited consultation on the document once changes have been made. We anticipate this guidance will be published in June 2010 and will be available free on line and in hard copy for a nominal charge.

In the meantime there is guidance available from the Fire Protection Association - *Joint Code of Practice Fire Prevention on Construction Sites 7th Edition*, published in May 2009. Annex A of this document deals with large timber frame buildings. It is available from the UK Timber Frame Association: http://www.timber-frame.org/html/free-downloads/. HSE contributed to the development of both of these documents.

4. Specific risks from building designs:

Fire risk on construction sites vary according to the specific site activity. HSE regards some activities/types of site as higher risk requiring enhanced levels of control. This includes multi-storey buildings, timber frame and other high fire load methods of construction and refurbishment of partly occupied, particularly multi-storey buildings.

HSE applies recognised risk control strategies to fire safety. Those strategies include minimising the amount of fuel for any fire; reducing the chance of ignition; providing means of stopping the spread of any fire which does start; the provision of an effective way of raising the alarm and ensuring that all times there is an effective means of escape for those who may be affected by a construction site fire.

With timber frame the main source of fuel is the timber frame structure itself. During the construction phase, when the structural elements of the building are being erected. At this point the buildings are at particular risk from fire because the measures which would normally prevent the spread of fire in the finished building are not yet in place. As with other health and safety matters, the legislation requires a risk assessment approach to fire safety , and during this vulnerable stage the Principal Contractor must put in place precautions and protective measures which give the highest standards of protection from the risk of fire.

The recent fires in London and elsewhere have sharpened the industry's focus on the levels of protection needed during this phase of construction. HSE's Construction Division have a programme of inspection for these sites which is designed to ensure that the highest standards are maintained.

5. Specific risks from Timber Frame:

The specific risks from timber frame buildings are outlined above. It is important to remember that the increased risks are associated with the building of the structure, before the compartmentalisation required by the Building Regulations is installed. We have no evidence to suggest that risks during refurbishment of existing timber frame structures are any greater than those associated with refurbishment work generally.

The recent fires at timber frame sites have all occurred during the pre-compartmentalisation phase described above. These fires have highlighted the potential risk to surrounding property during this vulnerable phase of construction. HSE's revised guidance will highlight the importance of considering the risk to surrounding property during the planning phase of new developments. The law requires that developers should take full account of these risks when selecting the method of construction, and the precautions they will put in place to control these risks.

In practice, developers will have two options, depending on the nature and proximity of surrounding properties. On high risk sites, they could chose to adopt an alternative build design- for example using steel or concrete frame to eliminate the particular risks associated with timber frame construction. Alternatively, where the risks are lower, they may chose to adopt timber frame construction and make the necessary arrangements to control the risks during the vulnerable phase. HSE's current inspection programme associated with timber frame buildings is designed to ensure that developers are giving proper consideration to these issues during the planning phase.

HSE is satisfied that the current legislative regime places comprehensive duties on those responsible to control the risks from fire during all types of construction work.

6. Specific risks from tall and Timber Frame residential buildings which are occupied:

Where construction and refurbishment work is carried out in partially occupied residential buildings, the risks to those who remain in occupation must be addressed by both the client and the contractor carrying out the work . As stated above, the increased fire risks from timber frame structures occur only during the construction phase of the buildings, and HSE has no evidence to suggest that refurbishment works in completed timber frame structures presents higher risks than that associated with other building types.

The Building Regulations specify the standard of protection that is necessary to prevent the spread of fire in occupied buildings. Any alterations to existing structures which may affect the integrity of these protective measures must meet the standards in the Building Regulations, and the relevant enforcing authority for such works would be the Local Authority.

7. Developments in Regulations, fire safety codes and risk assessments:

In 2006 the regulatory regime covering fire safety at work changed significantly in an attempt to simplify/reduce burdens. Essentially, the approach moved from one of certification and inspection by local fire authorities to one of assessment of risk and control by duty holders. Responsibility for ensuring fire risk management arrangements are in place rests with fire authorities through powers delegated to them. As outlined above, through the Regulatory Reform (Fire Safety) Order 2005 and Fire (Scotland) Act 2005, responsibility for regulating fire safety on construction sites rests with HSE.

In respect of current guidance and codes of practice relevant to construction work, the current situation is described in the response to question 3 above.

8. The impact of these changes:

In respect of construction activities, the changes in legislation did not significantly alter the existing arrangements for enforcement. The regime as a whole was simplified by bringing together all the legislative requirements in a single order. The current revision of HSE's main guidance on fire safety in construction (HSG 168) will take account of the legislative changes, but the opportunity has also been taken to update the guidance to take account of developments in fire safety practice.

As outlined above, the Fire Protection Association's Joint Code of Practice- *Fire Prevention on Construction Sites 7th Edition* was published in May 2009, and Annex A deals with the specific

risks from large timber frame buildings. The UK Timber Frame Association has also recently produced industry guidance on controlling the risks from fire (http://www.timber-frame.org/html/free-downloads/.). HSE contributed to the development of both of these publications.

9. Outstanding Actions:

Developers and contractors need to comply with the current regulatory regime and codes of practice for fire safety during construction work. Although HSE's own guidance (HSG 168) is not currently available, there are other publications mentioned above which have recently been revised and published setting out the standards they need to achieve. HSE is on target to publish its own revised guidance in June this year.

Following the Peckham fires, HSE met with representatives of CLG, Chief Fire offices Association, and representatives of Local Authority and private Building Control inspectors to examine ways to ensure fire authorities could be made aware of timber frame construction projects as early as possible. The notifications required by health and safety legislation were found to be unsuitable, but it was felt that modifications to the notifications required by building control legislation could provide a useful early warning to fire authorities. At the meeting it was agreed that the priority for guidance was completing the revision of HS(G)168 rather than producing interim, shorter guidance.

