



**FIRE
EMERGENCY**

NEW ZEALAND

Fire Research and Investigation Unit

HEADS UP

Issue 30 – Fires in Buildings under Construction – Released 5 September 2020

BACKGROUND

Fire and Emergency has attended several fires in buildings under construction or renovation where incompletely installed fire protection systems contributed to the development and spread of the fire, or impacted our ability to effectively deal with it. Typically, passive and active fire protection systems designed to detect, contain or control fires are often incomplete or their effectiveness is compromised while buildings are under construction.

HYDRANT SYSTEMS

Firefighting in multi-storied buildings was substantially delayed when building hydrant systems were inoperative due to construction or renovation activities.

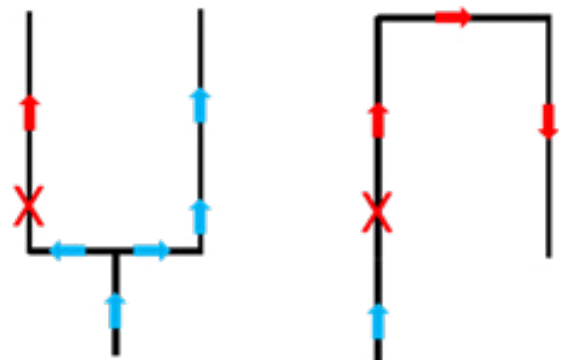
NZS 4510:2008 requires that building hydrant systems aid firefighting operations within buildings during construction, normal operation, and demolition, recognising there is a heightened risk of fires during construction and demolition periods.

Importantly the Standard requires that “building hydrant systems must be enlivened progressively (including pumps, if required) as construction advances”. Paragraph 8.1) requires fire hydrant systems to be commissioned progressively as the building construction proceeds. Paragraph 8.1.1.2 requires that, in a multi-storeyed building under construction, the fire hydrant outlets must be functional no lower than 9 metres below the highest floor slab.

Fire and Emergency attended a fire where the highest functional hydrant was more than 30 metres below where the fire occurred as the commissioning of the hydrant system had not kept pace with construction.

In another instance, due to a lack of detailed hydrant schematics, a hydrant system was thought to be ‘tee’d to supply different stairwells.

While undertaking maintenance, a valve was closed in the belief the operation isolated one side of the building. In fact, the system was continuous and the system became isolated from the entire building. When a fire broke out on the top level there was a 32 minute delay while a hose line was established to the fire.



Schematic of how the hydrant layout was thought to be (left) and how it was in reality (right). Blue arrow showing water, and red the isolated area.

HEADS UP

HOT WORKS

Hot works during construction have accidentally started several fires. In one example a fire occurred on the top level of a high rise building when nearby light combustibles ignited. They were located immediately behind the area where gas cutting was occurring. Welding, brazing, gas cutting, applying waterproofing membrane and many other construction activities involve hot works which bring a range of inherent fire risks.

Basic fire prevention measures include:

- relocating movable combustibles 10m away and shielding immovable combustibles
- monitoring heat transfer through steel members and checking for easily ignitable items in the immediate vicinity, around and behind the area where work is occurring
- ensuring adequate fire suppression is immediately available such as appropriately sized fire extinguishers. The discharge of a standard 9kg extinguisher lasts around 22 seconds so two extinguishers can provide improved protection to ensure adequate knock down
- ensuring a 30 minute (minimum) watch is maintained after finishing.

For an extensive list of considerations, refer to Worksafe assessment tools:

<https://worksafe.govt.nz/topic-and-industry/welding/health-safety-in-welding/>

FIRE ALARM SYSTEMS

Notification of a fire in a large city complex nearing completion was delayed 50 minutes because the fire alarm system for the building was isolated and didn't activate. Fire alarms are not required to be commissioned during construction and it is common during renovations for these systems to be isolated to avoid accidental activation. However, consideration should be given to how areas of a building are monitored and the alert raised in the event of a fire, when those areas have had the fire alarm system isolated. As fire alarm panels are usually not functioning, site emergency plans should allocate a site manager who can meet and direct firefighters to the appropriate location.

ACCESS WITHIN THE SITE

Site access for firefighters is a frequent challenge during fires on construction sites. This can be caused by a lack of information on site layout, egress that is only partially complete (e.g. stairs) or a lack of labelling of various levels and areas. For taller buildings the use of lifts can present challenges. During a recent fire, the installed lifts had been programmed for the contractors' use and did not respond to recall or to the firefighter's override controls. That meant they were unusable during the fire suppression operations.

HOUSEKEEPING

Construction sites produce debris which is often well managed and contained within skips but are a source of light combustible fuels that ignite easily in both accidental and deliberate fires. Recommended safe distances to position skips away from buildings can be viewed [here](#).

FURTHER INFORMATION

Refer to: www.fireandemergency.nz/business-and-landlords/designers-guide-to-firefighting-operations/



Hot works photos.



Fire alarm panel.