

Building risk Assessment Scores

Introduction

An integral part of the address assessment is the assigning of risk scores.

The risk score will allow all buildings to be compared and prioritised based on both the likelihood and consequences of a fire occurring.

The process of assigning a risk score still comes down to the subjective opinion of operational firefighters although the risk factors are broken down into more specific aspects and assessed individually before being added together to form an overall risk score.

Scores

A score from 0 – 5 is assigned to each of the five aspects of the risk score and the combined total is the overall risk score out of 25. A risk score under 10 would be a very low risk and anything over 20 would be a very high-risk score.

It is expected in the future, that once a large number of properties are in the database with specific details of the risk as well as a risk score our computer system can be refined to calculate a risk score. By recognising the key risk factors such as construction, use, location, history etc and comparing with properties with similar risk factors the system may be able to assign risk scores automatically.

The Likelihood of Fire

The likelihood of a fire is assessed on 3 levels:

- The **people** in the building and what effect they have on the likelihood of a fire occurring.
- The **property** itself in terms of how that would contribute to the likelihood of a fire.
- The **process** or activity that occurs within the building and how they contribute to the likelihood of a fire occurring.

Consequences of Fire

The consequences of a fire are measured on two different levels. Firstly, **internally**, the likely consequences of a fire in terms of loss of life or property. Secondly, **externally**, the likely consequences to people and property in the wider community.

The effect of people on the likelihood of fire

This includes social factors, behavioural factors and physical factors as they relate to the occupants, or others who may pose a threat to the property. A score is assigned as follows:

0	Rarely or never is the property occupied. No Public Access. Properties such as utility sub-stations, or other buildings designed to house fixed equipment only.
1	Generally has a low human occupancy and low Public traffic. Occupants generally fit, unimpaired and responsible. Properties with a low level of occupancy and strong behavioural management. Retailers and workshops that are well run and controlled may fit into this category.
2	Moderate level of occupancy with good behavioural management in place. Regular occupants likely to be fit, unimpaired and responsible. Public traffic generally light or moderate with normal cross section of society. Retailers and workshops would often fit into this category.
3	Moderate to high level of occupancy with generally good behavioural management in place. Regular occupants likely to be fit, unimpaired and responsible with only the rare exception, or subject to good controls. Public traffic moderate or high and representative of a cross-section of society. A hospital or a McDonalds restaurant may well fit into this category.
4	Any level of occupancy where some poor behaviour by occupants likely. Some occupants may be of varying physical or mental capacity. Premises where alcohol or drug consumption is likely, although in a largely controlled environment. Public traffic likely to be moderate or high at times. A hotel, motel or restaurant may well fit into this category
5	Any level of occupancy, but generally moderate to high occupancy. Poor behaviour due to impairment, mental or physical disability, or due to anti-social or criminal tendencies evident. Any previous record of fire losses caused by human carelessness or recklessness. Nightclubs, detention centres, boarding houses may fit into this category.

Effect of property on the likelihood of fire

This includes building construction, contents and fire resistant qualities, likely sources of ignition present; and the design and layout of the property in relation to detection and spread of fire. A score is assigned as follows:

0	Construction of all fire resistant materials and realistic fire protection in place. Very little, or no property contained within the building of a combustible nature. Modern and well maintained heating and lighting sources. No chemicals or highly flammable goods whatsoever. Empty buildings of FRC construction that are sprinklered and well secured may fall into this category, as may a concrete block building used for storage of wire and steel.
1	Construction of all fire resistant materials and have appropriate fire protection. Contents may be of varying types but nothing of a combustible nature. Building is likely to be modern and have well maintained lighting and heating sources. What few chemicals or combustibles that are present, are stored in the correct manner. A modern hospital or modern office block may fit into this category.
2	A building that is predominantly built of fire resistant materials. Although, some modern timber framed and clad buildings may fit this category if a high degree of static fire protection is in place. The building may be newer or older, but having been well maintained. Contents of the building may be of a mixed type but not predominantly combustible. Any chemicals or combustibles stored in accordance with regulations. This may be a retail property, domestic situation or other non-hazardous occupation where a good standard of building and fire protection exists.
3	Construction may be of any number of materials although old wooden structures that are not sprinklered are unlikely to fit this category. The minimum amount of fire protection to meet regulations is in place. Contents of the building may be partially flammable but generally of a mixed nature. No obvious sources of ignition present and all hazardous or combustibles stored in accordance with regulations. Many retailers, wholesalers etc may fit this category along with less hazardous manufacturing and really well protected industrial sites.
4	Construction can be of several common materials. It is likely that the fire protection while present is not really sufficient for the degree of risk present. Building is likely to have one inherent source of ignition present such as exposed wiring, large numbers of chemicals or naked flame heating. The building may have concealed spaces or other adverse features. A panelbeaters shop which although well managed and protected is located in an older timber building a lot of welding and grinding is carried out there.
5	Construction of the building is likely to be inferior. Wooden frames and/or cladding. The property is likely to contain moderate to large amounts of hazardous contents either due to chemical toxicity or combustibility. The nature of the business will be such that there are various possible sources of ignition present, chemical, electrical or frictional, or from light or heat sources. An old timber boarding house or a backyard woodworker in a shed out the back would fit this category.