As mentioned above, HSE's Construction Division has a programme of inspection which specifically targets timber frame sites. Following the fires on timber frame sites in Peckham and Camberwell, HSE's London Construction inspection teams worked with the London Fire Authorities and Local Authority Building Control departments to identify sites where timber frame buildings were under construction. In February this year we wrote to the Principal Contractors of all these sites reminding them of the fire safety standards which they are expected to achieve, and informing them that HSE inspectors would be visiting their sites in the near future to ensure that these standards were being met. This programme of visits is now nearing completion, and has resulted in enforcement action being taken on some sites. Once the visit programme is complete, our inspectors will meet to discuss the findings of these inspections to see what lessons have been learned, and how these can be applied to the national programme as a whole. We anticipate further work with stakeholders will be necessary to coincide with the launch of HSG 168 to ensure that developers and contractors are applying the standards which are required. Fire safety continues to be a priority topic in next year's national work plan, particularly focusing on refurbishment, multi-storey buildings and timber frame.

Contractors can and should engage competent advice when they need it. We have identified that there may be a lack knowledge on the part of the construction industry on fire matters and a lack of people competent to assess changing fire risks during the construction phase. The relevant industry skill body, Construction Skills, is currently developing a training course on fire matters aimed at site management level.

To ensure our inspectors' knowledge and skills were up to date, during February this year HSE's Construction Division conducted two internal training courses for construction inspectors in order to refresh their knowledge of current standards and developments in the fire safety field.

HSE's Construction Division has engaged the Construction Industry Research and Information Association to undertake research into the potential for major accidents from construction activities. The research is considering a range of scenarios and includes fire. The results of this research will inform our future work on this topic.

10. Other comments useful to the investigation:

We have no other comments to bring to the committees attention at this stage.

(Also attached: Further Tables)

FS037 Passive Fire Protection

Notes in Response to LA Review of Fire Safety in Tall and Timber Buildings

The details of this review were contained in a letter dated 8th February from London Assembly Member Jenny Jones that was not sent to the PFPF but of which we were given a copy by others. The letter made it clear that it was appropriate for us to comment despite no direct consultation of the PFPF and we apologise that the comments are late.
Overall the writer would like to say that the current legislative regime applicable in the UK is excellent and whilst it can be improved it is the implementation of the existing regulations that requires attention, no major changes are required.

Notes on Questions as posed in the letter dated 8th February:
Question1 concerned the future trends and likely numbers of tall and timber framed buildings and Question 2 concerned the number of fires and causes of these fires and the PFPF does not have such information and these questions will be more appropriately covered by others.

Question 3; "Who is responsible for ensuring that the relevant guidance on materials and construction in relation to fire safety is followed?"
The straight answer to this is that for new buildings either the Building Control Department of the Local Authority or an appointed Approved Inspector have this duty. The guidance contained in Approved Document B (ADB) of the Building Regulations gives ways in which the fire safety requirements may be met and also says that Fire Safety Engineering methods may be used as an alternative. The procedure for regulating this is done jointly with the Fire Safety Authority and set down in the Procedural Guidance published by CLG.
Plans for ensuring fire safety must be submitted by the developer and approved after consultation between the Building Control Authority and the Fire Safety Authority. Once this has been done the developer is responsible for ensuring that the plans are implemented and the work may be subject to inspection by the Surveyor during the construction process. The developer must inform the Surveyor that certain stages of construction have been reached but these stated stages do not include installation of fire safety measures.
In practice the level of inspection is variable and the extent to which the installed fire safety measures are in line with the approved plans and specifications is debateable. Once contracts have been let to construct the building deviations from the plans are frequent for a variety of reasons that may be either technical or financial and without rigorous inspection these can have a major influence on the actual installed products and the quality of their installation.
This problem is not new but has been growing in recent years under conditions of financial stringency or pressure to complete projects. The situation was highlighted in research undertaken under a "Partners in Innovation Project" sponsored by the DTI/ODPM between 1999 and 2003. The partners in this were the ASFP, PFPF, BRE and WFRC with the DTI/ODPM and full details of the findings of this project can be made available.
A prime example of what can happen when inadequate inspection appears to have been the case is the Pacific Wharf building in Rotherhithe that is currently being brought up to standard. We could provide more information on this and other projects where the problem is seen.
ADB advocates (Intruduction, para 0.15) the use of Third Party Certificated installers of fire safety measures and similar Certification of products but the use of such products and companies is NOT mandatory. However, under the recommendations of ADB a BC Surveyor may accept the work of such a contractor as proof that requirements of the regulations have been met.

Question 4: "What are the specific fire risk implications for various building designs, construction materials and construction methods in relation to both tall and timber buildings?"
This is a very big question the full answer to which would be too complex for this review in the writer's opinion. It is however appropriate to say that much work has been done on the subject and continues in construction companies, material manufacturers and test bodies. The overall situation in our opinion is that the current guidance in ADB and the methods advocated in the general regulations are adequate for the construction materials and methods used generally in tall housing blocks and timber framed buildings. Indeed on the latter a particular research project "TF 2000" in which we participated covered the fire safety of timber framed housing and should be studied, along with a follow up report into the reinstatement of such buildings after fire.
All materials will react in some way to fire and as an example tall buildings will have a framework for construction that may be steel, concrete or timber. In a fire situation steel will lose strength, concrete will lose strength and spall and timber will burn but all of these reactions are known, can quantified and can be countered to make them safe in use. Passive Fire Protection (PFP) materials are added to or used in the manufacture of such materials to enhance their performance in fire.
In general terms all buildings incorporate PFP materials and systems built into their structure which have two basic aims: To subdivide the building into areas of manageable risk, otherwise known as "compartmentation", and to ensure the structural stability of the building for given periods of time. There is an extensive range of BS and European tests to which materials are subjected to prove their performance as part of these objectives and several, independent, Third Party Certification schemes that have been set up by the industry to verify their tested achievements. As mentioned in the comments to Q3 above installation of

these materials and systems by properly trained staff is essential for their success when fire breaks out and if all guidance is followed they will counter most if not all major risks in modern designs.
The problems lie in the policing of the guidance in the market place as the construction of these buildings is always a matter of competitive tender and there are limited resources available to the authorities to ensure that fire safety objectives are met. This becomes a question of risk management and priorities for the authorities and owners of the building and is an area where some attention from a body such as the London Assembly could improve standards and public safety. At present we often apply more rigour to meeting environmental requirements than to life safety.

