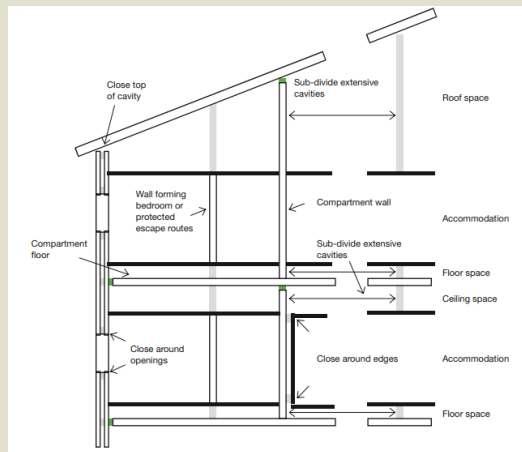


RESIDENTIAL CARE HOMES: Getting Fire Compartmentation Right



This Information Sheet has been prepared by Marpal and describes the forms of fire resistant construction that should be in place within purpose built Care Homes utilising a Progressive Evacuation Strategy

The arrangements for keeping residents safe from fire in Care Homes are different from those in place in most buildings; usually within Care Homes, residents are unable to self-evacuate and there are insufficient staff numbers to enable a total evacuation of the building.

Instead of evacuating the whole building, only the affected areas of the Home are evacuated, the intention being to leave residents in safe areas of the building until such time as the Local Fire and Rescue Service arrive and extinguish the fire. This type of evacuation strategy is known as 'Progressive Evacuation' and requires the building to be divided up with fire compartment walls and floors to ensure that a fire does not spread rapidly to multiple areas of the building.

To be suitable for 'Progressive Evacuation', every Care Home must have adequate fire compartmentation in place.

FIRE COMPARTMENT SIZE AND LOCATION

Care Homes should be divided in to at least three separate fire compartments. The walls providing this compartmentation should run in a continuous vertical plane throughout the buildings height and extend through any roof void areas.

Maximum distances of travel to a separate fire compartment/place of relative safety will influence the position of the required compartment walls. Within 'normal risk' areas the recommended maximum travel distance from a resident occupied room to a place of relative safety (such as another fire compartment) is 18m.

In addition to the vertical fire compartment walls required to divide the building in to separated parts, the below also need to be constructed as fire compartment walls:-

- Walls enclosing stairs.
- Passenger lift shafts.
- Service risers.

OTHER WALLS REQUIRING FIRE RESISTANCE

All loadbearing walls, those enclosing escape routes, bedroom walls and walls to ancillary accommodation also need to be of fire resistant construction.

All fire resistant walls need to extend up to the underside of the structural floor above; they should not terminate in void areas above suspended ceilings.

EXPECTED PERIODS OF FIRE RESISTANCE

Notwithstanding the fact that Care Homes built post 1994 should have been built in accordance with Building Regulation requirements similar to those in place today, there tends to be a large variance between the quality of fire compartmentation in place, thus necessitating the evaluation of arrangements on a Home by Home basis.

If your Care Home has been built in accordance with modern Building Regulation requirements, the below fire compartmentation should be in place:-

Two Storey Care Homes

Location of Building Element	Expected Period of Fire Resistance
Horizontal fire separation between a basement storey and the ground floor level accommodation	60 minutes
Horizontal fire separation between the ground floor level accommodation and first floor level accommodation	30 minutes
Horizontal fire separation between the first floor level accommodation and the roof void	30 minutes
Vertical fire compartment walls & doors therein	30 minutes

Care Homes up to 6 Storeys in Height

Location of Building Element	Expected Period of Fire Resistance
Horizontal fire separation between a basement storey and the ground floor level accommodation	60 minutes
Horizontal fire separation between the ground floor level accommodation and first floor level accommodation	60 minutes
Horizontal fire separation between the top floor level accommodation and the roof void	30 minutes
Vertical fire compartment walls & doors therein	60 minutes for walls required to facilitate progressive evacuation, 30 minutes elsewhere.

Pre 1994 and non-purpose built Care Homes may have very limited fire resistance between floor levels, for example they may contain areas with lath and plaster ceilings or decorative coverings; these Homes require particular consideration before implementing a progressive evacuation strategy.

SERVICE PENETRATIONS THROUGH COMPARTMENT FLOORS, WALLS, CEILINGS IN TO ROOF VOID AREAS AND ESCAPE CORRIDOR WALLS

Where services pass through fire compartment floors, walls and through ceilings in to roof void areas, suitable fire stopping should be carried out.

Examples of suitable fire stopping work include:-

- The fitting of fire collars to non-fire resistant pipes with an internal diameter of more than 40mm.
- The fitting of dampers to ventilation system pipes.
- Providing 'fire pillows' where electrical cable trays pass through the walls.
- Sealing around small diameter water pipes with fire resistant mastic.
- Fitting fire resistant 'hoods' over non fire resistant recessed light fittings.

