MAINTAINING PASSIVE FIRE PROTECTION SYSTEMS

Many changes can take place during the life of a building, including the components of passive fire protection.

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Passive fire protection doesn’t have to spray water or sound an alarm like an active fire protection system, but it still needs to be maintained. After passive fire protection is installed, satisfactorily inspected and given a Code Compliance Certificate indicating compliance with the Building Code, the building must be maintained so that the passive fire protection can carry on providing its fire or smoke separation function.

Passive fire protection includes any fire safety measure that does not actively respond to the presence of flame, high temperature or smoke and comprises aspects such as fire-resistant walls and doors, design of evacuation routes, passive signage, passive smoke venting and so on. Fire and smoke doors, for instance, which need to close in a fire, are considered passive fire protection even though they are activated by an alarm.

Inspect and correct

It is essential to maintain, inspect and undertake corrective actions on a passive fire protection system to maximise its reliability and ensure it continues to meet the requirements of the relevant design, installation and commissioning procedures until the next scheduled activity.

Maintenance and inspections must be carried out by qualified persons, such as an approved independent qualified person (IQP) or the manufacturer’s representative (the inspection period should be defined in the compliance schedule). Any defects must be remedied as soon as possible, with provisional measures put in place to compensate in the meantime, as the fire safety in the building will be reduced until the defect is rectified.

A passive fire protection scheme can consist of several components, each with unique maintenance requirements. Some passive fire protection, such as fire doors and fire dampers, may be part of a combined active-passive system. This is a special case known as an integrated system, which is not discussed here.

The elements of passive fire protection

The Building Code does not require regular inspection of some passive fire protection elements, such as firewalls or penetrations that are not part of an escape route. However, building owners should carry out their own inspections on a regular basis, particularly after work is carried out on the building.

FIRE AND SMOKE SEPARATIONS

Examples of a fire separation include a fire door or wall that forms a safe path within a building, a fire-rated floor in a service cupboard within a means of escape or a fire-resistant wall that separates parts of a building. Examples of a smoke separation include a wall forming a protected path in a building, a smoke-resistant lift lobby or a smoke-stop door.

Fire separations that bound exitways should be visually inspected each day for signs of damage or deterioration that could adversely affect their fire-resistance function, particularly with respect to closures, exposed fire-stopping and surface finish and new penetrations without suitable fire-stopping. Doors that form part of an escape route must be openable and not be locked, barred or blocked. Further checks should also be carried out at least yearly to ensure that:

- doors are not damaged or obstructed
- door leaves or fire shutters close and latch automatically from any position
- double-acting doors and double-leaf doors stop with the leaves in line with the frame and seals (where fitted) are in contact at meeting stile and/or frame
- door leaves on self-closers shut with an acceptable maximum closing force
- hardware is securely fixed
- no unauthorised hardware is attached
- fire doors in exitways can be opened without keys to allow ready egress from the building at all times
- fire door to frame clearances comply with AS/NZS1905.1:1997 or as tested
- the manufacturer’s label is on the fire door leaf or shutter and frame where installed in accordance with AS/NZS1905.1 (and where the door installation has been subject to a building consent, the labels comply with C/AS1 Part 6)
- fusible link/rollers/cables can be activated
doors or windows are not kept open by methods other than hold-open devices that comply with C/AS1 and are in good working order

- doors have not been relocated without suitable fire separation in the ceiling space above the door

- separations are not damaged or deteriorated in a way that could adversely affect their fire-resistance function

- separations do not have new penetrations without suitable fire-stopping.

SMOKE CONTROL SYSTEMS
Smoke control systems are not a dedicated escape route pressurisation system or part of the building’s normal mechanical ventilation system. They may include a mechanical ventilation system, such as dedicated fire mode extraction fans and relief air dampers, in addition to passive smoke control features, such as bulkheads, smoke curtains, pressure relief and venting openings.

Smoke control systems usually have mechanical components, such as automatic vents and automatic smoke curtains, but may use natural smoke control, such as a plenum area for collecting smoke, or contain passive components like smoke curtains, vents and so on. In buildings that include passive smoke control features, the maintenance and inspection is confined to ensuring the smoke separations will function as planned. Items to check include:

- additional installations in a plenum that would reduce the planned volume of smoke collecting

- any damage, deterioration or penetrations in the installation of the smoke separations that would allow smoke to penetrate

- alterations in the rest of the building affecting smoke movement.

FINAL EXITS
A final exit is defined in C/AS1 as the point at which an escape route terminates by giving direct access to a safe place. A safe place is a location where people may safely disperse after escaping the effects of fire. Examples of final exits include an exit door from the building to the street, an exit gate at the base of an external stair or between an enclosed yard of a building and the street, a door between two evacuation zones in a hospital with staged evacuation or a door between two buildings where either building is a safe place for the adjacent building.

Final exits should be inspected to ensure they can be opened from inside the building and are not locked, barred or blocked. Door-latching devices must be clearly visible, easily operated without a key or other security device and configured so they do not prevent or over-ride the direct operation of panic bolts fitted to any door. Maintenance must include measures to ensure that final exits are clearly identified, free of obstructions, unlocked and easy to use.

SIGNAGE
Signs communicate important information during an evacuation. Exit signs, ‘no exit’ signs and directional evacuation signs are just three examples of signs that facilitate evacuation and must be inspected regularly.

Illuminated signs should be inspected each month to ensure they are present, legible, illuminated, of the correct type and in the right locations. Illuminated signs should also be tested to ensure they remain illuminated in the event of a failure of the main lighting supply. Signs that do not need to be illuminated should be similarly inspected but on an annual basis.

The same principles of regular inspection and maintenance apply to other passive fire protection items found in buildings.

Frequency of inspections
The frequency of inspections varies with the activity in the building and type of passive fire protection. At a minimum, passive fire protection should be inspected:

- daily when the building is in use, for crowd occupancies and for all buildings where building work is occurring that may affect a fire separation

- 6-monthly for crowd occupancies when not in use

- monthly and annually for all other occupancies

- after any work has been carried out on the building.

Signs should be inspected monthly and annually regardless of type of occupancy.

For more information on passive fire protection systems and maintenance, see the Department of Building and Housing’s Compliance Schedule Handbook, AS 1851-2005 Maintenance of fire protection systems and equipment, AS/NZS 1905.1:1997 Components for the protection of openings in fire-resistant walls – Fire-resistant doorsets and compliance document C/AS1 Fire safety.