Question 5: What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?
As with Q4 this is a very large and complex subject but we can make a few direct points if we take the 3 questions posed here individually.
Firstly the specific problem with timber framed buildings under construction is that the amount of timber that is vulnerable to fire is greater than when other framing methods are used and so these sites require more diligence from the construction workers and perhaps more security when the site is closed at night and weekends. The HSE are currently reviewing this subject and have issued HSG 168 as a consultation document on the matter. The PFPF have responded to the proposals which, if implemented will greatly assist in the problem. The progressive completion of compartmentation measures will improve the situation but no incomplete building can be as secure from fire and fire spread as a completed building, this is covered in HSG 168.
Where completed buildings are concerned the aforementioned TF2000 research conducted tests on a real building and showed that they can be as good as any general building but that in some cases custom and practice on construction sites leads to more problems where timber is the frame of the building. Examples recalled from the project by the writer were that cavity barriers could be damaged or rendered useless by the practice of bricklayers flicking surplus cement down the void. With present cavity insulation methods this should be eliminated as a problem. Another frequent problem is the fixing of double layer plasterboard ceilings to create a Fire Separating Element where a single set of fixing nails is used in place of the double set of nails that would be used when fire tests are done in a fire test laboratory. These are examples of site control and discipline that is required to ensure that regulations are observed, any fire protection system must be installed exactly as tested to ensure that the expected performance is achieved in practice. For external fire spread the use of non flammable cladding such as brick is sound practice. Many problems have been found in Canada for example where timber housing is common and in fact amounts to much more use of timber than the timber frame methods common in the UK. Here they have had serious problems with plastic cladding that is easily ignited in a fire either by sparks or even radiant heat and UK regulations are tighter in this respect but need to be checked. The comparison between timber framed housing and the other more traditional methods used in the UK is covered by our earlier comments. Steel and concrete framed buildings have less combustible material in them but when incomplete can also be more vulnerable to fire than completed buildings. PFP measures to provide compartmentation and structural stability will be appropriately applied as the building progresses but the lower quantities of timber make them somewhat less vulnerable.

Question 6: What are the specific risks associated with both tall and timber framed residential buildings that are occupied? What can compromise fire safety post construction?
Assuming that the building has been constructed correctly and in accordance with the agreed fire strategy submitted at planning stage there is, in the writer's opinion, little difference between timber framed buildings and those constructed using more traditional methods.
The main concern of the Building Regulations and ADB is life safety and this means that an outbreak of fire should detected, residents warned, the outbreak contained in the place of origin as long as possible and escape routes kept clear of hazard including ingress by fire or the products of combustion to allow people to escape and the Fire Fighters to gain access. The risk of is that action in the occupation, running and maintenance (or lack of it) of the common areas could be detrimental to those objectives.
In tall buildings the escape route for those on higher floors involves using the stairs and it is vital that those stairs remain clear and as free from smoke as is possible for as long it will take to evacuate the building which is covered in the guidance. Keeping the stairs and corridors clear of smoke and fire is a function of the PFP in the structure and the compartmentation of the building. Such buildings fall under the Regulatory Reform (Fire Safety) Order (RRO) where these common areas of the building are concerned and the Procedural Guidance issued by CLG requires such areas in new buildings to have a Risk Assessment (RA) in place on the first day of occupation (see paragraph 2.41 and 2.41.1) and the Responsible Person (or the person completing this RA) should be satisfied that the fire safety measures planned for the building are in place. This can be a simple audit of the works as set out in Appendix G of ADB which requires the designer and constructor to provide such information.
From this point the RA should be a dynamic document such that any work undertaken within the common areas or the building that may influence the exit routes or allow fire and the products of combustion to impinge upon those areas does no compromise the fire precautions built into the structure. It is again recommended in the guidance documents issued for the RRO that Third Party Certificated contractors be used for such work. The procedure for evacuation is part of the RA and should be disseminated to all concerned and kept up to date at all times, another aspect of the dynamic nature of the RA.
For existing buildings the RRO requires a RA to be completed but makes no stipulation as to how soon after the implementation of the Order in 2006 this should be completed. In our opinion this is a mistake and some reasonable deadline should have been set. There was also a desire on the part of those implementing the Order within the ODPM/CLG to make the RA a simple matter and perhaps the complexity was underestimated. The ODPM/CLG published a simple 5 point basis for undertaking the RA and

for small businesses and simple premises this is fine but for the buildings being considered in this review a more detailed knowledge of the structure and function of the fire safety strategy is required. Sadly, it would appear that we had to have a tragedy for this to be realised as it was entirely predictable. Guidance was published for each sector of the built environment and it has been suggested in Sir Ken Knight's report in to the Lakanal House fire that this Guidance may need to be reviewed.
The wording of Question 6 asks what can compromise fire safety post construction and the answer is that a failure to understand and maintain the fire safety strategy within the building and those aspects of the construction that contribute to that strategy is the main danger. A list could be made here but the fact is that the requirements of the RRO and the RA cover the matter if followed correctly. Additionally it is essential that all residents understand the strategy and their part in it and while the RA is not required to cover individual dwellings the fire separating elements, or fire walls that make up the escape route must clearly be maintained where they are common to the escape route.