FIRE PROTECTION OF STAIRCASES, LIFT SHAFTS AND SERVICE RISERS

Stairs, lift shafts and service risers that pass through fire compartment floors need to be protected so that they do not transfer smoke between floor levels; they all need to be enclosed by fire compartment walls.

Within Care Homes that are progressively evacuated, passenger lifts should be located within the stair enclosures' protected shaft or within their own protected shafts to prevent smoke spread between floor levels. It is possible to source passenger lifts with top & side smoke seals, however, passenger lifts with smoke seals fitted to the bottom of the doors are not currently available (at the time of writing this article).

The positioning of passenger lifts within corridor areas, or even within rooms containing a fire load is not uncommon and may require either physical alterations to the building, an appropriate risk management strategy or a combination of both.

Service risers should not contain ignition sources such as electrical switch gear and should not be open to rooms from which they originate e.g. kitchen ceiling void areas, plant rooms etc.

FIRE RESISTANT CONSTRUCTION REQUIRED TO PREVENT FIRE SPREAD IN TO ROOF VOID AREAS

Within Care Homes, there is the option to extend all walls enclosing bedrooms to the underside of the roof structure, or to provide a 30 minute fire resistant ceiling throughout the building.

Most Homes are built with the intention of providing a thirty-minute fire resistant ceiling. The unprotected edges and board joints of the plasterboard represent a weak point in ceiling construction, hence most manufacturers require a double boarded ceiling. These ceilings should be imperforate throughout, hence recessed light fitting, soil pipe penetration, ventilation system penetration etc. all need to be fire protected.

FIRE RESISTANT CONSTRUCTION REQUIRED TO PREVENT FIRE SPREAD WITHIN A ROOF VOID AREA

The fire compartment walls should also extend through the roof void (following the lines of the walls below). It's important to differentiate between fire compartment walls which need to be self-supporting and cavity barriers (typically fire curtains) intended to reduce the size of roof voids. Cavity barriers usually rely on support from roof trusses and as such are likely to fall away/allow fire spread within less than the required time frame of either 30 minutes or 60 minutes (subject to building height).

The detailing at the top of the fire compartment walls is also important to prevent the walls being breached by fire; in Care Homes, the tile battens, roofing felt plywood or similar combustible material should not be carried across the top of these walls. Building Regulations guidance suggests that compartment walls should be extended above the buildings' roofline.

In some cases, as an alternative to extending lift and service riser shafts to the underside of the roof, they are 'capped off' at ceiling level. Any such caps need to be carefully designed so that they are not only of the required fire resistance (from both sides of the shaft), but are also able to resist impact damage from falling debris in a fire scenario e.g. falling roof tiles.

WHERE BREACHES OF FIRE COMPARTMENTATION ARE IDENTIFIED

A good quality Fire Risk Assessment (often referred to as a Type 1 Assessment) carried out by a competent person e.g. an independently registered Assessor, should identify Homes with fire compartmentation breaches.

Where there are significant breaches identified or suspected, that are likely to impact upon the Home's progressive evacuation strategy, further more intrusive investigation may be required (often referred to as a Type 2 Assessment, a Type 4 Assessment or a Fire Compartmentation Survey).

The work involved in improving fire compartmentation in buildings tends to involve specialist materials and processes, to avoid abortive inappropriate work being carried out, it is recommended that only experienced, competent contractors are used, such as those registered on the Association for Specialist Fire Protection website <https://asfp.org.uk>

Where significant breaches are identified, in some cases it may be necessary to take short-term precautions until such time as the defects are identified e.g. increased staff numbers.

SUMMARY

Providing adequate physical barriers to prevent the spread of fire and smoke is vital within Care Homes; to ensure that there is sufficient time available for staff to assist with the evacuation of vulnerable residents, before they are affected by fire and smoke. Assuming adequate arrangements are in place within existing facilities can be dangerous; professional advice should be sought before putting in to place a Progressive Evacuation Strategy that relies on it being safe to delay the evacuation of the building.

GENERAL

The information given above is for general information purposes only and is primarily based on Building Regulations Approved Document guidance and DCLG guidance applicable in England and Wales: requirements vary in Scotland and Northern Ireland where different guidance is in place.

ABOUT THE AUTHOR

Adrian Gouldin BSc (Hons) MRICS GFireE is the Head of Fire Safety Services at **Marpal Limited**. Adrian's experience is drawn from his role as an IFE Registered Fire Risk Assessor and Chartered Building Surveyor, predominantly carrying out Fire Risk Assessments and Fire Compartmentation Surveys within the Care Sector.

ABOUT MARPAL

Marpal Ltd are a Derby based Health and Safety Consultancy specialising in the Care Sector. Our goal is to provide you with professional advice, guidance and ongoing support services in order to create a healthy, safe working and living environment.



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