The effect of process on the likelihood of fire

This includes the processes or activities that are carried out at the premises. Consider if such activities are carried out with all possible precaution, are the activities of the property well managed and orderly, and most importantly are the activities hazardous by nature. A score is assigned as follows:

0	No process whatsoever is carried out on site. It is difficult to imagine what may attract a score of 0 but anything that is not occupied or used internally at any time. Perhaps a property that exists for aesthetic purposes such as a monument or a tomb may warrant a score of 0 in the process category.
1	There are few if any processes carried out at this building. What processes that are carried out would be deemed very non-hazardous in terms of their ability to be a source of ignition or to support a growing fire. Something like a small professional office where the processes are typing and filing. Little if any facilities for cooking or heating and few visitors.
2	These would be properties where a variety of common domestic or business related process may be performed but in the safest manner possible, or on a very small scale. Cooking or domestic heating for one or two people in a modern home for instance. There are also many retail properties that may fit into this category like clothing, footwear or homeware retailers.
3	These would be properties where there is a moderate number of activities performed which are of between low and high level of hazard. Industrial processes that don't require the application of heat or cooking on a reasonably large scale are the types of processes that may fall within this category. An average family home, a warehouse, or a department store might fit into this category.
4	These would include activities that would normally be in category 2 or 3 but are carried out on a large scale or with less safeguards in place. This category may also include the most hazardous of processes but where they are carried out in the safest manner possible. Consider for this category, a well-run industrial site, a poorly managed food preparation site, an average panel-beating shop where there are many possible ignition sources.
5	These would be all of the most hazardous types of processes such as plastic moulding or timber milling and drying in kilns, paint manufacturing etc. In addition to the obvious occupations the worst managed of the semi hazardous occupations might attract a process score of 5. An example might be a takeaway bar that appears poorly run with some glaring problems such as poor storage of hazardous goods and obvious lack of good housekeeping.

The effect of internal exposures on the consequences of fire

This can include the degree of loss that may occur in the event of a fire at the premises, the life exposure such as the number of people, their duration and frequency of occupation; and the value of property exposed. A score is assigned as follows:

0	No life exposure whatsoever. Premises that are never, or virtually never, occupied by people. The value of the property is likely to be low or of a nature that is unlikely to suffer great damage in the event of a fire. This score would be rare, but again the example of a monument or a memorial may be the most likely example.
1	Very little life exposure would exist. There would be no sleeping and occupation is more likely to be occasional (to service equipment or record data), rather than permanent like a home or retailer. The value of property is likely to be low to medium and generally of a non-flammable nature. A pump relay station or a bulk store for some inert material like bricks or stone may fit this score.
2	Some regular occupants are likely. Significant numbers of occupants for short periods of time, or a few people as permanent or semi permanent occupants. The possibility of some high value property in the building. Both life and property likely to be quite well protected. Some homes may fit this category (not large families or occupants with mobility issues). Many moderate sized retailers, trades and manufacturing sites may fit this category where there are quite low occupant numbers and a reasonable level of fire protection is in place.
3	Significant life and/or property exposure. Possibly a large family home or a home with elderly or disabled occupants. Property likely to be of moderate value but not well protected, or high value with a good level of protection. Occupant numbers could be quite high but not high numbers of sleeping occupants. A McDonalds Restaurant, a shopping complex or a large family home may fit into this category.
4	Major life exposure is likely to exist although generally very well protected. Property value could as high as possible but again a significant amount of protection or a lack of proneness to fire damage may be a feature of the property. A hospital or rest home that is sprinklered and has duty staff 24/7 may fit into this category.
5	A major life exposure exists. Likely to cover nightclubs etc where egress is always a problem, or a rest home where fire protection meets bare minimum requirements only. Property is likely to be extremely valuable and very sensitive to the effects of heat and or smoke. A museum or gallery of fine art may come into this category also.