Question 7: What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?
The first requirement is implementation of the RA requirements of the RRO by competent persons and completion of any work identified in the RA. Buildings are no longer inspected and certified by the Fire Safety Authority and the work that Fire Inspectors previously undertook is now the responsibility of the operator/occupier of the building. The definition of a person judged to be competent to undertake the RA is difficult and CLG is currently working with stakeholders to produce ways of enabling the Responsible Person to identify such people, again a matter raised in Sir Ken Knight's report.

Question 8: Do you currently have any other comments that may be useful to the investigation?
Tall buildings in general have a basic problem where evacuation is concerned and the current Building Regulations, through ADB speak of buildings over 30m high as one group. We are concerned that the growth of buildings a great deal higher than 30m poses a problem of evacuation that needs to be address with some research. The present thinking is that in such buildings what is known as "phased evacuation" will be used and whilst this is an excellent principle and works well in any fire drill we are concerned at people having the discipline to follow the plan in a real situation. These very tall buildings are often complex structures that incorporate dwellings and of necessity their design requires a fire engineered approach. The aspect of evacuation in that engineering requires very careful consideration and strong peer review at the planning stage.

FS038 London Borough of Southwark

Investigation into Fire Safety in Tall and Timber framed Buildings in London

Southwark Council

1. ***In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed?***

   The Housing strategy 2009-2016 sets out that the GLA estimated there were 116,300 households in Southwark in 2006 and projected this to increase to 136,100 by 2016 and 160,200 by 2026

   http://www.southwark.gov.uk/uploads/file_44908.pdf

   Our Housing requirements study 2008 estimates that there are 123,350 households in Southwark.

   http://www.southwark.gov.uk/YourServices/planningandbuildingcontrol/planningpolicy/researchandinformation/

   We monitor our policies and how this is affecting development in the borough in our Annual Monitoring Report which might provide some useful information for you. This is available on our webpage at:

   http://www.southwark.gov.uk/YourServices/planningandbuildingcontrol/planningpolicy/annualmonitoringreport.html

   We are unable at this time to offer numbers of tall or timber framed buildings across Southwark in general. However, within our housing stock we have 182 blocks of 7 storeys or higher.

2. ***Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?***

   The classification of a tall building is set out in the Southwark Plan:

   (http://www.southwark.gov.uk/YourServices/planningandbuildingcontrol/planningpolicy/southwarkplanudp)

   Policy 3.20 states that;

   Planning permission may be granted for buildings that are significantly taller than their surroundings or have a significant impact on the skyline, on sites which have excellent accessibility to public transport facilities and are located in the Central Activities Zone (particularly in opportunity areas) outside landmark viewing corridors. Proposals for tall buildings should ensure that there are excellent links between the building(s) and public transport services. Any building over 30 metres tall (or 25 metres in the Thames Policy Area) should ensure that it:
   i. Makes a positive contribution to the landscape; and
   ii. Is located at a point of landmark significance; and
   iii. Is of the highest architectural standard; and
   iv. Relates well to its surroundings, particularly at street level; and
   v. Contributes positively to the London skyline as a whole consolidating a cluster within that skyline or providing key focus within views.

   All planning applications for tall buildings will require a design and access statement, a transport assessment and a sustainability assessment

We have also carried out research into tall buildings and these papers can be found on our website

Borough wide Core Strategy background papers:

http://www.southwark.gov.uk/YourServices/planningandbuildingcontrol/planningpolicy/corestrategy.html

Bankside, Borough and London Bridge background paper:

http://www.southwark.gov.uk/YourServices/planningandbuildingcontrol/planningpolicy/SPDsandSPGs/bblbspd.html

3. ***Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?***

   Local authority Building Control does not hold this information. Please refer to the LFEPA

4. ***How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?***

   This is governed by legislation.

5. ***Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?***

   This is governed by legislation.

6. ***What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?***

   Please refer to the BRE, CLG and UK Timber Frame Association.

7. ***How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?***

   Please refer to CLG.

8. ***What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tailor timber framed buildings and fire safety is anticipated in the future?***

   No record of impact. CLG may have statistics, however.

   The biggest impact in practice has been the 2007 introduction of the recommendation in Part B of the Building regulations for sprinklers in new build blocks containing flats over 30m above ground level. Previously there was no requirement for sprinklers in residential buildings.

   CLG is best placed to comment on new guidance anticipated in the future on either timber framed buildings or fire safety.

9. ***What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?***

We would recommend better information regarding contractors, sub contractors and site management on safe working practices and site supervision for timber framed buildings under construction.

10. ***What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?***

    Review resources available to statutory bodies to take enforcement actions against contractors who are not taking proper precautions against fire during construction including controls on smoking and hot works. (HSE)

11. ***Do you have any other comments that may be useful to the investigation?***

    We have nothing further to add.

FS039 Peabody Trust

London Assembly Planning and Housing Committee
Investigation in to Fire Safety in Tall and Timber Framed Buildings in London

1. Peabody has 1495 residential buildings which provides approximately 20000 units:
    - 1223 of these buildings have common parts, which fall within the scope of the Regulatory Reform (Fire Safety) Order (RRO).
    - 486 have 5 or more floors (tall buildings)
    - At this time I have been unable to identify the number of timber framed buildings within Peabody's portfolio, more information to follow.

2. Information not available at this time further information to follow.

3. No statistics for the number and type of fires reported where kept before 2008. Recent analysis of fires has not revealed any discernable trends. During the period 2009/10 17 fires were reported, which was a 30.5% decrease on the fires reported in 2008/09 and is well above the 6% decrease recorded in National figures. For the second year there were no fire-related deaths reported. In the last year 58% of accidental fires in Peabody homes were attributed to a lack of fire safety awareness on the part of residents. A more sustained and planned approach to communicating fire safety awareness to both staff and residents is being planned for 2010/11

4. When designing new developments, our external design teams as a matter of course consult with any of the following bodies with respect to Building Regulations compliance:

    - NHBC
    - Approved Inspectors
    - LA Building Control
    - Peabody's design teams also consult separately with the London Fire Brigade to ensure that we have local agreement to the approach to Building Regulations Part B.

5. Peabody's Development Team is currently developing a manual for development staff which will include checklists at each project stage for e.g. CDM, leasehold issues, fire etc. We will ensure that his checklist includes timely consultation with the London Fire Brigade and we will invite Peabody's Fire Safety and Emergency Planning Manager Team to attend such consultation meetings.

6. The specific risks associated with tall and timber framed buildings can be identified in two distinct areas:

    - The initial fire resisting approved construction/compartmentation and fire precautions of any building should not be compromised or removed by any material alterations and additions.
    - To ensure compliance with the RRO and the provision of safer environments for residents, the efficient management of fire safety in the common parts, via the fire risk

7. Further information to follow.

8. In April 2009 Peabody's Fire Safety Adviser and Assistant Director Building Services wrote a fire safety strategy to deliver a fire risk assessment programme/process, which ensured Peabody's compliance with the RRO. In May 2009 an internal Fire Safety Team was crated and has assessed and/or reviewed 96.1% of the1220 Peabody properties (Blocks, street properties, sheltered and supported schemes and community based facilities), which required fire risk assessments to comply with the RRO. Actions identified in the fire risk assessments are being implemented on programmed priority basis. The remaining 3.9% have not been implemented as the auditors have not been able to gain access or the building is being refurbished. The reassessment /review process for 2010/11 will be based on a risk based matrix which will determine a re-inspection periods of 1, 3 and 5 years.

   Peabody has established a proactive working relationship with the London Fire Brigade at both senior and local level, which enables Peabody to resolve any fire related issues speedily and effectively. Local partnerships between the London Fire Brigade and Neighbourhood Managers have been developed to deliver the Brigade's Home Fire Safety Visits programme to Peabody's residents.
   With regard to the fire safety element of the HHSRS Peabody has a robust and proactive consultative process for responding to any Environmental Health Statutory Notices. In addition, any identified fire related HHSRS issues will be dealt with during decent homes works.

9. To maintain downward trends in accidental and arson fires in these types of buildings, a sustained and planned communication strategy should be devised, by landlords, to increase fire safety awareness of both their staff and residents. In addition, the efficient management of fire safety in the common parts, via the fire risk assessment and review process, continuous estate/building inspections, proactive and efficient maintenance of the buildings fire resisting construction and fire precautions are critical in reducing the potential for fires.

FS040 Mayor of London

Dear Jenny,

Thank you for your letter of 8 February about the scrutiny investigation into the hugely important issue of fire safety in buildings.
With regard to the questions raised in the letter, responsibility for areas such as materials used in building construction lie outside my remit and, as such, other organisations would be best placed to provide the information you request. However, I have discussed many of these issues with LFEPA.
You will be aware that there are general references to fire safety in my statutory London Housing Strategy which should encourage boroughs, developers and architects to give more consideration to the matter. Specifically:
• Under section 2.1.1, the London Housing Strategy states "More attention must also be paid to the quality of the urban realm. The design of new developments should enhance the quality of local places. Safety and security must also be key considerations, in terms of addressing both crime and anti-social behaviour, and fire safety, particularly in communal areas of blocks of flats."
• Section 2.1.1 A sets out the key issues addressed by the London Housing Design Guide, including: "Minimum requirements are set for the design of entrances and shared circulation areas, as well as fire safety, lighting, car parking, cycle storage and waste so communal areas are safe and secure and welcoming, accessible for all and contribute to a sense of ownership and belonging."
• Section 2.3.1 B states that "Regeneration should deliver high quality environments and homes, achieving the Mayor's design standards as set out in his draft London Housing Design Guide. Where homes are being refurbished, physical improvements should be designed to improve accessibility and inclusion, and particular attention should be paid to fire safety."

Further, the Decent Homes programme does not cover all aspects of the building, nor is it funded to do so. However, the report to the Secretary of State by the Chief Fire and Rescue Adviser on the emerging issues arising from the fatal fire at Lakanal House, Camberwell, stated that:
" ... in carrying out improvements under the Decent Homes programme, local authorities can use the opportunity to do additional work. The guidance on Decent Homes states that all dwellings should be free from category one hazards as assessed under the Housing Health and Safety Rating System. This system is a tool to assess the potential health and safety risks in homes, and includes an assessment of the risk from fire. Category 1 hazards include the most significant risks that can result in death or major injury and health issues. "
Thank you again for writing to me.
Yours ever,
Boris Johnson
Mayor of London

FS041 Commission for Architecture and the Built Environment (CABE)

Dear Jenny Jones

LONDON ASSEMBLY: INVESTIGATION INTO FIRE SAFETY IN TALL AND TIMBER FRAMED BUILDINGS IN LONDON

Thank you for consulting CABE about the Planning and Housing Committee's investigation into fire safety in tall buildings in London. We support the proposal to carry out research on the implications of fire safety on this new building form and we are interested in the impact of any new regulations or guidance on the planning and design of tall buildings that may emerge as a result, however we do not wish to comment on this investigation.