The effect of external exposures on the consequences of fire

The degree to which the wider community will be affected by the consequences of a fire. For example: the social impact of the loss of the facilities or services the property provided, the environmental impact of run-off and fumes, and the disturbance to employment and the wider economic activity in the community. A score is assigned as follows:

0	Would be a property where the community on the whole would probably benefit by having the property be destroyed. Clearly abandoned and dangerous building would fit this category. Building may also be isolated and poses no threat to neighbouring properties.
1	Only a very minor impact on the wider community would be felt in the event of a fire loss. In terms of domestic properties the occupants are likely to be resilient and accustomed to moving regularly. In terms of commercial properties the occupants are likely to be small local employers of low paid staff more likely owner operated. Likely there is plenty of competition and the goods or products produced are of marginal benefit to the wider community. A small casino bar may fit into this category. Any low cost rental accommodation may meet this score if there is an over supply of rental properties
2	A property that may be a local employer or provide some relatively significant social function. The consequences of a fire loss may be felt within the wider community but not to a great degree and only for a relatively short period of time. Many retailers and professional offices may fit this category especially where there is an alternative goods or services provider in the community. There may be some environmental harm but kept to a minimum through good management and levels of protection. Some examples may be a local Fish & Chip shop or Dairy in a decent sized town or city, or even more specialised businesses in larger cities.
3	A property that may be a relatively large employer and financial contributor to the local economy. There may be significant environmental threat but well managed and protected. May be the provider of important social services although alternative services should be able to be installed within a relatively short period of time. A Fire Station, Doctors Surgery or the local McDonalds may fit this category, as might a well-run manufacturer of electronic goods.
4	A property that is deemed very important in the local community. May be a supplier of products that is very important to the local community or may be the employer of many local unskilled labourers. The property may pose a serious threat to the local environment due to possible runoff and fumes or due to proximity to particularly sensitive environment. May be the provider of important local goods or services particularly social services. Some examples of this category could be a unique historic or tourist site, or an agricultural supplier in a rural community. The local bank or post office (where few alternatives exist). Local trends and geographical proximity to other towns etc will have a bearing on this score.
5	Generally properties that if lost will have a far-reaching and major adverse effect on the local community. Often smaller communities rely almost solely on a single industry or employer. It may be a tourist site or historic site for which the community is famous. Some examples might be the freezing works, Milk factory or a timber mill in a rural town such as Kawerau or Tokoroa. A score of 5 may be justified where the property supplies crucial services such as power, sewerage and water particularly where poor contingency plans exist. The environmental

Scenario examples

People Score Small retail clothing shop in a suburban Mall. People risk consists of two staff members and regular customers People risk = 1-2

Large office/community services building. Large number of staff both professional people and volunteer services. High customer numbers including people with mental disabilities, drug & alcohol issues and financial problems. People Risk = 3-4

Property Score

Multi-Storey, modern, sprinklered, commercial building made of largely concrete and glass. Property Score = 1-2

Single storey, 30 year old school room type construction (weatherboard) used as a kindergarten. Relatively high fire loading due to paper, books etc. Property Score = 4

Process score

Private dwelling owned and occupied by elderly person. Processes consist largely of cooking and heating for one person.

Commercial premises where a manufacturing process includes the heating and moulding of plastics. Although well monitored and run there are several ignition sources involved. Process Score = 4

Internal Exposures

A small Mechanics workshop where owner and one employee service one or two vehicles at a time. Occupants are highly mobile, have easy means of escape and relatively low value building and contents. Internal Exposure Score = 1-2

Residential Care for the elderly with varying degrees of mobility. Due to number of lives at risk within the property. Internal Exposure Score = 4-5

External Exposures

Local Bakery. Owner Operated. One of two in suburban shopping block. Little if any impact on community if it were to close. External Exposure = 1-2

Chemical Depot. Other businesses depend on the depot to supply chemicals to keep their businesses running. Run-off from an incident could affect important waterway in the township and fumes could be harmful to people and animals. External Exposure = 4-5