CABE has an important role to play in evaluating the planning and design of tall building proposals as consultees in the planning process. However, we acknowledge that there are a broader range of issues that need to be taken into account in the design of this challenging building type. Although CABE supports an integrated approach to all aspects of design and takes an interest in the impact of fire safety considerations on design quality in the round, we do not have the remit, expertise or capacity to advise on the demanding and complex requirements of Building Regulations, including fire safety.

FS042 London Borough of Lambeth

Investigation into Fire Safety in Tall and Timber Framed buildings in London

Further to Jenny Jones' letter of 8 February, please find below responses to the questions she raised.

1. In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed?

There are approximately 130,000 dwellings across all tenures in the Lambeth. We do not have figures that tell us how many are classified tall buildings or timber framed overall, though we do know that, within the stock the council owns that there are 5377 units in 140 blocks of over 6 stories.

2. Are there any '"estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?

Various studies, including the GLA's SHLAA and Lambeth's Affordable Housing Viability study have indicated that new developments in Lambeth will be at high densities. This is associated with high rise developments in certain locations and there are a number of schemes which envisage mixed use tower blocks of 40 stories in the north of the borough,

3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?

Please refer to the London Fire and Emergency Planning Authority.

4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?

It is a requirement of the Building Regulations 2000 (as amended) that a person intending to construct a new building or refurbish an existing building (where this includes notifiable work, a material alteration or material change of use) is required to deposit full plans with Building Control. Alternatively a private sector Approved Inspector (AI) can be chosen to act as the Building Control Body. In this case an Initial Notice has to be registered with the relevant local authority.

Local Authority Route:

Full plans are defined as plans in sufficient detail to show that the proposed work would comply with the Regulations. This includes fire strategy, relevant plans, construction details etc.

In case of buildings to which the Regulatory Reform (Fire Safety) Order 2005 apply ie *'relevant buildings;* the Local Authority is required to consult the Fire Authority, (LFEPA), in respect of fire safety. The consultation includes plans and details of the proposed work and the form of construction (if known) is also notified.

Please note, 'relevant buildings' includes most buildings with the exception of single family dwelling houses. Flats are covered by the Order due to the common parts.

Private Approved Inspector Route:

The private sector AI supplants the local authority as the Building Control Body (BCB) and the person intending to carry out work and the AI jointly register an Initial Notice (IN)with the local authority indicating the location of the building and describing the work. Where an AI is appointed to act as a BCB there is no requirement for either detailed plans or notice of commencement to be given to the Local Authority Building Control Department. The I N remains in force until the AI registers a final certificate with the local authority to indicate satisfactory completion of the building or work. The local authority is prohibited from further involvement once an Initial Notice is in force.

AI's are also obliged to consult the Fire Authority (LFEPA) on fire safety matters, and before a final certificate is issued for relevant buildings. Als are represented by the ACAI The Association of Consultant Approved Inspectors (ACAI)

5. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?
Clearly the Owners and their agents should ensure that the correct materials and forms of construction are used during construction to ensure fire safety. Building Control has a part to play in ensuring that standards of construction are observed in so far as they relate to the BUilding Regulations and to the guidance documents.
6. What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during constructioh and after completion)? What risks do other materials and construction methods pose in comparison?
We would advise that reference is made to the CLG and the UK Timber Frame ASSOCiation in this respect.
7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings? -
Please refer to the CLG in this respect.
8. What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new gUidance on either tall or timber framed buildings and fire safety is ahticipated in the future?
The biggest impact has been the introduction of the recommendation in Part B of the Building Regulations for sprinklers in blocks containing flats over 30 m above ground level.
The CLG is best placed to comment on new guidance anticipated in the future on either tailor timber framed buildings or fire safety.
9. How do you follow the RRO (Regulatory Reform Order) Fire Risk Assessment process for ongoing building and occupant life safety under the Housing Health and Safety Rating System (H HSRS)?
The two pieces of legislation are totally separate with their own powers of enforcement for fire safety related matters. The responsible persons will be required to undertake a risk assessment to meet the requirements of the RRO, over and above the requirements that may be issued to comply with of Housing Act. Primacy of legislation will differ between local fire safety offices and the boroughs they serve.

10. What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings In London?
Pubiicise the RRO and in particular the duty of 'Responsible Persons' to carry out fire risk assessments and to ensure the maintenance of fire safety arrangements and measures provided for the protection of fire fighters (article 38 of the RRO)
38 (1) Where necessary in order to safeguard the safety of fire-fighters, in the event of a fire, the responsible person must ensure that the premises and any facilities, equipment and devices provided in respect of the premises for the use by or protection of fire fighters under this order or under any other enactment, including any enactment repealed or revoked by this order, are subject to a suitable system of maintenance and are maintained in an efficient state, in efficient working order and good repair.
Experience shows that one cause of the compromise of fire safety post construction is unauthorised work eg the running of cables in common areas and protected shafts, where fire stopping is disturbed or removed and compartmentation is breached.
There are also cases where long standing fire safety measures e.g. opening vents/windows to common parts have been disabled or rendered ineffective.
These issues should now be recognised and addressed by the 'Responsible Person' designated under the RRO, as should the maintenance of active fire safety measures e.g. ventilation arrangements and systems to common partsfinternal fire fighting access, which form an integral part of a fire strategy to ensure they function correctly at the required time.
11. . Do you have any other comments that may be useful to the Investigation?

No further comment.

FS043 Mike Leonard

Investigation into Fire Safety in tall and timber framed buildings in London

Brick and Block is the Cost Effective Sustainable Solution!

The drive towards zero carbon homes has been hijacked by foreign government sponsored propaganda, which has attempted to pursuade decision makers that imported timber frame systems are the only way forward.

The opposite is true as evidenced when all the facts are taken into account:

- We have to import all of the structural grade timber we use to build timber frame homes in the UK, no account is taken of the environmental impact of deforestation or the shipping on some of the oldest and most inefficient ships
- We choose to measure the carbon footprint of imported timber from the port of entry which is just plain wrong
- Timber frame is at least 15% more expensive than Brick and Block. Public money continues to be wasted on more expensive and less efficient building systems. This is despite the fact that we have 5 million people waiting for social homes and we are committed to achieving " More for Less"
- Concrete and Clay do not burn which prevents risk to life and property
- Concrete and Clay share the same Green Guide Rating as Timber
- The first Code Level 6 home in the UK was built in Brick and Block
- There is no issue in meeting the highest standards of environmental performance using masonry
- The Homes and Community Agency scrapped the requirement for so called "Modern Methods of Construction" for affordable housing projectsin 2008.
- They did this because they realised that the unintended consequence was an increased use of timber frame that does not offer thermal mass
- Thermal mass will be vital in London if predicted temperatures of 40 degrees are realised by 2050
- The raw materials for Brick and Block are quarried and the products are manufactured and installed on site in the UK, creating significant employment and as a direct result sustainable communities
- The fact that brick and blocks are produced in the UK and distributed locally reduces the environmental impact of transportation

- The concrete industry has significantly reduced embodied energy and can demonstrate true responsible sourcing accreditation – The timber industry is currently unable to meet this requirement
- The design life of many lightweight structures is 60 years whist masonry homes are predicted to last at least 150 years – This is critical to the long term sustainability agenda

Masonry is safe, preferred, cheaper and truly sustainable. Timber frame construction is not suitable for high-rise accommodation or care homes and should be excluded from future social funding for such projects.

FS044 London Borough of Wandsworth

INVESTIGATION INTO FIRE SAFETY IN TALL AND TIMBER FRAMED BUILDINGS IN LONDON

WANDSWORTH COUNCIL RESPONSE

1. In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed.
As at March 2009 the total number of residential units in the borough was 132,079 of which 33,370 were Council owned residential units. Information is not available in an easily accessible form for the borough regarding tall buildings and those which are timber framed for the borough generally. It has been suggested that this information could be obtained for London with a sub count by borough by using Cities Revealed and then the National Land and Property Gazetteer. The information below refers to tall buildings only and does not identify those which are timber framed.

Status	Dwellings
Completed 1997	253
Completed 1998	50
Completed 1999	27
Completed 2000	545
Completed 2001	133
Completed 2002	383
Completed 2003	235
Completed 2004	973
Completed 2005	528
Completed 2006	1,480
Completed 2007	574
Completed 2008	890
Completed 2009	394
Completed 2010	97

In terms of the Council residential stock there are some 352 blocks which are five storeys or more. Of these 14,570 residential units are on the fifth floor or above. Timber framed is not a construction mode generally used by the Council.

2. Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?
Information is not available in an easily accessible form regarding tall buildings and those which are timber framed. The information below refers to tall buildings only and does not identify those which are timber framed.

Status	Dwellings
Under Construction	1,654
Planning pipeline	3,717

3. Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?
The Council is not always informed of all the fires. Only fires that result in potential structural damage are referred to the Council for possible assessment and action as dangerous structure. LFEPA have been contacted for information for Wandsworth. It has been suggested that this question might have been better asked of the LFEPA for a co-ordinated response for London as a whole with a sub count for each borough.

4. How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?

LABC would know if the building under construction is controlled under building regulations through local authority route. Developers have the option to use a private Approved Inspector (AI) to obtain approval, in which case LABC would not have the information. LFEPA are unlikely to receive the information.

5. Who is responsible for ensuring the relevant guidance on materials and construction in relation to fires safety is followed?

The developer and/or builder may be responsible which would depend on the contract specification.

6. What are the specific risks associated with both tall and timber framed buildings under construction and occupied? Do current Regulations sufficiently control fires spread/external fire spread (both during construction and after completion)? What risks do other material and construction methods pose in comparison?

Experience shows that one cause of the compromise of fire safety post construction is unauthorised work e.g. the running of cables in common areas and protected shafts, where fire stopping is disturbed or removed and compartmentation is breached.

There are also reported cases where long standing fire safety measures e.g. opening vents/windows to common parts have been disabled or rendered ineffective.

These issues should now be recognised and addressed by the 'Responsible Person' designated under the RRO, as should the maintenance of active fire safety measures, e.g. ventilation arrangements and systems to common parts/internal fire fighting access, which form an integral part of a fire strategy to ensure they function correctly at the required time.

7. How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?

Refer to CLG: http://www.communities.gov.uk/planningandbuilding/buildingregulations/

8. What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tailor timber framed buildings and fire safety is anticipated in the future?

The biggest impact has been the introduction of the recommendation in Part B of the Building regulations for sprinklers in blocks containing flats over 30m above ground level. Timber frames do not normally reach these levels due to structural limitations.

CLG is best placed to comment on new guidance anticipated in the future on either tailor timber framed buildings or fire safety.

9. How do you follow the RRO Fire Risk Assessment process fro ongoing building and occupant life safety under the Housing Health and Safety Rating System (HHSRS)?

The "responsible person" as referred in the RRO is required to assess the risk at the time. It would be a dynamic process during construction as the conditions may very from day to day. Once occupied, it would be more stable. The responsibility would rest with the "responsible person" at all times.

10. What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?

Publicise the RRO and in particular the duty of 'Responsible Persons' to carry out fire risk assessments and to ensure the maintenance of fire safety arrangements, and measures provided for protection of fire-fighters [article 38 of the RRO].

***38.**—(1) Where necessary in order to safeguard the safety of fire-fighters in the event of a fire, the responsible person must ensure that the premises and any facilities, equipment and devices provided in respect of the premises for the use by or protection of fire-fighters under this Order or under any other enactment, including any enactment repealed or revoked by this Order, are subject to a suitable system of maintenance and are maintained in an efficient state, in efficient working order and in good repair.*

11. Do you have any other comments that may be useful to the investigation?

No

FS045 London Borough of Barking and Dagenham

London Barking and Dagenham Council Response
London Assembly investigation on fire safety - response
1 April 2010

Question	LBBD Response
1 In your borough how many residential units are there, how many units are classified as being in tall buildings and how many are timber framed?	We have 935 blocks of which 42 are classified as tall blocks ; 115 medium-rise and 778 low –rise None of the blocks are timber frame
2 Are there any estimates for the likely increase in numbers, or general trends for the construction of either tall or timber framed residential buildings in London over the next 10 years?	There are no estimates available at moment
3 Do you have any record of the number of fires in either tall or timber framed residential buildings in London either under construction or occupied? Are there any trends in terms of the causes of these fires and the seriousness of them over the last 20 years?	We don't have accurate records for the past 20 years. From April 2008 to February 2010 we suffered approx 20 fire incidents. Most of the fire incidents were caused by unknown arsonist entering the block and setting on fire either bags/furniture/litter left in the communal area of the blocks by the residents and on some occasions by setting on fire the internal bin compounds. The damaged caused by the fire has meant that on some occasions we had to evacuate a small number of people until the repairs were completed. The learning from each fire has confirmed that generally the communal area of the blocks are a low risk and the flats have been build as individual fire containing units, concrete wall, landing and stairs has so far prevented the fire spreading inside people flats and in other area of the building. Following the learning from the fires incidents we increased the number of Security doors installed, increased of CCTV security cameras and Concierge Services, introduced a caretaking cleaning service to all low-rise blocks, and reviewed our estate inspections regime ,the strategy also included the restructure of the Landlord Services and the creation of two new departments (Tenancy Services and Estate Services) to ensure a more robust management of both key Landlord functions (tenants behaviour / tenancy agreement and

	Estate Management).
4 How does the London Fire Brigade or Local Building Control know whether tall or timber framed buildings are being constructed or refurbished? What information is supplied to them, and by whom?	Any work to which the Building Regulations are applicable will require an application to be made to the Building Control Body (Either the Local Authority Building Control Service or Approved Inspector). If the Regulatory Reform (Fire Safety) Order 2005 applies, full construction details will be submitted with that application and the BCB will consult with the London Fire Brigade as required by the legislation.
5 Who is responsible for ensuring the relevant guidance on materials and construction in relation to fire safety is followed?	Where the Building Regulations apply Part B(Fire Safety) of those regulations will be applied by the Building Control Body.
6 What are the specific fire risks associated with timber framed buildings under construction? Do current Regulations sufficiently control fire spread/external fire spread (both during construction and after completion)? What risks do other materials and construction methods pose in comparison?	This is a detailed question and research has been carried out by various bodies on most of the sub-questions Specifically, where the question relates to fire spread/external fire spread during construction and after completion this is covered by legislation that is not applied or enforced by the local authority.
7 How have building regulations, fire safety codes and risk assessments developed over time in relation to both tall and timber framed residential buildings?	The CLG and its predecessors have amended, improved, extended regulations, codes, assessment processes with due consultation with relevant parties. The new RRO has put the responsibility on the duty holder (landlords) to ensure that there are effective management in place to prevent fires. In response to the new Duty, LBBD has reviewed all its approach to fire safety management including creating an in-house competency/capacity to carryout effective fire risk assessments and fire preventive actions.
8 What has been the impact of recent amendments to fire safety regulations for residential buildings under construction and occupied? What new guidance on either tall or timber framed buildings and fire safety is anticipated in the future?	Since July 2009 we received advice and guidance from the following officers: London Fire Brigade (London Fire Commissioner)- LFB (Fire Safety Regulation)-LFB (Assistant Commissioner)- LFB (Barking and Dagenham)- Communities and Local Government (Director of Housing Delivery & Homelessness). The learning form each advice is informing all our fire risk prevention approach.
9 How do you follow the RRO (Regulatory Reform Order) Fire Risk Assessment process for ongoing building and occupant life safety	Any requirement of the RRO which impacts through the Building Regulations is dealt with during the approval process. In September 2008 , the Council invested in building an in-house skill capacity to carryout an effective Fire risk management including

under the Housing Health and Safety Rating System (HHSRS)?	all fire risk assessments for the LBBD housing stock including : In September 2008 The Estate Services Manager was trained by the London Fire Brigade to the IFE Fire Risk Assessments Level 2 and is now fully qualified for the purpose of the IFE Register of fire Risk Assessors and Auditors. In August 2009 11-Estate Services Officers, 1 Hostel Services Officer and 1 Property Services Officer were also trained by The London Fire Risk Assessment Training Company in carrying out Fire Risk Assessments. In 2008 all our frontline Caretakers were trained by the LFB Fire Safety Officer on the fire risks, fire prevention and the cause of fires awareness.
10 What do you think currently are the outstanding actions required to reduce the risk of and number of fire incidents in tall and timber framed buildings in London?	For LBBD will be to continue building the necessary in-house skills and competencies capacity to carryout effective and robust fire risk assessments in-house to ensure that the approach taken by LBBD continue to be relevant to our needs, and the training and qualifications achieved by the in-house officers provided the Council with a long-term investment and the necessary skill base to keep improving our fire risk management of the Council Housing Stock.
11 Do you have any other comments that may be useful to the investigation	To continue to work close with the London Fire Brigade and take part of the information/knowledge sharing net work, to ensure that we all learn from best practice